Safety Task Force Meeting and Implementation Workshop

Overview of SHRP2 Safety Implementation
March 19, 2014
Washington, D.C.

Welcome and Participant Introductions

Rudy Malfabon, Chair
Sandra Larson, Vice Chair
King Gee, AASHTO
Gordon Proctor, Facilitator

SHRP 2 Program Overview

Neil Pederson, TRB
Pam Hutton, AASHTO
Tony Furst, FHWA

Ms. Pam Hutton, P.E.

- SHRP 2 Implementation Manager

What is SHRP 2?

- The Second Strategic Highway Research Program (SHRP 2): a large scale research program designed to make significant advances in some of the most challenging areas in the highway industry

- A nine-year, $232 million research program due to be completed March 15, 2015

- TRB: managed over 100 research contracts, involving more than 300 research contractors

- Research is about 90% – 95%

- FHWA and AASHTO: underway with implementation activities for the highest priority products emanating from the research

Four Focus Areas

Safety: fielding the largest-ever naturalistic driving study to reduce crashes and save lives through understanding driver behavior

Renewal: making rapid, innovative construction possible for "ordinary" projects

Reliability: Providing management and technical tools to reduce congestion through operations

Capacity: Systematizing collaborative decision making to achieve better, faster project decisions

Safety Highlights

- **Data collection complete:**

    - 3,150 drivers, male female, all ages
    - 5 million trips; 40 million miles of driving
    - 12,500 center-line miles of roadway data
    - Cell phone records and "supplemental" data

- **Data file is huge (4 petabytes) & complex**

- **2014 focus on making data usable**

- **Interest in using data from outside of SHRP 2 (FHWA, NHTSA, auto mfrs, academics, IIHS, AAA FTS, public health,etc.)**

Making the Data Usable

- **Quality controlled datasets (April, 2014)**

- **NDS and roadway data linking (Dec. 2014)**

- **NDS Website (requires IRB certificate)**

  - **https://insight.shrp2nds.us**

- **Trip summary files**

- **Crashes, near crashes, baseline trips**

- **Reduced datasets**

  - **e.g. trips with teenage drivers, trips through urban intersections**

Research to Implementation

Research   Development   Implementation

| Research responds to known transportation challenges | A research product emerges and is refined through pilots and other activities | Potential implementation explored through knowledge transfer | Partner agencies select, prioritize, and prepare product for implementation | Product is marketed to users and integrated into standard practice |

Implementing SHRP2 Solutions

Moving Forward

- Approximately 65+ high-priority products introduced over the next several years

- Users run the gamut of the transportation industry

- Selected products integrated into current transportation practices

Turning Innovation into Every Day Practice

- Products include:
  - Guides
  - Software tools
  - New processes
  - Technologies and Tools
  - Testing procedures
  - Collaborative-decision making protocols
  - Driver behavior data

Prioritizing States' Needs

- AASHTO's role is focused on identifying which products meet the states' practical needs
- We are relying on members and committees to define how implementation can be successful
- FHWA and TRB are our partners in this effort.
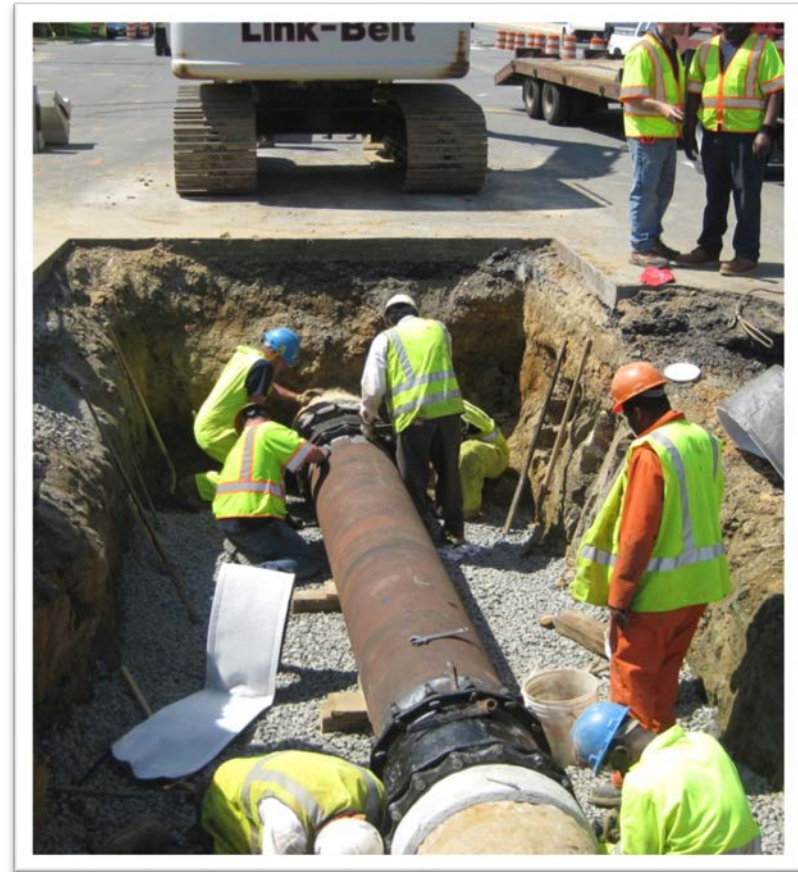
Product Implementation Steps

- Assess readiness for implementation

- Plan for Implementation Planning Workshop

- Conduct IPW

  - Discuss how best to advance use of the products

- Develop implementation plan

- Roll out product per plan

  - Implementation resources – funding, tech expertise
  - Implementation Assistance Program

- Share results

SHRP2 Implementation Assistance Program

SHRP2 Implementation Assistance Program

Proof of Concept Pilot

- Funds for piloting products to evaluate readiness for implementation
- Contractor support to collect data and evaluate the application

Lead Adopter Incentive

- Funds for early adopters to offset implementation cost and mitigate risks
- Recipients required to provide specific deliverables designed to further refine the product, and possibly "champion" the product to other states and localities

User Incentive

- Funds for implementation support activities after early adopter use
- Used to conduct internal assessments, build capacity, implement system process changes, organize peer exchanges, or offset other implementation costs

SHRP2 in Action
(Rounds 1 and 2)

Renewal

- Bridge Designs for Rapid Renewal (R04)
- Performance Specs for Rapid Renewal (R07)
- Managing Risk in Rapid Construction Projects(R09)
- Managing Complex Projects (R10)
- Railroad Agreements (R16)
- Preservation on High-Volume Roadways (R26)

Capacity

- Implementing Eco-Logical (C06)
- Expedited Project Delivery (C19)

Reliability

- Organizing for Reliability Tools (L01/L06)

Photos from projects in CA and PA
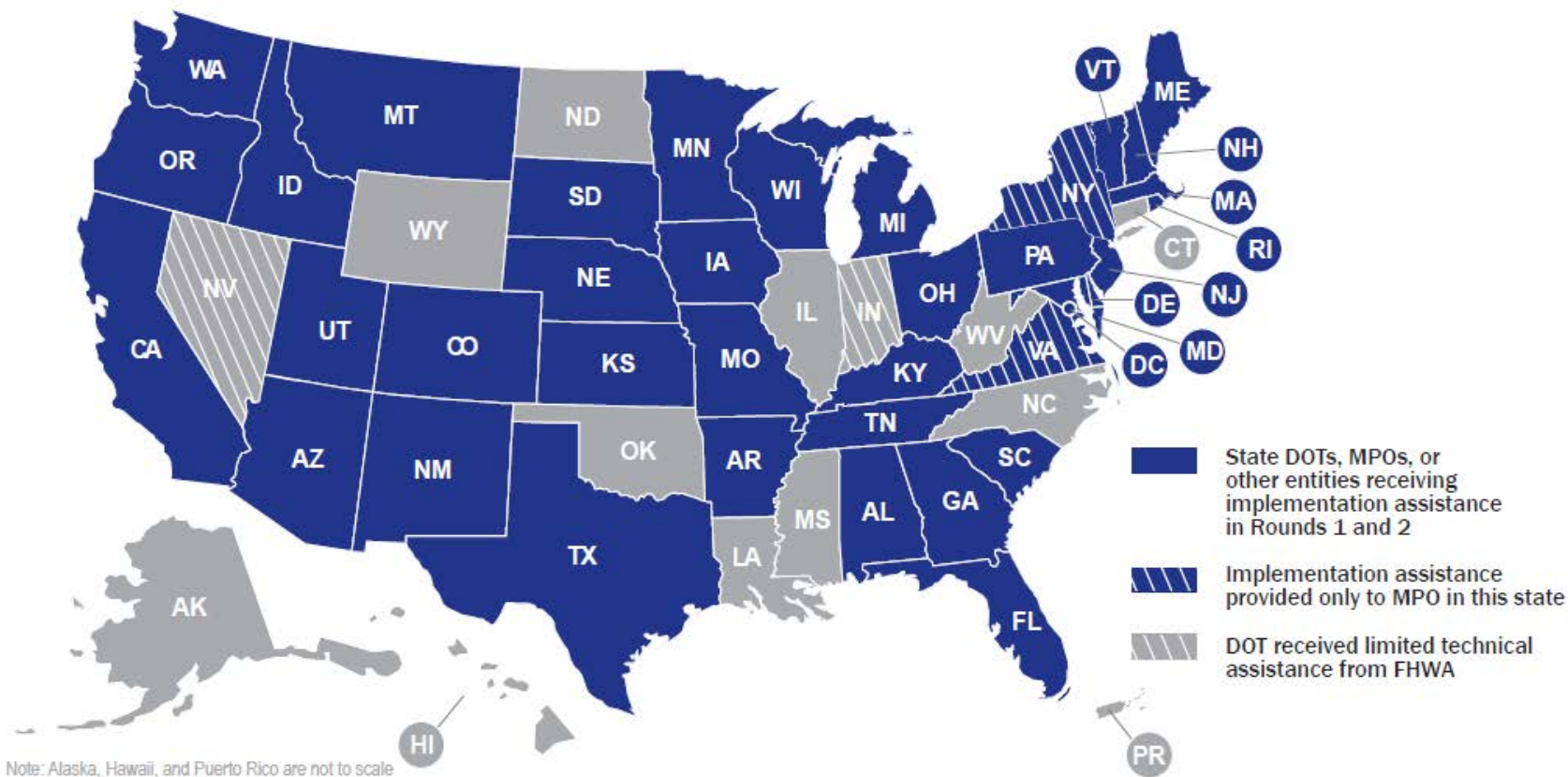
SHRP2 in Action

135 projects underway in 38 states with more opportunities in 2014

Participating States (Rounds 1 and 2)

Transportation Agencies Begin Implementing SHRP2 Rounds 1 and 2 Products – FHWA/AASHTO Implementation Assistance Program

Legend:
- State DOTs, MPOs, or other entities receiving implementation assistance in Rounds 1 and 2
- Implementation assistance provided only to MPO in this state
- DOT received limited technical assistance from FHWA

Note: Alaska, Hawaii, and Puerto Rico are not to scale

Implementation Assistance Round 3

Renewal:

➢ R02: Web-based Technical Support Tool for Geotechnical Solutions

➢ R05: Precast Concrete Pavement

➢ R15B: Identifying and managing Utility Conflicts

➢ R23: Pavement Renewal Solutions

Capacity:

➢ C20: Freight Demand Modeling and Data Improvement

Implementation Assistance Anticipated Round 4

C03 & 11 – TPICS/Economic Analysis Tools
C10 – Integrated Travel Demand Modeling

R01A – Technologies to Store, Retrieve and Use 3D Utility Location Data
R06A – Nondestructive Testing Technologies for Concrete Bridge Decks
R06C – Rapid Technologies to Enhance Quality Control on Asphalt Pavements
R06E -- Real-time Smoothness Measurements on PCC
R06G – Mapping Defects in or Behind Tunnel Linings
R09 – Managing Risk in Rapid Renewal Projects
R10 – Innovative Strategies for Managing Complex Projects
R19A – 100 Year Bridges: Service Limit State Design
R21 – Composite Pavement Systems

L02/05/07/08/37/38 – Reliability Data and Analysis Tools (Bundle)

Safety NDS Research Topics - TBD

Safety Deployment

- **Research solicitations to be issued**
  - through the Implementation Assistance Program (IAP)
    - This puts Safety Focus Areas on same footing as Renewal, Reliability and Capacity
    - It draws states into the NDS research process
    - It could create partnerships between states, researchers, universities and others
    - It creates a national focus on the NDS through the IAP solicitation
  - through FHWA's Data Analysis Center at TFHRC
    - Establish capacity at the Data Analysis Ctr for future
    - Provide training and become a resource for the State DOTs

Timeline

Round 4 solicitation date (June 1ˢᵗ) drives Task Force schedule

January 2014 – May 2014

- Identify the type of research topics
- Build interest among the States
- Promote and advertise for the June solicitation
- Finalize process with FHWA on using safety implementation funds for both IAP and TFHRC managed research

June 2014 IAP

- Application period June 1ˢᵗ to July 1ˢᵗ
- Team selections – end of August
- Defining and negotiating research details Oct – Nov
- Research begins - December 2014

Implementation Concept

- **Implementation Assistance Program**
  - New concept in the IAP – more complex, possible phased approach
  - States that are selected manage research - contract with researchers, oversee work product, etc.
  - Task Force serves as OC for the research
  - States that are selected agree to implement C/M or champion change
- **TFHRC**
  - FHWA manages a complex research contract
  - Task Force serves as OC for the research
  - Contractors competing for work must come with State partner(s)
  - A state that is partnered with a selected contractor agrees to implement C/M or champion change
- **S08 Research Projects**
  - Convert findings to C/M or other industry changes
  - Task Force works with AASHTO Committees to champion changes

Thank you!!!

- On behalf of the SHRP 2 program, thank you for agreeing to help with planning for implementation with the Safety Focus Area.

- Your work over the next two days will be critical to the successful deployment and demonstration of this product nationwide for the SHRP 2 program.

SHRP 2 Safety Research—Status Update

AASHTO SHRP 2 Safety Task Force

March 19, 2014

Neil Pedersen

TRB

SHRP2
STRATEGIC HIGHWAY RESEARCH PROGRAM

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- Data collection ended November 30 – both driving (NDS) and roadway (RID) data

- Data processing for the NDS and RID databases complete March 31, 2014

- Data enhancements to assist users implemented throughout 2014

- Three analysis contracts underway; final reports - July 2014

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- Data collection complete November 30, 2013:
    - 3,147 participants completed (at least 4 months in study)
    - 5.4 M trips (consented drivers)
    - 3,958 vehicle-years of data, 101% of 3,900 goal
    - 49.6 M vehicle-miles
    - 532 known crashes, more in database not yet identified
    - 12,500 centerline miles of roadway data
    - Currently collecting supplementary data from sites
        - AADT, weather, work zones, crashes, etc.
        - collection through June 2014

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- Processing includes:
  - Download driving data from field to VTTI
  - Verify each driver on each trip is a consented participant; delete trips with non-participant drivers (about 85% of trips are participant drivers)
  - Quality control all NDS and RID data; flag all spurious data
- Schedule:
  - To be complete March 31, 2014

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Smaller, more accessible data sets

1. Website

   Available now, 310,000 trips; 1 M trips April 2014;
   quarterly releases with more trips, complete Dec. 2014

2. Trip summary files same schedule as website

3. Crash, near-crash, and baseline event files

   initial release April 2014; 100 crashes;
   quarterly updates; complete Dec. 2014

Critical tool for data users

4. Link NDS and Roadway data complete Dec. 2014

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Data coding to help users

5. Code critical incident button pushes – 50% complete
6. Code MUTCD signs and barriers – complete; 518,570 signs
7. Radar data processing and coding – 10/14
8. Add cell phone data – 10/14
9. Evaluate alcohol sensor usefulness – 7/14

Documentation, place data into national context

10. NDS sample description, representativeness – 9/14
11. Document all data files and user tools – 12/14

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- Trip summary file - categorical data on each trip
  (think of a spreadsheet with 1 row per trip, 5.4M rows)
  - Identify trips of interest; also can be analyzed directly

- Variables
  - Driver data – demographics, driver assessments
  - Vehicle data – descriptive
  - Roadway data for each trip – roadway class, speed limit, intersections, data source
  - Trip data – duration, speed, accelerations, headway, etc.
  - Variables that change during a trip in bins, counts, or max/min:
    - speed bins 0-10 mph, 10-20 mph, etc. – time or % of trip in each
   - number of accelerations higher than threshold value

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Crash, Near-crash, Baseline Files

- Crashes: expect 700, varying severity
- Near-crashes: "almost" crash but for …; 7,000
  - Crash surrogates; how did driver avoid a crash
- Baseline: randomly selected across all vehicles; 30,000
  - Denominator for risk calculations; measure overall prevalence
- <u>Event</u> files for each – categorical data
  - Coded from last 6 seconds of "before" data
  - Manual video reduction (eg., driver distraction)
- <u>Epoch</u> files for each – sensor and video data
  - 30-second data segments (20 before, 10 after; only 20 for baseline)
  - Manual eye-glance coding

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Website

- Information on website
  - Categorical data on driver demographics and assessments
  - Vehicle descriptors
  - Trip summary data
  - Aggregated time series data
  - Crash and near crash data

- Schedule
  - Jan. 2014: 310,000 trips, driver demographic data, vehicle data
  - April 2014: 1 million trips, additional data added
  - July 2014: 2 million trips, additional data added
  - Sept. 2014: 3 million trips, additional data added
  - Jan. 2015: all 5.4 million trips, all website data available

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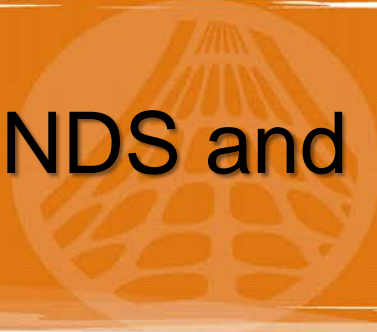
- Identify all trips passing over a given roadway segment
- Identify all roadway segments over which a given trip travels
- Link will match trip IDs and roadway segment IDs

- Linking will be completed December 2014

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Program Sponsors

U.S. Department of Transportation
Federal Highway Administration

Mr. Tony Furst
- FHWA Associate Administrator