



SHRP2 SOLUTIONS

TOOLS FOR THE ROAD AHEAD

Concept to Countermeasure – Research to Deployment Using the SHRP2 Safety Databases

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Sandra Larson
Bureau Director
Systems Operations
Iowa DOT

U.S. Department of Transportation
Federal Highway Administration

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Today's Presentation

- Brief Overview of SHRP2 Program
- New SHRP2 Safety Database
  - NDS: Naturalistic Driving Study
  - RID: Roadway Information Database
- Implementation Assistance Program
- Challenges & Potential Benefits in Iowa
- Data Access & Availability
- Lessons Learned for Data Use

What is SHRP2?

Save lives. Save money. Save time.

- Over $230 million, federally funded research program to address **critical transportation challenges:**
  - Making highways safer
  - Fixing deteriorating infrastructure
  - Reducing congestion

- **Implementation phase underway by FHWA and AASHTO**

- Innovative **systematic** advancements to plan, renew, operate, and improve safety on the Nation's highways

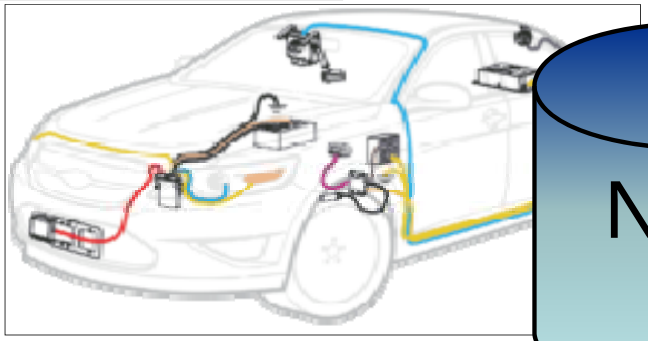
Who will benefit?

- Motorists
- State/local transportation agencies
- Metropolitan Planning Organizations
- Highway designers, suppliers, and construction contractors
- Freight industry
- Environmental agencies
- Communities and businesses
- Emergency medical services
- Railroads

Four Focus Areas

- **Safety**: fostering safer driving through analysis of driver, roadway, and vehicle factors in crashes, near crashes, and ordinary driving
- Rapid **Renewal:** meeting the challenge to get in, get out, and stay out
- Travel-Time **Reliability**: providing reliable travel times by preventing and reducing non-recurring congestion
- **Capacity**: systematically delivering highway projects that meet community, environmental, and economic goals

Naturalistic Driving Study & Roadway Information Databases



NDS
Data

RID
(GIS)

Data from **3,147 volunteer drivers and their vehicles** in six sites using passenger cars, vans, SUVs, pickups

New data collected 12,500 centerline miles consistent across six sites
Acquired data (DOTs, others) on 200,000 centerline miles with varying conditions - roadway, weather, traffic ..

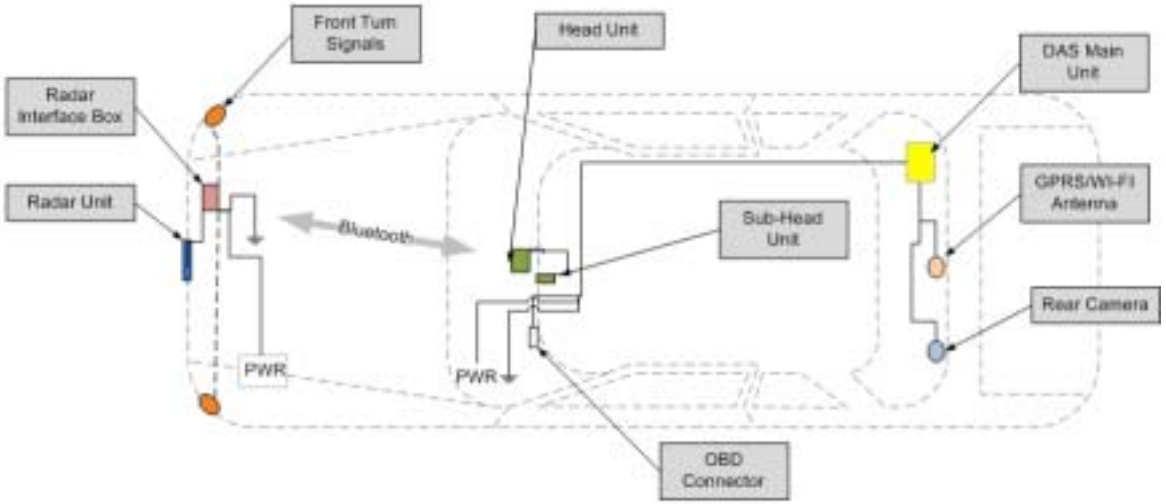
NDS Study Design

- **Largest naturalistic driving study ever undertaken**
  - 3,147 drivers, all age/gender groups.
  - 3,958 data years; 5 M trip files; 49.7 M vehicle miles
  - 3 years of data collection
    - Most participants 1 to 2 years
  - Vehicle types: All light vehicles
    - Passenger Cars
    - Minivans
    - SUVs
    - Pickup Trucks
  - Six data collection sites
  - Second by second data on what happens in vehicle

Naturalistic Driving Studies

Instruments volunteer drivers' vehicles and collects data continuously during their normal driving

- What do drivers really do?
- What were they doing just before they crashed?
- How did they avoid a crash?
- How do the roadway, vehicle, and environment impact driving?



SHRP2 NDS data will be used for 20 years or more

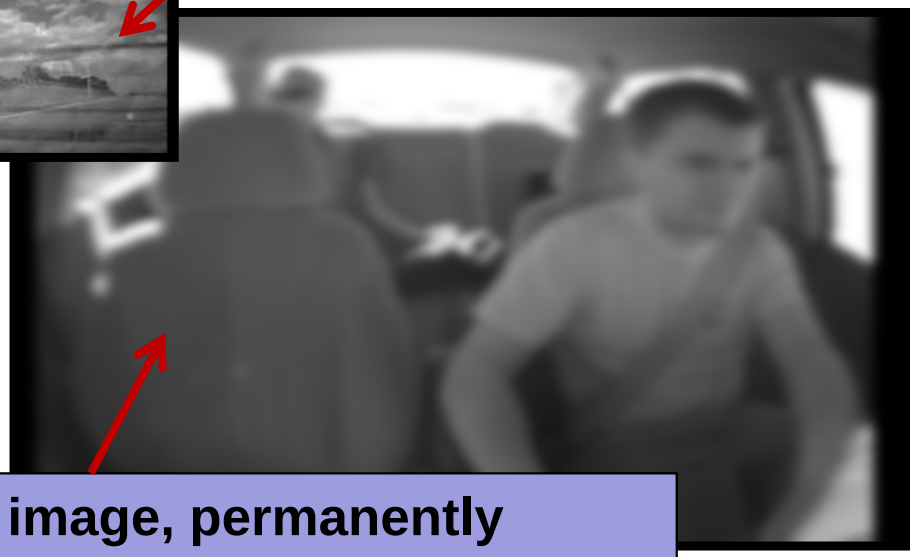
Camera Image Samples

Forward View - color

•15 Hz continuous video

Driver Face – Rotated for max pixel efficiency

Right-Rear View



Center stack – Pedal Interactions

Periodic still cabin image, permanently blurred for passenger anonymity

What's in the NDS Data?

- Driver demographics, assessments
- Vehicle descriptors

TRIP DATA

- Multiple Videos
- Machine Vision
- Accelerometer Data (3 axis)
- Rate Sensors (3 axis)
- GPS
- Forward Radar
- Cell Phone Records
- Passive Alcohol Sensor
- Illuminance sensor
- Infrared illumination
- Incident push button
- Turn signals
- Vehicle network data

RID Data Overview

Roadway Information database (RID) will be linked to the NDS data by December 2014

- Four data sources
  - ESRI
  - State roadway inventory data
  - Mobile van data
  - Supplemental data
- Will provide state departments of transportation, researchers, and others with powerful data sets
  - Will allow for driver behavior to be associated with physical environment

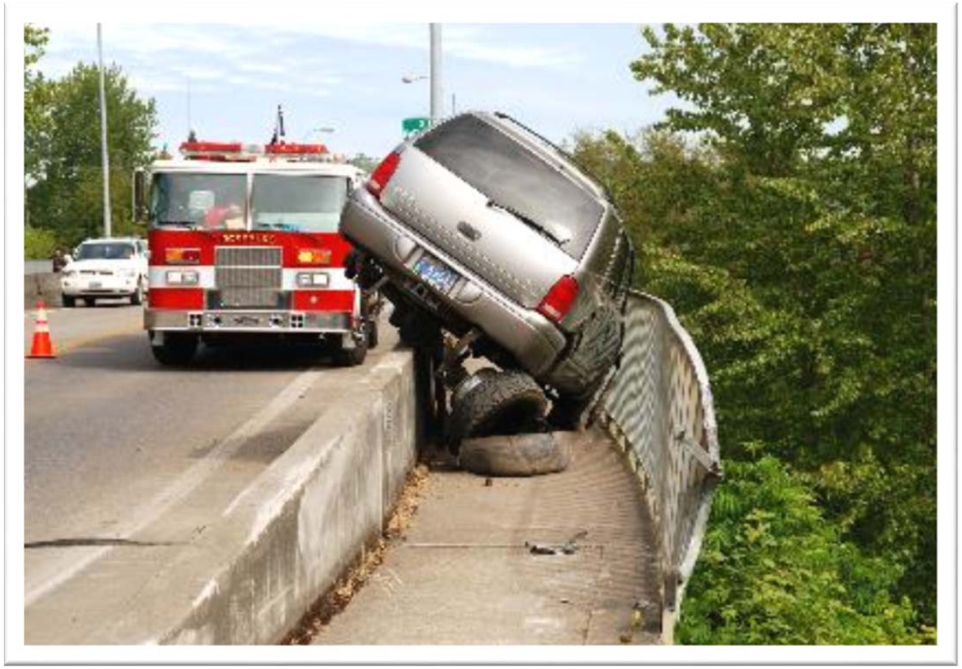
Benefits to States Using SHRP2 Safety Data

- Can lead to practical measures that reduce crashes and achieve safety targets
- Let's us understand how drivers interact with vehicles and the roadway
- Can lead to life-saving improvements
  - Development and deployment of new safety countermeasures
  - Updating current design guides and associated practices
  - Driver training programs
  - Vehicle design
  - Infrastructure improvements
  - Public policy and enforcement
  - New approaches to Public Safety Campaigns

Implementation Assistance Program (IAP)

Main Objectives

- Demonstrate use of the SHRP2 Safety Data
- Increase states' understanding of its potential
- Identify countermeasures
- **Reduce crashes and save lives !**



Safety IAP Process

Phase I - Proof of Concept with a sample reduced data set , January – September 2015 timetable

Decision

Phase II full data set and in-depth research and analysis with countermeasure identification

Decision

Phase III – Deployment, to adopt, champion or implement countermeasure nationally

Key Dates and Selection

- 30 applications were submitted
- Safety Task Force – made up of state DOT/AASHTO representatives along with FHWA – are reviewing the applications
- Selections: **August 2014**
- Expected Phase I start date: **January 2015**
- Phase I complete: **September 2015**

Iowa DOT Involvement in Safety

Iowa DOT and Center for Transportation Research and Education (CTRE) have participated in multiple SHRP2 safety projects

- Lane departure crashes (S01-E)
- Identifying Appropriate Analysis methods for NDS (S02)
- Developing the RID (S04-A)
- Also participated in S08-D project: Rural Curves

Used NDS and roadway inventory data for all projects

Iowa's Round 4 Application

- Proof of Concept Proposal
- Builds on work Iowa undertook in TRB Pilot Phase
- Asks: Which driver and roadway characteristics play the most significant role in road departure crashes and safety critical events?
- Analysis of approximately 410 crash/near-crash road departures from database specifically to assess road design
- Example: the odds of a right-lane departure are 2 times higher in the absence of edge line rumble strips.

Questions

For more information:

Sandra Larson

Systems Operations Bureau Director, Iowa DOT

515-239-1205

sandra.larson@dot.iowa.gov

Aladdin Barkawi

FHWA Safety Implementation Lead

Aladdin.Barkawi@dot.gov

Kelly Hardy

AASHTO Safety Implementation Lead

KHardy@aashto.org