MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 19-381 (project 475) | April 2019

Analysis of the Relationship of Roadside Inspections on Large Truck Crashes

the ISSUE

Researchers want to better understand the relationships between roadside inspection data and safety performance data for large trucks. The research will provide insight into those relationships for various-sized motor carriers. An improved understanding about the importance of various factors (driver characteristics, trucking company characteristics, road conditions, etc.) in crash severity can improve crash prevention and enforcement efforts and overall road safety.

the RESEARCH

The following major tasks were performed:

1. A national and state literature review pertaining to commercial motor carriers' safety performance and roadside inspection with the objective of identifying analysis techniques and data requirements were performed. The review will cover journal articles and government reports.
2. Data Collection and preparation: Motor Carrier Management Information Systems data are the main data resource. The primary data documentation to be explored to summarize required inputs to perform the analysis may include:
   - Crash File Documentation
   - Census File Documentation
   - Inspection File Documentation
3. Analysis and Evaluation: Gradient boosting, a data mining technique, is used to study significant influential factors and their non-linear marginal effect on injury severity.

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Project Title

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the **FINDINGS**

Trucking company and driver characteristics have significant impacts on truck crash injury severity. Some of the results in this study reinforce previous studies' conclusions. For example, wet road surface, bad visibility (dark or low light conditions, or fog/poor weather conditions), strong crosswind, heavy gross vehicle weight (over 26,000lbs), and collisions with opposing traffic are estimated to increase the likelihood of more severe outcomes. Young drivers (under 25 years old) and old drivers (over 75 years old) are predicted to be the most likely groups to be involved in crashes resulting in fatalities. Also, truck crash severity level increases when more vehicles are involved in truck crashes.

the **IMPACT**

This research has impacts for motor carrier regulation and operations. An improved understanding of the factors that influence crash severity will lead to improved safety regulations and enforcement and will help trucking companies take steps to improve operations to reduce risks from those factors that have the greatest impacts on crash severity.

For more information on this project, download the entire report at http://www.ugpti.org/resources/reports/details.php?id=939

For more information or additional copies, visit the Web site at www.mountain-plains.org, call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.

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