



Research Project Statement 19-403 FY 2019 Annual Program

Title:	Improve System Emergency Response Performance in the Houston District Using Connected Vehicle Technology
The Problem:	<p>The latest advances in Connected Vehicle (CV) technology have provided tools to improve system emergency management practices. In particular, emergency services may utilize these new technologies to enable adaptive traffic signal preemption, allowing emergency vehicles to reach their destinations as fast as possible. The Texas Department of Transportation (TxDOT) has accepted the SPaT (Signal Phase and Time) Challenge from the Federal Highway Administration and plans to deploy Dedicated Short Range Communication (DSRC) infrastructure with SPaT broadcasts in the Houston District. Additionally, the recently emergence of Bluetooth Low Energy (BLE) technology for mobile applications may also provide a low cost alternative solution for V2X communication. TxDOT believes that these developments can be leveraged to improve emergency response services in the following aspects:</p> <ol style="list-style-type: none">1. Improved emergency vehicle signal preemption along coordinated corridors.2. Better informed emergency vehicles with signal, roadway, and traffic condition messaging.3. An efficient and secured CV emergency management system.
Technical Objectives:	<p>Researchers will work on CV implementation procedures and application guidelines for system emergency management in the Houston District. Two major efforts in developing the procedures and guidelines include:</p> <ol style="list-style-type: none">1. Testing and evaluation of CV technology for EVs.2. Prototyping of CV applications for system emergency management. <p>Detailed tasks are as follows:</p> <ol style="list-style-type: none">1. Review the state of the art of CV technology for system emergency response.2. Develop a CV implementation best practices guide for Emergency Vehicles based on a real world selected study corridor.3. Determine configurations of hardware and software for CV implementation for emergency response and assemble a prototype vehicle unit that will function with TxDOT infrastructure.4. Through real world testing, improve and evaluate preemption performance at intersections with connected technologies.5. Test message broadcasting and receiving interactions with infrastructure, including messages for SPaT, BSM, and MAP using connected technologies.6. Perform a cost-benefit analysis for the connected emergency management system.7. The expectation of this project is that the end product will obtain a TRL level 7
Desired 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 research report.4. Research report documenting the findings of the research.5. Project Summary Report.6. Prototype programs for DSRC or BLE messaging for signal preemption7. A working prototype system that operates with TxDOT infrastructure to preempt signals along a corridor.8. A best practices manual for implementing CV technology for system emergency response.

Proposal Requirements:	<ol style="list-style-type: none">1. Utilize the deliverable based templates (see the appendices provided).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.3. Proposals should be submitted in PDF format, 1 PDF file per proposal. The PDF file name should include Project Statement Title, Project Statement Number and abbreviated Performing Agency(ies) Name.4. This project will be tracked during the life of the project using a Technology Readiness Level (TRL) scale. More information about the use of a TRL can be found at https://www.fhwa.dot.gov/publications/research/ear/17047/17047.pdf.
Pre-Proposal Meeting Information:	Friday, December 7, 2018 10:00 AM - 11:30 AM Austin Riverside Campus 118 E. Riverside Drive RTI Conference Room, 1st Floor Webex Information: <ol style="list-style-type: none">1. See attached Webex meeting notification.2. If requested, enter your name and email address.3. If a password is required, enter the meeting password: De8Mft7N4. Click "Join". Teleconference information: Provide your phone number when you join the meeting to receive a call back. Alternatively, you can call: Call-in toll-free number: 1-855-437-3563 (US) Conference Code: 734 619 030
Proposal Deadline:	Proposals are due to RTI by 3:00 PM Central Time, Thursday, January 24, 2019. Email proposal submissions are to be sent to RTIMain@txdot.gov .