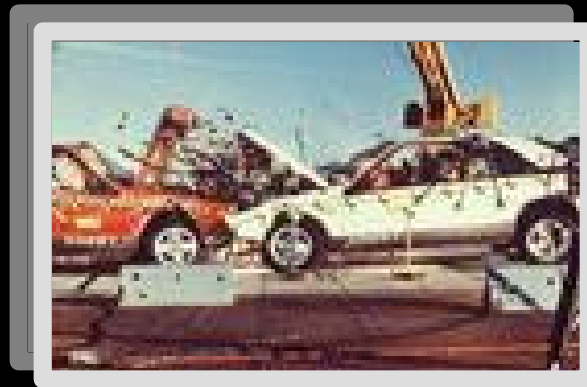


# Evaluation of Crash Types Associated with Test Protocols



# Test Protocols



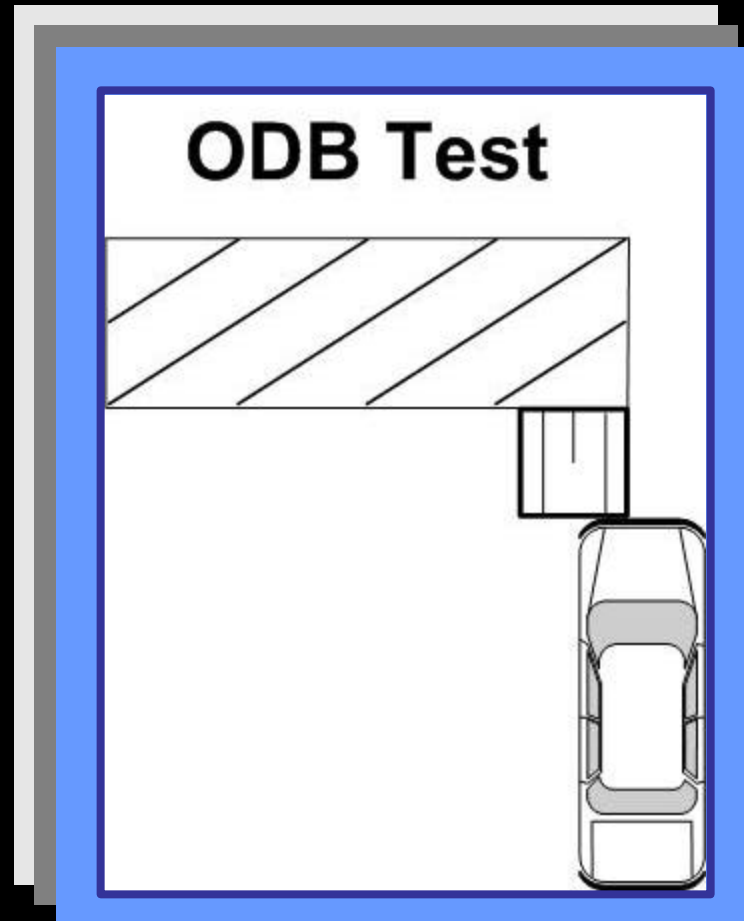
- **Offset Deformable Barrier (ODB)**
- **Moving Deformable Barrier (MDB)**
- **Fixed Rigid Barrier (FRB)**

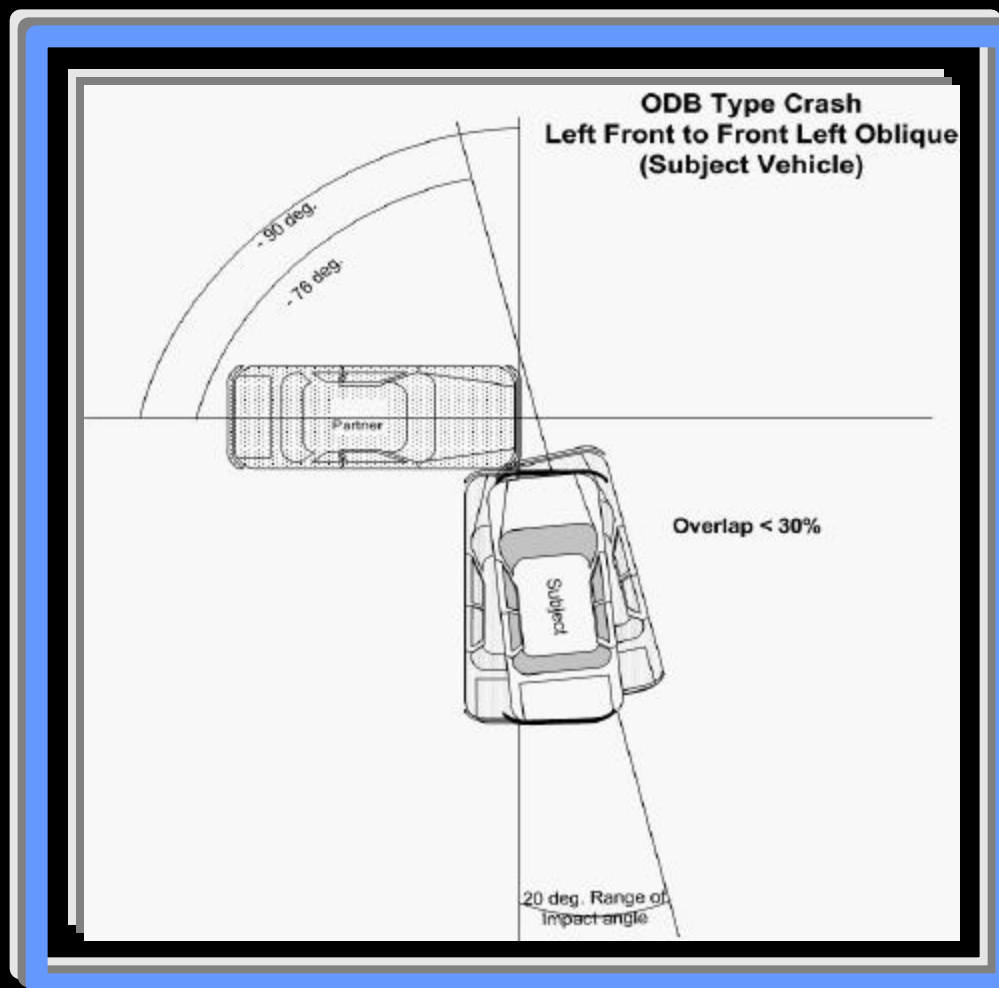
# NASS Variables



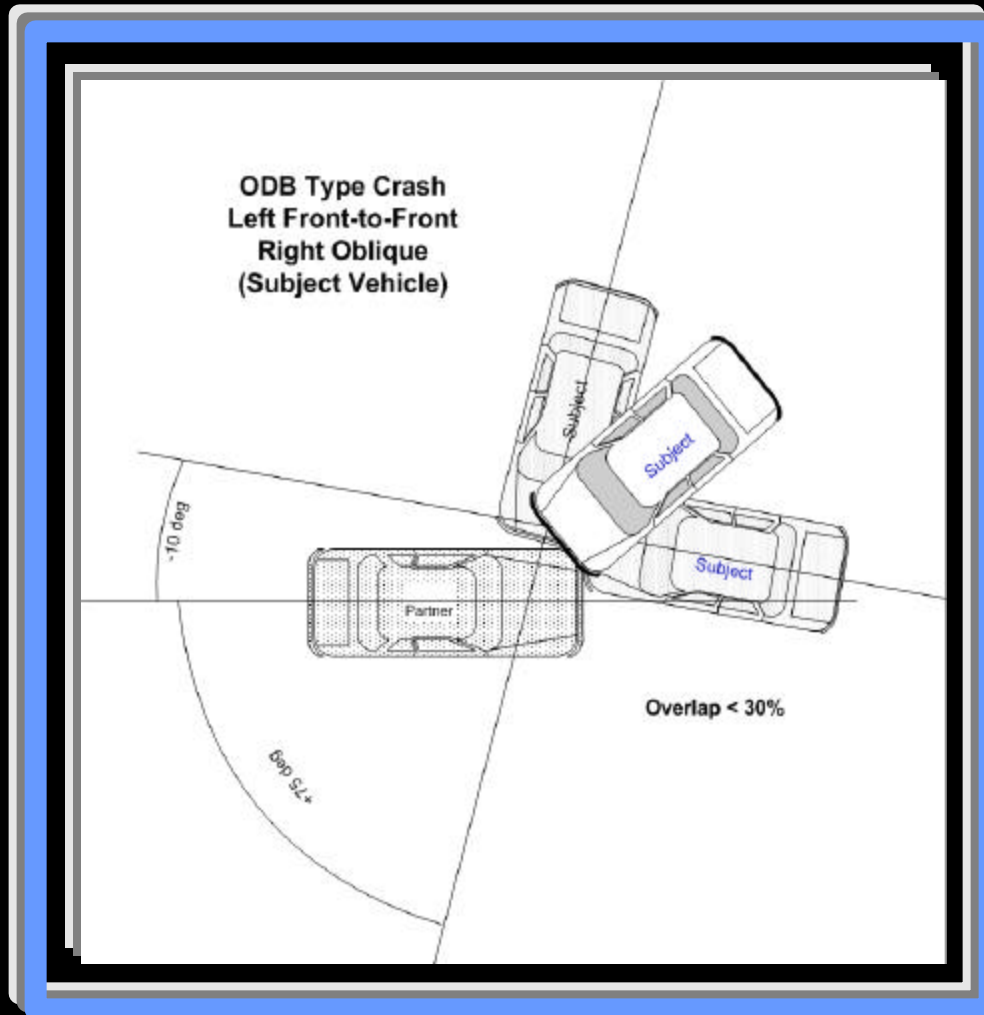
- Object contacted
- GAD of other vehicles
- Specific horizontal location (SHL)
- Direct damage width
- Heading angles
- GAD of the other vehicle in combination with heading angles

# Offset Deformable Barrier





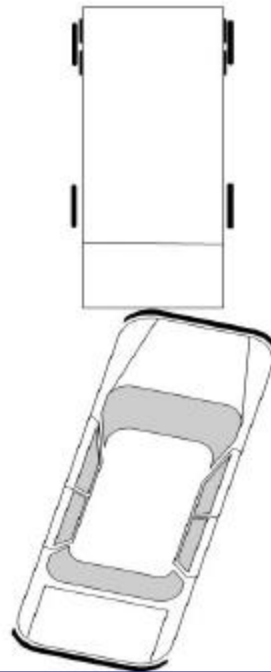
**ODB type crash with left offset**



**ODB type crash for a left offset, with  
An oblique angle**

# Moving Deformable Barrier

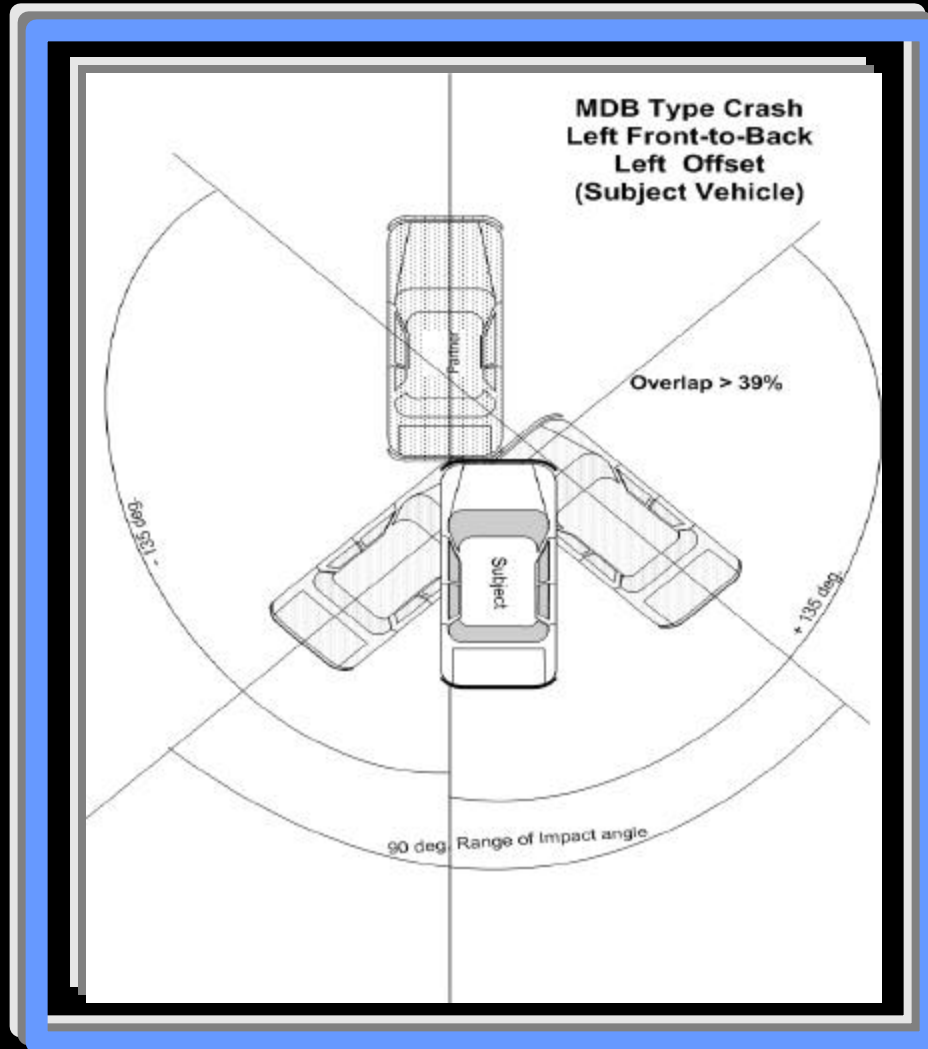
**MDB Test at Oblique Angle**





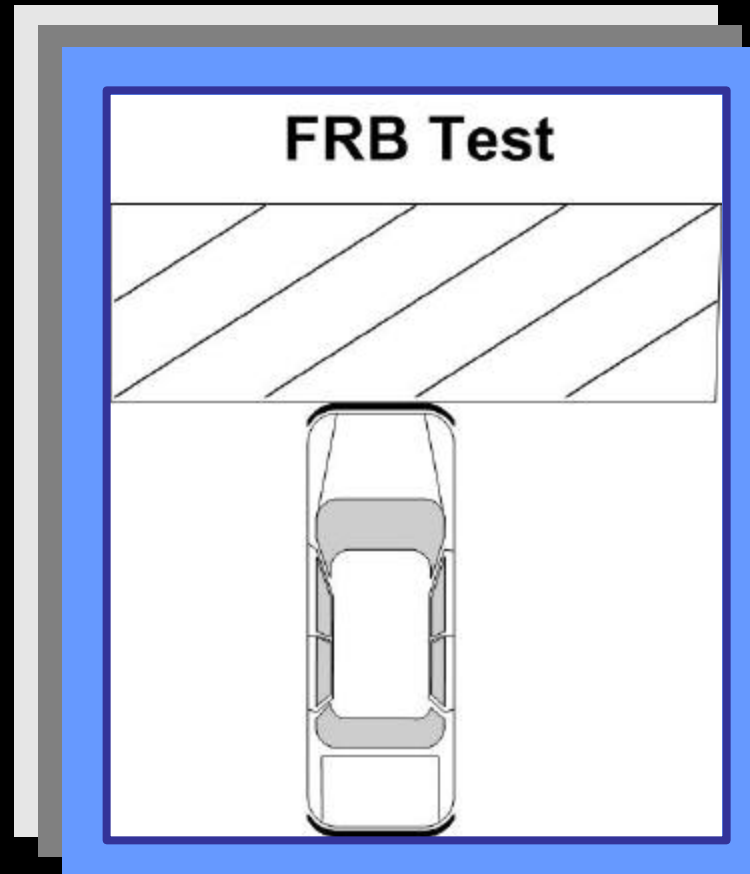
**MDB type crash with a right oblique  
right offset configuration**

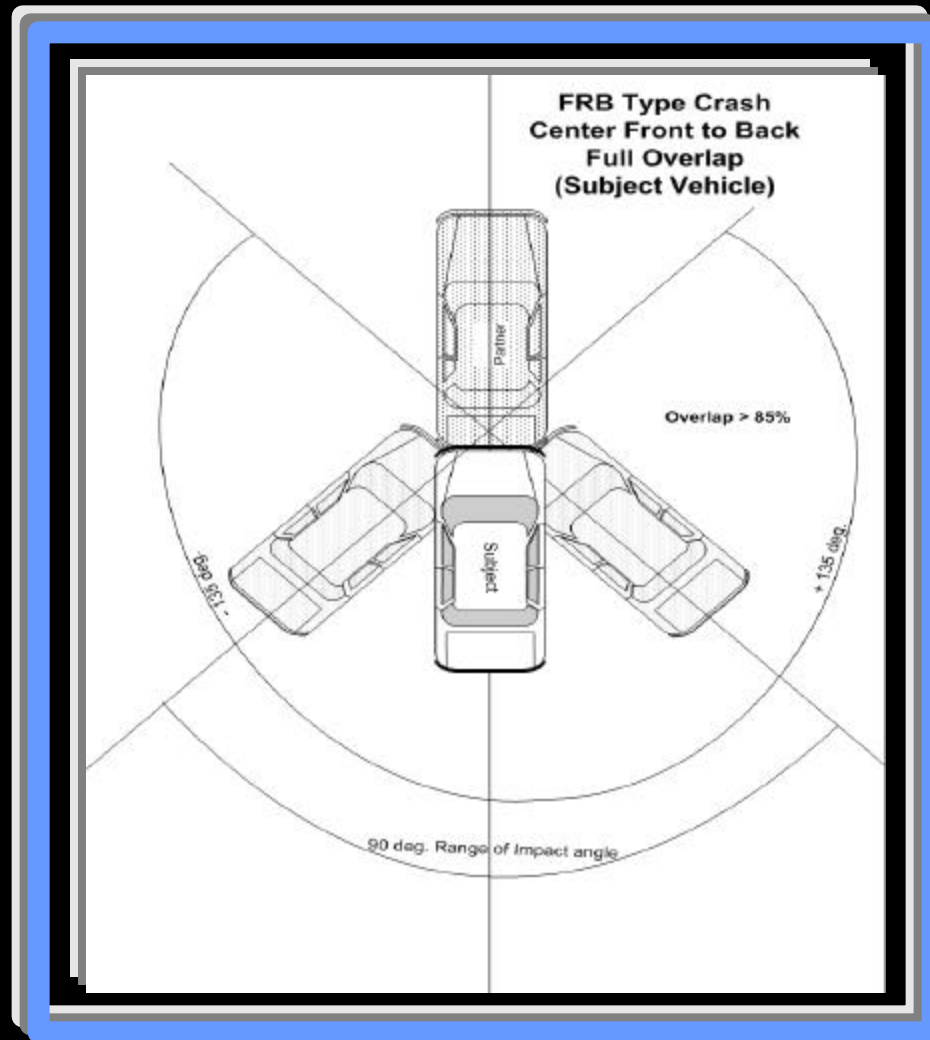




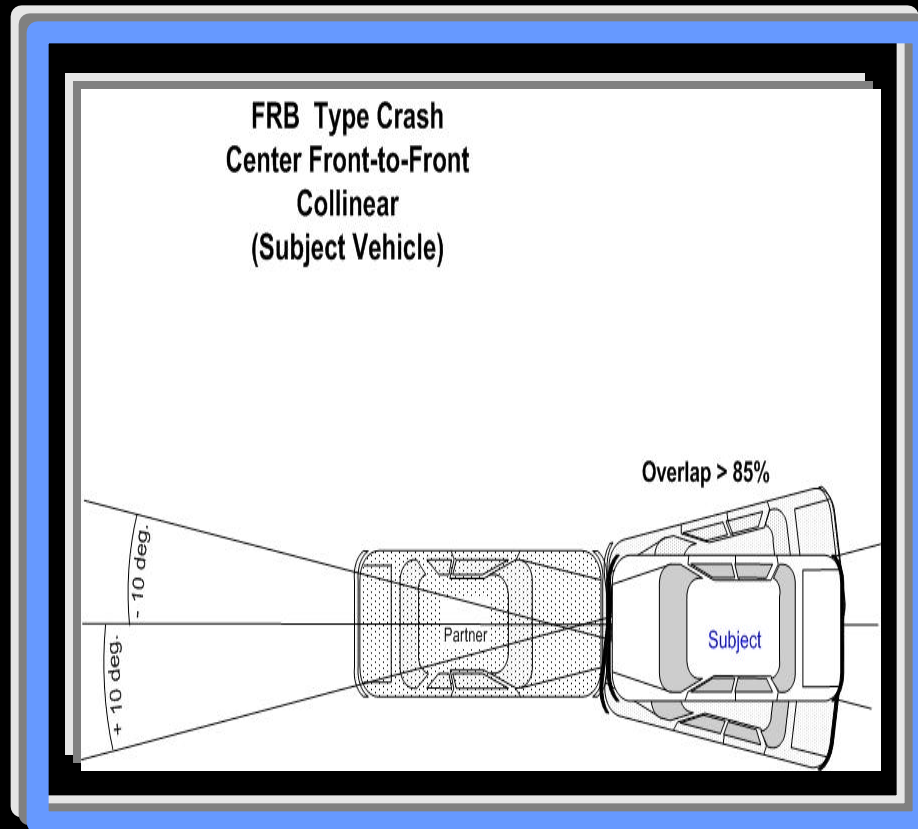
**MDB type front-to-rear crash configuration**

# Fixed Rigid Barrier





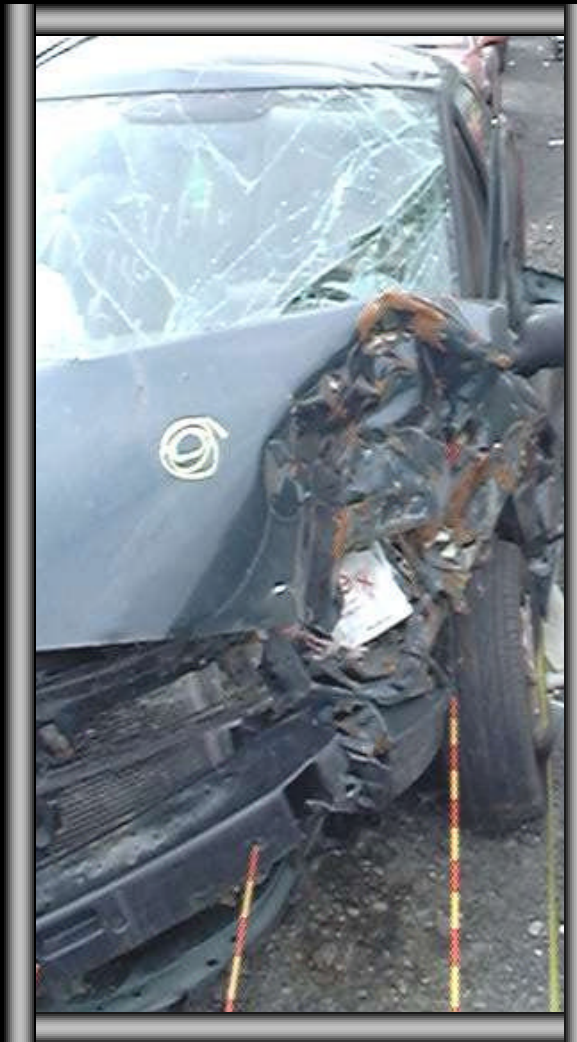
Front-to-rear **FRB** type crash



**FRB type crash configuration for a full-frontal, nearly full-engagement, head-on crash**

# ODB Type Crash

Hyundai Elantra, Offset Frontal With  
Corolla



# ODB Type Crash

Toyota Corolla, Offset With Elantra



# MDB Type Crash

## Toyota Avalon, Oblique With Chevrolet Suburban



# MDB Type Crash Toyota Avalon (Continued)





# MDB Type Crash

**Chevrolet Suburban, Oblique With Avalon**



# MDB Type Crash

**Buick Century, Oblique With Explorer  
Partner**



# Buick Century Interior



# Explorer Partner Not Categorized

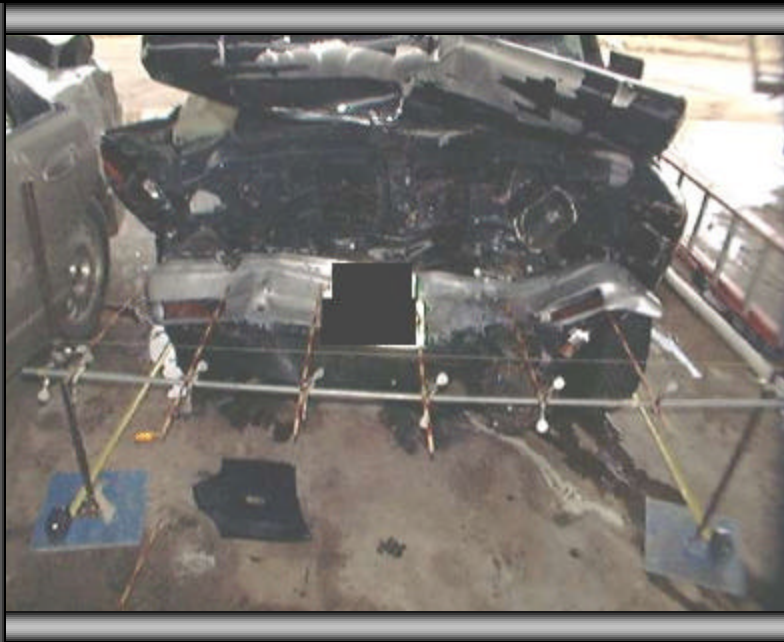


# FRB Type Crash VW Jetta Full Frontal, With S10 Partner



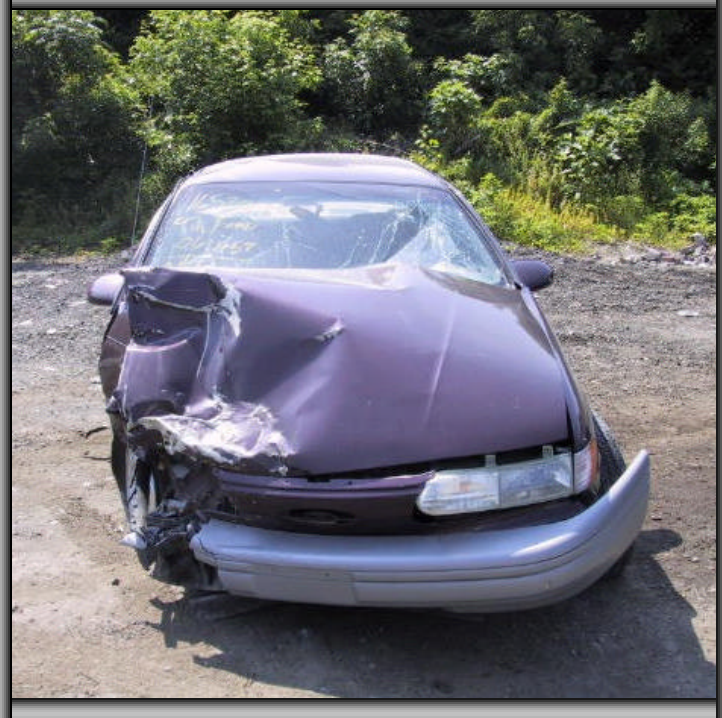
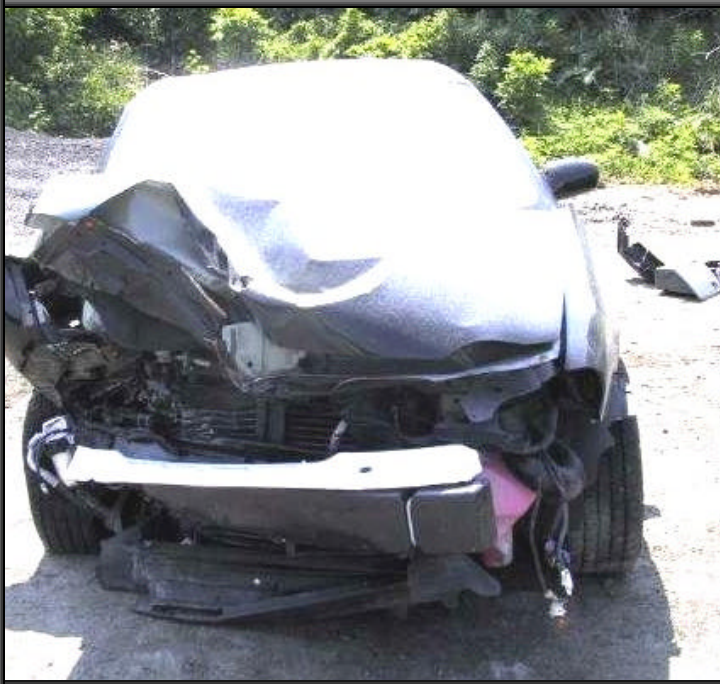
# FRB Type Crash

**Chevrolet S-10 Pickup, Full Frontal With  
Jetta Partner**



# ODB & MDB

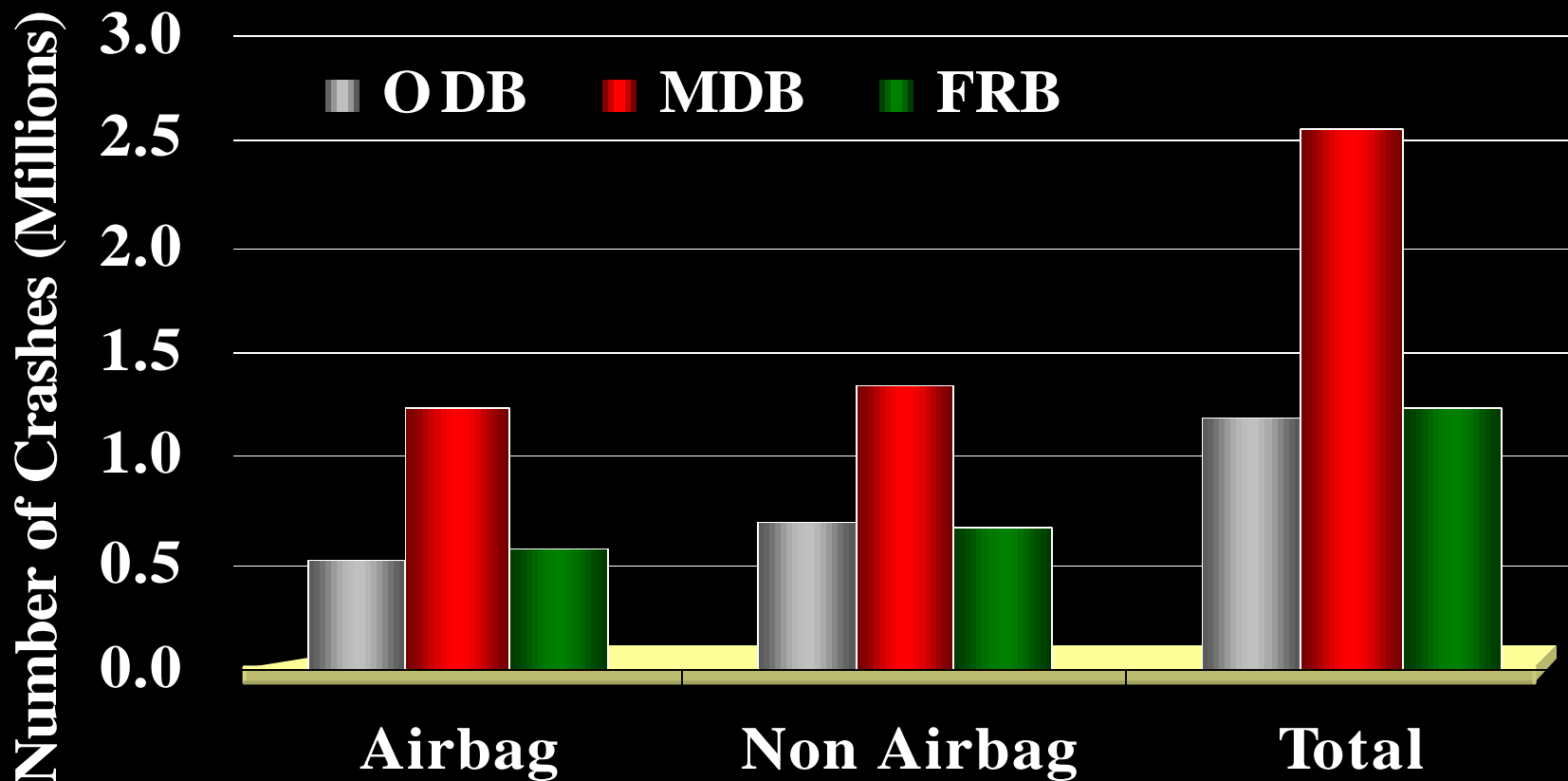
## Chevrolet Malibu And Ford Taurus, Right Offset



# Frontal Crashes Represented by Crash Type

NASS 1995-2001

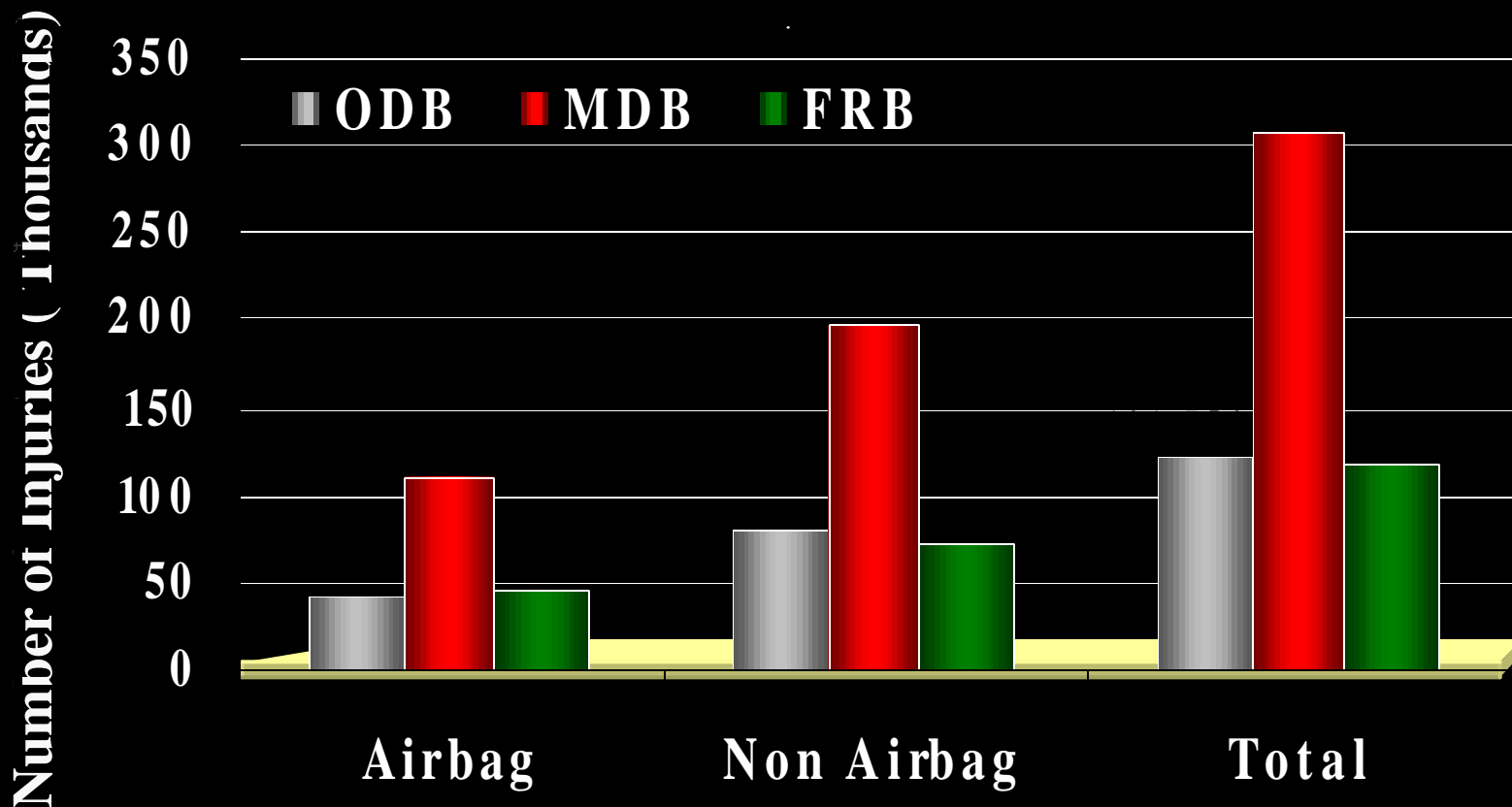
(Accident exposure by crash type and air bag availability)





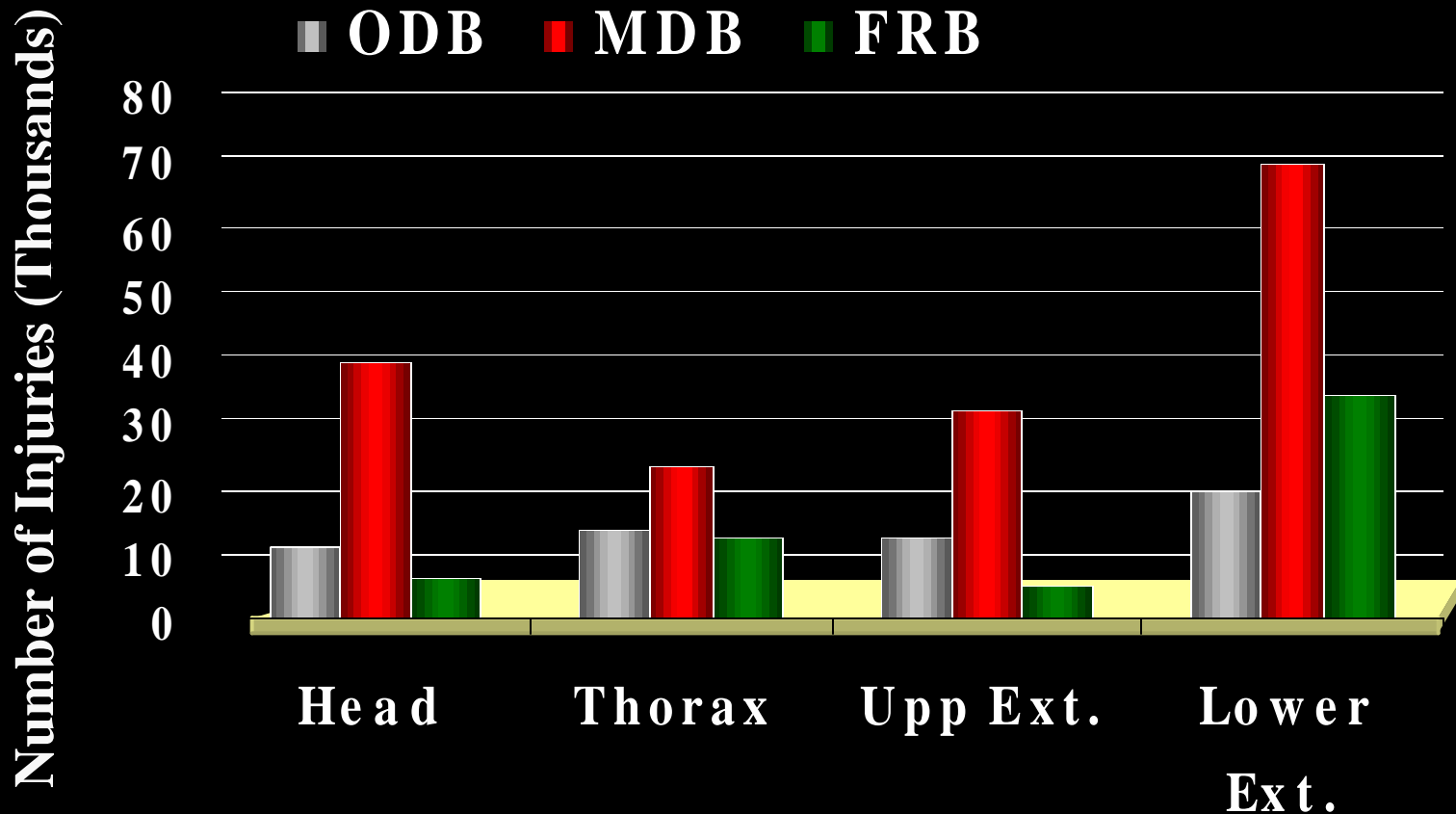
# MAIS 2-6 Driver Injuries by Crash Type NASS 1995-2001

(Injury distribution by crash type and air bag availability)



# AIS 2-6 Driver Injuries by Body Region in Airbag Vehicles NASS 1995-2001

(Distribution of driver injuries by body region for air bag-equipped vehicles)



# Conclusion

## MDB Type Crash

- Most frequent frontal crash
- Predominant cause of overall injuries and injuries to the lower extremities
- Intrusion rather than inertial loading is the predominant cause of injuries to the lower extremities

# Conclusion (Cont'd)

## ODB & FRB Type Crash

- Inertial loading is the predominant injury mechanism for the lower extremities in **ODB** and **FRB** type crashes
- There are nearly 2 times more lower leg injuries in **FRB** type crashes, than in **ODB** type crashes

# Questions

