

# Research Project Statement 22-203 FY 2022 Annual Program

<b>Title:</b>	Digitizing Traffic Control Infrastructure for Autonomous Vehicles (AV)
<b>The Problem:</b>	Traditional traffic control infrastructure, such as traffic signals and signs, has been designed with human drivers in mind. To perceive these traffic control units, an autonomous vehicle (AV) would usually have to capture the image of the unit through its camera and then identify the instruction from the control, such as setting a new speed limit or stopping at an intersection. It will be beneficial if CAVs can digitally access the current state of traffic control, including static infrastructure, thereby adding redundancy to the function of correctly detecting and classifying traffic control units. In addition, integration of the live state of traffic control infrastructure in one place will greatly assist in traffic operations, optimization, and emergency response and recovery.
<b>Technical Objectives:</b>	<p>This research will accelerate the development of a live map of traffic infrastructure in Texas, which will accelerate the testing and deployment of CAVs. The work to be performed shall include:</p> <ol style="list-style-type: none"> <li>1. Investigate existing available market solutions and recommend a concept of operations for the digital sharing of traffic control infrastructure.</li> <li>2. Perform a high-level identification of any legal issues that may be associated with deployment of the system.</li> <li>3. Develop a proposed framework for digitization and sharing of TxDOT roadway assets.</li> <li>4. Analyze validation and certification procedures including novel solutions such as blockchain.</li> <li>5. Perform a cost-benefit analysis of deploying the system.</li> <li>6. Conduct an analysis of the resources for necessary data collection, upkeep and management and propose procedural concepts</li> <li>7. Produce procurement requirements to TxDOT to procure an appropriate system.</li> </ol> <p>The expectation of the project end product(s) shall attain a Technology Readiness Level of 5.</p>
<b>Anticipated Deliverables:</b>	<ol style="list-style-type: none"> <li>1. Technical memorandum for each task completed.</li> <li>2. Monthly progress reports.</li> <li>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>.</li> <li>4. Research report documenting the findings of the research, including guidance on digitizing traffic control infrastructure for CAVs.</li> <li>5. Project Summary Report</li> </ol>
<b>Proposal Requirements:</b>	<ol style="list-style-type: none"> <li>1. Utilize the "Proj/Agre" and "PA_Form" templates located at the <a href="#">TxDOT RTI website</a>.</li> <li>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 <a href="#">University Handbook</a>, which is also located at the RTI website.</li> <li>3. Proposals should be submitted in PDF format, 1 PDF file per proposal. File name should include project name and university abbreviation.</li> <li>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 <a href="#">TRL</a>, click.</li> </ol>