NHTSA's SOURCES OF "REAL WORLD" CRASH OCCUPANT PROTECTION DATA

Augustus "Chip" Chidester,
National Highway Traffic Safety Administration
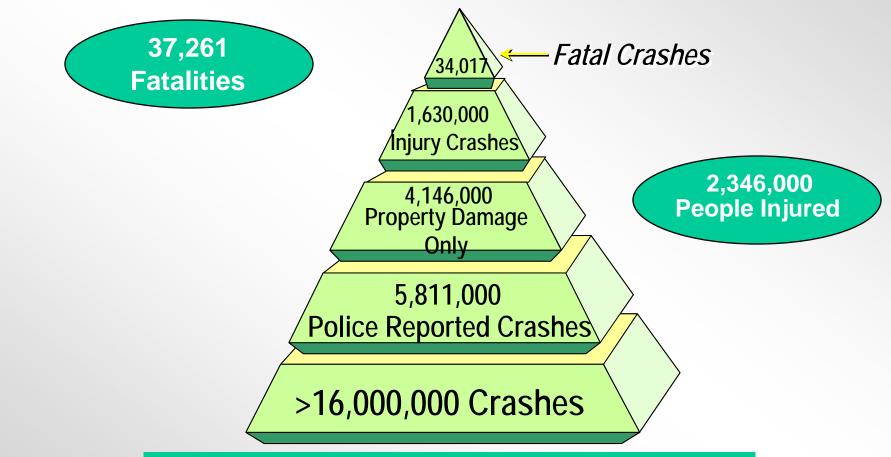
Overview

- **Size of the issue**
- **NHTSA's real world crash data systems (NCSA)**
- **Police Crash Report Based Systems**
- **NHTSA Investigation Based Systems**

NHTSA
www.nhtsa.gov

NHTSA Crash Data (2008)

37,261 Fatalities

Fatal Crashes

34,017

1,630,000 Injury Crashes

4,146,000 Property Damage Only

2,346,000 People Injured
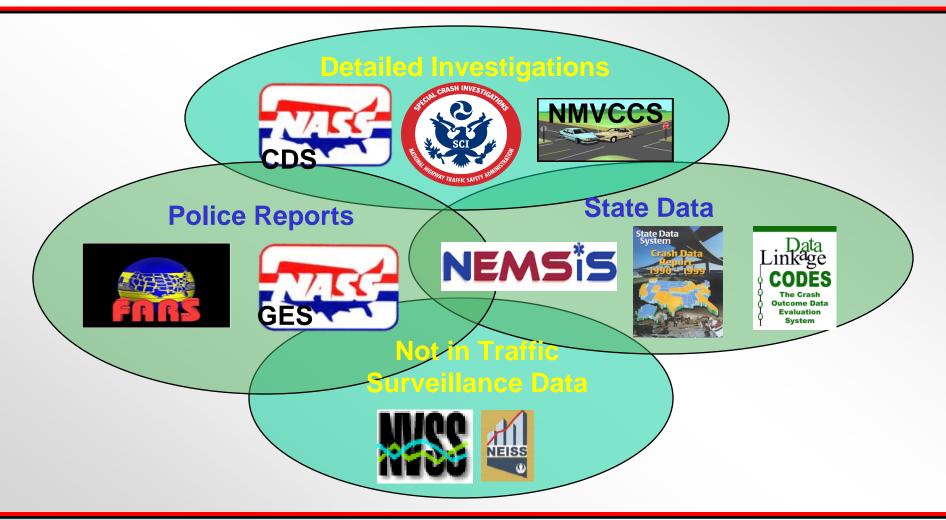
5,811,000 Police Reported Crashes

>16,000,000 Crashes

$230 Billion Societal Cost in 2000

NHTSA Crash Data Systems

Fatality Analysis Reporting System (FARS)

♦ **Census on all police-reported fatal motor vehicle <u>traffic</u> crashes within the 50 States, the District of Columbia, Puerto Rico and the Virgin Islands.**

♦ **State data based**
  o **Police Accident Report (PAR)**
  o **Death Certificates**
  o **DMV, etc**
  o **Recoded at the State into a uniform national data set**

♦ **Fatality w/in 30 Days of Crash**
  o **~ 37,000 fatalities/year**

National Automotive Sampling System (NASS)

- **Nationally representative data**

- **Two Components**

  - ♦ **General Estimates System (GES)**
    - o **Tracks Motor Vehicle Crash Trends**

  - ♦ **Crashworthiness Data System (CDS)**
    - o **Evaluate Motor Vehicle Safety Countermeasures**

National Automotive Sampling System (NASS)

- **GENERAL ESTIMATES SYSTEM (GES)**
  - ♦ **Sole Source**
    - o **National estimates on all police reported crashes**
  - ♦ **Nationally representative**
    - o **Sample based**
    - o **Collected at 410 Police Jurisdictions**
    - o **in 60 locations across the US**
  - ♦ **Data from the Police Accident Report (PAR)**
    - o **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**
  - ♦ <u>**Field Investigation Based**</u>
    - 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**
    - o **On scene data on the factors or events that led up to a crash (primary prevention) of towed light passenger vehicles**
  - ♦ **Nationally representative**
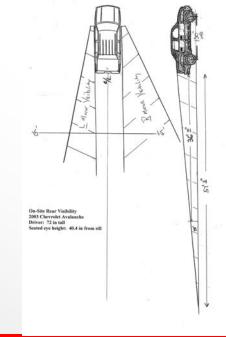   - o **Sample based**
  - ♦ **On scene field investigation**
    - o **Pre-crash events and associated factors related to how crashes occur**
      - ▪ **Starts at the critical event**
  - ♦ **Data collection Period**
      - ▪ **2005 – 2007**
    - o **5,000 cases investigated**
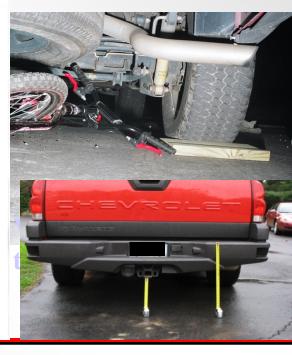 - ♦ **Last study performed > 30 years ago**

Special Crash Investigations (SCI)

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

On-Site Rear Visibility
2003 Chevrolet Avalanche
Driver: 72 in tall
Seated eye height: 40.4 in from sill

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

SAS		
GES	FARS	
30	00	Not Applicable*
31	07	None Used – Motor Vehicle Occupant
1	03	Shoulder and Lap Belt Used
3	01	Shoulder Belt Only Used
2	02	Lap Belt Only Used
8	08	Restraint Used - Type Unknown
37	10	Child Restraint System - Forward Facing
38	11	Child Restraint System - Rear Facing
39	12	Booster Seat
40	04	Child Restraint Type Unknown
42	05	DOT-Compliant Motorcycle Helmet
43	16	Other Helmet
41	17	No Helmet
98	98	Other
97	98	Not Reported
99	99	Unknown

Police Crash Report Based Systems

- **2010 Any Indication of Misuse of Restraint/ Helmet Use**

- **Person Level**
  - ♦ **FARS titled P11**
  - ♦ **GES titled P24**

	ELEMENT VALUES	
	SAS	
GES	FARS	
1	0	No
2	1	Yes

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

SAS		
GES	FARS	
0	00	Not Applicable*
1	01	Deployed-Front
2	02	Deployed-Side (door, seatback)
3	03	Deployed-Curtain (roof)
4	07	Deployed-Other (knee, air belt, etc.)
5	08	Deployed-Combination
6	09	Deployment-Unknown Location
7	20	Not Deployed
8	28	Switched Off
97	**98**	**Not Reported**
9	99	Deployment Unknown

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
www.nhtsa.gov

National Center for Statistics & Analysis

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**

NHTSA Investigation Based Systems

- **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**

NHTSA Investigation Based Systems

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**