

***It's Not The Crash That Kills, It's The Underride;
A Research Study To Examine the Relative Role of Truck Underride
& Passenger Compartment Intrusion (PCI) In Truck Crash Fatalities***

There has been a [dearth of information](#) on the true number of underride deaths and injuries. This has led to flawed [cost benefit analysis](#) with the result that underride rulemaking has too often been deemed as not [cost-effective](#). Opponents of this rulemaking suggest that crash avoidance technology to prevent crashes from happening would be a better use of funds.

In order to strengthen support for [making use](#) of the [underride protective devices](#), which have been [proven to prevent underride](#), we propose a study to review truck crashes in which the involved passenger vehicle had multiple occupants. The [severity](#) of injuries for [those passengers who experienced](#) underride and Passenger Compartment Intrusion (PCI) should be compared to those passengers who did **not** experience underride and PCI.

The hypothesis is that the most severe injuries occurring in truck/car collisions is from the intrusion of the truck/trailer body into the passenger compartment. This occurs when a portion of the passenger vehicle goes under the truck because of a geometric mismatch. The bottom of a truck is up higher than the bumper of most passenger vehicles (including pick-ups and SUVs). So when there is a collision, the smaller vehicle easily slides under the truck and the first point of actual impact is at the windshield -- which is not designed to stop a truck. The next impact (the second collision) is between the truck and the heads and upper torsos of the passengers of the smaller vehicle.

When this kind of collision takes place, the crashworthy features of the passenger vehicle are, for the most part, not triggered. The crush or crumple zone, air bags, and seat belt tensioners do not function as intended, so that the passengers are left totally vulnerable and experience catastrophic injuries. However, this does not necessarily occur for **every** passenger in the passenger vehicle; it depends on whether **their** part of the car goes under the truck. Because some passenger vehicle occupants may be positioned outside of the area of Passenger Compartment Intrusion (PCI), they are less likely to experience catastrophic, unimaginable injuries.

A look at even a handful of truck crashes demonstrates this key principle: where a passenger is seated and the degree of underride and PCI will determine who lives and dies. On May 4, 2013, [AnnaLeah and Mary Karth](#) were in the part of the car which went under the truck (in this case, the back seat); they died. Their mother and brother in the front seat did not go under the truck; they lived. In 1967, Jayne Mansfield, and two other adults in the front seat with her, died when their part of the car went under the rear of the truck. The three children in the back seat, including [Mariska Hartigay](#), did not go under the truck; they

lived. On January 2, 2020, [Rhett Green](#) rear-ended a tractor-trailer in Texas with his pick-up. His part of the pick-up did not go under the truck; he lived. The passenger side of his pick-up went under the trailer. His [8 year-old son](#) was sitting there; he died. [Roya Sadigh](#), went under the side of a trailer on November 24, 2004; she died. Her driver's part of the car did not go under the trailer; he walked away from the crash.

This same scenario happens over and over again. It illustrates a very important point: it's not necessarily the crash that kills, it's the underride.

What is the significance of this? First of all, it is important to realize that crash avoidance technologies are not guaranteed to completely prevent a collision. More often than not, what will happen is that crash avoidance technologies will reduce the speed of the bullet vehicle at impact. However, there will still be a collision, and deadly underride can occur even at 15 m.p.h.

Because of this, even with increased use of crash avoidance technologies, there will still be truck crashes. And because there will still be truck crashes, there will still be underride. And because there will still be underride, there will still be underride deaths and catastrophic injuries.

The only thing, in this scenario, that will prevent underride deaths will be the installation of underride prevention devices. And the only thing likely to get timely installation of comprehensive and effective underride protection on all large trucks is a federal mandate that makes it The Law. But because this problem is poorly understood and the opposition to underride regulations is monumental, a research study that clearly documents the direct causal relationship between underride/PCI and truck crash fatalities would prove the efficacy of, and justify the need for, underride protection. It could be instrumental in finally moving long-overdue, life-saving rulemaking forward.

Secretary Buttigieg, Deputy Administrator Moshi, Acting Administrator Cliff, it is past time to appropriately address the deadly truck underride problem. Act decisively to get this study underway as swiftly as possible. Make it a priority. Establish an Underride Protection Committee, with a diverse group of stakeholders, to be an essential part of developing and discussing the details of this research -- including use of digital technology to speed up the research process. Make truck crashes more survivable.

Marianne Karth, August 16, 2021