KENTUCKY TRAILER
A Servant Leader Company

Kentucky Trailer
3400 Robards Court
Louisville, KY 40218
(502) 637-2551
(502) 635-1314 fax
(888) 598-7245 toll free

Corporate Support Center

January 10, 2022

Via Electronic Mail: nate.seymour@dot.gov and ODI_IRresponse@dot.gov

U.S. Department of Transportation
National Highway Traffic Safety Administration
1200 New Jersey Avenue S.E.
Washington, DC 20590

Re: Kentucky Trailer Manufacturing Response to December 13, 2021 Letter from Office of Defects Investigation of the National Highway Traffic Safety Administration

Dear Sir or Madam,

This response letter ("Response Letter") is delivered on behalf of Kentucky Trailer Manufacturing ("KTM") in response to that certain letter ("Letter") directed to KTM dated December 13, 2021 from the Office of Defects Investigation ("ODI") of the National Highway Traffic Safety Administration ("NHTSA") regarding Defect Petition DP21-004 assessing the lack of side underride guards on select semi-trailers and requesting certain information. As an initial point of clarification, "Kentucky Trailer Manufacturing", the entity to which the Letter was directed, is a tradename utilized by the R.C. Tway Company, LLC, a Kentucky limited liability company ("Kentucky"). Kentucky manufactures "van-type semi-trailers" for sale or lease in the United States and also owns and operates certain subsidiary entities that manufacture "van-type semi-trailers" for sale or lease in the United States. This Response Letter is delivered by Kentucky, and is responsive as to Kentucky and all such subsidiary entities (during the period of their ownership by Kentucky).

1. **State by model year the number of subject vehicles Kentucky has manufactured for sale or lease in the United States since 2006. Include by model year the number of subject vehicles which were manufactured by Kentucky with side underride guards as original equipment.**

Year	Number of subject vehicles manufactured during relevant period (None manufactured with side underride guards as original equipment)
2006	2,108
2007	1,516
2008	1,070
2009	690
2010	871
2011	1,459
2012	1,438
2013	1,367
2014	1,284
2015	1,210
2016	1,361

2017	1,403
2018	1,625
2019	2,390
2020	1,687
2021	1,490
Total	**22,969**

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

2. **State the current or estimated number of Kentucky subject vehicles still in service for all model years.**

The service life for van-type semi-trailers varies widely depending on, among many other factors, the particular type of trailer, the intensity of use, the environmental conditions in which the trailer operates, the degree of ongoing preventative and other maintenance, and any damage sustained during operation. However, Kentucky has attempted to factor in all of the above across all of its van-type semi-trailers and estimates that 85% of the 22,969 van-type semi-trailers manufactured by Kentucky since 2006, or 19,524 units, remain in service today.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

3. **Please report Kentucky current percent of the subject vehicle market share.**

Based on data provided by ACT Research, a provider of market data, industry analysis, and forecasting services for the commercial vehicle and transportation markets, the annual production of van-type semi-trailers in the United States for 2020 was approximately 158,935 trailer units. In light of the fact that Kentucky manufactured 1,687 van-type semi-trailers during the 2020 year, Kentucky estimates that its current percent of the subject vehicle (van-type semi-trailer) market share is approximately 1.061%.

Source of Information: ACT Research market data and internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

4. **Provide a brief summary of any and all reports, claims, or other notices received by Kentucky, or of which Kentucky is otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles or vehicles equipped with side underride guards.**

As best Kentucky is able to determine, of the 22,969 van-type semi-trailers manufactured for sale or lease in the U.S. since 2006, Kentucky is aware of only one vehicle side underride incident involving a Kentucky trailer. No lawsuit was filed or claim asserted in connection with the incident nor was any notice provided to Kentucky in connection with same. Kentucky became aware of the incident only when the subject trailer was brought in for repair.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

5. **Does Kentucky currently offer side underride guards as standard or optional equipment? If yes, is it a Kentucky design or from another supplier? If from another supplier, identify the supplier and provide their contact information.**

Kentucky does not currently offer side underride guards as standard or optional equipment on its van-type semi-trailers.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

6. **Produce copies of all installation, service, warranty, and other documents that relate to, or may relate to, the subject component in the subject vehicles.**

Kentucky is not in possession of any installation, service, warranty, and other documents that relate to, or may relate to, the subject component in the subject vehicles.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

7. **Provide a brief summary of all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations that relate to, or may relate to the subject component that have been conducted, are being conducted, are planned, or are being planned by, or for, Kentucky.**

Kentucky has reviewed the information available online for the AngelWing and Safety Skirt products. Kentucky has also preliminarily considered the performance characteristics of side underride guards generally. Side underride guards are a complex subject and their design is technically challenging. In regard to the above products, the information available online with respect to installation requirements, performance specifications, and cost is not very thorough or informative. The installation requirements of a guard are important inputs as they help ensure that the trailer structure is not compromised (among other things). The area on the side of a trailer that a side guard would attempt to protect is also an important performance specification. The testing thus far made available with respect to the AngelWing guard has only focused on the center area of the guard. It is possible that a vehicle strike near one end or at a small approach angle could give rise to negative unintended consequences. There does not appear to be any data available related to these circumstances.

Another element of side underride guards to be considered is the rigidity of the guard. Both rigid and flexible guards have benefits and burdens. Ground clearance is a major shortcoming of rigid guard designs as they increase the potential risk of a driver "high centering" a trailer. Rigid guards are also prone to being quite heavy due to the weight of the materials from which they are constructed. This additional weight directly offsets the amount of cargo a trailer can carry, which in turn increases the number of trips the trailer must take to carry the same

amount of product. Rigid guards also have the potential to reduce the durability of the floor system of the trailer by not allowing the floor to flex during forklift loading.

Flexible guards have their own set of shortcomings ranging from additional strength needed for the mounting points to their potentially hindering the visibility of key items in the driver's pre-trip inspection. A flexible guard also has the potential to act like a rubber band, with the results of a glancing impact on a passenger vehicle or its occupants not known. In addition to the above, feasible side underride guard designs must take into consideration ground clearance, effects on the durability of the trailer structure, additional weight, cost, repair needs, and visibility concerns for inspections.

As a general matter, Kentucky is a relatively small manufacturer (by volume) and has historically primarily manufactured "drop deck" or "drop frame" van trailers. A drop deck trailer has a lower floor level behind the front landing gear area of the trailer, which gives them lower ground clearance than a typical straight floor van trailer. In a typical drop deck furniture van trailer (Kentucky's legacy product line), the belly of the trailer behind the front landing gear is equipped with a belly mounted storage box, walkboard rack, and/or spare tire rack. Many of Kentucky's other product lines, including double-expandable trailers, vehicle transport trailers and mobile medical trailers, also utilize a drop deck trailer design. The installation of a side underride guard on these trailer models would likely not be possible or practical given the trailer's design.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

8. **Anglewing is one aftermarket manufacturer of side underride guards. Please assess the compatibility of this product with Kentucky trailers. See the following link for additional information: http://www.angelwingskirts.com/**
   a. **Effect, if any, this guard will have on the structural integrity of Kentucky trailers;**

There are no design specifications or drawings and very little installation information on the website to allow Kentucky to make any determinations as to the effect this guard would have on a Kentucky trailer structure. The guard appears to be very rigid and low to the ground, which has the potential to lead to dangerous high-centering situations. If a trailer with a rigid side underride guard gets high-centered it could cause serious structural damage to the trailer. Also, drilling holes in the ends of floor cross-members may not be the best mounting location for this guard, as it may lead to durability issues with the floor system after repeated forklift traffic.

   b. **The approximate weight this side underride guard will add to Kentucky trailers;**

There is no weight information for this guard on the manufacturer's website, so the approximate weight this guard will add to a Kentucky trailer can only be estimated. The guard appears to be made of steel tubing and angle, which we assume were heavy enough that they needed to be supported by a forklift in the installation video. Based on the assumed lengths and quantities of material, Kentucky estimates that this guard would add approximately 800 lbs. to a Kentucky trailer.

   c. **The approximate reduction in cargo carrying capacity adding this side underride guard will have on Kentucky trailers;**

Again, there is no weight data for this guard available on the manufacturer's website, so we are unable to accurately determine what the reduction in cargo carrying capacity this guard would impose on a Kentucky trailer. As mentioned above, we estimate that the guard would reduce the cargo carrying capacity by approximately 800 lbs. The design of this guard would also impair Kentucky's ability to mount belly-mounted storage boxes on its

trailers, which is a common feature on Kentucky furniture vans and other trailers. This would further reduce the cargo carrying capacity due simply to reduced volume.

d. Effect, if any, this guard will have on the durability and service life of Kentucky trailers;

Without more complete mounting specifications it is difficult to determine how the mounting would affect the durability and service life of a Kentucky trailer. The mounting in the installation video only shows drilling holes in the cross-member web near each end. Trailer floor rating testing puts high loads and flex into the ends of the cross-members, and the mounting is critical to the durability of the floor system. Without testing the mounting of the guard, it is difficult to determine what its effect on the durability or service life of a Kentucky trailer would be. Different trailer models would likely all react differently to the installation of the guard, and they would have to be evaluated individually for how the guard might affect the durability or service life of that model.

e. The approximate cost, including materials and labor for installation of these guards both on new production and in-service Kentucky units;

There is no pricing available on the manufacturer's website to assist in making a determination of the cost of materials or installation of this guard on a new or in-service Kentucky trailer. As such, the costs provided herein are only estimates. If we were to assume that the guard weighs somewhere around 800 lbs., we would estimate the installation cost, including materials and labor, to be approximately $4,750 for installation on a new production unit. Installation on an in-service unit would likely be significantly greater.

f. Effect, if any, this guard will have on the maneuverability and operating environment compatibility of Kentucky trailers;

This guard appears to be made of steel tubing with rigid vertical supports tied into the floor cross-members. The guard also appears to be mounted fairly low and close to the ground, which has the potential to lead to a dangerous high-centering situation. If a trailer with a rigid guard gets high-centered it could cause serious structural damage to the trailer. There are many opportunities for a trailer to get high-centered in normal day-to-day driving. Railroad crossings, loading dock approaches, and parking lot features all have the potential for a trailer to get high-centered. Also, drivers who are accustomed to driving straight floor van trailers are probably not as likely to consider their travel route with high-centering in mind like a driver accustomed to driving a drop deck trailer. These drivers could have a higher potential to drive a route that would include some high-centering features because historically they never had to consider these types of features in their routes.

g. Your assessment of the effectiveness this side underride guard would have preventing injury or death of other roadway users when installed on Kentucky trailers; and

It is difficult to determine the effectiveness of this side underride guard without any data other than the video of one particular test case tested at the Insurance Institute for Highway Safety. This particular test case was a perpendicular crash into the middle section of the guard. From the video of this test on the IIHS website it is unclear whether the car struck one of the vertical supports directly or in between the vertical supports. This may have had a substantial effect on the guard's performance. Also, the test was never duplicated on the front or rear of the guard, which could potentially have reacted differently than the middle section of the guard. It is also unclear what the loading condition of the trailer was during this test. A fully loaded trailer with the load evenly distributed over the length of the trailer could react very differently than an empty trailer. Further, the guard does not cover the area behind the axles of the trailer. With the limited information and testing available, it is difficult to assess the effectiveness of this side underride guard would have preventing injury or death of other roadway users when installed on Kentucky trailers.

h. Your assessment of any additional concerns, issues, or benefits this side underride guard may have.

All current concerns, issues and benefits, and assessments thereof, are incorporated into the above responses.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

9. **Safetyskirt is one aftermarket manufacturer of side underride guards. Please assess the compatibility of this product with Kentucky trailers. See link for additional information: http://www.trailerguards.com/**
   a. **Effect, if any, this guard will have on the structural integrity of Kentucky trailers;**

There is no installation information on the website that would allow Kentucky to make any determination as to the effect this side underride guard would have on a Kentucky trailer structure. The guard and its mounting method is mostly obscured behind an aerodynamic skirt in the photos and videos on the website. It does appear to have a large rigid structure mounted to the lower rail and the underside of the floor at the rear of the trailer. How this is connected to the underside of the floor is unknown, and it is unknown what effect this might have on the structural integrity of a Kentucky trailer.

   b. **The approximate weight this side underride guard will add to Kentucky trailers;**

There is no weight information for this guard on the manufacturer's website, so the approximate weight this guard will add to a Kentucky trailer is only an estimate. The guard appears to include a large steel assembly at the rear and an unknown attachment point at the landing gear, and it is apparently combined with the Angelwing side guard mounted between the landing gear and the front trailer axle. Based on the assumed weight of the Angelwing guard being 800 lbs, (as set forth in Section 8 above) plus the additional Safetyskirt portion's estimated weight of the large steel assemblies and front attachment point being 350 lbs, we estimate that this complete guard system would add approximately 1,150 lbs. to a Kentucky trailer.

   c. **The approximate reduction in cargo carrying capacity adding this side underride guard will have on Kentucky trailers;**

There is no weight data for this guard on the manufacturer's website, so we are unable to accurately determine what the reduction in cargo carrying capacity this guard would impose on a Kentucky trailer. As mentioned above, we estimate that the guard would reduce the cargo carrying capacity by approximately 1,150 lbs. The design of this guard would also inhibit Kentucky's ability to mount or access its belly-mounted storage boxes, which is a common feature on Kentucky furniture vans and other trailers. This would further reduce the cargo carrying capacity due simply to reduced volume.

   d. **Effect, if any, this guard will have on the durability and service life of Kentucky trailers;**

Without more complete mounting specifications it is difficult to determine how the mounting would affect the durability and service life of a Kentucky trailer. As mentioned above, this guard appears to incorporate the Angelwing guard into its design. The mounting of the Angelwing guard in the installation video only shows drilling holes in the cross-member web near each end. Trailer floor rating testing puts high loads and flex into the ends of the cross-members, and the mounting is critical to the durability of the floor system. The Safetyskirt portion of the guard system and its mounting method is mostly obscured behind an aerodynamic skirt in the photos and videos on the website. It does appear to have a large rigid structure mounted to the lower rail and the underside of the floor at the rear of the trailer, and the mounting point at the front is unknown. How this is connected to the underside of the floor is unknown, and it is unknown what effect this might have on the durability or service life of a Kentucky trailer. Without testing the mounting of this combination guard system, it is difficult to determine what its effect on the durability or service life of a Kentucky trailer would be. Different trailer models would react

differently to the installation of the guard system, and they would have to be evaluated individually to determine how the guard system might affect the durability or service life of each model.

e. The approximate cost, including materials and labor for installation of these guards both on new production and in-service Kentucky units;

There is no pricing available on the manufacturer's website to assist in making a determination of the cost of materials or installation of this guard on a new or in-service Kentucky trailer. As such, the costs provided herein are only estimates. As mentioned above, this guard appears to incorporate the Angelwing guard into its design, so the cost of the Angelwing guard would be combined with the additional cost of the Safetyskirt portion of the guard system. Assuming the additional Safetyskirt portion of the guard system weighs an additional 350 lbs. and includes the aerodynamic skirts, we would estimate the installation cost, including materials and labor, to be approximately $7,250 for installation on a new production unit. Installation on an in-service unit would likely be significantly greater.

f. Effect, if any, this guard will have on the maneuverability and operating environment compatibility of Kentucky trailers;

The information available on the website for this side underride guard does not describe or show the guard design or how it is installed. As mentioned above, the Safetyskirt guard appears to incorporate the Angelwing guard into its design, thus all the maneuverability and operating environment compatibility issues mentioned for the Angelwing guard would apply to this guard system. Kentucky is able to determine that the guard shown may have the negative effect of obscuring the ends of the trailer axles, which may make it difficult to verify wheel bearing lubricant levels or check the pressure levels of the trailer's tires.

g. Your assessment of the effectiveness this side underride guard would have preventing injury or death of other roadway users when installed on Kentucky trailers; and

It is difficult to determine the effectiveness of this side underride guard without any data other than the photos and video of the installed guard on the website. The website does not give any technical data in regard to the strength of the guard or any testing performed on the guard. It also does not give any information in regard to the type of protection it offers based on the location the striking vehicle impacts the trailer, or the approach angle of the striking vehicle. As mentioned above, the Safetyskirt guard includes the Angelwing guard between the landing gear and the front axle, so all the effectiveness comment items listed for the Angelwing guard apply here as well.

h. Please provide your assessment of any additional concerns, issues, or benefits this side underride guard may have.

All current concerns, issues and benefits, and assessments thereof, are incorporated into the above responses.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

10. Furnish Kentucky's assessment of the following in today's transportation system:

a. The feasibility of side underride guards;

In today's transportation system there are many different types of trailers utilized for many different tasks. As mentioned above, many of the trailers manufactured by Kentucky are drop deck trailers that would not accommodate a side underride guard without a removal of significant operational features. Further, trailer designs

and set-ups vary widely across the all trailers manufactured in the U.S. making a "one size fits all" approach to this issue complicated.

b. The industry financial cost of side underride guards;

The size, location, and performance criteria of particular side underride guards must all be known in order to understand the financial cost. Maintenance of a guard must also be considered in order for the guard to perform as designed. Without the necessary data, the final cost of a side guard could vary considerably based on the assumptions made by the guard manufacturers. In any event, we estimate the industry financial cost of side underride guards (including design, testing, manufacture, and installation) to be significant.

c. The effectiveness side underride guards may have preventing traffic crash injuries and fatalities;

The dynamics of a crash are complex when taking into account the varied approach angles, impact locations on a trailer, and impacting speeds. The reaction of the vehicle and the occupants in an angled impact need to be considered, and the lack of crash data makes the development of performance criteria dependent on assumptions by the manufacturer. More data is needed in order to make an assessment of the effectiveness of a side underride guard in preventing traffic crash injuries and fatalities.

d. The potential changes in the US transportation system side underride guards may require; and

Adding equipment to a trailer will ultimately displace cargo that the vehicle can carry. Thus, installing additional guards to a trailer will require more trailers on the road to deliver the same amount of cargo. The U.S. transportation system would need to be prepared to accommodate this additional traffic if side underride guards are mandated. Also, clearance challenges along trailer routes may need to be modified or marked to warn drivers of the potential of high centering.

e. The reports included with this inquiry.

No reports were included with this inquiry.

Source of Information: Internal communications and discussions with Kentucky and subsidiary management, engineering and finance teams.

Last date the above information was gathered: January 7, 2022

Should you have any further questions or need clarification regarding any of the above, please do not hesitate to contact me directly.

Sincerely,

[redacted]

George Gauntt,
Sr. Director of Research and Development