



# Project Summary

Texas Department of Transportation

## 0-6121: Prototype Design for a Predictive Model to Improve Evacuation Operations

### Background

Mass evacuations of the Texas Gulf Coast remain a difficult challenge. These events are massive in scale, highly complex, and entail an intricate, ever-changing conglomeration of technical and jurisdictional issues. This project focused primarily on the specific issue of developing a new technical tool to help TxDOT and other key operating agencies/stakeholders better predict when major elements of evacuation operations should be implemented.

### What the Researchers Did

In particular, the researchers used various technical analyses to develop a prototype decision support system that provides additional insights to more effectively decide when evacuate shoulder operations versus full contraflow operations are needed to manage evacuation demand. This new tool has a predictive mechanism designed to provide lead time for implementing these two prospective operational scenarios. The work conducted during this research involved a large-scale application of the DynusT model (see Figure 1), and integrates several different factors into the evacuation operation decision-making process—namely, real-time traffic conditions, hurricane characteristics (strength and size), and human behavior. The region used as a case study for the new tool was the Houston-Galveston area.

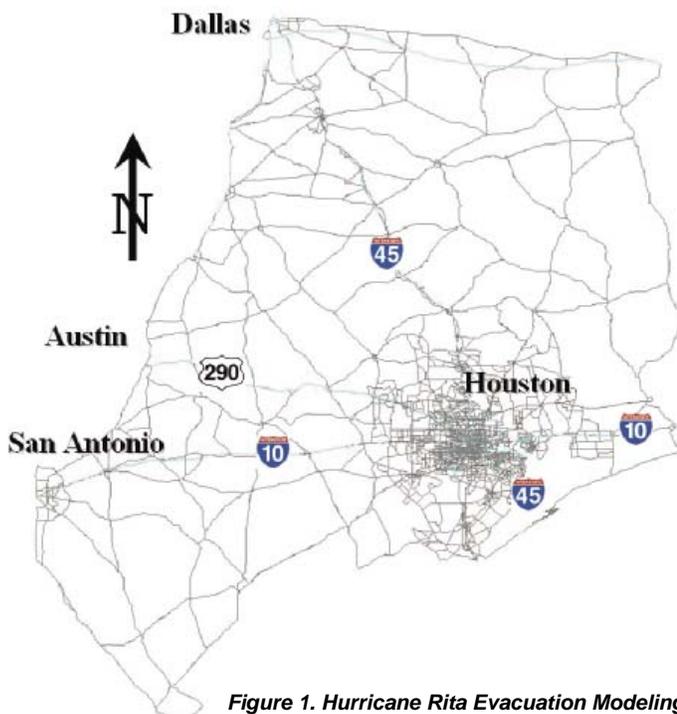


Figure 1. Hurricane Rita Evacuation Modeling Network.

### Research Performed by:

Texas Transportation Institute (TTI),  
The Texas A&M University System  
University of Houston (UH)

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**Project Completed:** 1-31-11

## What They Found

The new tool was tested against a dozen different scenarios and performed well with regard to statistical analyses as well as the opinion of the large, diverse set of expert stakeholders from a wide variety of operating agencies in Texas assembled as the project monitoring committee for this project. The scenarios examined for hypothetical application and analyses of the prototype tool included Hurricanes Rita and Ike, as well as a variety of storm strength and real-time traffic conditions. This prototype tool provides an on-line interface with TranStar's real-time traffic map (see Figure 2).

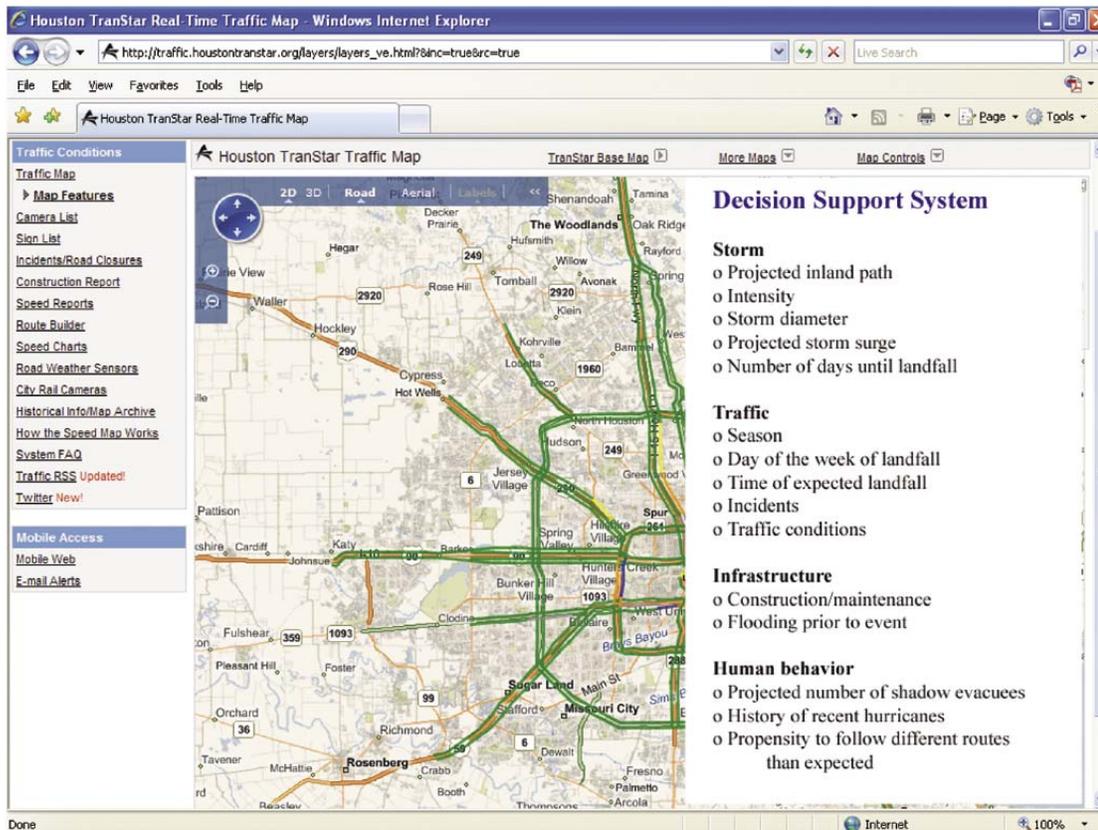


Figure 2. Prototype DSS Interface.

## What This Means

The research team and panel of experts agreed that the prototype tool provided logical and meaningful results, and that it needed to be shared with a broader range of stakeholders and regions in Texas. The tool was specifically developed and tested using the Houston-Galveston region as the base case. The panel has suggested that this new application be further developed, tested, and shared with all of the at-risk regions (and populations) in Texas coastal areas.

### For More Information:

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