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August 12, 2020

VIA FAX 1-202-493-2251, EMAIL, and ELECTRONIC SUBMISSION

National Highway Traffic Safety Administration
Room W53-312,
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: Docket Number NHTSA-2015-0118 and GAO-19-264 Recommendation

Shashi Kuppa:

As NHTSA moves on the GAO recommendation to "***conduct additional research on side underride guards to better understand the overall effectiveness and cost associated with these guards and, if warranted, develop standards for their implementation,*** " I felt it important that NHTSA considers information which I am in position to bring attention as a semi-trailer engineer, accident reconstructionist and frequent investigator of underride tragedies.

In summary, the information I provide NHTSA below leads to several key insights: **1)** the trailer industry has provided NHTSA with a 'side guard' cost-to-manufacture that is four times too high; **2)** detailed study by the IIHS of side underride crashes from field data and their own crash tests show that strong side guards are three-and-a-half to nine times more effective (89%) in preventing injury from passenger compartment intrusion than NHTSA-cited studies for rear guards (this leads to significant ***cost-positive*** ramifications for side guards) and; **3)** the review of recognized road surface Design Standards shows that supposed operational issues due to side guard ground clearance are not encountered during dock use nor at railroad crossings.

Attached for NHTSA's consideration:

1. Side guard cost calculations by Strick Trailer Manufacturers from the year 2000, produced by them in response to subpoena (Attachment A).

   Comment: In 2000 Strick was the sixth largest trailer manufacturer in North America. Strick estimated for a roughly 730lb side guard, the cost to manufacture was $329.82 (year 2000 dollars). The TTMA submitted to NHTSA in 2006 and again in 2016 that a 750lb side guard would cost $1,554 (2004 dollars). The TTMA collected this cost information from certain members as part of "defense strategies to side underride lawsuits." The TTMA submission to NHTSA implies that a side guard would cost over $2 per pound to manufacture (2004 dollars). A plain 53' dry freight trailer weighed roughly 15,000lbs and

cost around $17,000 in 2004, or about $1.10 per pound. A side guard is uncomplicated and made of unremarkable, commonly available components like much of the trailer itself. Therefore, any cost estimate that claims, on a per pound basis, that a side guard is twice a basic trailer's cost to manufacture should be viewed with skepticism. In fact, the Strick cost calculations show it to be less than half the cost to manufacture on a per pound basis relative to a dry freight trailer. The cost of after-market side guards produced in low volumes like that tested by the IIHS in no way accurately reflects the cost to produce guards at full scale.

2. "Potential Benefits of Underride Guards in Large Truck Side Crashes" by Matthew Brumbelow of the Insurance Institute for Highway Safety (Attachment B).

   Comment: Matthew Brumbelow of the IIHS brings attention to two important factors in the above-cited report. First, the rate of underreporting of side underride in the crash cases he looked at, where "only 3 of 22 fatal crashes with severe or catastrophic truck side underride based on the case review were coded as having side underride in FARS (Fatal Accident Reporting System)." Undercounting of underride is a well-established problem with the FARS database and must be factored in the tally of side underride deaths and serious injuries.

   Second, the IIHS report concludes that a side underride guard would have reduced injury severity in 25 of 28 (89%) serious injury and fatal impacts with trailers which were studied. As reflected in the NHTSA- sponsored side guard modeling by Texas A&M in 2018, even crashes of higher speeds with shallow approach angles have the potential to be non-injurious due to their glancing nature. The high effectiveness of side underride guards increases their cost benefit way beyond the 10-25 percent effective rate NHTSA applied to rear underride guards in its 1995 FRE.

3. Insurance Institute for Highway Safety Test Reports CF17002, CF17003, CF17005 (Attachment C).

   Comment: The IIHS ran three Malibu-into-trailer tests: two with side guard/aero-skirt combinations, and one with just an aero-skirt. The second with-side-guard test successfully protected the driver dummy at 40mph, 90 degrees, which represents a "collision severity" of 197 kip-ft. "Collision severity," which factors in speed and collision angle of the striking car, was defined by the 2018 NHTSA computer-based study which examined side guard designs. NHTSA examined computer simulated crashes at a maximum severity of up to 67 kip-ft (50mph, 30 degrees). The successful testing and simulations at speeds up to 50 and angles from 90 to 15 degrees further speaks to the wide range of accident scenarios and severities for which side underride protection is proven effective.

4. FMCSA cost figures and a rear underride guard cost/benefit analysis by the Upper Great Plains Transportation Institute at North Dakota State (Attachment D).

   Comment: The investment in side underride safety is not solely an out-of-pocket cost bourne by the trucking industry; it's also significant money kept in their pocket through loss prevention. FMCSA estimated in 2008 that the cost of a single fatal tractor trailer accident to be $7,633,600, and $334,892 for a non-fatal crash with injuries (See:

https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/FMCSACrashCostCalculationsDec08.pdf). With the most conservative, industry-sponsored, estimates assigning over 200 annual side underride fatalities for semi-trailers alone, and IIHS estimating an 89% effectiveness for strong underride guards, the massive financial benefit to the industry and society through the prevention and reduction of deaths and injury - at least $1.5 billion annually - should be considered. For example, when the Upper Great Plains Transportation Institute at NDSU included reduced medical expenses resulting from the addition of rear impact guards on their truck farm fleet, the study determined adding these guards to be cost-positive.

5. SAE Surface Vehicle Recommended Practice J699 and related ground surface-based analysis (Attachment E).

   Comment: A side guard such as that tested by the IIHS would not create a ground clearance hinderance on the maximum 6% dock slope as set forth in Society of Automotive Engineers' SAE J699. Analysis conducted by Christopher Bonanti, formerly NHTSA's Associate Administrator for Rulemaking, shows that ground clearance is maintained with 10% dock slopes, even with the trailer axles set at the full rearward position. This data shows hanging up on submerged docks is not a detriment to the implementation of side underride protection.

6. "Development of Design Vehicles and Characteristics for the Hangup Problem," and Federal Railroad Administration Data (Attachment F).

   Comment: Research conducted by West Virginia University shows that for Standard-complaint railroad grade crossings, semi-trailers would only "hang up" if far closer to the ground than the side guard-fitted trailers successfully crash tested by the IIHS. Compiled data on railroad grade crossing accidents shows that from 2014 to 2018 there were zero fatal grade crossing accidents coded "semi-trailer stuck on tracks" which would include the population of trailers far lower to the ground than is required by a side guard. Hanging up on railroad tracks is not a detriment to the implementation of side underride protection according to the data.

7. Krone "Safeliner" trailer plans, literature, and photographs (Attachment G).

   Comment: Building a durable side underride guard requires only the application of the basic engineering knowledge and the quality construction required to build a durable trailer writ large. A side guard on a standard trailer is but 650-800 pounds on a vehicle capable of carrying 50,000 pounds of cargo. Unsurprisingly, the side guard builds I have been involved with have accumulated over a million trouble-free road miles and have been successfully durability tested.

   TTMA's letter to NHTSA Docket 2015-0118 attempts to portray the German company Krone's experience with its curtain-sided drop-frame trailer re-design as analogous to adding a side guard to existing U.S. trailers. A cursory review of its low-frame layout and plans reveals Krone did not "add a side guard" and a full read of the submitted testimony by Krone employee Yorg Sanders reveals the plain distinction between their revamped drop-frame curtain-siders and an existing US box-trailer with side underride protection.

SEVEN HILLS ENGINEERING, LLC.
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Continuing to allow truck and trailer induced PCI in rear and side underride crashes to occur at otherwise survivable crash speeds (delta-V's of 45mph and beyond) discards years of crashworthiness efforts and wastes the safety benefits we have come to expect and pay for in our cars. From an engineering perspective the need for vehicle crash compatibility in the form of adequate heavy truck underride guarding is apparent in order to protect against the hazard of PCI which exposes the vulnerable head and neck region to severe, potentially fatal or crippling injury. This hazard is easily remedied by readily available materials and simple structural analysis. The FMVSS standards should be broadened to include guarding for the sides and rear of heavy straight trucks, as well as the sides of heavy trailers. This was the original intent of NHTSA rulemakers in the 1969 NPRM, Docket No. 1-11; Notice 2.

Yours very truly,

SEVEN HILLS ENGINEERING, LLC.

Perry L. Ponder, P.E.,
President, Consulting Engineer

Attachments: As stated above

Cc: Susan Fleming, GAO