September 14, 2021

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Dear Secretary Buttigieg:

In accordance with 49 U.S.C. 30162 and 49 C.F.R § 552.1, we hereby petition the National Highway Traffic Safety Administration (NHTSA) to promptly initiate a safety defect investigation into van-type or box semitrailers[1] when being operated as intended because of a known safety hazard and defect from collisions with passenger vehicles and other vulnerable road users (pedestrians, bicyclists, or motorcyclists) resulting in death and significant injuries due to a lack of side underride guards. This investigation will clearly demonstrate that NHTSA should issue a recall order pursuant to 49 U.S.C. §§ 30118(b), 30119, and 30120 for all van-type and box semitrailers that lack side underride guards.

An "underride" collision occurs when a semitrailer collides with a passenger vehicle causing the passenger vehicle to slide under the body of a semitrailer, often crushing the vehicle and passengers within, or dragging the vehicle causing it to burn with passengers inside. Due to the height difference between passenger vehicles and semitrailers (in addition to single unit trucks; see NHTSA 2013), a collision bypasses the car's safety features because the point of impact is the passenger compartment, not the front bumper of the car (Kiefer as cited by Zasky 2018a). The bottom edge of a semitrailer is between forty-two and forty-five inches high, which is about eye height for passengers of a motor vehicle. Side underride guards work by engaging safety accessories like airbags, crash avoidance sensors, and other features of cars as well as preventing vehicles from going under the truck and encountering the semitrailer body or rear wheels, increasing the chance of survival with these types of collisions, many of which would be minor collisions if not for the "underride" (Airflow 2020; Zasky 2018, 2018a). Without engaging a car's safety features which would otherwise absorb the force of the collision, the passenger compartment can be crushed when it contacts the semitrailer, resulting in death or severe injuries

[1]The most common trailer type is the standard dry van or box trailer, which is a fully enclosed trailer that can haul most types of mixed freight (Environmental Protection Agency (EPA) 2016). Together, the standard box vans and reefers are the likely types of trailers for side underride guards and make up greater than 70 percent (7.7 of 11 million) of the registered semi-trailers (EPA 2016).

for the occupants. This story map, *Unguarded & Unsafe: Death By Underride*, provides a comprehensive overview of the side underride issue, literature, and data.

The National Highway Traffic Safety Administration is directed by Congress to protect the safety of the driving public against unreasonable risk of death or injury that may occur because of the design, construction, or performance of a motor vehicle or motor vehicle equipment and, is charged with reducing deaths, injuries, and economic losses resulting from motor vehicle crashes (49 U.S.C. § 30102). The concerns raised in this petition are best exemplified by a New Mexico jury verdict finding that Utility Trailer Manufacturing Company was negligent because their newly-manufactured semitrailer lacked side underride guards (Sievers 2020). This case represents 1 tragic death; however, there are similarly at least 500 deaths and 5,000 serious injuries annually from collisions with semitrailers lacking side underride guards (Bloch and Schmutzler 1998, Bodapati 2004, Braver et al. 1997, Brumbelow 2012, GAO 2019, Mattos and Friedman 2021, NTSB 2014, Padmanaban 2013, Sievers 2020), indicating that semitrailers without side underride guards contain a *defect that presents an unreasonable risk* to the public from "…a "significant number of failures" in "normal operation" that is "reasonably foreseeable" (*United States* v. *General Motors Corporation* ("*Wheels*"), 518 F.2d 420 (D.C. Cir. 1975)). As NHTSA recognizes, a "significant number of failures" is merely a "non-de minimus" quantity; it need not be a "substantial percentage of the total" (*Wheels*, 518 F.2d at 438). In fact, hundreds of deaths and thousands of injuries occurring annually from vehicles colliding with semitrailers that lack side underride guards demonstrates a defect because there is no dispute that this hazard "…can definitely be expected to occur in the future" (*United States* v. *Gen. Motors Corp*., 565 F.2d 754, 758 (D.C. Cir. 1977)).

Similarly, where a defect "is systematic and prevalent in a particular class [of motor vehicles or equipment], . . . this is prima facie an unreasonable risk" (*United States* v. *General Motors Corp*., 561 F.2d 923, 928–29 (D.C. Cir. 1977) ("*Pitman Arms*"). In the context of the National Traffic and Motor Vehicle Safety Act of 1966, (Safety Act), "motor vehicle safety" refers to an "unreasonable risk of accidents" and an "unreasonable risk of death or injury in an accident" (49 U.S.C. § 30102(a)(8)). Thus, while defect analysis has generally entailed a retrospective look at how many failures have occurred (see, e.g., *Wheels*), the safety-relatedness question is forward-looking, and concerns hazards that may arise in the future from, for example, side underride collisions resulting in death and serious injury to the traveling public (e.g., see *United States* v. *Gen. Motors Corp*., 565 F.2d at 758).

Although currently there is no applicable Federal Motor Vehicle Safety Standard (FMVSS) for side underride guards on semitrailers (or single unit trucks), NHTSA has the authority to recall vehicles or equipment that pose an "unreasonable risk" to safety even when there is no FMVSS. Under the Safety Act, a safety "defect" includes "any defect in performance, construction, a component, or material of a motor vehicle or motor vehicle equipment" 49 U.S.C. § 30102(a)(2). Importantly, this includes a defect in design of a safety part missing from the vehicle (i.e., lacking side underride guards; see *Wheels*, 518 F.2d at 436; see for example Safety Research and Strategies 2021).

Congress intended the Safety Act to represent a "commonsense" approach to safety and Courts have followed that approach in determining what constitutes a "defect" (*Wheels*, 518 F.2d at

436). For this reason, a defect determination for semitrailers lacking side underride guards does not require an engineering explanation or root cause, but instead "may be based exclusively on the performance record of the component" (*Wheels*, 518 F.2d at 432). The substantial amount of research and data on the number of deaths and serious injuries from collisions with semitrailers without side underride guards is clear; failure to include a side underride guard amounts to a defect in the semitrailer's design, construction, and performance.

I also note the following facts to consider:

1. For over 50 years, NHTSA has been remiss in failing to correct this extreme safety hazard posed to the traveling public. In 1969, the DOT, published in the *Federal Register* that the proposed standard for rear underride protection would be amended after technical studies to extend the requirement for underride protection to the sides of large vehicles large trucks and trailers (34 FR 5383). Fifty-three years later, NHTSA has taken no action to mitigate this known defect, while the risk and number of deaths due to side underride guard omission have increased proportionately with the number of semitrailers on the road. Side underride guard crash tests have demonstrated that the guards can prevent a passenger vehicle from becoming trapped underneath the semitrailer and prevent intrusion into the vehicle's compartment by stopping the car from underriding the semitrailer (Zasky 2018, 2018a; see also GAO 2019). A side underride guard helps avoid windshield-first crashes and improves the chances that a car's air bags, and other lifesaving built-in occupant protection systems can function as intended, earning endorsement of side underride guards by Consumer Reports (2019).

2. Without a government recall in the United States, truck and trailer manufacturers and operators will not voluntarily stop the known unreasonable risk to public safety by designing and implementing safer trucks and trailers with effective side underride prevention guards (Bloch and Schmutzler 1998; GAO 2019). Crash tests and side underride guard international standards demonstrate that side underride guard technology is available, has been well-studied, and would be an easy and inexpensive solution to the known hazard of side underride collisions to the traveling public. For example, starting in 2010, the AngelWing has been installed on a small number of semitrailers that have already logged over 1 million miles delivering loads with no issues of road clearance, structural deficiencies (e.g., stress cracks on welds), or loading/unloading at docks (P. Ponder pers. comm.).

3. Importantly, Wabash holds three patents (issued in 2012, 2020, and 2021) and Vanguard holds one patent (issued in 2019) for side underride guards. These are two of the eight major semitrailer manufacturers, indicating the industry has already designed and tested a solution to this known defect. Moreover, semitrailer manufacturers have known of this defect for years and have not reported it to NHTSA, even though manufacturers have a continuing obligation to proactively identify and mitigate such safety risks (*Wheels*, 518 F.2d 420, 427 (D.C. Cir. 1975). Similarly, under the Transportation Recall Enhancement, Accountability, and Documentation Act (2000), manufacturers were supposedly required to report information to NHTSA related to defects, especially in cases of injury or death related to their semitrailers (also referred to as Early Warning Reports; e.g., see Safety Research Strategy (2021) detailing NHTSA fines to vehicle manufacturers for untimely

recalls and failing to submit Early Warning Reports). However, early warning reporting has been abysmal compared to known occurrences of underride collisions (Karth 2018). As referenced below, all the Wabash and Vanguard patents clearly acknowledge the known defect and unreasonable risk posed by the geometric mismatch of semitrailers and passenger vehicles. Wabash (2021) also indicated that its side underride system may provide 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".

a. From Wabash (2012 and 2020): "Truck trailers typically have a higher elevation than passenger vehicles. This presents a risk that a passenger vehicle will underride the trailer in an accident, potentially resulting in damage to the underriding vehicle and injury to occupants therein. Accordingly, some trailers may include a side protection device, or underride guard, to reduce the risk of such passenger vehicles underriding the trailer. The side protection device is intended to reduce the extent to which a "passenger vehicle" (as defined in 49 C.F.R. Part 571S) can intrude under the side of a trailer, diminishing passenger compartment intrusion."

b. From Wabash (2020 and 2021): "The above-described side underride system…may reduce the risk of passenger vehicle underride in the event of a side impact collision, as well as reduce the risk of pedestrians, bicyclists, or motorcyclists from falling or sliding under the trailer, for example, between the landing gear and rear wheel assembly."

c. From Vanguard (2019): "Truck trailers typically have a higher elevation than passenger vehicles. This presents a risk that a passenger vehicle will underride the trailer in an accident, potentially resulting in damage to the underriding vehicle and injury to occupants therein. Accordingly, the United States Federal Motor Vehicle Safety Standards require the installation of underride guards or bumpers on certain trailers. The underride guards must comply with certain deflection and energy absorption requirements. Underride guards are common on the rear of trailers; however, underride guards between the landing gear and wheel assembly of the trailer are less common. A device positioned between the landing gear and wheel assembly of the trailer can function to prevent an impacting vehicle from underriding the trailer. Additionally, such a device can have features to reduce the aerodynamic drag on the trailer."

4. In addition to industry-designed side underride guards, Perry Ponder of Tallahassee, Florida and Aaron Kiefer of Cary, North Carolina have designed different underride guards that have been successfully crash tested. The Insurance Institute for Highway Safety (IIHS) crash testing of Mr. Ponder's AngelWing design, which uses steel and, more recently, aluminum, showed that side guards could stop a car from going underneath a trailer in crashes up to 40 mph (IHHS 2017; Zasky 2018; GAO 2019). Mr. Kiefer's Safetyskirt design, which uses a lightweight but strong fabric, has also been crash tested and can stop underride (Zasky 2018a, Safetyskirt 2020). In March 2019,

> additional crash tests were conducted in Washington DC for Mr. Ponder's AngelWing and Mr. Kiefer's Safetyskirt. They were also both successful, demonstrating that side underride guards can prevent intrusion into the vehicle's passenger compartment by stopping the car from underriding the semitrailer. As such, underride guards have been proven to help stop a car from continuing under a semitrailer in the event of a collision (Zasky 2018, 2018a).

For the reasons discussed above, we urge NHTSA to grant this Petition for a Defect Investigation into van-type or box semitrailers due to a lack of side underride guards. Deaths and serious injuries continue to occur every day across our Country. Pursuant to 49 U.S.C. § 30162(d), we formally request NHTSA respond to this petition within 120 days. The DOT can no longer feign ignorance to the danger of underride collisions. NHTSA must conduct an analysis, in which they will certainly find that this known defect poses an unreasonable risk to motor vehicle safety and is therefore a "safety defect," and subsequently order manufacturers to conduct a recall to mitigate the dangers of death and serious injury from semitrailers lacking side underride guards (49 U.S.C. § 30118(b)). Please fix this defect now.

Sincerely,
Eric Hein

Marianne and Jerry Karth

Lois Durso

Cc:
Representative Earl Blumenauer
Representative David Price
Representative Cohen
Representative DeSaulnier
Representative DeFazio
Senator Ron Wyden
Senator Jeff Merkley
Senator Richard Burr
Senator Gillibrand
Senator Heinrich
Senator Luján

Literature Cited

Airflow Deflector. 2020. Side Underride Truck Side Guards Side Underride Protection Devices for Semi and Flat Bed and Trailers.

Bloch, B., and L.O.F. Schmutzler. 1998. Improved crashworthy designs for truck underride guards. Paper Number 98-S4-O-07, 14 pp.

Bodapati, V.K.K. 2006. Evaluation of energy absorbing pliers underride guards for rear and side of large trucks. Master's Thesis, Wichita State University.

Brumbelow M.L. 2012. Potential Benefits of Underride Guards in Large Truck Side Crashes, Insurance Institute for Highway Safety, Traffic Injury Prevention.

Braver E.R., Cammisa M.X., Lund A.K., Early N., Mitter E.L., and Powell M.R. 1997a. Incidence of Large Truck Passenger Vehicle Underride Crashes in Fatal Accident Reporting System and the National Accident Sampling System, 76th Annual Meeting of the Transportation Research Board, Washington DC, 1997a.

Consumer Reports. 2019. Press release: Consumer Reports urges Congress to pass the Stop Underrides Act. 2 pp.

Government Accounting Office. 2019. Truck underride guards: Improved data collection, inspections, and research needed. GAO-19-264.

Karth, M. 2018. What's the intent of Early Warning Reporting & what's it done to end underride?

Mattos, G., K. Friedman, A. Kiefer, and P. Ponder. 2021. Protecting Passenger Vehicles from Side Underride with Heavy Trucks. SAE Technical Paper 2021-01-0288, 2021, doi:10.4271/2021-01-0288

NHTSA. 2013. Single-Unit straight trucks in traffic crashes. Traffic Safety Facts: Research Note, #811740. National Center for Statistics and Analyses, Washington, DC.

National Transportation Safety Board. April 3, 2014. Safety recommendations: mitigation of blind spots; protection of passenger vehicles from underriding the sides of tractor-trailers; protection of passenger vehicles from underriding the rears of trailers; and improving traffic safety data (H-14-001 through -007).

Padmanaban, J. 2013. Estimating Side Underride Fatalities Using Field Data. Annals of Advances in Automotive Medicine.

Safety Research and Strategies Inc. 2021. Hundai's billion dollar engine problem that broke the NHTSA civil penalty barrier.

Safetyskirt. 2020. Testing underride guard using safetyskirt.

Sievers, M. 2020. Hein V. Utility Trailer Manufacturing Company: Jury Sends a Message to Trailer Manufacturers About Side Underride. Journal of Trucking Litigation Winter/Spring 2020 pp. 3-9.

U.S. Environmental Protection Agency. 2016. Greenhouse gas emissions and fuel efficiency standards for medium- and heavy-duty engines and vehicles - Phase 2. Regulatory Impact

Analysis Office of Transportation and Air Quality U.S. Environmental Protection Agency and National Highway Traffic Safety Administration U.S. Department of Transportation. EPA-420-R-16-900

U.S. Department of Transportation. 1969. Federal Highway Administration. [Docket No. 1-11: Notice 3] Motor Vehicle Safety Standards; Rear Underride Protection; Trailers and Trucks with Gross Vehicle Weight Rating Over 10,000 Pounds Federal Register. 34:5383-5384.

Vanguard National Trailer. Corporation. 2019. Strap underride guard; Patent No.: US 2019 / 0184925 A1. Monon, Indiana.

Wabash National, L.P. 2012. Side underride guard cable system for a trailer. Patent No.: US 8,162.384 B2. Lafayette, Indiana.

Wabash National, L.P. 2020. Side underride guard. Patent No.: US 10,549,797 B2. Lafayette, Indiana.

Wabash National, L.P. 2021. Side underride guard. Patent No.: US 10,946,824 B2. Lafayette, Indiana.

Wilson, C. 2017. Wabash prototype: Side underride guard with aero skirt. Trailer Body Builders.

Zasky, J. March 8, 2018 (2018). AngelWing Can Prevent Side Underride: Aftermarket technology that attaches to the sides of trucks can make underride crashes more survivable. Failure Magazine

Zasky, J. April 26, 2018 (2018a). Making Underride Accidents Less Deadly: New technology aims to reduce the number of deaths caused by side and rear underride accidents. Failure Magazine