

Organizing to Improve Travel-Time Reliability

Road users see the benefits of managing highway operations

Given that traffic congestion caused by weather, crashes, and other events creates more than 50 percent 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.

Several new tools to help agencies advance their business practices as well as their organizational structures are now available from the second Strategic Highway Research Program. Taken together, they provide a structure to modernize current practices and, ultimately, improve the overall transportation network.

Integrating Business Processes to Improve Reliability

The Solution

A new suite of guides and web tools will assist transportation agencies in integrating travel-time reliability into planning, programming, and project delivery processes while overcoming inter-departmental and inter-agency barriers to improving highway operations. Because reliability is an emerging business activity, materials are also being developed to help agency leaders recognize the value of reengineering day-to-day business practices to optimize the benefits of operations management.

The first product (L01) focuses on integrating business processes to improve reliability, which will effectively reduce congestion by providing methods to mitigate the effects of incidents, weather, work zones, special events, traffic control, devices, fluctuations in demand, and bottlenecks.

The second product (L06), which includes a web-based self-evaluation guide, provides a comprehensive and systematic examination of ways agencies can be more effectively organized to successfully execute operations programs that improve travel-time reliability.

Together they offer:

- ▶ A detailed introduction to applying a highly successful business-process mapping tool to improve highway systems operation.

Fostering Faster Travel-Time Reliability through Smarter Operations

FOCUS AREA:
Reliability (L01/L06)

Comprehensive guides and web-based tools to advance business practices and identify practical measures that ease congestion and keep cars and trucks moving.

Save Lives

- Faster incident clearance reduces secondary crashes.
- Standard procedures protect responders.
- Work zone management and operations are improved, resulting in safer, more efficient, and less congested work zones.



Save Money

- Streamlined operations lead to cost savings.
- Abbreviated closures and earlier identification of problems reduce costs of congestion for travelers and freight industry.



Save Time

- Tools lead to reduced traffic congestion and traveler delay.
- Preventive measures mitigate problems before serious delays and bottlenecks occur.



Who Does It Benefit?

- State and local highway agencies
- Incident responders
- Contractors
- Drivers
- Designers
- Taxpayers



- ▶ Case studies that show how business processes were successfully re-engineered in traffic incident management, work zone management, and other areas related to travel-time reliability.
- ▶ A system and templates for advancing an agency's ability to improve systems operations and management.

The Benefits

Improving travel-time reliability by improving operations management is like discovering new highway capacity. Road users can see the benefits of techniques such as quick clearance, roadside assistance, alternative route information and other strategies. Organizing agencies to integrate systems operations and management strategies offers the additional benefits of improved coordination and collaboration in other business areas and helps to build opportunities and the impetus to continually improve processes.



Photo Credits: VDOT – Trevor Wayton

How can you learn more?

To have a SHRP2 representative contact you about technical assistance or other information, contact Robert.Arnold@dot.gov; Wayne.Bergman@dot.gov; Stephen.Clinger@dot.gov; Gummada Murthy at gmurthy@aaashto.org; David Plazak at dplazak@nas.edu; or Bill Hyman at whyman@nas.edu. A web-based tool, *Systems Operations Management Guidance*, is available on the AASHTO website at aaashtosomguidance.org. The following resources are available online and from the TRB Bookstore:

- ▶ *Integrating Business Processes to Improve Travel Time Reliability:*
www.trb.org/Publications/Blurbs/165283.aspx
- ▶ *Guide to Integrating Business Processes to Improve Travel Time Reliability:*
www.trb.org/Publications/Blurbs/165284.aspx
- ▶ *Institutional Architectures to Improve Systems Operations and Management:*
www.trb.org/Publications/Blurbs/165285.aspx
- ▶ *Guide to Improving Capability for Systems Operations and Management:*
www.trb.org/Publications/Blurbs/165286.aspx



About SHRP 2 Implementation

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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 provides transportation agencies with predictive tools to plan for and respond to non-recurrent 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
- Incorporating travel-time reliability into the *Highway Capacity Manual*

Reliability Analysis Tools

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, analytical, economic and institutional implementation 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 DOTs and MPOs to fully integrate mobility and reliability performance measures and strategies into transportation planning and programming 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 web-based tool being developed as a part of the SHRP2 Solutions Capacity Project known as TCAPP.

Accurately forecasting travel times on heavily traveled roads

Focus Area: Reliability (L02/L05/L08)

Tools to help transportation planners better predict and plan for unexpected travel delays.

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

- More reliable travel-time information enables better trip planning and less time traveling.
- Reduced delay and lost productivity.

Incorporating Travel-Time Reliability into the Highway Capacity Manual (L08): New analytical procedures developed as part of this effort incorporate travel-time reliability 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 DOTs better analyze strategies for addressing causes of non-recurrent 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?

To have a SHRP2 representative contact you about technical assistance or other opportunities to use these reliability tools, contact Robert Rupert at Robert.Rupert@dot.gov; Douglas Laird at Douglas.Laird@dot.gov; Jim Hunt at Jim.Hunt@dot.gov; Gummada Murthy at gmurthy@ashto.org; or William Hyman at whyman@nas.edu.



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National Traffic Incident Management Training



Faster, safer incident recovery depends on an integrated, well-trained responder corps.



First responders study traffic incident scenarios as part of a training pilot held in Georgia.

The impact of traffic incidents on highway operations, reliability, and safety is well known and alarming. About 25 percent of all delays are caused by traffic incidents. Congestion costs are counted in hundreds of billions of dollars and wasted fuel is measured in billions of gallons. More importantly, traffic incidents pose a significant safety risk to both responders and travelers. The likelihood of a secondary crash increases with each minute that an incident remains unresolved.

Clearing incident scenes quickly with a well-coordinated, multidisciplinary team of first responders and transportation personnel is an important means of reducing the risk of secondary crashes and congestion delays. The second Strategic Highway Research Program (SHRP2) now offers multidisciplinary training for both responders and trainers to meet this need.

The benefits of SHRP2's National Traffic Incident Management Training include:

- ▶ A unified, multidisciplinary approach that promotes a more effective incident response.
- ▶ Lessons in new multi-agency standards and best practices.
- ▶ Curricula based on 100 core competencies from 9 disciplines shown to improve on-scene responder and driver safety.
- ▶ A train-the-trainer curriculum that provides cost-effective alternatives for qualified trainers across the country.



Save Lives

Better training leads to faster incident response and clearance. This means fewer secondary crashes result from the original incident, and less exposure to moving traffic while the incident is resolved.



Save Money

Efficient response also saves money. In Atlanta, improved incident clearance practices reduced secondary crashes by 69 percent in 12 months, saving lives and more than \$1 million.



Save Time

Well-trained responders can cut clearance time in half, decreasing delays caused by incident-related congestion. Train-the-trainer courses help responders learn more quickly.

Photo credits: (top/center) iStockphoto.com; (lower right) SAIC.

A Stronger Responder Corps

Traffic Incident Management Training helps improve traffic incident response. Better incident response improves the safety of responders and drivers, reduces crashes that occur because of incident-related congestion, decreases traffic delays caused by incidents, and can cut incident response time in half.

Delivered in an intensive, two-day course or single-lesson modules, SHRP2's Traffic Incident Management Training includes:

- ▶ Interactive seminars
- ▶ Case study analysis
- ▶ Tabletop role-play and scenarios
- ▶ Field practicum that focus on the safety of responders and drivers, quick clearance, and effective communications at traffic incident scenes

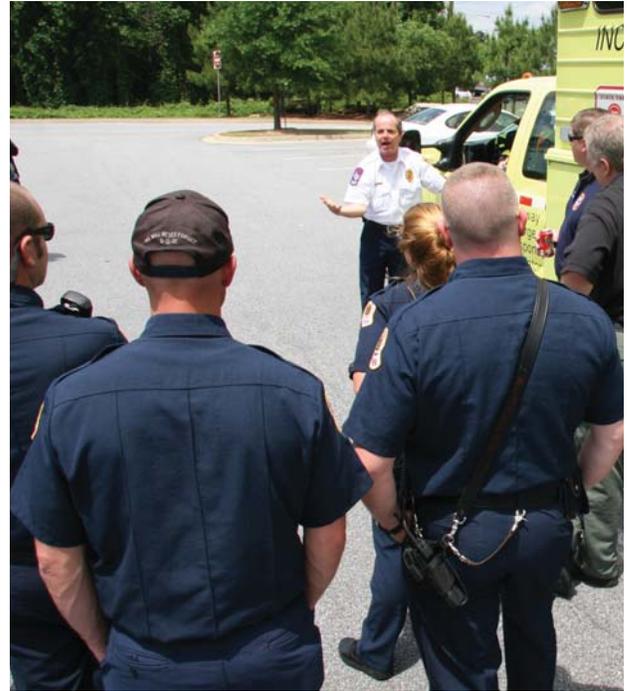


Photo credit: SAIC

First responders participate in a training pilot held in Georgia.

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



To learn more about the Federal Highway Administration's Traffic Incident & Events Management program, including National Traffic Incident Management Training, visit:
www.ops.fhwa.dot.gov/eto_tim_pse.



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KNOWLEDGE TRANSFER SYSTEM FOR SYSTEMS OPERATIONS & MANAGEMENT

Focus area: Reliability (L17)

Easy Access to
Essential
Information

PROBLEM: As an emerging approach to reducing nonrecurring congestion and improving mobility, the area of travel time reliability has yet to develop the basic elements on which an area of practice can be built. These include a common language that overcomes the technical jargon of various disciplines, the basic analytical tools and guidance that support acceptance and use of new strategies and techniques, and a widely acknowledged source of reliable information.

SOLUTION: An online resource known as a Knowledge Transfer System for the field of systems operations and management (SO&M) is being developed. It will provide a first point of access to key materials, including syntheses of all SHRP 2 Reliability research, new information that fills gaps in current knowledge, a glossary of common terms, and business case resources. It will also function as a portal to the complete range of information on SO&M. Community-building functions such as peer dialog and news and events will also be features of the Knowledge Transfer System. Content is of use to policy-makers, practitioners, and researchers.

BENEFITS: The Knowledge Transfer System establishes a 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 systems operations and management 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.

SCHEDULE AND CONTACTS: A working version will begin a beta testing phase in the fall of 2012. For information, contact Gummada Murthy, gmurthy@aathto.org, or David Plazak, dplazak@nas.edu.



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REGIONAL OPERATIONS FORUM

GAINING
GROUND IN THE
FACE OF GROWING
DEMAND

FOCUS AREA: RELIABILITY (L36)

PROBLEM: Many new strategies, technologies, and practices are emerging to help transportation agencies realize the benefits of operating highway systems to improve travel time reliability and safety, but they have not yet been routinely incorporated into business processes and decision making. Many transportation agency leaders do not have a background in transportation operations, and as a result lack an understanding of how to move their agencies toward an operations orientation. A total-immersion forum is needed for transportation agency leaders to learn about leadership and management issues related to operations and reliability if they are to take advantage of the many advances being made in operations.

SOLUTION: This project will develop a curriculum and model for establishing regional forums at which senior managers and program leaders can build expertise in the emerging strategies for improving travel time reliability. The curriculum includes topics such as the principles of building capability within organizations, performance measurement, goods movement, workforce development, and building a business case for systems operations and management. Participants will also learn how to create individual implementation plans.

BENEFITS: By understanding the inherent value of advanced operations strategies and how to implement them, transportation leaders can increase their agency's ability to operate highway systems to gain the economic, environmental, and safety benefits of reliable travel times.

SCHEDULE AND CONTACTS: Project L36 is just getting under way. The forum will be piloted in 2013, with full implementation of the forums occurring in 2014. For more information, contact Steve Clinger, Stephen.Clinger@dot.gov, Gummada Murthy, gmurthy@aathto.org; or Neil Pedersen at npedersen@nas.edu.



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