

Request for Research Funding for FY 2020-2021

Requesting Office	District VI	Priority	1 of 1
Proposed Title	Assess the Impacts of Autonomous Connected Electric and Shared (ACES) Mobility		
Justification	<p>Recent advances in information and communication technologies (ICT) have significantly revolutionized the modern world in many ways, transforming our cities into a more connected and technology-oriented environment. Rapidly emerging mobile apps have contributed to the quick expansion of car-sharing, ride-sourcing, and various other on-demand services around the world. Similarly, electric, connected and autonomous vehicle technologies hold the promise to provide a smart, efficient and sustainable transportation system.</p> <p>While the technologies mature, and the services enter the market, it is essential to incorporate ACES considerations into current long-range transportation planning efforts. Particularly, policy and investment decision makers are interested to know how ACES technologies may affect mobility patterns and system performance.</p> <p>The Forecasting and Trends Office has conducted research in understanding use adoption, attitudes and preferences toward ACES mobility options. Built upon previous effort, this project aims to incorporate the derived behavior insights and market assessment into the demand analysis and planning process to determine the impacts of ACES mobility. The specific objectives of this project include:</p> <ul style="list-style-type: none"> • Develop a framework that can incorporate ACES considerations into the transportation demand analysis and planning process; and • Assess the impacts of ACES on mobility patterns and system performance consider market penetration and user acceptance. <p>Given the above goal and objectives, there are several major efforts that need to be accomplished through this project. The first major effort focuses on developing the modeling framework that can account for ACES mobility in the demand analysis process. This includes identifying model components and parameters that are likely to be affected by ACES options and determining ranges of parameter values that can reflect the potential impacts of ACES on travel choices and mobility patterns.</p> <p>The second major effort involves scenario analysis and sensitivity tests to assess the possible effects of ACES on the transportation network using the Southeast Regional Planning Model (SERPM). Different levels of market penetration will be considered, and a set of scenarios will be designed considering various aspects of user adoption and preferences. Combinations of various ACES options will also be considered in the scenario design.</p> <p>This modeling framework will enable the agency to model and evaluate ACES applications. Such scenario analysis will be very helpful in a wide range of policy discussions relevant to ACES mobility options.</p>		
Impact	<p>Given the emergence of new mobility options and vehicle technologies, there is a need to reassess the modeling assumptions of current transportation planning models. This project intends to provide a systematic framework that incorporates ACES considerations into the demand analysis and planning process. This allows planners and policy makers to better anticipate the mobility, energy, and environmental impacts of ACES options. The impact assessment using the SERPM will facilitate a wide range of policy discussions relevant to ACES mobility and helps inform infrastructure investment decisions.</p>		
Affected Offices			

Existing Work	<p>Previous effort conducted by the Forecasting and Trends Office has provided better understanding of the behavioral changes in light of ACES mobility options. This project aims to incorporate the results into the planning process through a systematic modeling framework. The Office of Policy Planning published a policy guide to assist MPOs and local governments for ACES considerations (https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/policy/metrosupport/resources/fdot_mpo_guidebook_20181005.pdf?sfvrsn=7d194ed6_2). Built upon the policy guide and the behavior insights derived through previous effort, this project will conduct a set of scenario analysis using the SERPM modeling framework and assess the impacts of ACES applications in Florida.</p>		
Keywords Used in Existing Work Search	autonomous connected electric shared, mobility patterns, scenario analysis, impact assessment		
Related Contracts (Give contract numbers)	BDV29 977-47		
Funding Request	\$200,000	Anticipated Duration	15 months
Project Manager	Neil Lyn District Statistics Administrator Planning and Environmental Management Office Florida Department of Transportation - District 6 Phone: (305) 470-5373 E-mail: Neil.Lyn@dot.state.fl.us	Contracting Method	direct contract with university
Urgency	1= highest, most immediate need	As advanced technologies and services emerge, there is a pressing need to update our planning models that can incorporate ACES considerations. These models are essential to the development of policy and investment strategies	
Implementability	1=greatest likelihood of and proximity to implementing results	This project provides a framework and recommend scenario designs to incorporate ACES considerations into the demand analysis and planning process. The SERPM will be used. The scenario analysis can be adopted by MPOs and local governments.	
<p>Project Benefits (Succinct, complete explanation)</p> <p>The rapid development of ACES technologies requires adequate tools that are able to assess the impacts of ACES technologies and evaluate various investment and policy alternatives. This study will examine the modeling assumptions of current transportation planning models, and develop an approach that incorporates ACES considerations into the demand analysis and planning process and allows better anticipation of the mobility, energy, and environmental impacts of ACES technologies.</p>			
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	

○ Materials Enhancement		
○ Materials Savings		
○ Time Savings		
○ Lives Saved/Injuries Prevented		
○ Other (Explain)	Better planning models to address ACES considerations	This project assesses the potential impacts of ACES technologies on mobility patterns and system performance. The results of this study will facilitate a wide range of policy discussions relevant to ACES mobility and helps inform infrastructure investment decisions.