The overall SHRP II Reliability program goal as stated in TRB Special Report 260 is:

To provide highway users with reliable travel times by preventing and reducing the impact of non-recurring incidents.

Reliability research encompasses seven major sources of unreliability that account for approximately half of the total traffic delay: traffic incidents, work zones, weather, fluctuations in demand, special events, traffic control devices, and inadequate base capacity. Three of them, traffic incidents, weather, and work zones, are major components of non-recurrent delay and the focus of the SHRP II Reliability focus area. These sources of unreliability can vary over time and our understanding of how they contribute to travel time variability is nascent at best, but the research is nonetheless promising because of the improvements already realized in many localities and states throughout the nation. Strategies to address the root causes of unreliable travel times relate to how the highway system is operated. The Reliability research will address the gaps in our knowledge about how the sources of unreliability affect travel time reliability and how to manage them to reduce delays.

The Technical Coordinating Committee (TCC) for Reliability met on June 8 and 9, 2006, to define the overall Reliability focus area, based on the Interim Plan completed in 2003 and plan adjustments made by the SHRP II Oversight Committee in January, 2006, in light of subsequent funding provided in SAFETEA-LU. The TCC reviewed 17 projects forwarded to it by the SHRP II Oversight Committee and prioritized them in light of the SHRP II Reliability research goals and the available funding. The TCC selected 12 projects for the program under three broad themes. The projected budget for these projects is $21.8 million. On July 19, 2006, the SHRP II Oversight Committee approved three Reliability projects for release in the Fall of 2006: L01, L03, and L06, which are described below. The others will be released at future dates.

The three research themes and the projects that address them are discussed below.

**Theme 1: Building a Foundation and an Institutional Setting for Operations**

This theme recognizes that improving travel time reliability requires a systematic compilation and assessment of what works and what doesn’t regarding how the highway system is operated, how agencies are organized to operate the system, and how individual 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. The three initial projects will systematically assess information to provide practitioners with guidance to move the state of the practice closer to the state of the art.

- Project L01: Identification and Analysis of Best Practices for Improving Travel Time Reliability
- Project L06: Institutional Architectures to Advance Operational Strategies
- Project L12: Improving Traffic Incident Scene Management
Theme 2: Improving Performance by Integrating Operations into Agency Decision Making

This theme has its origins in the fact that travel time reliability is a new area of investigation for the transportation profession and many fundamental concepts, including the relative contribution of different sources to overall reliability, how to measure and analyze travel time reliability, and the impacts of mitigation strategies, are still being investigated. As a result, practitioners are hindered in their ability to incorporate these strategies in transportation planning and programming activities and decision makers are limited in the extent to which they can 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.

- Project L03: Analytic Procedures for Determining the Impacts of Reliability Improvement Strategies
- Project L04: Incorporating Reliability Estimation into Planning and Operations Modeling Tools
- Project L05: Incorporating Reliability Performance Measures into the Transportation Planning and Programming Process
- Project L10: Measures for Reducing Inappropriate Driver Response to Adverse Weather, Roadside Distractions, Traffic Incident Scenes, and Queues
- Project L11: Evaluating Alternative Traffic Operations Strategies

Theme 3: Developing Improved Operations Strategies for Implementation

This theme addresses the need to improve design and operations practices aimed at reducing the impacts of non-recurring congestion through capacity analysis and facility design. It also addresses the need for monitoring programs that provide data for analysis of such practices, especially for operational strategies that are becoming more sophisticated in their ability to respond to real-time changes in traffic demands.

- Project L02: Establishing Monitoring Programs for Mobility and Travel Time Reliability
- Project L07: Identification and Evaluation of the Cost-Effectiveness of Highway Design Features to Reduce Non-Recurrent Congestion
- Project L08: Incorporation of Non-Recurrent Congestion Factors into the Highway Capacity Manual Methods
- Project L09: Incorporation of Non-Recurrent Congestion Factors into the AASHTO Policy on Geometric Design

Table 1 lists the projects and their budgets and durations. Figure 1 illustrates the research program project timeline.
<table>
<thead>
<tr>
<th>Project Number</th>
<th>Title</th>
<th>Allocated by TCC*</th>
<th>Duration</th>
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<td>L11</td>
<td>Evaluating Alternative Traffic Operations Strategies</td>
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<td>L12</td>
<td>Improving Traffic Incident Scene Management</td>
<td>$1.0</td>
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<td><strong>Projects for Year 3 and 4 Funding</strong></td>
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<td>L09</td>
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<td></td>
<td><strong>Reliability Program Total</strong></td>
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* When Expert Task Groups (ETGs) meet to develop a request for proposals, they determine whether the allocated budget is appropriate for the scope of work. An ETG also determines how the project should be organized into tasks and phases and specifies the total project budget; the project budget can be less than the amount allocated by the TCC, but not more. If the money allocated by the TCC is not spent in the project it can be reallocated to other projects.
L01: Identification and Analysis of Best Practices for Improving Travel Time Reliability
[An RFP has been issued.]

Budget: $1.0 million (48 months)

Objective: The objective of this project is to develop baseline knowledge of best practices for improving travel time reliability through integrated programs, policies, and practices that will serve as a foundation for SHRP II reliability research.

Project Summary: The first phase of this project will begin with an information gathering effort to identify best practices for improving travel time reliability. This includes a workshop with a small group of key practitioners to provide direction on key topics and sites. The contractor will conduct in-depth site visits involving a small group of senior practitioners (peer-to-peer) to gather specific information on best practices. After analysis and review of the information the contractor will prepare a report on best practices and guidance for further study. Specific tasks in the second phase will depend on Phase I findings about the need for additional information gathering and site visits.

Relationship to Other Projects: This project is an important first step toward developing a systematic approach to reliability research. Most of the other projects in the SHRP II Reliability focus area will benefit from the knowledge gained here.

Expected Research Products: A report to the Reliability TCC on issues and information gaps that will inform the direction of future projects; a best practices report; and an information dissemination plan.

L03: Analytic Procedures for Determining the Impacts of Reliability Improvement Strategies [An RFP has been issued.]

Budget: $1.75 million (24 months)

Objective: The objective of this project is to develop the technical relationships between reliability improvement strategies and reliability performance measures.

Project Summary: Phase I will identify countermeasures and performance measures that are fundamental to measuring reliability performance improvement. Based on this information, the contractor will prepare an experimental design and field data collection and analysis plan. Phase II will consist of pilot studies to field test the data collection effort and, if the pilots are successful, performance of the full data collection plan. Phase III will consist of analysis of the data and development of the statistical relationships between the measures taken to improve reliability and reliability performance.

Relationship to Other Projects: The project results will feed directly into Projects L02 and L04.

Expected Research Products: The project will produce a data set, an analysis of data, and credible statistical relationships that can be used for decision making. All will help establish a systematic basis for further research and timely implementation of reliability improvement measures.
L06: Institutional Architectures for to Advance Operational Strategies [The RFP has been issued.]

Budget: $1.0 million (48 months)

Objective: The objective of this project is to undertake a comprehensive and systematic examination of the way agencies should be organized to successfully execute operations programs that improve travel time reliability.

Project Summary: The first phase of the project will begin with a workshop to frame the key issues involved in creating an institutional architecture that supports and manages operational activities that can improve travel time reliability. The contractor will identify and assess institutional change that have been made at exemplary transportation agencies and analyze how these changes are applicable to other agencies. The fundamental principles of organizational theory will be investigated to determine how they apply to transportation agencies as well. A draft report will be prepared with findings and recommendations. It will be reviewed in a series of regional executive forums by senior transportation officials to determine their potential for widespread application. A final report will provide transportation agencies with guidance on institutional architecture components that support operations activities. Specific tasks for Phase II will depend on the need for additional development to support implementation in transportation agencies.

Relationship to Other Projects: This project will serve as an information base for other projects; it is important because it addresses how to organize for improved reliability.

Expected Research Products: The documented case studies will serve as a resource for other Reliability program projects. The executive forums will enable the project team to refine their recommendations for improved institutional architecture and make them more user-ready and user-friendly.

Reliability Projects Proposed for 2007

L02: Establishing Monitoring Programs for Mobility and Travel Time Reliability

Budget: $1.3 million (36 months)

Objectives: The objectives of this project are to (1) identify performance measures for recurring and nonrecurring delay and events (e.g., work zones and traffic incident characteristics); and (2) design data collection and analysis programs at local and state levels to support mobility and reliability monitoring. The project will take account of a range of geographic characteristics and sources of congestion and make optimum use of existing monitoring programs.

Project Summary: Building on the work of SHRP II Project L03, the contractor will identify which performance measures are needed for overall system monitoring of reliability; identify the data needed for such monitoring; and develop the needed monitoring programs. Consideration will be given to need for local and state agencies to aggregate data from specific locations or events to corridors, and then to encompass entire systems. The contractor will develop analytical procedures for carrying out system-level monitoring; such procedures should support reliability monitoring integration in the planning and programming process (see SHRP II Project L05) and planning and operations models (see SHRP II Project L04). This project includes identifying appropriate statistical measures, sampling requirements, geographic and time scales, and data
quality and processing parameters to meet the needs of a monitoring program. The contractor will develop prototype monitoring programs and identify candidate states and metropolitan areas for implementing monitoring systems and undertake a limited data collection effort to establish proof of concept.

The contractor will take account of efforts under way at FHWA regarding SAFETEA-LU Section 1201 that are aimed at developing a real-time system management information structure for the National Highway System and other major arterials in metropolitan areas, and transit systems.

**Relationship to Other Projects:** SHRP II Project L03 will provide valuable input to this project; furthermore, this project will provide input to Projects L08, L09, L04, and L05. It should be coordinated with projects in the SHRP II Capacity focus area.

**Expected Research Products:** The products of this research will be prototype monitoring programs that can be used by local and state transportation agencies to support reliability monitoring.

**L07: Identification and Evaluation of the Cost-Effectiveness of Highway Design Features to Reduce Non-Recurrent Congestion**

**Budget:** $2.5 million (36 months)

**Objective:** The objective of this project is to evaluate the cost-effectiveness of promising highway design features capable of reducing delays due to key causes of non-recurrent congestion.

**Project Summary:** Crash investigation sites, pull-outs, median crossovers, and paved shoulder bypass lanes could speed up the arrival of emergency personnel and equipment at an incident or reduce the time it takes to re-open the travel lanes on a facility. Design features such as median crossovers and wide paved shoulders can make it possible to keep more traffic moving in work zones by enabling the use of contraflow lanes. There are also design features that can reduce the delays due to weather and special events. Many of these features are not currently included in standard highway design practices because of perceived high costs and the lack of data on the cost savings to the facility operator and the general public over the life of the project. The aim is to identify the full range of possible roadway design features; develop cost-effective designs for these features; and estimate the cost effectiveness of the design features.

The first step for the contractor will consist of a combination of best practice review and needs assessment. One or more focus groups—comprising emergency management personnel, construction experts, highway designers, and other appropriate practitioners—will be convened to review promising and proven design features and formulate a list of possible design improvements and alternatives aimed at reducing delays due to incidents, work zones, weather, special events, and other causes of non-recurrent congestion. Consideration will be given to roadway type and geometry, terrain and climate, and other factors; the focus will be on freeways and arterials.

The contractor will then refine the design features and assess them in terms of cost due to construction, maintenance, and operation and expected local levels of on-going investment in traffic congestion management. Prototype designs and cost estimates for each alternative will then be prepared for a range of right-of-way widths, soil conditions, climate conditions, and heavy vehicle volumes representative of the traffic, soil, and climate conditions in 6 to 10 U.S. cities.

For each combination of design group alternative and example city the contractor will estimate the construction cost ranges of (1) new facilities and (2) retrofits onto an existing facility for both sufficient right-of-way and insufficient right-of-way conditions. The contractor will then estimate
the likely effectiveness of each investment level of design improvement at reducing delay for
different levels of agency commitment to emergency management services, maintenance, and
operations. Finally, the contractor will prepare a guidebook on the cost effectiveness of different
design improvements for reducing non-recurrent congestion for new projects and for retrofitting
existing facilities under a range of prevailing demand conditions, climates, types of terrain, and
levels of incident management.

Relationship to Other Projects: The results of this project will provide input for SHRP II
Reliability Projects L08 and L09.

Expected Research Products: This research will produce information that can be used to update
highway design practices that help reduce non-recurring delays. The project will provide
information needed by the appropriate committees to prepare design guidance for national
highway design guidelines.

L11: Evaluating Alternative Traffic Operation Strategies

Budget: $4.0 million (48 months)

Objective: The objective of this project is to identify best practices in traffic operations strategies
and the methods used to get them implemented, and examine how they can be more widely
implemented individually and in combination to improve reliability. While some agencies
aggressively use traffic control measures and operations plans to improve travel conditions for a
range of reasons, others address only relatively major or crisis events, or use only a few of the
many potential strategies available to them. Aggressive operations-oriented agencies have
developed institutional structures and internal decision tools and fostered public expectations that
differ from other agencies.

Project Summary: Based on review of Projects L01, L06, and other literature, the contractor will
identify successful and promising traffic control and alternative equipment deployment strategies,
such as those listed below, to identify best practices for significant strategies:

- Traffic signal re-timing in response to weather and other extreme events
- Patrol officer deployment as traffic control
- Implementation of communication plans for interagency cooperation
- Roadway or ramp closure or reversal schemes
- Variable speed limits
- Incident–management equipment deployment (including pre-deployment of equipment and
  matching appropriate equipment to the needed response)
- Pre-planned diversion plans (both temporary and permanent)
- Alternate route guidance, especially considering truck and hazardous material restrictions
- Contracting methods to ensure operations and maintenance coordination (including
  incentives, inspection, and enforcement activities related to contractor performance)

The contractor will then estimate the potential benefits of implementing such strategies in terms
of travel time reliability, travel time savings, energy or emissions savings, collision reductions
and other benefits. Based on the estimated potential benefits, the contractor will (a) develop a
field test plan for selected strategies; (b) identify transportation agencies willing to host and
support field tests; (c) conduct the field tests in cooperation with selected transportation agencies;
and (d) evaluate the results. Based on the evaluation the contractor will then prepare a best practices manual.

**Relationship to Other Projects:** This project will use information and data from Reliability Projects L01 and L06 and the site-based Safety project, if it goes forward; its results will provide information and data for Reliability projects L04 and L05. Staff will work with the contractor to ensure that information is shared across projects to the extent possible.

**Expected Research Products:** The primary product is a report that will describe improved deployment strategies and their benefits.

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**L12: Improving Traffic Incident Scene Management**

**Budget:** $1.0 million (36 months)

**Objective:** The objective of this project is to improve how police, fire, emergency management, and transportation personnel respond to and manage traffic incident scenes to reduce traffic delays. Many agencies with different responsibilities are often involved in responses to traffic incidents, particularly major ones, and incident scenes can quickly become confusing and dangerous places for both motorists and responders. It is imperative that as response to an incident progresses, safety and positive traffic guidance are well-managed by the responders. In addition, safety concerns must be balanced against the need to clear the scene and/or to facilitate traffic movement and take account of many factors, including transporting victims, responder safety, and fatal crash investigations.

**Project Summary:** The project begins with the preparation of a checklist of actions taken by responders for key incident types followed by development of proposed techniques aimed at improving responder actions. Key incident types include, but are not limited to, the following:

- Lane-blocking incidents involving a non-injury crash or disabled vehicle
- Crashes involving multiple serious injuries (no fatalities)
- Crashes involving one or more fatalities
- Crashes involving fuel spills from large trucks
- Crashes involving the release of hazardous cargo from large trucks
- Crashes involving the release of non-hazardous cargo.

Responder actions can include establishing on-scene command chains, positioning of police, fire, and rescue vehicles, traffic control, first responders’ actions, and data collection.

For responder actions, or combinations of them, the contractor will propose improvements in methods and techniques, equipment, and action sequences on total clearance times, responder safety, and alternative incident command systems for different situations. The amount of time and personnel needed to undertake each alternative will also be estimated by the contractor.

Working with incident management specialists from the different fields of practice involved in incident scene management, the contractor will then review the proposed alternatives to evaluate their potential for use and/or the need for further refinement. Based on these reviews, the contractor will then prepare draft protocols for managing various types of incident scenes. The contractor will also prepare a draft field test plan that agencies and associations can use to test the new protocols.
Relationships to other projects or SHRP II areas: Projects L01 and L06 can provide input; this project should be coordinated with Project L11 as well as the FHWA Incident Management program and the National Traffic Incident Management Coalition.

Expected Research Products: The main product of this research consists of recommendations for improved protocols for managing incident scenes. The benefits of instituting the improvements will be reduced incident durations, improved responder safety, and reduced secondary crashes.

Projects Proposed for Release in 2008 and 2009

L04: Incorporating Reliability Performance Measures into Planning and Operations Modeling Tools

Budget: $1.25 million (48 months)

Objectives: The objectives of this project are to (1) develop the capability of producing measures of reliability performance as output in planning and traffic simulation models; and (2) determine how travel demand forecasting models can use these reliability measures to produce revised estimates of travel patterns.

Project Summary: If reliability performance is to be an established part of the transportation investment decision process, these models must have the ability to estimate reliability as a function of highway and traffic conditions. This is significant for both planning future improvements and evaluating current deployments, and is supported by evidence that travelers make choices of trip time, mode, and route by considering travel time reliability. This project has two phases. The first phase is aimed at modifying planning and traffic simulation models so that they can provide reliability estimates as output. Building on the results of Project L03 and, possibly L02, the phase will develop the underlying relationships between reliability and travel demand. These relationships will be incorporated into three selected model types—a travel demand forecasting model, a microscopic traffic simulation model, and a macroscopic traffic simulation model. This phase involves developing conceptual plans for incorporating the key relationships into the selected model; if necessary, proof of concept software to modify the models will be developed. In the second phase, tests will be conducted on a travel demand forecasting model, modified to incorporate how travelers use reliability information, to determine the effects on trip generation and traveler choice of mode, route, and destination.

Relationship to Other Projects: Projects L03 and L02 will provide input to this project.

Expected Research Products: This research will develop the underlying relationships between reliability and travel demand and incorporate these relationships into planning models. Proof of concept software that can be used by planners and vendors to modify existing planning and travel demand models will be developed. Software may take the form of revised source code for specific modeling products, open source code for adaptation to other products, or stand-alone software meant to be used in conjunction with existing modeling products.

L05: Incorporating Reliability Performance Measures into the Transportation Planning and Programming Processes

Budget: $1.0 million (24 months)
Objectives: Currently, the technical procedures needed to incorporate mobility and reliability performance measures into the transportation investment process are not available, and as a result the effect of short- and long-term strategies addressing mobility and reliability on traditional capital expenditures cannot be determined. The objective of this project is to develop procedures for the transportation planning and programming process that demonstrate the benefits of operational strategies aimed at improving mobility and reliability.

Project Summary: This project will have three phases and will build on the statistical relationships between countermeasures and reliability performance measures developed in Project L03. In the first phase, the contractor will develop corridor and network level strategies using countermeasures and strategies from Projects L03 and L11, best practices identified in Project L01, and model results from Project L04, as well as information from other sources. The contractor will develop procedures for linking changes in performance measures to specific reliability improvement strategies (e.g., traffic incident management, work zone management). The second phase will consist of analyses of the tradeoffs in capital vs. operating expenditures that result from using mobility and reliability performance measures in the programming process. Both the short-range and long-range effects on transportation agency budgets and the user costs of shifting funds from capital improvements to operations-oriented strategies will be examined. The third phase will document how using performance measures fits into the short-range programming process; identify process steps where the strategies selected via performance measures conflict with those from the traditional programming process; and assess the effects of using the performance measures on the annual budget, expenditure of funds by types of improvement, and the priority ranking of projects.

Relationship to Other Projects: Information from Projects L01, L03, L04, and L11 will be used in this project. The project should be coordinated with the SHRP II Capacity focus area.

Expected Research Products: This project will produce analyses of the impacts of reliability strategies on performance, programming, and budgets, and provide guidance on how reliability performance measures can be integrated into the transportation planning and programming processes.

L08: Incorporation of Non-Recurrent Congestion Factors into the Highway Capacity Manual Methods

Budget: $2 million (36 months)

Objective: The objective of this project is to determine how data and information on the impacts of the differing causes of non-recurrent congestion on highway capacity can be incorporated into the performance measure and level of service estimation procedures contained in the Highway Capacity Manual (HCM). The HCM is the main tool of designers for determining the appropriate size of a facility to meet future demand levels, but its limited information on the impacts of weather and work zones on freeway capacity is from other countries. No information is provided for other facility types or for other causes of non-recurrent congestion. The methodologies contained in the HCM for predicting delay, speed, queuing, and other performance measures for alternative highway designs are not currently sensitive to incident management techniques and other operation/design measures for reducing non-recurrent congestion.

Project Summary: The contractor will review the work of Reliability Projects L03 and L07 and other sources and compile information on the frequency and capacity impacts of non-recurring incidents on highway capacity and how current and potential countermeasures can reduce the impact of non-recurrent congestion on facility delay, speed, queuing, and capacity. The
The contractor will then develop a plan for collecting data on significant gaps at selected U.S. sites for a variety of freeway, conventional highway, and urban street facilities.

The contractor will then develop a set of methodologies to accomplish the following: (a) predicting probability of occurrence and duration of non-recurring incidents for peak seasons, peak hours, and off-peak hours during the year as a function of the facility type, area type, terrain type, and other characteristics of the facility and its environs. This methodology should be sensitive to changes in operational strategies (e.g., incident management, work zone design, etc.); be capable of estimating capacity reduction as a function of event type and duration by season of year, day of week, hour of day; (b) predicting impacts on speed and delay of each event type that incorporates the probability of occurrence and duration of each event type; (c) predicting the effectiveness of various design and management strategies for reducing non-recurrent congestion.

Finally, the contractor—working with the TRB Committee on Highway Capacity and Quality of Service—will prepare draft sections of the HCM on the effect of non-recurrent congestion and the effectiveness of non-recurrent congestion management strategies for the urban arterials, signalized intersections, non-signalized intersections, freeway basic sections, freeway merge sections, freeway weaving sections, and freeway facilities chapters of the manual.

Relationship to Other Projects: Reliability Projects L01 and L07 provide valuable input to this project by identifying potential design feature options for reducing non-recurrent congestion. The HCM then needs to address the analysis of those features.

Expected Research Products: This project will produce suggestions for new sections for the HCM, which is the essential highway operations analysis tool for the United States.

**L09: Incorporation of Non-Recurrent Congestion Factors into the AASHTO Policy on Geometric Design**

**Budget:** $2.0 million (36 months)

**Objective:** The objective of this project is to develop guidance on roadway design features that support the reduction of delays due to the key causes of non-recurrent congestion so that such features can be included 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. Currently this design guide does not provide explicit guidance on the placement and dimensions of facilities that support incident management and reduce the impacts of work zones.

**Project Summary:** The contractor will review the results of Projects L01 and L07 and identify cost-effective design features for reducing non-recurrent congestion for incorporation in AASHTO Policy Guide and prepare a report to be reviewed with appropriate AASHTO panels for comments and suggestions. Based on these reviews, the contractor, in conjunction with the AASHTO Subcommittee on Design, will provide background material to guide preparation of draft sections for the AASHTO design guide on specific design features for reducing non-recurrent congestion. This background material will be submitted to appropriate AASHTO panels for their consideration.

**Relationship to Other Projects:** Project L07 provides valuable input to this project. Work on the project should be coordinated with Project L08, which can provide valuable analytical tools for quantifying the cost-effectiveness of the proposed design changes.
Expected Research Products: This research will result in suggestions for new sections of the AASHTO highway design guide for the design of facility features to enhance incident management and work zone management.

L10: Measures for Reducing Inappropriate Driver Response to Adverse Weather, Roadside Distractions, Traffic Incident Scenes, and Queues

Budget: $3 million (24 months)

Objective: The objective of this project is to estimate the potential effectiveness of selected measures aimed at reducing inappropriate driver response to adverse weather conditions and roadside activity. Drivers often fail to respond appropriately to adverse weather conditions or activities on the roadside—e.g., due to work zones, breakdowns, or emergency vehicle response—by maintaining high speeds as weather conditions deteriorate or slowing down to look at nearby construction or emergency response activity.

Project Summary: The contractor will review countermeasures—including driver education, training, changeable message signs, in-vehicle information systems, vehicle guidance, and visual barriers—used to reduce inappropriate driver response to adverse weather and roadside incidents and identify those that have helped improve driver response. The contractor will then develop an experimental program for estimating the effect of the measures, using driving simulators or other data collection methods. Particular attention will be paid to the cost-effectiveness of the measures.

Relationship to Other Projects: Related projects have been removed from this focus area.

Expected Research Products: This research will provide guidance to decision makers for targeted programs aimed at reducing inappropriate driver response to weather and roadside conditions.
Revised SHRP II Reliability Research Program
[As of October 20, 2006]

### Theme 1: Improving Knowledge Base
- **L01:** Identification and Analysis of Best Practices
- **L06:** Institutional Architectures
- **L12:** Traffic Scene Incident Management
- **L03:** Analytic Proc. Determining Effects of Mitigation Measures

### Theme 2: Integrating Improved Perf. Into Agency Decision Making
- **L11:** Evaluating Alternative Operations Strategies
- **L04:** Reliability Estimation in Planning/Operations Modeling
- **L05:** Reliability Perf. Measures in Transportation Prog. Process
- **L10:** Reducing Inappropriate Driving Behavior

### Theme 3: Improving how Operational Perf. Is Measured and Used
- **L07:** Evaluation of Cost-effectiveness of Highway Design Features to Reduce Non-Recurring Congestion
- **L08:** Incorporating Congestion Factors in Hwy. Capacity Manual
- **L09:** Incorporating Congestion Factors in Geometric Design Guide

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#### Preliminary Schedule of Oversight Committee and Reliability TCC Meetings and Issuance of RFPs

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<td>July</td>
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* L07 L02 L04 L05