



University Transportation Research Center
RFP Cover Sheet

Title: **Underground Conduits Without Trace Wires**
Proposal Number: 2010-10
Sponsor: NJDOT
Date Issued: August 21, 2009
Pre-Proposal Meeting: Contact NJDOT
RFP Due at NJDOT: by October 1, 2009
RFP Closing Date: October 1, 2009

If you plan to apply:

1. Please contact Camille Crichton-Sumners (camille.crichton-sumners@dot.state.nj.us) or Stephanie Nock (609-530-5637 or STEPHANIE.NOCK@dot.state.nj.us) to request a pre-proposal meeting, and so that you will receive information about this meeting if it is held. *This meeting will be your only opportunity to ask questions about this proposal.*

2. If you plan to submit a proposal through UTRC, please notify us by email at peickemeyer@utrc2.org and ckamga@utrc2.org. Please indicate whether you are open to teaming up with faculty at other universities on this project.

Proposal submission guidelines:

Please contact Camille Kamga (ckamga@utrc2.org, 212-650-8087) to discuss submission logistics. After UTRC confirms that the proposals' budgets meet UTRC and NJDOT guidelines, please use the UTRC cover sheet available at <http://www.utrc2.org/research/resourcesforpis.php> for submission of printed proposals to NJDOT.

Proposals must be prepared in accordance with NJDOT's Information and Instructions for Preparing Proposals. Please visit: <http://www.state.nj.us/transportation/refdata/research/pdf/techpropresproj.pdf>

For questions about budget preparation, contact: Camille Kamga, ckamga@utrc2.org

NJDOT has not specified a budget or timeline for this project. Please note that matching funds up to \$35,000 are available from UTRC for this RFP.

New Jersey Department of Transportation

Bureau of Research

RESEARCH PROJECT

Request for Proposals

2010 Program

Date of RFP

08-21-09

Closing Date

10-01-09

Underground Conduits Without Trace Wires
Project 2010-10

(Proposals must be prepared in accordance with NJDOT's *Information and Instructions for Preparing Proposals*. Please visit: <http://www.state.nj.us/transportation/refdata/research/pdf/techpropresproj.pdf>
Revised Proposal Evaluation Forms are available for your information on the website.)

Proposals will be based on the merit of the information contained in the proposal. Budgets will be evaluated separately. Please place three (3) copies of the budget for this project in a separate sealed envelope.

1. RESEARCH PROBLEM STATEMENT, BACKGROUND AND OBJECTIVES

Over 300 miles of fiber optic cable and over 400 miles of conduits alongside NJ highways form a fiber optic network that is a vital part of NJDOT's and the State of New Jersey's communication system. Owned by NJDOT, these facilities are also utilized by the NJ State Police, OIT, and other agencies.

Communications systems technicians are often asked to locate and mark out conduits with fiber optic cable so that digging or boring can be done without damaging them. However, many of these conduits are missing the trace wires used to locate them accurately. By using a transmitter to put a tone on the copper trace wires and detecting this signal with an antenna, conduits can be accurately located.

Trace wires are missing for various reasons such as the contractor never installed them; the trace wires were used as pull wires to pull conductors through conduit and were never replaced; etc. When fiber conduits are missing trace wires they cannot be located accurately during markup, and therefore digging or boring operations may severely damage them, putting NJDOT's entire fiber network in jeopardy. In addition to NJDOT Statewide Traffic Operations using this fiber network for close circuit TV cameras, VMS, and other information, NJ State Police, OIT, and NJDOT's IT unit also use NJDOT's network of fiber optic cable running through underground plastic conduit.

Trace wires were recently added to the standard details for underground conduit. This should alleviate some of the problem. However, there are many miles of existing conduit that were installed before trace wires were required by spec. Also as mentioned, contractors sometimes use trace wires to pull fiber optic cable, and then do not replace them.

Whether repaired or installed, underground conduits need trace wires to aid in accurate markup prior to digging or boring operations. Research is needed to:

- Determine why underground conduits are missing trace wires
- Determine locations and lengths of conduits with missing/damaged trace wires, with priority on conduits already in use (fiber, wiring, etc.)
- Investigate what other methods are available to locate conduits that have missing/damaged trace wires including their cost & ease of implementation and accuracy
- Investigate whether inspection practices need to be improved to insure that contractors strictly adhere to the new specs or perform proper repairs, and

- Examine the feasibility and costs of installing trace wires in older conduits that were installed without them.

The benefits of having trace wires in all conduits for fiber optic cables include:

- (1) Reduced man-hours due to more expedient mark outs, and
- (2) Less accidental damage to conduits carrying fiber, thereby avoiding major connectivity problems, including loss of communications with crucial Intelligent Transportation Systems (ITS) and Information Technology (IT) Systems, and preserving the integrity of the fiber optic communications network.

2. Tasks

[Provide a listing of appropriate general tasks divided into phases based on types of work (e.g., laboratory, field) or by year (e.g., year 1, year 2) or other appropriate milestones]

The NJDOT is seeking the insight of proposal responders on how best to achieve the research objectives. Proposers are expected to describe a research effort that can realistically be accomplished as expeditiously as possible. Proposals must present the proposers' current thinking in sufficient detail to demonstrate their understanding of the problem and the soundness of their approach for conducting the required research.

PHASE I – Literature Search

Conduct a literature search of the current state of the practice.

After the award of the project, a more comprehensive literature search should be conducted. At the completion of this literature search, the PI will make a presentation to the Research Project Selection and Implementation Panel to discuss their findings and to discuss the appropriate research approach.

PHASE II – Research Approach and Anticipated Results

Clear description of how you will solve the problem and implement anticipated findings. Work may be divided into phases (e.g., Laboratory, Field or Year 1, Year 2) as necessary to clarify tasks. *Exit Criteria* must be developed during this phase.

3. Implementation and Training Plan

The PI must meet with the Research Project Selection and Implementation Panel (RPSIP) and other NJDOT units to present the findings and as appropriate train these personnel in the use the project results.

The PI will develop an implementation plan as per the guidelines provided by NJDOT Research Bureau.

4. Deliverables: [List of minimum deliverables necessary to complete the project]

- Presentation of Summary of Literature Search Results
- Discussion to Support and Refine the Project Tasks
- Project work plan.
- Technical Memorandum on the survey results
- Technical memorandum on the measures that are working or not working
- Technical memorandum on actions taken
- Interim Status reports suitable for Senior Leadership if required
- Quarterly Reports, and
- Final report with appropriate tables, graphs and charts in hard copy version, PDF file format, Word, and on CD ROM. Two copies plus one per RSIP member of each presentation, technical memorandum, draft final report and Final Report (plus 10 copies). The Final Report and Tech Brief are due three (3) months before the end date of the project to allow time for review by the Research Project Selection and Implementation Panel. Final Acceptance will be granted upon receipt of ten

copies of the approved final report.

5. Contract Time:

The PI must provide the anticipated research study duration based on the proposed tasks. Consideration should be given to potential impediments so that adjustments are incorporated into the schedule minimizing the need for time extensions.

6. Contacts:

A meeting may be scheduled with interested parties upon request after the RFP's are distributed to refine the objectives and deliverables and to promote a better understanding of the research needs. Questions on this topic **shall not** be directed to any Research Project Manager, Research Customer, or any other NJDOT person. All questions and answers would be addressed **during this meeting**. Contact Camille Crichton-Sumners (Camille.CrichtonSumners@dot.state.nj.us) on or **before September 9, 2009** to confirm your interest in participating in such a meeting.

7. DEADLINE

<p>Proposals (10 single-bound copies) are due at the NJDOT Bureau of Research no later than 4:00 p.m. October 1, 2009</p>
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Authorization to Begin Work: January 1, 2010--estimated or as negotiated

8. Delivery Instructions:

For private, paid messenger services such as Federal Express, DHL, UPS, etc., or for hand-carried deliveries:

2010 PROPOSAL-NJDOT
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Bureau of Research
1035 Parkway Avenue
Trenton, New Jersey 08625-0600

For U.S. Postal Service mail:

New Jersey Department of Transportation
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