

**Request for Research Funding for FY 2019-2020**

<b>Requesting Office</b>	FMO	<b>Priority</b>	2 of 4
<b>Proposed Title</b>	Assessing the Impacts of Roadway and Design Features on Large Truck Crashes for Freight Mobility and Safety Enhancement in Florida		
<b>Justification</b>	<p>Freight mobility plays a vital role in fueling Florida’s economic prosperity and the well-being of all Floridians. Between 2007 and 2016, there were a total of 231,890 crashes in the state that involved large trucks, which resulted in over 6,600 incapacitating injuries and fatalities. Crashes involving freight mobility imposes enormous costs on society, from property damage, injuries and medical expenses, and loss of life, to the impact on prosperity of the industry due to delay-related cost, additional operations costs and productivity loss. Despite various safety enhancement measures and initiatives, the number of large truck involved crashes has been increasing, from just a little over 9,000 in 2010 to almost 20,000 in 2016, at an annual increasing rate of 14%.</p> <p>In the aims to improve transportation safety and economic viability in Florida, the FMO office conducted a comprehensive statewide crash analysis focusing on large truck crashes in the last ten years. The study analyzed critical reasons for trucks and non-trucks, identified top locations with high crash density for each district, and investigated contributing factors to crash severity at disaggregate level. These analyses represented the first comprehensive attempt to analyze large truck crashes in the state and paved the pathway to further analysis that would help develop more effective strategies in enhancing freight safety and mobility. Extensive effort has been spent in cleaning, processing and exploring the ten-year large truck crash dataset. Given the understanding of the data and considering the analysis that has been achieved through the previous project, the following analysis needs have been identified that will help further support the office’s freight mobility and safety initiatives:</p> <ul style="list-style-type: none"> <li>• Risk analysis that identifies and evaluates all co-existing conditions that contribute to the occurrence of a crash, and compares how the risk factors might be different for trucks and non-trucks, which will provide a comprehensive understanding of the causes and contributing risk factors that lead to large truck crashes;</li> <li>• Aggregate (segment-level) analysis that investigates the occurrence (i.e. crash frequency or crash rate) as well as severity of large truck crashes, which will allow predictive analysis of expected safety performance on freight-related crashes and development of freight-specific countermeasures;</li> <li>• Heterogeneity analysis that examines the potential sources of heterogeneity in crash severity which shows how the impacts of the same contributing factor may vary by driver characteristics or roadway conditions, which will provide the means to develop more effective countermeasures that target specific market segments.</li> </ul> <p>Freight mobility and safety enhancement is a mission critical focus area of the FMO office. This project provides the analytical foundation to the development of effective countermeasures and strategies.</p>		
<b>Impact</b>	The results of this project will further advance our understanding on the mechanism and contributing factors of large truck crashes and lead to the development of more targeted and effective countermeasures that focus on specific market segments. Findings from this research will be used to support safety, design and analysis decisions. Without this research, the Office will be left with no analytical evidence to support the development of countermeasures and strategies to improve freight mobility and safety.		
<b>Affected Offices</b>	Freight & Multimodal Operations Office; Safety Office		
<b>Existing Work</b>	Focusing on large truck crashes in Florida, there is only one project that has attempted to conduct a comprehensive statewide crash analysis. Due to the size and complexity of the statewide large truck crash dataset, the previous project spent significant effort in data cleaning, data processing and data exploration. Another major contribution of the previous study is the disaggregate analysis on crash severity that provide valuable information with a behavioral foundation, as it incorporates driver and vehicle level information. However, this information would not be available before actual crash occurrence, and predictive analysis		

	requires accessible segment-level information such as roadway, traffic and weather conditions. Therefore, this project aims to fill in the knowledge gap in aggregate analysis of large truck crashes in Florida.		
<b>Keywords Used In Existing Work Search</b>	Large truck crash analysis, crash frequency, severity analysis		
<b>Related Contracts</b>	BDV 29 977-31		
<b>Funding Request</b>	\$250,000	<b>Anticipated Duration</b>	18 months
<b>Project Manager</b>	Rickey Fitzgerald Manager Freight & Multimodal Operations, FDOT <a href="mailto:Rickey.Fitzgerald@dot.state.fl.us">Rickey.Fitzgerald@dot.state.fl.us</a> Phone: 850.414.4702	<b>Contracting Method</b>	Direct contract with university
<b>Urgency</b>	1= highest , most immediate need	Florida Transportation Policy has explicit objectives to decrease crashes by 5% annually, to improve safety and to enhance operational efficiency in goods movement; this study provides a means to address these urgent issues.	
<b>Implementability</b>	1=greatest likelihood of and proximity to implementing results	The study results will be recommendations for strategies to reduce freight mobility related crashes. The recommendations can be directly implemented.	
<b>Project Benefits (Succinct, complete explanation)</b>			
A comprehensive understanding of the patterns and contributing causes of large truck crashes will facilitate the investment and policy decisions in reducing truck crashes and promoting freight safety, which have direct impacts and significant benefits in terms of reductions in the societal and environmental costs associated with truck crashes, improvement in transportation system performance and freight transportation productivity, and enhanced economic outcomes in the state.			
<b>Project Benefits (Select all that apply and explain)</b>	<b>Quantifiable Benefits (units, dollars, etc...if applicable)</b>	<b>Methodology or Data Sources Used to Determine Quantifiable Benefits. If not applicable, please give justification of project benefits</b>	
<input type="radio"/> Materials Enhancement			
<input type="radio"/> Materials Savings			
<input type="radio"/> Time Savings			
<input type="radio"/> Lives Saved/Injuries Prevented	Enhanced safety	The study will develop countermeasures that reduce the occurrence and/or severity of large truck involved crashes, which lead to lives saved and injuries prevented.	
<input type="radio"/> Other (Explain)	Enhanced freight mobility and economic viability	The study will provide countermeasures that will reduce society and industry costs by removing crashes as an inhibitor thus enhancing freight mobility and economic viability. A 1% reduction would remove almost \$1 billion in costs nationwide.	