Response to Reviewers' Comments for TRC_2019_1394

We would like to thank the three anonymous reviewers for their comments, which significantly improved our manuscript. In this document, we detail how we have addressed all the comments made by the reviewers. For your convenience, we first reproduce your comments in a grey box , then highlight our response in **bold**. Changes in the manuscript are highlighted in blue, with the exception of minor edits relating to typos and language issues.

1 Response to Reviewer 1's Comments

1.1 General Comments for Part 1 and Part 2:

> The paper reads well and this study explores the association between truck crashes and safety-critical events using crash reports and naturalistic driving data. The topic is interesting. However, the reviewer has some concerns.
>
> 1. Justification of the research gap is weak, especially the introduction. Besides, what are the safety-critical events (SCEs)? Could you provide a definition?

Thank you for your comments and suggestions.

> 2. The introduction is not good and some sentences make them confused. The authors would be suggested to improve it largely.

> 3. Authors also kept silent regarding data quality & integrity.
>
> What is the percentage of drivers excluded? How about the accuracy of the GPD data? As we know, sometimes, the coordination of the GPS may be far away from the actual location, even the other side of the road.
>
> How to choose the thresholds? Any references?
>
> The quality of crash data in this manuscript should be reported.

> 4. In 4.1, why not report the driving experience (e.g., driving years)? Why not report the statistical summary of the variables?

5. Were all variables included in the models? So the authors did not consider the multicollinearity? And the tables made the reviewer confused.

6. "In the two models using the number of fatalities as the outcome variable (column 4 and 5), all 95% CIs of IRRs included one and the CIs were very wide", it means that the variables are not statistically significant?

7. The analysis on the model results, such as the association between four different types of SCEs and crashes, the relationship between the SCEs (e.g., Headways) of the variables, etc., are simple and weak. The authors would be suggested to add the deeper analysis. Otherwise, the contributions of this manuscript would be limited.

8. The discussion and conclusions would be also suggested to be improved substantially.

9. Many sentences are weak / improper and make readers confused.

For instance, page 11: One unit increase in the number of any type of SCEs per 10,000 miles was associated with 8.4% (95% CI: 8-8.8%) increase in the number of crashes per mile. How do you know 8.4%?

10. The website of the data sets provided in the manuscript does not work.

11. Lastly, the review would suggest that the authors re-check their grammar and text as there are many spelling mistakes in the manuscript. For instance, line 2 in page 5: "The found that ......". This manuscript should be revised properly.

2 Response to Reviewer 3's Comments

This paper investigated the association of the surrogate safety metrics and crashes using the NDS data collected from instrumented trucks. Below comments can further improve the quality of the manuscript.

Please contact the journal in case of clarifying the data source and data reliability step.

While authors reviewed some NDS studies, the biggest NDS study in the US and Europe i.e. "SHRP2" and UDRIVE are missing from the review. Below papers can provide more info about the latest and the largest scale NDS studies with more than 3200 drivers. Please update the Table 1, accordingly.

- Complementary Methodologies to Identify Weather Conditions in Naturalistic Driving Study Trips: Lessons Learned from the SHRP2 Naturalistic Driving Study & Roadway Information Database
- Eenink, R., Barnard, Y., Baumann, M., Augros, X., & Utesch, F. (2014). UDRIVE: the European naturalistic driving study. In Proceedings of Transport Research Arena. IFSTTAR.
- The impacts of heavy rain on speed and headway behaviors: an investigation using the SHRP2 naturalistic driving study data (TRC).
- The study design of UDRIVE: the naturalistic driving study across Europe for cars, trucks and scooters

Please introduce the data ping. What frequency of data a data ping is representing?

Please explain the collision mitigation surrogate in table1.

The authors should explain the method that they calculated headway. Were the vehicles instrumented with radar?

More explanation of the hard brakes and the threshold that was used should be added. What was the threshold for the 231101 hard brakes? Clarify whether this number represents the events or data pings.

Rolling stability should be defined.

Description of the headway calculation and the threshold for critical headway SCE should be added.

What are the present thresholds on page 8?

Regarding rolling stability, any NDS study that consider adverse weather and driver performance?

It would be interesting to see challenges with the data, missing values, etc. to be explained in a paragraph as a data preparation stage.

Page 9 the authors mentioned the median distance of the trip and the median number of miles per trip as 2.61 and 77.06. did the authors only considered trucks in the urban environment?

Xk should be xik

Authors need to explain how did they come up with K values.

It is recommended that page 10 paragraph 1 be summarized in a table and provide stat for each category.

Page 11 talked about table 2 and table two is presented in page 14. please keep the tables close to the description, if possible.

References