



Moving Research Results into Implementation

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The suite of products rolling out of the second Strategic Highway Research Program (SHRP 2), a more than \$200 million investment, is impressive. These products can improve the way transportation agencies do business and can save lives, save time, and save money for the users of the U.S. highway system. These outcomes are only possible, however, if state departments of transportation (DOTs) and other implementing agencies widely use the SHRP 2 products.

The ultimate measures of success for an applied research program and for SHRP 2 specifically are the following:

- ◆ The extent to which the products are incorporated into the everyday business practices of implementing agencies,
- ◆ How the products are used routinely to improve the delivery of services, and
- ◆ Whether users of the highway system experience improved safety, reduced congestion, and less disruption from construction activities as a result of the product applications.

Designed for Implementation

The Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the Transportation Research Board (TRB) have developed an approach to facilitate the movement of research results and products into widespread use. To provide a context for the approach adopted by FHWA, AASHTO, and TRB, some historical perspective is helpful.

From the beginning, SHRP 2 was designed for implementation. The goal was to produce results that would be useful to professionals in transportation, as well as in other related fields. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), the legislation that originally authorized SHRP 2, required TRB to “complete a report on the strategies and administrative structure to be used for implementation of the results” of SHRP 2 within two years of the research program’s start. In January 2009, TRB published Special Report 296, *Implementing the Results of the Second Strategic Highway Research Program*, which included several recommendations on implementation and estimated that a \$400 million budget would be needed.¹

Addressing the Transition

As the research program progressed, the SHRP 2 Oversight Committee and the Technical Coordination Committees for each of the four focus areas began to address the transition from research to implementation. The committees recognized that research and implementation have no clear dividing line and that further work often is needed to convert research results into products for use by practitioners in the field.



Recommendations for SHRP 2 implementation were presented in Special Report 296.



PHOTO: MISSOURI DOT

More than 65 SHRP 2 products, from pavement preservation approaches to environmental review strategies, are available for implementation.

¹ www.trb.org/Publications/Blurbs/160621.aspx.

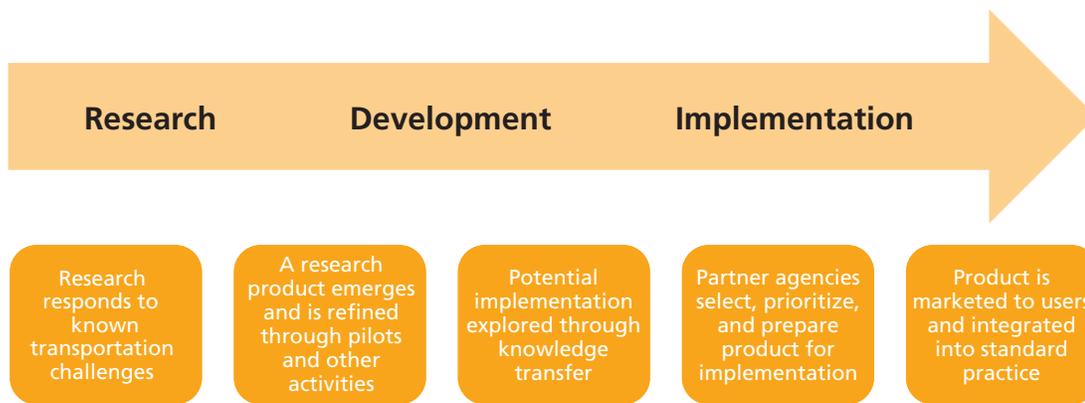


FIGURE 1 Continuum from research to implementation.

In many cases, pilot testing is necessary to identify refinements to the products and to demonstrate the benefits. The transition from research to implementation can be approached as a continuum (see Figure 1, above). TRB undertook several development activities to ensure that products would be ready for deployment when the research phase was complete.

FHWA, AASHTO, and TRB defined implementation as the routine use of a product in everyday business by state DOTs and other agencies. Following the recommendation of Special Report 296, FHWA has assumed the lead responsibility for managing SHRP 2 implementation, working in partnership with AASHTO, the National Highway Traffic Safety Administration (NHTSA), and TRB. The approach is

Assistance Program Accelerates Implementation

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To improve and accelerate the deployment of solutions from the second Strategic Highway Research Program (SHRP 2) by state departments of transportation (DOTs), metropolitan planning organizations, and local or tribal transportation agencies, the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) have established the SHRP 2 Implementation Assistance Program.

The assistance varies with the status of product development and the steps necessary to make the product ready for market. The assistance may be in the form of direct funding to the recipient, technical assistance through FHWA or AASHTO, or both. The assistance includes the following:

- ◆ **Proof-of-concept pilots** for products that FHWA and AASHTO are evaluating for final readiness before beginning widespread implementation. Contractor support may be provided during the pilot to collect data or to analyze the effectiveness of the product.
- ◆ **Lead adopter incentives** to offset implementation costs and help mitigate the risks for states willing to be early adopters. In exchange, recipients must document the implementation processes or serve as a peer champion to other states interested in implementing the product.
- ◆ **User incentives** to support implementation activities for products ready for widespread deployment and funding. Examples include conducting internal assessments, hosting



Photo: FHWA

A program to provide assistance for the implementation of SHRP 2 products, such as accelerated replacement of the Keg Creek Bridge in Iowa, has been established by state, local, and tribal agencies; FHWA; and the American Association of State Highway and Transportation Officials.

peer exchanges, building capacity, providing training and technical assistance, or offsetting other implementation costs.

These implementation assistance opportunities are now available; opportunities are announced twice each year.

FHWA is establishing a Safety Analysis Center to provide technical assistance and learning opportunities for transportation partners to use the SHRP 2 Safety databases effectively. This includes assistance in scoping research and in applying new analytical approaches and tools. The implementation assistance will start when the SHRP 2 Safety databases come online in 2015.

Agencies interested in participating in the Implementation Assistance Program should visit FHWA's GoSHRP2 website, www.fhwa.dot.gov/goshrp2/.

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From Concept to Countermeasure

Applying Early Findings from the Naturalistic Driving Study

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The American Association of State Highway and Transportation Officials (AASHTO) anticipates enormous value from the data gathered in the Naturalistic Driving Study (NDS) managed by the second Strategic Highway Research Program (SHRP 2). The largest-ever study of its kind, with an extremely diverse group of participants, the NDS will yield many insights about driver behavior for those charged with ensuring that the nation's roadways are as safe as possible.



Oregon DOT's innovative dedicated green bicycle lanes; many state initiatives expect to benefit from actionable safety countermeasures from the SHRP 2 Naturalistic Driving Study.

To that end, AASHTO is pursuing an early SHRP 2 implementation activity, a concept-to-countermeasure initiative to demonstrate the use of the NDS database to state departments of transportation (DOTs) and others. With the support of the Federal Highway Administration (FHWA) and the Transportation Research Board (TRB), this initiative will demonstrate the usefulness of the entire dataset in the concept phase and perhaps lead to changes in AASHTO manuals, guidebooks, and other applications in the countermeasure phase. Through AASHTO's national network of state transportation professionals, the research results from the NDS can efficiently make their way into actionable countermeasures for the nation's roadways.

Because driver behavior plays a role in 90 percent of roadway crashes, states are eager to turn research findings into actionable and effective roadway safety countermeasures. AASHTO's committees comprise leaders in state DOTs who are knowledgeable about cutting-edge research like the NDS and who will implement the research results to improve roadway standards. Through its committees, AASHTO will gauge members' views on the most pressing safety issues for state DOTs. This information will facilitate beneficial short-term research with reduced data sets from the NDS.

In addition, AASHTO will look to use previous findings from TRB's NDS pilot studies to produce additional roadway safety countermeasures. With the help of FHWA and TRB staff and database experts, AASHTO will communicate with the professionals who are on the front lines of implementing roadway countermeasures and who can best discern which products will have the highest benefits as roadways are built, maintained, and operated.

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to enlist a critical mass of early adopters to use the product and to establish through experience a model for others to follow. The opinion of peers is key to widespread adoption of any new product. FHWA also may support a limited number of pilot tests when necessary.

Components of Success

The partner agencies agreed that successful implementation will include the following components:

- ◆ Attaining the tipping point of national adoption with a significant number—10 to 15 percent—of implementing agencies incorporating the SHRP 2 innovations into everyday practices;
- ◆ Creating nationwide interest among a broad cross section of implementing agencies and stakeholders in following the lead of the early implementers;
- ◆ Creating the support needed to transfer the innovation from early applications to standard practice by providing the necessary policies, manuals, guidance, specifications, codes of practice, training, information technology (IT) platforms, and professional technical support;
- ◆ Developing the institutional support within AASHTO and FHWA to perpetuate an innovation into standard, ongoing practice;
- ◆ Generating awareness, support, and use of the product among private-sector consultants, contractors, and material suppliers, and by their organizations;
- ◆ Having college and university students learn about the innovation in their studies and having researchers use the product to perform further research on the topic;
- ◆ Providing metrics for the success of the innovation and evaluating the impact of the innovation on practice; and
- ◆ Reducing the net cost of implementation to make the innovation financially attractive and administratively feasible, demonstrating the value of implementation.

Developing Plans

In spring 2012, FHWA, AASHTO, and TRB jointly developed an initial implementation plan to use the \$81 million of implementation funds then available from SAFETEA-LU and its extensions. The plan identified 31 products in the Renewal, Reliability, and Capacity focus areas for implementation over a three-year period; set aside \$10 million for Safety implementation, and allocated additional funds for outreach and communication, IT support, program management, and support for other products not in the plan.

In July 2012, Congress passed the Moving Ahead for Progress in the 21st Century Act (MAP-21), which authorized implementation of SHRP 2 through 2014. MAP-21, however, required the states to use a percentage of their Statewide Planning and Research (SPR) funds in 2013 and 2014 for SHRP 2 implementation; moreover, at least three-quarters of the states would have to agree on the percentage amount. Forty-five states voted for all states to set aside 4 percent of their SPR funds for SHRP 2 implementation. Added to funds from FHWA, the state funding increased the amount available for implementation to \$169 million.

In spring 2013, FHWA and AASHTO developed a plan to implement 66 products from the Renewal, Reliability, and Capacity focus areas and to set aside \$33 million for implementation activities for the databases developed in the SHRP 2 Safety focus area, including maintenance and support of the databases for five years. An AASHTO task force with representatives from 28 states provided input to the plan.

Support Activities

FHWA and AASHTO are working together to provide the following implementation support activities:

- ◆ Educating implementing agencies about SHRP 2 products and processes to gain ready adoption and use in everyday practices;
- ◆ Developing technical standards, policies, and construction specifications, as appropriate, for highway agencies to apply the SHRP 2 products within complex transportation environments;
- ◆ Training agency personnel in the use of the SHRP 2 products, increasing awareness and understanding of the innovations to achieve widespread adoption;
- ◆ Providing technical assistance to lead agencies, covering the costs of initiating the use of new products, and providing incentives to undertake demonstration projects; and
- ◆ Establishing communities of practice to facilitate peer-to-peer support.

With input from potential product users, implementation plans are being developed for each of the 66 products. These product-level implementation plans address goals and strategies, the target audiences, outreach and communications, budget, schedule, IT support, and evaluation.

Maximizing the Value

Implementation of individual SHRP 2 products will generate much value, but the greatest value will come from implementing combinations of products

on individual highway or corridor projects. A strategic approach unified the development of research projects that were interrelated and supported each other; use of the interrelated products on a highway or corridor project therefore is likely to yield the greatest benefits. SHRP 2 products can be adapted to meet an implementing agency's specific needs or to fit an agency's business processes.

The 66 products available for implementation, plus the safety databases, are many more than any single agency will be able to implement. State DOTs and other implementing agencies should identify their highest-priority business needs and evaluate which SHRP 2 products can best help in meeting those needs.

The TRB, FHWA, and AASHTO websites offer extensive information about the products, the assistance available to support implementation, and the experiences of early users of the products:

- ◆ www.TRB.org/SHRP2;
- ◆ www.fhwa.dot.gov/goSHRP2; and
- ◆ <http://SHRP2.transportation.org>.

Pilot projects such as Iowa DOT's accelerated replacement of the US-6 bridge over Keg Creek—shown here in progress in October 2011—have demonstrated the practical, efficient products, tools, and procedures developed through SHRP 2.

Photo: FHWA

