TTMA
TRUCK TRAILER Manufacturers Association
TTMAnet.org Since 1941

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Administrator Mark R. Rosekind, PhD.
National Highway Traffic Safety Administration
Docket Management Facility, M-30
U.S. Department of Transportation
West Building, Ground Floor, Rm. W12-140
1200 New Jersey, Ave. SE
Washington, DC 20590

Docket No. NHTSA-2015-0118

Dear Mr. Rosekind,

The Truck Trailer Manufacturers Association (TTMA) is an international trade association representing approximately 90% of the truck-pulled trailers manufactured in the United States. TTMA has a history of working closely with regulators to help them understand the unique nature of the heavy-duty trailer industry and to act as a conduit between the member companies and regulators.

INTRODUCTION

On July 10, 2014, NHTSA published a notice granting petitions for rulemaking submitted by Marianne Karth and the Truck Safety Coalition. [NHTSA-2014-0080]. In the notice, NHTSA announced that it was initiating rulemaking and would issue two separate notices pertaining to rear impact guards for single unit trucks and for trailers. [See 79 FR 39362-01]. NHTSA has subsequently opened rulemaking dockets on rear impact guards for single unit trucks [NHTSA-2015-0070; 80 FR 43663 (Jul. 23, 2015)] and for trailers [NHTSA-2015-0118; 80 FR 78418 (Dec. 16, 2015)].

In its 2014 notice, NHTSA also indicated that the Petitioners had met with the Secretary of Transportation and had requested that NHTSA begin studies and rulemaking for "side guards." NHTSA stated in the 2014 notice that it "is still evaluating the Petitioners' request to improve side guards ... and will issue a separate decision on those aspects of the petitions at a later date." [79 FR at 39363]. TTMA submits this comment and the attached materials to assist the agency in evaluating that aspect the Petitioners' request as it pertains to trailers and semi-trailers. This submission will outline a few of the more important economic and technological challenges that must be solved in any rulemaking initiative that would require side impact guards on trailers.

PREVIOUS DOT ASSESSMENTS

TTMA first observes that side underride counter-measures for commercial vehicles have been considered by the United States Department of Transportation on numerous occasions during the rulemaking process that culminated in the 1996 publication of FMVSS 223 and 224. [49 CFR §§ 571.223 and 571.224]. Over the years, various DOT agencies have expressed opinions regarding the feasibility and cost-effectiveness of side impact guards:

In a DOT Memorandum filed in Docket 1-11, Rear Underride Protection, dated January 23, 1968, W.R. Fiste, then the Chief, Regulations Division of the Federal Highway Administration, Bureau of Motor Carrier Safety, wrote to Dean P Niedernhofer of the National Highway Safety Bureau: **"Regarding your proposal for requiring such an underride guard around the sides of vehicles, we have some doubt in our mind about the practicality of such a requirement, especially in the case of trailers and semitrailers.** It is true that, in some cases, automobiles are driven under trucks and trailers**. Any device to prevent such occurrences would have to be of such strength that it would be, in our opinion, impractical.**" [Docket 1-11-ANPRM-034 (emphasis added)].

In a notice proposing a standard for rear underride protection published the following year, on March 19, 1969 [Docket No. 1-11; Notice 2], the Federal Highway Administration stated: "**It is anticipated that the proposed Standard will be amended, after technical studies have been completed, to extend the requirement for underride protection to the sides of large vehicles."** [35 FR 5383, 5384 (Mar. 19, 1969)(emphasis added)].

In a notice of proposed rulemaking on rear underride protection published on August 14, 1970 [Docket No. 1-11; Notice 5], the National Highway Safety Bureau stated: "**Further consideration will be given, after issuance of the standard and completion of technical studies, to the inclusion of energy management of underride protection to the sides of large vehicles."** [35 FR No 158 12956, 12957 (Aug. 14, 1979)(emphasis added)].

In a notice that terminated rulemaking on rear underride protection published on June 18, 1971 [Docket No. 1-11; Notice 6], NHTSA concluded: "**Based upon the information received in response to the notices and evaluations of cost and accident data, the Administration has concluded that, at the present time, the safety benefits achievable in terms of lives and injuries saved would not be commensurate with the cost of implementing the proposed requirements**. ... [N]otice is hereby given that the rulemaking action is terminated, and that no final rule will be issued on this subject without further notice of proposed rulemaking." [36 FR 11750 (June 18, 1971)(emphasis added)].

NHTSA reopened this rulemaking docket in 1977. [Docket 1-11; Notice 7 (ANPRM Aug. 29, 1977)]. On September 24, 1979, NHTSA denied a petition for rulemaking submitted by William H. Page, Jr., the holder of a patent on a "guard rail device for protecting ... animals, people, automobiles, etc., from falling under the rear wheels of a large wheel diameter vehicle" such as a trailer. [Abstract to Patent No. US 4060268 A]. Mr. Page had requested that NHTSA require side guard devices of this type on all large trailers. In its published denial of that request, NHTSA stated that it was "pursuing rulemaking in the area of truck rear underride devices. In the course of that rulemaking, **the agency will collect information relating to the problem of**

side underride. Until the agency has gathered this material on side underride, it does not consider it appropriate to invest more of its limited agency resources in this area. The agency will continue to gather information on side underride during the rear underride rulemaking. **If the evidence gathered by the agency indicates that side underride rulemaking could contribute significantly to safety, the agency will commence rulemaking.**" [44 FR 55077 (Sept. 24, 1979)(emphasis added)].

In its 1991 Preliminary Regulatory Evaluation of proposed guards for rear underride, NHTSA's Plans and Policy Office of Regulatory Analysis stated: **"Combination truck side underride counter-measures have been determined not to be cost-effective."** [Docket 1-11; Notice 9; Comment 002, page 15 (emphasis added)].

As far as TTMA has been able to determine, this 1991 pronouncement is the last official published statement by NHTSA on whether side guards for passenger vehicle impacts are warranted on large trailers. In 1996, when NHTSA announced final rules establishing safety standards to govern rear impact guards, neither the 1995 Final Regulatory Evaluation supporting the new rear impact guard standards [Docket 1-11; Notice 10; Comment 003], nor the agency's technical analysis set forth in the Federal Register announcement [61 FR 2004 (Jan. 24, 1996)], mentioned again any proposal to require side guards on trailers.

ECONOMIC FEASIBILITY

In 2004, after inquiring unsuccessfully at NHTSA whether the agency had retained its analysis supporting the statement in the 1991 PRE that side countermeasures were not cost-effective, TTMA engaged NHTSA's former Executive Director, Robert Shelton, to review that conclusion using the same analytical approach that NHTSA would use if the question was presented anew. Mr. Shelton previously had oversight responsibility at NHTSA's Office of Regulatory Analysis and was familiar with the analytical techniques utilized at NHTSA for evaluating proposals for underride protection. Mr. Shelton's study, "Potential Costs, Safety Benefits, and Cost Effectiveness of Side Impact Guards for Truck Trailers," is premised on the *assumption* that the general designs and costs of rear impact guards can be extrapolated to hypothetical side impact guards on van-style trailers. Based on an estimated guard length of 26 feet on each side of a trailer, and using weight and cost data for rear impact guards obtained from TTMA members, Mr. Shelton estimated that side impact guards, if designed similarly to then current rear impact guard designs, would add at least 750 pounds and $1,560 (2004 dollars) to each van trailer. Consistent with NHTSA's determination in the 1991 PRE, Mr. Shelton concluded that side guards for trailers were not cost-beneficial.

TTMA produced the Shelton Report for public review and comment by delivering a copy to NHTSA for filing in the rear underride docket [Docket 1-11]. TTMA also submitted a copy of the Shelton Report to the federal Pipeline and Hazardous Materials Safety Administration, which had requested comments on the feasibility of requiring side guards for "damage protection" or the alternative of requiring "purging systems" for piping underneath tank trailers. 69 Fed. Reg. 78375, 78378 (Dec. 30, 2004) (acknowledging concerns regarding costs of adding 1,100-to-1,200 pound side guard devices that would be rigid enough to protect wetlines in the event of a side impact); 80 Fed. Reg. 81501, 81503 (Dec. 30, 2015) (concluding that purging system is the only workable option but that prohibiting the transport of flammable liquids in wetlines through the mandated use of those systems is unlikely to be cost beneficial given the low-frequency of

side underride accidents into tank trailers). (Another copy of the Shelton Report is attached to the present comment as "Exhibit A," amended version – April 2006.)

TTMA has recently obtained additional information regarding the analytical support for NHTSA's determination in the 1991 PRE that side guards for trailers were not cost-beneficial. James Simons, the former Director of the Office of Regulatory Analysis and Evaluation at NHTSA, has documented for the record the analysis he performed in 1991 and in1995 in reaching the conclusion that side underride guards were not cost-beneficial. (Mr. Simons has authorized TTMA to file a copy of his recent report, and a copy is attached to the present comment as "Exhibit B.")

TTMA believes that the cost-benefit analyses by Shelton and Simons are consistent with market indications both in the 1990s and at present. None of the trailer manufacturers that have undertaken to assess the possibility of installing side guards, or that have gone so far as attempt to design such guards, have actually moved forward with testing or production of side guards. None of the side guard concepts that have been patented in recent years are known to have been actually built, tested and offered for sale. No component part supplier is known to have attempted to introduce side impact guards through any of the national trade shows where new products are announced. Simply put, there are no side impact guards that are commercially available for installation on trailers. TTMA believes that customer demand is non-existent due, in part, to the relatively low frequency of side underride accidents and the significant added cost and weight per trailer inherent in the design concepts that have been analyzed.

TECHNOLOGICAL FEASIBILITY

TTMA also believes there is no customer demand for side impact guards because of the many unresolved technological challenges to equipping trailers with such guards. NHTSA has already recognized in its rulemaking analysis for rear impact guards that there is a trade off between guard strength and energy absorption. Increasing guard strength may result in a decrease in the guard's ability to absorb energy, and simply preventing excessive underride may not result in a survivable accident due to the high deceleration forces that can be imposed on occupants of the impacting vehicle. [See 61 FR at 2008-2009]. The "balancing" of strength and energy absorption defined by NHTSA for rear impact guards may not be the optimum balance needed for side guards.

Even the current rear impact guard requirements have not been reliably determined to have achieved a net benefit. (DOT HS 811 375, October 2010, "The Effectiveness of Underride Guards for Heavy Trailers"). Moreover, based on 2008-2009 data in a Truck Involved Fatal Accidents Study, it appears that nearly half of the fatalities in rear underride collisions into trailers equipped with guards occurred in crashes in which the rear of the trailer did *not* compromise the passenger vehicle windshield. (See UMTRI 2001-51, 5/20/11, "Analysis of Rear Underride in Fatal Truck Crashes," p.45, Table 31). The same study reported that in offset crashes into trailers equipped with rear impact guards, nearly two-thirds of the reported fatalities did *not* involve any passenger compartment intrusion. (Id. p.41, Table 25).

It therefore appears that the guards involved in the reported 2008-2009 crashes represent a roughly 50/50 or 60/40 "balance" between fatal deceleration and other contact injuries in collisions without excessive underride, and fatal injuries resulting in crashes that did involve

passenger compartment intrusion (which may, or may not, have caused the fatal injuries). There are no doubt non-fatal injuries also occurring to *other* occupants in some of these collisions, and some of these injuries are likely of high severity. Within this universe of rear crashes, to the extent the guards are strengthened at the center or outboard positions in an effort to reduce the likelihood of passenger compartment intrusion, the risk of more severe (and even fatal) injuries to these other occupants will increase, assuming all other factors in these collisions remain the same. By strengthening guards, the "balance" may shift in an effort to reduce excessive underride fatalities, but a complete assessment of the net benefits, if any, must also account for the likely increase in fatalities in accidents where there is no passenger compartment intrusion. This same assessment must also be undertaken for any proposed side guards on trailers for passenger vehicle impacts. For example, the unbelted rear seat passenger or the small child passenger who may not be injured in a side collision into a trailer not equipped with sideguards will experience different and more severe deceleration or contact forces if the trailer is equipped with side impact guards. These increased forces can be fatal.

Moreover, rear impacts usually occur with the front of the impacting vehicle striking the rear of the trailer at angles of approximately 90 degrees to the rear of the trailer. In those accidents, several feet of frontal structure of the impacting vehicle and its design crush characteristics are available, along with the energy dissipation capability of the trailer's rear impact guard, to effectively resist passenger compartment intrusion and reduce excessive deceleration forces, at least at speed differentials up to the 30-35 mph considered by NHTSA in its rear underride rulemaking. Side impacts however, can and do occur at angles of 0 through 180 degrees to the side of the trailer. At smaller angles, the contact becomes more of a "glancing" rather than frontal impact. The "glancing" impacts can range from same-direction overtaking accidents to high speed opposing direction accidents. In either orientation, in these glancing impacts the vehicle's frontal structure and its crush characteristics are not available to absorb energy and resist underride. In a side-to-side impact there is little protection afforded by the relatively shallow side structure and smaller crush resistance of the impacting vehicle, and any energy absorption provided by a deforming a side guard would only increase the possibility of excessive underride and passenger compartment intrusion.

Therefore, an additional dilemma exists in establishing design criteria for side guards in these circumstances. For impacts occurring at angles of approximately 90 degrees (and *assuming* an equivalent array of impact speeds as NHTSA considered for developing the rear impact guard standards), NHTSA might conclude that side guards should provide a balance of strength and energy absorption as is required for rear impact guards. On the other hand, for shallow "glancing" impacts, the guard theoretically should be non-yielding. It must also be determined whether the desired outcome should be to "redirect" the impacting vehicles in glancing accidents, or to "capture" those vehicles against the trailers, which themselves will likely be in motion (and in directions more varied in relation to the impacting vehicles than in collisions into rear impact guards). All of these alternatives can create additional safety risks, depending on the circumstances of the accidents. Thus, extensive data will needed on the range of impact angles and speeds, on the performance of various vehicle crush characteristics and restraint systems, on the resultant vehicle dynamics if the impacting vehicle is engaged or redirected, and on the full range of occupant kinematic responses under these varying conditions, before effective standards can be established for trailer side guards.

Another technical challenge lies in fact that most semi-trailers sold in the United States are equipped with sliding tandem axles at the rear, which allow the operator to move the axles

forward or rearward and thereby allocate more or less of the cargo weight to the tractor axles in order to comply with per-axle weight limits and bridge laws imposed by various state and federal highway departments. A "fixed" side guard could not occupy the expanding areas behind, or in front of, the tandem axles as they are repositioned. Without guard coverage in those areas, any estimates of the effectiveness of proposed side guards would have to account for the percentage of collisions that are occurring behind, or in front of, the tandems, since those areas would not be guarded unless some kind of adjustable guard sections were incorporated into the guard designs.[1] However, no side guards have been designed and tested that are both adjustable in this manner and strong enough to prevent passenger compartment intrusion to the degree that NHTSA has required for rear impact guards. There is simply no commercially available device that would cover the entire trailer sides, allow for sliding tandem axles and provide the load bearing capability required for 30-35 mph impacts. Without full coverage, any feasibility assessment of proposed side guards would have to consider only crashes into the covered areas, and TTMA is not aware of any comprehensive accident data that provides this level of detail regarding collision locations in side impacts.

Adding side guards to trailers would also increase the trailer tare weights substantially (approx.1,100 pounds) and thus decrease the allowed maximum cargo weight on those trailers. [See 23 CFR 658.17(b) (80,000-pound limit for combined tractor, trailer and cargo weight)]. For those trailers that are routinely loaded at or near the allowed maximum, some cargo would be displaced and would have to be transported on other trailers. The net result would be more and heavier tractor-trailers traveling on the nation's highways, which would produce dis-benefits in terms of not only fuel consumption and greenhouse gas generation, but also decreased highway safety since the statistical likelihood is that those additional trucks would be exposed to more accidents of all types, not just side underride accidents. The bottom line: Cargo displacement puts more heavy trucks on the road, and more trucks will contribute to an increase in the number of truck-involved accident of all types.

Operational conditions must also be considered when analyzing proposals to equip trailers with side impact guards. Snow and ice buildup on the guard structures would be likely during winter operations. The weight of compacted snow and ice would also add to the tare weight of the trailer and further reduce the weight of the cargo that can be legally transported. And there is a potential safety issue with chunks of melting ice falling off the trailer into the paths of on-coming or adjacent vehicles. In addition, there is the significantly increased likelihood of high-centering the side guards on steep changes in highway and street levels, such as elevated railroad crossings, and at warehouse docking wells. Not only could high-centering result in damage to the side guards and their supporting structures, but more importantly this situation could result in the undesirable consequences of tractor-trailers becoming stranded on railroad tracks. Such incidents already occur when operators of low frame trailers misjudge clearance heights at railroad crossings. If all trailers are to have substantial side guards extended beneath the trailer sides, these accidents would undoubtedly become more likely.

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[1]Because this data does not exist, the Shelton Report could not attempt to carve out these accidents in its analysis, and therefore in essence the Shelton Report assumed that all of the accidents occur in areas that would be protected by the hypothetical side guards in front of the tandem axle slide range, thus overestimating the effectiveness of the hypothetical guards considered in that report.

2014 NTSB RECOMMENDATION

In 2014, the outgoing Chairman of the National Transportation Safety Board, Deborah A.P. Hersman, published a letter she sent to David J. Friedman, then Acting Administrator of NHTSA, recommending "that NHTSA require that newly manufactured trailers with GVWRs over 10,000 pounds be equipped with side underride protection systems that will reduce underride and injuries to passenger vehicle occupants." [See NTSB "Safety Recommendations" p. 8 (H-14-002) (April 3, 2014)]. NTSB is required to only consider the safety implications of its recommendation and need not consider whether its recommendation is cost-effective which, as discussed above, has already been analyzed by NHTSA. Thus, without regard to the expected costs of this recommendation, and without specific assessment of the likely benefits of any particular side guard concept, NTSB recommended that NHTSA require side guards based on what it concluded were "promising technological solutions" to protecting passenger vehicle occupants from being injured in side underride collisions. According to NTSB:

> A 2009 project funded by the European Commission designed and tested a side underride guard for trailers that prevented passenger vehicle compartment intrusion from side underrides. A side underride protection system on trailers was also developed and tested in the United States. It prevented passenger compartment intrusion and reduced the likelihood of head, chest, neck, and femur injuries. Some European researchers have proposed systems that would modify frames of trailers as an alternative to side underride guards and at least one manufacturer has sold trailers with a protective frame that is designed to prevent or mitigate both rear and side underride collisions.

[See NTSB "Safety Recommendations" pp. 7-8 (H-14-002) (April 3, 2014) (footnotes omitted)].

In a footnote to this analysis, NTSB identified the 2009 European Commission project, which had reported the results of a crash test not into a trailer equipped with a "side underride guard" but rather into a "reinforced pallet box" attached underneath a European-style flatbed trailer. The reinforced pallet box reportedly prevented excessive underride in a 40 mph perpendicular crash test using a 2,646-pound Fiat Bravo. The reinforced pallet box weighed 880 pounds, and it covered only the area in front of the triple-axle suspension of the trailer.

As NHTSA is no doubt aware, European trailers typically do not have sliding suspensions, but rather permanently set axles, and these trailers are typically constructed using two large frame rails that run the entire length of the trailer, unlike most trailers manufactured in the US which are of a semi-monocoque design. As a result, the European test trailer provided substantial frame rails to which the reinforced pallet box could be attached. Only flatbed or platform trailers in the US offer similar frame rails. Moreover, the width of the reinforced pallet box was not described in the 2009 report, but photographs suggest that it was only a few feet wider than the Fiat Bravo – perhaps 10 feet at most. If 26 feet of trailer length needed equivalent protection on a US trailer, the added weight would likely exceed 2,000 pounds and still not cover the areas in front of, or behind, the sliding tandem axles used on most trailers in the US. In sum, the lack of comparable attachment rails and the substantial weight penalty indicate that the reinforced pallet box concept would find no market acceptance in the US absent a federal regulatory requirement. Even the European Commission has not mandated reinforced pallet boxes or side

guards for passenger vehicle impacts, but rather only requires light-weight guards for pedestrian and cyclist protection against getting caught under the trailer wheels.

The NTSB 2014 recommendation also referenced a European trailer manufacturer that has sold trailers with "a protective frame that is designed to prevent or mitigate both rear and side underride collisions." This is likely a reference to the Safe Liner model trailer developed in Germany in the late 1990s by Bernard KRONE GmbH. Again, as a European-style trailer, the trailer rear axles on the Safe Liner design were not adjustable. The full-length longitudinal frame rails were redesigned and located outboard of the trailer wheels, and an internal "space frame" system of frame supports and storage boxes was incorporated in front of the wheels, below the trailer floor. The exterior was completely covered to promote aerodynamic performance. Crash tests involving small passenger vehicle impacts at speeds between 30 and 40 mph demonstrated the ability of the exterior frame to prevent excessive underride, and the Safe Liner was widely publicized in early 2000 as safer trailer design.[2]

However, what is not disclosed in the NTSB recommendation is that the Safe Liner model was a technological and commercial failure. Between 1999 and 2003, KRONE sold 387 Safe Liner trailers, but beginning in late 2000 and in early 2001, its customers started to report problems in trailers that had traveled about 50,000 miles, especially those trailers that had been subjected to full payload use. Due to the increased rigidity in the trailer structure that resulted from the added frame supports, the trailers were less flexible when operated over uneven road surfaces or on surfaces that produced twisting forces. Cracks began to appear in the major beams and cross members. Safe Liner trailers became disabled during highway use and presented safety risks to other motorists. Attempts to reinforce the areas where cracks had appeared only made the frames more rigid and transferred the location where cracks would develop. Even though KRONE had conducted test runs over its test tracks, it took actual road mileage to expose the detrimental and dangerous effects of adding rigid structures underneath the sides of trailers. In addition, the fully-enclosed sides of the trailers reduced the airflow over brake disks and allowed too much heat to build up inside the brake housings. KRONE eventually concluded that the Safe Liner design was not technologically feasible and presented a risk of major accidents, so in 2003 it discontinued production and repurchased these trailers from its customers. This history of the KRONE Safe Liner is documented in a deposition of Yorg Sanders, a KRONE representative who testified in 2006 a lawsuit then pending in Texas against Lufkin Industries, Inc., a US company that no longer manufactures trailers. (A copy of the transcript of that deposition is attached to the present comment as "Exhibit C.")

The remaining reference in the 2014 NTSB recommendation to a "side underride protection system ... developed and tested in the United States" is supported by a footnote citation to a paper authored by, among others, Bruce Enz and Perry Ponder, two consultants who for several years have been engaged to testify for plaintiffs in product liability lawsuits filed against trailer manufacturers arising out of underride accidents. Along with John Tomassoni, a former NHTSA official and also former consultant for plaintiffs in litigation, Mr. Enz has in fact built and tested rigid side guards that were installed as after-market devices on van-style trailers. Mr. Enz has recently testified that at some point Mr. Tomassoni delivered the crash test data to NHTSA, although TTMA has not been able to locate this information in the rulemaking docket. TTMA

[2] See, e.g., http://trailer-bodybuilders.com/archive/outside-frame-avoids-side-underride

understands that a patent application under the name of Mr. Enz and Mr. Tomassoni, among others, was filed in 2006 but was denied. [Patent Application No. US 20080116702 A1].

The Enz side guard design depicted in the patent application weighed 1450 pounds and only covered the area underneath the trailer in front of the trailer wheels after allowing for the full slide range of the tandem axles. The angled bracing in the Enz design (called "V bar struts" and "angled struts" in the patent application) provide connecting points between the horizontal portion of the guard and cross members on the bottom of the trailer. A later, lighter version of the Enz design has fewer struts, but in both versions the struts are welded to the bottom flanges of the I-beam cross members that support the trailer floor. As with the Krone design, these connections to the rigid side guard alter the flex characteristics of the trailer structure.

TTMA has issued a Recommended Practice (TTMA RP 37-07) that establishes a standardized method to test and certify the strength of a trailer floor. In the course of evaluating the Enz guard designs, a former trailer engineer for a TTMA member arranged to retro-fit a 2012 Great Dane van-style trailer with the most recent Enz side guard design and subject the trailer to a slightly modified version of this floor-rating test. The weight of the test trailer prior to installation of the side guard system was 13,180 pounds and, after installation, 14,360 pounds—an increase of 1,180 pounds. The Recommended Practice requires driving a lift truck with its front axle loaded to the floor's rated load (19,000 lbs in this test) in and out of the trailer for 4,500 center cycles, followed by 2,000 cycles close to a side of the trailer, and then 100 cycles under a 125%-overload condition. The test started with running the 4,500 center cycles but was modified so that the lift truck was not required to exit and re-enter the trailer with each cycle. (The side guards did not extend to the rear of the trailer, so the strength and durability of the rearmost section of the floor was not at issue.) Before completion of the first 4,500 cycles, a floor cross-member near the rear of the side guards prematurely cracked where an angled strut from the side guard was attached, exhibiting a catastrophic fatigue failure. The remaining 2,000 side-cycles and 100 overloaded cycles were not performed.

Although a floor rating test is not a comprehensive, life-cycle endurance test, it does realistically simulate loadings to the floor and its structural components that a van trailer experiences during its service life. The TTMA RP 37-07 establishes the criteria that all cycles of a test must be completed without a component failure. In this instance, the floor failed at less that 65% of the total required cycles, and it did so in a manner consistent with the experience of the KRONE Safe Liner: Adding rigid components underneath and along the sides of the trailer floor made the frame more rigid and created focal points for fatigue failures. TTMA submits that had the test trailer been subjected further to a rigorous, comprehensive life-cycle endurance test, additional unacceptable structural weaknesses of the Enz side guard system and its attachments would have been revealed. (Copies of photographs showing the crack that occurred during the center-cycle test is attached to the present comment as "Exhibit D.")

CONCLUSION

TTMA appreciates this opportunity to comment on a few of the important issues that should be considered as NHTSA reviews the Petitioners' "request to improve side guards." [79 FR at 39363]. The agency's previous cost-benefit analysis of hypothetical side guards appears well-founded, as are the practical negative considerations of cargo displacement, fuel penalty and greenhouse gas generation. Side guards, if required as rear guard equivalents, are not cost-

beneficial under the agency's formula, particularly if side underride accidents into areas that would be left unguarded as a result of sliding tandem axles are somehow quantified and considered. TTMA members have experienced no market demand from their customers for side guards of sufficient strength to resist passenger vehicle underride, and no after-market parts supplier is actively marketing such side guards for retrofit use.

In addition, numerous technological challenges are presented by the concept of adding side impact guards to existing trailer designs or by redesigning trailers entirely, as was attempted in the case of the KRONE Safe Liner. The bottom line is that *theoretical* design concepts are easy to generate, but labeling such ideas as "promising technological solutions," as has the NTSB (apparently without full knowledge of the designs and their field experience), does not advance the science of feasible technology. Meanwhile, crash avoidance technologies are rapidly developing for passenger vehicles that may prove both technologically feasible and cost-beneficial for all types of collisions, including collisions into the sides of trailers.

TTMA would support the implementation of side impact guards if they ever become justified and technologically feasible. We continue to support the NHTSA review of Petitioners' requests and stand ready to partner in the development of justified and feasible designs if they possibly emerge.

Sincerely,

Jeffrey M. Sims

Jeffrey M. Sims
President