Request for Research Funding for FY 2021-2022			
Requesting Office	State Traffic Engineering and Operations Office	**Priority**	6 of 15
Proposed Title	Development of a Roadway Corridor Safety Approach to Identify High-Risk Corridors and Prevent Fatalities on Florida Roadways		
Justification	In 2018, 27.6% of the 3,135 traffic fatalities in Florida occurred on state highways. To assess the safety of these highways, the current engineering standard is to analyze roadway segments and intersections separately using guidance from publications like the Highway Safety Manual (HSM). These assessments use historical data to predict crash frequency and require large amounts of data. Rather than focusing on historical crashes, a better approach is to develop crash risk models that proactively identify high-risk roadway corridors based on citations, corridor design characteristics, traffic volumes, context classification, and other factors. By using these models, FDOT can proactively reduce the risk of fatal crashes in the near future while requiring less granular data, saving lives and resources.		
Impact	Developing a roadway corridor safety approach that can be used to define, identify, and evaluate high-risk roadway corridors with respect to fatal crash frequency can assist FDOT's effort of Toward Zero Deaths. This corridor approach will allow FDOT to identify high-risk corridors and significant corridor characteristics that affect fatal crash frequency, and also help determine appropriate countermeasures to prevent fatalities from occurring in these high-risk corridors. Analyzing entire roadway corridors that include intersections and roadways segments can provide insights not identifiable when studying intersections and roadway segments separately.		
Affected Offices	FDOT Central Office and all FDOT districts will benefit from the findings of this research. This research will develop roadways corridors for signalized arterial highways in select areas in Florida, with potential expansion to other types of roadways in the future.		
Existing Work	While a thorough literature review will be conducted as part of this study, some existing studies on roadway corridor safety were found: Alarifi, S. A., Abdel-Aty, M.A, Lee, J., and Park, J. Crash modeling for intersections and segments along corridors: A Bayesian multilevel joint model with random parameters. *Analytic Methods in Accident Research*, Vol. 16, December 2017. DOI: 10.1016/j.amar.2017.08.002 El-Basyouny, K. and Sayed, T. Accident prediction models with random corridor parameters. *Accident Analysis & Prevention*, Vol. 41, Issue 5, September 2009. DOI: 10.1016/j.aap.2009.06.025 Xie, K., Wang, X., Huang, H., and Chen, X. Corridor-level signalized intersection safety analysis in Shanghai, China using Bayesian hierarchical models. *Accident Analysis & Prevention*, Vol. 50, January 2013. DOI: 10.1016/j.aap.2012.10.003 The following software that could be used for corridor-level analyses were also found. The benefits and shortcomings of these software will be examined as part of this research. American Association of State Highway and Transportation Officials (AASHTO). Safety Analyst. Washington, DC, 2020. Retrieved from https://www.safetyanalyst.org/. Federal Highway Administration (FHWA). Interactive Highway Safety Design Model (IHSDM): Overview. Washington, DC, 2019. Retrieved from https://highways.dot.gov/research/safety/interactive-highway-safety-design-model/interactive-highway-safety-design-model-ihsdm-overview.		
Keywords Used In Existing Work Search (Cannot leave blank)	Roadway Corridor, Risk Modeling		
Related Contracts (Give contract numbers)	None		
Funding Request	$230,000	**Anticipated Duration**	18 months
Project Manager	Alan El-Urfali, P.E.	**Contracting Method**	Direct Contract with UCF (Dr. Al-Deek)

Urgency	1	A risk-based corridor safety approach helps to prevent future fatal crashes from occurring on roadways, helping FDOT proactively work Towards Zero Deaths. Building models for high-risk corridors allows FDOT to understand contributing factors and identify the most effective ways to mitigate these crashes and improve safety. Developing a standard definition of roadway corridors will ensure that FDOT can apply the results quickly and effectively to achieve the most fatal crash risk reduction for the lowest cost.
Implementability	1	Using the results of this research, FDOT can move Towards Zero Deaths and achieve its goal much faster by identifying high-risk corridors that are expected to experience many fatal crashes in the near future and implement effective countermeasures to reduce these fatal crashes. Implementing these countermeasures will allow FDOT to be proactive and prevent fatal crashes before they occur rather than waiting for them to occur to decide where to implement countermeasures.

Project Benefits (Succinct, complete explanation)
This project will develop models to identify high-risk roadway corridors and identify the factors contributing to these risks. Creating a consistent way to split the roadway system into corridors will allow for the collected data to be uniform and reliable and the developed models to be more accurate with less bias. Using corridor-level data rather than intersection- and segment-level data takes less time to collect and does not demand as many resources while providing insights on factors related to the interaction between intersections and segments. These developed models will help FDOT identify high-risk corridors that can have countermeasures implemented to reduce the risk of fatal crashes from occurring, thereby working Towards Zero Deaths.

Project Benefits (Select all that apply and explain)	**Quantifiable Benefits (units, dollars, etc…if applicable)**	**Methodology or Data Sources Used to Determine Quantifiable Benefits. If not applicable, please give justification of project benefits**
o Materials Enhancement		
o Materials Savings		
o Time Savings		
o **Lives Saved/Injuries Prevented**	Reductions in fatal crashes and associated fatalities/injuries.	Developing risk-based models will allow FDOT to help prevent fatal crashes on the state roadway system in a proactive and much faster way. Identifying contributing factors and countermeasures for these high-risk corridors will improve safety by cost-effectively reducing crashes.
o **Other (Explain)**		Consistently dividing the roadway system into corridors allows for the collected data to be standardized and reliable. Developing models at the corridor level also provides additional insights and requires less data than developing models at the intersection or segment level, making it less labor intensive. Benefit-cost analyses will also be conducted for select countermeasures and corridors to demonstrate the potential impacts of this approach.

*Comments should explain and support urgency, financial benefit, and implementability scores