



Development of a Research Methodology specifically addressing Coastal Mobility in terms of Road Accessibility. This methodology includes a preliminary experimental design that will integrate results within the 3 States (i.e., perceived, actual, designed) into advanced visualization techniques for better decision-making.



Project Requirements Form USDOT

CREATE UTC Contract Number 69A3552348330

Center Lead: Texas State University; University of Puerto Rico – Mayagüez

A presentation was offered at the Mega Viernes Civil 2024 Conference of the Puerto Rico Institute of Civil Engineers, related to the project's overall scope and objectives. Additionally, a poster was also presented with an in-depth overview of our research.

We participated in the UPRM Research Symposium for Faculty and Graduate Students where we showcased three posters, related to the project activities in CREATE.

Outcomes/Impacts: CREATE-UPRM seeks to continue expanding the methodological concept based on the three states or dimensions: perception (social), reality (measured), and resilient design (target), to develop a comprehensive framework for a decision-making & project management tool. This model is also being referred to as the Equilibrium Cycle, which intends to address coastal mobility in terms of road accessibility due to multi-hazard by gathering perceptual information to propose solutions based not only on effectiveness and efficiency but also to propose tailored ones that meet the genuine societal needs of the most burdened communities.

CREATE-UPRM aims to develop interactive simulations using software such as Unity, which will allow for the creation of detailed models of solutions to improve accessibility on coastal roads for coastal communities through immersive virtual reality technologies. These models will serve as valuable tools to assess the impact of various proposed solutions before their real-world implementation. As the project progresses, there may be opportunities to patent specific simulation technologies or innovative evaluation methodologies. Integrating these simulations into the planning and design process will enable more active participation from the affected communities. This participatory approach will not only enhance the accuracy and relevance of the proposed solutions but also promote greater acceptance and adaptability of the final solutions. Additionally, the use of advanced visualization technologies will facilitate a more precise assessment of the communities' needs and preferences, ensuring that the solutions are optimally tailored to their specific realities.

CREATE-UPRM also aims to develop a tool similar to the Caltrans EQI to obtain a transportation-based priority populations screen for Puerto Rico coastal communities. By identifying not only measures to account for perception/reality/designed outcomes and transportation-based priority communities, but also including blue economy workforce zones with potential sustainable development, the tool would assess issues within the transportation network, ensuring that all residents and visitors have access to transportation services. Similarly, the rise of the blue economy workforce development should provide opportunities for local entrepreneurship within coastal employment.

Final Research Report: URL to final Report will be provided upon completion.