



**Project Number**  
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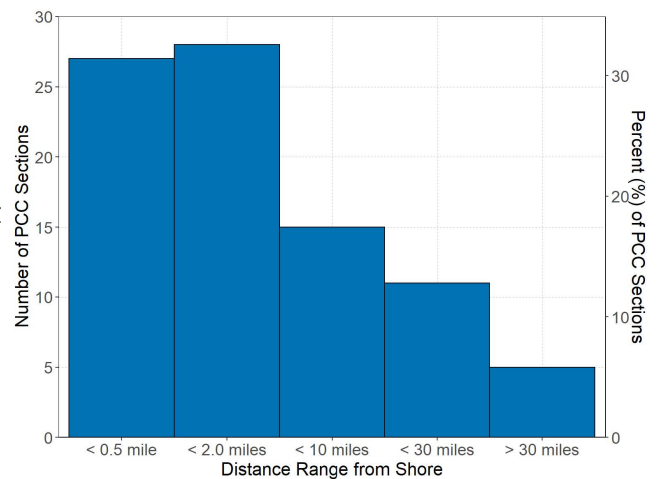
# Florida Department of Transportation Research Improved Resilience of Rigid Pavement Systems

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## Current Situation

Due to hurricanes, flooding, and rising sea levels, State transportation agencies spend millions of dollars annually constructing and maintaining safe, smooth, and durable pavements. For Florida, these wet conditions impact the durability and service life of the Florida Department of Transportation's (FDOT) roadway network infrastructure.

Moisture within the pavement foundation may lead to detrimental impacts. The consequence may range from total washout of the pavement when under very severe storms and hurricanes to inundation that may lead to pavement structure serviceability loss.



*The distance (in miles) between FDOT's rigid pavements and closest shoreline.*

## Research Objectives

The objective of this research project was to develop cost-effective and practical solutions to enhance the performance of new and existing rigid pavement systems. To achieve this, the researchers aimed to develop a tool to assess and improve the resilience of pavements under flooding and other moisture-related conditions.

## Project Activities

The project team developed a Rigid Pavement Resiliency Tool, implemented in a macro-enabled Excel spreadsheet, to evaluate the structural performance of pavements under different moisture conditions. The tool relies on a mechanistic-empirical approach to estimate the damage caused by inundation, simulating various scenarios of moisture flow and its effects on rigid pavement systems. This tool was demonstrated through several examples, highlighting how it could be used to modify rigid pavement design features in response to changes in moisture levels.

The team preliminarily evaluated the vulnerability of Florida's existing rigid pavement sections and conducted sensitivity analyses to develop potential design strategies that enhance pavement performance. Although the tool makes use of established models from the literature, it requires further calibration and validation with field data to ensure accuracy.

## Project Conclusions and Benefits

The project concluded that Florida's rigid pavements are not entirely impervious from the effects of flooding and sea-level rise. The Rigid Pavement Resiliency Tool could provide a practical approach for engineers to assess and enhance pavement performance against environmental hazards. By incorporating moisture considerations into rigid pavement design, the research showed the tool supports the development of more durable infrastructure that can better withstand moisture-related stresses, ultimately leading to reduced maintenance costs and extended pavement service life.

*For more information, please see [fdot.gov/research](https://fdot.gov/research).*