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**SHRP 2 Reliability Research**

*Data and Analysis for Travel Time Reliability Performance*

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Predicting the Unpredictable: Better Travel-Time Reliability for Busy Roads

New tools help identify the best ways to improve travel-time reliability by addressing the causes of delay

Unexpected traffic delays caused by crashes, work zones, special events or other factors can cause frustration and increased hazards for those who depend on a reliable and safe trip on a predictable basis. More effective planning tools that help reduce congestion can also reap great improvements in safety, in addition to cost and time savings.

A suite of new products developed in the second Strategic Highway Research Program (SHRP2) provides transportation agencies with predictive tools to plan for and respond to nonrecurring congestion and its cascading effects. The products will aid in:

► Establishing monitoring programs for mobility and travel-time reliability;
► Incorporating reliability performance measures into transportation planning and programming processes; and

Data and Tools for Reliability Analysis

The Solution

Establishing Monitoring Programs for Mobility and Travel-Time Reliability (L02): This tool provides a blueprint for designing programs to monitor travel-time reliability and a guidebook for designing, building, operating, and maintaining those systems. The guidebook addresses freeways, toll roads, and urban arterials, and provides direction on technical and analytical issues.

Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes (L05): This “how-to” handbook provides the means—including technical procedures—for state and local transportation agencies to integrate mobility and reliability performance measures and strategies into transportation planning and programming.

Save Lives

• Reducing reliability-related delays will result in fewer incident-related crashes.

Save Money

• Investments in reliability improvements have benefit-cost ratios ranging from 5:1 to 30:1 due to reduced traffic delays and improved safety.
• Less variability in travel time means less time has to be planned for trips. Improved reliability supports efficient freight movement, with national economic benefits.

Save Time

• Tools lead to reduced traffic congestion and traveler delay.
• Preventive measures mitigate problems before serious delays and bottlenecks occur.
processes. It provides guidance on how to maintain or improve traffic throughput on existing systems before capacity enhancement projects are undertaken or where capacity improvements cannot practically be undertaken. This product will be integrated into the collaborative decision making framework and web-based tool being developed as a part of the SHRP2 Solution known as Transportation for Communities—Advancing Projects Through Partnerships (TCAPP).

Incorporating Travel-Time Reliability into the Highway Capacity Manual (L08): New analytical procedures developed as part of this effort are intended to be incorporated into the Highway Capacity Manual, which will enable planners and engineers to apply travel-time reliability performance measures to major freeways and urban streets in a corridor context.

The Benefits

This suite of tools will help state and local transportation agencies better analyze strategies for addressing causes of non-recurring congestion and improve travel-time reliability. Once these strategies are in place, variability will be reduced, offering more reliable travel times for commuters and other travelers as well as the freight industry. Additional benefits are potential savings in fuel and emissions, a better functioning freight system, and fewer crashes.

Breakthroughs in reliability planning also pave the way for all types of operational improvements to be considered at the same time as more traditional project investments. The result will be more prudent investment of limited dollars and optimal value from existing investments in capacity.

Who will benefit from the use of these tools?

► State and local transportation agencies
► Shippers and receivers
► Business owners
► Commuters

How can you learn more?

For more information, contact Robert Rupert at FHWA, robert.rupert@dot.gov; Douglas Laird at FHWA, douglas.laird@dot.gov; Jim Hunt at FHWA, jim.hunt@dot.gov; Gummada Murthy, coordinating with Matt Hardy at AASHTO, gmurthy@aashto.org; or William Hyman at TRB, whyman@nas.edu.

About SHRP2 Implementation

The second Strategic Highway Research Program is a national partnership of key transportation organizations: the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the Transportation Research Board. Together, these partners conduct research and deploy products that will help the transportation community enhance the productivity, boost the efficiency, increase the safety, and improve the reliability of the Nation’s highway system.

Strategic Highway Research Program

U.S. Department of Transportation | Federal Highway Administration
American Association of State Highway and Transportation Officials ● Transportation Research Board
Understanding Reliability

*Establishing the foundation for achieving reliable travel times*

This project of the second Strategic Highway Research Program (SHRP2) will set out the basic concepts needed to address travel-time reliability. It has been developed to provide both a simple method for predicting reliability and a richer model that will include some key causal factors, such as a means to reflect the lanes blocked and the duration of incidents and work zones. These models will be applicable to planning, the evaluation of strategies to improve travel-time unreliability, and enhancements to other models.

The Solution

This project defines travel-time reliability, explains the importance of travel-time distributions for measuring reliability, and recommends specific reliability performance measures. An important conclusion of the study is that actions to improve operations, reduce demand, and increase capacity all can improve travel-time reliability. The study reexamined the contribution of the various causes of non-recurring congestion. Models for predicting non-recurring congestion were developed using two methods based on empirical data. A large and comprehensive dataset was compiled in order to conduct the research. The details of assembling the data to estimate predictive models are described for others who wish to conduct similar work. The research resulted in a two sets of models: the first relates the mean travel time on a segment to some measure of the variability in travel time. This easy-to-apply model set only requires that the analyst (or analytic procedure) provide the mean travel time along a segment. The second set of predictive models requires more inputs that reflect key contributors to travel-time unreliability.

**How can you learn more?**

For more information, contact William Hyman at TRB, whyman@nas.edu.

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Deriving Reliability Performance Measures from Travel Models

*Linking performance measurement and reliability planning*

Transportation agencies rely on their planning and traffic simulation models to assist with project and scenario planning. Agencies also are increasingly concerned both with improving travel-time reliability and producing performance measures to track their progress. By enhancing traffic simulation and planning models, they can better produce performance measures that would show the relationship between certain projects and strategies and how they could affect travel-time reliability.

**The Solution**

Developed through the second Strategic Highway Research Project (SHRP2), the objectives of this project were to (1) develop the capability of producing measures of reliability performance as outputs in traffic simulation and planning models, and (2) determine how travel demand forecasting models can use reliability measures to produce revised estimates of travel patterns. The project will result in application guidelines for incorporating reliability into micro- and meso-simulation models and will identify key steps for integrating demand and network models. The product will also include first generation software that can potentially be integrated with many simulation packages. A preprocessor will generate scenarios involving factors contributing to unreliable travel time such as incidents, weather, and work zones. A post-processor will portray the variability in travel-time and reliability performance metrics from origins to destinations and for segments and links.

**The Benefits**

The research would be useful for evaluating the effects of scenarios, strategies, projects, or practices on non-recurring congestion.
How can you learn more?
For more information, contact John Halkias at FHWA, john.halkias@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org; or William at TRB, whyman@nas.edu.

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Planning for More Reliable Travel Times

Requirements, actions, and performance-based planning options to improve non-recurring congestion

Road users—from long-distance travelers and truckers to local businesses and commuters—need and want a more reliable transportation network that will enable them to arrive on time with more certainty. To accomplish this goal, state and local departments of transportation (DOTs) need a sound way to plan for better travel-time reliability.

Elements of this planning should include: 1) a clear understanding of the needs and requirements of road users, including freight carriers; 2) performance-based planning tools that include goals, performance measures, and targets; 3) the role of changing demographics, economics, and climate change; 4) technological advances in operations; and 5) the critical roles played in managing and operating a reliable highway network.

The Solution

Using the elements outlined above as a starting point, recent research from the second Strategic Highway Research Program (SHRP2) has identified a full range of actions DOTs can take to improve travel-time reliability. Different approaches to reduce non-recurring congestion have been categorized according to different levels of effectiveness, and each potential action has been graded according to a cost range. The report will describe one possible method for determining the economic value of improvements in reliability. Overall, this information may have direct use in efforts to establish the benefits of actions to improve the consistency of travel times and could also be used in benefit-cost calculations. The report will also address how road pricing can significantly improve travel-time reliability.

How can you learn more?
For more information, contact William Hyman at TRB, at bhyman@nas.edu.

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Strategic Highway Research Program

U.S. Department of Transportation | Federal Highway Administration
American Association of State Highway and Transportation Officials ● Transportation Research Board
Reaching Travelers with Effective Information on Travel-Time Reliability

**New lexicon to communicate real-time information more effectively**

A key question for motorists often is, "How much extra time should I add to my trip to account for congestion?" An important task for transportation agencies is conveying information so that travelers can make informed decisions and better plan for arriving at their destination on time. Uncertain travel times frustrate motorists, sometimes more than slow travel speeds. Transportation departments need to know how to communicate travel-time reliability information that is accurate and route-specific.

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**Traveler Information and Travel-Time Reliability**

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**The Solution**

Developed through the second Strategic Highway Research Program (SHRP2), the lexicon is the first resource for identifying the best ways to introduce the concept of travel-time reliability to motorists and to provide information about reliability so that it is understood and useful. This new resource emphasizes that agencies should use familiar concepts and terminology, communicate the amount of buffer time needed, assist in departure time and route decision making, and consider how information needs to be different for those who frequently travel a route and for those who are only occasional users.

Another consideration is how information should be conveyed to different types of drivers with different trip purposes. Communicating with an elderly driver would be much different from communicating to a well-equipped trucker. Those who carpool may have very different information needs about a given trip’s reliability than would a weekend recreational traveler. What different media to use, when to provide the information, and what to convey are important considerations when planning a messaging effort.

The lexicon and accompanying report emphasize messages and media that can effectively communicate information without increasing the risk of driver distraction. The material was developed through surveys, focus groups, and experiments that examined what combination of words, numbers, symbols, layout, lighting, color, and spacing of user information messages, along with communications channels and technology platform, best communicate information about travel time and reliability to travelers.
The Benefits

The lexicon can help a transportation agency better communicate travel-time reliability information to the traveling public. With the right information, travelers can make the best travel choices from their point of view, which may include whether or not to take a trip, and what may be the departure time, mode choice, and route choice.

Who can benefit from using these tools?

Transportation agencies and other entities that provide information to the traveling public, as well as those who are trying to better understand how to convey reliability information to travelers, will find this product helpful.

How can you learn more?

For more information about this research, contact Jimmy Chu at FHWA, jimmy.chu@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org; or William Hyman at TRB, whyman@nas.edu.

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Integrating Business Processes to Improve Travel-Time Reliability

Road users see the benefits when highway operations are managed more strategically

Given that traffic congestion caused by weather, crashes, work zones, and special events creates more than half of all motorist delay, processes to better manage traffic operations and leverage existing capacity will make the highway system more reliable and reduce the cost of congestion for drivers, freight operators, and other users.

Transportation systems management and operations (TSM&O) is a cross-cutting, cross-silo discipline that engages multiple divisions within a state or local department of transportation (DOT), as well as other transportation, enforcement, and emergency services agencies within a region. Improving operations-related business practices can help transportation agencies establish a structure to enhance current practices and implement new practices to plan and respond more effectively to nonrecurring congestion on their systems.

The Solution

Integrating Business Processes to Improve Travel-Time Reliability (L01) helps transportation agency managers evaluate and improve their organizational capabilities to conduct effective and efficient operations. Developed through the second Strategic Highway Research Program (SHRP2), it defines key business processes within DOT and transportation agency operations related to travel-time reliability, and demonstrates how successful strategies and business process integration activities can be adopted to improve travel-time reliability.

Business processes include management strategies and related programming activities that directly or indirectly affect operations in a significant way. Integrating these processes may bring together certain steps of a specific business process and/or allow for the integration of multiple steps involving several agencies. These processes allow DOTs
to improve reliability through management of six major sources of nonrecurring congestion: incidents, weather, work zones, special events, traffic incidents, and fluctuations in demand.

The product also helps agency managers identify critical gaps in their current processes and provides strategies to address these gaps, including combining and integrating processes that will result in greater travel-time reliability.

**The Tools**

This product provides step-by-step instructions for integrating operational and programmatic processes to help managers identify and leverage new efficient processes that improve the reliability of the network and conditions for its users. It also provides recommendations for documenting and institutionalizing operational processes to improve their sustainability after implementation. In addition, this product summarizes the benefits and challenges associated with integrating and institutionalizing operational processes related to travel-time reliability.

Case studies demonstrate how other states and metropolitan planning organizations have adjusted their business processes to better handle traffic incident management, work zone management, and other business functions related to travel-time reliability.

**The Benefits**

Using this product enables an agency to add transparency to business processes and subsequently build trust with partnering entities and credibility with the public. Ultimately, a more efficient operations management system will result in processes that can lead to cost savings and reduced congestion.

**How can you learn more?**

For more information, contact Wayne Berman at FHWA, wayne.berman@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org; and David Plazak at TRB, dplazak@nas.edu. A web-based tool, Systems Operations and Management Guidance, is available on the AASHTO website at www.aashtosomguidance.org. The following resources are available online and from the TRB Bookstore: the report, Integrating Business Processes to Improve Travel Time Reliability, at http://www.trb.org/Publications/Blurbs/165283.aspx; and Guide to Integrating Business Processes to Improve Travel Time Reliability, at http://www.trb.org/Publications/Blurbs/165284.aspx.

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Organizing to Improve Travel-Time Reliability

Helping transportation agencies fulfill their mobility mission

In recent years, transportation agencies have begun to evolve from the traditional construction and maintenance focus that started in the interstate highway construction era towards recognition of the need to take a customer-focused approach to operating the system as a coordinated transportation network. Key challenges to improved effectiveness of transportation systems management and operational strategies are no longer primarily related to technology or understanding of best practice. Reaching full potential requires that specific supportive business processes and institutional arrangements be put in place, monitored, and managed—just as is typically done for the other formal core programs, such as construction and maintenance.

Operational strategies also require a collaborative and coordinated effort among many state and metropolitan transportation organizations and other entities such as enforcement and emergency services, including departments of transportation (DOTs), fire, police, emergency medical units, and towing and recovery.

Advancing Operational Strategies

The Solution

A formal procedure to integrate and mainstream operations into a transportation agency’s program has been developed through the second Strategic Highway Research Program (SHRP2). This SHRP2 Solution offers a structure that will enable agencies to develop institutional arrangements that are suitable to the special real-time demands of transportation systems management and operations (TSM&O), which is now emerging as a new transportation agency priority.

Advanced Operational Strategies provides transportation agencies with a “capability” framework in which to conduct a comprehensive and systematic self-assessment of current and desired capabilities to successfully execute operations programs that improve travel-time reliability.
Using a focused workshop setting, state and local transportation agencies can undertake a self-assessment of their existing operations, using the capability framework. The framework identifies all the elements needed to continually improve activities one level at a time for business processes, systems and technology, performance management, culture, organization and workforce, and collaboration.

The structure of these workshops is an evaluation of the strengths and weaknesses of six dimensions of organizational capability, which enables the agency to assess the effectiveness of its existing current range of TSM&O programs, as well as identify the features associated with effective programs. The workshops include an analysis of the relationships and interactions among program effectiveness, required technical and business processes, and supportive institutional and organizational arrangements.

Following the self-assessment workshop, an implementation plan is developed, identifying specific actions, with the goal of elevating the agency’s capabilities to improve travel-time reliability and the efficiency of their transportation system.

**Who is using this product?**

Several state DOTs and metropolitan planning organizations are now beginning the self-assessment process through the FHWA/AASHTO Implementation Assistance Program. Several pilots have been conducted across the country, including for example, Arizona and Tennessee.

**The Benefits**

Successfully executed systems operation and management will streamline operations and lead to reduced congestion and reduced costs. Additionally, it will build credibility with the public and improve trust and partnering with entities as it adds transparency to the business model. In accordance with *Moving Ahead for Progress in the 21st Century* (MAP 21) performance guidelines, the product will assist DOTs with the development of required asset management plans.

**How can you learn more?**

For more information, contact Joe Gregory at FHWA, joseph.gregory@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org; and William Hyman at TRB, whyman@nas.edu. A web-based Capability Maturity Model (CMM) tool, *Systems Operations and Management Guidance*, is available on the AASHTO website at www.aashtosomguidance.org. The following resources are available online and from the TRB Bookstore: *Institutional Architectures to Improve Systems Operations and Management*, at http://www.trb.org/Publications/Blurbs/165285.aspx; and *Guide to Improving Capability for Systems Operations and Management*, at http://www.trb.org/Publications/Blurbs/165286.aspx.

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**Strategic Highway Research Program**

U.S. Department of Transportation | Federal Highway Administration
American Association of State Highway and Transportation Officials ● Transportation Research Board
Coordinated Training Program Builds Stronger Responder Corps for Safer Incident Recovery

Unified “team” approach allows the roads to be cleared faster

Three injury crashes occur every minute in the United States, putting nearly 39,000 incident responders potentially in harm’s way every day. Congestion from these incidents often generates secondary crashes, further increasing traveler delay and frustration. The longer incident responders remain at the scene, the greater the risk they, and the traveling public, face. Minimizing the time and resources required for incident clearance is essential to meeting our goals for safety and reliability.

A cadre of well-trained responders can more quickly reduce the time it takes to clear accidents, offering the benefits of reduced congestion and lost travel time for travelers, as well as the potential to better protect our incident responders.

The Solution

A new coordinated, multi-disciplinary training program developed through the second Strategic Highway Research Program (SHRP2) is now available for all emergency responders and those supporting Traffic Incident Management operations. The training puts police, firefighters, state and local departments of transportation, towing, medical personnel, and other incident responders on the same page, leading to a safer, faster, integrated responder team.

The train-the-trainer curriculum is aimed at building a cadre of qualified trainers within each state or region, using a common set of practices and advanced standards. The training is delivered through interactive seminars, case study analysis, tabletop role-play, and field practicum. Participants can attend a 10-hour intensive course, a four-hour modified version, or several shorter, single-lesson modules. These programs have been shown to facilitate traffic incident recovery, resulting in streamlined, effective responses while building a common platform of proven practices in incident management training.
The Benefits

Participants in SHRP2’s National Traffic Incident Management Training have access to the most up-to-date, multi-agency standards and best practices successfully used across the nation to improve on-scene responder and motorist safety. **Training modules are flexible and can incorporate local or state regulations or techniques.** Bringing together responders across all agencies improves team performance. Trained responders work together in a coordinated manner, from the moment the first emergency call is made, to the correct deployment of response vehicles, traffic cones, and advanced warning devices to ensure proper safety buffers and a secure work area. Proper handling and identification of hazardous materials, guidelines for working with hybrid vehicles, debris clearance, tow truck protocols, and cleanup are among the guidance covered in the curriculum.

Who is using these tools?

In Atlanta, GA, improved incident response practices reduced secondary crashes by 69 percent in 12 months, saving lives and more than $1 million in delays. Training has been held in Virginia, Florida, Montana, Arizona, Tennessee, Oklahoma, Ohio, and Colorado. The International Association of Chiefs of Police, the International Association of Fire Chiefs, and the National Volunteer Fire Council have endorsed the program.

Who benefits?

- Law enforcement
- Fire and rescue
- Emergency medical services
- Transportation agencies
- Training and recovery professionals
- Notification and dispatch personnel
- Hazardous materials management responders
- Coroners and medical examiners
- Public works professionals
- The public

How can you learn more?

Training classes are forming now. The curriculum is described in *Training of Traffic Incident Responders*, available online at [http://www.trb.org/Publications/Blurbs/166877.aspx](http://www.trb.org/Publications/Blurbs/166877.aspx). For more information on how to enroll, contact Jim Austrich at FHWA, jim.austrich@dot.gov; Paul Jodoin at FHWA, paul.jodoin@dot.gov; Gummada Murthy at AASHTO, gmurthy@asasho.org; or Kevin Sanders at AASHTO, ksanders@asasho.org; David Plazak at TBR, dplazak@nas.edu.

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Strategic Highway Research Program

U.S. Department of Transportation | Federal Highway Administration
American Association of State Highway and Transportation Officials ● Transportation Research Board
Comprehensive Resource for Systems Operations

Knowledge Transfer System provides easy access to information

Roughly 50 percent of highway congestion is caused by events such as traffic incidents, special events, weather, construction, or maintenance, causing costly and frustrating travel-time delays for motorists. Well-designed and managed systems operations improve travel-time reliability, bringing smarter and safer approaches to reducing nonrecurring congestion while significantly improving mobility.

As state and local transportation agencies look to improve the functionality of their highway networks, the field of systems operations has become a more critical function, and the latest information, techniques, and approaches must be readily available to practitioners and policymakers alike. Establishing a framework for communicating the available body of knowledge is essential for this emerging field. Given the diversity of the audience—customers, owners, and operators—it is critical that this framework include a common language that overcomes the technical jargon of various disciplines, provides the basic analytical tools and guidance that support acceptance and use of new strategies and techniques, and becomes a widely acknowledged source of reliable information.

The Solution

Based on research developed by the second Strategic Highway Research Program (SHRP2), a comprehensive online resource called the Knowledge Transfer System for the field of systems operations and management (SO&M) is being developed. The web-based Knowledge Transfer System provides a first point of access to key materials, including abstracts and syntheses of existing reliability research, new information to supplement and expand current knowledge, a standardizing glossary of common terms, and a library of business case resources.
Intended for use by practitioners, researchers, and policymakers, the site functions as a portal to the complete range of SO&M information available. It also includes links to external websites and selected technical documents; background materials; an extensive section for frequently asked questions; and community-building functions such as peer dialog, news, and a calendar of events.

In addition, a Business Case Premier has been developed to help identify the “who, what, when, and how” information needed to more effectively communicate the business case for traffic systems operation and management. In addition, several other tools are being developed to advance the state of the practice, including a briefing book, deployment and budget guidance, evaluation measures, and options for integrating operations into decision making.

**The Benefits**

The Knowledge Transfer System is an easily accessible “home base” for this emerging area of practice. By collecting, developing, and supporting the exchange of knowledge across the topic, it raises the visibility of SO&M as an efficient approach to meeting travel demand. It will serve as the **“go-to” resource for those who are involved in managing and improving traffic operations and travel-time reliability.**

SO&M strategies increase options for practitioners faced with solving the problem of growing congestion in ways more quickly implemented for immediate impact. Realizing that transportation agencies need options other than construction, SO&M efforts stress the importance of making the most effective use of existing structure before adding capacity. The Knowledge Transfer System provides a means to move SO&M strategies and the SHRP2 reliability research findings and products into mainstream practice among transportation professionals.

**How can you learn more?**

For more information, contact Darren Buck at FHWA, darren.buck@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org; or David Plazak at TRB, dplazak@nas.edu.

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**Strategic Highway Research Program**

U.S. Department of Transportation | Federal Highway Administration
American Association of State Highway and Transportation Officials ● Transportation Research Board
E-Learning and Assessment Training Tools for Traffic Incident Responders Add Value to the National TIM Responder Training Program

Online tools assist with national deployment of incident responder training program

The National Traffic Incident Responder Training program to improve incident scene management was developed under the second Strategic Highway Research Program (SHRP2) and is now being implemented across the country through train-the-trainer sessions. The program was designed to establish a cadre of multi-agency trainers and wider use of a comprehensive national curriculum to achieve three key goals: improved responder safety; safe, fast clearance; and prompt, reliable, and interoperable communications. The in-person course uses a variety of adult-learning techniques, including interactive seminar, case study analysis, tabletop role-play and scenario, and field practicum.

As effective as the in-person training can be, however, many incident responders are seeking an on-line alternative for learning new and effective techniques for clearing highway incidents quickly and safely.

Training Options for Traffic Incident Responders

The Solution

Two new products are under development to assist and enhance the national deployment of incident responder training. They include an e-learning tool and an assessment e-tool that will enable course participants to assess the effectiveness of their training and its implementation. The e-learning tool is based on the full curriculum and will allow responders to take the course modules on-line and at their discretion.

The Benefits

These products work as a complement to the in-person product now being implemented to deliver a consistent and nationally researched curriculum to traffic incident responders across the country. The products assist with national deployment of the traffic incident responder training program.
Who is using these tools?

The in-person training program has been extensively tested and is now being implemented through train-the-trainer sessions led by the Federal Highway Administration in cooperation with the American Association of State Highway and Transportation Officials. States already participating in the training include Tennessee, Virginia, Arizona, Florida, Ohio, Oklahoma, Montana, Colorado, and Missouri. Once the additional products are completed, the training modules and assessment tools will be used as a follow-up for those states receiving the initial training.

How can you learn more?

For additional information, contact Jim Austrich at FHWA, james.austrich@dot.gov; Paul Jodoin at FHWA, paul.jodoin@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org; or Reena Mathews at TRB, rmathews@nas.edu.

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E-Tool to enhance products aimed at improving travel-time reliability through better agency processes and organizational structures

**FOCUS AREA:**
Reliability (L34)
(Enhancement to L01 and L06)

This on-line tool will help transportation agencies identify improvements to organizational structures and processes that can result in more reliable travel times.

As helpful as these products are, however, an e-based option to the existing paper analytical process is needed to carry out the recommendations derived from the assessment.

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**E-Tool for Business Processes to Improve Travel-Time Reliability**

**The Solution**

An e-tool is currently under development that will take the recommended processes offered in the earlier products and convert them into a web-based tool. Its intent is **to enable a user to input a variety of scenarios, describe the desired outcomes, and have the software generate solutions to re-engineer day-to-day business practices.** The software will allow agencies to “map” their current practices and compare them to optimal practices that could maximize the agency’s highway operations success.

The content will include material from the *Guide for Integrating Business Processes* (L01) and *Institutional Architectures to Improve Systems Operations and Management* (L06). The *Guide* addresses various ways that transportation agencies can re-engineer their day-to-day business practices to improve traffic operations, nonrecurring traffic congestion, and the reliability of travel times delivered to roadway system users. *Institutional Architectures* is intended to integrate disparate agency processes and reorganize agencies and functions to advance operations and improve efficiency.
The Benefits

Transportation agencies will benefit from having e-tools available to integrate both day-to-day agency processes and institutional and programmatic structures to actively manage highway operations. Implementing improvements to business processes and organizational structures, as described in the original research materials, will contribute to improved highway operations and more reliable travel times.

Who can benefit from using these tools?

This e-tool is currently under development with a planned completion date of early 2013. The project sponsors are now seeking 15 pilot agencies to undertake workshops and analyses to fine-tune their organizations and processes to focus more effectively on systems operations and management.

How can you learn more?

The E-Tool for Integrating Business Processes automates the Guide for Integrating Business Processes (L01), which can be found at http://www.trb.org/Publications/Blurbs/165284.aspx. The e-tool is also closely linked to Institutional Architectures to Improve Systems Operations and Management (L06) and can be found at http://www.trb.org/Main/Blurbs/165285.aspx. Elements of the products, such as a one-minute self-assessment evaluation, are already available on the web at http://www.aashtosomguidance.org/. For additional information, contact Wayne Berman at FHWA, Wayne.Berman@dot.gov; Gummada Murthy at AASTHO, gmurthy@aashto.org; or Reena Mathews at TRB, rmathews@nas.edu.

About SHRP2 Implementation

The second Strategic Highway Research Program is a national partnership of key transportation organizations: the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the Transportation Research Board. Together, these partners conduct research and deploy products that will help the transportation community enhance the productivity, boost the efficiency, increase the safety, and improve the reliability of the Nation’s highway system.

STRATEGIC HIGHWAY RESEARCH PROGRAM
Focused Training for Transportation Leaders to Advance Travel-Time Reliability

Regional forums expand opportunities to gain expertise in new strategies, technologies for enhancing transportation systems operations

Transportation leaders are seeking ways to deliver the infrastructure to support reliable trips for drivers. Although many new strategies and technologies for operating highway systems are emerging that can help transportation agencies improve travel-time reliability and safety, many are not yet routinely incorporated into business processes and decision making. A new total-immersion forum now offers transportation agency leaders the opportunity to learn about leadership and management issues related to operations and reliability and how to take advantage of the many advances being made in operations.

The Solution

New curriculum for regional training (or regional operations forums) allows senior managers and program leaders at public agencies to build expertise in the emerging highway operations field. The curriculum is designed to benefit leaders and practitioners from transportation systems operations and management (SO&M), as well as participants whose expertise is outside the SO&M field.

Topics such as the principles of building capability within organizations, performance measurement, goods movement, workforce development, and building a business case for SO&M are covered in depth. The new curriculum includes components tailored to the interests and capabilities of the specific regions where the Regional Operations Forums are delivered. Participants will also learn how to create individual implementation plans.

Training and executive workshops give agency leaders operating strategies to mitigate congestion

FOCUS AREA: Reliability (L36)

Regional training forums expand current learning opportunities for improving highway systems operations and management.

Save Lives
- Enhanced understanding by transportation agency leaders of new strategies and technologies for highway system operations can result in greater system safety.

Save Money
- Building management capabilities at public transportation agencies supports cost savings, operating, and business efficiencies.

Save Time
- Concentrated curriculum focused on regional needs and the latest advances in transportation systems operations save time in gaining valuable expertise for busy public agency managers and practitioners.
The Benefits
The new curriculum transmits the latest strategies and technologies to transportation agency leaders, helping agencies immediately enhance their highway systems operations. That, in turn, results in the economic, environmental, and safety benefits generated by more reliable travel times.

How can you learn more?
Implementation for this product is just getting under way. The curriculum will be piloted in 2013, with full implementation occurring in 2014. To learn more or become involved in these efforts, contact, Tracy Scriba at FHWA, tracy.scriba@dot.gov; Gummada Murthy at AASHTO, gmurthy@aashto.org, or Neil Pedersen at TRB, npedersen@nas.edu.

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Strategic Highway Research Program
U.S. Department of Transportation | Federal Highway Administration
American Association of State Highway and Transportation Officials | Transportation Research Board
Design Features to Reduce Nonrecurring Congestion

Designing Reliable Travel Times into Highway Projects

An important element of travel-time reliability is the physical design of highway facilities. Although Policy on Geometric Design of Highways and Streets (the “Green Book”) and other manuals provide extensive guidance on highway design, they do not specifically address how different design elements compare in contributing to more reliable travel times. Highway design engineers need tools that allow them to evaluate which of several design solutions may be better suited to reduce nonrecurring congestion, and at what cost.

Cost-Effectiveness of Design Features to Reduce Nonrecurring Congestion

The Solution

Developed through the second Strategic Highway Research Program (SHRP2), this product provides a design guidebook and an Excel-based tool that designers can use to estimate the cost-effectiveness of alternative design elements that can improve travel-time reliability.

The design guidebook provides a catalog of different treatments, including summary information on each treatment’s objective, a description of each geometric and non-geometric approach, advantages and disadvantages such as expected operational benefits, factors to consider when selecting a treatment, applicability to nonrecurring congestion, typical applications, design criteria and practices, and insight on safety effectiveness. Quantitative information about the performance, cost-effectiveness, and costs of each design treatment is included as well as an evaluation process to compare alternatives and select treatments for a specific site.

The accompanying software simplifies a user’s analysis of a design option to reflect site conditions and traffic data and compare the option to doing nothing. The software predicts the changes in delay, accidents, the travel-time distribution, and various measures of travel-time reliability. It also calculates cost-effectiveness of measures and performs lifecycle benefit-cost analysis. Results are displayed in easy-to-understand tabular and graphical form.

The Benefits

Use of the guidebook and software will benefit highway design engineers by allowing them to incorporate reliability into the benefit and cost considerations they use to select design alternatives. Once decisions are implemented through completed projects, highway travelers should see more consistent travel times and fewer backups. The SHRP2 suite of reliability...
products allows transportation agencies to integrate travel-time reliability considerations into all major activities. These research products address how transportation agencies can be organized for reliability, how they can incorporate reliability into the planning process, and how they can measure and model reliability across their highway network.

How can you learn more?

This product is currently under development; summaries can be found at [http://onlinepubs.trb.org/onlinepubs/shrp2/RFPL38/L07designguidesummary.pdf](http://onlinepubs.trb.org/onlinepubs/shrp2/RFPL38/L07designguidesummary.pdf), [http://onlinepubs.trb.org/onlinepubs/shrp2/RFPL38/L07toolsummary.pdf](http://onlinepubs.trb.org/onlinepubs/shrp2/RFPL38/L07toolsummary.pdf), and [http://www.4ishgd.valencia.upv.es/index_archivos/80.pdf](http://www.4ishgd.valencia.upv.es/index_archivos/80.pdf). For more information, contact Jawad Paracha at FHWA, jawad.paracha@dot.gov; Greta Smith at AASHTO, gsmith@aashto.org; Ralph Hessian at TRB, rhexian@nas.edu; or William Hyman at TRB, whyman@nas.edu.

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Strategic Highway Research Program

[Logo of SHRP2]

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