U.S. Department
of Transportation

Federal Motor Carrier
Safety Administration

Office of the Administrator

1200 New Jersey Ave, SE
Washington, DC 20590

September 4, 2025

AnnaLeah and Mary for Truck Safety
Jerry & Marianne Karth
1201 Penselwood Dr.
Raleigh, NC 27604

Dear Mr. and Mrs. Karth,

This letter responds to your Request for Correction (RFC) dated April 29, 2025, under section 515 of Public Law 106-554, Consolidated Appropriations Act (2001); known as the Information Quality Act, IQA), to the U.S. Department of Transportation on behalf of AnnaLeah and Mary for Truck Safety (you or ALMFTS). In the RFC, you request correction of "A Literature Review of Lateral Protective Devices on Trucks Intended for Reducing Pedestrian and Cyclist Fatalities" (Literature Review) published through the Federal Motor Carrier Safety Administration (FMCSA) in May 2020. The Literature Review was prepared by the Department's Volpe National Transportation Center (Volpe), its service provider, under an interagency agreement (IAA). As explained below, DOT concludes that the RFC is not a necessary correction.

## Summary of the Request

ALMFTS claims that the Literature Review has several "inaccuracies, misrepresentations, and omissions" that render it "unreliable and misleading to policymakers, regulators, industry, advocates and the public" and asks for the FMCSA to revise the Literature Review.

Regarding the accuracy of the review, the ALMFTS asserts the following:

1. The estimations of fatalities of vulnerable road users (VRUs) were inaccurate due to calculation and filtering errors.
2. Multiple sources referenced in the Literature Review were misrepresented.
3. Two reports from the National Transportation Safety Board (NTSB) were omitted in the Literature Review.
4. Two sources that were cited in the Literature Review were not referenced in the discussion.

## Background and IQA Analysis

This request is analyzed under the October 31, 2019, DOT "Secretary's Policy Statement on Information Quality". The ALMFTS has the burden of proof with respect to establishing the necessity for correction. The ALMFTS has not met this burden and FMCSA has determined that there is no inconsistency with the Literature Review and the IQA guidelines.

The Literature Review on pedestrian and pedalcyclist fatalities in the U.S. summarized both a literature review of Lateral Protection Device (LPD) regulatory and technical standards in other countries and published effectiveness estimates of LPDs in mitigating injury and death using data from other countries. FMCSA entered into an IAA with Volpe to examine the safety benefits, costs, and feasibility of deployment of LPDs on heavy-duty trucks in the U.S. to reduce fatalities from collisions of trucks with pedestrians and bicyclists, or other VRUs. In keeping with standard practices at DOT, the Volpe Report was peer reviewed by multiple Agency subject-matter-experts, managers, and executives with the approved version, the Literature Review, being published in May 2020.

**1. Estimation of Fatalities**

***The Denominator Calculation***

The first issue raised by ALMFTS is purported inaccuracies in the calculation of fatality rates for VRUs. Specifically, ALMFTS points to page 23 of the Literature Review and corresponding Table, which includes a statistic of 0.5 percent (27 pedestrian fatalities where the initial impact point was the left or right side of a large truck out of the 5,363 total pedestrian fatalities) of the pedestrian fatalities and 3.3 percent of cyclist fatalities involved an impact to the left or right side of large trucks. ALMFTS asserts that these two figures are inaccurate because of a "calculation error." ALMFTS asserts that the proper denominator is pedestrian and cyclist fatalities from *known crashes with large trucks*, and they provide a figure of 256 crashes in the case of pedestrians, as opposed to the 5,363 figure used in the Literature Review, and assert that the actual fatality rates are 10.5 percent for pedestrians and 14.9 percent for cyclists.

The rate proposed by ALMFTS describes the distribution of pedestrian fatalities across *a subset* of crashes involving pedestrian fatalities and large trucks rather than across *all* crashes involving pedestrian fatalities. The same reasoning holds for ALMFTS's proposed rate for cyclists.

The figures in the Literature Report were calculated from the *total pedestrian and cyclist fatalities* recorded in 2017 (5977 for pedestrians and 783 for cyclists). The unit presented by ALMFTS provides an alternate measure of pedestrian and cyclist fatalities. In fact, the Literature Review also provided this alternative rate, albeit with a denominator of 290, in the third paragraph of the report:

> Among the 5,363 pedestrian fatalities in single vehicle crashes, only 5.4 percent (290) involved impacts with large trucks, among which 27 (9.3 percent) involved impacts to the left or right side of large trucks.

The Literature Review's central concern is the evaluation of the effects of lateral protection devices (LPD) on pedestrian and cyclist fatality, and therefore the introduction and summary of the review contextualized the potential benefits of LPD adoption in terms of their ability to reduce overall fatalities experienced by pedestrians/cyclists. The measure focused on by the Literature Review was accurate, and regardless, the alternative rate provided by ATMFTS was provided as well along with the underlying data.

***The Numerator Calculation***

The second calculation error asserted by ALMFTS is the Literature Review's consideration of "unknown" crashes in the fatality rate calculations. ALMFTS asserts that "unknown" crashes with unknown crash points (initial impact) can be distributed to all sides of the truck proportionally. ALMFTS suggests that ignoring "unknown" crash points in the numerator of the fatality rate calculation results in negatively biased estimates of fatality rates. ALMFTS failed to provide any reasoning why the "unknown" crashes should have been considered in the calculation.

The Literature Review provided analysis of fatalities based on the initial point of impact (front, left, right, rear). *See e.g.* Literature Report Tables 1-2. The Literature Review determined the initial impact points of crashes by using the "clock" system as reported in the Fatality Analysis and Reporting System dataset (FARS). FARS is a census containing records of fatal crashes on US roads from 1975 to present. *See* Literature Review, fn 6. This system assigns a number (1-12) to areas of a vehicle indicating the point of initial impact.[1] The 11 through 1 o'clock position represents the front of the truck and the 5-7 o'clock positions represent the rear, with sections of the right side of the vehicle taking points 2-4 and sections of the left side taking points 8-10.

It is not always the case that the initial impact point can be clearly distinguished using the clock reference system. Impacts may straddle the border of two points (and thus not be mutually exclusive). The clock points are also not exhaustive; impacts to the top and the undercarriage of a vehicle are not considered part of the clock system and have their own codes in FARS. This means one cannot assume that an "unknown" impact location necessarily corresponds to a specific known impact location on the clock system.

The approach advocated by ALMFTS introduces strong assumptions that the categories used in the identification of initial impact points are mutually exclusive and exhaustive, and further, that the theoretical identification of unknown initial impact points follows a similar distribution as the known impact points.

The proportional allocation of unknown initial impacts advocated for by ALMTF makes an assumption about the relative distributions of known and unknown impacts. Table 1 presented in the Literature Review shows that known initial impacts in large truck fatal crashes are predominantly to the front and rear of the vehicle, but this fact does not guarantee that the true impact points of unknown impacts follow the same distribution even if they can, in principle, be identified. Unknown impacts may, for example, be distributed more to parts of the truck that are difficult to observe (like the undercarriage), or to parts of the truck where damaging marks are less likely to be created during initial impact (like protrusions hanging from the side of a truck).

The approach taken in the Literature Review provided a reasonable measure of the distribution of crashes by initial impact point, since this approach does not make unnecessary assumptions

[1] Fatality analysis Reporting System Analytical User's Manual, 1975-2023. 2025:416. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813706

about the impact points of crashes categorized as unknown. In sum, the approach presented in the Literature Review was not incorrect, it was one of many possible ways of dealing with imperfect data.

***Filtering Errors***

ALMFTS claims that FMCSA used erroneous filtering and was "not transparent in the methodology it used to determine which crashes were included or excluded from its analysis" and the search results were "skewed." This claim is centered around methods for identifying relevant side underride crashes in FARS. ALMFTS acknowledges that filters were required due to the large dataset in FARS. Because the majority of fatal crashes recorded in FARS fall outside the scope of the review, it was necessary to filter the data to select only crashes that involved side-impact collisions. For the Literature Review, FARS data were filtered to crashes that involved both a large truck and a pedestrian or cyclist, and whose initial impact points for the pedestrians corresponded to clock positions that indicated a side impact.

ALMFTS argues that the results presented in the Literature Review are "skewed" because the results presented in the review differ from those presented in the initial report developed by VOLPE (titled "Truck Side Guards and Skirts to Reduce Vulnerable Road User Fatalities: Final Report on Net Benefits and Recommendations" (Volpe Report)[2]) that was revised into the final Literature Review. While FMCSA and the National Highway Traffic Safety Administration (NHTSA) reviewers determined that the Volpe Report provided valuable information about LPDs for VRUs, and therefore issued the Literature Review, both FMCSA and NHTSA concluded that revisions to the Volpe Report were needed before publication.

The Literature Review summarizes its FARS data filtering as follows:

> FARS data were queried for single-vehicle crashes involving single unit trucks (SUTs) or truck-trailers with a gross vehicle weight rating (GVWR) greater than 4,536 kg where the first harmful event in the crash was a collision with a pedestrian or cyclist.

Literature Review, p. 4. While the Literature Review did not explicitly explain the filtering choices, the methodology used in the initial Volpe Report included incidents in which the vulnerable road user was struck at an impact location where LPDs would not be present, such as by the front of the commercial motor vehicle. The change was made, at FMCSA's discretion, after the multi-agency peer review because it was determined that the analysis in the Volpe Report would result in an over-estimation of the target population associated with LPDs, thereby leading to a significant over-estimation of the benefits. The filtering method used for the analysis presented in the Literature Review accounted for the fact that there are positions along the side of a truck where an LPD installation will not impact a crash outcome. Thus, the review filtered out side-impact crashes where the first impact occurred at the 5 to 7 and 11 to 1 o'clock positions.

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[2] Although the Volpe Report was not intended to be disseminated, it has been made public. *See* https://annaleahmary.com/wordpress/wp-content/uploads/2024/05/Cover-Sheet-Exhibit-B-combined.pdf

It is important to note that the Department's research reports are disseminated in the interest of information exchange. The contents of the reports reflect the views of the authors, who are responsible for the facts and accuracy of the data presented therein. However, during the review process for outsourced deliverables, the Department's agencies reserve the right to remove inaccurate and potentially misleading information at their discretion. FMCSA did so here when issuing the Literature Review. Simply because ALMFTS disagrees with FMCSA's decision and particular analysis, or prefers the Volpe Report, does not require correction. There is no requirement that FMCSA publish a draft report that it determines has less than accurate or useful information.

Regarding ALMFTS's claims that FMCSA improperly filtered out multi-vehicle crashes, with the purported "effect of reducing the number of fatalities potentially preventable through the use of lateral protection devices," this also is not improper or inaccurate. While the Literature Review did not explicitly address this filtering choice, removing multi-vehicle crashes was done because it is often impossible to attribute pedestrian injuries and fatalities to specific vehicles in multi-vehicle crashes. The presence of additional vehicles in a crash introduces ambiguity about how a pedestrian fatality occurred. To ensure the summary of fatalities only included crashes in which the pedestrian fatality was clearly attributable to the large truck, these crashes were removed from the analysis.

**2. DOT Cited Authorities**

ALMFTS claims that FMCSA misrepresented the work of Van Kampen (1999) and Cookson and Knight (2010)[3].

***Van Kampen***

ALMFTS's claim the Literature Report misrepresented the conclusions of the Van Kampen (1999) source when citing it as one report to support a statement that LPDs are not effective in mitigating VRU fatalities and injuries in VRU collisions with the side of trucks when the truck is turning left or right. However, that statement was describing the entire breadth of the reviewed literature. Single articles contradicting a general trend do not invalidate the trend.

Four sources presented in the Literature Review examined the effects of LPDs on side-impact crash fatalities during turning-crash events: (1) Knight (2005) which found no benefits, (2) Cookson and Knight's (2010) "before and after" analysis which found no benefits, (3) Cookson and Knight's (2010) "exempt vehicle" analysis which did find a benefit but the analysis included confounds, and (4) Van Kampen's (1999) bus analysis which did find a benefit, but did not include heavy trucks with LPDs, using buses as a stand in for LPDs. Of the four analyses considered, the two that assessed effects under the most comparable conditions found no effect, and the two that found effects were unable to differentiate the effect of LPDs (or their proxies) from confounds introduced in the analysis. Accordingly, the studies under consideration that

[3] Cookson and Knight. 2010. "Sideguards on heavy goods vehicles assess the effects on pedal cyclists injured by trucks overtaking or turning left." Transportation Research Laboratory.

found no LPD benefits in turning-event crashes are more robust than the studies that contradicted this result.

A proper summary of literature should present the scientific concordance, if one exists, as the current state of knowledge on a topic while making contradictory information available to the reader. It can easily be the case that a body of scientific literature generally indicates one fact about a phenomenon, even if some of the findings present in the literature contradict that fact. The Literature Review provided this scientific concordance.

***Cookson and Knight***

ALMFTS claims the Literature Review misrepresented the conclusion of Cookson and Knight (2010) when it characterized that report as showing *that LPDs had no effectiveness* in preventing bicyclist fatalities and injuries for other pre-crash vehicle maneuvers such as when the truck is turning left or right.

Despite ALFMTS' assertion, the Literature Review's presentation of Cookson and Knight is an accurate summary of the work. The summary of Cookson and Knight provided by the Literature Review can be found on page 20 and reads as follows (the snippet presented by ALMFTS is in bold):

> [The Transportation Research Laboratory] also conducted an in-depth report which suggested that crashes between cyclists and trucks turning left (a left turn in U.K. is equivalent to a right turn in the U.S.) often involve a collision with the vehicle side toward the front of the vehicle which knocks the cyclist to the ground. As the truck progresses with its turn, the rear of the vehicle cuts into the corner, and the LPD passes over the top of the prone cyclist who then gets run-over by the rear wheels of the truck.
>
> A follow up report was conducted by TRL in 2010 comparing STATS19 accident data of bicyclist collisions into the side of large trucks, where the truck and the bicyclist were traveling straight ahead roughly parallel to each other, for the years 2006–2008 and 1980–1982. This 2010 report showed that after LPDs became a standard feature in the U.K. truck fleet, the percentage of bicyclist fatalities decreased by 56 percent and the percentage of serious injuries decreased by 3 percent in bicyclist collisions with the side of trucks (passenger-side of truck) when both the truck and cyclist were traveling straight ahead, roughly parallel to each other. However, **this report also showed that LPDs had no effectiveness in preventing bicyclist fatalities and injuries for other pre-crash vehicle maneuvers such as when the truck is turning left or right.** TRL suggested that a lower ground clearance than the required 550 mm could improve the effectiveness of LPDs in left turn crashes but noted that further research is needed.

The summary in the Literature Review noted the decline in both fatalities and serious injuries of cyclists traveling parallel to a truck in the post LPD installation period, that Cookson found no effectiveness for LPDs on fatality and injury prevention during precrash maneuvers, and finally

that the report suggested one mechanism to improve the effectiveness of LPDs and the need for more research. Once placed into context, The Literature Review provided a thorough and nuanced summary of a series of analyses done by the Transportation Research Laboratory.

Furthermore, the executive summary in Cookson and Knight included the following:

> In-depth accident case studies suggest that turning left accidents often involve a collision with a cyclist towards the front of the vehicle which knocks the cyclist to the ground. [. . .] and the sideguard passes over the top of the prone cyclist who gets run over by the rear wheels. [4]

This quote is consistent with the summary provided in the Literature Review and explains *why* LPDs are ineffective at preventing or reducing fatalities during turning-event crashes.

Table 3-4 of Cookson and Knight's analysis (2010:9), which was prepared from the Stats19 data, examines the distribution of injuries where a cyclist impacted the left-hand side of a truck while the truck was turning left. The table examines a pre-LPD period of 1980-82 and a post period (where more trucks are expected to have LDPs installed) of 2006-08. The table shows a decrease in serious injury (about 14 percent fewer in the post period) but an increase of about 19 percent in fatalities during the post period. Cookson and Knight remark that:

> This [result] is not consistent with a benefit as a result of introducing sideguards and supports the theory that sideguards would not help to prevent pedal cyclists being run over by the rear wheels when the HGV was turning left."

The executive summary of Cookson and Knight also includes the results of an analysis they conducted on exempt vehicles, writing:

> The analysis of exempt vehicles has suggested that vehicles equipped with sideguards are both less likely to become involved in a left turn collision with a cyclist and less likely to cause serious injury when they do become involved in such a collision.[5]

ALMFTS claims that the Cookson and Knight report provides support for concluding that side guards were protective in turning accidents and cited to a quote from the report regarding exempt vehicles. The Cookson and Knight analysis compared exempt to non-exempt vehicles finding that non-exempt vehicles are involved in more left turn accidents with cyclists, that they yield more fatalities for cyclists, and finally, that serious injuries are higher in these cases. However, Cookson and Knight point out that there are potentially many differences between exempt and nonexempt vehicles beyond the use of LPDs. Differences between the two groups of vehicles means that confounds are introduced into the analysis that Cookson and Knight were unable to account for, suggesting this result may not be replicated in more robust designs. Concerning this limitation Cookson and Knight remark:

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[4] Cookson, R., & Knight, I. (2010). Sideguards on Heavy Goods Vehicles: Assessing the Effects on Pedal Cyclists Injured by Trucks Overtaking or Turning Left, iv. Transport Research Laboratory.
[5] Id.

> It is, therefore, possible that other factors could explain the results such as the use of vehicles in different environments [. . .], driver behaviour, or the field of view, for example the fitment of close proximity mirrors [. . .].”[6]

Finally, Cookson and Knight remark in their discussion section that the inconsistency of their left-turn crash analysis with prior work may be due to the fact that exempt vehicles have different exposure risks or different driver views that increase their chances of side impact crashes with cyclists.[7]

The totality of the Cookson and Knight analysis does not provide strong evidence that LPDs will reduce crashes, fatalities, or injuries sustained by cyclists during turning-event crashes with trucks. Accordingly, the Literature Review’s summary of this work was accurate.

**3. NTSB Reports**

ALMFTS claims that two reports from the NTSB were omitted from the Literature Review: NTSB/SS-13/01 PB2013-106637[8] and H-14-001-007[9]. NTSB/SS-13/01 PB2013-106637 (hereafter, “SUT analysis”) was an analysis of single unit truck (SUT) crashes and H-14-001-007 (hereafter, “safety letter”) is a safety recommendation letter addressed to the then acting administrator of NHTSA, David Friedman. ALMFTS also claims that “the omission reveals that the DOT’s estimate put forth in its scientific literature review grossly underestimates those [pedestrian and cyclist] fatalities.”

FMCSA did not include the safety letter in the Literature Review because it was unnecessary. The data from the letter cited by ALMFTS was derived from the SUT analysis. The purpose of the safety letter is to make safety recommendations to NHTSA and, as such, it is not scientific research. Rather, it is a summary of other work that contextualizes and support’s NTSB’s recommendations to NHTSA. Since the data highlighted by ALMFTS from this letter is all contained in the SUT analysis, its inclusion in the Literature Review would have been duplicative of the SUT analysis.

ALMFTS claims the omission of the SUT analysis resulted in the Literature Review underestimating fatalities, however, the purpose of the review was not to provide an estimate of pedestrian or cyclist fatalities. The purpose was to review LPD regulations, standards and effectiveness as shown in the Literature Review’s executive summary, which stated:

> This report presents a review of lateral protection device (LPD) regulatory and technical standards and specifications in the U.S. and other countries. The report also summarizes published effectiveness estimates of LPDs in

[6] Id. at 13-14.
[7] Id. at 21.
[8] “Crashes Involving Single-Unit Trucks that Results in Injuries and Deaths”. 2013. National Transportation Safety Board. https://www.ntsb.gov/safety/safety-studies/Documents/SS1301.pdf
[9] Safety Recommendations. 2014. National Transportation Safety Board

> mitigating injury and death, obtained from studies conducted in other countries.

The Literature Review does include summary statistics that provide insight into the number of pedestrian and cyclist fatalities in the introduction section. However, these figures are oriented towards assessments of relevant side-impact crashes. The NTSB uses the 12 and 6 o'clock positions to characterize front and rear crashes, but, as discussed above, this is not an appropriate designation for impacts relevant to LPD analysis since it would blur the line between fatalities than can be mitigated by LPDs and fatalities than cannot. The data that were summarized in Section 1 of the Literature Review were done so from specific data sources and for the specific purpose of contextualizing the risk of fatality to pedestrians and cyclists as they pertain to the efficacy of LPDs. That an alternate report or data source exists that were used to investigate different research questions and thus arrived at different numbers does not constitute an error on the part of FMCSA.

Furthermore, the SUT analysis presented data from the period of 2005-2009 (*see* page 72). The analysis period presented in Section 1 of the Literature Review was from 2013 to 2017. Given that the SUT analysis and Literature analysis do not cover the same time period, they are not comparable. Accordingly, it was not erroneous for FMCSA to not include the SUT or safety letters.

**4. Sources Reviewed But Not Referenced**

Finally, ALMFTS claims that FMCSA cited two sources but did not include them in the discussion. These two studies are Keigan (2009)[10] and Talbot (2014)[11]. Of the Keigan report ALMFTS asserts:

> Keigan (2009) examined crashes by type and determined that LPDs are effective at preventing death in 93.8% of crashes where the large commercial truck is changing lanes or turning left (which in the US context would be turning right) and are effective in preventing death in 45.5% of crashes where the bicyclist has lost control while riding alongside the large commercial truck.

Concerning Talbot, ALMFTS asserts:

> Talbot (2014) examined crashes by type of lateral protection device and found that LPDs meeting current UK regulatory standards are effective in 11.5% of all bicycle crashes with the sides of large commercial trucks. LPD effectiveness rose to 26.9% when LPDs meet a higher standard that requires closing gaps between the LPD and trailer wheels.

[10] Keigan M, Cuerden, R and Wheeler A. 2009. "Analysis of Police Collision Files for Pedal Cyclist Fatalities in London, 2001 – 2006". Transport Research Laboratory

[11] Talbot R, Reed S, Barnes J, Thomas P, and Christie N. 2014. "Pedal Cyclist Fatalities in London: Analysis of Police Collision Files (2007-2011)" Transport for London.

More generally, ALMFTS claims that "these omitted sources contradicted information and conclusions contained in DOT's literature review."

In fact, both studies were cited, and both were summarized in a section that considered hybrid quantitative/qualitative research designs. These studies are explicitly mentioned in the appendix titled APPENDIX B – REVIEW OF EFFECTIVENESS STUDIES. Their consideration is presented on pages 49-50 of the Literature Review. This appendix was explicitly referenced in the second paragraph of section 3.1 (part of the effectiveness review section):

> Some publications had multiple report components and are therefore cited in more than one section. A systematic review of the published findings is provided in Appendix B. The following is a summary of this review.

The summaries provided by the Literature Review of both studies are accurate depictions of the report's work.

The Literature Review summarizes the contribution of Keigan et al. (2009) by noting that:

> [. . .] 20 of the 27 fatalities could have been prevented had the vehicle been fitted with a LPD (or a LPD with more rigorous technical specifications).

This reflects the findings of Keigan et. al, presented on page 46 of their report. It should be noted, however, that the authors qualified their assessments of efficacy on page 47 as follows:

> This interpretation is limited in that the evidence basis for the interventions described in Appendix B is variable. Some interventions have a reasonably strong research evidence base, others less so, while for other interventions there is currently no research evidence at all.

Regardless of how the efficacy of LPDs is estimated from the Keigan report, these figures should not be treated as if they will readily generalize to the full population of trucks.

Turning to Talbot et al (2014) this research is summarized by the Literature Review as follows:

> It found that all the fatally injured cyclists were on the ground before any LPD interaction could have occurred. The UK LPD requirement allows a gap of up to 550 mm from the bottom of the LPD to the road surface. A guard set this high can pass over a person already completely prone on the ground, and this sample did not show LPDs to be effective.

This information can be found on pages 83-87 of Talbot (2014). Therefore, the Literature Review did provide discussion of both the Talbot and Keigan reports.

**Conclusion**

FMCSA has determined that no correction is necessary under the IQA.

**Your Right to Appeal**

If you are dissatisfied with this response, you may submit a Request for Reconsideration (RFR). DOT requests that any such RFR be submitted within 30 days of the date of DOT's response. If you choose to submit an RFR, you may email a request to InformationQuality@dot.gov. If you wish to use postal mail, please send your request to:

U.S. Department of Transportation (DOT)
Docket Management
Re: Request for Correction of Information under the Information Quality Act
West Building, Room W12-140,
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Sincerely,

Jesse Elison
Chief Counsel