

Reliability Data and Analysis Tools (L02/L05/L07/L08/C11)

A suite of tools that supports data collection, analysis, and decisionmaking for improving operations and travel-time reliability.

Challenge

Travelers continue to experience congestion on America's roadways. More than half of all congestion is due to unexpected or nonrecurring delays, caused by crashes, construction work zones, special events, or weather conditions. Inconsistent travel conditions are frustrating, cost travelers time and money, and put motorists and traffic incident responders at greater risk.

Reliability promotes the quality and consistency of travel times encountered by people as they go about their daily lives. To improve travel-time reliability, transportation agencies need data monitoring, analysis, and planning tools to understand how fluctuations in traffic and road conditions affect traffic operations, and to identify effective strategies to reduce the variable and uncertain travel times caused by recurring and nonrecurring congestion.

Solution

SHRP2 has developed a bundle of products to enable agencies to include reliability in their assessment of transportation alternatives so they can consider a more complete set of benefits in their decisions.

The Bundle: Reliability Data and Analysis Tools

- Guide to Establish Monitoring Programs for Travel-Time Reliability (L02)
- Reliability by Design (L07)
- Incorporating Travel-Time Reliability into the Highway Capacity Manual (L08)
- Tools for Assessing Wider Economic Benefits of Transportation (C11)
- Handbook for Incorporating Reliability Performance Measures into Transportation Planning and Programming (L05)

Accurately assessing travel times on heavily traveled roads

FOCUS AREA:

Reliability (L02/L05/L07/L08/C11)

Guidebook, how-to handbook, and analytical procedures to help transportation agencies better predict, plan for, and reduce unexpected travel delays.

Save Lives

- ▶ Reducing unexpected delays will result in smoother traffic flow that reduces the likelihood of crashes.



Save Money

- ▶ Investments in reliability improvements have strong benefit-cost ratios.
- ▶ Less variability in travel time means less extra time has to be planned for trips. Improved reliability supports efficient freight movement, with national economic benefits.



Save Time

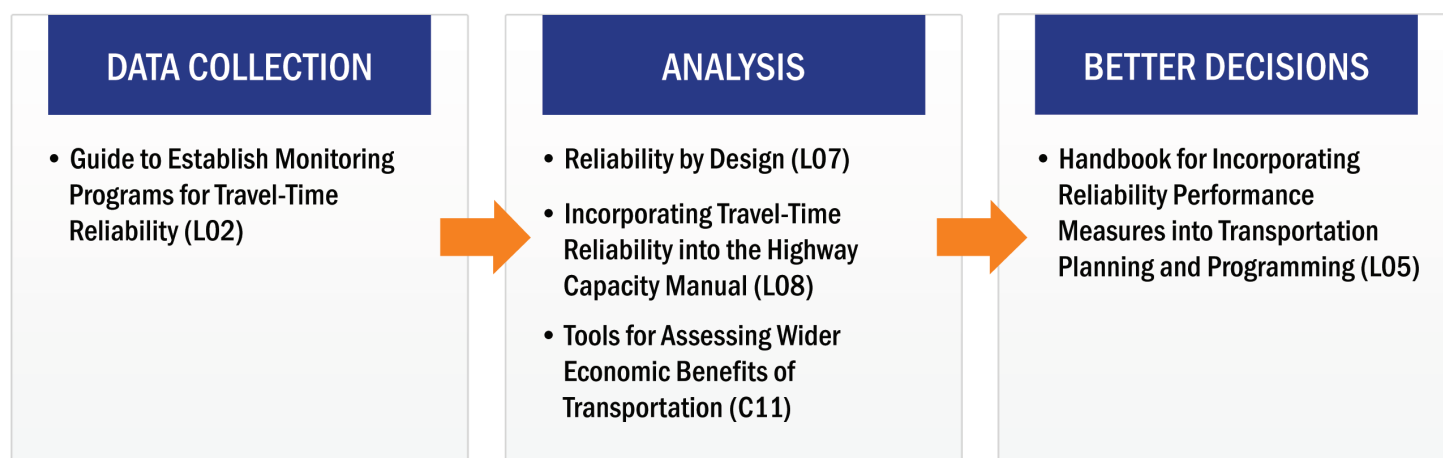
- ▶ Tools help identify design and operational improvements that reduce traffic congestion and traveler delay.
- ▶ Preventive measures mitigate problems before serious delays and bottlenecks occur.



Photo Credit: Trevor Wrayton, VDOT



Addressing travel-time reliability as part of a logical path of improvement from data to decisions



Data Collection

Guide to Establish Monitoring Programs for Travel-Time Reliability (L02)

This guide provides agencies with methods for designing programs to monitor travel-time reliability and helps them establish a baseline of system data used to identify current performance and areas for improvement. It serves as a guidebook for designing, building, operating, and maintaining these data systems and addresses freeways, toll roads, and urban arterials, providing direction on technical, analytical, economic, and institutional implementation issues.

Analysis

With improved data, agencies are better equipped to analyze current conditions and forecast the benefits of various design and operational treatments intended to improve reliability.

Reliability by Design (L07)

This product consists of a spreadsheet-based treatment analysis tool and design guidebook that help agencies estimate the effectiveness and comparative economic benefits of design treatments at specific locations. This tool's ability to predict how a wide range of design treatments and strategies will affect congestion and reliability enables agencies to consider these benefits in planning processes.

Incorporating Travel-Time Reliability into the Highway Capacity Manual (L08)

This product provides reliability assessment methods based on the Highway Capacity Manual freeway and urban street facility procedures and computational engines. The methods generate scenarios (such as weather, incidents and work zones) to consider the underlying causes of travel time variations. They provide a strong platform for assessing the benefits of operational management improvements and capacity enhancements.

Tools for Assessing Wider Economic Benefits of Transportation (C11)

This product, developed under the Capacity focus area, offers a suite of spreadsheet-based analysis tools that provide a range of reasonable economic impact expectations for travel-time reliability. One of the economic analysis tools in this suite focuses on Reliability and was tested with the other Reliability Data and Analysis Tools during pilots at several sites.

Better Decisions

Handbook for Incorporating Reliability Performance Measures into Transportation Planning and Programming (L05)

This handbook provides an overview of procedural and technical approaches for State DOTs and MPOs to integrate mobility and reliability performance measures and strategies into transportation planning and programming processes. These approaches enable agencies to include reliability in their decisions about which transportation investments to select. 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 PlanWorks.

Benefits

State and local transportation agencies, shippers and receivers, business owners, and commuters all benefit from Reliability Data and Analysis Tools. This suite of products helps transportation agencies better identify and implement strategies to reduce the variability and uncertainty of travel times, leading to more reliable travel for everyone who uses the transportation system.

How can you learn more?

For more information, visit the SHRP2 Solutions website at www.fhwa.dot.gov/GoSHRP2

Or contact: Douglas Laird with FHWA at douglas.laird@dot.gov, Gummada Murthy with AASHTO at gmurthy@aaashto.org, or Steve Andrie with TRB at sandrie@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

