

<b>UTC Project Information</b>	
Project Title	MPC 475 – Analysis of the Relationship of Roadside Inspections on Large Truck Crashes
University	North Dakota State University
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Project Duration	September 30, 2013 to September 30, 2018
Brief Description of Research Project	<p>About 3,341 large truck related fatal crashes happened in United States in 2011 and more than 3,700 people died, which counted for more than 11% of all motor vehicle fatal crashes and fatalities, even though large trucks only accounted for 4% of registered vehicles and 9% of vehicle-miles traveled (VMT) (USDOT, 2013). Large truck VMT decreased 6.7% from 2010 to 2011 however, large truck related fatal crashes still increased 2% from 2010 to 2011 (USDOT, 2013).</p> <p>To reduce serious accidents involving these vehicles, the Federal Motor Carrier Safety Administration (FMCSA) [formerly the Federal Highway Administration Office of Motor Carriers] provides support for states to perform roadside inspections of commercial vehicles (large trucks, commercial buses, and hazardous materials vehicles) and drivers, compliance reviews and other safety programs (GAO, 1997).</p>

On-site reviews of motor carriers' compliance with federal safety regulation are known as compliance reviews, which can be used to determine a safety fitness rating. The safety rating is used to determine how well each carrier is fit to operate safely on the nation's highway.

Roadside inspections occur on a particular driver or vehicle, most often when the driver/vehicle is en route to their destination. Violations found during the inspection can be divided into two groups: 1) minor and 2) out-of-service (OOS). Minor means those violations do not pose any immediate danger and the driver/vehicle can return on the road even before the violations are fixed. Out-of-service violations are those that require the vehicle/driver violations to be fixed immediately before it can return back to service. The purpose of the OOS is to ensure that a vehicle and/or its driver are not allowed to proceed back on the road until the conditions are safe. In return, it can decrease accident rates caused by mechanical defects. (Randhawa, Miller, Bell and Montagne, 1998). Even though, some researchers found that there are some problems such as an officer can't always remain at the site to make sure the violation is corrected (Patten, 1989), great numbers of researchers still found that the roadside inspection is a useful tool to remove some potential unsafe vehicles from the highway and reduces commercial vehicle accident rate. (Patten, 1989; GAO, 1997; Mitchell, Friswell, and Mooren, 2012; Schoor, Niekerk, and Grobbelaar, 2001; Randhawa, Miller, Bell and Montagne, 1998; Hall, and Intihar, 1997).

Previous researchers shed light for helping us better understand the relationships among the commercial vehicle safety performance, roadside inspection data, and motor carrier's position (Lantz, B.M. 1993; Britto, R.A., Corsi, T.M., and Grimm, C.M., 2010), however, many of such research are out dated. Moreover, very few previous researchers focus on small motor carriers. There is need to revisit investigating the relationship among motor carrier's position (such as size, and financial status), safety performance, and roadside inspection data. This research will provide additional evidence on such relationships especially for various sized motor carriers. In addition, the trend in the relationships will be provided by comparing the most up-to-date analysis with previous ones.

**Research Objectives:**

The primary objective of this project is to conduct a statistical analysis to better understand the relationships among roadside inspection data and safety performance data, using data from

	<p>the Motor Carrier Management Information System (MCMIS).</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>Developed data-mining algorithm, gradient boosting, for the commercial truck safety analysis to understand the contributor effects on truck crash severity especially for the commercial truck company related factors.</p> <p>The non-linear effects relationships among truck crash contributors and truck crash severity levels enhanced the crash severity contributors' effects in the body of knowledge.</p> <p>The published journal at the top journal in the area of transportation safety could promote increased understanding and awesomeness of commercial truck related crashes.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>Transportation safety professionals would benefit from the research to improve their base knowledge on what and how contributors impact on commercial truck crash severity.</p> <p>The potential impact of the research has regulatory and operational use. It provide more information on effects of commercial trucking company related contributors and other external contributors such as weather, time of the day on crash severity.</p>
<p>Web Links</p> <ul style="list-style-type: none"> <li>• Reports</li> <li>• Project Website</li> </ul>	<p><a href="https://www.ugpti.org/resources/reports/details.php?id=939">https://www.ugpti.org/resources/reports/details.php?id=939</a></p>