

April 30, 2024

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

On April 24, 2024, National Highway Traffic Safety Administration (NHTSA) hosted a virtual public meeting for the Advisory Committee on Underride Protection (ACUP meeting; [89 FR 3020](#); [Docket No. NHTSA-2024-0002](#)). I appreciate the opportunity to present at the ACUP meeting and am submitting the following written materials¹ for the ACUP to consider on the estimated number of side underride, rear underride, and front override crashes and fatalities over the last 50 years to demonstrate the substantial societal impact that could easily be reduced by comprehensive underride and override protection.

The NHTSA is an agency of the U.S. Department of Transportation (USDOT), formed by Congress on December 31, 1970 under the Highway Safety Act, which outlined its mission to reduce deaths, injuries, and economic losses resulting from motor vehicle crashes.

As part of their operations, NHTSA manages and maintains Fatality Analysis Reporting System (FARS), which became operational in 1975. The FARS collects data from all 50 States, the District of Columbia, and Puerto Rico under Cooperative Agreements to report a standard set of data elements on each fatal vehicle crash within their jurisdictions (e.g., see NHTSA 2022; 87 FR 19573). To be included in the FARS database, a crash must involve a motor vehicle traveling on a public road and must result in the death of a vehicle occupant or a nonoccupant within 30 days (NHTSA 2023). FARS is populated using data from each State's Police Crash Reporting form and the sole source for cataloging deaths from underride crashes (National Center for Statistics and Analysis (NCSA) 2023, NHTSA 2014).

The Government Accountability Office (2019) identified underreporting of underride crashes and fatalities in FARS due to variability in the State's data collection. Consequently, I used data cataloged in the FARS and followed the methodology of NCSA (2023) to apply three "undercount correction factors" to estimate the number of side underride, rear underride, and front override crashes and fatalities that occurred in the United States from 2007 to 2020. Specifically, NCSA (2023) corrected for FARS underreporting of side underride crashes using an estimated correction factor of 1.77; Hein (2023) estimated a correction factor of 2.4; and Padmanaban (2013) identified a correction factor of 3.1.

The first step was to develop a customized query using the Fatality and Injury Reporting System Tool ([FIRST Query](#) (2007-2020 Final File; Report Generated: Tuesday, January 30, 2024 Version 7, Released Jan 24, 2024; NCSA 2022, 2023a; USDOT 2022) to locate putative

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

cataloged side underride, rear underride, and front override crashes and fatalities in FARS from 2007 to 2020. Using the FIRST Query and the FARS underride/override data elements, tables were created that tabulated side underride, rear underride, and front override crashes (Table 1; Table 2, Table 3). Next, the number of fatalities involved in each side underride, rear underride, and front override crashes were compiled by clicking the link within each of table's cells to view the corresponding fatal crash records on a web map. Crash layers for each of the years were opened (toggled on) on the web map to display point locations of vehicles involved in side underride, rear underride, and front override crashes and aggregate the number of resulting fatalities (Table 4).

Although the U.S. population has grown 65 percent from 216 million to 332 million over the last four decades, the rate of deaths from motor vehicle crashes per 100,000 people was 39 percent lower in 2021 than it was in 1975 (Insurance Institute for Highway Safety (IIHS) 2021). Moreover, the overall per capita death rate from motor vehicle crashes decreased 56 percent from 1975 compared with 2021; whereas, the overall number of deaths from motor vehicle crashes has decreased 4 percent from 1975 compared with 2021 (IIHS 2021). As a result, the side underride, rear underride, and front override crash and fatality estimates should be considered conservative (i.e., the crash and fatality estimates are lower than the true value).

Utilizing FARS data from 2007 to 2020 and applying the smallest undercount correction factor (i.e., using NCSA's 2023) generated the following estimates (Table 4):

- 2,191 side underride crashes, which resulted in 2,505 fatalities or an average of 157 side underride crashes and 179 fatalities per year;
- 2,813 side underride crashes, which resulted in 4,023 fatalities or an average of 201 side underride crashes and 289 fatalities per year; and
- 2,009 side underride crashes, which resulted in 2,294 fatalities or an average of 144 side underride crashes and 164 fatalities per year.

Lastly, using NCSA's (2023) undercount correction factor, generated the following cumulative estimates over the 50 years starting when NHTSA was formed in 1970 to 2020 the present FARS data (Table 5):

- 7,850 side underride crashes and 8,950 corresponding fatalities;
- 10,050 rear underride crashes and 14,350 corresponding fatalities; and
- 7,200 front override crashes and 8,200 corresponding fatalities;
- 25,100 crashes and 31,500 corresponding fatalities from side underride, rear underride, and front override crashes.²

² On March 19, 1969, the Federal Highway Administration proposed adding rear underride guards to semitrailers following Jayne Mansfield's death from an underride collision in 1969 (34 FR 5383). In the Proposed Rule, the Federal Highway Administration indicated that, "It is anticipated that the proposed [rear underride guard] standard will be amended, after technical studies have been completed, to extend the requirement for underride protection to the sides of large vehicles" (34 FR 5383). The proposal to mandate rear underride guards was withdrawn

The underride and override fatality estimates³ are staggering, particularly considering NHTSA's conclusion that side underride guards would be highly effective in mitigating fatalities and serious injuries⁴. Clearly, comprehensive underride protection would save thousands of lives on our public roadways.

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

Sincerely,

Eric Hein

in 1971 after strong lobbying and opposition by the trucking industry (New York Times 1971; NHTSA 1971, 36 FR 11750) and was not Federally mandated until 1996, but did not go into effect until 1998 (NHTSA 1996, 61 FR 2004). The trucking industry has also lobbied against and been opposed to side underride guards on semitrailers (e.g., see American Trucking Associations 2019; Truck Trailer Manufacturers Association 2016). To date, a side underride guard mandate has yet to ever be studied or proposed by NHTSA. In fact, for side underride guards, NHTSA has disregarded successful crash tests that stop a passenger vehicle from underriding a semitrailer (IIHS 2017, Wilson 2017, Utility 2022), ignored recommendations (NTSB 2014), disregarded administrative petitions (NHTSA 2014a, 79 FR 39362), and denied petitions (NHTSA 1979, 44 FR 55077; NHTSA 2022c, 87 FR 39899).

³ These data do not account for the thousands of serious injuries that also occur from side underride, rear underride, and front override (e.g., see NHTSA 2023a, NCSA 2023b, NTSB 2013).

⁴ NHTSA (2023a) estimated a 97 and 85 percent effectiveness of side underride guards in mitigating fatalities and serious injuries, respectively, in underride crashes into the side of trailers.

Table 1. Number of fatal side underride crashes cataloged in FARS from 2007 to 2020.

Crash Date (Year)	Crash Date (Month)												Total
	January	February	March	April	May	June	July	August	September	October	November	December	
2007	12	9	5	7	11	9	6	9	6	13	9	10	106
2008	13	5	8	6	7	7	5	10	13	12	1	7	94
2009	6	5	5	11	6	3	6	8	4	5	11	6	76
2010	9	12	7	3	4	5	6	6	4	9	12	8	85
2011	6	11	10	5	3	4	5	6	5	4	8	8	75
2012	11	14	3	10	7	7	8	13	7	7	3	11	101
2013	8	5	7	3	4	12	9	6	8	7	9	11	89
2014	12	2	4	2	3	11	8	5	6	11	7	5	76
2015	5	6	5	6	9	6	8	5	7	12	5	12	86
2016	7	6	4	6	11	5	3	13	6	10	1	8	80
2017	11	10	6	4	5	10	8	11	8	16	8	24	121
2018	8	9	7	6	4	6	10	6	5	10	8	4	83
2019	6	8	6	7	5	3	8	6	12	3	10	8	82
2020	6	6	3	5	5	6	10	10	7	11	6	9	84
Total	120	108	80	81	84	94	100	114	98	130	98	131	1,238

Table 2. Number of fatal rear underride crashes cataloged in FARS from 2007 to 2020.

Crash Date (Year)	Crash Date (Month)												Total
	January	February	March	April	May	June	July	August	September	October	November	December	
2007	9	8	16	5	15	9	8	10	5	6	9	10	110
2008	6	11	12	6	2	10	7	5	7	8	3	6	83
2009	6	9	5	10	4	10	11	8	8	11	9	10	101
2010	5	7	8	12	13	5	10	13	12	13	8	6	112
2011	10	9	13	7	4	10	7	7	4	12	5	12	100
2012	10	12	11	8	2	21	15	9	13	14	12	2	129
2013	8	1	8	9	7	15	6	8	12	10	13	13	110
2014	4	7	12	10	7	9	8	9	4	15	6	10	101
2015	16	4	15	7	11	15	10	8	8	8	9	8	119
2016	5	19	10	7	8	4	8	12	10	9	10	2	104
2017	10	11	9	8	15	13	16	11	11	9	13	6	132
2018	15	7	9	9	12	5	5	8	9	10	13	13	115
2019	16	17	13	9	14	10	7	13	15	11	8	9	142
2020	8	6	7	11	11	10	8	12	8	21	19	10	131
Total	128	128	148	118	125	146	126	133	126	157	137	117	1,589

Table 3. Number of fatal front override crashes cataloged in FARS from 2007 to 2020.

Crash Date (Year)	Crash Date (Month)												
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2007	6	3	8	3	4	11	6	3	1	11	6	8	70
2008	8	10	8	10	5	9	9	11	8	9	4	8	99
2009	8	7	6	3	3	5	7	7	6	7	8	8	75
2010	9	12	11	12	7	9	16	9	6	8	8	11	118
2011	11	9	7	7	4	4	11	7	9	4	6	7	86
2012	12	11	9	8	8	10	8	10	14	11	4	8	113
2013	10	6	5	6	9	11	9	6	9	7	3	9	90
2014	6	5	4	8	12	7	7	4	8	6	12	4	83
2015	4	4	11	3	5	9	7	9	4	5	5	5	71
2016	6	6	8	5	5	7	4	9	4	10	3	9	76
2017	5	2	8	9	3	5	8	3	11	5	9	1	69
2018	3	2	2	2	2	5	4	6	5	7	5	4	47
2019	2	8	8	5	7	10	6	6	8	4	3	3	70
2020	2	7	4	2	4	8	7	7	5	8	6	8	68
Total	92	92	99	83	78	110	109	97	98	102	82	93	1,135

Table 4. Estimated number of side underride, rear underride, and front override crashes and associated fatalities in the United States from 2007 to 2020 using cataloged FARS data multiplied by undercount correction factors.

Type of Crash	Number of Crashes in FARS	Number of Fatalities in FARS	Undercount Factor	Estimated Number of Crashes	Estimated Number of Fatalities	Estimated Average Number of Crashes and Fatalities Per Year
Side Underride	1,238	1,415	1.77	2,191 ^A	2,505	157/179
Rear Underride	1,589	2,273	1.77	2,813	4,023	201/287
Front Override	1,135	1,296	1.77	2,009	2,294	144/164
Total	3,962	4,984		7,013	8,822	

^A Example Calculation: number of side underride crashes multiplied by undercount correction factor: $1,238 * 1.77 = 2,191$

Table 5. Estimated number of side underride, rear underride, and front override crashes and associated fatalities in the United States from 1970 to 2020 using estimated average number of crashes and fatalities from 2007 to 2020.

Type of Crash	Estimated Average Number of Crashes and Fatalities Per Year	Estimated Number of Crashes Over 50 Years	Estimated Number of Fatalities Over 50 Years
Side Underride	157 ^A /179	7,850	8,950
Rear Underride	201/287	10,050	14,350
Front Override	144/164	7,200	8,200
Total		25,100	31,500

^A Example Calculation: estimated number of side underride crashes per year multiplied by 50 years: $157 * 50 = 7,850$

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