November 22, 2023

James Myers, Designated Federal Officer
U.S. Department of Transportation
National Highway Traffic Safety Administration
Special Vehicles and Systems Division
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Mr. Myers:

Following the November 15, 2023 Advisory Committee on Underride Protection public meeting (ACUP meeting; 88 FR 73940; Docket No. NHTSA-2023-0045), I am submitting the following written materials, questions, and comments.[1] The purpose of this letter is to request clarification of statements made during the ACUP meeting (see recording) and model an approach to data driven discussions.

It would be helpful if ACUP members provided records (i.e., documentation, data, or research) to substantiate their statements. Otherwise, statements or observations based solely on an opinion should be dismissed and not included in any written consensus advice to the Secretary. A publicly available document repository would be extremely beneficial to collate and organize these records.

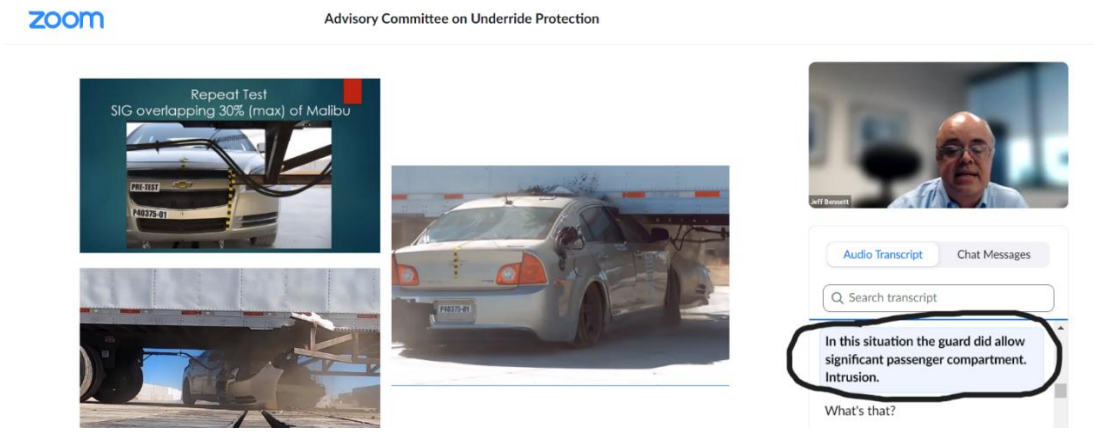
Statements from ACUP members that would benefit from clarification, records, and more discussion are provided below.

Statement 1: Mr. Matthew Brumbelow indicated that "There are over one hundred pedestrian cyclists, motorcyclists killed per year in crashes with the side of a trailer. Certainly not all of those would be prevented with an underride guard, but the potential benefits.
They should at least be estimated." Additionally, Mr. Brumbelow noted "…that's just the link to our comments. So if you're interested in more details. It can all be found there."

Clarification requested: The Insurance Institute for Highway Safety (IIHS 2023) did not estimate the effectiveness of side underride guards in preventing fatalities pedestrian cyclists, motorcyclists. Would NHTSA or the ACUP please ask the Department of Transportation's Volpe Center whether the effectiveness of a side underride guard would be similar to estimates of effectiveness of Lateral Protective Devices in mitigating pedestrian, cyclists, and motorcyclists fatalities (e.g., Epstein 2022)? Would the addition of an aerodynamic skirt to the side underride guard change its effectiveness?

[1] Any member of the public is permitted to file a written statement with the advisory committee (General Services Administration; Federal Advisory Committee Management; Final Rule; 66 FR 37728, p. 37745).

Statement 2: Mr. Jeff Bennett indicated: “This thirty percent overlap test that they came up with for the rear guard that Utility applied to its side impact guard. In this situation, the guard did allow significant passenger compartment intrusion."



Clarification requested: Would Mr. Bennett please provide the Utility Trailer Manufacturing Company's (UTM) Side Impact Guard (SIG) crash test report to the ACUP and clarify the extent of passenger compartment intrusion (PCI) that was recorded? Would the ACUP also gather and review other side underride guard crash tests (e.g., Kumar et al. 2009; IIHS 2017; Wilson 2017 (Wabash); Ponder 2018; Jenkins 2023 (Fortier); Kiefer 2023 and others). Moreover, computer-based simulations should be gathered and reviewed because they have also been used by researchers investigating crash attenuation of side underride guards up to 50 mph (Bodapati 2006; Moradi 2012; Galipeau-Belair 2014; NHTSA 2018a; Mattos et al. 2021). In addition, the ACUP should gather and review data submitted to NHTSA (2022a) by Great Dane; Hyundai Translead; Kentucky Trailer; Stoughton; Strick Trailers; Utility Trailer Manufacturing; Vanguard; and Wabash. NHTSA requested and received information from each trailer manufacturer (e.g., see 1 of 8 letters NHTSA 2021) on “… all assessments, analyses, tests, test results, studies, surveys, simulations, investigations…” that relate to side underride guards.

Mattos et al. (2021) reported that not all PCI is deadly or even catastrophic. From the UTM 30% offset crash test (UTM 2023b), the airbag deployed and the A-pillar did not deform. This demonstrates that a side underride guard can provide a sufficient reaction surface to allow for the vehicle’s passive and active safety systems (e.g., airbags, crumple zones) to protect the occupant (Mattos et al. 2021). Mattos et al. (2021) reported the presence of a side underride guard also causes the location of PCI to move from near the occupant’s head and torso to the lower extremities, which reduces the likelihood of serious or fatal injury.

Clarification requested: Would Mr. Bennett please provide context to his December 9, 2022, letter to Mrs. Marianne Karth, that reported some of the results of UTM’s SIG crash tests: "Utility Trailer retained a certified test center to perform three 35-mph dynamic crash tests-- two in the center of the guard, and the other at a 30% overlap. In each test, Utility Trailer's SIG prevented passenger compartment intrusion without significant injury to the instrumented crash test dummy.”

UTILITY TRAILER MANUFACTURING CO.
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The First Name In Trailers

December 9, 2022

Utility Trailer has already conducted significant tests of its guard. Specifically, Utility Trailer has subjected the SIG to the same stress and high-centering tests that it performed on the AngelWing, and that it uses in testing its aerodynamic side-skirts; those tests demonstrate that the SIG passes without damage.

Additionally, Utility Trailer retained a certified test center to perform three 35-mph dynamic crash tests – two in the center of the guard, and one at a 30% overlap – using the same protocol that the IIHS uses for rear-impact-guard tests. And unlike the tests the IIHS conducted on the AngelWing, Utility Trailer used a fully loaded trailer in its tests of its SIG. In each test, Utility Trailer's SIG prevented passenger-compartment intrusion without significant injury to the instrumented crash dummy.

Statement 3: The NHTSA recall that Mr. Bennett mentioned relating to aerodynamic skirts was because "The mounting brackets may separate from the skirt panels (NHTSA 2018)." However, the PowerPoint slide was of a Walmart trailer with an attached Strehl aerodynamic skirt contacting the ground.

Clarification requested: Would Mr. Bennett please clarify whether the recall mentioned ground clearance of the Strehl aerodynamic skirt? Because UTM sells the Strehl aerodynamic skirt, would Mr. Bennett also provide a brochure or sales pamphlet that indicates weight and ground clearance for context?

Statement 4: Mr. Bennett indicated that one of the reasons for lack of interest in the UTM SIG was "…the possibility of damage to the guard and the trailer in high-centering situations" (i.e., potential ground clearance issues).

Clarification requested: Previously, UTM's SIG (2022) "…did not high center in the same ground-clearance tests Utility uses to test the performance of its aerodynamic skirts". Consequently, would Mr. Bennett please clarify whether the deployed UTM SIGs have demonstrated any ground clearance issues and if so, please share those data with the ACUP to review? If UTM has identified any structural, operational, or safety issues, would they be considered a 'defect' in the context of the National Traffic and Motor Vehicle Safety Act of 1966 (49 U.S.C. § 30102)?

UTM's SIG Patent (UTM 2023a), indicated that "With the side guard bars and the leaf springs restraining the side skirts, these skirts can be more flexible below the side underride guards to accommodate inevitable high centering." The patent clearly and repeatedly indicates the design achieves "effective ground clearance" (UTM 2023a).

Statement 5: Mr. Bennett indicated that "Out of seventy guards available, only about thirty have been deployed by customers, so, in short, we can't even give it away." Yet, during the May 2023 ACUP meeting Mr. Bennett stated, "UTM has installed their side impact guard on twenty customer trailers operating in the field, and recently installed it on another forty customer trailers" (Bennett 2023).

Clarification requested: Would Mr. Bennett please clarify how many trailers have been deployed with UTM's SIG?

Statement 6: Mr. Bennett stated that "Since 2021, we have produced over seventy prototypical side impact guards. [that cost] approximately $4,500" and "…the guard weighs approximately nine hundred pounds."

Clarification requested: Would Mr. Bennett please clarify whether the 962-pound UTM SIG also included the aerodynamic skirt (UTM 2023b) and if the $4,500 cost included both the SIG and aerodynamic skirt? Would Mr. Bennett also provide separate weight and cost documentation of the UTM SIG and the aerodynamic skirt to the ACUP to review?

It is my understanding that aerodynamic skirts generally weigh 200 to 300 pounds (Wabash 2022), but I could not locate the weight or cost of a UTM aerodynamic skirt.

The National Center for Statistics and Analysis (NCSA 2023) estimated that aerodynamic side skirts would add approximately $600 to $1,500 in hardware and installation costs. Is it correct to state that with $4,500 combined cost (~$1,000 for the skirt and $3,500 for the SIG), a UTM semitrailer equipped with aerodynamic side skirts would save 746 gallons of diesel per semi-trailer per year (UTM 2022a) and pay for both the SIG and aerodynamic skirt in just over a year? It appears that Wabash (2021) came to this conclusion with their side underride system that provides dual aerodynamic efficiency and protection to road users without operational limitations such as "…costly installation, access to the underside of the trailer, or adding considerable weight".

Clarification requested: Would Mr. Bennett please clarify why the UTM SIG costs about $3,500 given the cost for the Angelwing, which is privately produced, is $2,897 (NCSA 2023)? Would UTM expect that the cost of a SIG would decrease as more were produced, similar to how NCSA (2023) believed (i.e., that broad adoption of side underride guards would likely lead to market experiencing downward price pressure due to increasing returns to scale and competition from other potential suppliers)?

Statement 7: Mr. Bennett indicated that "Clearance is a significant concern as demonstrated by both real-world experience and testing…" and "…as all trailers, the manufacturers know, damage to side skirts is very common."

Clarification requested: Would Mr. Bennett please clarify ground clearance differences between the UTM aerodynamic skirt and the UTM SIG without an aerodynamic skirt?

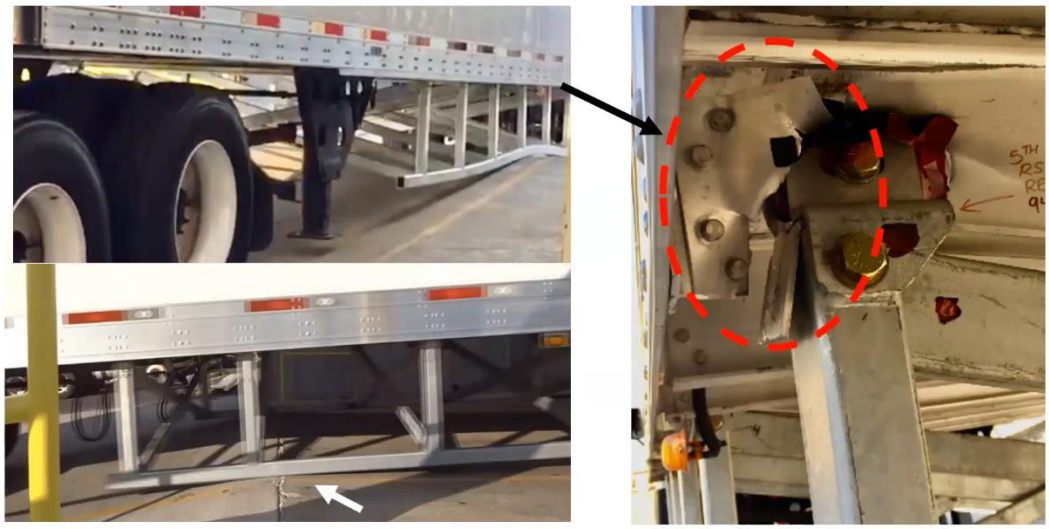
It is my understanding that ground clearance of most aerodynamic side skirts is between 6 and 11 inches, but I could not locate the ground clearance of a UTM aerodynamic skirt. It appears that the ground clearance of the AngelWing (Airflow 2022) is 23 inches and UTM's SIG (UTM 2023) is 27 inches.

Statement 8: Mr. Bennett stated that "In 2018, Utility performed its change of grade, standard floor and track tests on the only other commercially available side underride guard, the aforementioned AngelWing guard. These tests demonstrated conclusively that changes in grade, and in other situations normally encountered by a trailer in day-to-day operations will significantly damage the guard and the trailer structure, as shown here. As a result, Utility concluded that the AngelWing was not a safe device for widespread application. Utility has provided a copy of this test report to the manufacturer of the angel wing, but it has never received any response or dispute concerning our tests."

Clarification requested: Would Mr. Bennett please provide the test report to the ACUP for review, which will clarify the percent slope used during UTM's "change in grade" tests on the AngelWing?

These change in grade tests have been disputed in Court because they were "…primarily aimed at demonstrating that the underride guards, as Utility installed them, can scrape the ground when a trailer encounters an off-standard loading dock" (Sievers 2020). A side underride guard with at least 22 inches of ground clearance would not be a hindrance on the maximum 6% dock slope as set forth in Society of Automotive Engineers' SAE J699 (Kelly 2013; SAE International 2011 cited in Ponder 2020a). Ponder (2023) indicated that "Testing of the AngelWing design by a TTMA member referenced in their comment of June 6, 2023, was on a 19.4% slope, more than three times that permissible under the SAE Recommended Practice." Moreover, it is my understanding that the Truck Trailer Manufacturers Association (TTMA) does not have a Recommended Practice for loading docks.

Angelwing Rigid Side Impact Guard Reduces Trailer
Ground Clearance Resulting In High Centering Damage
To Itself And The Trailer's Structural Integrity



Statement 9: Mrs. Karth indicated that "…the engineers from the Truck Trailer Manufacturers Association drafted a Recommended Practice on side underride guards, I think we should hear from them."

Clarification requested: My understanding is that the TTMA drafted a Recommended Practice for a Side Impact Guard (NHTSA 2023) and shared this document with NHTSA. This document should be shared with the ACUP to review.

Statement 10: Mr. Dan Horvath indicated that "We've talked about a few times today already about the concerns with highway railroad crossings and high centering events. If we install side underride guards, especially to the rigid, requirements that we've discussed before today. We're going to see an increase in high centering events. It's just something that we need to discuss as part of this group, you see, with tank trailers. They have post connections that are underneath. That is relevant among vehicles and milk collars, and a lot of various types of tank vehicles. We also have trailers that have compatibility requirements for storage underneath. This shows an agricultural use trailer. That's considered a grain hopper."

Clarification requested: Would Mr. Horvath please provide documentation for the ACUP to review that identifies the ground clearance of special purpose trailers such as tank trailers with post connections, trailers with requirements for storage underneath, grain hopper agricultural use trailers as shown in his slides? For perspective on ground clearance, would Mr. Horvath please provide TTMA's Recommended Practice for Trailer Ground Clearance for rigid auxiliary equipment (e.g., fuel tanks, storage boxes, side-door steps, tire carriers) that can be attached underneath semi-trailers without contacting the ground when the trailer goes over a change in

grade? Does TTMA's Recommended Practice for side impact guards address special purpose trailers?

Side guards have been developed for a wide variety of trailers (e.g., see Airflow 2022; Karth 2020; Karth 2021; Ponder 2018). Does the TTMA's Recommended Practice for Trailer Ground Clearance provide strategies for specialty trailers with rigid equipment underneath to navigate highway railroad crossings and avoid high centering events where ground clearance is limited? If so, are the recommendations similar to low clearance trailers avoiding high centering events, like the video shown by Mr. Doug Smith that demonstrated a successful railroad crossing of a low boy trailer hauling a bulldozer with only a few inches of ground clearance?

Statement 11: Mr. Horvath indicated that "There would need to be considerations for what takes place if we were to have side guards [on intermodal trailers]. Beyond even the fact that whether it can be possible to continue stacking trailers or not. Uh, but also to what happens if for stacking trailers, we might then have damage to side underride guards."

Clarification requested: Would the ACUP please gather documentation and review on Intermodal chassis trailers with side guards to further confirm their use? This picture demonstrates that stacked Intermodal chassis trailers can accommodate one type of side guard (lateral protection devices; see also Alibaba 2023).

Statement 12: Mr. Lee Jackson mentioned "I'm the guy who used to weigh the trucks who pulled the scales out of my trunk, and actually weighed to see what these trucks were weighing in at, and then would write the appropriate weight violations and a very small percentage of them would actually come close to that 80,000 pounds. Your typical Amazon truck and Amazon prime truck is going to cube out before it's going to weigh out."

Statement 13: Mr. John Freiler mentioned "We really need to be using hard data rather than you know feelings or what we think we do think. So, the comprehensive size and weight limits study done by MAP-21 put about thirty percent of trucks are operating at or near their weight

limit. So that's a figure that we can track into where it's not one or two percent. It's not ninety percent. We have data that says it's thirty percent."

Clarification requested: Would the ACUP please investigate and document whether the majority of freight hauled in semi-trailers cubes-out (is volume-limited) before it grosses-out (is weight-limited) (e.g., see EPA 2016)? I could not locate the cube-out vs. weigh-out data referenced by Mr. Freiler in the MAP-21 report (US Department of Transportation 2016). However, my understanding is that the MAP-21 data are not accurate: "The Department believes the current data limitations are so profound that the results cannot be accurately extrapolated to predict national impacts. As such, the Department believes that no changes in the relevant truck sizes and weight laws and regulations should be considered until these data limitation are overcome" (US Department of Transportation 2015). Have these data quality issues been overcome?

Other estimates of cube out v. weigh out include: A) The Federal Highway Administration (2000) estimated that about 80 percent of enclosed van trailer combinations "cubes out before it weighs out" because enclosed van trailers, in many instances, are used to transport commodities that have low density; and B) Williams and Murray (2020) reported that the average operating weight of a tractor and semi-trailer in 2019 was 63,000 pounds, leaving 17,000 pounds on average before reaching the 80,000 pound weight limit.

Thank you for the opportunity to submit information to the ACUP.

Sincerely,

Eric Hein

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