



AUTOMOTIVE ASSOCIATION

Summary of NHTSA Data

June 16, 2009

H.R.3 SAFETEA-LU

Subtitle C, SEC. 10301, § 30128, (c)

“(c) OCCUPANT EJECTION PREVENTION.—

“(1) IN GENERAL.—The Secretary shall also initiate a rule-making proceeding to establish performance standards to reduce complete and partial ejections of vehicle occupants from outboard seating positions. In formulating the standards the Secretary shall consider various ejection mitigation systems. The Secretary shall issue a final rule under this paragraph no later than October 1, 2009.

The NHTSA Guided Impactor Test

Ejection Mitigation Guided Impactor

- **18 kg Mass**
- **Featureless Headform**
 - Average of front & side of head geometries
 - More uniform shape
- **Measures Displacement**
- **Positioned Inside Vehicle**
- **Impact a Variety of Locations**

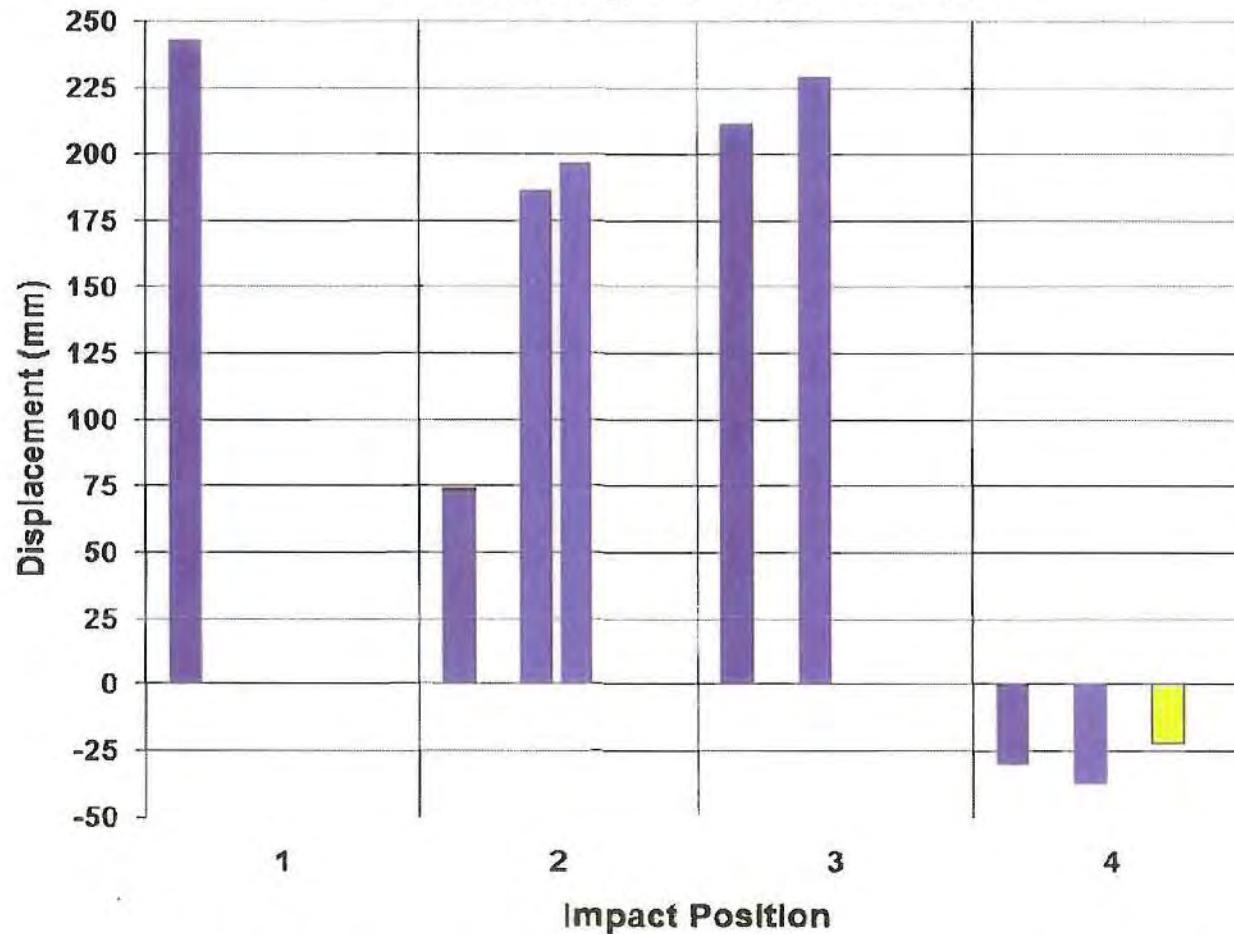


Conclusions on NHTSA Test Data

- ◆ **NHTSA data supports the conclusion that a combined system of laminated glass and airbags gives better performance under the NHTSA draft test protocol “Research Test Procedure For Ejection Mitigation Testing” (Docket No. NHTSA-2006-26467) than either technology alone . Some specific observations:**
 - **Certain air bag designs when used alone provide no coverage at specific test locations**
 - **Air bags that provide coverage at all test impact locations when used alone may still leave areas of the window opening without coverage**
 - **Combined systems provide reduced impactor deflection over each technology alone**
 - **Combined systems leave no areas of the window opening without coverage**

Air Bag Alone No Coverage Of Impact Location 1

Maximum Excursion Beyond Window Plane
Lincoln Navigator - Open Window

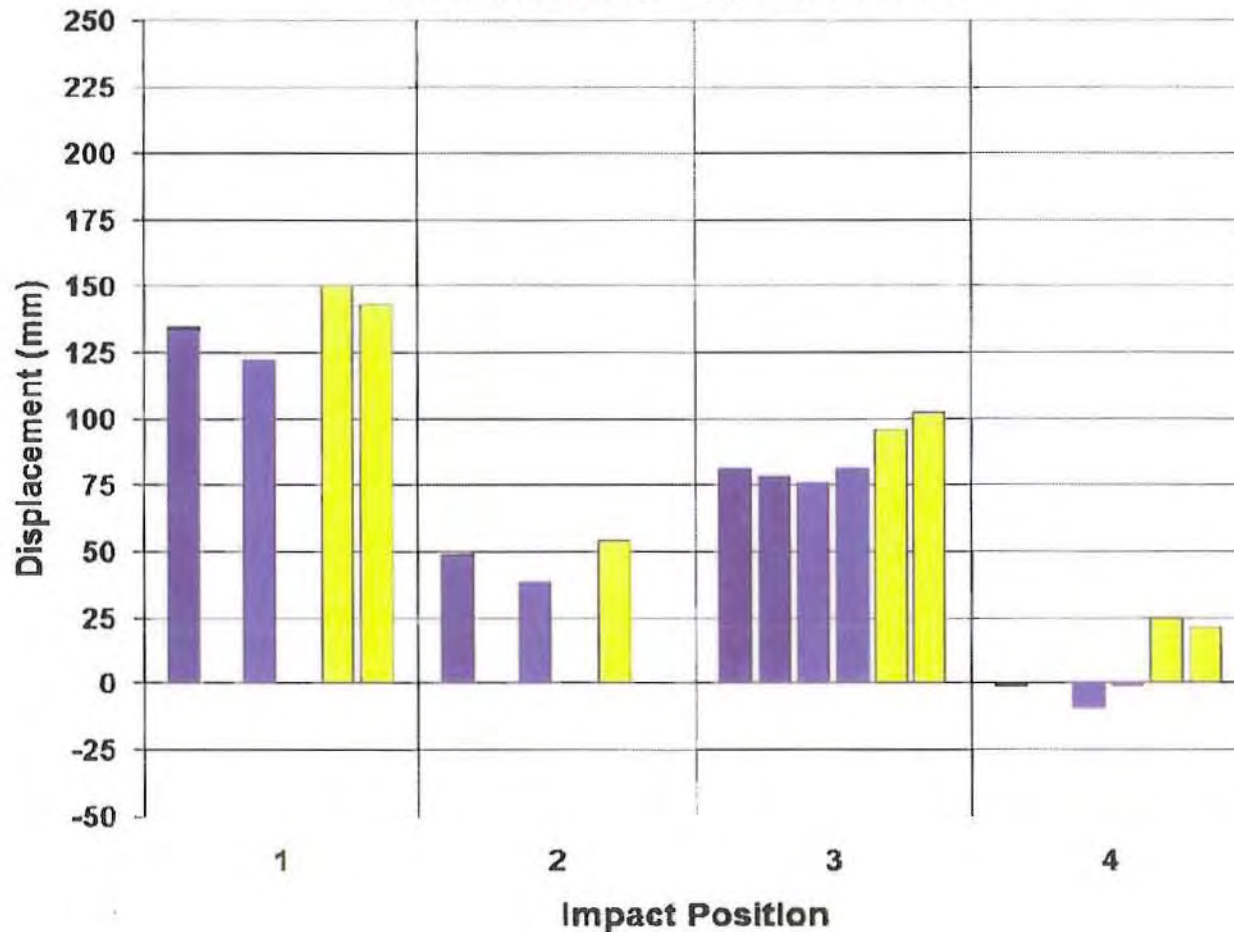


■ 16 kmph/6 sec
■ 20 kmph/1.5 sec
■ 24 kmph/1.5 sec

Data Reprinted from: <http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/SAE/SAE2005/Duffy.pdf>

Air Bag Alone (All Impact Locations Covered) Incomplete Window Opening Coverage

Maximum Excursion Beyond Window Plane
Zodiac AHPC - Open Window



■ 16 kmph/6 sec
■ 20 kmph/1.6 sec
■ 24 kmph/1.5 sec

Data Reprinted from: <http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/SAE/SAE2005/Duffy.pdf>

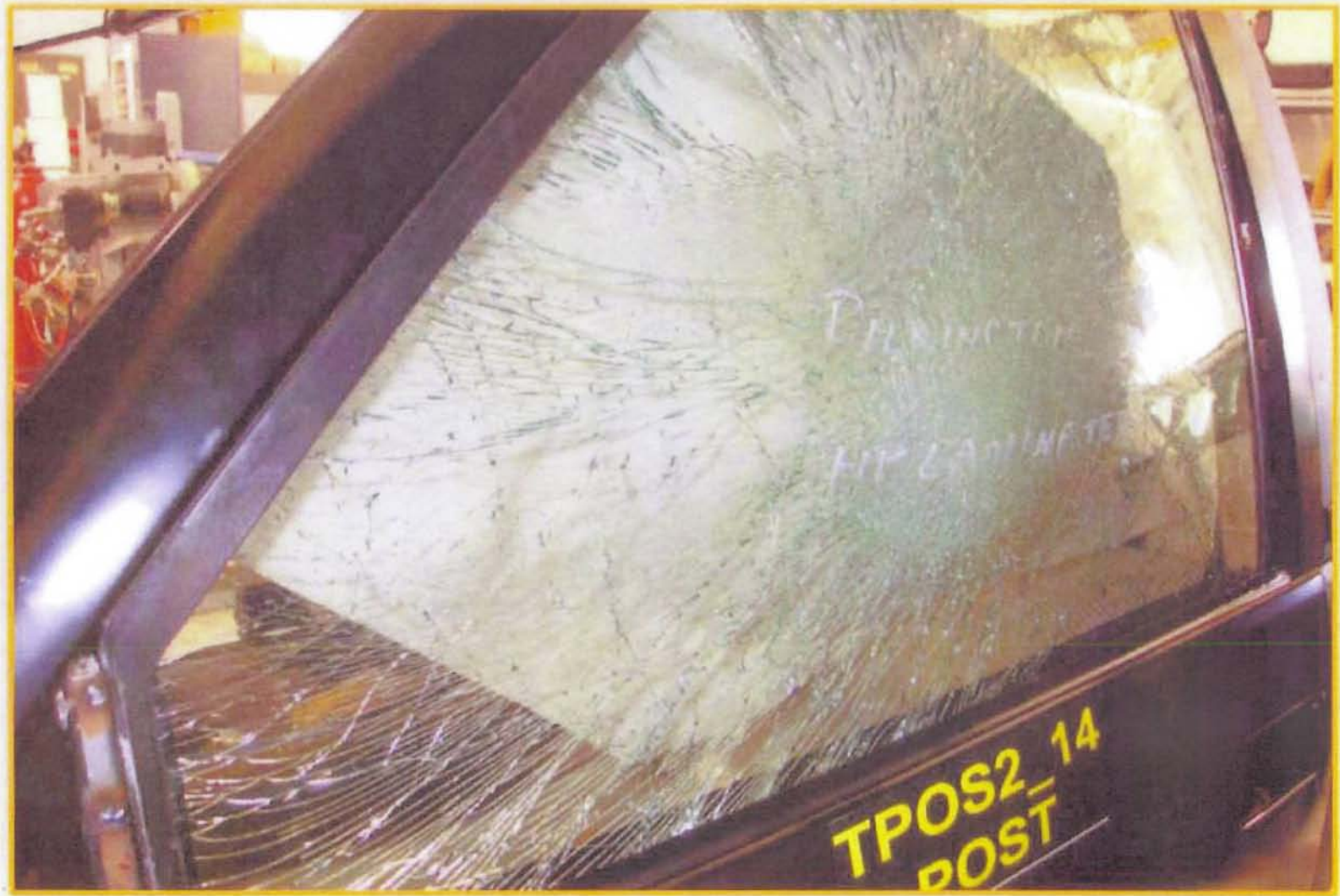
Combined System Reduces Impactor Deflection

Impactor Deflection Beyond Window Plane (mm)	Impact Location on Side Window Area											
	1			2			3			4		
	16 kmph 6 sec	20 kmph 1.5 sec	24 kmph 1.5 sec	16 kmph 6 sec	20 kmph 1.5 sec	24 kmph 1.5 sec	16 kmph 6 sec	20 kmph 1.5 sec	24 kmph 1.5 sec	16 kmph 6 sec	20 kmph 1.5 sec	24 kmph 1.5 sec
Lincoln Navigator (Open Window)	243*			74	186* 196*		211*	229*		-30	-37	-22
Lincoln Navigator With Side Laminate (pre-broken)	157			-14	6	35	137					
Volvo XC90 (Open Window)	154 167	163		93 52	84 107	193*	78	131 107	130	-22	-3	18
Volvo XC90 With Side Laminate (pre-broken)	58 105 86	102 151		26	27	44	59	97	118			15
Zodiac AHPC (Open Window)	135	122	150 143	49	38	54	81 78	76 81	96 102	-0.2	-9 -0.89	24 21
Zodiac AHPC With Side Laminate (pre-broken)	104						70		97 91			

* Impactor reached physical stops

Data Reprinted from: <http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/SAE/SAE2005/Duffy.pdf>

Combined System Complete Window Opening Coverage



Data Reprinted from: http://www-nrd.nhtsa.dot.gov/pdf/nrd-01/SAE/SAE2004/EjectMitigate_Duffy.pdf

Expected NHTSA Next Steps (Ejection Mitigation)

- ◆ **NHTSA published draft test specification (12/06)**
 - Includes: impact at 4 locations, 3 energy levels and 2 delay times.
 - Includes pre-breakage of laminated glass
 - Performance criteria not specified
- ◆ **Expect NPRM publication in early 2009.**
 - This has not occurred as of 16 June 2009
- ◆ **Final Rule Due by 10/09.**
 - Timing appears to be in jeopardy
- ◆ **Occupant ejection systems will phased in**
 - Implementation could be quick as technologies exist and are already adopted on commercial vehicles.