

Update on NHTSA's Small Overlap/Oblique Testing



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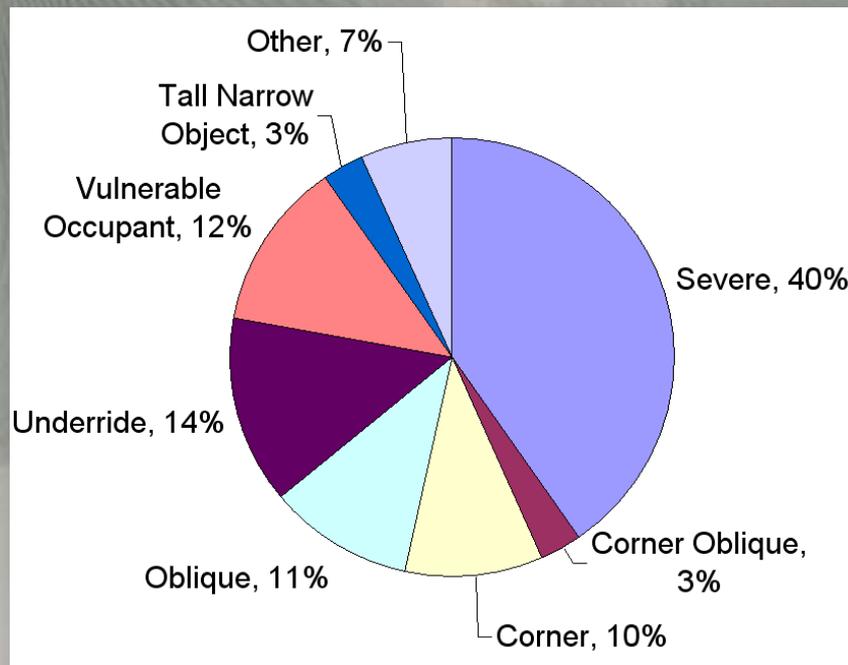


Background



Fatalities in Frontal Crashes Despite Seat Belts and Air Bags

- 2000-2007 NASS fatalities for model year vehicles 2000+ where occupant was restrained



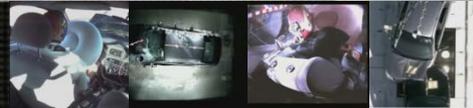
Oblique Offset Testing

(15 degrees, 50% Overlap)

- o **2010 SAE Government/Industry**
 - o Demonstrated the Thor head contact similar to case reviews
 - o A-pillar, door, or IP in all tests
 - o Crush pattern similar to case reviews



Small Overlap VtV Testing



2007 Taurus-to-Taurus



- * Aligned outside the rails
- * Thor-NT in driver position
- * Theoretical DV=35 mph
(Bullet moving 70 mph)
- * Target positioned 7 degrees relative to bullet vehicle

2007 Taurus-to-Taurus



2007 Taurus-to-Taurus



Tears down the rail and engages occupant compartment causes A-pillar collapse and IP intrusion

2010 Yaris-to-Yaris

0.0



*Aligned outside the rails

*Thor-NT in driver position

*Theoretical DV=35 mph
(Bullet moving 70 mph)

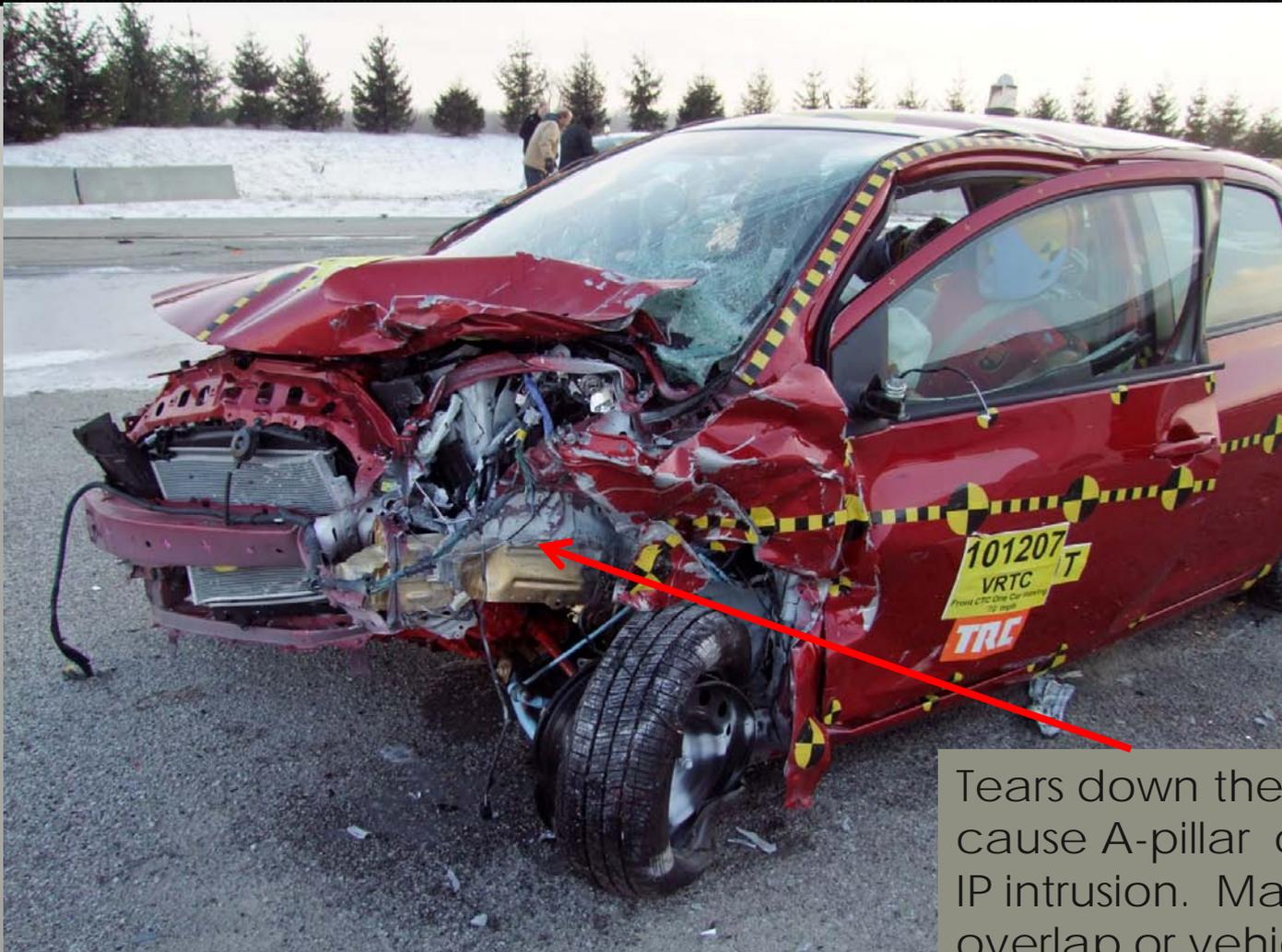
*Target positioned 7
degrees relative to bullet
vehicle

2010 Yaris-to-Yaris

0.0



2010 Yaris-to-Yaris



Tears down the rail, but does not cause A-pillar collapse or a lot of IP intrusion. May be due to overlap or vehicle design. (Need to look at newer vehicles)

Real-world Comparison



NASS: 2002-09-131
2001 Taurus into 1994 Impala



Crash Test

Observations

- Taurus-to-Taurus small overlap crush similar to real-world cases.
- Thor dummy rolled off the air bag



Future Research



Future Research

- o Try recreate vehicle-to-vehicle results using a MDB in both small overlap and Oblique crash modes



Research Plan



NASS Definition of Crash Modes

- o MCW developed a methodology using NASS data to define small overlap crashes
 - o Publishing report and SAE paper
- o MCW developing methodology to define oblique crashes and other frontal crash modes



Intrusion versus Injury

- Updating previous NASS analysis to evaluate relationship of intrusion to injury for frontal crashes



Vehicle-to-Vehicle Testing

- o **Oblique Offset**

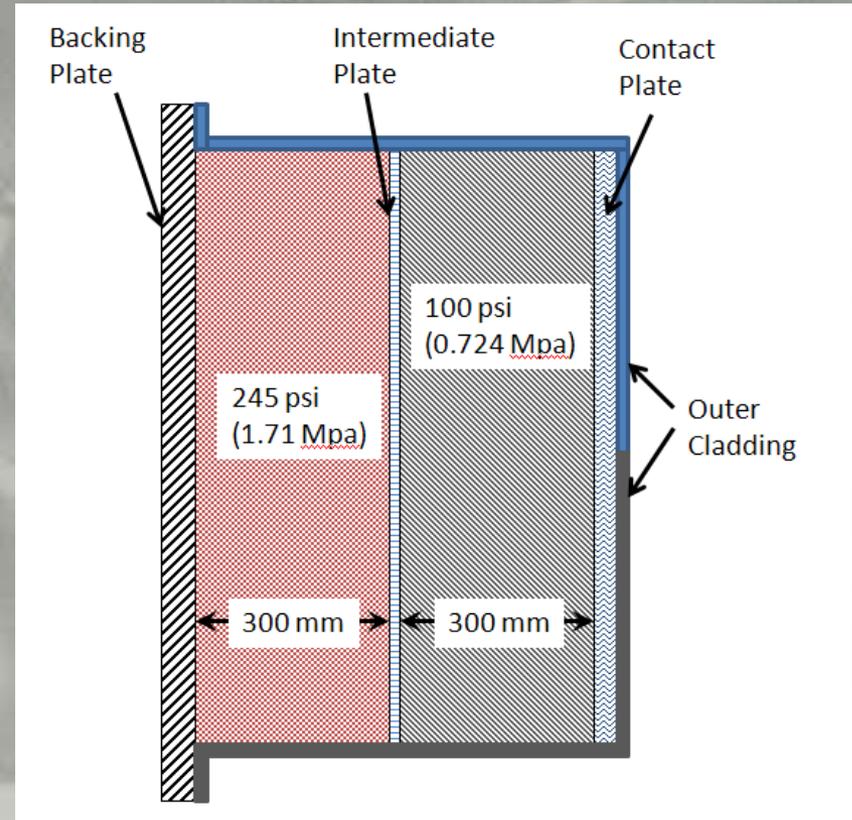
- o Yaris-to-Yaris (35 mph DV, 15 degrees, 50 % Overlap)



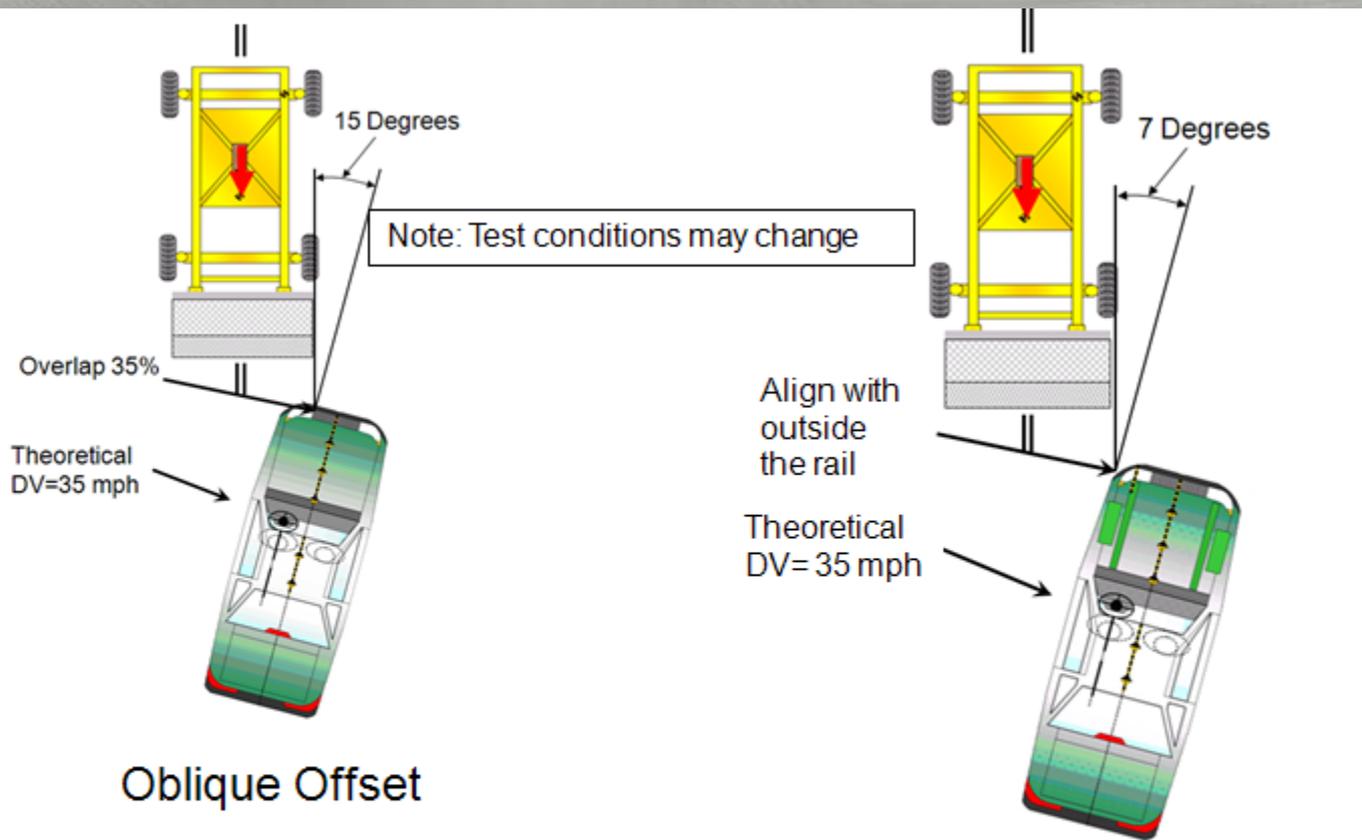
New MDB Design

o Why New Barrier?

- o 214 honeycomb bottomed out to soon
- o Damage to the barrier



MDB Test Setup



Note: Thor-NT in driver position and Hill 5th female in left rear seat

MDB Test Matrix

o **Oblique Offset**

- o 2007 Ford Taurus
- o 2007 Ford 500
- o 2010 Toyota Yaris
- o 2010 Ford Fusion

o **Small Overlap**

- o 2007 Ford Taurus
- o 2010 Toyota Yaris

Note: The test matrix may change due to results



THANK YOU!

