

Heavy Truck Front Underride Protection ACUP

**Keith Friedman
Friedman Research Corporation
Austin, TX**



OUTLINE

- What is the Problem
- Opportunities of Improved Front Underride Protection
- Summary
- Recommendations

Problem

- **Thousands of fatalities and injuries a year in the US involving the front end of heavy trucks**
- Heavy Truck Front Hitting Other vehicle Front, Side, or Rear
- **FAR MORE Passenger vehicle fatalities and injuries occur involving the front of heavy trucks than occur in rear or side impacts.**
- Manufacturers would like **a level playing field** for introducing significant safety improvements.

Frontal Impact Prevention and Mitigation (Integrated Systems Approach)

- Collision Detection and Automatic Braking
- Improved Braking Systems
- Front Underride Protection Devices (FUPDs)

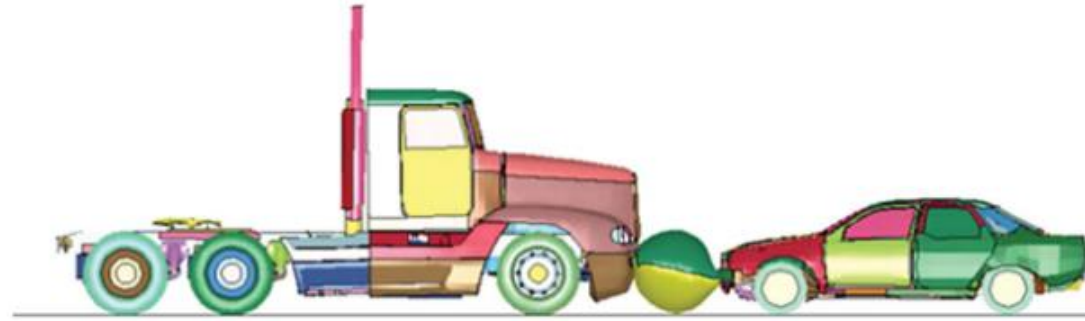
Front Underride Protection Devices

- Front Underride Prevention in Europe mandated in early 1990s
- Energy Absorbing Front Underride Devices early 2000s
- Advanced Technology Systems

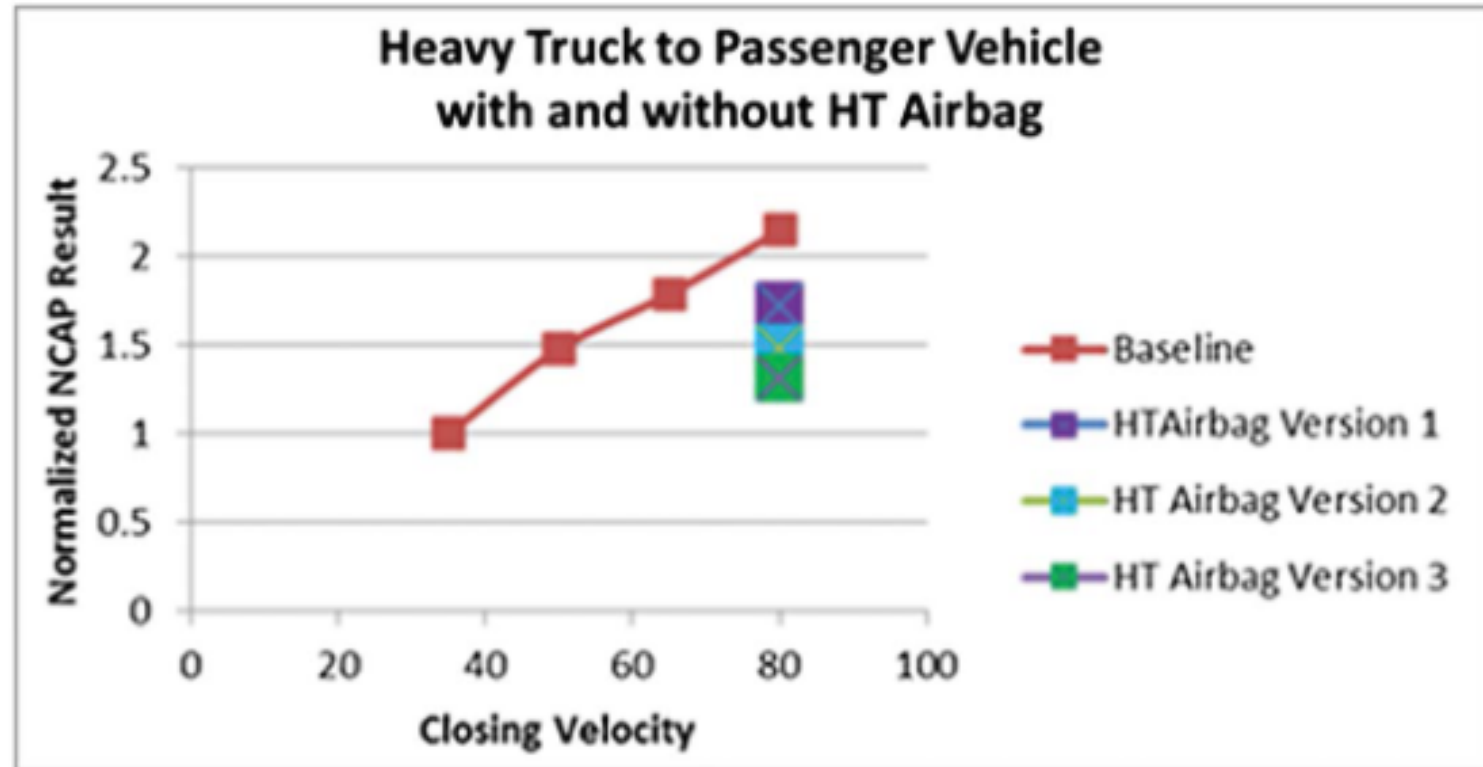
Advanced Technology System Opportunities

- Collision Detection Systems
- Automated Braking Systems
- Deployable Systems

80 mph Impact Closing Velocity



Example Performance Improvements



Comparison of passenger car response normalised to NCAP results.



Reference: Friedman, K., Mihora, D., & Hutchinson, J. (2017). Heavy truck front-end deployable system opportunities for crash compatibility with passenger vehicles. In *International Journal of Crashworthiness* (Vol. 23, Issue 2, pp. 161–172). Informa UK Limited. <https://doi.org/10.1080/13588265.2017.1290735>

Summary

- Heavy Truck Front end impacts result in thousands of fatalities and tens of thousands of serious injuries in passenger vehicles annually in the US.
- Opportunities to substantially reduce the number of these fatalities and injuries are available

Recommendation

- ACUP recommendation to the Department of Transportation Secretary to mandate the requirement for Front Underride Protection System Technology already existing in Europe
- ACUP recommend that increased FUPD effectiveness be phased into the requirement.