



REQUEST FOR PROPOSAL #22-01

Optimum Traffic Signal Condition Assessment and Strategic Maintenance Planning

POSTED DATE: 4/1/2022

CLOSE DATE: 4/30/2022 at 11:59 p.m. CST

Submit Proposals to: ICTProjectManagement@illinois.edu

PROJECT INFORMATION

Funds: \$175,000 total (includes a required 25% cost share of \$43,750 from proposing agency)

Estimated Contract Term: 24 months

Projected Start Date: 8/16/2022

BACKGROUND

Traffic signals are a frequent focus of transportation engineering research. Previous related work includes survey studies on transportation agencies' management and operation of traffic signals. Findings suggest that state transportation agencies commonly use asset management systems for traffic signals and most agencies are challenged to support traffic signal systems to the desired level. Related ongoing research evaluates the life span of signal components, such as steel structures (e.g., Utah) and LED signals (e.g., North Carolina). Although previous research has considered how to assess the condition of traffic signal hardware approaches, those studies are outdated and not specific to traffic signal structures and hardware utilized in Illinois. Hence, there is a need to collect information on the state of practice and identify condition thresholds for maintenance of various traffic signal components as well as identify strategies that best match the needs of the Illinois Department of Transportation.

OBJECTIVE

The objective of this study is to develop guidance for the condition assessment of traffic signals in Illinois and develop improvement plans. The outcome of this study may be incorporated into future traffic signal maintenance agreements between IDOT and local public agencies.

RESEARCH TASKS AND REQUIRED DELIVERABLES

The proposed research will address the following tasks.

Task 1 — Review the current state of knowledge to synthesize best practices, challenges, synergistic criteria, and strategies being employed to guide the condition assessment of traffic signals.

Task 2 — Develop recommended condition assessment procedures for traffic signals in Illinois. The procedures should be based on previous research and guided by input from a variety of IDOT districts and the Bureau of Bridges and Structures. The recommended procedures shall be refined by the lessons learned from a case study including a sample of traffic signals.

Task 3 — Recommend condition standards for traffic signals and components. The recommended standards shall be based on previous research and common practice in Illinois. The recommended condition standards would assist in determining and prioritizing the timing for maintenance/replacement considering various funding scenarios, including limited funding. Condition standards should include both ideal and minimum standards for traffic signal structures and common hardware. Advances in traffic signal technology should be considered in the recommended standards.

Task 4 — Develop companion procedures to attain and maintain recommended conditions, while minimizing equipment damage. The procedures should be developed with consideration of best practices for maintaining traffic signal assets to the appropriate standards and which asset management tools are already leveraged by IDOT. The procedures should include handling of existing devices that may still have use but are no longer supported by the vendor because of advances in technology. Sources of damage to consider should include moisture, dust, extreme temperatures, rodents, electrical surges, and vehicular physical damage.

Task 5 — Prepare a final report detailing the study's process, findings, and recommendations.

INSTRUCTIONS FOR SUBMITTING A PROPOSAL

The proposal shall be prepared in accordance with the guidelines presented in Appendix A.

By submitting a proposal, potential principal investigators are acknowledging they have read and understand the IDOT/ICT [PI responsibilities and Guidebook](#) and terms and requirements under the current [IDOT/ICT Intergovernmental Agreement \(IGA\)](#)*.

Technical questions regarding the research project or RFP procedures should be submitted to the ICT Project Management team via email at ICTProjectManagement@illinois.edu within 14

days of the posting date. Technical questions and answers will be posted on ICT's website as they are received.

* A new IGA will be effective July 1, 2022. Terms and conditions, excluding the F&A rate, are not anticipated to change.

SPECIAL CONDITIONS FOR REVIEWING PROPOSALS AND AWARDING ICT FUNDS

Please note that the following conditions will be applied when reviewing all received proposals and in awarding ICT funds:

- 1) Preference will be given to Illinois universities (both public and private) when multiple proposals from this solicitation are reviewed and have identical scores.
- 2) The award of this project is contingent upon the availability of funds at the time of award.

APPENDIX A: Guidelines for Preparing Proposals for the Illinois Center for Transportation

Please use the following format when submitting Illinois Center for Transportation proposals for consideration. Proposals should be a maximum of 15 pages (excluding the cover page, itemized budget, budget justification and optional appendices) with a minimum 11pt font, standard margins, and in Adobe PDF file format.

1. Cover Page

Use the cover page found [here](#).

2. Research Plan

Clearly and concisely address the proposed approach for solving the issue described in the problem statement. The research plan should be subdivided into the following sections:

(a) Introduction, Including Research Objective

Introduce the proposal and provide a concise overview of the research approach. Outline the objectives of the research project and explain the questions that will be answered by the research.

(b) Research Approach/Work Plan

Include details of the research project and strategies to accomplish the project objectives. Itemize the tasks and provide clear explanation of the research approach, deliverables, and identify the research team lead for each task.

(c) Anticipated Research Results

State the anticipated research results and deliverables.

(d) Expected Implementable Outcome(s)

All IDOT/ICT research is expected to be implementable. Describe what implementable outcomes (e.g., specification, test, recommendations, etc.) are anticipated that will facilitate implementation of the research results.

3. Qualifications and Accomplishments of the Research Team

Identify who will perform the research and provide a brief explanation of each researcher's qualifications and related research efforts.

4. Other Commitments of the Research Team

Outline the other commitments of the research team to demonstrate the ability to fulfill the commitments of the proposal.

5. Facilities and Equipment

Describe the facilities and equipment available to conduct the research.

6. Timeline Requirements

Include a timeline of the research project’s tasks in this section. Describe the required time to complete the research, including final report preparation, ICT’s editing process, review of the report by the Technical Review Panel, and publication of the report. Please note the final report must be submitted in Section 508 compliant format at least three months before the project’s end date. Below is an example of a project timeline.

Project Milestones (assuming an August 16 Start Date, and a 24 month project)	2022				2023								2024												
	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8
1 Kickoff Meeting	█																								
2 PI conducts Research	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
3 PI writes DRAFT report																									
4 PI Submits Final DRAFT report to ICT for editing																									
5 ICT Preliminary editing phase																									
6 PI/TRP editing phase																									
7 Final editing phase																									
8 Report published																									
(Quarterly Progress Reports Due)		█			█				█					█						█					
(TRP Meetings)		█			█				█					█						█					

7. Itemized Budget

Provide an itemized project budget including the cost of personnel, consultants, subcontracts, equipment, materials, travel, indirect costs, and cost share.

A minimum 25% of the total project budget must be cost share from the proposing agency. Under the IGA effective July 1, 2022, the indirect cost rate used for institutions with a federally negotiated F&A rate cannot exceed 37.7% of the modified total direct costs. If the proposing agency does not have a federally negotiated rate, a 10% de minimus rate must be used.

Subaward costs from outside the proposing agency cannot exceed 50% of the total project budget without prior approval.

A part of the cost share requirement may be fulfilled using unrecovered indirect costs. Any proposal submitted by an agency outside of the University of Illinois system that plans to use unrecovered indirect cost as cost share must submit a request for approval to IDOT/Federal Highway Administration. More information on this letter will be provided if a proposal is selected for funding.

Please utilize ICT’s budget templates when submitting a proposal: [UIUC Budget Template](#) and [Subawardee Budget Template](#).

8. Budget Justification

Include a budget justification that explains the itemized budget in narrative form. The budget justification shall provide sufficient detail so there is a clear understanding of how the project costs were calculated and why they are necessary. The narrative discussion of the project cost categories and related line items should be presented in the same order as they appear in the itemized budget. If the project requires the purchase of equipment, out-of-state travel, or out-of- or in-state conference registration/attendance expense, please list and explain here.

*Under the terms of our IGA, equipment is defined as any tangible or intangible product, having a useful life of **two years or more**, an acquisition cost of at least \$500, and solely purchased for use in the IDOT-ICT project. Equipment purchased on IDOT-ICT projects is to be returned to IDOT at the conclusion of the project, unless otherwise agreed upon. Equipment purchases on IDOT-ICT projects must have a **signed** pre-approval.*

*Travel expenses should include, but are not limited to, travel to TRP meetings, travel for testing / sampling, etc. Any out-of-state travel expenses and **any** conference expenses charged to the project must have a **signed** pre-approval.*

Inclusion of equipment and travel expenses in the project budget and workplan does not meet the requirement for pre-approval. Signed, pre-approval request forms must be submitted prior to purchase of any equipment or travel meeting the above criteria to be considered allowable expenses on the project. Expenses not meeting this requirement may not be reimbursed.

9. Cooperative Features (if appropriate)

If assistance or cooperation is required from other agencies, public or private, to complete this proposed research, describe the plans for securing this assistance.

10. Appendices (if appropriate)

References or any additional materials deemed necessary may be provided here.