

# **Rollover**

## **Field Data Collection Activities**

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✓ **NASS CDS – Crashworthiness**

✓ **Future**

- *Changes to the data collected*
- *Special Study – Researching the possibility of increasing the number of rollover cases*
  - *Sample – Added Identifier in sampling listing file in 2005*

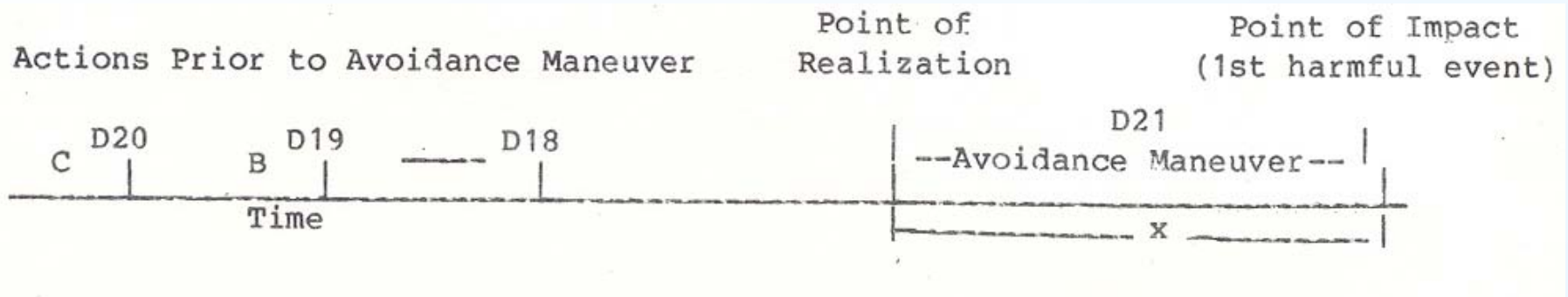


# Rollover

- ✓ **NMVCCS – Pre-crash data**
  - *New variables to capture the pre-event movements*
  - *ID crashes of special interest*

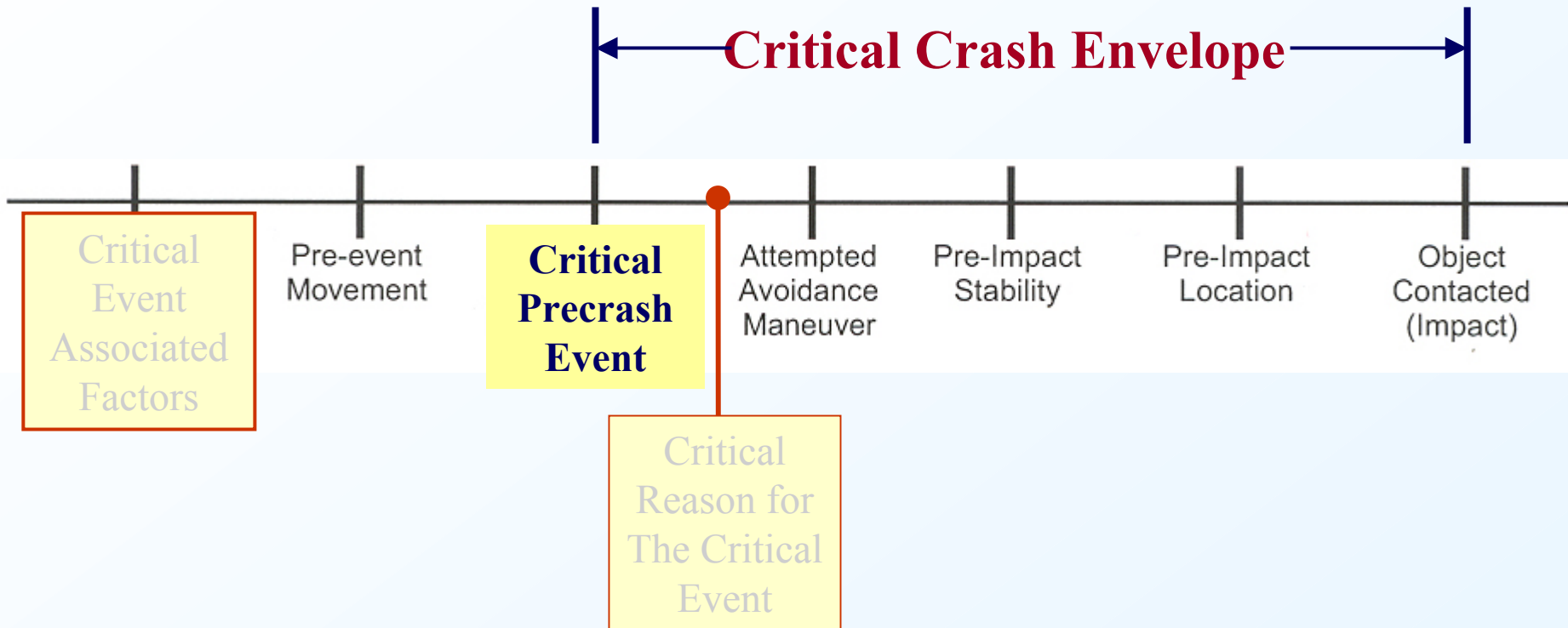
# Pre-crash Overview

- NASS CDS Coding



# Pre-crash Determination

## Typical Order of a Single Critical Crash Envelope



# Rollover

## ✓ NMVCCS –

### ▪ *Pre-event Movement/Intention*

- *This variable captures the driver's intended vehicle motion before the situation became critical.*
- *This variable looks for a general description of what the driver was intending to do before the critical envelope*

- ***Pre-event Movement/Intention***
  - *This variable captures the driver's intended vehicle motion before the situation became critical. This variable looks for a general description of what the driver was intending to do before the critical envelope, two steps prior to the crash.*
    - ***Attributes:***
      - ***Go straight***
      - ***Slow down, Accelerate, Stop***
      - ***Change lanes to right or left***
      - ***Turn left or Turn right***
      - ***Merge, Negotiate curve, Backup, U-turn***
      - ***Stopped, no movement intended***
      - ***Other (specify)***

- ***Pre-first harmful event maneuver sequence***
  - *This variable describes vehicle movements along the vehicle's trajectory between the end of the pre-event movement phase and the first harmful event.*
  - *For the purposes of this variable, movement components are defined as lane departures/returns, road and departures/returns.*
    - *For example, if an inattentive driver suddenly realizes that traffic forward of his position is stopped, applies heavy braking and steering inputs .*
    - *The vehicle is equipped with anti-lock brakes.*
    - *The vehicle departs its travel lane*



- *Attributes:*
  - *Lane departure- left side*
  - *Lane return- left side*
  - *Lane departure- right side*
  - *Lane return- right side*
  - *Road departure- left side*
  - *Road return- left side*
  - *Road departure- right side*
  - *Road return-right side*
  - *Other (specify)*

# NMVCCS - Rollover

- ***Pre-first harmful event maneuver sequence***
  - *If there are no lateral movements between the end of the pre-event movement phase and the initiation point of the first harmful event, this variable should be coded **No pre-first harmful event maneuver sequence**.*
    - *For example, if an inattentive driver suddenly realizes that traffic forward of his position is stopped, applies heavy braking inputs causing the vehicle to skid forward to impact without departing its travel lane, then code*
  - ***Attribute:***
    - ***No pre-first harmful event maneuver sequence***

- *Pre-rollover maneuver*
  - *The last controlled maneuver, relative to the roadway, prior to the initiation of the rollover.*
    - *Attributes:*
      - *Departing roadway (to paved surface) or (to nonpaved surface)*
      - *Returning to roadway (from paved surface) or (from nonpaved surface)*
      - *On roadway or Off roadway maneuver*

- *Attempted avoidance maneuvers*
  - *Attempted avoidance maneuvers are movements/actions initiated by the subject driver within the critical crash envelope in response to a Critical precrash event.*
    - *Attempted avoidance maneuvers occur after the driver realizes an impending danger.*
    - *This variable documents the driver's actions initiated in response to the realization of impending danger.*

- *Attempted avoidance maneuvers*
  - *Attributes*
    - *Code all that apply.*
      - *Full ABS application*
      - *Braking without lock-up, with lock-up or lockup unknown*
      - *Releasing brakes*
      - *Steering left or right*
      - *Braking and steering left*
      - *Braking and steering right*
      - *Accelerating*
      - *Accelerating and steering left*
      - *Accelerating and steering right*
      - *Other (specify)*

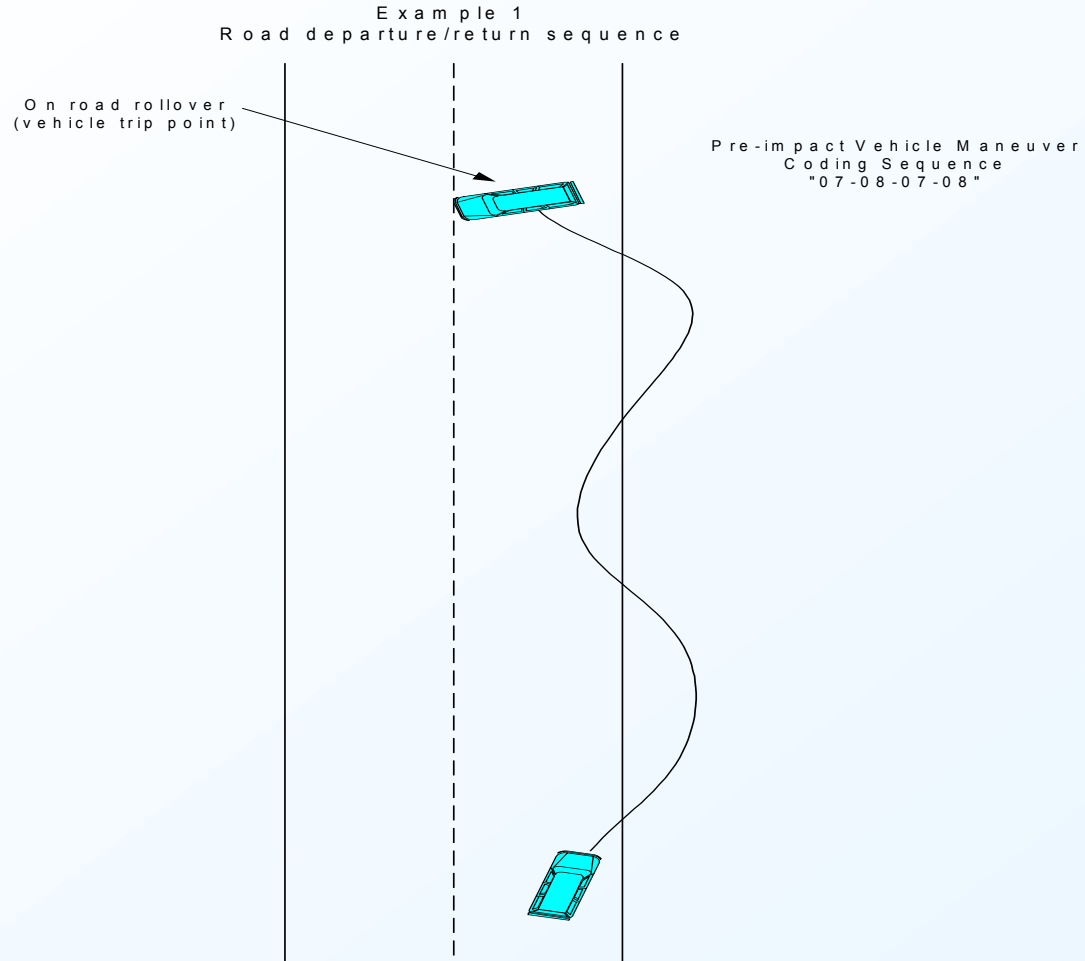
- *Location of this vehicle's first harmful event*
  - *Location of this vehicle at the time of impact relative to original travel lane.*
    - *Attributes:*
      - *Original travel lane*
      - *Different travel lane*
      - *Off roadway to right*
      - *Off roadway to left*
      - *Other (specify)*

- *Location of rollover initiation*
  - *Select the attribute which best describes the vehicle's location, relative to the roadway, at rollover initiation*
    - *Attributes:*
      - *On roadway*
      - *On shoulder -paved*
      - *On shoulder - unpaved*
      - *On roadside or divided trafficway median*
      - *Rollover - end-over-end*

- *Location on vehicle where initial tripping force is applied*
  - *Identify the specific point on the vehicle where the tripping force was applied.*
    - *Attributes:*
      - *Wheels*
      - *Tires*
      - *Side plane*
      - *End plane*
      - *Undercarriage*
      - *Other location on vehicle (specify)*
      - *Non-contact rollover forces (specify)*
      - *Rollover - end-over-end*



# NMVCCS - Rollover



# Special Crash Investigations Rollover Research

- ✓ **SCI – Detailed Investigations of Special Interest**
  - ✓ Researching **NEW TECHNOLOGY** in rollover occupant protection
    - *NHTSA/FORD Joint Study*
    - *Seven Air Bag Canopy cases*



# Special Crash Investigations Rollover Research

## *NHTSA's Role:*

- **Utilize its existing notification system to locate applicable crashes.**
- **Establish minimum criteria, (along with input from Ford), for case selection.**
- **Perform on site in-depth investigations of selected crashes.**
- **Document the real-world performance of the occupant protection systems.**
- **Facilitate joint case reviews to NHTSA and Ford engineers.**

# Special Crash Investigations Rollover Research

## *Ford's Role:*

### **Ford's Safety group:**

- **Assists in case identification.**
- **Provides technical support.**
- **System nomenclature.**
- **System logic.**
- **Provide a means to timely interrogate the case vehicles EDRs.**
- **Provide EDR data reports until such time, if ever, SCI investigators have a stand- alone device to complete this task**

## 2003 Mercury Mountaineer

- Heavy Snow ,vehicle departed the roadway onto a negative sloped embankment
- The vehicle initiated a rollover sequence that was detected by the rollover sensor within the vehicle .The safety canopy deployed and remained inflated for period of six seconds (as reported by Ford)
- The vehicle completed one full roll (four quarter turns)
- 20 year old driver and 19 year old FR passenger were reportedly restrained.The driver suffered a right thigh contusion and the passenger experienced “whole body pain”

# Questions?

