Title:	Define a Statewide Plan for a Sustainable Real-Time Travel Time Network for Texas Hurricane Evacuations and Safe Citizen Return
The Problem:	The aftermath of Hurricane Rita in 2005 in southeast Texas served as a spring board for the state of Texas to dedicate resources for improvements in hurricane evacuation efforts. TxDOT was a major player in this multi-agency effort by reviewing evacuation and contra-flow plans and installing real-time traffic monitoring devices in some coastal regions with a focus on the Houston and Beaumont regions. Except for Hurricane Ike in 2008, there have been limited other significant hurricane threats to Texas in which a large portion of the population considered evacuation from threatened regions. Although there have been some additions to roadway monitoring systems state-wide for local traffic operations, there has not been a focused effort to examine or recommend the expansion of these critically needed capabilities with respect for evacuation purposes. While the addition of more monitoring stations will provide for additional traffic management information tools, the issue of who maintains these devices as well as funding for the sustainability of the system is of critical importance. An additional area of concern that was first observed during the 2005 evacuation was the impact upon cellular communication to the existing field devices. As a larger percentage of the population is equipped with smart phone technology, the cellular networks are more likely to become overloaded with traffic generated by the evacuating citizens. There are significant concerns in how this impacts the ability of roadside traffic monitoring devices to deliver real-time traffic data (including CCTV) via cell connections. This is especially concerning for connecting rural areas where the installation of agency exclusive fiber optic networks is cost prohibitive. In addition to monitoring during an evacuation event in Texas, there are similar issues as citizens are allowed to safely return to their home cities after the storm threat has passed. This may be more challenging as existing infrastructure may have been damaged by the event.
Technical Objectives:	This project will provide traffic and emergency management personnel and their operational centers the ability to obtain real-time traffic information on evacuation routes during emergencies as well as for normal day-to-day operations. The work to be performed shall include: 1. Determine the existing state-wide resources available to provide real-time traffic information during evacuation scenarios to first responders, traffic management centers, and the general public. 2. Investigate if there are available resources maintained by other agencies, which would be valuable tools to be included in a state-wide system. 3. Make recommendations for expansion of the resources on a regional and state-wide basis: a. For coastal areas subject to evacuations. b. For an expanded state-wide system to provide for connections between major Texas cities throughout the state. 4. Evaluate the need for providing information directly to the public along evacuation routes locally. 5. Determine estimated costs for the deployments and make recommendations on priority scheduling of installations based upon criteria established in coordination with TxDOT and local agencies. 6. Evaluate the resources and funding needed to be able to provide the necessary maintenance of field devices and to assure continuous communication connections to be able to sustain the roadside equipment year-round. 7. Develop recommendations for a failsafe communication framework to provide resilient connectivity during evacuation events. The expectation of the project end product(s) shall attain a Technology Readiness Level of 8.

Anticipated Deliverables:	1. Technical memorandum for each task completed. 2. Monthly progress reports. 3. Value of Research (VoR) that includes both qualitative and economic benefits, to be included in the final research report; not a stand-alone deliverable. 4. Research report documenting the findings of the research, including recommendations for evacuation route monitoring and effective maintenance plans to ensure roadside devices and communications hubs are operating properly. 5. Project Summary Report
Proposal Requirements:	1. Utilize the "Proj/Agre" and "PA_Form" templates located at the TxDOT RTI website. 2. Proposals will be considered non-responsive and will not be accepted for technical evaluation if they are not received by the deadline or do not meet the requirements stated in RTI's University Handbook, which is also located at the RTI website. 3. Proposals should be submitted in PDF format, 1 PDF file per proposal. File name should include project name and university abbreviation. 4. This project will be tracked during the life of the project using a Technology Readiness Level (TRL) scale. For more information about the use of a TRL, click.