SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

SHRP2 MILESTONES

Transportation Projects Powered by SHRP2

INSIDE ISSUE 2

The second Strategic Highway Research Program (SHRP2) is providing transportation agencies with new and innovative ways to improve safety, rebuild aging infrastructure, and increase mobility for the traveling public. This news brief highlights significant project developments, case studies, and best practices from around the country. There are 350 SHRP2 projects underway across all 50 states, the District of Columbia, and Puerto Rico.

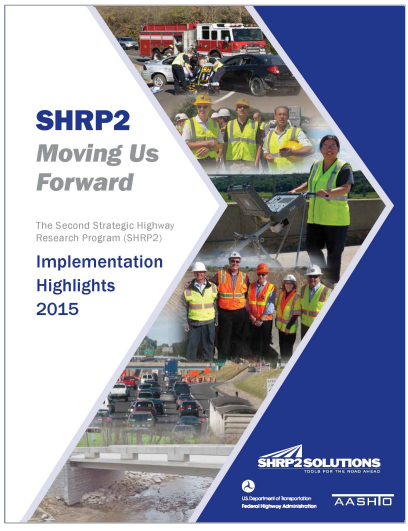
SHRP2 Moving Us Forward

Implementation Highlights

Coming in January 2016, a new report, *SHRP2 Moving Us Forward*, will highlight SHRP2 implementation activities and progress over the past three years. The American Association of State and Highway Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA) share a goal of making SHRP2 Solutions available to as many transportation professionals as possible— knowing that the extensive research would reap important innovations that could change the way transportation agencies approach familiar challenges. In 2013, AASHTO and the FHWA launched the SHRP2 Implementation Assistance Program (IAP) to deploy SHRP2 Solutions in real-world situations.

As of October 2015, SHRP2 has successfully delivered $122 million in financial and technical assistance to agencies across the nation. More than 40 SHRP2 Solutions have gone through six rounds of the IAP, enabling state departments of transportation (DOTs), metropolitan planning organizations (MPOs), tribal agencies, FHWA's Federal Lands divisions, and others to benefit from the power of innovation. Additional significant SHRP2 deployments have taken place outside the IAP, most notably through FHWA's Every Day Counts initiative.

The upcoming report emphasizes accomplishments from the first three rounds of the IAP. *SHRP2 Moving Us Forward* includes a summary of each product's implementation activities, four feature articles showcasing solutions that have already demonstrated extraordinary results, and a description of what's to come. In April, round 7 of the IAP will offer incentives for 13 SHRP2 products. As SHRP2 implementation continues, subsequent reports will focus on the products launched in rounds 4-7 of the IAP and the impacts all SHRP2 Solutions have made on the state of practice.



The report, *SHRP2 Moving Us Forward,* will be available in January through the GoSHRP2 website.

Scan for the latest *SHRP2 Milestones* on GoSHRP2

SHRP2 concentrates resources in four broad focus areas: Renewal, Reliability, Capacity, and Safety. Visit SHRP2 booth 1337 to learn more about the program and for additional product information.

Roadmap to SHRP2

Solutions showcased at TRB Annual Meeting 2016

Transportation practitioners are working hard to build better projects faster and more safely, all while reducing costs and inconvenience to motorists. Through SHRP2, a new body of knowledge now exists to help practitioners address pressing roadway needs.

Where ideas get traction

SHRP2 offers dozens of ready-to-deploy solutions, as well as the critical technical and financial support needed to successfully apply these innovations. Receive the latest information about SHRP2 Solutions at the Transportation Research Board (TRB) 95th Annual Meeting, January 10-14, 2016, in Washington, DC. Meet with Product Leads, participate in workshops, attend demonstrations, and join poster sessions about new assistance opportunities available in April 2016 through Round 7 of the Implementation Assistance Program.

Relevant resources, reports, brochures, and fact sheets available at the SHRP2 exhibit display in the TRB Exposition Hall. Explore how organizations across the country are using SHRP2 Solutions on hundreds of projects to save lives, money, and time.

EVENT #	TITLE	TIME
	SUNDAY, JANUARY 10	
W 142	SHRP2 C20, Part 1: Innovations in Local Freight Data Implementation Projects—Progress and Outcome	9:00 AM - 12:00 PM
W 123	Long-Life Concrete Pavements	9:00 AM - 12:00 PM
W 188	SHRP2 C20, Part 2: Regional Freight Data Collaboration and Standardization	1:30 PM - 4:30 PM
W 182	Introduction to SHRP2 Roadway Information Database	1:30 PM - 4:30 PM
	MONDAY, JANUARY 11	
S 387	Operational Effects of Geometrics	2:00 PM - 3:45 PM
S 374	Current Trends in Transportation Funding and Financing	2:00 PM - 3:45 PM
E 459	Student Competition Winners: Research Using SHRP2 Safety Data	4:15 PM - 6:00 PM
E 436	SHRP2 Education Connection, Part 1: Integrating SHRP2 Products into University Curricula	4:15 PM - 6:00 PM
	TUESDAY, JANUARY 12	
S 515	Vehicle Inventory and Use Surveys	8:00 AM - 9:45 AM
S 616	Bridge Sliding: An ABC Method to Reduce Construction Time	1:30 PM - 3:15 PM
S 678	Innovation Management: Building a Foundation for Effective Technology Transfer Through Integration with the Research Process	3:45 PM - 5:30 PM
S 680	Using Naturalistic Driving Study Data for Road Safety Analysis: Connecting Crashes to Safety-Critical Events	3:45 PM - 5:30 PM
S 725	Surface Transportation Weather and Its Effects on Traffic Networks	4:15 PM - 6:00 PM
E 740	Users of SHRP2 Naturalistic Driving Safety Data: Research Topics, Preliminary Findings, Lessons Learned	7:30 AM - 9:30 AM
	WEDNESDAY, JANUARY 13	
S 777	Transportation Economics Topics: Cost-Benefit Analysis, Pricing, Mileage-Based User Fees, Elasticities, and More	8:30 AM - 10:15 AM
S 790	Driver Distraction, Fatigue, and Attention	8:30 AM - 10:15 AM
E 883	SHRP2 Education Connection, Part 2: Incorporating SHRP2 Solutions into Academia	2:30 PM - 4:00 PM

An aerial image of the I-95 Northbound Viaduct Replacement site in Providence, RI.

Renewal Enabling faster, minimally disruptive, and longer-lasting improvements.

Rhode Island: *Project Management Strategies for Complex Projects*

It's an unwritten, paradoxical law: the more stakeholders, the more complex the project; and the more complex the project, the more stakeholders there are. In addition to the extra stakeholder scrutiny, complex projects also involve financing challenges beyond the traditional technical, cost and schedule complexities. Find out how Rhode Island DOT (RIDOT) is meeting these challenges in a new SHRP2 case study.

The SHRP2 Solution, *Project Management Strategies for Complex Projects* (R10), was developed to help anticipate and manage the issues that seem inherent in complex projects. The case study follows RIDOT's use of *Project Management Strategies for Complex Projects* on its I-95 Northbound Viaduct Replacement project in Providence. RIDOT is using this SHRP2 Solution to help deliver the project on time, within budget, and with minimal traffic disruption.

This SHRP2 Solution provides a systematic and collaborative approach that goes beyond traditional project management methods, accelerates decision making, addresses complex issues, and expedites project delivery. The SHRP2 product guides project teams through five dimensions of project management (5DPM): cost, schedule, technical requirements, finance, and context, expanding on the traditional three-dimensional process (cost, schedule, technical requirements).

The Rhode Island Demonstration Workshop

Members of RIDOT's project planning team applied *Project Management Strategies for Complex Projects* first during a demonstration workshop. Samuel Hawkes, a member of the team, explained during the workshop, "We already use a lot of these strategies, but what we are learning here today is how to put them in the right order and get to them earlier. I will be able to take these materials back to my desk and use them as a resource for future projects." The RIDOT team perceived the workshop as an opportunity to learn skills that would help them plan for and address potential issues earlier in the project development process.

The RIDOT project team is using the 5DPM process not only as an initial project assessment, but also as a progress assessment tool over the course of the project, in order to more rationally allocate resources. RIDOT has already realized a number of benefits from using the product, and of most importance, the project is on track for a successful delivery. Will Hernandez, managing engineer, RIDOT, said, "We have a strong team that is open to new ideas. When I learned about this product as part of the (SHRP2) Implementation Assistance Program, I knew we would get a lot out of it."

Read more about *Project Management Strategies for Complex Projects* in the *Rhode Island Department of Transportation: Complex Bridge Replacement Case Study.*

Implementation Benefits

The RIDOT will continue to use ***Project Management Strategies for Complex Projects*** as it delivers the Northbound Providence Viaduct Replacement project. However, the project team has already benefited from the product by:

- Conducting an in-depth self-assessment to determine opportunities to improve the agency's complex project management maturity and capability in all phases of project development
- Identifying potential alternative sources of project funding
- Developing an action plan to receive contractor constructibility input earlier in the design process
- Leveraging existing stakeholder relationships established during the Providence Southbound Viaduct project

Intersection outside Ft. Leavenworth repaired with PCP. (Photo Source: Shiraz Tayabji, ARA Associates, Inc.)

Multiple lane replacement with jointed PCP on Interstate H-1 in Hawaii. (Photo Source: Shiraz Tayabji, ARA Associates, Inc.)

The Illinois Tollway is using PCP for the replacement of bridge approaches to minimize traffic delays. (Photo Source: Illinois Tollway)

Precast Concrete Pavement Used in a Variety of Applications

Precast Concrete Pavement (PCP) (R05) is being implemented in many ways by highway agencies throughout the United States to reduce the duration of lane closures during construction, improve work-zone safety, and provide long-lasting pavement performance.

Texas, Alabama, Pennsylvania, and Kansas: Rehabilitating traffic intersections

One such application is the rehabilitation of traffic intersections; both the replacement of deteriorated concrete intersections and the reconstruction of asphalt intersections where rutting and shoving require frequent maintenance activities. The Texas DOT has awarded a contract to use PCP to reconstruct the intersection of SH 72 and SH 97 in its "energy sector" where heavily loaded trucks are a large percentage of daily traffic. The Alabama DOT is planning to use PCP in Mobile, where Exit 2 from I-165 southbound intersects US 90 — a heavily trafficked area not possible to shut down for an extended time. The Pennsylvania DOT has designated an urban intersection in Norristown for reconstruction with PCP. The Kansas DOT is in the process of replacing the intersections that provide access from US 73/92 to Ft. Leavenworth.

Will Lindquist, concrete research engineer from Kansas DOT said, "Precast concrete panels were selected for their potential to provide long-term durability and because they can be installed quickly helping to minimize disruptions in the busy intersections and bridge approach. The panels offered an alternative to high-early strength cast-in-place concrete with the advantage of being produced in a controlled environment at a PCI certified plant without concern for concrete maturity."

Hawaii: Replacing concrete pavement

The Hawaii DOT used PCP in another way: to replace a section of concrete pavement that had been continually fixed with asphalt to allow safe travel for over 20 years. The project on H-1 required the placement of 70 panels across five lanes and was performed during a series of daily work zones maintained from noon until 6:00 the following morning. According to Gary Iwamoto, director of construction services for KSF, Inc., which was the design consultant on the project, "PCP offered significant advantages to the project within our urban core where detour routes werev not available or impractical. We have found that the overnight repairs are very reliable and could be accomplished in weather conditions where asphalt or poured-in-place concrete could not be used."

Illinois Tollway: Replacement of bridge approaches

The Illinois Tollway is using PCP for the replacement of bridge approaches where embankments behind abutments have settled and damaged approach slabs need to be replaced quickly to minimize traffic delays. Additionally, the Tollway plans to investigate the use of PCP approaches in the construction of new longer span integral abutment bridges for the purpose of eliminating stress crack development of cast-in-place approaches built with such bridges.

"In 2016, PCP approaches will be constructed as part of several expressway integral abutment bridges being built for the Tollway's new Elgin-O'Hare corridor, and hopefully for many more in the future as the Tollway's expansion and reconstruction program continues," according to Steven Gillen, deputy program manager for the Illinois Tollway.

For more information on PCP, see the following technical briefs *Precast Concrete Pavement Technology Resources*, and *Precast Concrete Pavement Implementation by U.S. Highway Agencies*.

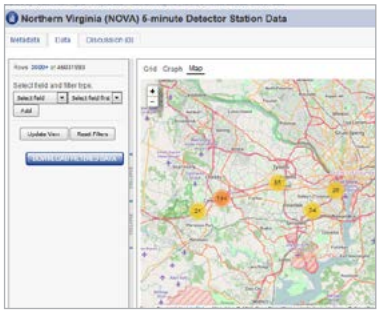
Reliability Championing predictable travel times

Visit the **SHRP2 Archive**. The archive is free for users to search, visualize, and download travel time reliability-related data. The archive was created to provide an open and accessible data hub at a single location to store and make available transportation data to the research community.

45 projects +1 Web site = Many Benefits to Transportation Research

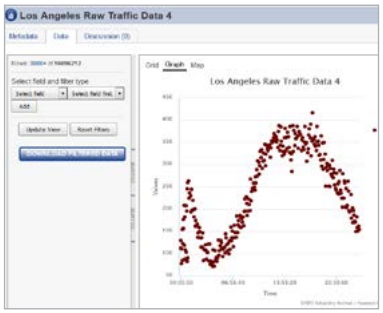
The research community, traffic engineers, planners, data managers, and others interested in data related to transportation operations and travel time reliability have an exciting new resource at their disposal. This resource — SHRP2Archive.org — is a major accomplishment for the SHRP2 Reliability focus area and is expected to provide significant benefits for users involved with transportation research or policy projects.

The *SHRP2 Reliability Archive* (L13A) provides over 2 TB of structured and unstructured data from more than 45 SHRP2 Reliability and Reliability-related projects. Users will find nearly 800 artifacts available for download including raw datasets; analysis results; tools and models; and documentation from projects that can be used as the basis of new analysis work. The Reliability Archive provides information that can help practitioners decide which SHRP2 Reliability products may be most useful and applicable to them, including user experiences from SHRP2 pilot projects on work zone coordination analysis and incorporating reliability into design decisions and capacity analysis.

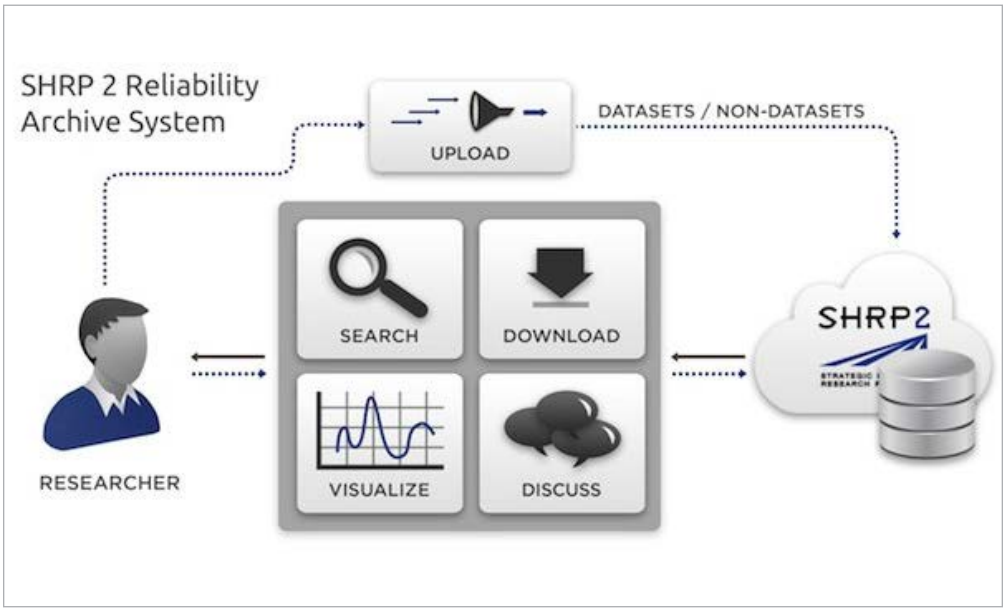


Users have multiple ways to view the datasets.

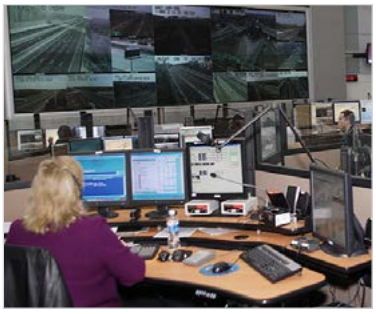
Most importantly, the archive includes tools that make it easy to find specific data and to extract valuable information from it. The archive's interactive features allow users to search and study data on freeway travel times; traffic volume, speeds, and occupancies; factors affecting reliability, including weather, work zones, and incidents; and Level of Service. The site's visualization tools allow users to preview and evaluate whether a dataset is of interest. Users have multiple ways to view the datasets — including putting the records into tables, viewing maps to see the precise location of the traffic detectors used to collect the data, or graphing the relationships between different numerical fields in the dataset.



A sample of a raw traffic data view.



Explore this new Reliability resource free of charge at SHRP2Archive.org. Want to try one of the Reliability analytics tools without creating your own data set? Go to the SHRP2Archive to download the tool and a sample data set from one of the earlier pilot projects.



Staff in the McConnell Public Safety Transportation Operations Center monitor roadways in northern Virginia. (Photo source: McConnell Public Safety Transportation Operations Center)

Equipping Agencies and Practitioners for TSM&O

With tighter budgets, growing demands to move people and goods, and new operations data and strategies available, many State DOTs are increasing their emphasis on effectively managing and operating their existing facilities. To do this, some DOTs are elevating the role of transportation systems management and operations (TSM&O) by restructuring their organization, reworking their business processes, and working to change their culture.

As Ryan Rice of Colorado DOT noted in a recent webinar on CDOT's experience re-organizing for TSM&O, "TSM&O helps you buy the most mobility for the lowest possible cost. In better equipping CDOT for TSM&O and institutionalizing TSM&O as part of the organization, we have really leaned on the SHRP2 products. It can be real easy for TSM&O to still be considered as fringe. Training has been a critical part of our process toward culture change. You can't elevate TSM&O in the department without training."

SHRP2 *Regional Operations Forum*

The SHRP2 Solution, *Regional Operations Forums for Advancing Systems Operations, Management and Reliability* (L36) sought to advance TSM&O and support mainstreaming of SHRP2 Reliability research results by providing transportation agencies and their partners with education and training on TSM&O business processes, organizational capabilities, operations and planning, and technical and analytical tools. The SHRP2 effort identified the key topics to be covered, outlined the organization of the workshop, developed the materials, and piloted the workshop. The forum was designed to bring together representatives from several states in a region for training, peer exchange, and practical exercises.

Participants leave with a new understanding of TSM&O, awareness of techniques and tools, and a network of peers to call on when questions and issues arise. Brad Freeze, traffic operations director at Tennessee DOT, described the regional operations forum as "...a TSM&O on-boarding program" for the way its nearly week-long immersion-style program can bring practitioners up to speed on TSM&O quickly.

Why is this training needed?

Many college engineering curricula, even civil engineering, touch on elements of TSM&O but not on a comprehensive basis, so graduates often have limited foundation in TSM&O concepts and strategies. TSM&O is a cross-cutting field, requiring a variety of skills that are often spread across college departments and DOT units. The regional operations forum is an opportunity for a range of practitioners that contribute to TSM&O to come together and learn how to more effectively manage and operate their transportation facilities:

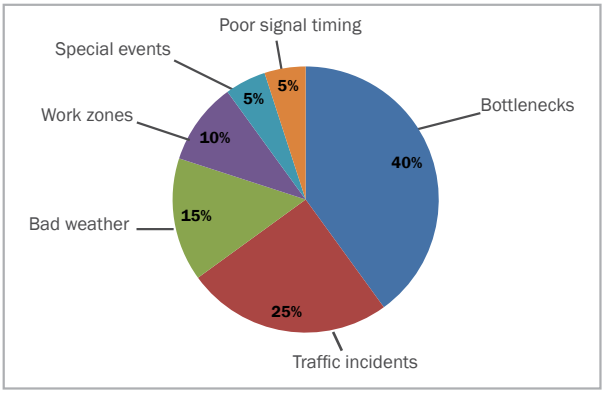
- from Intelligent Transportation Systems engineers.
- to Traffic Management Center managers.
- to transportation planners at an MPO.
- to state police involved in traffic incident response.

Transportation Systems Management and Operations (TSM&O)

An integrated program to optimize the performance of existing infrastructure through the implementation of systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system.

(Source: Planning for Operations Glossary)

Causes of Traffic Congestion



Caltrans participates in a Regional Operations Forum. (Photo source: FHWA)

Goals of the forum

- To mainstream TSM&O into the culture of state DOTs and their partners by transitioning the state of the art closer to the state of the practice.
- To strengthen TSM&O programs at the state and regional level.
- To develop a community of practice through the development of a peer network.
- To provide the next generation of leadership with the necessary skills for advancing TSM&O.
- To provide awareness on effective use of SHRP2 Reliability products.

Target audience

- Director/Manager of Traffic Operations
- Director/Manager of Transportation Planning
- District/Division/State Traffic Engineers
- Regional Director/Operations Chief
- Director of Maintenance/ Construction
- Information Technology Managers
- Transportation Operations/ Management Center Manager
- Manager of Traffic Engineering in State or local jurisdiction
- Senior Transportation Planner in State or local jurisdiction or MPO
- State Police and other Public Safety Managers

States Value Lessons Learned in Regional Operations Forum

The SHRP2 Solution, *Regional Operations Forums for Advancing Systems Operations, Management and Reliability* (L36), was piloted in five regions in 2013-2014. A region includes around five states, with each State sending four to six representatives from its own agency and its partner agencies. The forum typically runs from midday Monday to midday Friday and includes a mixture of presentations, group discussion, and small group exercises, as well as breaks for individual interaction with peers.

Sessions include:

- Business topics such as communicating the value of operations and performance measures.
- Technical topics such as traffic incident management, traveler information, and work zones.
- Institutional topics such as planning for operations and how to organize for operations.
- Emerging topics such as connected vehicles and managing a corridor.

In 2014 and 2015, California, Colorado, and Vermont each sponsored a statewide version of the regional operations forum, while the Northwest Passage Pooled Fund sponsored a variation focused on their multi-state corridor. In 2015, the California DOT (Caltrans) began an effort to bring a shortened version of the forum to each of its Caltrans Districts to reach even more of its staff and partner agencies with the training, and to accommodate busy schedules.

Caltrans combines forum with self-assessment

The Caltrans effort is combining a shortened regional operations forum followed by a 1-day TSM&O capability self-assessment workshop. Joan Sollenberger, chief of the office of strategic development, Caltrans division of traffic operations, says, “Our goal is to help equip each of our Caltrans Districts, and their regional and local partners for TSM&O. We have a plan to go across the state over the next couple of years with this combination workshop and at the same time, support our implementation of integrated corridor management.” To date, these workshops have been held in two Caltrans Districts.

The FHWA is bringing the forum to the other regions of the country in 2015-2016 so that each state has an opportunity to participate in a regional operations forum. The FHWA is exploring additional formats for the regional operations forum to meet user needs, and working with AASHTO and the National Operations Center of Excellence on follow-up activities. FHWA also plans to work with states to identify ways that the regional operations forum can be used to catalyze further development of a state’s own TSM&O training efforts and programs.

Desired outcomes

The forum is a new learning tool to help equip transportation professionals for today's challenges. After completing the *Regional Operations Forum*, participants should be able to:

- Understand the importance and value of a TSM&O focus within their agency.
- Know how to plan, program, and organize for TSM&O.
- More effectively use a management and operations perspective in identifying and implementing cost effective solutions to address transportation problems.
- Measure the operational performance of their transportation network.
- Work with a peer network of regional agencies to share ideas/information, learn from the activities of others, and work together more effectively.
- Apply, where applicable, the results of the SHRP2 Reliability research and other nationwide systems management and operations research programs.

Assessment workshops

- Florida Department of Transportation - District 4
- Massachusetts Department of Transportation
- South Dakota Department of Transportation
- Arizona Department of Transportation
- Arkansas Highway and Transportation Department
- Vermont Agency of Transportation

Capacity Bringing greater collaboration to road building.

State DOTs Identify Strategies to Expedite Project Delivery

Six state DOTs identified constraints associated with their project development and delivery processes and practices — and defined strategies for addressing them using the SHRP2 Solution, *Expediting Project Delivery* (C19). Navigating the transportation planning and project development processes can be time consuming and costly. Elected officials and the public expect transportation projects to be developed and delivered with fewer delays, greater transparency and collaboration, and in ways that address environmental challenges. *Expediting Project Delivery* identifies strategies to speed the development and delivery of transportation projects, balanced with environmental and resource issues.

Between mid-May and early-September 2014, six of the SHRP2 Implementation Assistance Program recipients for *Expediting Project Delivery* participated in assessment workshops that were developed and facilitated by the FHWA Resource Center to strengthen the agencies' project development and delivery processes. These assessment workshops were customized to assist the recipients — all of which were state DOTs — in identifying ways to improve and expedite project development and delivery processes by drafting action plans to guide their process improvement efforts.

FHWA staff facilitate a group action planning discussion, during an assessment workshop. (Photo source: Volpe Transportation Center)

Common observations and themes

Although each of these assessment workshops was tailored to different DOTs, several common project development and delivery themes emerged as successes for expediting project delivery:

- **Improved Internal and External Communications:** Early, continuous, and effective communications (both internally and externally) are key ingredients to efficient project development and delivery.
- **Well-Documented and Understood Work Flow Processes:** Well-documented work flow processes can help sub-units and work groups establish roles and responsibilities and define key entry points throughout the various phases of project development and delivery.
- **Strong Project Management/Tracking and Accountability:** Each of the state DOTs visited indicated that enhancements to how they utilize their project management/tracking systems would be worthwhile action steps to consider, acknowledging the importance of holding staff accountable to project development and delivery schedules.
- **Effective Cross-Functional Relationships:** Due to the multi-faceted nature of project development and delivery within a state DOT, cross-functional, multidisciplinary approaches can play a prominent role in expediting project development and delivery.
- **Collaborative Information and Data Sharing:** Having a central repository of information and data to be accessed throughout the organization was a common, key theme highlighted through the assessment workshops.
- **Improved Project Scoping:** Several of the state DOTs visited indicated that improved project scoping could alleviate some of the project development and delivery obstacles and bottlenecks they had been experiencing, which could then yield several other downstream benefits (most notably, better purpose and need statements developed earlier in the process).

At the conclusion of the assessment workshops, the state DOTs developed action plans. The strategies established in these plans will lead to strengthened coordination and collaboration processes, approaches, and tools for expediting project delivery for each of the six DOTs. Experiences and lessons learned from these action plans will later be used in further advancing the state of the practice on a national level.

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North Carolina: Freight Demand Modeling Offers Roadmap to 2020

Major industries in the Piedmont Triad region of North Carolina, one of the world's largest transportation and logistics clusters, have shifted from the textile industry to the freight and logistics industry. This cluster originally emerged from serving the manufacturing sector, but has continued to grow through diversification into Transportation and Warehousing and Retail Trade. This growth is not surprising given the confluence of I-85 and I-40 and the connectivity they provide to major logistic centers like Atlanta and the Boston-New York-Washington Mega-Region.

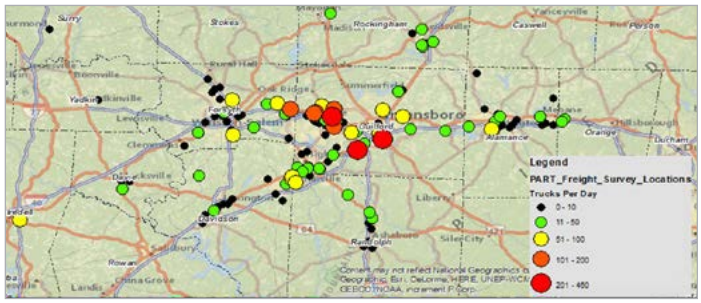
This shift in industry focus coupled with the Piedmont region's proximity to major logistic centers has emphasized the need for efficient movement of freight. The area's existing travel demand model, the Piedmont Triad Regional Model (PTRM), was not describing freight flows in the region sufficiently to meet that need.

About the project

In recognition of the importance of freight in the Triad, the Piedmont Authority for Regional Transportation and the Triad MPOs embarked on a three-phased approach to developing an enhanced freight component for the PTRM. The first phase involves the identification of key freight nodes in the region and the collection of survey data to better understand the key attributes and trip making characteristics of these facilities. The survey data includes information on facility square footage, number of employees, facility type, daily truck operations, commodity, average daily truck trips, and truck type distributions.

In support of this project approach, a member of the Triad – the Winston-Salem Urban Area MPO – applied for and was awarded implementation assistance in the Round 3 IAP under the SHRP2 Solution *Freight Demand Modeling and Data Improvement* (C20). The assistance was for a local data pilot with three goals:

- Identifying freight model design and future data collection needs for the region.
- Identifying and tabulating regional freight facilities.
- Conducting a freight carrier survey to support development of a tour-based truck sub-model.



The identification of key freight nodes and the collection of survey data was the first phase in a three-phased plan for developing an enhanced freight component for the Piedmont Triad Regional Model. (Source: *Piedmont Triad Freight Study Final Report*)

Fredrick Haith, Transportation Engineer for the Department of Transportation for the City of Winston-Salem said, "We learned a valuable lesson; don't start with a design objective; start with a communication objective. Our project became a success after we found various ways to communicate with the freight industry." For example, surveys dropped off during a site visit received better response rates, because it helped to demonstrate that the information request was sincere and less impersonal. The MPO also noted that having prior relationships with existing freight industry firms made it easier to obtain data from those more difficult to reach.

The pilot, completed in June 2015, resulted in data that can be used to inform land use planning, transportation planning, and project prioritization from the standpoint of freight. The key lessons learned highlight the methodology for delivering the survey and collecting data from the freight agencies. These lessons about gathering research can benefit other transportation agencies who seek to be on the leading edge of the national initiative for improved freight modeling and data by 2020. A case study is currently in development, and will be available in 2016.

Share your "Powered by SHRP2" success by emailing GoSHRP2@dot.gov

Cutting-Edge Planning and Analysis Tools Are Just 1 Click Away

Access cutting-edge tools on the planning tools website.

With one click, the SHRP2 planning tools website provides transportation professionals with three key planning and analysis tools: *PlanWorks* (C01), *TravelWorks* (C16), and *EconWorks* (C03 and C11). These tools – which originated from SHRP2 Capacity focus area research – will help transportation planners create better collaborative processes; produce better modeling and transportation analysis; and introduce economic benefit analysis into early project decision making.

PlanWorks: Better Planning. Better Projects.

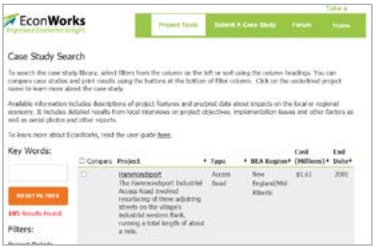
Under *PlanWorks*, site visitors can find a decision guide, assessments, and a library – just to name a few of the robust resources that were developed to aid collaborative decision making in transportation planning and project development.

Reporting tab from the Rapid Policy Assessment Tool in *TravelWorks*.

TravelWorks: Advanced Travel Analysis Tools

A new Rapid Policy Assessment Tool – called RPAT – gives transportation planning agencies improved tools and methods for integrating investment decision making with land use strategies. As a tool within *TravelWorks*, RPAT is a strategic model that quickly explores multiple scenarios to assess land use and transportation policies.

RPAT bridges the gap between regional visioning and transportation plans. The tool enables the rapid consideration of many possible scenarios by combining high-level analyses of the built environment and travel demand. RPAT considers growth and changes in households, firms by industry, and expected policy impacts. Performance metrics include aggregate impacts on the community, changes in travel, environmental and energy impacts, and financial and economic impacts.



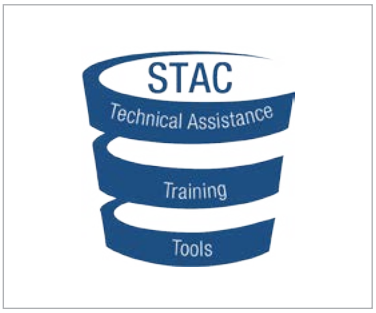
Case Study Search feature from *EconWorks*.

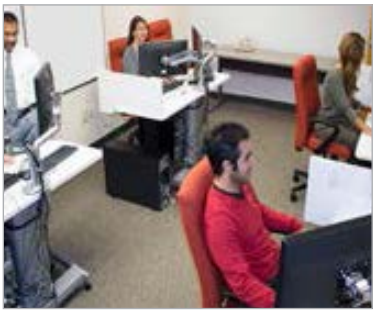
EconWorks: Improved Economic Insight

EconWorks offers a collection of tools designed to help planners incorporate economic analysis into early transportation project planning. These tools include a case study search functionality, an "Assess My Project" tool, and downloadable Excel-based Economic Analysis Tools useful for assessing wider economic benefits from transportation projects. The EconWorks Economic Analysis Tools are designed to help transportation professionals make more comprehensive and realistic assessments of the economic development impacts of transportation projects.

These tools help estimate which transportation improvements will support economic vitality by allowing decision makers to gauge the potential increases in jobs and output, and by providing estimates of economic benefits in the areas of travel time reliability, access to labor and goods markets, and intermodal connectivity. *EconWorks* tools are designed to be used step-wise beginning with case studies as standalone tools, or in conjunction with other transportation models. These tools include:

- **Case Study Search:** A library of case studies, searchable by project attributes, to demonstrate the economic impacts of transportation investments. Available information includes descriptions of project features and pre/post data about impacts on the local or regional economy.
- **Assess My Project:** A web-based tool that estimates the economic impact of potential projects based on parameters defined by users.
- **Wider Economic Benefits Analysis Tools:** Downloadable spreadsheets useful for assessing the wider economic benefits from transportation projects: accessibility, reliability, connectivity, and accounting framework.





The STAC provides transportation researchers with training, technical assistance, and analytical tools to expand the use of the SHRP2 Safety data. (Photo Source: FHWA)

Safety Identifying the behaviors that cause and avert collisions.

Safety Training Analysis Center Promotes Use of SHRP2 Data

The Safety Training Analysis Center (STAC) at the FHWA Turner Fairbank Highway Research Center (TFHRC) was established to expand understanding of the SHRP2 Safety Data, which includes the Naturalistic Driving Study (NDS) and Roadway Information Database (RID). The STAC has three major goals:

- Increase access to the data.
- Improve the usability of the data.
- Expand the number of users.

In support of these goals, the STAC is developing hands-on training and analytic tools, producing reduced datasets, and pilot testing its new secure data enclave to remotely access the SHRP2 NDS data. In cooperation with the National Highway Institute, the STAC is completing the development of an instructor-led training course designed to provide an introduction to the SHRP2 Safety Data. This course will serve as a promotional tool to provide basic information about the data available from the SHRP2 NDS and RID, requirements to access the data, and concepts for potential uses of the data by state DOTs and transportation agencies. The STAC also provides sponsored opportunities for graduate and postdoctoral students, fellows, and other researchers to gain experience working with the data.

SHRP2 Education Connection

- Bradley University (Illinois)
- Colorado State University
- Methodist University (North Carolina)
- North Dakota State University–Upper Great Plains Transportation Institute
- Rowan University (New Jersey)
- University of Missouri
- University of Idaho
- University of Nebraska–Lincoln (Nebraska)
- University of North Carolina–Charlotte (North Carolina)
- University of Wisconsin

SHRP2 Education Connection
Incorporating SHRP2 Solutions into Academia

Universities Integrate SHRP2 into Transportation Curriculum

In April 2015, the FHWA accepted applications from universities interested in incorporating SHRP2 Solutions into their curricula. The application process resulted in 10 universities becoming recipients of an estimated total $100,000 in cooperative agreements under the SHRP2 Education Connection initiative. Over the subsequent months, lesson plans, case studies, or other learning opportunities that integrate SHRP2 Solutions into their curricula were developed for both undergraduate and graduate courses covering a broad spectrum of products from the Renewal, Capacity, and Reliability focus areas.

These courses offer an excellent opportunity for professors and instructors to bring state-of-the-practice solutions into their classrooms and familiarize their students with the innovations and tools that are being implemented by transportation agencies across the nation.

Project work from the SHRP2 Education Connection will be featured in a session at the Transportation Research Board 95th Annual Meeting. A panel of four university professors will present their different integration methods to build SHRP2 products into transportation coursework, and their effectiveness in engaging students. A companion poster session also will be held to highlight the strategies of SHRP2 Education Connection recipients.

SHRP2 Education Connection sessions at TRB Annual Meeting are listed on page 2.

Round 7 of the Implementation Assistance Program Opens April 1, 2016

Established in 2013, the SHRP2 IAP offers transportation agencies financial and technical assistance in deploying SHRP2 Solutions. To date, six IAP rounds have been offered. Below are the products being considered for inclusion in Round 7—the final round. Applications for Round 7 will be available April 1, 2016.

CAPACITY

PlanWorks (C01)
Systematic web-based resource that supports collaborative decision making to deliver projects that meet environmental, community, and mobility needs.

RENEWAL

Utility Bundle (R01A/R01B/R15B)
Products to identify, record, and retrieve utility locations throughout the design process to aid in reducing costly relocations.

Railroad-DOT Mitigation Strategies (R16)
Model agreements to improve coordination between transportation agencies and railroads.

Techniques to Fingerprint Construction Materials (R06B)
Procedures and equipment to identify various construction materials in the laboratory and with portable devices.

Advanced Methods to Identify Pavement Delamination (R06D)
Tools to detect subsurface delamination in asphalt pavements.

Guidelines for the Preservation of High-Traffic-Volume Roadways (R26)
Your guide to selecting the most affordable options for extending pavement life.

Nondestructive Testing for Concrete Bridge Decks (R06A)
Recommended technologies to detect deterioration of concrete bridge decks.

Nondestructive Testing for Tunnel Linings (R06G)
Nondestructive testing technologies to pinpoint defects in or behind tunnel linings.

Service Life Design for Bridges (R19A)
Guidance, training, and technical assistance promoting service life design concepts and methods.

Service Limit State Design for Bridges (R19B)
Tool kit to perform state or site-specific calibrations for service limit state design for bridges.

RELIABILITY

Reliability Data and Analysis Tools Bundle (L02/L05/L07/L08/C11)
Tools to help transportation planners and engineers improve monitoring and analysis of data to achieve more consistent, predictable highway travel.

Reliability in Simulation and Planning Models (L04)
Guidelines for incorporating reliability performance measures into travel models.

Regional Operations Forum (L36)
Training program to advance transportation systems management and operations.

About SHRP2

SHRP2 is a partnership of the Federal Highway Administration (FHWA), American Association of State and Highway Transportation Officials (AASHTO), and the Transportation Research Board (TRB). TRB completed the research, and now FHWA and AASHTO are jointly implementing the resulting SHRP2 Solutions that will help the transportation community enhance productivity, boost efficiency, increase safety, and improve the reliability of the Nation's highway system. If you would like additional information or have questions about SHRP2, please contact Carin Michel, FHWA SHRP2 Implementation Manager at GoSHRP2@dot.gov, 410-962-2530, or Pam Hutton, AASHTO SHRP2 Implementation Manager at phutton@aashto.org, 303-263-1212. Visit the GoSHRP2 website for additional SHRP2 Milestones and updates.

U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO

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