MarTREC UTC Project Information Form
USDOT Tier 1 University Transportation Center
Agency ID or Contract Number 69A3551747130

Project Title: The Unintended Consequences of Flood Mitigation along Inland Waterways – A Look at Resilience and Social Vulnerabilities
Project Abstract (Brief Description): The objective of this proposed project is to evaluate different flood mitigation efforts in terms of the community costs of measures such as residential buyouts or elevation of structures. For years, home buyout programs have been promoted to remove individuals and their homes from risk of flooding by local practitioners and federal agencies. However, due to limited funds and criteria, this type of approach can often lead to a checkerboard effect in neighborhoods that have experienced flooding. When enough residents leave, the social fabric of the community can break down, the tax base for supporting schools and maintain infrastructure also leaves. In rural communities, this loss of community members can be significant, but elevating or relocating structures to maintain the community is often overlooked. In this study, we will utilize agent-based models and empirical data from select communities where significant buyouts have taken place to simulate and estimate the extent to which buyouts may actually negatively affect community resilience. We will also examine the extent to which community size and ruralness may contribute to this phenomenon.
Describe Implementation of Research Outcomes (or why not implemented) - Place any photos here *To be determined upon conclusion of the project*: The project will have four key parts. In the first phase, we will perform a literature review and gather case studies of buyout and other flood mitigation programs across both urban and rural communities including any available data on the buyout and mitigation programs. In the second phase, we will utilize GIS to map and develop social vulnerability scores for the communities pre- and post-event mitigation. In the third phase, we will develop an agent-based model and use it to simulate and evaluate the mitigation options and estimate the social fabric/connectedness and economic impacts of the mitigation efforts. The final phase includes documentation of the project methodology and findings as both a final report and peer reviewed journal paper for publication. We anticipate that the results will also be presented at an appropriate conference.
Impacts/Benefits of Implementation (actual, not anticipated) *To be determined upon conclusion of the project:* The proposed research effort addresses the theme of MarTREC in the area of "Disaster Response and Transportation Planning for Coastal and River Valley Communities". Findings from this project could inform flood mitigation efforts for riverine communities. It may also identify characteristics of communities that lend toward choosing one mitigation option over another to maintain community social fabric and resilience.
Web Links: martrec.uark.edu
Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): $79,656.76 USDOT + $39,828.39 matching = $119,485.14 total
Project Start and End Dates: 07/01/2020-03/30/2023 complete
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Principal Investigator Institution (University): Vanderbilt University