

# National Transportation Safety Board

Office of the Chair

Washington, DC 20594



June 6, 2023

Docket Management Facility  
US Department of Transportation  
1200 New Jersey Avenue SE  
West Building Ground Floor, Room W12-140  
Washington, DC 20590-0001

Re: Docket Number NHTSA-2023-0012

Dear Sir or Madam:

The National Transportation Safety Board (NTSB) has reviewed the National Highway Traffic Safety Administration's (NHTSA) advance notice of proposed rulemaking (ANPRM) titled "Side Underride Guards," published at 88 *Federal Register* 24535 on April 21, 2023. The ANPRM is responsive to the 2021 Infrastructure Investment and Jobs Act (IIJA), which required the US Department of Transportation to complete research on side underride guards to better understand their overall effectiveness, assess benefits and costs associated with side underride guards on newly manufactured trailers and semitrailers with a gross vehicle weight rating (GVWR) of 10,000 pounds or more, and seek public comment regarding its findings.<sup>1</sup>

The NTSB has long recognized side underride as a safety issue for passenger vehicle occupants as well as for vulnerable road users, such as motorcyclists, cyclists, and pedestrians. Side underride can occur when a passenger vehicle slides under a heavy vehicle during a collision. Side underride can also involve motorcyclists, cyclists, or pedestrians becoming trapped beneath the open sides of trucks or trailers.

The following comments describe NTSB safety recommendations issued to NHTSA that are directly related to side underride guards on trucks and trailers. The comments also document potential shortcomings of NHTSA's analysis of benefits associated with side underride guards. Finally, they describe several other NTSB safety recommendations, which, if implemented, could reduce the incidence of fatalities and injuries associated with heavy vehicle underride.

---

<sup>1</sup> IIJA, [Public Law 117-58](#), 135 Stat. 429 (2021), section 23011(c).

## NTSB Recommendations Concerning Side Underride Guards

As early as the 1970s, the NTSB recognized the potential benefits of side underride protection and issued a recommendation asking NHTSA to consider requiring it.<sup>2</sup> In 2013, the NTSB published a safety study concerning crashes involving single-unit trucks that resulted in injury or death.<sup>3</sup> Two of the safety recommendations issued in that study called on NHTSA to develop performance standards for side underride protection systems for single-unit trucks with GVWRs over 10,000 pounds ([H-13-13](#)) and to require newly manufactured single-unit trucks to be equipped with systems meeting those standards ([H-13-14](#)).

In 2014, the NTSB issued two additional recommendations concerning side underride as part of an NTSB assessment of tractor-trailer collisions.<sup>4</sup> Safety Recommendation [H-14-2](#) asked NHTSA to require 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. Safety Recommendation [H-14-3](#) called for similar side underride protection requirements for truck-tractors with GVWRs over 26,000 pounds.

In May 2020, the NTSB classified [H-14-3](#) Closed–No Longer Applicable. The NTSB determined that the recommendation was no longer necessary because truck-tractor designs had changed in response to fuel economy requirements and incentives. The new designs, which ride lower to the ground, had reduced the risks of passenger vehicle side underride crashes. Also in May 2020, the NTSB classified Safety Recommendations [H-13-13](#), [H-13-14](#), and [H-14-2](#) Open–Acceptable Response in response to a 2019 letter from NHTSA in which it committed to analyzing the impacts of requiring side guards on trucks and trailers by September 2020.

## NHTSA's Cost-Benefit Analysis

In the ANPRM, NHTSA described research it has done to estimate the benefits and costs associated with requiring side underride guards on combination vehicle trailers to prevent light passenger vehicle underride.<sup>5</sup> To calculate the annual number of fatalities and serious injuries associated with a passenger vehicle underriding the

---

<sup>2</sup> Safety Recommendation [H-71-42](#) was classified Closed–Acceptable Action in 1975.

<sup>3</sup> (a) Single-unit trucks are large trucks (with a GVWR over 10,000 pounds) with typically non-detachable cargo units that have all axles attached to a single frame. (b) See *Crashes Involving Single-Unit Trucks that Resulted in Injuries and Deaths*, [SS-13/01](#) (Washington, DC: NTSB, 2013).

<sup>4</sup> Deborah A.P. Hersman, Chairman, NTSB, letter dated April 3, 2014, to David J. Friedman, Acting Administrator, NHTSA, issuing [Safety Recommendations H-14-1 through H-14-7](#).

<sup>5</sup> (a) See the Office of Regulatory Analysis and Evaluation, National Center for Statistics and Analysis, *Side Impact Guards for Combination Truck-Trailers: Cost-Benefit Analysis*, DOT HS 813 404, (Washington, DC: NHTSA, 2023), which is available in the ANPRM docket [NHTSA-2023-0012](#). (b) In the ANPRM, NHTSA defines light passenger vehicles as passenger cars, light trucks, and vans with GVWRs of 10,000 pounds or less. For simplicity, throughout the remainder of this response, the NTSB will refer to such vehicles as passenger vehicles.

side of a trailer, NHTSA reviewed police crash reports from fatal crashes involving a passenger vehicle striking the side of a trailer in 2017. The agency concluded the number of fatalities associated with side underride was 78% higher than reported in its Fatality Analysis Reporting System. As a result, NHTSA estimated that there are about 89 passenger vehicle occupant fatalities and about 409 passenger vehicle occupant serious injuries associated with large truck side underrides of trailers annually.

The ANPRM also described a 2017 Insurance Institute for Highway Safety crash test that involved a midsize car impacting a trailer with a side underride guard (the AngelWing by Airflow Deflector) at a 90° angle at 40 mph.<sup>6</sup> The side guard prevented underride and the Insurance Institute for Highway Safety concluded that there would be a low likelihood of passenger vehicle occupant injuries in a similar real-world crash.

In its cost-benefit analysis, NHTSA limited its focus to two-vehicle crashes involving the front of a passenger vehicle striking the side of a trailer and did not fully consider other crash types that would likely benefit from side underride guards, such as high-speed sideswipe crashes. It also did not consider large truck side impacts with vulnerable road users or any type of side underride collisions with single-unit trucks. Further, NHTSA only calculated potential safety benefits for about 20% of fatal crashes in which NHTSA estimated that the passenger vehicle was traveling under 40 mph. For crashes where the estimated speed was over 40 mph, NHTSA's analysis assumed that a side underride guard would have no effectiveness.

NHTSA concluded that equipping trailers with side underride guards would save lives and prevent injuries but that the total costs of equipping new trailers with side guards would be six to eight times larger than the corresponding estimated safety benefits. The ANPRM requests comments on NHTSA's cost-benefit analysis.

## **NTSB's Response**

The subject ANPRM estimates the potential effects of a particular side underride guard (the AngelWing by Airflow Deflector) on preventing fatalities and injuries of passenger vehicle occupants involved in collisions with the sides of combination vehicle trailers. Employing this somewhat narrow approach, NHTSA found that the costs of requiring such guards exceeded the benefits.

---

<sup>6</sup> Insurance Institute for Highway Safety, Highway Loss Data Institute, "[Side Guard on Semitrailer Prevents Underride in 40 mph Test](#)," August 29, 2017.

The NTSB believes that the cost-benefit analysis presented in the ANPRM has several potential shortcomings, including the following:

- The analysis did not consider the potential costs or benefits of equipping single-unit trucks with side underride guards.
- The analysis did not consider the potential benefits of side underride guards in preventing or mitigating injuries to vulnerable road users, such as motorcyclists, cyclists, and pedestrians.
- The analysis did not consider the costs or benefits of other lateral protective devices, such as aerodynamic side skirts.<sup>7</sup> Aerodynamic side skirts are panels fitted to the lower edges of a trailer. Although they are not designed to prevent passenger vehicle underride, they can prevent vulnerable road users from being trapped between the open sides of trailers and may also save fuel by reducing air drag.
- The analysis assumed no effectiveness of side underride guards for speeds over 40 mph. However, since side underride guards were nearly 100% effective at 40 mph, it is likely that they would be at least partially effective at reducing death and injury at higher speeds.
- The analysis focused on benefits in two-vehicle, passenger vehicle front-to-side crashes with trailers rather than including all crash types in which side underride guards could provide safety benefits.
- The analysis used crash data from between 2008 and 2017; however, since 2017, there have been increases in the number of fatalities in large truck crashes for both occupants of other vehicles and nonoccupants.<sup>8</sup>

The NTSB believes that NHTSA should address these shortcomings in future analyses of the potential benefits of side underride guards. Further, the NTSB believes that NHTSA must engage in a more comprehensive and systemic approach to address the broader problem of heavy vehicle underride. Since 2013, the NTSB has issued numerous additional recommendations to NHTSA and the US Department of Transportation that, if implemented, have the potential to reduce fatalities and injuries from all heavy vehicle underride crashes, including side underride crashes. The recommendations, several of which are related to the [2021-2023 NTSB Most Wanted List of Transportation Safety Improvements](#), include the following:

---

<sup>7</sup> Lateral protection systems are required in several countries and in certain US cities. See the John A. Volpe National Transportation Systems Center 2021 document on "[Truck Lateral Protective Device Technical Overview](#)" for more information.

<sup>8</sup> National Center for Statistics and Analysis, "[Large Trucks: 2020 Data](#)," *Traffic Safety Facts*, DOT HS 813 286 (Washington, DC: NHTSA, 2022).

- Visibility enhancement systems to improve the ability of truck drivers to detect vulnerable road users in their travel paths ([H-13-11](#), [H-13-12](#), [H-14-1](#))<sup>9</sup>
- Conspicuity treatments on the sides and rears of single-unit trucks ([H-13-17](#))<sup>10</sup>
- Connected vehicle technology ([H-13-30](#), [H-13-31](#), [H-18-30](#), [H-19-35](#), [H-19-37](#), [H-22-1](#))<sup>11</sup>
- Test protocols to assess passenger vehicle collision avoidance systems at high velocities and high velocity-differentials ([H-15-4](#))<sup>12</sup>
- Forward collision avoidance systems for commercial vehicles ([H-15-5](#)) and assessing performance of passenger vehicle collision avoidance systems to detect cross-traffic vehicle profiles and other common obstacles ([H-20-1](#))<sup>13</sup>

On April 18, 2023, NHTSA announced the formation of an Advisory Committee on Underride Protection with members representing multiple stakeholder groups.<sup>14</sup> The committee was formed as a requirement of the IIJA; it is charged with providing “advice and recommendations to the Secretary [of Transportation] on safety regulations to reduce underride crashes and fatalities relating to underride crashes.”<sup>15</sup> The NTSB hopes that our recommendations aimed at reducing underride-related fatalities and injuries will be useful to this committee and that NHTSA will accelerate its efforts to address these recommendations.

## Summary

In summary, the NTSB is concerned that NHTSA’s cost-benefit analysis for side underride guards described in the ANPRM took a narrow focus, which led to an underestimation of the potential benefits of side underride guards. Further, the NTSB believes that NHTSA must engage in a more comprehensive and systemic approach to address the broader problem of heavy vehicle underride, and we encourage NHTSA to act on the recommendations described in this letter.

---

<sup>9</sup> Safety Recommendations [H-13-11](#), [H-13-12](#), and [H-14-1](#) are classified Open–Unacceptable Response.

<sup>10</sup> Safety Recommendation [H-13-17](#) is classified Open–Unacceptable Response.

<sup>11</sup> Safety Recommendations [H-13-30](#), [H-13-31](#), [H-19-37](#), and [H-22-1](#) are classified Open–Unacceptable Response. Safety Recommendation [H-18-30](#) is classified Open–Acceptable Response. Safety Recommendation [H-19-35](#), which was issued to the Intelligent Transportation Systems Joint Program Office within the US Department of Transportation, is classified Open–Await Response.

<sup>12</sup> Safety Recommendation [H-15-4](#) is classified Open–Unacceptable Response.

<sup>13</sup> Safety Recommendation [H-15-5](#) is classified Open–Unacceptable Response. Safety Recommendation [H-20-1](#) is classified Open–Acceptable Response.

<sup>14</sup> The members represent families of underride crash victims, truck safety organizations, motor vehicle crash investigators, law enforcement, labor organizations, motor vehicle engineers, the insurance industry, motor carriers, owner-operators, and truck and trailer manufacturers. (For more information, see NHTSA’s “[USDOT’s NHTSA Takes Steps to Advance Safety in Crashes Involving Passenger Vehicles and Large Trucks and Trailers](#),” April 18, 2023.)

<sup>15</sup> IIJA, [Public Law 117-58](#), section 23011(d).

Thank you for the opportunity to provide comments.

Sincerely,

Jennifer Homendy  
Chair