2009 SAE Government/Industry Meeting

NHTSA's Rollover Data Special Study (RODSS) Methodology

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Special Crash Investigations

- **Rollover Data Special Study (RODSS)**
- **Agency wanted additional data on rollover crashes**
- **Some crashes available but not captured in other data systems (NASS, SCI, CIREN)**
- **Some crashes may have detailed data available**
- **Determine:**
  - ◆ **Could we get the data**
  - ◆ **Usefulness of the data (good data vs. minimal data)**
  - ◆ **Standardize data for NHTSA research needs**
- **RODSS was the inaugural project – a different approach than other data systems**

RODSS Overview

- **Queried FARS and GES for potential cases**

- **FARS was only database that had reconstruction data available**

- **We learned that the information (detailed reports and photos) resided at the individual police jurisdictions – no central location for each State**

- **Utilized our crash reconstruction expertise in SCI**

- **Utilized 2005-2008 FARS database**

- **PARS provided by FARS**

  - **Case Selection Criteria:**

    - **Rollover**

    - **Late model year vehicles (last four model years)**

    - **Electronic Stability Control as standard equipment in vehicles**

      - **VIN decoder program to help identify vehicles**

    - **Images available**

    - **Side curtain air bag**

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- **Feasibility Study began in the Spring of 2007**

- **Detailed data obtained on ~ 300 cases**
  - ◆ **Currently completing data collection and coding**

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Overview of Process

RODSS Pursued / Active Cases

- **Phase I**
  - ♦ **Total number of FARS PARS identified for years 2005 to early 2007** — **325**
  - ♦ **Total number of active cases with usable images, with and without reconstruction reports** — **~200**

- **Phase 2**
  - ♦ **Total number of FARS PARS identified for years 2007 to 2008** — **188**
  - ♦ **Anticipated number of cases with usable images, with and without reconstruction reports** — **~100**

- **Determined the investigating agency from the Police Accident Report (PAR)**

- **Contact the investigating agency to obtain:**
  - ◆ **Police pictures/images of crash (35 mm, slides, film rolls, paper copies, digital CD)**
  - ◆ **Detailed PAR's and reconstruction reports**

- **Await receipt of requested data**

- **Conducted a thorough review of the crash and schematics to determine:**
  - ♦ **Vehicle pre-crash circumstances (trajectories, driver actions, avoidance)**
  - ♦ **Crash dynamics**
  - ♦ **Estimated speeds using software applications and hand calculations**
  - ♦ **If interview data provided further clues or clarifications**

RODSS Data Coding Process

- **Reviewed all paper reports**

- **Reviewed all print and digital images**

- **Reconstructed the events based on the evidence**

- **Prepared a detailed narrative summary**

- **Data entered into tracking database**

- **No images supplied with police data**
- **Inadequate or unusable images**
  - **Dark / nighttime images**
  - **Scene images without vehicle images**
  - **Images of undercarriage only**
- **This case was previously selected as a NASS case**
- **Medium / heavy truck rolled - not a light vehicle (Volvo)**
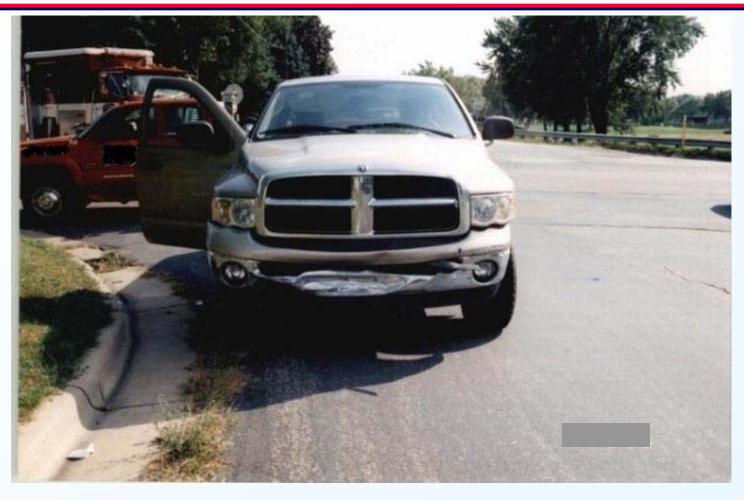- **Non-cooperative police departments**

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Case Example

Case Example

- **Case Vehicle – 2005 Toyota Highlander SUV**

- **ESC – Standard**

- **Inflatable Curtains – optional, not equipped on this vehicle**

- **Side Impact Air Bags – Optional, not equipped**
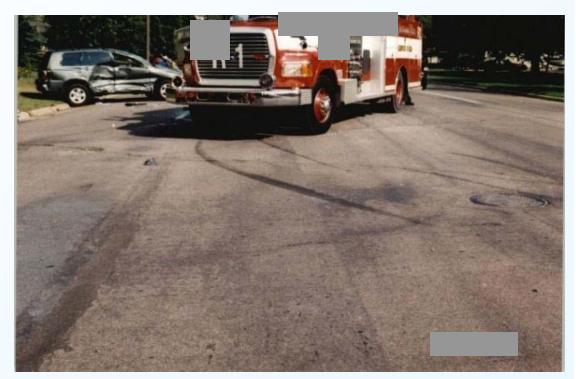
- **Intersection crash w/rollover**

Other Vehicle – 2003 Dodge Ram Quad-Cab
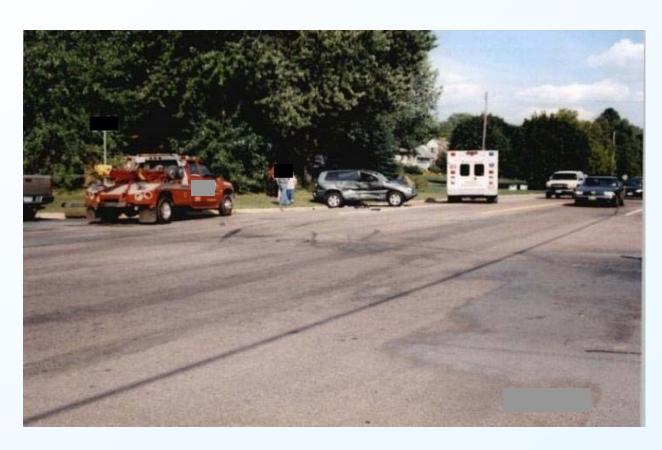
Case Example

- **Toyota struck on right side, 02RYEW3**

- **Side impact crash induced a CW rotation across intersection**

- **Left side leading rollover**

- **Toyota completed four quarter turns**

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- **Based on the available evidence and the rapid CW rotation, Rollover Initiation was classified as a Turn Over**

Case Example

Toyota Roof Crush

Vertical – Est. at 5"

Lateral - Est. at 2"

Case Example

- **Advantage of digital images – ability to zoom for detail**

Case Example

Toyota

- **Driver – Belted 66-year old female, not injured**

- **Right Front Passenger – Belted 92-year old female, fatal (body area not specified)**

- **Unknown if partially ejected during rollover**

- **RF glazing disintegrated**

What's Next?

- **Complete Phase II data collection**

- **Complete Phase II crash analysis and data entry**

- **Report**
  - ◆ **Document this RODSS process**
  - ◆ **Lessons learned (future applicability)**
  - ◆ **Analyze data**