Title:	Develop A New Tool for Evaluating Infrastructure and Planning Impacts from Changes in Truck Traffic and Truck Technologies
The Problem:	TxDOT research project 0-6984, "Evaluate Potential Impacts, Impediments, and Solutions of Autonomous Trucks and Truck Platooning on Texas Highway Infrastructure," led to the adaptation of a versatile and fast analysis tool for planning and strategy scenario evaluations. The tool allows for the combination of infrastructure conditions (bridges and pavements) and economic analysis with stressors, such as technology changes due to truck automation and platooning. There is a need to tailor the user interface and develop this tool fully for TxDOT users in freight planning and strategy for ease of use in assessing the various impacts of freight traffic and its composition on the Texas Highway Freight Network. This also includes incorporating condition histories from the pavement and bridge asset management databases. There is also a strong need to perform detailed analysis for planning and strategy purposes on freight corridors designated for early adoption of autonomous and platoon truck traffic, such as IH 10, IH 35, and IH 45 to identify and evaluate key design, operational, and hardening improvements that minimize the negative impacts of autonomous and platoon truck traffic on these corridors, and at the same time maximize the economic benefits to Texas.
Technical Objectives:	This research will develop user interfaces for the fast scenario analysis tool and automate the coupling of bridge and pavement conditions, economic analysis and truck traffic composition. To achieve these objectives, the work to be performed shall include: 1. Identify potential design improvements, such as the introduction of auxiliary lanes near on-ramps. 2. Determine location of optimal dedicated truck lanes; i.e., right lane versus other lanes. 3. Recommend most effective pavement hardening options. 4. Identify bridges that could benefit from upgrades or hardening. 5. Evaluate impacts of bridge height restrictions. 6. Prepare recommendations for platoon truck following distances and truck weight axle distributions. 7. Prepare for requiring wheel wander for automated truck technologies to minimize negative impacts on pavements. The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.
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. Product P1: State-of-the-art web-based tool for highway freight strategic and planning scenario evaluations. 5. Research report documenting the findings of the research, including detailed recommendations for freight corridors being considered for early adoption of autonomous and platoon truck traffic. 6. 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.