

Updating Reliability Research in SHRP 2

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Travel time reliability is a relatively new, driver-focused way of looking at nonrecurring congestion, the kind that builds from unexpected rain storms, work zones, incidents, and stadium traffic after a baseball game, that can turn a three-hour trip to the beach into four hours of frustration. When one or more random events like these leads to traffic congestion, then unreliability increases.

Improving reliability can increase the efficiency of the highway system without expanding it by mitigating the random factors that lead to unexpected congestion. Reliability research in SHRP 2 is developing a new method for diagnosing an important class of congestion problems and identifying different strategies to reduce their effects. Many of these strategies will prove cost-effective in helping states and local governments reduce traffic congestion.

Projects in the program address definitions, performance measures, data collection, highway design features, operational strategies, travel information, incident management, corridor and long-range planning, as well as how to continually improve organizations to enhance reliability through systems operations and management. One key project addresses ensuring that states and metropolitan planning organizations adequately consider allocating funds to operations projects that improve reliability.

This document highlights some of the emerging research products. Full descriptions of projects in the Reliability research plan are available on the Reliability web page: www.TRB.org/SHRP2/Reliability.

Organizing Transportation Agencies to Improve Reliability

Research Products

Products from Reliability research can help transportation agencies organize to improve travel time reliability. SHRP 2 created an institutional maturity framework and refined it in follow-up activities. This tool can be used to conduct a self-assessment of current organizational features to achieve effective systems operations and management. In addition, this framework helps identify all the elements needed to continually improve activities one level at a time. This framework applies both within an organization and in its relationships with other organizations, both public and private; and it can be used by any organization that is responsible for the management and operations of highways. Based on Reliability research, the American Association of State Highway and Transportation Officials (AASHTO) developed an online guide for systems operations and management that can be found at <http://www.aashtosomguidance.org>. Another guide is being developed to use business processes to improve travel time reliability. Other products include a training and certification course for helping incident responders from multiple disciplines achieve national unified goals for traffic incident management and a knowledge

transfer system of Reliability research to state departments of transportation and academia; this system will include links to the repository of structured and unstructured data from the Reliability data archive.

Webinar

In October 2010, SHRP 2 hosted a webinar that explored the institutional maturity framework and online AASHTO guide. This webinar was part of SHRP 2 Project L06: Institutional Architectures to Advance Operational Strategies. The recorded webinar is available on the SHRP 2 website.

Workshop

A national workshop convened key stakeholders in transportation, emergency medical services, and local government in Phoenix, Arizona, in May 2009 to identify how the identified benefits of business process integration can be institutionalized to achieve broader goals of improving travel time reliability. The outcomes of the workshop were useful in developing the *Guide to Integrating Business Processes to Improve Reliability*, the primary product of project L01.

Pilot Tests

Indiana DOT and Georgia DOT each hosted a pilot test of the traffic incident management training course developed in SHRP 2 Reliability project L12. Conducted over two days in the spring of 2010, the pilot workshops each included responders from eight different disciplines who engaged in classroom instruction, hands-on role-playing activities, and full-scale field demonstrations. The training approach was enthusiastically received and other pilots are being planned to continue refinements of the course materials.

Core competencies that are shared across responder disciplines and political jurisdictions can reduce incident clearance times. The risk of a secondary crash increases 3%

for every minute of incident delay, one reason why quick clearance is so important to safety.

New Data Collection and Analysis Tools for Reliability

Research Products

Travel time reliability must be accurately measured if we are to know how different factors affect it. To improve the collection and analysis of travel time reliability data, SHRP 2 is designing travel time reliability monitoring programs and preparing a guidebook that practitioners and others can use to design, build, operate, and maintain monitoring systems. Methods and tools are being developed for analyzing how travel time reliability changes with highway improvement projects. A guide for building reliability factors into travel demand models is in development. A data archive is also being created that will house all the structured and unstructured data that is generated through Reliability research.

Webinar

In August 2010, TRB hosted a webinar that explored practical methods that can be used in predicting highway travel time. This webinar was part of SHRP 2 Project L03: Analytical Procedures for Determining the Impacts of Reliability Improvement Strategies.

Pilot Study

Pilot studies of analytic procedures developed in Reliability project L03 were conducted using urban freeway data before and after implementation of strategies to improve reliability. The data came from traffic management centers in seven cities, including Houston, Minneapolis, Los Angeles, San Francisco Bay Area, San Diego, Atlanta, and Jacksonville.

Reliability in Planning, Programming, and Geometric Design

Research Products

Travel time reliability is not yet a mainstream concern of transportation planning, programming, or geometric design, but Reliability research is developing the means—including technical procedures—for state DOTs and metropolitan planning organizations to fully integrate mobility and reliability performance measures and strategies into the transportation planning and programming processes. A guide on how geometric design features can improve reliability is also being developed. Work is under way to include reliability factors into the *Highway Capacity Manual*. A guide on roadway design features will be written to support the reduction of delays that reduce travel time reliability



so that such features can be considered for inclusion in the AASHTO Policy on Geometric Design of Highways and Streets—the primary document used by state DOTs and other public agencies for the design of freeways, conventional highways, and urban streets. Techniques are being created to assess the value of different strategies to improve travel time reliability.

Encouraging Innovations that Foster Reliability Improvements

Research Products

Innovative ideas have the potential to significantly improve travel time reliability in the long term. To achieve this, Reliability research is developing innovative operations strategies. SHRP 2 is also sponsoring a Reliability IDEA program, which funds early-stage proof-of-concept investigations.

SHRP 2 Reliability IDEA Program

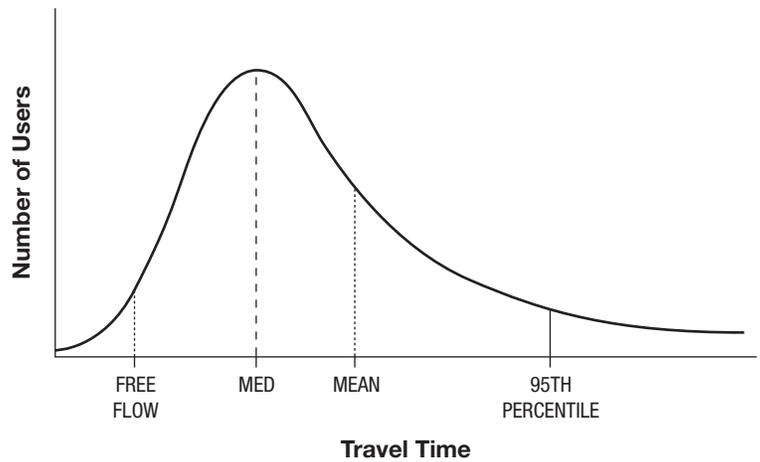
The SHRP 2 Reliability IDEA program is available to support innovative approaches, technologies, and projects that will help to improve travel time reliability. The program will foster selected innovations that could improve the consistency or dependability of travel times, improve the prediction of travel times, and provide information that travelers and other highway system users could use when dealing with unexpected delays. Proposals for the Reliability IDEA program are due March 1. Details about the program and the submission process can be found on the IDEA website: www.TRB.org/IDEA.

Driver Behavior and Human Factors in Reliability

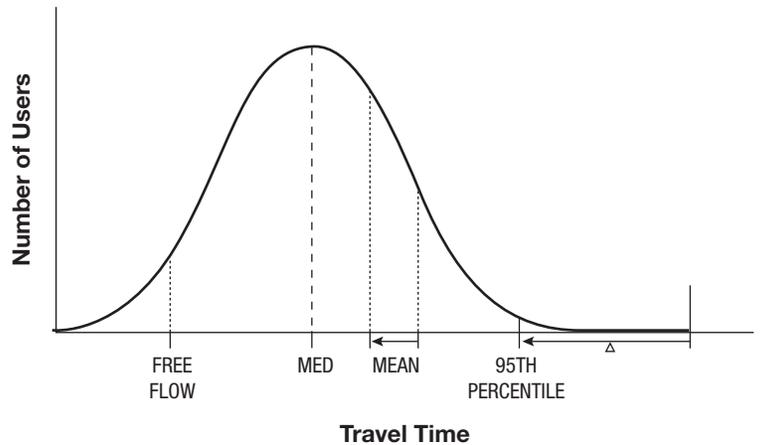
Research Products

Machines move through our transportation systems, but they are operated by people. Traffic incidents are a leading cause of nonrecurring congestion and to reduce these incidents Reliability research is developing strategies for reduc-

Drivers **without** information on options & pricing



Drivers **with** information on options & pricing



ing inappropriate driving behavior. People are also nearly as (if not more) concerned about travel time reliability as they are about average travel time, so states and metropolitan areas are increasingly communicating reliability information to travelers. To help facilitate this process, Reliability research is producing a guide for communicating reliability information to system users.

SHRP 2 Reliability Projects

PROJECT NUMBER	PROJECT TITLE
Organizing Transportation Agencies to Improve Reliability	
L01	Identification and Analysis of Best Practices
L06	Institutional Architectures to Advance Operational Strategies
L12	Improving Traffic Incident Scene Management
L17	A Framework for Improving Travel Time Reliability
New Data Collection and Analysis Tools for Reliability	
L02	Establishing Monitoring Programs for Mobility and Travel Time Reliability
L03	Analytical Procedures for Determining the Impacts of Reliability Improvement Strategies
L04	Incorporating Reliability Performance Measures in Operations and Planning Modeling Tools
L13	Archive for Reliability and Related Data
L13A	Design and Implement a System for Archiving and Disseminating Data from SHRP 2 Reliabilities and Related Studies/Assistance to Contractors to Archive their Data for Reliability Projects
Reliability in Planning, Programming, and Geometric Design	
L05	Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes
L07	Evaluation of Cost-Effectiveness of Highway Design Features
L08	Incorporation of Travel Time Reliability into the Highway Capacity Manual
L09	Incorporation of Non-recurrent Congestion Factors into the AASHTO Policy on Geometric Design
L11	Evaluating Alternative Operations Strategies to Improve Travel Time Reliability
Encouraging Innovations that Foster Reliability Improvements	
L11	Evaluating Alternative Operations Strategies to Improve Travel Time Reliability
L15	Reliability Innovations Deserving Exploratory Analysis (IDEA)
Driver Behavior and Human Factors in Reliability	
L10	Feasibility of Using In-Vehicle Video Data to Explore How to Modify Driver Behavior that Causes Non-Recurring Congestion
L14	Traveler Information and Travel Time Reliability

RELIABILITY TECHNICAL COORDINATING COMMITTEE

R. Scott Rawlins, Nevada Department of Transportation; John F. Conrad, CH2M HILL; Malcolm E. Baird, Independent Consultant; Kevin W. Burch, Jet Express, Inc.; John M. Corbin, Wisconsin Department of Transportation; Henry de Vries, New York State Police; Leslie Spencer Fowler, Kansas Department of Transportation; Steven B. Gayle, Binghamton Metro Transportation Study; Bruce Hellinga, University of Waterloo; Lap T. Hoang, Lap T. Hoang and Associates, LLC; Patricia S. Hu, Oak Ridge National Laboratory; Sarah C. Joshua, Maricopa Association of Governments; Mark F. Muriello, Port Authority of New York and New Jersey; Richard J. Nelson, Nevada Department of Transportation; Richard Phillips, Washington State Department of Transportation; Constance S. Sorrell, Virginia Department of Transportation; L. Scott Stokes, Idaho Transportation Department; Jan van der Waard, Netherlands Institute of Transport Policy Analysis (KiM); John P. Wolf, California Department of Transportation; Margot Yapp, Nichols Consulting Engineers, Chtd.; Robert Arnold and C. Y. David Yang, Federal Highway Administration; Andrew Beal, Ontario Ministry of Transportation

SHRP 2 RELIABILITY STAFF

William Hyman, Senior Program Officer; Gummada Murthy, Senior Program Officer; Abdelmenname Hedhli, Visiting Professional; Ralph Hessian, Visiting Professional; Hans van Saan, Visiting Professional; Michael Miller, Senior Program Assistant;