SHRP 2 Renewal Program
Bridge Grouping and Implementation Updates
Mark S Bush

AASHTO SCOBS Meeting  May 16-19, 2011
SHRP2 - Accelerating solutions for highway safety, renewal, reliability, and capacity
What are we facing?

- Heavy and Increasing Traffic Volumes
- Concern to maximize the movement of traffic
- Restrictions on the time and length of traffic lane closures
- Need to maximize service life of facilities
- Need to minimize impacts to the community
- Resource Challenges
  - Staff, Financial, Legislation
What is Highway Renewal?

The reconstruction or substantial rehabilitation of deteriorating highway infrastructure to new standards of service, while the infrastructure continues to serve the traveling public.

Rapid Renewal implies accelerated construction but also includes project delivery, design, and operational & maintenance features that minimize the total project length and produces long lasting facilities.
The search for renewal tools and techniques that reduce preparation and execution times, reduce disruptions to traffic, utilities, and neighborhoods, and extend the time between renewal activities.
28 Research Projects - $32 Million

**Rapid Approaches**
- R01. Locating Utilities*
- R02. Geotech Solutions
- R03. Worker Fatigue
- R04. Innovative Bridge Designs
- R05. Modular Pavement
- R06. High-Speed NDT*
- R07. Performance Specs
- R09. Risk Manual
- R10. Project Management for Large Projects

**Minimize Disruption**
- R11. Strategic Approaches at Corridor/Network Level
- R15. Integrating Utility and Transportation Agency Priorities*
- R16. Railroad-DOT Mitigation Strategies

**Long-Lived Facilities**
- R19. Bridges for Service Life of 100 Years*
- R21. Composite Systems
- R23. Using Existing In-place Pavement & Achieving long Life
- R26. Preservation Approaches

Technology Related
Project Delivery Related
* Indicates Multiple Projects
SHRP 2 Products – How do they fit
SHRP 2 Renewal The Life Cycle Approach
Long Life Bridges

Service Limit State Design

Focus on developing
new design codes that incorporate a rational approach based on SLS for durability and performance of bridges
performance measures that utilize full probability-based service life design criteria

Planning → Design → Procurement → Construction → Operations and Maint.

- Recommendations for LRFD Design and LOAD RATING Specs
- SLS approach, method for re-calibration, toolbox database, examples
- Implementation plan

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
Long Life Bridges

Innovative systems

Focus on

Improving existing and prove promising concepts for systems, subsystems, and components that historically limit the service life of bridges

- Recommendations for LRFD Design Specs
- Analysis methods
- Details

Recommendations for LRFD CONSTRUCTION Specs

Planning → Design → Procurement → Construction → Operations and Maint.

Stand-alone guide devoted to Design for Service Life.

SHRP2

STRATEGIC HIGHWAY RESEARCH PROGRAM

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R02 Geotechnical Solutions

• Electronic catalogue of existing and emerging materials and systems for ground improvement
• Model design, construction, QA/QC and cost estimating procedures for application
• Draft performance specs
R02 Project Vision

To make geotechnical solutions more accessible to public agencies in the United States for rapid renewal and improvement of the transportation infrastructure.
Construction over Unstable Soils

Construction over STABLE/STABILIZED Soils

Geotechnical Pavement Components (Base, Subbase, and Subgrade)

Working Platforms
Technology Selection Application

Select an Application

Begin the interactive selection system by selecting one of the applications to the right. These inputs are the basic information required for screening potential technologies.

The technologies shown in the far right-hand column are all the potential solutions available in this system. After selecting one of the applications below, a short list of potential solutions for the selected application will appear in the right hand column. As additional inputs are entered, potential technologies are highlighted and eliminated technologies are faded.
### Aggregate Columns

The links below open PDFs in a new window. The documents provide information about the selected technology.

- Technology Fact Sheet
- Photos
- Case Histories
- Design Procedures
- Quality Control/Quality Assurance
- Cost Estimating
- Specifications

The SHRP2 R02 ratings for this technology are as follows:

<table>
<thead>
<tr>
<th>Degree of Technology Establishment</th>
<th>Potential Contribution to SHRP2 Renewal Objectives</th>
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<tbody>
<tr>
<td>4</td>
<td>4</td>
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<td>4</td>
<td>1</td>
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<td>4</td>
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(Rating Scale: 1 = not established or low applicability, 5 = well established or high applicability)
## Renewal Implementation Strategies

<table>
<thead>
<tr>
<th>Strategic Packaging and Branding</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Overall Packing of Renewal Program</td>
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<tr>
<td>- Packing within product areas (pavements, bridges, etc)</td>
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</table>

<table>
<thead>
<tr>
<th>Technical Assistance</th>
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<tr>
<td>- Highly specific technical expertise for particular products to range of tools, on site construction to web based</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Standard Specs, Guidelines and Manuals</th>
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<tbody>
<tr>
<td>- Recommendations Model Standards, Specifications and Guidelines for development of standards by specifying agencies</td>
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</table>
Renewal Implementation Strategies

Follow on Research, Testing and Evaluation
- Decision making tools to aid agencies
- Big winner – R02 Geotechnical Decision Webtool

Lead Users and Demo Projects
- ABC - IA DOT lead user and demo project, UT DOT innovator

Training and Education
- Pilot workshops identified
- Development of Training materials
Renewal Implementation Challenges

• Effectively Answering the Question: “How is this Different from what we are doing now?”

• Respecting the stovepipes while presenting an integrated view of developing, managing and executing Renewal Projects.

• Finding institutional homes for web products
22 States Participate in 30 SHRP 2 Activities
(as of April 2011)

**WASHINGTON**
- Seattle vicinity – Safety Naturalistic Driving Study site; Puget Sound Regional Council - pilot test TCAPP (project C18); Planning for freight demand focus group (project C20); Field tests of NDT for HMA-layer delamination

**OREGON**
- Pilot test of TCAPP (project C18)
- Pilot test of ecological approach to integrating conservation and transportation planning (C21)

**CALIFORNIA**
- Sacramento – Pilot test the integration of advanced travel demand model and network simulation (project C18B)
- Pilot test of ecological approach to integrating conservation and transportation planning (C21)

**COLORADO**
- Colorado Springs, Pikes Peak – Pilot test of TCAPP website (project C18)
- Pilot test of ecological approach to integrating conservation and transportation planning (C21)

**TEXAS**
- Nondestructive testing demonstration for quality control of new hot-mix asphalt pavement (project R06-C)

**WISCONSIN**
- Renewal composite pavement demonstration (project R21); Pilot test TCAPP, Grand Rapids (project C18); Nondestructive testing demonstration for quality control of new hot-mix asphalt pavement (project R06)

**MINNESOTA**
- Utilities Conflict Matrix training workshops

**SOUTH DAKOTA**
- Accelerated bridge construction demonstration (project R04)

**IOWA**
- Planning for freight demand focus group (project C20)

**OHIO**
- Bloomington vicinity – Naturalistic Driving Study site; Indianapolis – Pilot test for incident responder training (project L12)

**INDIANA**
- Planning for freight demand focus group (project C20)

**PENNSYLVANIA**
- State College vicinity – Naturalistic Driving Study site

**MARYLAND**
- Buffalo – Naturalistic Driving Study site

**NEW YORK**
- Planning for freight demand focus group (project C20)

**NEW JERSEY**
- Field tests for NDT for HMA-layer delamination

**WEST VIRGINIA**
- Pilot test of ecological approach to integrating conservation and transportation planning (C21)

**VIRGINIA**
- Field rodeo for nondestructive testing techniques for bridge decks (R06-A); Field test of 3-D utility location data system

**HEALTH/CDM**
- Raleigh/Durham vicinity – Naturalistic Driving Study site

**GEORGIA**
- Pilot test for incident responder training (project L12); Field test of real-time smoothness measurements of PCC

**FLORIDA**
- Jacksonvile - Pilot test site for the integration of advanced travel demand model and network simulation (project C10A); Nondestructive testing demonstration for quality control of new hot-mix asphalt pavement (project R06); Tampa-Naturalistic Driving Study site; Field tests of NDT for HMA-layer delamination

**ARKANSAS**
- Utilities Conflict Matrix training workshops

**KANSAS**
- Field tests of NDT for HMA-layer delamination

**ILLINOIS**
- Pavement deflection device testing

**TCAPP** = Transportation for Communities – Advancing Projects through Partnerships is a website for most products of SHRP 2 Capacity research. Visit the site at: www.transportationforcommunities.com
Thank You

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