



## Reliability Research in SHRP 2

Reliability research targets travel time variation, which affects the time it takes to reach a destination and influences how much extra time drivers must allow to arrive within a desired time window. For example, to address the risk of being late, a person planning a trip that normally takes 30 minutes might allow 45-60 minutes. Not only is travel time reliability an important component for travelers and shippers, it is also a piece of the congestion problem in which transportation agencies can make significant gains even as travel demand grows.

SHRP 2 Reliability research addresses the root causes of unreliable travel times by focusing on how the highway system is *operated*. Research projects will identify effective operations strategies; improve the means of integrating operations activities into planning, modeling, and decision making; and aid implementation of operations strategies.

### Current Projects

Two projects are currently under way. Cambridge Systematics will conduct the research for *Project L03: Analytic Procedures for Determining the Impacts of Reliability Improvement Strategies*. The objective of this 24-month, \$1.75M project is to develop technical relationships between strategies to improve reliability and reliability performance metrics. The technical relationships will quantify the effects of reliability improvement strategies and enable them to be incorporated into planning, programming, and operations models in later Reliability projects.

PB Consult, Inc. will conduct the research for project *L06: Institutional Architectures to Advance Operational Strategies*, a \$1.0M, 48-month project. The expected outcome is a clear basis for integrating highway operations into transportation agency activities so that strategies that improve travel time reliability can be more readily implemented. Organizational theory, case studies, and the input from regional forums of transportation executives will inform the conduct of this study and shape its outcome.

## Research Questions

Because travel time reliability is a relatively new field of investigation, opportunities for early impact may exist. For example, techniques have been developed to manage special events, but they may not have been made available for wider application. Some projects will identify, evaluate, and compile these best practices. A larger challenge is to be forward-looking in this endeavor, to evaluate the possible contributions of advanced technologies that may re-invent the frame of reference for operations strategies. It is likely that the focus, scope, or research products will evolve as projects are informed by continuing input.

The Research Plan is structured around three themes that provide context for the individual projects. The themes are described in the following sections and the projects are shown in Table 1.

### *Theme 1: Improving the Knowledge Base*

This theme recognizes the need to systematically assess how the highway system is operated, how agencies are organized to operate the highway system, and how incident scenes are managed. Programs and strategies developed to provide a reliable highway system will involve many different agencies, different units within agencies, and private businesses—a distinct change from the traditional approach to implementing improvements in travel time reliability. The three projects within this theme will provide practitioners with guidance to move the state of the practice closer to the state of the art and respond to the future operations environment.

### *Theme 2: Integrating Improved Performance into Agency Decision Making*

Because travel time reliability is a relatively new area of investigation for the transportation profession, some fundamental concepts are still being investigated. These areas include (a) the relative contribution of different sources to overall reliability, (b) how to measure and analyze travel time reliability, and (c) the impacts of mitigation strategies. Without this understanding, practitioners are hindered in their ability to incorporate these strategies in transportation planning and programming activities and decision makers cannot fully address the consequences of travel time reliability and congestion. The five projects in this theme area address a range of research needs for both practitioners and decision makers.

### *Theme 3: Implementing Reliability Concepts*

This theme addresses the need to improve design and operations practices to reduce the impacts of non-recurring congestion through capacity analysis and facility design. The theme also considers monitoring programs that provide data to analyze operational strategies, especially as they become more sophisticated in their ability to respond to real-time changes in traffic demands. The four projects in this theme will

result in evaluation and analysis that provide the basis for national standards to facilitate implementation of effective strategies.

**Table 1 Reliability Research Plan**

	2007	2008	2009	2010	2011
Theme 1 Improving Knowledge Base		L01: Identification and Analysis of Best Practices			
	L06: Institutional Architectures				
		L12: Traffic Scene Incident Management			
Theme 2 Integrating Improved Performance into Agency Decision Making	L03: Analytic Procedures for Determining Effects of Mitigation Measures				
	L11: Evaluating Alternative Operations Strategies				
			L04: Reliability Estimation in Planning/Operations Modeling		
			L05: Reliability Performance Measures in Transportation Programming Process		
			L10: Reducing Inappropriate Driving Behavior		
Theme 3 Implementing Reliability Concepts	L02: Reliability Monitoring Programs				
	L07: Evaluation of Cost-Effectiveness of Highway Design Features to Reduce Non-Recurring Congestion				
			L08: Incorporating Congestion Factors in Highway Capacity Manual		
			L09: Incorporating Congestion Factors in Geometric Design Guide		

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