Title:	Examine Reconnaissance Scanning of Underground Utilities in the ROW
The Problem:	Mapping of buried utilities using Subsurface Utility Engineering (SUE) Level B as is frequently performed or recommended can be costly. It can also be ineffective for unknown utilities; i.e., utilities that are discovered, but no other information is available. This is particularly common and problematic in areas of oil and gas operations. If undiscovered until construction, these unknown pipes cause serious scheduling disruptions as well as higher construction costs, and safety and environmental risks. There is a need for a faster, less expensive method of scanning the ROW for these unknown pipelines.
Technical Objectives:	This research will test the application of two newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown metallic pipelines in the ROW. The work to be performed shall include: 1. Test the application of two newly available geophysical measurement systems for quickly and cheaply detecting and mapping unknown metallic pipelines in the ROW. a. System 1 is a ground-based array of electromagnetic (EM) sensors towed by an ATV type vehicle. This type of system can detect any metal down to at least six feet of depth, depending on pipe diameter. Deeper detection is possible under certain circumstances. This research will test recently developed, commercially available systems. b. System 2 is an airborne passive magnetic sensor that can detect ferrous metal down to six feet or more, depending on pipe diameter. Newly developed micro-magnetic sensors have led to commercially available drone deployments, which is the facet of this system to be investigated. 2. Determine if either or both systems can be deployed effectively on transportation projects. The variables to be tested include working within the constraints of the TxDOT ROW, such as height and thickness of vegetation, and presence of fences, overhead utilities, passing traffic, and nearby structures. 3. Compare the cost of deployment to the cost of standard SUE Level B with modifications for the types of ROW tested. 4. If one or both systems are technically successful and can be deployed for a reasonable cost, develop deployment strategies, parameters and guidelines, and document the results. 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. Product: Operating Manual or draft revisions to existing manuals on deploying SUE Level B with new systems, if applicable. 5. Research report documenting the findings of the research, including a set of guidelines and recommendations on how to merge these results with utility data generated from the standard SUE process. 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.