Request for Research Funding for FY 2022-2023			
SPR Subpart B Project: TEO-23-04			
Requesting Office	State Traffic Engineering and Operations Office	**Priority**	4 of 22
Proposed Title	Service Patrol Vehicle Enhancements to Reduce Responder Crashes		
Justification	The Road Ranger Service Patrol (RRSP) provides traffic incident management response services to assist the motorists traveling on Florida's over 2,000 miles of limited access roadways. RRSP operators are often the first responders to incidents and set up maintenance of traffic portable signing and channelization devices on high-speed roadways. This exposes the RRSP operators to high-speed traffic and the potential danger of being struck by an errant driver (i.e., non-compliant to move over law). Advance warning and visual identification of RRSP vehicles by approaching traffic provides motorists the opportunity to uniquely identify RRSP vehicles and comply with the "Move Over or Slow Down" requirements. Like other emergency vehicles, there are distinguishing features that are unique to a particular agency or discipline. The research team will examine how the use of vehicle colors, emergency lighting packages/options, vehicle-mounted dynamic message signs, swing out gates, and graphics including the configuration of conspicuity chevrons influence motorists to observe the move over law and evaluate how effective the measures are in reducing crashes with emergency vehicles. The research team will also examine the effectiveness of vehicle hardening such as bumper technologies and use of larger vehicles in protecting RRSP operators when they are involved in a crash.		
Impact	The new technology has the potential to improve safety of the RRSP personnel. The study results will help FDOT District 1, District 2, District 3, District 4, District 5, District 6, District 7, and Florida's Turnpike Enterprise (FTE) to assess impacts of the deployed technologies and expand their implementation to similar locations statewide. The study will establish a statewide standard for RRSP vehicles and emergency lights that will feed into the RRSP contract requirements.		
Affected Offices	• State Traffic Engineering and Operations Office, Traffic Incident Management Division • District Transportation Systems Management and Operations Program Engineers • District Traffic Incident Management Program Managers • State Safety Office		
Existing Work	TRID (https://trid.trb.org/) and RIP (https://rip.trb.org/) revealed few studies related to optimizing RRSP vehicle visibility. A study in Texas suggests use of red/blue/amber lights provides maximum braking response from approaching drivers. Many studies validated the effectiveness of freeway service patrols, a few listed below: • Effectiveness of Warning Lamps on Pedestrian Visibility and Driver Behavior, University of Michigan, Michael J. Flannagan and Joel M. Devonshire, April 2007 • Inferences about Emergency Vehicle Warning Lighting Systems from Crash Data, Society of Automotive Engineers, July 2005 • Optimal Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles, SAE International, June 2013		
Keywords Used In Existing Work Search	Service Patrol, Service Patrol Vehicles		
Related Contracts	N/A		
Funding Request	$250,000	**Anticipated Duration**	9 months
Project Manager	Shawn Kinney District Co-PM TBD	**Contracting Method**	RFP
Equipment	Estimated equipment cost (or N/A) = $50,000 to $100,000	Acquire equipment, or possibly a prototype RRSP Vehicle, recommended by the study to evaluate driver reaction in real time at traffic incident sites.	
Urgency	1	Urgency = 1: Statewide there were 5 fatalities since RRSP program inception in 1999 and over 40 serious injuries since 2014. Even one RRSP operator injury is too many!	

Implementability	1	Implementability = 1: FDOT central office funds the RRSP program, District Offices implement RRSP contracts. FDOT Central Office establishes standards that are implemented through the District RRSP contracts. RRSP contractors provide RRSP vehicles in accordance with contract requirements. If the research results in identification of revised RRSP Vehicle standards, it will take a short amount of time to establish the standards and amend existing contracts and new contract requirements to incorporate the new standards. FDOT central office is motivated to make this change statewide as soon as the study findings are available.

Project Benefits (Succinct, complete explanation)

This research request will directly support the Florida Strategic Highway Safety Plan (Mar 2021) Emergency Response Key Strategy for "Emergency Response" by implementing proven strategies for ensuring the safety of emergency response personnel while en route or at the scene of a crash and by implementing proven and innovative strategies for enforcement and traffic operations personnel to clear vehicles and manage and restore traffic flow at the scene of a crash with emphasis on avoiding secondary crashes. Avoiding secondary crashes is also a goal of FDOT's Statewide Transportation Systems Management and Operations (TSM&O) Strategic Plan (Aug 2017) and TIM Strategic Plan (Jan 2019).

The project will result in standards for RRSP vehicles that will optimize vehicle conspicuity and maximizes rate at which vehicles approaching RRSP vehicles will slow and "move over" in compliance with Florida statues regarding moving over for emergency vehicles. The goal is that no RRSP Operator will be killed or injured at a traffic incident site when using optimally equipped and appropriately used on-board equipment. On-board equipment may include enhanced light configurations, larger (wider/higher) portable arrow boards, and other technologies such as a portable connected vehicle on-board unit that continuously transmits traffic incident basic safety messages to approach vehicle equipped with connected vehicle on-board units.

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	Uniform RRSP Vehicle Criteria	Specifications and uniformity of RRSP vehicles will be enhanced statewide for maximum recognition and appropriate response by travelers.
o Materials Savings	N/A	
o Time Savings	N/A	
o Lives Saved/Injuries Prevented	1-2 fatalities/serious injuries per year	• FDOT's Crash Analysis and Reporting System (CARS) and Signal4 contains RRSP crash data involving operators and vehicles. • FDOT's SunGuide database contains data on RRSP activities and activations including numbers and types of incident to which RRSP responded. • FDOT's HERE data stored at RITIS contains data to measure speed of vehicles approaching a traffic incident. • *Ad hoc* rear-facing machine vision cameras can be used to measure action of approaching vehicles in response to activation of RRSP on-board warning equipment.
o Other (Explain)		

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