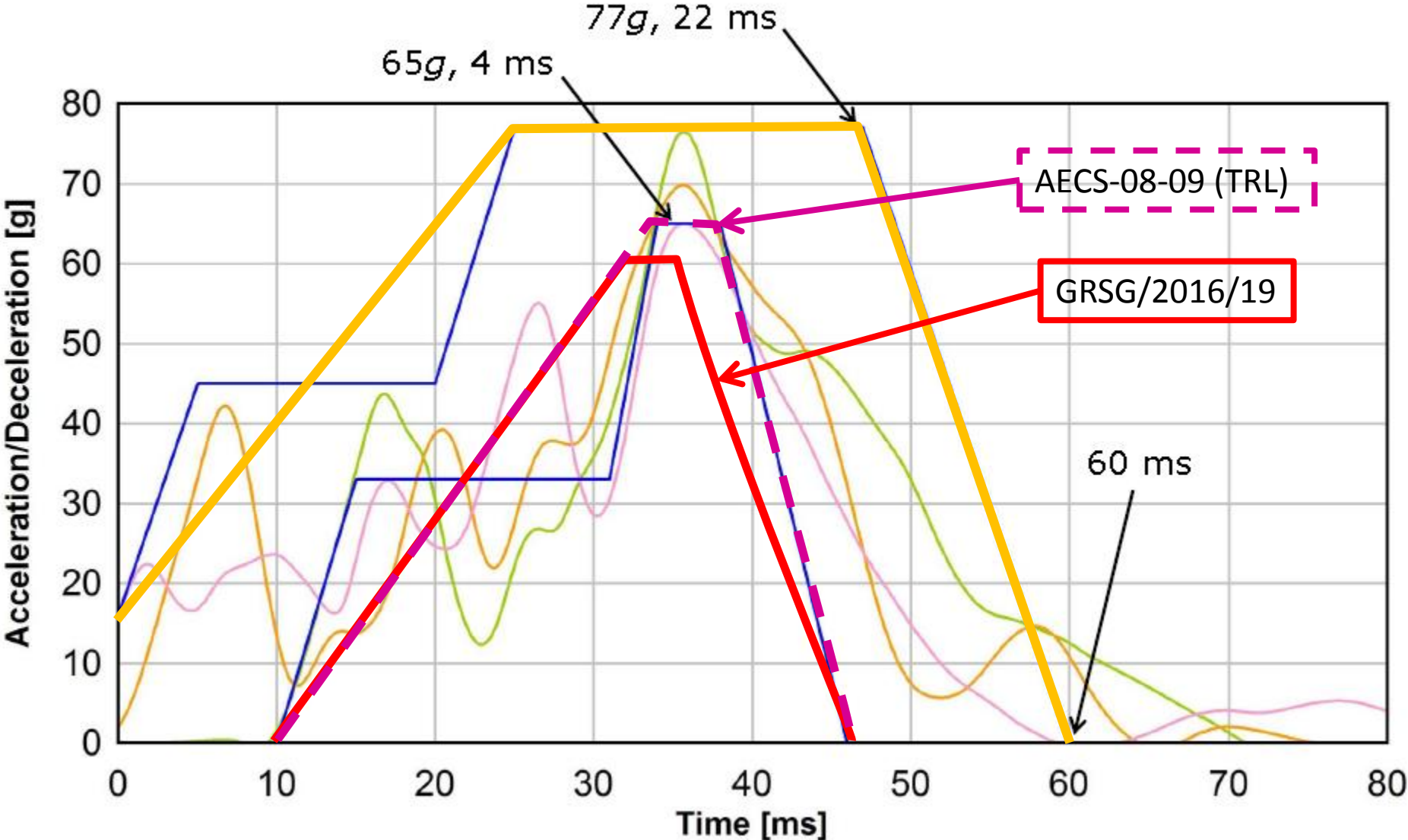


Submitted by the expert from Japan

Informal document GRSG-111-26  
(111th GRSG, 11-14 October 2016  
agenda item 13)

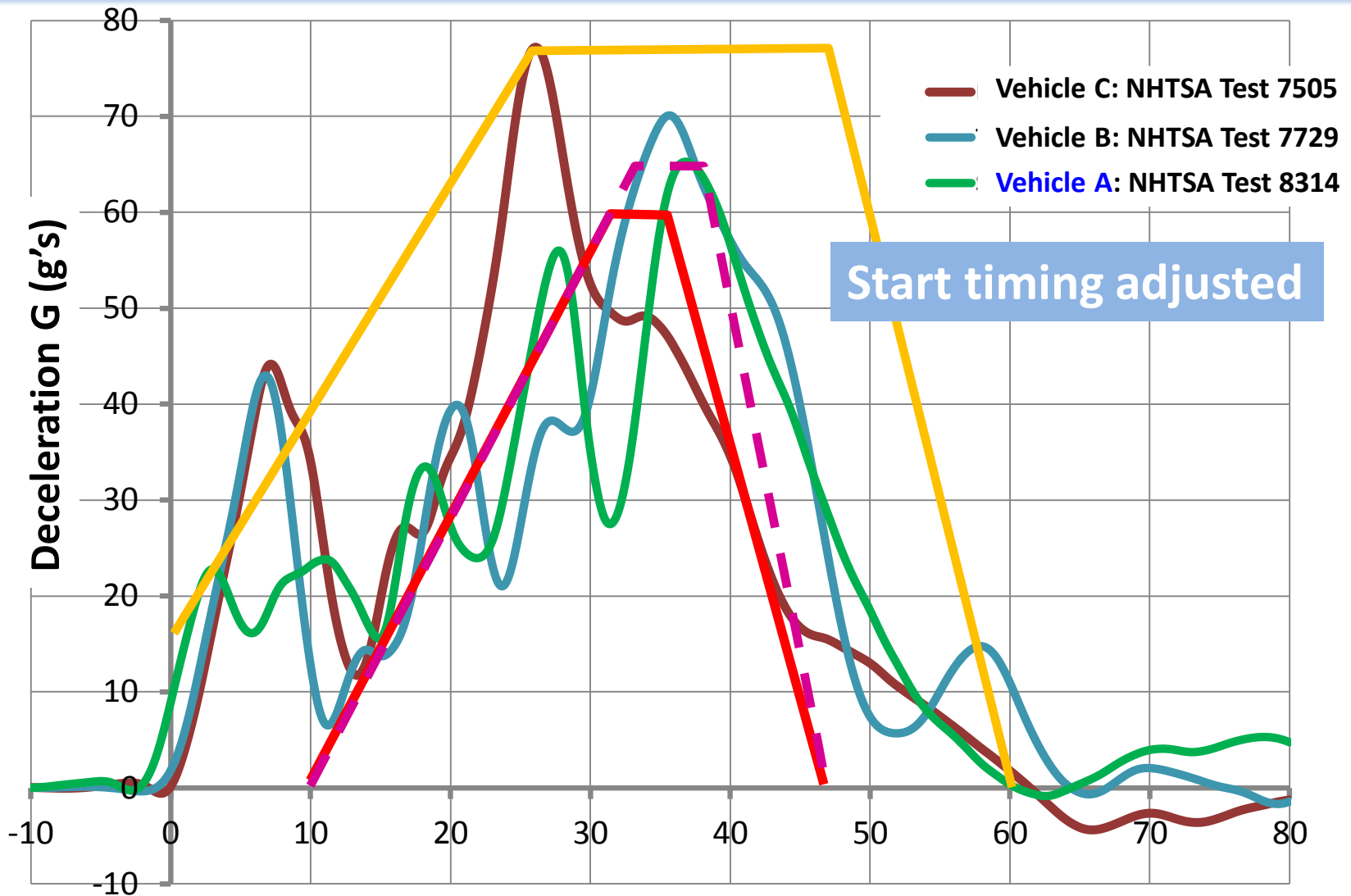
# Consideration of G Corridor based on Crash Pulses

# Deceleration corridor based on full-width tests



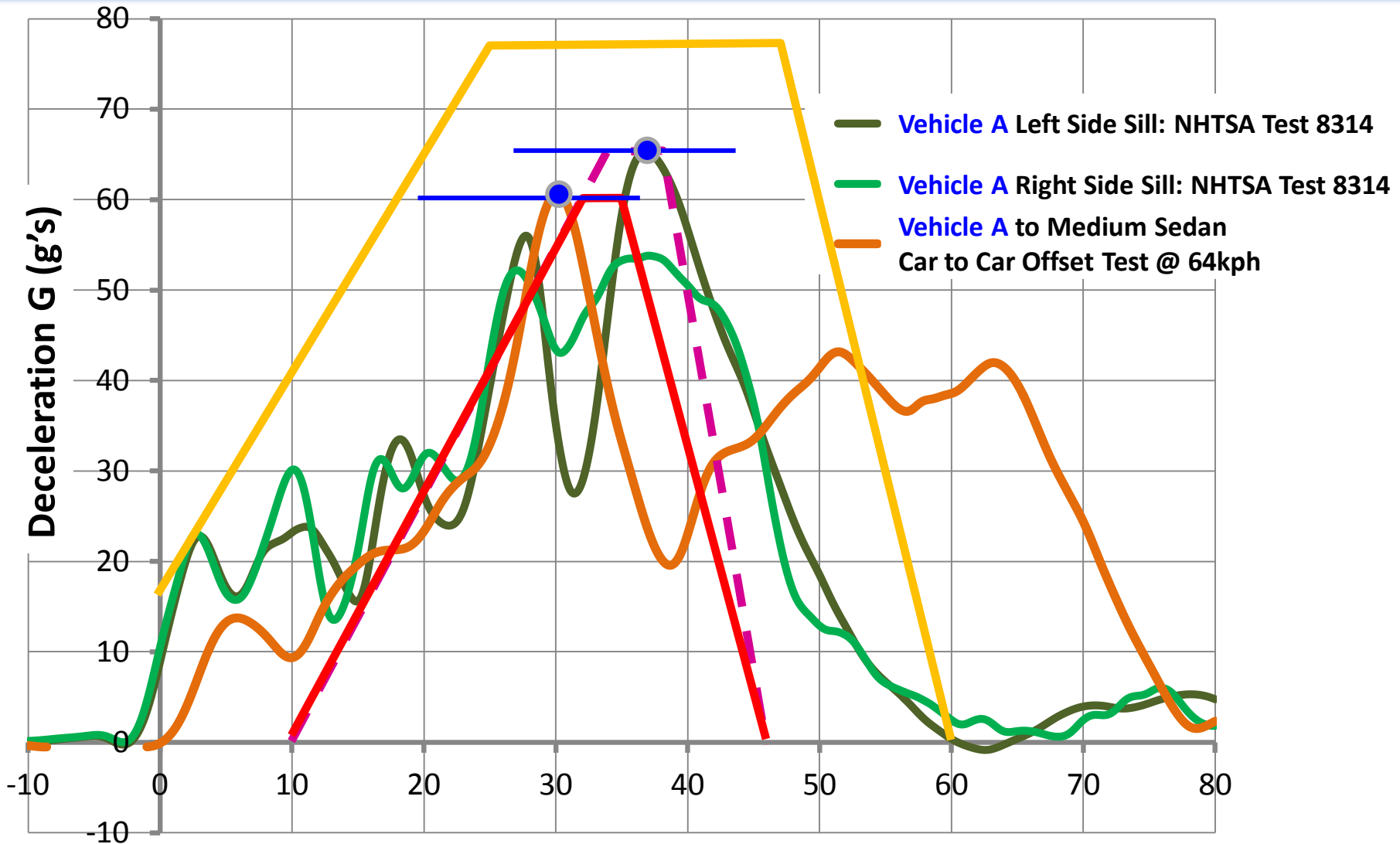
The peak timing of three cars crash pulse were adjusted to create the corridor

# G-t Profile Comparison with Small Vehicles in NHTSA Full-width Barrier Test



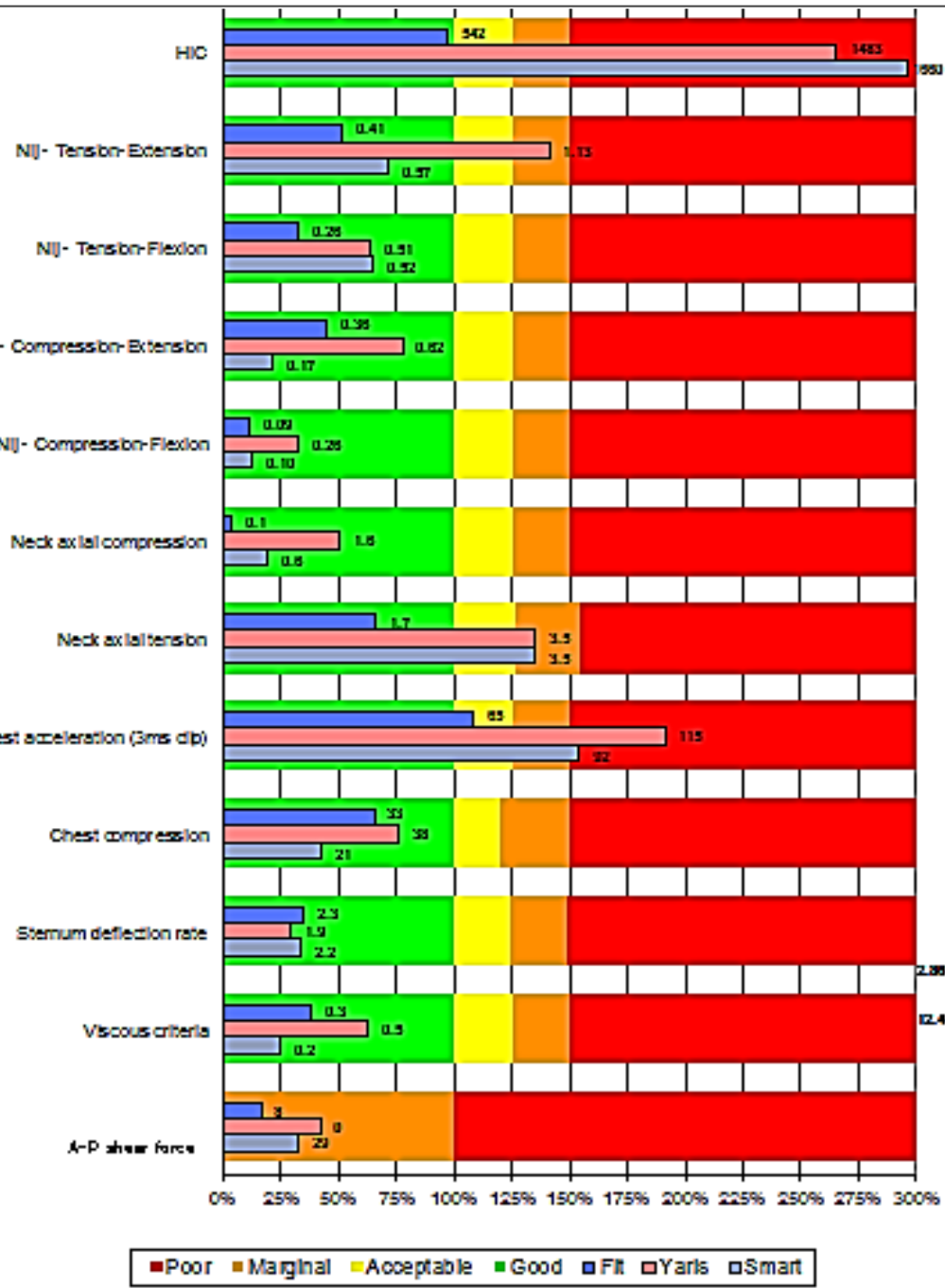
The peak timing of such three cars are different in actual crash test data. Especially of the crash pulse of Vehicle C is faster peak timing and shorter duration.

# G-t Comparison of Vehicle A with Full-width and Car to Car 64kph



**Car to car crash with different weight may be severer than Full-width crash. Its crash pulse with Vehicle A is softer due to characteristics of other side vehicle structure , so the proposal of GRSG/2016/19 is reasonable.**

# Car-to-car crash with Vehicle A and Medium Sedan @64kph



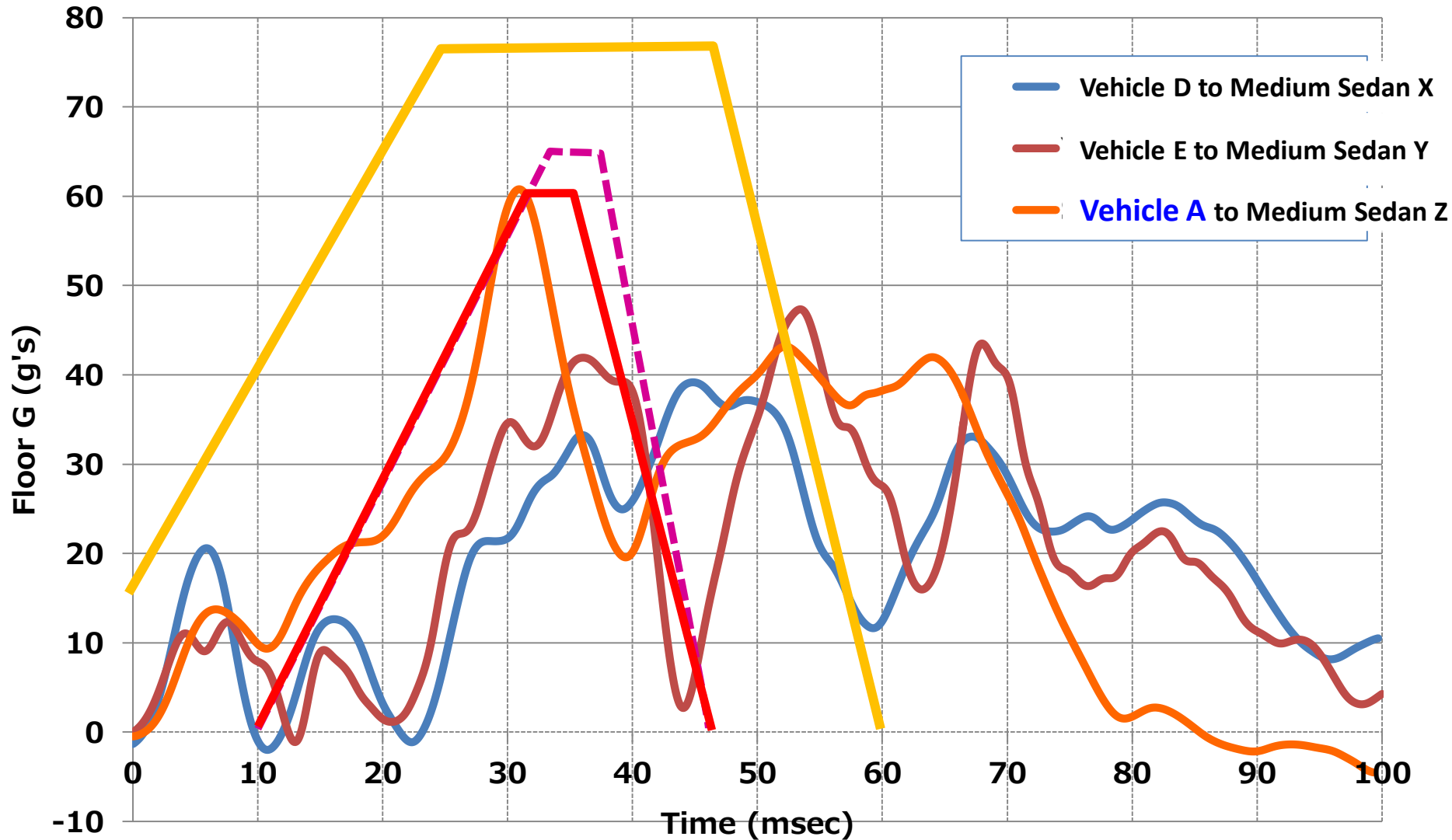
Status Report, Vol. 44, No. 4 | SPECIAL ISSUE: CAR SIZE, WEIGHT AND SAFETY | April 14, 2009

### NHTSA NCAP Result

Year/Make/Model	Overall	Frontal Crash
2013 Vehicle A	★★★★☆	★★★★☆

Vehicle A has a standard safety performance with four stars in NHTSA NCAP. However the injury score in this Car-to-car crash is very severe.

# Comparison with AECS Sled Corridor and Crash pulse with IHS Car to car crash



Crash pulse with **Vehicle A** to Sedan Z is the most severe among three kind of crash tests

# IIHS Crash Mode Analysis in comparison with CDC code

IMPACT AND INJURY PATTERNS IN FRONTAL CRASHES OF VEHICLES WITH GOOD RATINGS  
FOR FRONTAL CRASH PROTECTION

Matthew L. Brumelow

David S. Zuby

Insurance Institute for Highway Safety

United States

Paper No. 09-0257

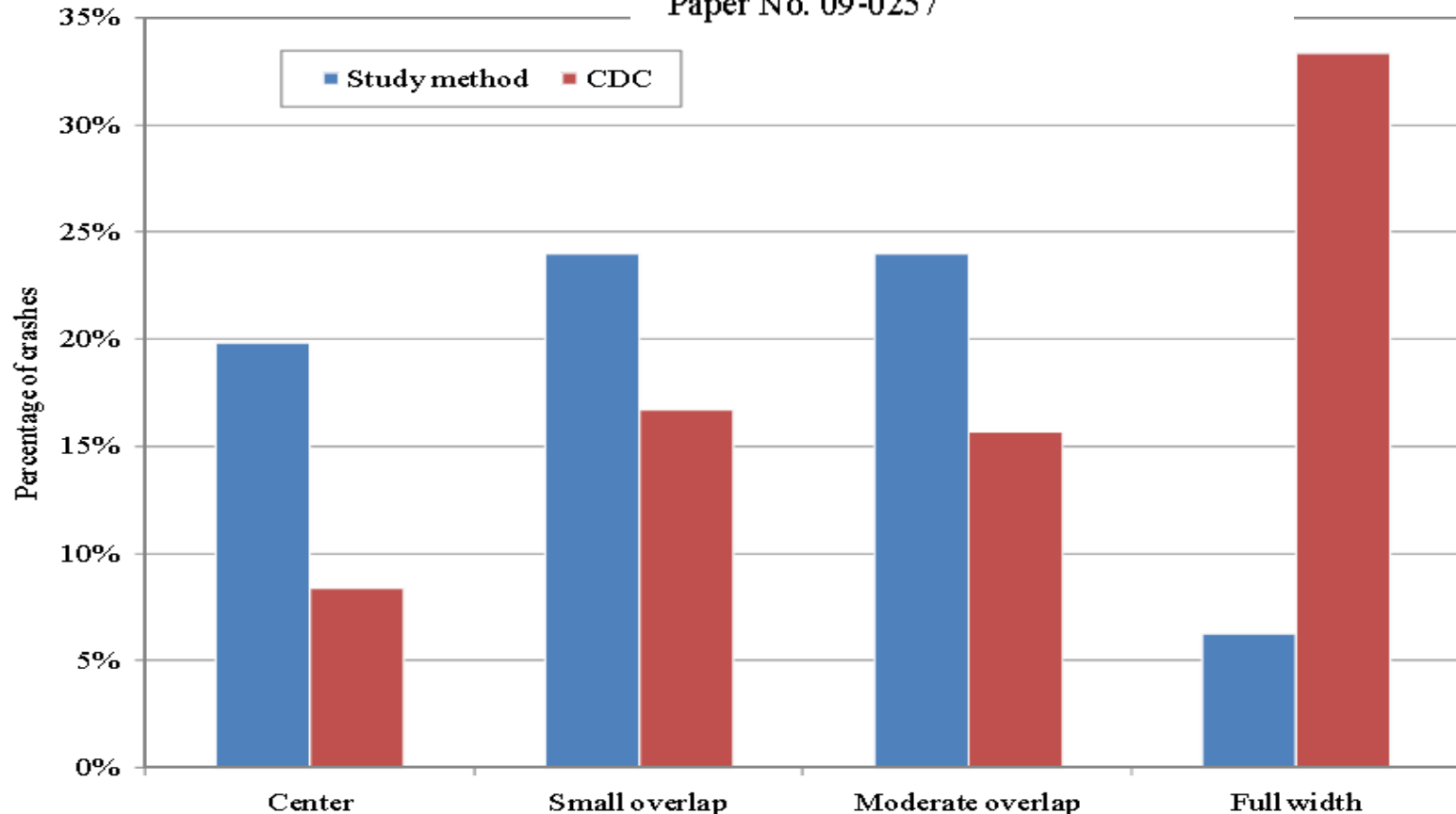


Figure 11. Distribution of crashes for study crash configurations and CDC codes

While Full width crash is larger in NASS CDS, it's not large part in the actual detail analysis along this article. Its ratio is only 6%.

CDC: Collision Deformation Classification

# Conclusion

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- **Duration of Crash pulse**

The reference data of AECS-08-09 (TRL) is modified to adjust the peak timing of crash pulse. If focused on the peak pulse, the required sled pulse may be simplified and shorter.

- **Peak G**

The car to car crash with different size is severer than Full-width barrier crash in the view point from occupant injury. Its peak G of crash pulse is less than Full-width barrier crash.

The corridor of sled pulse in GRSG/2016/19 is severe enough in the real world crash.