NHTSA’s SOURCES OF “REAL WORLD” CRASH OCCUPANT PROTECTION DATA

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Overview

• Size of the issue
• NHTSA’s real world crash data systems (NCSA)
• Police Crash Report Based Systems
• NHTSA Investigation Based Systems
NHTSA Crash Data (2008)

- 37,261 Fatalities
- 2,346,000 People Injured
- >16,000,000 Crashes
- 5,811,000 Police Reported Crashes
- 4,146,000 Property Damage Only
- 1,630,000 Injury Crashes
- 34,017 Fatal Crashes

$230 Billion Societal Cost in 2000

NHTSA Crash Data (2008)
Fatality Analysis Reporting System (FARS)

- Census on all police-reported fatal motor vehicle traffic crashes within the 50 States, the District of Columbia, Puerto Rico and the Virgin Islands.
- State data based
  - Police Accident Report (PAR)
  - Death Certificates
  - DMV, etc
  - Recoded at the State into a uniform national data set
- Fatality w/in 30 Days of Crash
  - ~37,000 fatalities/year
National Automotive Sampling System (NASS)

- Nationally representative data
- Two Components
  - General Estimates System (GES)
    - Tracks Motor Vehicle Crash Trends
  - Crashworthiness Data System (CDS)
    - Evaluate Motor Vehicle Safety Countermeasures
National Automotive Sampling System (NASS)

- GENERAL ESTIMATES SYSTEM (GES)
  - Sole Source
    - National estimates on all police reported crashes
  - Nationally representative
    - Sample based
    - Collected at 410 Police Jurisdictions
    - in 60 locations across the US
  - Data from the Police Accident Report (PAR)
    - Recoded to into a uniform data set
  - ~55,000 crashes annually
National Automotive Sampling System (NASS)

• CRASHWORTHINESS DATA SYSTEM (CDS)
  ◆ Sole source
    o Data on vehicle damage and the occupant outcome (crashworthiness) of towed light passenger vehicles
  ◆ Nationally representative
    o Sample based
  ◆ Field Investigation Based
    o Crash Events
    o Damage to Vehicle
    o Crash Forces Involved
    o Injuries to Victims
    o Injury Mechanisms
National Motor Vehicle Crash Causation Survey (NMVCCS)

- NATIONAL MOTOR VEHICLE CRASH CAUSATION SURVEY (NMVCCS)
  - Sole source
    - On scene data on the factors or events that led up to a crash (primary prevention) of towed light passenger vehicles
  - Nationally representative
    - Sample based
  - On scene field investigation
    - Pre-crash events and associated factors related to how crashes occur
      - Starts at the critical event
  - Data collection Period
    - 2005 – 2007
      - 5,000 cases investigated
  - Last study performed > 30 years ago
Special Crash Investigations (SCI)

- Detailed data on new and rapidly changing technologies
  - First Alert (Problem Identification)
  - Most detailed investigations into:
    - Backover Avoidance
    - Alternative fuel systems
    - Air Bag systems:
      - Front, Side, Rollover Canopy
    - School Bus Crashes
    - Potential Vehicle Defects
- 180 cases annually
Police Crash Report Based Systems

• The 2010 FARS / GES Manual
  ♦ Fatality Analysis Reporting System (FARS)
  ♦ General Estimates System (GES)

• Elements
  ♦ Restraint System / Helmet Use
  ♦ Any Indication of Misuse of Restraint / Helmet Use
  ♦ Air Bag Deployed
Police Crash Report Based Systems

• Restraint System/ Helmet Use
• Person Level
  ♦ FARS: P10
  ♦ GES: P15
• Definition:
  ♦ The restraint equipment in use by the occupant, or the helmet in use by a motorcyclist, at the time of the crash
• History
  ♦ Prior to 2007, this element was called “Restraint” System Use
  ♦ 2007-2009, this element was called “Protection System Use”
  ♦ Changed in 2010 to “Restraint System/Helmet Use to align with MMUCC"
## Police Crash Report Based Systems

### 2010 Element Values

<table>
<thead>
<tr>
<th>SAS</th>
<th>GES</th>
<th>FARS</th>
<th>Description</th>
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<td>31</td>
<td>07</td>
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<td></td>
<td>1</td>
<td>03</td>
<td>Shoulder and Lap Belt Used</td>
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<td>01</td>
<td>Shoulder Belt Only Used</td>
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<td></td>
<td>2</td>
<td>02</td>
<td>Lap Belt Only Used</td>
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<td></td>
<td>8</td>
<td>08</td>
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<tr>
<td></td>
<td>37</td>
<td>10</td>
<td>Child Restraint System - Forward Facing</td>
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<td></td>
<td>38</td>
<td>11</td>
<td>Child Restraint System - Rear Facing</td>
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<td>39</td>
<td>12</td>
<td>Booster Seat</td>
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<td>04</td>
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<td>05</td>
<td>DOT-Compliant Motorcycle Helmet</td>
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<td>43</td>
<td>16</td>
<td>Other Helmet</td>
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<td>17</td>
<td>No Helmet</td>
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</table>
Police Crash Report Based Systems

- 2010 Any Indication of Misuse of Restraint/ Helmet Use
- Person Level
  - FARS titled P11
  - GES titled P24

<table>
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<th>ELEMENT VALUES</th>
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Police Crash Report Based Systems

• 2010 Air Bag Deployed
• Person Level
  ♦ FARS: P12
  ♦ GES: 21
• History
  ♦ Prior to 2009, this element was called “Air Bag Availability/Deployment”
  ♦ Changed in 2009 to “Air Bag Deployed” to align with MMUCC
• Definition:
  ♦ This element is used to record air bag availability and deployment for this person.
  ♦ Code this element according to this person’s Seating Position, regardless of the motor vehicle’s Body Type or the age of the motor vehicle.
# Police Crash Report Based Systems

## 2010 Element Values

<table>
<thead>
<tr>
<th>SAS</th>
<th>GES</th>
<th>FARS</th>
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<tr>
<td>GES</td>
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<tr>
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<td>Deployed-Front</td>
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<td>2</td>
<td>Deployed-Side (door, seatback)</td>
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<tr>
<td></td>
<td>3</td>
<td>Deployed-Curtain (roof)</td>
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<td>4</td>
<td>Deployed-Other (knee, air belt, etc.)</td>
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<td>5</td>
<td>Deployed-Combination</td>
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<td>Deployment-Unknown Location</td>
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<td>9</td>
<td>99</td>
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</table>
NHTSA Investigation Based Systems

- NCSA Systems
  - Crashworthiness Data System (CDS)
  - Special Crash Investigations (SCI)

- Field Investigation Based
  - Crash Events
  - Damage to Vehicle
  - Crash Forces Involved
  - Detailed Restraint data
  - Injuries to Victims
  - Injury Mechanisms
NHTSA Investigation Based Systems

- Crash Events
  - Frontal, Side, Rollover, etc
  - Backover, Power Window, etc
- Crash Forces Involved
  - Delta V
  - EDR
NHTSA Investigation Based Systems

- Detailed restraint data
  - Safety belts, air bags
  - Availability
  - Deployment and/or use

- Injuries to Victims
  - AIS 90 (update 98)
  - AIS 2005 (in 2010)

- Injury Mechanisms
• Expanded child safety seat data began in 2002
  ♦ Separate data collection elements for child Occupant/child safety seat/safety belt selections and installations.
    o New data will allow for user to make outcome determinations based on use
  ♦ Child restraint photos (when available)
• New child restraint interview form
• Field researchers were extensively trained
  ♦ Many are “Certified” CSS Technicians
Child Restraint Attributes Pre and Post 2002

- Pre 2002
  - Make, Model, Type
  - Orientation
  - Harness, Shield
    - Designed with Harness or Shield
    - Not Designed with Harness or Shield
    - Unknown
  - Tether

- 2002 To Date
  - Make, Model, Type, Model No. and DOM
  - Orientation
  - Harness/Shield
    - 3-pt, 5-pt, T-Shield, Tray-Shield, etc.
  - Retainer Clip
  - Tether
  - LATCH
  - Belt Routing