Request for Research Funding for FY 2019-2020			
Requesting Office	**FDOT District 5**	**Priority High**	# of # (projects may not have the same ranking – no ties)
Proposed Title	**A GIS-Based Systemic Safety Analysis Tool for a Multimodal Transportation System – A County Focus Approach**		
Justification	Describe the current situation, why the research is needed, and how the research affects your office's mission critical focus areas With the transition to the mobility of people through multimodal transportation systems, pedestrian safety has become more prevalent for governmental agencies to address and prioritize for strategic constructing. The state of Florida has frequently ranked as one of the worst states in terms of pedestrian crashes, injuries and fatalities according to the National Highway Traffic Safety data. Furthermore, the "Dangerous by Design" reports, since 2011 until the recently published report in January 2019, consistently ranked four metro areas in Florida (Orlando-Kissimmee-Sanford, Tampa-St. Petersburg-Clearwater, Jacksonville, Miami-Fort Lauderdale-Pompano) as the most dangerous and deadliest for pedestrians among all the United States with Central Florida topping the list. However, the methodology used in these reports is based on PDI (Pedestrian Danger Index), an approximate measure to estimate the total number of people who walk to work for all trips as reported in the American Community Survey (ACS) which is not precise since there is no common rigorous survey of all walking trips exists across cities, regions or states. Therefore, It is important to address the pedestrian-vehicular conflict as well as the safety of all modes of the transportation system through a systemic approach rather than focusing only on an approximate measure or specific sites experiencing a history of severe crashes as in the traditional site analysis. The Florida Strategic Highway Safety Plan (SHSP) provides a comprehensive framework for reducing traffic fatalities and serious injuries on all public roads. The SHSP establishes key emphasis areas developed in consultation with federal, state and local safety stakeholders. The key areas addressed in the SHSP are aggressive driving, intersection crashes, vulnerable road users, lane departure crashes, impaired driving, at-risk drivers (aging road users and teens), distracted driving, and traffic data. Although, the SHSP addresses pedestrian and bicycle safety issues in the Vulnerable Road Users emphasis area, the Florida Pedestrian and Bicycle Strategic Safety Plan (PBSSP) supplements and expands on it with more detailed objectives and strategies to improve pedestrian and bicycle safety in Florida. Furthermore, the "Moving Ahead for Progress in the 21st Century Act" (MAP-21) continues the Highway Safety Improvement Program (HSIP) as a core Federal-aid highway program and emphasizes reducing fatal and serious injury crashes on all public roads. MAP-21 encourages each State to consider systemic safety improvements as they update their strategic highway safety plan (SHSP).The legislation acknowledges that a State's HSIP should identify projects to improve safety not only on the basis of crash history, but also on crash potential. MAP-21 places a significant emphasis on systemic safety analysis and improvements as part of the safety management process and ensures that they are eligible highway safety improvement projects.		
Impact	How shall the results impact practice? Consequences of not doing the research? The systemic approach is a data-driven process that involves analytical techniques to identify sites for potential safety improvement which are not typically identified through the traditional site analysis methods. Systemic analysis addresses the crash types that result in a significant number of fatal and serious injury crashes spread across the network rather than focusing only on specific sites experiencing a history of severe crashes as in the traditional site analysis. The key to the systemic planning process is the concept of evaluating an entire system using a multiyear effort that involves many data sources with a defined set of criteria that will vary depending on the available data. The systemic approach reaches more locations in less time than the traditional approaches. When first implemented, it should act as a baseline scenario and the FDOT can start tracking safety improvements annually and implemented countermeasures to evaluate its effectiveness and changes in crashes.		

	As activities move forward, the tool will provide a primary source of a Systemic Multimodal Safety Plan (SMSP) to evaluate progress and advance the efforts of FDOT's safety management program. The main objectives of the proposed research is to: 1. Identify focus crash types, focus facilities and risk factors 2. Identify low cost and effective countermeasures to prioritize safety projects 3. Develop a systemic safety analysis tool for all modes of the transportation system		
Affected Offices	Identify any office that will need to be involved in the scoping or conduct of the research, will be affected by implementation of the results, or will need to participate in the implementation process—including OTIT, if enterprise data/network software application will be a deliverable, and district staff, as appropriate, e.g., through statewide meetings. **If the requesting office will not be the implementing office, please identify which office will have to serve in that capacity—has it been involved?** **Traffic Operations Office (Safety Division), GIS Enterprise Office.**		
Existing Work	Learning About and Using the Research in Progress (RiP) Database http://www.trb.org/main/blurbs/176215.aspx As a minimum, the Transportation Research International Documentation (TRID) and the Research in Progress (RIP) online databases should be reviewed by an expert in the research subject matter to assure research effort and resources shall not duplicate prior or ongoing work. TRID: https://trid.trb.org/Results RIP: https://rip.trb.org/ A quick review of the TRID databases has been conducted to ensure that research efforts and/or resources are not duplicated or ongoing. There are plenty of previous studies and work conducted in the area of vehicular, pedestrian and/or bicycle safety. However, A systemic safety analysis that includes all modes of the transportation system has not been identified in previous work specifically for FDOT District 5.		
Keywords Used In Existing Work Search **(Cannot leave blank)**	Systemic Safety Analysis, Multimodal Safety Plan, Data Driven Approach, Pedestrian-Vehicle Conflicts, Conflict Analysis, GIS		
Related Contracts (Give contract numbers)	None		
Funding Request	Estimated cost: **375,000**	**Anticipated Duration**	Estimated length of time to complete work: **2 Years**
Project Manager	Proposed technical manager to oversee research: **Joe Santos/Chad Lingenfelter**	**Contracting Method**	Anticipated procurement method (e.g., supplement to existing project, RFP to universities only, RFP to all registered vendors, direct contract with university): **Direct Contract with University**
Urgency	Score 1-5 1= highest , most immediate need: **1**	Comments* (elaborate as appropriate on justification/impact comments to explain the urgency of the need . . . is a solution needed immediately, needed within a certain period of time or by a known or anticipated deadline, desired for enhancement, etc.) **Pedestrian safety is of particular concern to Florida and specifically District 5 and a systemic safety analysis approach is crucial to determine where factors converge to identify safety areas of concern to prioritize safety projects.**	
Implementability	Score 1-5 1=greatest likelihood of and proximity to implementing results: **1**	Comments* (consider both the likelihood of implementation and the length of time and resources required to implement the results of the research.) Identify any prerequisites to, requirements for, or barriers to implementing the anticipated results of this research (e.g., new or change to existing specifications, development of production units of prototype device, legislative change); please indicate if multiple phases of work shall be required: **The developed GIS application tool will be prepared in a consistent framework that can be easily integrated into the GIS Enterprise System.**	

Project Benefits (Succinct, complete explanation)

The proposed research will develop a systemic safety analysis tool that would assist governmental agencies in the prioritization of safety projects based on a balanced approach between safety needs, operational constraints and fiscal assessment. Several factors should be considered in measuring the benefits of conducting this research. First, the State and local representatives will have a qualitative measure for determining and identifying critical safety locations across the state roadway system. Second, a systemic tool to prioritize safety projects along with the recommended countermeasure will be developed which would potentially minimize Department staff hours on safety projects by identifying "hot spots" or critical areas of concern more readily versus lengthy reviews of crash reports.

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	**Staff Hours**	A systemic tool to prioritize safety projects along with the recommended countermeasure will be developed which would potentially minimize Department staff hours on safety projects by identifying "hot spots" or critical areas of concern more readily versus lengthy reviews of crash reports.
o Lives Saved/Injuries Prevented	**Human lives, Dollars**	The selected countermeasures will not be based solely on the safety effectiveness but also the implementation and maintenance costs, and consistency with the agency's policies and practices. A benefit-cost analysis will determine the most cost-effective countermeasure allocated to systemic improvements. The systemic approach is focused on mitigating types of crashes that are widely scattered across a roadway system. Therefore, the primary purpose is to develop a short list of effective, low-cost countermeasures and a few higher-cost countermeasures for each focus crash type which are the main focus of the systemic safety investment plan. The projects will be prioritized for implementation by considering factors such as funding, other programmed projects, expected crash reduction as well as environmental and right-of-way constraints. The prioritization will also take into account an evaluation of locations located along a roadway segment or intersection identified within the local MPO's priority list, Transportation Improvement Plan or funded within the Department's Work Program assure that funds are not duplicated
o Other (Explain)		

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