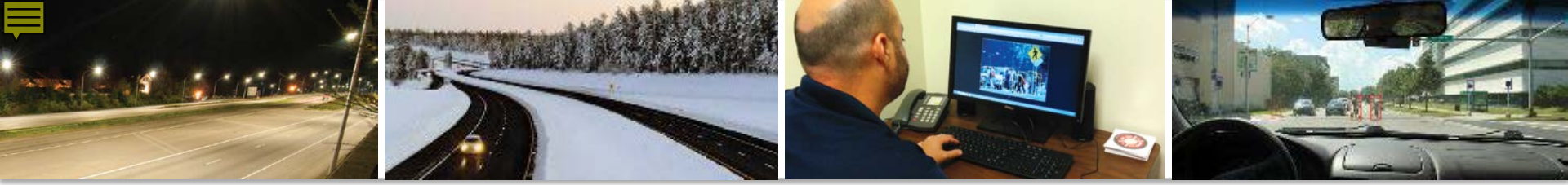

SHRP2 SOLUTIONS
STRATEGIC HIGHWAY RESEARCH PROGRAM

Preventing Lane Departure Crashes on Rural, Two-Lane Roads Using the New SHRP2 Data

Brian Mayhew, Traffic Safety Systems Engineer, Traffic Safety Unit,

North Carolina DOT

August 4, 2015

U.S. Department of Transportation
Federal Highway Administration

American Association of State Highway and Transportation Officials
AASHTO

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

The Cost of Highway Crashes

- Traffic accidents in 2013, caused **32,000+ fatalities** and **2.3 million injuries** in the United States..
- Crashes are the leading cause of death for children age 4 and for every age from 11 through 27.
- Economic cost of accidents was **$277 billion** in 2010. Total societal cost estimated at $870 billion.
- **Every 1 percent reduction in traffic-related injuries and fatalities saves an estimated $2.3 billion annually.**

- Sources: NHTSA, FHWA, Economic Cost of Motor Vehicle Traffic Crashes 2010 (DOT HS 812 013)

A Wealth of New Data

New SHRP2 data provide new set of tools for reducing crashes and improving highway safety:

- **Naturalistic Driving Study** (NDS) database - what preceded crash and near-crash events, what drivers actually are doing during real-world driving conditions

- **Roadway Information Database** (RID) - a geo-database that contains detailed information about the roadway characteristics in and around the NDS study cities

SHRP2 Safety: Strategic Rationale

Driver behavior is key:

- Primary factor in two-thirds of crashes
- Contributing factor in more than 90% of crashes
- Hardest to study; the thing we know the least about

Opportunity - Naturalistic Driving Study (NDS):

- Miniaturized sensor technologies and increased computing capacity: can observe real-world driving
- Crash, pre-crash, near-crash, and “normal” driving data

SHRP2’s NDS effort:

- 3,500+ drivers; 6 sites; all ages
- Data to be available for other researchers for decades

Safety - Implementation Assistance Program (IAP)

Main Objectives

- Support demonstration projects on the use of the SHRP2 Safety Data
- Increase states' understanding of the potential uses of the data
- Identify safety countermeasures based on research projects
- **Reduce crashes and save lives !**

Safety IAP Process

Phase 1 - Proof of Concept with a sample reduced data set

Decision

Phase 2 full data set and in-depth research and analysis with countermeasure identification

Decision

Phase 3 – Deployment, to adopt, champion or implement countermeasure nationally

SHRP2 Ongoing Safety Projects

Pedestrian	Florida DOT Nevada DOT New York State DOT
Roadway Departure	Iowa DOT
Speeding	Michigan DOT Washington DOT
Work Zones	Minnesota DOT
Horizontal & Vertical Curves	North Carolina DOT
Interchange Ramps	Utah DOT
Adverse Conditions	Wyoming DOT
Roadway Lighting	Washington DOT

Horizontal and Vertical Curves

More accidents occur on roads with horizontal and vertical curves

- Question at hand: Why are certain conditions at higher risk?
- Driver behavior data from SHRP2 may provide that insight.

Research Questions

NDS Data Will Answer:

- Differences in speed, lane-keeping, other variables of drivers
- Ability to recover from run-off-road event
- Daytime vs. nighttime behavior
- Effects of closely spaced curves and grades
- Impact of familiarity with road

Current Status Phase 1

- **Identify study locations** using RID
  - Horizontal curves (radius, start point, end point) provided explicitly in RID
  - Vertical curves (length, start point, end point) not provided
    - Using grade data (percent grade every 25 ft) to identify vertical curves
  - Status: Identified an initial small group of locations and submitted for NDS data reduction process

Phase 1 Steps and Status

- **Compile NDS data for identified locations**
  - Virginia Tech Transportation Institute will perform this task.
  - Status: Work has begun on identifying trips conducted on the initial batch of selected locations.
  - Data reduction (watching video) begun in early July.

More Information

- **GoSHRP2 website**

  www.fhwa.dot.gov/goSHRP2

  – Product details

  – Information about SHRP2 implementation phases

- **SHRP2 @AASHTO**

  http://SHRP2.transportation.org

  – Implementation Information for AASHTO members

Questions?

- *State Contact:* Brian Mayhew, bmayhew@ncdot.gov
- *FHWA Contact:* Clayton Chen, clayton.chen@dot.gov
- Pam Hutton, AASHTO SHRP2 Implementation Manager, phutton@aashto.org, 303-263-1212