

Proposal for an Underride Prevention System
Senior Design Project
2015/16

Background

I am the mother of nine children and was driving the three youngest from North Carolina to Texas on May 4, 2013, to attend four college graduations and the wedding of one of their older siblings, when a truck hit us twice spinning us around and sending us backward under the tractor trailer in front of us. AnnaLeah (17) and Mary (13) were in the back seat. AnnaLeah died instantly from mechanical asphyxia and Mary died a few days later from injuries (including severe head trauma, carotid artery dissection, and LeFort fractures of her face) she sustained in the crash. I was in the hospital for almost a week but am totally healed physically, and my 15 year-old son in the front passenger seat had a mild concussion and was released that same day from the Emergency Room. The girls, in the back seat, experienced underride; we did not.

In the days, weeks, and months following that crash, our family discovered many things about truck safety. One of the things which we learned about were underride guards, steel bars on the back of a trailer mandated by federal regulations following the national attention gained by the death of actress Jayne Mansfield due to an underride crash in 1967.

<http://www.bloomberg.com/news/2014-12-16/dead-girls-mom-says-100-truck-fix-may-have-saved-them.html>

Unfortunately, the specifications have been shown to be inadequate in many circumstances; many of the underride guards on the road today too often fail to prevent underride—whether it be due to the design, installation, or maintenance of the guards. This has been seen both by review of the Large Truck Crash Causation Study and through research done by the Insurance Institute for Highway Safety (IIHS)—among others.

<http://annaleahmary.com/2014/10/iihs-reports-on-new-crash-testing-for-improved-underride-guards/>

Following our crash, we initiated an online petition requesting DOT to make improvement in three truck safety areas, including underride guards. After delivering the 11,000+ petitions to DOT in Washington, DC, we met with top administrative officials from FMCSA and NHTSA on May 5, 2014— one year after the crash. We were able to meet for an hour—sharing our concerns and hearing what their plans were relative to our three requests.

After hearing that NHTSA was not able to let us know if they were going to initiate a new rulemaking process on underride guards, my husband Jerry asked several times when we might expect that they would decide whether to go ahead with such a process. Finally, David Friedman, deputy director of NHTSA, replied that we could expect a decision in two months. I then asked him to email me as soon as the decision was made. And he did so—emailing me on July 9, 2014 — almost exactly two months later — to let me know that they had issued a rulemaking to study this issue.

Unfortunately, this is a very lengthy process which is frequently subject to setbacks due to opposition from the trucking industry. In addition, there is controversy about whether the guards could be made “too rigid” and result in unintended consequences due to deceleration forces.

Yet, the IIHS has told us in person that, “It is safer to run into a brick wall than into the back of a truck.” This is due to the fact that if you run into a brick wall with a vehicle equipped with a crush zone, that crush zone is able to go into effect and protect the occupants. However, if a vehicle hits the back of a truck and the underride guard fails, the vehicle goes under the truck so that the passenger compartment is intruded upon and the crush zone (air bags and seat belts) is not allowed to operate as designed.

We have also written letters to trailer manufacturing companies asking them to voluntarily improve their guards—as did Manac, Inc. IIHS has continued to communicate with manufacturers to let them know that they would be glad to test any new designs. They have gotten some response.

<http://annaleahmary.com/2014/07/making-progress-on-improving-underride-guards-just-in-time-for-someone-else/>

The bottom line is that NHTSA is hoping to issue a new rule within the coming year and whatever they propose, if passed, will likely have an impact on road safety for years to come. It is my hope that there would be cooperative efforts taking place to come up with the best possible protection for travelers so that others will not have to go through what our family has had to and lives will not unnecessarily be abruptly brought to an end.

<http://annaleahmary.com/2014/12/underride-guards-lets-move-forward-in-2015/>

Defining the Problem

It is our hope that engineering students and professionals would take on the challenge of creating an underride prevention system that would surpass the current U.S. federal standards as well as the Canadian standards and that they would design a guard which would withstand a crash at any speed up to 50 mph and at any point along the back of the trailer.

It is our understanding that research, especially that which has undergone peer review, will be considered by NHTSA as they continue the process of rulemaking for underride guards. Therefore we are putting out a Request for Papers which address the need for a more effective underride prevention system and design a creative solution to the problem of failed underride guards which result in horrific injuries and tragic deaths.

Papers should be completed and mailed, no later than March 1, 2016, to:

Marianne Karth
AnnaLeah & Mary for Truck Safety
2800 Ridgecrest Drive
Rocky Mount, NC 27803

Authors wishing to present their paper at the Underride Roundtable to be held in the Spring of 2016 should indicate their intent by October 1, 2016 by emailing marianne@annaleahmary.com.

Questions should be directed to Marianne Karth at 432-556-1567.

A panel will review all submitted papers.. All participants will be honored for their contribution to the advancement of underride prevention—a challenging and valuable endeavor.