



## REQUEST FOR PROPOSAL #26-03

### *Impact Detection System*

**POSTED DATE: 06/16/2026**

**CLOSE DATE: 07/15/2026 at 11:59 p.m. CST**

**Submit Proposals to: [ICTProjectManagement@illinois.edu](mailto:ICTProjectManagement@illinois.edu)**

#### **PROJECT INFORMATION**

<b>Funds:</b>	\$75,000 total (includes a required 25% cost share of \$18,750 from proposing agency)
<b>Estimated Contract Term:</b>	9 months
<b>Projected Start Date:</b>	10/01/2026

#### **BACKGROUND**

Roadside safety hardware, such as guardrails, guardrail end terminals, impact attenuators, high tension cable (HTC) median barriers, HTC median barrier terminals, and concrete barriers for temporary and permanent applications, are frequently impacted by errant vehicles. In many cases, these impacts go unreported or are discovered long after they occur. This delay may leave damaged systems in service for extended periods, potentially increasing risk to the traveling public during subsequent crashes.

Recent advancements in impact detection technologies provide opportunities for transportation agencies to automatically identify and report impacts to roadside safety hardware in real time. However, the feasibility, reliability, durability, integration requirements, and cost-effectiveness of these systems remain uncertain. Research is needed to evaluate available technologies and determine their robustness and practicality for deployment across the Illinois transportation network.

## OBJECTIVE

The objective of this research is to review available impact detection technologies for roadside safety hardware and assess their feasibility, accuracy, reliability, durability, and cost-effectiveness under real-world field conditions. The research will identify practical solutions for statewide implementation that can automatically detect and report impacts, improve response times, support maintenance prioritization, reduce inspection needs, and enhance roadway safety.

## RESEARCH TASKS AND REQUIRED DELIVERABLES

This proposed research shall include the following tasks:

**Task 1: Literature Review and Technology Assessment.** Conduct a thorough and inclusive review of existing and emerging impact detection technologies applicable to roadside safety hardware. The literature review shall include technologies applicable to guardrails, guardrail end terminals, impact attenuators, HTC median barriers and terminals, and concrete barriers. A summary of the current state of practice shall be prepared. The summary shall include system capabilities, sensing mechanisms, communication methods, durability considerations, limitations, and deployment experiences.

**Task 2: Development of Evaluation Framework.** Develop evaluation criteria and testing procedures for assessing impact detection technologies under field conditions. The evaluation framework shall include, at a minimum, accuracy, reliability, durability, integration requirements, communication and power needs, cost-effectiveness, and suitability for various applications. In addition, any limitations of any system shall be itemized.

**Task 3: Field Testing and Validation.** Coordinate with the Illinois Department of Transportation (IDOT) to identify representative locations for deployment and evaluation. These locations shall reflect a range of roadway classifications, traffic volumes, and roadside safety hardware applications. Conduct field testing of selected impact detection technologies at approved locations. Evaluate system performance under real-world conditions, including environmental exposure and traffic operations. Document installation requirements, constructability, and operational considerations.

**Task 4: Comparative Evaluation.** Perform a comparative assessment of the evaluated technologies based on the established criteria from Task 2.

**Task 5: Implementation and Integration Assessment.** Evaluate requirements for implementation, including system integration with existing IDOT maintenance management and traffic operations systems. Develop recommendations for deployment, including appropriate use cases, installation procedures, communication protocols, and maintenance requirements.

**Task 6: Cost and Benefit Analysis.** Conduct a life-cycle cost analysis that includes initial installation, operations, and maintenance costs. Assess anticipated benefits, including reduced inspection efforts, improved response times, enhanced prioritization of repairs, and potential safety improvements.

**Task 7: Final Report.** Prepare a final report documenting the research approach, analyses, findings, and recommendations. The report shall include technology evaluations, field testing

results, comparative evaluation, implementation guidance, and cost-benefit analysis findings, along with recommendations for statewide application.

## **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](mailto: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.

## **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 an Adobe PDF file format.

### **1. Cover Page**

Please include the following information on the proposal cover page:

- RFP number (e.g., RFP #26-03)
- Proposal title
- Proposed principal investigator (and co-investigator, if any), along with associated organizations and email addresses.

### **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 a October 1 Start Date)	month	2026			2027							
		10	11	12	1	2	3	4	5	6	7	
1 Kickoff meeting		█										
2 PI conducts research		█	█	█	█	█	█					
3 PI begins preparing interim deliverable						█						
4 ICT edits interim deliverable							█					
5 PI submits final DRAFT report to ICT for editing								█				
6 ICT preliminary editing phase									█			
7 PI/TRP editing phase										█		
8 Final editing phase											█	
9 Report posted to ICT website												█
(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 of 25% of the total project budget must be cost share from the proposing agency. Under the new IGA effective July 1, 2024, the indirect cost rate used for institutions with a federally negotiated F&A rate cannot exceed 42.97% of the modified total direct costs. If the proposing agency does not have a federally negotiated rate, a 10% de minimis 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 the University of Illinois system that plans to use unrecovered indirect costs 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 refer to ICT's [budget templates](#) when submitting a proposal:

- [UIUC Budget Template](#) – UIUC institutional budget template without subawards.
- [Subawardee Budget Template](#) – Each subawardee institution shall complete this budget form or may submit a budget using its institutional template, as long as it complies with the guidelines outlined in this RFP.
- [UIUC Budget Template with Subawardee](#) – UIUC institutional budget template that includes a subaward in the project.

## 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 expenses, 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.