

Research Project Statement 22-223

FY 2022 Annual Program

Title:	Working with Autonomous Trucks to Improve Routine Maintenance Operations
The Problem:	Texas is a hub for freight activity and has begun to attract autonomous truck deployments which present a valuable opportunity. TxDOT can increase awareness of routine maintenance needs by working with autonomous trucks installed with cameras and other sensors directed on to TxDOT road surfaces which they operate on. Autonomous trucks may be particularly good at reporting potholes and lane striping issues which are often underreported by the motoring public. Work needs to be performed on a statewide level along all major TxDOT corridors. In addition, a plan is necessary for addressing these reports through TxDOT maintenance crews to show TxDOT's responsiveness to these concerns.
Technical Objectives:	<p>This research will develop an end-to-end framework to collect reports of routine maintenance needs for TxDOT facilities across the state from autonomous trucking entities. The work to be performed shall include:</p> <ol style="list-style-type: none"> 1. Develop an end-to-end framework for receiving data, evaluating, distributing, monitoring, repairing and reporting on physical roadway conditions. 2. Conduct outreach to autonomous trucking companies, both in-state and out of state to explore cooperation. 3. Create a plan for involvement of Texas local government agencies. 4. Develop procurement requirements for any systems that may need to be procured following the research. 5. Identify gaps in any framework that are not currently addressed by commercial products and recommended solutions. 6. Produce conceptual infographics for TxDOT staff, stakeholders and AV trucking companies. 7. Develop template data standards considering other TxDOT efforts in this area. 8. Conduct a cost/benefit analysis of deploying the system. <p>The expectation of the project end product(s) shall attain a Technology Readiness Level of 7.</p>
Anticipated Deliverables:	<ol style="list-style-type: none"> 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; <u>not a stand-alone deliverable</u>. 4. Research report documenting the findings of the research, including a catalog of available AI models to support congestion detection, forecasting (short, medium and long term) and management, and corresponding data needs. 5. Project Summary Report
Proposal Requirements:	<ol style="list-style-type: none"> 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.