



Florida Department of Transportation Research

Assessment of Transportation Systems Resilience for Vulnerable Communities and Populations

August 2023

Project Number
BDV30-977-31

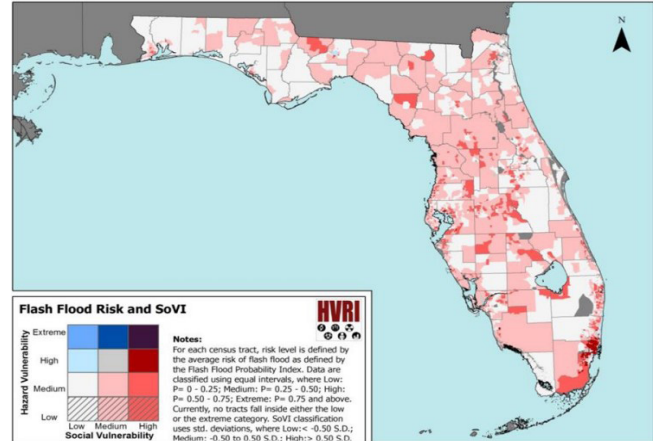
Project Manager
Jennifer Carver
FDOT Office of Planning

Principal Investigator
Yassir Abdelrazig
Florida State University

Current Situation

Historically, disruptions caused by natural hazards have had notable impacts on vulnerable communities, primarily including older adults, ethnic minorities, and rural populations. Data show these communities are overrepresented among people failing to evacuate or those injured or killed during hurricanes.

However, transportation agencies are aiming to lessen these impacts by prioritizing resilience in transportation planning. This means more mobility, better emergency response, greater access to essential services, and improved overall socioeconomic well-being of these vulnerable communities. Creating resilient transportation systems is a critical priority for the Florida Department of Transportation's (FDOT's) Florida Transportation Plan (FTP). Resilient transportation systems can withstand disruptions, adapt to changing conditions, perform effectively, and recover rapidly. Resilience, however, must also encompass the people who use and rely upon transportation systems. This study examines transportation system resilience through the lens of these vulnerable population groups.



This map indicates the flash flood risk and social vulnerability index across the state of Florida.

Research Objectives

This research aimed to develop decision support tools for transportation systems resilience planning pertaining to three vulnerable populations—older adults, ethnic minority groups, and rural populations. Also, it provided resilience policy and planning recommendations for transportation systems to improve the outcomes for vulnerable communities and populations, especially regarding resilience to natural hazard events.

Project Activities

After a literature review that sought to identify social vulnerability characteristics that create mobility vulnerability and to identify current resilience practices and outline their shortcomings in addressing the vulnerabilities of the focus groups, the Florida State University research team surveyed these vulnerable populations to understand their unique transportation system considerations. These included things like dependence on public transportation, the need for assistance in accessing transportation, and difficulties communicating.

Using the survey results as a guide, the team conducted statistical, geospatial, and economic analyses to assess the current transportation system's capabilities in meeting the groups' special transportation needs. For example, a vulnerable population's ability to access the transportation system during a hurricane can be affected by the quality of the drainage system. Identifying areas where drainage improvements are needed was included as a recommendation. Finally, the team developed policy and planning guidelines to bridge the gap between the current system capabilities and the needs of these vulnerable populations.

Project Conclusions and Benefits

The team provided several policy and planning recommendations that FDOT can incorporate across its offices to help vulnerable populations. These include system improvements, community-based initiatives, post-disaster monitoring, system recovery, and communications and outreach, as well as additional research to better understand the relationship between vulnerable populations and vulnerability to natural hazards. Additionally, FDOT can use the decision-support tool created during the project to incorporate the needs of vulnerable populations into FTP objectives.

For more information, please see fdot.gov/research.