

# FHWA Updates

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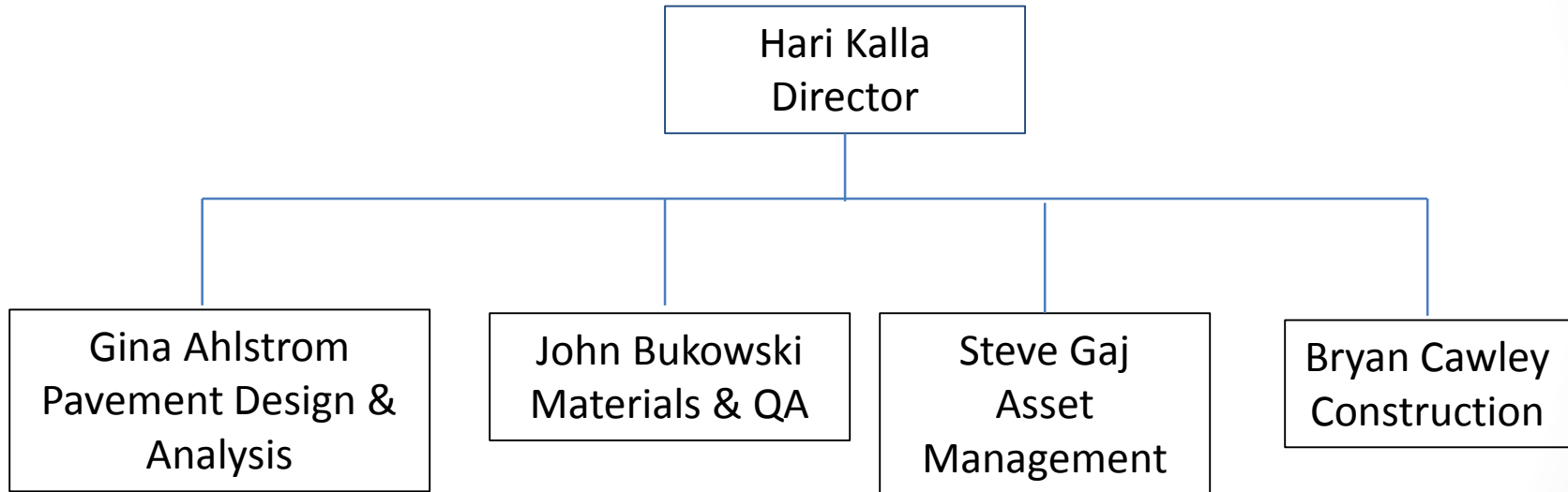
FHWA, Team Leader- Pavement Design and Analysis

NCC Fall 2015

September 16, 2015



# Office of Asset Management, Pavements, and Construction



# Program Priorities

# Performance Concrete Pavements

## Performance Specification

- Draft Specification (in progress)
- Review by ETG
- Review by Stakeholders

## Performance Tests

- Summer 2015 Data Gathering (in progress)
- Identify knowledge gaps

## Quality Plan

- Draft QA requirements
- Draft QC template for Contractor

# Concrete Sustainability

- Opportunities for advancing recycling in concrete pavements
  - New pavement
    - Optimized mixes with SCM, recycled materials, etc.
  - Repurpose existing PCC
    - Full depth reclamation, crack and seat, rubblization
  - Concrete recycling opportunities
    - Coarse aggregate, fine aggregate, various uses
- Expert Task Group and Champion States
  - CA, IL Tollway, KS, NC, OK, PA, TX, UT, WA, ACPA, NRMCA, PCA, AASHTO, UNC Charlotte



# Life Cycle Cost Analysis

- Technical Bulletin dated 1998
- GAO Audit Completed and FHWA Response sent
- Ultimately a collection of technical policy and guidance is needed
- Technical Advisory outlined



# Sustainable Pavements Program

- Provide technical guidance ahead of requirements imposed by others
  - SP TWG
  - Roadmap
  - Life Cycle Assessment- quantification of environmental impacts
  - Advance sustainable technologies and practices
    - Case studies
    - Economic impacts



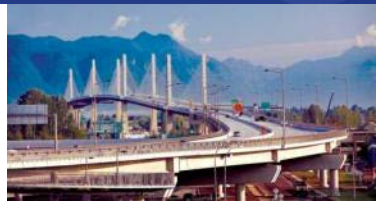


# Other Activities

- Technology Implementation and Deployment through the Mobile Concrete Lab
- Implementation of ME Pavement Design
- Technical Guidance



# SHRP2 Updates



# SHRP2 Implementation Assistance Program - PCC Products Update

*New Composite Pavements (R21)*

*Precast Concrete Pavement (R05)*

*Real-time Smoothness Measurements on PCC (R06E)*



U.S. Department of Transportation  
Federal Highway Administration



# SHRP2 Project R21 Implementation

- Goal: Support and promote adoption of new composite pavement systems
  - PCC/PCC
  - HMA/PCC
- Support Contractor:
  - Applied Pavement Technology
- Contracting Period
  - 2014 to 2017



# SHRP2 R21 Opportunities

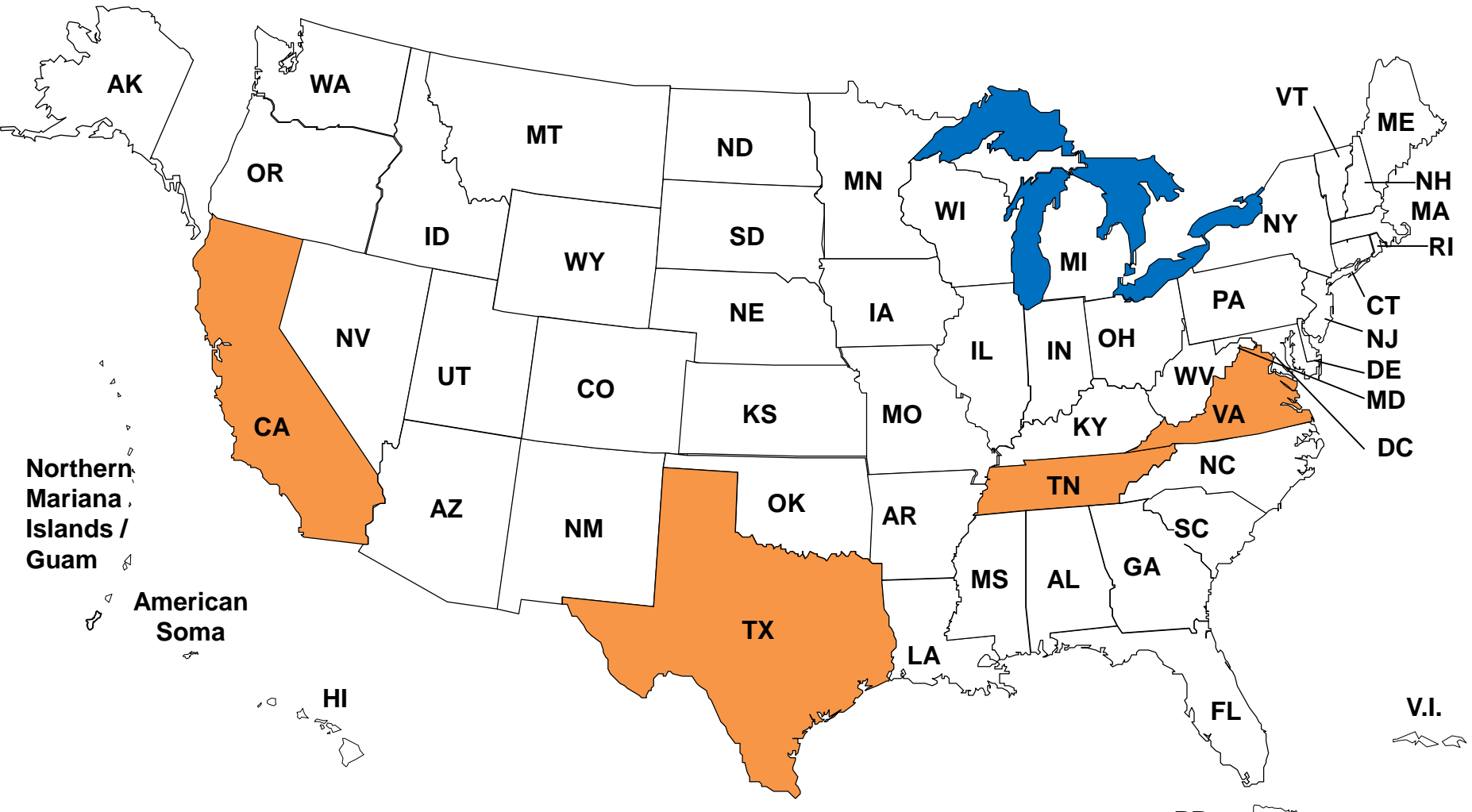
## Round 4 of IAP

- Two lead adopter agencies (TN & TX)
  - Both 2-lift utilizing locally avail. aggregates

## Round 6 of IAP (Announced Aug 7, 2015)

- Two new Lead Adopter agencies (CA & VA)
  - CALTRANS – 2-lift utilizing Recycled Concrete
  - VA DOT - New HMA over CRCP Evaluation

# R21 New Composite Pavement



**Proof of Concept Pilot**

**Lead Adopter Incentive (2+2)**  
\$170k to \$300/ea., ~\$1m total

**User Incentive**

# Early Success Story: Tennessee DOT

- Recent adoption of new specification for surface aggregate
  - Higher quality aggregate required
  - Increased PCC costs
- Explore use of two-lift pavement (PCC/PCC) to help offset costs
- Demonstrated viability of two-lift system



# 2-Lift Paving Project

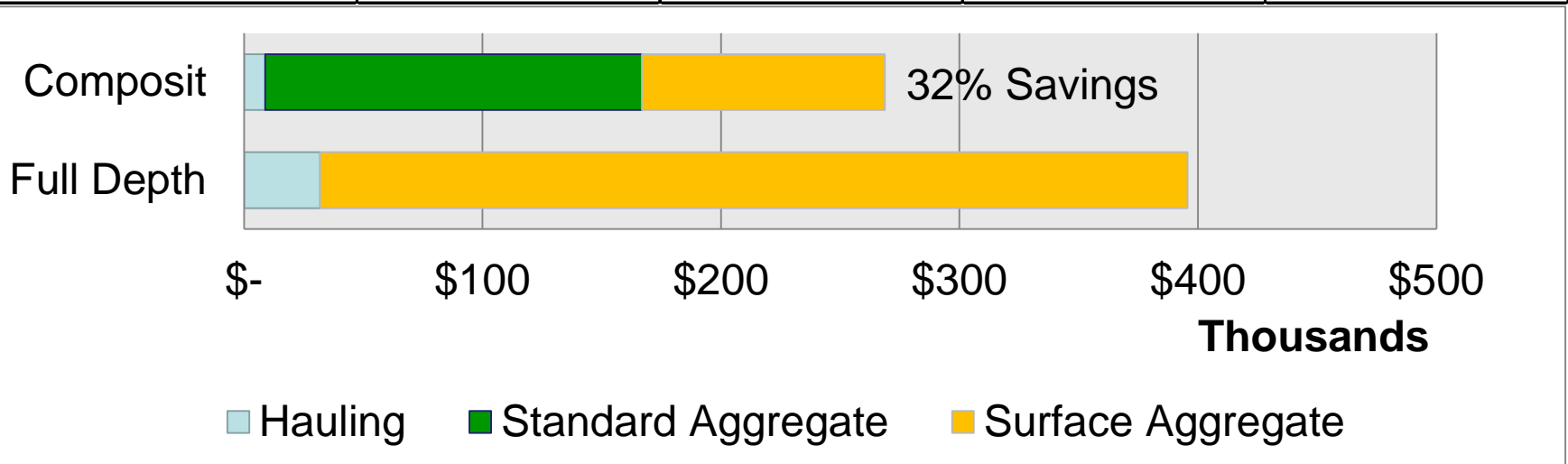
- I-65 NB, Nashville (Fall 2014)
- 10-ft outer shoulder, 5000-ft long
- Top Lift
  - 3 inches
  - High quality aggregate
- Bottom Lift:
  - 10 inches
  - Local aggregate





# Benefits - TN

Pavement Options	Total Extra Cost of Hauling	Cost of Standard Coarse Aggregate [(\$10-\$12)/ton] (\$10 USED)	Cost of Surface Coarse Aggregate [(\$14-\$16)/ton] (\$16 USED)	Total Cost
Full Depth	\$31,834.96		\$363,828.16	\$395,663.12
Composite	\$8,907.57	\$157,944.40	\$101,800.80	\$268,652.77



This cost analysis illustrates that a total aggregate cost savings of **\$127,010** would be seen if composite pavement had been utilized throughout the project.

# R21 Implementation Support Activities

## Technical Assistance

- Design and construction support
- On-call and site visits
- Document findings

## Showcase/Open House

- Planned for Houston, TX  
Spring in 2016
- Document proceedings



# R21 Implementation Activities (continued)

## Workshops

- Provide guidance on design & construction of composite systems
- Tailored to agency's interests
- 1-day workshops; up to 5 each available
  - ✓ First pilot conducted at NM DOT on 15 July 2015
  - ✓ Houston, TX scheduled on 17 Nov 2015
  - ✓ Two scheduled for CA fall/winter 2015.

Lesson	Topic
1	Executive Summary
2A	Introduction to Design
2B	Design of HMA/PCC
2C	Design of PCC/PCC
3A	Construction of HMA/PCC
3B	Construction of PCC/PCC

# R21 Implementation Activities (continued)

## Peer Exchange

- Tentatively Summer 2016
- Share agency experiences & lessons learned
- Identify implementation issues & solutions
- Identify additional research needs
- Document findings



# R05 - Precast Concrete Pavement (PCP)

## Challenge

- Traffic delays due to roadway repair and rehabilitation result in lost productivity, increased fuel use, driver irritation and safety issues.



## Solution

- R05 **guidelines** and **model specifications** help Agencies to select best uses of PCP and to design, fabricate, and install long-life PCP systems.
- FHWA assistance to highway agencies: Webinars; Workshops; Peer-to-peer assistance from planning through construction.

# Benefits from Use of PCP

- **Maintenance of Traffic**
  - Limited lane-closure times
  - Work-zone safety
  - Open to traffic immediately
- **Long-Life Pavement Performance**
  - Off-site fabrication/quality assurance
  - High-strength durable concrete





# Lead Adopters / Round 3



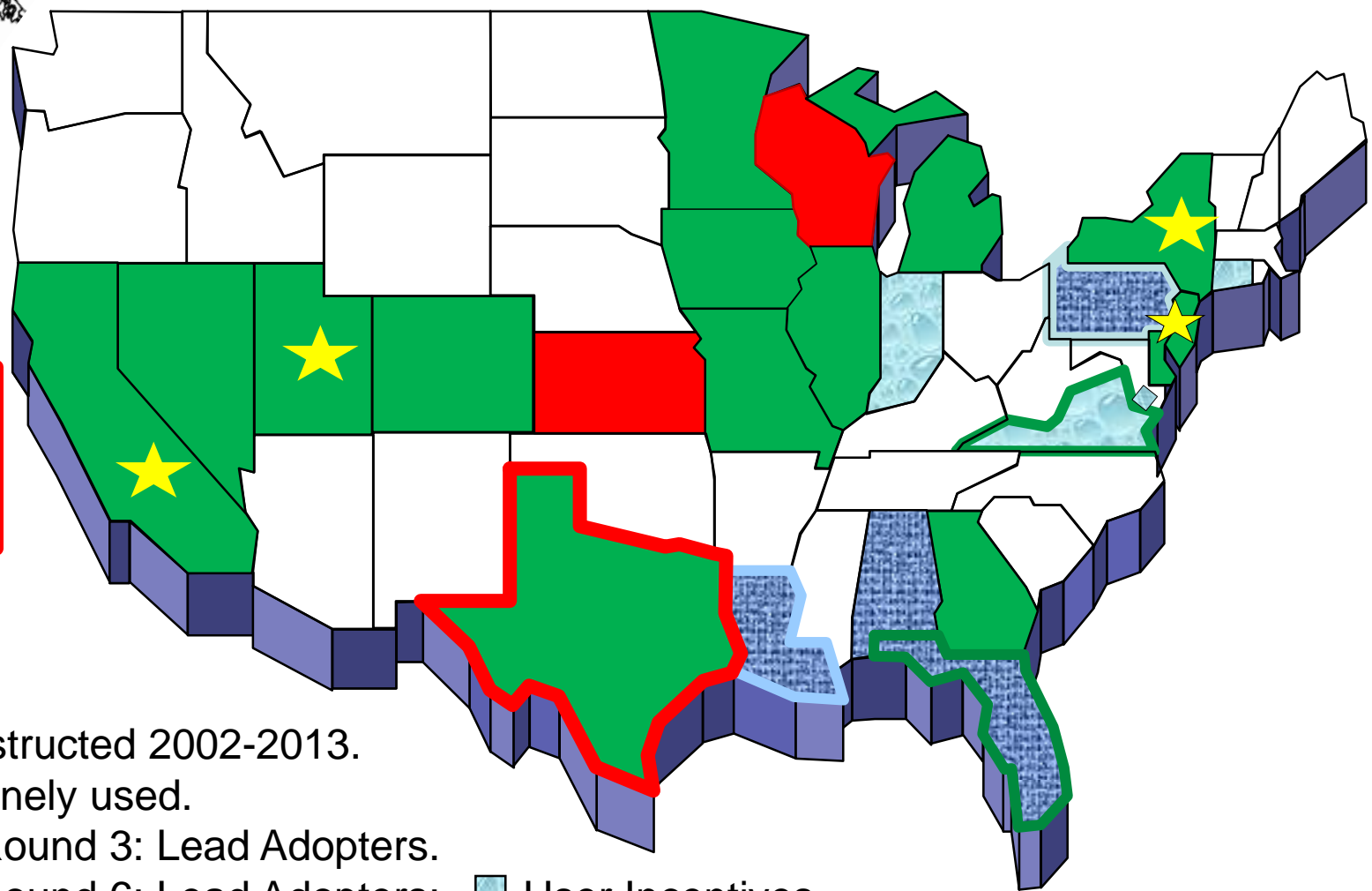
- **Hawaii DOT** – Inlay of existing asphalt on interstate H-1 pavement. (completed March 2015)
- **Illinois Tollway** – Bridge approaches in center lanes of toll road.
- **Kansas DOT** – Intersections at entrances to Fort Leavenworth. (Project awarded)
- **Texas DOT** – Replace T-intersection carrying heavy truck loads. (Project awarded)
- **Wisconsin DOT** – Intermittent full-depth repairs on Beltline Highway. (completed; **Installation of 600 panels**)

# Implementation Assistance Program – SHRP2 Round 3 and Round 6

- Lead Adopter Awards
  - **Alabama**, **Florida**, Hawaii, Illinois Tollway, Kansas, **Louisiana**, **Pennsylvania**, Texas, Wisconsin
- User Incentive Awards
  - **Connecticut**, **District of Columbia**, **Indiana**, **Louisiana**, **Pennsylvania**, **Virginia**



# PCP Use by Highway Agencies



- PCP constructed 2002-2013.
- ★ PCP routinely used.
- SHRP2 Round 3: Lead Adopters.
- SHRP2 Round 6: Lead Adopters; ■ User Incentives.

# (R06E) Real-Time Smoothness Measurements on PCC

R06E

- Background 2010 and 2011
- SHRP2 R06E
  - Evaluation of GOMACO GSI and Ames Engineering RTP
  - Georgia, Arkansas, Texas, Michigan and New York



# Real-Time Smoothness Measurements on PCC Pavements

## BENEFITS:

- SHRP2 Solution provides real-time information for process control of smoothness
- Allows for immediate adjustments to equipment and operations
- Minimizes pavement grinding and remediation
- Better quality control
- Potentially better long-term performance

## PRODUCTS:

- Model Specifications
- Guidelines
- Documentation of profiler performance and recommendations



R06E



**Non-Destructive Testing Tools**

# Real-Time Smoothness



- Support Objective: Routine use of RTS technology by agencies and contractors who routinely construct PCC pavement
- CP Tech Center: Awarded 36 month contract in Aug 14 to provide implementation support for RTS.
- Round 4 - Lead Adopt States:
  - ✓ Alabama
  - ✓ Idaho
  - ✓ Indiana
  - ✓ Ohio
  - ✓ Pennsylvania

# Real-Time Smoothness

## SHRP2 Implementation Support

- **Equipment Loan / Demo (2015 and 2016)**
  - Demo Equipment ( **11 each Demos available** )
  - Full use of an RTS system for two weeks
  - On-site technical support and training
- **Showcase (Tentatively June 2016)**
- **4-HR Workshops (8 each available)**
- **Documentation of Results/Case Studies**
  - Synthesis of contractors' experience
  - Case study – Comparing real-time measurements to QA results
  - Case study – Long-term performance of RTS
  - Documentation of equipment loans and lessons learned
- **Specification Refinement**
  - QC approach
  - Process improvement
- **Marketing & Outreach (10ea 30-min presentations available)**





# Equipment Loan / Demo:

- Completed:
  - Boise, ID – April 2015
  - Lincoln, NE – May 2015
  - Michigan – July 2015
  - Houston, TX – Aug 2015
- Scheduled / Potential Sites:
  - PA (Sept 15)
  - IN (Oct 15)
  - IL Tollway
  - OH
  - NC – I-85
  - NM – US-60/285
  - WI



Lincoln, NE I-80 Demo, Jul 15

# SHRP2 Round 7

## Round 7:

- ✓ Last Round for IA Program
- ✓ Application Period: April 1 - 29, 2016
- ✓ Announcements on June 10, 2016

## Anticipate Renewal Products Included:

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### **Utility Bundle (R01A/R01B/R15B)**

Products to identify, record, and retrieve utility locations throughout the design process to aid in reducing costly relocations.

### **Railroad-DOT Mitigation Strategies (R16)**

Model agreements to improve coordination between transportation agencies and railroads.

### **Techniques to Fingerprint Construction Materials (R06B)**

Procedures and equipment to identify various construction materials in the laboratory and with portable devices.

### **Advanced Methods to Identifying Pavement Delamination (R06D)**

Tools to detect subsurface delamination in asphalt pavements.

### **Guidelines for the Preservation of High-Traffic-Volume Roadways (R26)**

Your guide to selecting the most-affordable options for extending pavement life.

### **Nondestructive Testing for Concrete Bridge Decks (R06A)**

Recommended technologies to detect deterioration of concrete bridge decks.

### **Nondestructive Testing for Tunnel Linings (R06G)**

Nondestructive testing technologies to pinpoint defects in or behind tunnel linings.

### **Service Life Design for Bridges (R19A)**

Guidance, training, and technical assistance promoting service life design concepts and methods.

### **Service Limit State Design for Bridges (R19B)**

Tool kit to perform state or site-specific calibrations for service limit state design for bridges.

# For More Information

## Pavement Contact:

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Renewal

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Save time.

The second Strategic Highway Research Program (SHRP2) is at the forefront of transportation innovation—helping the Nation's transportation community improve safety, enhance productivity, boost efficiency, and increase reliability by introducing solutions that improve the country's highway network. [Read More](#)

**What's New**

**New Brochure Highlights How States Will Use SHRP2 Safety Data in 11 Research Efforts**

SHRP2 recently completed the largest study of in-vehicle driver behavior. The study collected trip and video data from more than 3,100 drivers over a 1- or 2-year period. A new brochure details how 10 State DOTs will use the newly available SHRP2 Naturalistic Driving Study and Roadway Information databases to pursue safety research across 11 topics. [More of What's New](#)

**Register Now for Implementation Assistance Webinars**

Round 5 Implementation assistance opens January 16, 2015. [Register now](#) for upcoming informational Webinars to learn more.

Visit: [www.fhwa.dot.gov/GoSHRP2](http://www.fhwa.dot.gov/GoSHRP2)

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