

2013

OUR YEAR IN REVIEW

The second Strategic Highway Research Program (SHRP 2) addresses the need to speed the delivery of transportation projects that meet users' expectations for safe and reliable trips on roads planned, built, and operated to help communities thrive. With less than two years remaining in TRB's cooperative agreement with the Federal Highway Administration (FHWA), SHRP 2 continues to carry out a full agenda while working to transfer the knowledge developed during the program to FHWA, the American Association of State Highway and Transportation Officials (AASHTO), and implementing agencies, such as state departments of transportation (DOTs). Project activities in all four focus areas—Capacity, Renewal, Safety, and Reliability—will continue well into 2014.



STRATEGIC HIGHWAY RESEARCH PROGRAM
Accelerating solutions for highway safety, renewal, reliability, and capacity

Capacity

While the Reliability focus area addresses the costly and complex problem of congestion through improvements in transportation operations, the Capacity focus area addresses systematic ways to reduce congestion by speeding the delivery of transportation projects that can increase capacity.

Many stakeholders with diverse points of view and goals are represented in the process of planning and delivering highway capacity, and finding the most appropriate solutions is inherently difficult. To achieve its objectives, the research has addressed collaborative decision making; ecological approaches to integrating environmental protection and transportation planning; the consideration of freight in the planning process; the economic impacts of highway investments; and the development of tools for analyzing travel demand.

AASHTO conducted a series of workshops this year with practitioners across the country. Participants provided valuable input for refining and finalizing the main product of the Capacity focus area, a web-based resource recently renamed PlanWorks, which encompasses many of the Capacity research products. At its core, PlanWorks offers a basic decision support system for planning, programming, and project development activities by providing information that practitioners need.

Additional research topics, including freight and operations, are being incorporated as PlanWorks moves from the beta version to its final form and host agency. Pilot test projects have become a major source of information to improve PlanWorks, with 12 teams of practitioners providing insights into to what is most valuable and what is still needed. Transportation agencies in California, Colorado, Minnesota, Oregon, South Carolina, Washington State, Virginia, and West Virginia have used PlanWorks and its applications to support an array of transportation planning, programming, and project development needs.



Renewal

The Renewal focus area addresses the need for a consistent and systematic approach to delivering infrastructure renewal projects quickly, with minimal disruption to traffic and communities, while producing long-lasting facilities. Of 31 Renewal projects, 19 are complete, 8 projects are being pilot-tested, and 4 are still active.

Many innovative methods that could save time and money have not been widely used for a variety of reasons. Renewal research has addressed these reasons by developing advanced products and methods that transportation agencies can apply with confidence. Examples include next-generation project management tools; standard and customizable plans for innovative bridge designs; tools for managing utility conflicts; performance specifications to speed construction, reduce oversight, and encourage innovative approaches; an online tool to select the appropriate nondestructive testing techniques for pavements, bridges, and tunnels; and resources that streamline permitting processes and reduce delays on projects that include railroads.

New York State DOT is using 12 Renewal products, including several on the Tappan Zee Bridge project over the Hudson River. Some products are being tested as part of demonstration or pilot projects, while others involve full implementation of final products. Seven Renewal projects are included in the first two rounds of the FHWA Implementation Assistance Program, which will quickly build expertise among transportation agencies across the nation.



Safety

SHRP 2 undertook a study of unprecedented scope and scale in conducting the Naturalistic Driving Study to develop an objective way to understand the role of driver behavior and performance in crash causation. Approximately 3,300 volunteer drivers in data collection areas in six states participated in the study by allowing researchers to install cameras and sensors in their vehicles to capture real-world driving data.

The data collection, which ended in November 2013, yielded data for 5 million trips that will be available for analysis. Data also were collected on more than 12,500 centerline miles of roads that study participants drove to determine the relationship of crash risk to characteristics such as grade, curvature, cross slope, posted speed limits, and intersections. A spatial database of roadway characteristics, features, and other data, such as weather and work zones, will describe the context in which participants drive. Additional data were collected in the six study sites, including the five-year crash history, traffic information, weather, work zones, changes to infrastructure, and aerial imagery.

The data offer the highway safety community an extraordinary opportunity to study direct relationships between driver behavior and safety outcomes. Benefits to safety will come from analysis of the data to develop improved countermeasures, including targeted policies for mitigating risky driving behavior, safer roadway design, more effective deployment of countermeasures, in-vehicle safety technology, and other crash reduction actions. Three data analysis projects, addressing driver distraction and safety at intersections and rural two-lane roads, are under way and findings will be available in 2014.

In addition to completing data collection in the field, work in 2013 focused on developing methods for researchers to access and analyze the data while protecting personal information about participants; a long-term stewardship plan was established for the database. Selected data will be available through a website, and all data will be available to qualified researchers under sharing agreements that protect the confidentiality of the participant drivers.

The newly-formed Committee on the Long-Term Stewardship of Safety Data from SHRP 2 met twice in 2013 to examine the stewardship requirements and to advise on strategies for meeting the requirements. All of these activities will support use of the data to address issues such as distracted driving, speeding, aggressive driving, seat belt use, impaired driving, highway design, traffic control device standards, and vehicle design.



Reliability

Research conducted under the Reliability focus area is providing a comprehensive approach to reducing unexpected delays and congestion caused by events such as crashes, special events, work zones, weather events, and surges in demand. The research products provide transportation agencies new tools and methods for organizing their agencies, evaluating appropriate countermeasures, planning projects, and operating highway systems in ways that improve travel time reliability.

With the core research now mostly complete, the focus this year has been on converting research results into products through validation and pilot-testing projects. In one project, teams including transportation agencies in California, Florida, Minnesota, and Washington are testing combinations of Reliability products that provide new resources for data collection; for the analysis of design effects, methods to enhance capacity, and benefit-costs; and for decision making during planning or programming. These projects are ongoing through June 2014.

Four Reliability projects are related to national training for traffic incident responders from all the disciplines that have roles at an incident scene. FHWA is already offering this multidisciplinary training, which is in great demand. As of September, nearly 15,000 responders in 23 states had completed the training.

The two active projects include conversion of the curriculum to an e-learning tool and finalizing a tool to assess the usefulness of the training for the individual and the agency. Both projects will be completed by early 2014.

Three other projects will help ensure dissemination and knowledge transfer of the Reliability research. One is a web portal to access comprehensive information about travel time reliability; another will develop five regional operations forums to provide transportation agencies with education and training on the best use of SHRP 2 Reliability products; and the third will establish an archive to make data collected through the SHRP 2 Reliability projects available for research.



Supporting Implementation

This past year was pivotal, as SHRP 2 turned much of its focus to converting research results into tools and resources for delivery to users. Like the program itself, these activities responded to user goals and were carried out in collaboration with stakeholders and partners.

More than 700 transportation experts have served on SHRP 2 committees, including representatives from 40 states; 37 states have had hands-on involvement through 119 field activities, such as pilot tests, demonstration projects, data collection, and specifications development. Findings from these activities, along with the insights and experiences of participating transportation agencies, are applied to develop and improve products before the FHWA and AASHTO implementation programs and activities make them widely available. The results have taken many forms, including more than 30 web-based resources, as well as guides, curricula and other training materials, analytical models, and data sets.

In February, FHWA and AASHTO initiated the SHRP2 Implementation Assistance Program, which offers incentives for transportation agencies to adopt the products of the research program, known as SHRP2 Solutions. The first round of assistance funding was available for the implementation of six products; as a result, transportation agencies in 34 states and the District of Columbia undertook 108 projects. The second round of the program offered four products in August, and two additional solicitation rounds are planned for 2014. The SHRP2 Solutions website serves as a resource for information about implementation. It is on the web at www.fhwa.dot.gov/GoSHRP2.

By design, SHRP 2 research addresses big challenges that confront transportation leaders across the country. The challenges include increasingly urgent needs to rebuild highway infrastructure, to reduce congestion, and to address the primary factor in most crashes—driver error and behavior. These challenges were addressed in four research focus areas; the following sections describe accomplishments in each focus area during the past year.



Publications and Communications

New this year in the communications toolkit is a webinar series, SHRP2 Tuesdays. Twice a month, from May through December 2013, free webinars have provided substantive technical overviews of research projects and results. Where possible, SHRP2 Tuesdays have included a first-person account from someone who has used or tested the product. Registered participants can earn professional development hour credits.

The pace will quicken in 2014 to accommodate the number of completed projects—three webinars are scheduled each month from February through June. The schedule is posted on the SHRP 2 website, and announcements are sent via the TRB E-Newsletter and the SHRP2 News.

Formal research reports describe the work done in each SHRP 2 project, and many projects also produce guides, toolkits, and other publications. In 2013, the program published 22 documents; nearly 90 SHRP 2 publications are available for download²; many are also available in print and can be purchased from the TRB Bookstore. E-book versions for iPad, Kindle, and Google have been developed for 16 reports, available from e-book vendors.

Each research project is summarized in a 4- to 8-page Project Brief, available on the website; 30 Project Briefs have been published. Videos, articles, brochures, and product charts that offer detailed information about the research results are also available on the TRB website at www.TRB.org/SHRP2.



2014 SHRP2 Tuesday Webinars

- Jan 21: Freight Demand Modeling and Data Improvement Strategic Plan (C20)
- Feb 4: Pavement Renewal Solutions (R23)
- Feb 18: Analytic Procedures for Determining the Impacts of Reliability Mitigation Strategies (L03/07/33)
- Feb 25: A Framework for Collaborative Decision Making on Additions to Highway Capacity (C01/18/22)
- Mar 11: SHRP 2 Naturalistic Driving Study
- Mar 18: High-Speed Nondestructive Testing Methods for Mapping Voids, Debonding, Delaminations, Moisture, and Other Defects Behind or Within Tunnel Linings (R06 G)
- Mar 25: Real-Time Smoothness Measurements on Portland Cement Concrete Pavements During Construction (R06E) and Development of Continuous Deflection Device (R06F)
- April 1: A Systems-Based Performance Measurement Framework for Highway Capacity Decision Making (C02) and Community Visioning Approach to Support the SHRP 2 Collaborative Decision-Making Framework for Additions to Highway Capacity (C08)
- April 8: Roadway Information Data from the SHRP 2 Naturalistic Driving Study
- April 29: Identifying and Reducing Worker, Inspector, and Manager Fatigue in Rapid Renewal Environments (R03)
- May 6: Bridges for Service Life beyond 100 Years: Service Limit State Design (R19B)
- May 13: Innovative Bridge Designs for Rapid Renewal (R04)
- May 20: Innovations in Locating and Characterizing Underground Utilities (R01A-C)
- June 3: Using Both Infrared and High-Speed Ground-Penetrating Radar for Uniformity Measurements on New HMA Layers (R06 C) and Nondestructive Testing to Identify Delaminations between HMA Layers (R06D)
- June 10: Strategic Approaches at the Corridor and Network Levels to Minimize Disruption from the Renewal Process (R11)
- July 22: Analysis of In-Vehicle Field Study Data and Countermeasure Implications (S08)
- Aug 26: Traveler Information and Travel Time Reliability (L14)
- Sept 9: Local Methods for Modeling, Economic Evaluation, Justification and Use of the Value of Travel Time Reliability in Transportation Decision Making (L35)
- Sept 16: Incorporating Reliability Performance Measures in Operations and Planning Modeling Tools (L04)
- Sept 23: Utility Locating Technology Development Utilizing Multi-Sensor Platforms (R06B)