

0-7079: Establish TxDOT Transportation Resilience Planning Scorecard and Best Practices Project Status Meeting

Background

More frequent extreme weather events and natural hazards call for improving the resilience of Texas's transportation infrastructure. In particular, Texas has experienced a growing number of hurricanes and flooding events impacting its transportation infrastructure over the past two decades. The recent Federal Highway Bill specifies requirements for improving disaster resilience.

In order to better integrate and operationalize resiliency in transportation planning for the Texas Department of Transportation (TxDOT), this project created foundational knowledge and tools for planning and decision making. This project is the first research conducted on transportation resilience sponsored by TxDOT; therefore, TxDOT had an ambitious work plan to build the foundational information and tools needed to enhance the resilience of the state transportation infrastructure.

The scope of this research project is road infrastructure networks; the outcomes are also informative for other elements of transportation systems.

What the Researchers Did

Researchers in this project performed six main tasks:

1. Evaluation of the current state of the practice, needs, gaps, and priorities related to transportation resilience through surveying various state and local stakeholders.

2. Employment of analytical and data-driven methods to implement vulnerability and resilience assessments on the state road network.
3. Development of a transportation resilience scorecard to inform current and future transportation resilience planning efforts.
4. Identification of transportation resilience best practices and measures to objectively improve transportation resiliency.
5. Presentation of research outcomes in a guide document for TxDOT and other local transportation agencies.
6. Transportation resilience training through a workshop and a minimum of three webinars.

The outcomes of this research project provide the foundational information needed to operationalize resilience into transportation

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infrastructure planning and project development.

What They Found

With a focus on the transportation infrastructure in Texas, the results of this project:

- Highlight the gaps and challenges in implementing resilience practices in transportation planning and project development.
- Identify and analyze four quantitative metrics for assessing road network vulnerability and resilience for the state road network.
- Introduce a resilience scorecard, a checklist, and measures to systematically incorporate resilience into transportation infrastructure planning and project development.

The sets of information and methods include:

- The vulnerability and criticality assessment metrics for the state road network.
- A transportation resilience scorecard for operationalizing resilience into the planning process.
- Transportation resilience best practices and measures.

This information and methods can be used to inform future planning, investment, and hardening prioritization decisions to enhance transportation resiliency in the state.

What This Means

This project provides tools and methods to help transportation agencies in Texas incorporate resilience into transportation planning and project development. These tools include:

- **Resilience metrics** for road network vulnerability and asset criticality assessment. The metrics can be used to inform future planning, investment, and hardening prioritization decisions to enhance transportation resiliency in the state.
- A **transportation resilience scorecard** can be used to systematically evaluate the level of implementation of each practice and establish resilience programs at the organizational (i.e., district and metropolitan planning organization) level.
- A **transportation resilience practices checklist and measures** can be used to assess the extent to which individual projects are aligned with resiliency requirements during the project development phase.

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