



Identifying the Potential of Improved Heavy Truck Crashworthiness to Reduce Death and Injury for Truck Drivers

Chiara Silvestri Dobrovolny, Nathan D. Schulz, Daniel Blower, Marco Benedetti

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Research Summary

Commercial truck drivers are killed on the job at a higher rate than any other category of worker other than those in agriculture and forestry. Although the overall rate of traffic fatalities is declining, it is declining much more rapidly for drivers of light trucks and passenger cars than it is for drivers of heavy trucks. However, advanced crash-avoidance technologies are being developed and installed on heavy trucks that hold the promise of increasing that rate of decline for drivers of heavy trucks.

Researchers in this study sought to determine how truck-driver fatalities and injuries could be reduced if all tractor-semitrailers were to be equipped with all available advanced crash-avoidance technologies. These technologies are intended to prevent or mitigate truck crashes to reduce the toll on truck drivers, as well as any other motorists involved. Although advanced crash-avoidance technologies can be effective in a wide variety of crashes, they will have a proportionally greater benefit for trucker drivers in frontal and rollover crashes, which are the crash types that put truck drivers at the greatest risk.

The main purpose of the research was to be able characterize the types of crashes and truck-driver injuries that would occur even after advanced crash-avoidance technologies are installed in all trucks. Truck crashes would likely be reduced overall by 10 percent, but rollover and frontal crashes, which currently result in most truck-driver fatalities and serious injuries, would still be the primary crash types.

The authors used a computer model of a truck cab to analyze injury risk in various crash scenarios. They also developed a method to simulate the movement of occupants in the truck cab during various crash types. This method allowed them to examine the types and severity of injuries that might occur with and without various configurations of seat belts and air bags.

Although the crash simulations are very effective, evaluation of advanced crash-avoidance technologies in the real-world can reveal so much more. Further research will also teach us more about the types of crashes that advanced crash-avoidance technologies cannot prevent and the effectiveness of improved seat belts and air bags in heavy trucks.