



**University Transportation Research Center
RFP Cover Sheet**

Title: Traffic Signal Pole Analysis Tool

Proposal Number: C-14-03

Sponsor: NYSDOT

Date Issued: February 20, 2015

RFP Closing Date: April 3, 2015 @ 5:00 PM

(Submit through the UTRC Online Submission System at www.utrc2.org)

If you plan to apply:

Please contact Penny Eickemeyer at peickemeyer@utrc2.org to let us know you are assembling a proposal. We will make sure you receive any additional information that becomes available about this RFP.

Proposal submission guidelines:

Please submit your proposal electronically to UTRC at www.utrc2.org. All proposals must include the UTRC cover page (<http://www.utrc2.org/sites/default/files/Technical-Proposal-Cover-Sheet.doc>)

Funding available:

Up to \$250,000 is available for the study - \$200,000 from NYSDOT and \$50,000 from UTRC. Facilities and Administrative Costs (or Indirect Costs) charged by academic institutions are included in the above amount. To the extent possible, we request that PIs identify sources of in-kind funding from their home institution (e.g., tuition waiver/reductions, overhead cost-sharing, faculty release time, etc.)

Budget forms can be downloaded at

<http://www.utrc2.org/sites/default/files/budget-Template.xls>

For questions about this proposal, please contact:

Deborah L. Mooney, Head,
Research & Policy Studies Section, 6th Floor
New York State Department of Transportation
50 Wolf Road
Albany, NY 12232

For questions about budget preparation or submission, contact: Penny Eickemeyer,
peickemeyer@utrc2.org

New York State Department of Transportation
Request for Proposals
SPR # C-14-03: Traffic Signal Pole Analysis Tool
February 20, 2015

RESEARCH PROBLEM STATEMENT

Structural Analysis of Traffic Signal Poles is a time-consuming and necessary process for Engineers at the New York State Department of Transportation (NYSDOT). This process is currently done manually and consequently is prone to errors.

It would benefit the State of New York if this capacity analysis could be performed by a standardized computer program to determine if a proposed load configuration can be supported by the existing structure(s).

OBJECTIVES

The goal of this project is to develop a computer program(s) to perform various load and stress analyses of existing and proposed Mast Arm and Span Wire pole installations (using the latest AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals) with the ability to enter an array of inputs at different locations including but not limited to:

Traffic Signal Heads
Backplates
Overhead Signs
Traffic Cameras
Vehicle Detectors
Complex Web Wire Spans
Multiple Arms

The computer program(s) must be able to account for damages or section losses when analyzing existing structures (traffic signal installations). The program(s) will become property of NYSDOT and must run on NYSDOT computers as a standalone or as a web based application(s).

PROPOSED RESEARCH TASKS

Task descriptions are intended to provide a framework for conducting the research. NYSDOT is seeking the insights of proposers on how best to achieve the research objectives. Proposers are expected to describe research plans that can realistically be accomplished within the constraints of available funds and research period. Proposals must present sufficient detail to demonstrate the proposers' understanding of the issues and the soundness of their approach to meeting the research objectives.

Possible Tasks:

- Develop, test and deliver a computer program or module that can perform Capacity Analysis for Traffic Signal Pole configurations shown in the AASHTO Standard Specification. This product should be capable

of analyzing both existing poles/installations and poles in the design process. Include a process to determine the structure's geometry (cross section, size, section loss, etc) for an existing traffic signal installation (not from drawings). Loading shall consider any fatigue loading on poles and anchor bolts.

- Develop, test and deliver a computer program or module that can perform Load Analysis for all types of spanwire and Mast Arm traffic signal installations.
- Develop, test and deliver a computer program or module to perform Capacity Analysis for all types of Spanwire and Mast arm traffic signal installations.
- Develop and deliver a User's manual for all the modules.
- Provide training for a minimum of ten (10) NYSDOT staff and interested parties.

Note 1: Each software module should have the ability to provide summary and detailed reports. The software modules need to provide, among other applicable information, dimension details, loading details (wind, dead load, etc), factor of safety, the moment, shear, and deflection details at different sections, and connections (gusset plates, bolts, and welds). The maximum moment a mast arm and the pole base can safely support/withstand. Stress ratios at critical locations like connections, signs, traffic signal heads and any other load location. Each module should be able to store its input files and retrieve them when requested by the user.

Note 2: Signal installations can have single spanwire, dual spanwire, box span, single mast arms, dual mast arms, etc.

RESEARCH PRODUCTS

- A computer program or programs (modules).
- Programming source code and software documentation
- User's Manual which includes a list of all assumptions made.
- Final report summarizing the research and results, including all tasks performed, deliverables, findings, recommendations and an implementation strategy, as applicable.
- One page summary of the research and results for technical transfer purposes.
- Training sessions for a minimum of ten (10) NYSDOT staff.
- 6 months of software support to correct any bug(s) found in the program.

URGENCY / EXPECTED BENEFITS

It is imperative that this software performs the structural analysis including the capacity of the existing Mast Arm and Spanwire Poles when loads are added, moved, or removed.

This software will allow NYSDOT to fully utilize the structural capacity of existing traffic signal installations, to possibly enhance safety by safely accommodating additional devices to meet changed traffic demands, and to save time.

RESEARCH PERIOD

18 months

FUNDING

\$ 250,000 has been budgeted for this project, exclusive of administrative fees. New York State believes this is a reasonable estimate for the total cost of the work being requested.

The net cost to New York State is one of the selection criteria. When compared to competing proposals, a proposal that requires fewer New York State dollars will receive a higher score on the cost component of the selection criteria. The value of New York State funds required could be reduced through efficiencies (fewer hours per task and / or lower cost per hour) or through cost-sharing where other funds substitute for New York State funds.

Proposals with a New York State cost over the budgeted amount will also be considered, provided the New York State cost, exclusive of administrative fees, does not exceed the budget estimate by more than 10%. (Note: Cost-sharing funds may increase the total project cost further.)

If a sufficient number of potential Principal Investigators indicate in writing that they believe the research cannot be reasonably conducted within these funding constraints and there are only a limited number of proposals submitted within the funding constraints, New York State reserves the option of not proceeding with the work or revising the budget estimate and issuing a new Request for Proposals. Potential Principal Investigators who believe the budget estimate is unreasonable should write to:

Deborah L. Mooney, Head
Research & Policy Studies Section, 6th Floor
New York State Department of Transportation
50 Wolf Road
Albany, NY 12232

SPECIAL NOTES

- **Proposals are due by close of business, Friday, April 3, 2015.** This Request for Proposals (RFP) is being offered to the University Transportation Research Center (UTRC) members only. Members should submit proposals through the Administrator of this research consortium. The receipt of an electronic PDF copy of the proposal by NYSDOT on or before the above due date is satisfactory, providing hard copies follow within a week.
- **Ten (10) hard copies** of the proposal should be provided.
- NYSDOT and the City University of New York Research Foundation (RF-CUNY) on behalf of the UTRC have an executed University Transportation Research Consortium Agreement in place (Contract #C030793). RF-CUNY/UTRC is the prime consultant for NYSDOT Task Assignments executed under this prime contract. All sub-consultants (UTRC consortium members included) and sub-contractors performing work under the prime consultant contract shall be bound by the same required contract provisions as the prime Consultant. All sub-agreements between UTRC and a sub-consultant or sub-contractor shall include all standard required contract provisions, and such agreements shall be subject to review by the State.

- Proposals should indicate direct and indirect costs, hourly rates and hours by task, travel costs, and material costs to assist NYSDOT in understanding how the total cost for the work was estimated. The winning proposal will result in a fixed cost contract based on the details provided in a supporting detailed budget.
- Please provide a Budget Chart which shows for each task the deliverable and cost. Task headings in the Budget Chart are to match the scope task headings.
- Please include a Gantt Chart, showing the duration (start to finish) for each task in terms of months (i.e. Month 1, Month 2, etc) since the actual start date is an estimate. This can be combined on one page with the Budget Chart.
- If the proposal involves a joint venture or sub-consultants, it must be clear as to how tasks will be distributed or shared in the scope of work.
- The Principal Investigator is required to submit quarterly project status reports to the NYSDOT Project Manager, as specified in the Task Assignment.
- The Principal Investigator is required to submit all project task deliverables, first, in draft formats for review and comment by the NYSDOT Project Manager and Technical Working Group (TWG). The Principal Investigator is required to revise draft task deliverables, based upon comments, as needed, and re-submit to the NYSDOT Project Manager for review. Upon acceptance by the NYSDOT Project Manager, the Principal Investigator is required to submit draft task deliverables to the NYSDOT Project Manager in final formats, as specified in the Task Assignment.
- The final report on the results of the research is to contain, at a minimum, the information described in Attachment A, *Requirements for the Final Report*.
- Principal Investigators should be familiar with and follow the requirements of New York State with regard to the *Compliance Procurement Lobbying Law* and consultant contract procurement. Information can be found on the NYSDOT website under Business Center / Doing Business with NYSDOT / Consultants / Non-Architectural Engineering Information / Active Solicitations: <https://www.dot.ny.gov/main/business-center/consultants/non-architectural-engineering/active-solicitations>
- **The designated contact for this solicitation is Deborah L. Mooney.** Questions seeking clarification on the RFP will be accepted up to three (3) weeks prior to the due date for proposals and should be e-mailed to: Deborah.Mooney@dot.ny.gov

CRITERIA FOR SELECTION

- **Expertise / Understanding / Approach (Weight: 70%)**

Expertise: What is the extent of the relevant expertise of the Principal Investigator? What is the extent of the relevant expertise of others who will be involved in the research?

Understanding of the Problem: Does the proposal reflect an understanding of the problem and its relevance to New York State? Does the proposal reflect an understanding of existing data and the current state of knowledge in New York State?

Approach: Is the proposed approach clear, especially in how it will build upon and enhance the state of knowledge in New York State? Will it yield the deliverables called for in the RFP? Does the approach show insight that will lead to results that will sufficiently assist New York State in addressing the problem? Is the proposed approach practical given the schedule and total budget? Will the proposed research draw upon all critical sources of pertinent information?

- **Investigators' Previous Experience with Similar Projects (Weight: 10%)**

Successful completion of previous projects by the Investigator(s) will be considered. These projects should be in the area of expertise required for successful completion of this project, such as computer programming and structural engineering.

- **Cost to New York State (Weight 20%)**

The lower the New York State cost, the greater consideration a proposal will receive.

Requirements for the Final Report

Copies of Final Report – Ten (10) hard copies of a bound, final report are required at the conclusion of the research study. An electronic PDF copy of the final report is required, as well. In addition to the final report, a one page document, summarizing the project and project findings, shall be provided for technical transfer purposes. This is required in PDF format only.

Required Organization for the Final Report

Title Page (front cover) - that contains:

- The research number (C#) assigned by the Research & Policy Studies Section of the Policy & Planning Division;
- The name of the research study as stated in the Task Assignment (contract);
- The words “Final Report;”
- The date (month & year) the final report is completed;
- The name(s) of the Consultant(s) / Principal Investigator(s), along with the name(s) of the organization(s) they represent and their address(es); and,
- If the final report has a security classification, it shall be noted on the title page.

Disclaimer (inside cover) - as follows:

DISCLAIMER

This report was funded in part through grant(s) from the Federal Highway Administration, United States Department of Transportation, under the State Planning and Research Program, Section 505 of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the United States Department of Transportation, the Federal Highway Administration or the New York State Department of Transportation. This report does not constitute a standard, specification, regulation, product endorsement, or an endorsement of manufacturers.

Form DOT F 1700.7 – complete the standard form used throughout the country to summarize federally funded transportation research

Table of Contents

Executive Summary - a non-technical summary of the research and its findings

Introduction – a discussion of the problem, its background, and a concise history of research previously completed on the topic, and a discussion of what NYSDOT policies, procedures, and practices are currently in place related to the research topic

Research Method – a description of the methods used in conducting the research

Findings and Conclusions – a discussion on the analysis of the data (findings) and the conclusions reached based on the findings. Suggestions for additional research, if appropriate, would appear in this section.

Statement on Implementation – a brief discussion on what would need to occur to introduce the results into practice, and a discussion on possible technology transfer activities

Appendices – as appropriate