SHRP2: Accomplishments and Opportunities

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ABSTRACT

This presentation discusses the accomplishments and opportunities of the second Strategic Highway Research Program (SHRP2). The four research focus areas of safety, renewal, reliability, and capacity are reviewed, and recommendations for the future are provided.

Key words: capacity—reliability—renewal—safety—Strategic Highway Research Program 2
Accomplishments and Opportunities

MidContinent Transportation Research Symposium
Iowa, August 20, 2009
SHRP 2

• Authorized in SAFETEA-LU
• $170 million, 7 years
• First research contracts signed 2/07
• Administered by TRB under MOU with FHWA and AASHTO
• 3-tiered stakeholder governance: 400-500 volunteers serving on 40-50 committees/panels
Providing outstanding customer service for the 21st Century

- Safety ($51M)
  - Safe Highways
- Capacity ($21 M)
  - Better Transport Decisions
- Reliability ($20 M)
  - Reliable Travel Time
- Renewal ($34M)
  - Great Customer Service
  - Rapid Renewal and Lasting Facilities

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Status of Contracts

• 50 signed contracts: $53.2 mil
  – 227 primes and subs
  – 40% of funds to universities
  – 55% to private institutions
  – 5% to public sector and international

• 2 projects finished
• 19 under negotiation: $38.4 mil
• 2 RFPs currently advertised ($2.5 million)
First Six Reports

- Implementation Report to Congress (SR 296)
- Innovation in Locating and Characterizing Underground Utilities (R01) (In Press)
- High-Speed Nondestructive Testing (R06)
- Integrating Utility Co. and Transportation Agency Priorities (R15) (In Press)
- Composite Pavements: European Experience (R21)
- Performance Measurement Framework for Highway Capacity Decision Making (C02)
SHRP 2 Safety
Research Focus Area

“Make a significant improvement in highway safety”

Safer driving through knowledge of driver, roadway, & vehicle factors in crashes, near crashes, ordinary driving

Video from DriveCam.com
Naturalistic Driving Study

• Instrument vehicles of 3100 volunteers in 6 sites:
  – Speed, acceleration, braking, seat belt, air bag
  – GPS, alcohol indicator, radar, video: 4 cameras

• Other data:
  – Driver assessment
  – Roadway/roadside data
  – Detailed crash investigations

• Develop analytical methods
• Address high-priority safety questions
• Make data available for continued analysis after SHRP 2
Naturalistic Driving Study

• Strategic focus on the driver
• Collect more and better data:
  • Objective pre-crash data
  • More accurate crash data
  • Near crash/incident data
  • “Exposure” (ordinary driving) data
• Determine relative crash risk for different factors
• Develop crash surrogates
NDS Sites
Opportunities in Safety

• Multiple awards for analysis projects to address high-priority safety questions (2010)
SHRP 2 Renewal
Research Focus Area

“Get in, get out, stay out”

Provide rapid, minimum disruption highway renewal that produces long-last ed facilities
3 Strategic Objectives for Successful Highway Renewal

- Rapid Approaches
- Long-Lived Facilities
- Minimal Disruption

Successful Renewal
Balanced approach
Technology Examples

• High-speed non-destructive testing
• Utility location technologies
• Structures: innovative bridge designs; strategies for 100-year bridges
• Pavements: composite, modular, in-place
• Geotechnical solutions
Project Delivery Examples

- Risk manual for innovative contracting
- Integrating utility and DOT priorities
- Railroad-DOT mitigation strategies
- Reducing personnel fatigue
- Innovative project management
- Performance and incentive specs
- Corridor/network planning for renewal
Opportunities in Renewal

• Pilot test guidelines for risk manual
• Pilot test guidelines for use of existing pavements in place to achieve rapid renewal
• Pilot workshops for corridor and network level impact analysis
• Demonstration projects for performance specifications
• (No more RFPs in Renewal)
Traffic Congestion Is A Core Issue

Source: Texas Transportation Institute, Urban Mobility Study, 2007
Major Sources of Congestion

**Recurring:** due to mismatch between capacity and demand, usually in predictable patterns

**Non-recurring:** due to events that reduce effective capacity in a temporary, often unpredictable way

Source: FHWA
Reliability & Capacity Address Congestion

Capacity tackles *recurring* congestion from inadequate base capacity.

Reliability tackles *nonrecurring* congestion resulting from incidents, special events, weather, etc.
SHRP 2 Reliability Research Focus Area

Provide a highway system with reliable travel times

Improve travel time reliability for all classes of users by preventing and reducing the impact of non-recurring incidents
Reliability Project Themes

• Data, Metrics, Analysis and Decision Support
• Institutional Change, Human Behavior and Resource Needs
• Incorporating Reliability in Planning, Programming and Design
• Fostering Innovation to Improve Travel Time Reliability

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Opportunities in Reliability

• Workshops on institutional frameworks for reliability
• Pilot testing of incident response training
• Reliability IDEA projects
• RFPs to incorporate reliability into HCM and AASHTO design guide (2010)
SHRP 2 Capacity Research Focus Area

Provide highway capacity in support of the Nation’s goals

Integrate mobility, economic, environmental, community needs into the planning and design of new highway capacity
Underlying Principles of SHRP 2 Capacity Research

• Collaborative decision making → better decisions → better projects and reduced risk of delays and cost increases

• Use systems approach to collaborative decision making:
  – Integrate mobility, economic, environmental, community goals
  – Ensure that the right people are at the table at the right time with the right information

• Develop a flexible framework, not a new process:
  – Focus on decision points—each state reaches those points in its own way
  – Systematically incorporate principles from ISTEA, TEA-21, and SAFETEA-LU
  – Focus on successful practices that others can replicate
Elements of Capacity Research

Collaborative Decision-Making Framework

- Performance Measures
- Greenhouse gases
- Pub-Priv Part.
- Visioning
- Freight
- Expedited Schedule

- Ecological Approach to Environment:
  - Wetlands
  - Endangered Species
  - Habitats

- Economic Impact:
  - Case Studies
  - Analytical techniques

- Improved Models & Networks
  - Pricing Operations
  - Smart Growth

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The Collaborative Decision – Making Product

• Integrated web-based tool for collaborative decision making
• Will allow users to enter the framework at any point and follow an issue either horizontally or vertically
• Results of individual research projects will be synthesized and condensed in a final user-oriented product with links to full text source material
Opportunities in Capacity

• State and/or MPO to implement advanced travel demand models
• Pilot test web-based tool for collaborative decision making
• Pilot test the “ecological” approach
• RFPs for economic analysis tools, PPP, freight needs, smart growth, “decision makers guide” (2010)
Implementation Report

• Required in SAFETEA-LU

• Components:
  – Promising results of research; likely users
  – Incentives, impediments, methods
  – Estimated implementation costs
  – Recommended methods, organization

• Presented to Congress: February 1, 2009
Recommendations: Summary

1. A SHRP 2 implementation program should be established
2. FHWA should serve as the principal implementation agent in partnership with AASHTO, NHTSA and TRB
3. Funding: $400 million for first 6 years
4. Establish a formal stakeholder advisory structure
5. Develop detailed implementation plans
Early Implementation Activities

- TRB implementation staff position—Jerry DiMaggio
- Meetings with FHWA, NHTSA, other user and stakeholders
- Prepare product lists
- “Collaborative staff”: international, FHWA
- “First Fruits”—early product marketing
- Workshops at RAC and TRB
Thank You

For more information:

SHRP 2: www.trb.org/shrp2

SHRP Implementation Report: