REQUEST FOR PROPOSAL #21-02

Developing Deterioration Curves for Bridge Elements

POSTED DATE: **4/26/2021**
CLOSE DATE: **5/24/2021 at 11:59 p.m. CST**

Submit Proposals to: ICTProjectManagement@illinois.edu

PROJECT INFORMATION

Funds:	$200,000 total (includes a required 25% cost share of $50,000 from proposing agency)
Estimated Contract Term:	15 months
Projected Start Date:	8/16/2021

BACKGROUND

The Federal Highway Administration recently required for state departments of transportation to develop/procure and begin using a bridge management system. Per the *AASHTO Manual for Bridge Element Inspection*, "The proper assessment of the condition of bridge elements is the cornerstone of sound bridge management. The introduction of element inspection condition methods in the early 1990s represented a significant advancement in bridge inspection practice and has been adopted by the vast majority of the state transportation departments in the United States. Bridge Owners nationwide have recognized the benefits of detailed condition assessments through the use of raw inspection information, expanded performance measures, and bridge management system deterioration forecasting and evaluation." To ensure accurate deterioration forecasting, Illinois Department of Transportation is seeking to have deterioration curves developed based on element-level inspection data collected in Illinois since the mid-1990s for use in IDOT's bridge management system, AASHTOWare BrM. The accuracy of the deterioration curves will directly impact the quality of decision-making by IDOT's programming staff as they identify, prioritize, and program bridges for maintenance, preservation, rehabilitation, or replacement projects. This will significantly assist IDOT in maximizing the service life of bridges and the returns on taxpayer investment.

OBJECTIVE

The overall objective of this research project is to develop deterioration curves based on the element-level inspection data from Illinois' bridge inventory. The deterioration curves will provide the basis for IDOT's bridge management system, AASHTOWare BrM.

RESEARCH TASKS AND REQUIRED DELIVERABLES

The proposed research shall address the following tasks.

Task 1 — Prepare data, including, but not limited to, identifying erroneous and abnormal condition state quantities as well as identifying and collecting influential variables such as traffic data, climate conditions, bridge materials, bridge type, and preservation / maintenance / repair / rehabilitation history.

Task 2 — Develop reliable deterioration curves compatible with AASHTOWare BrM for different geographical regions in Illinois. Evaluate the need for specific deterioration curves for major bridges, which are defined by structure length and main span type.

Task 3 — Propose modifications to the deterioration curves to represent element improvement after preservation, maintenance, repair, and/or rehabilitation activities.

Task 4 — Develop a user-friendly tool/application, including detailed supporting documentation, to continuously update the deterioration curves as new element-level inspection data is available.

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. All potential principal investigators should read and understand their responsibilities, which are presented in Appendix B.

Technical questions regarding the research project or RFP procedures should be submitted to the ICT Project Management team via email at ICTProjectManagement@illinois.edu. Technical questions and answers will be posted on ICT's website as they are received.

SPECIAL CONDITIONS FOR REVIEWING PROPOSALS AND AWARDING ICT-IDOT FUNDS

Please note that the following conditions will be applied when reviewing all received proposals and in awarding ICT-IDOT 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. Limit your total proposal to 15 pages (excluding the cover page and optional appendices) and use a font size no smaller than 10. We suggest Arial font with 1.5 spacing between lines.

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

Provide an introduction to the proposal and a concise overview of the research approach. Then, 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. Then, itemize the tasks for completion, explaining in sufficient detail what will be done and what will be produced or completed with each task.

(c) Anticipated Research Results

State the anticipated research results and deliverables.

(d) Expected Implementable Outcome(s)

Describe how the anticipated research results can be used to support Illinois Department of Transportation's implementation of the expected outcome(s).

3. Qualifications and Accomplishments of the Research Team

Identify who will perform the research and provide a brief explanation of each researcher's qualifications to perform the research. Please provide examples of similar research that the proposed individuals have performed.

4. Other Commitments of the Research Team

Briefly outline the other commitments of the proposed principal investigator and Co-PIs to demonstrate that both will be able to fulfill the commitments of the proposal.

5. Facilities and Equipment

Describe the facilities and equipment available to undertake the research. Under the terms of the Intergovernmental Agreement between ICT and IDOT, laboratories meeting the criteria of Bureau of Materials Policy Memorandum 6-08.4 require proof of qualifying laboratory status. More information on this will be provided if and when a proposal is selected for funding.

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 plan on submitting the final report, in Section 508 compliant format, to ICT for initial editing at least three months before the project's end date. Below is an example of a project timeline.

	Project Milestones (assuming a January 1 Start Date, and a 2 year project)	2021												2022											
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
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 Posted to ICT website**																								
	(Quarterly Progress Reports Due)																								
	(TRP / PI Meetings)																								

7. Itemized Budget

Provide an itemized budget for the entire project, including the cost of personnel, consultants, subcontracts, equipment, materials, travel, overhead/indirect costs, and cost share (match).

Each project must include a budget that clearly shows the portion of the total cost requested from IDOT/ICT (75%) and the matching funds/cost share (25%) required from the proposing agency. The indirect cost rate (also known as overhead or F&A) used for facilities and administration (F&A) cannot exceed 50% of the modified total direct costs. If a subaward is necessary for extra support from outside the proposing agency, then the subaward cannot exceed 50% of the total project budget without prior approval.

A part of the 25% cost share requirement may be fulfilled through the use of unrecovered indirect costs. Any proposal submitted by an organization outside of the University of Illinois system that plans to use unrecovered indirect cost to meet part of the required 25% cost share must submit a request for approval to IDOT/Federal Highway Administration. More information on this letter will be provided if and when a proposal is selected for funding.

Please refer to ICT's budget templates when submitting a proposal to ICT: UIUC Budget Template and Subawardee Budget Template.

8. Budget Justification

Each project must include a budget justification that explains the itemized budget in narrative form. The budget justification provides 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 over $500 or travel (out-of-state, or to any conference), 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 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 or conference expenses charged to the project must have pre-approval.

Inclusion of equipment and travel expenses in the project budget and workplan does not meet the requirements 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.

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)

Items such as statements regarding previous work on the problem or related problems, abstracts of related projects, a bibliography or list of references, or materials describing the submitting organization may be included here.

APPENDIX B:

Principal Investigators Quick Reference Guide for IDOT-ICT Sponsored Projects

Downloadable forms and guidelines are at:
https://ict.illinois.edu/research/resources-and-guidelines

1. **Prepare and submit a detailed work plan:** The project's work plan is to include a line-item budget, budget justification, project timeline, implementation strategy, and deliverables; and should be consistent with the "ICT Request for Research Ideas" submission or Request for Proposal (whichever is applicable).

2. **Finalize work plan with Technical Review Panel:** Revise the work plan as agreed upon with the TRP. ICT will assign a project number, attach the workplan to an approval form and send an approval form via DocuSign. Once the Workplan Approval Form is fully signed, ICT will enter project data into the ICT Quarterly Progress Report database.

3. **Review Principal Investigator section in the online ICT QPR database:** Go to the ICT website at https://apps.ict.illinois.edu/projects/ to log into the database. ICT will provide new PIs with a username and password to log on. Click on the new project title, then click on the **Edit QPR** button and complete or review the following sections: Personnel (add project team members, including co-PIs and students); Project Details (project tasks, the project description), and other information for accuracy.

4. **Conduct research as agreed upon with the TRP:** Notify the TRP if any problem develops during the project. If the project requires the purchase of equipment over $500 or travel (out-of-state or to any conference), the PI shall submit a request for approval by the TRP Chair prior to the expenditure.

5. **Provide quarterly progress reports:** No later than the 14th of the month after the end of each calendar quarter, submit your project's online QPR to send it to the TRP Chair for review and approval. ICT sends intermittent emails reminding PIs to fill out the QPR for their research projects.

6. **Provide research progress updates to TRP:** Attend all TRP meetings as scheduled by the PI and TRP chair (generally once per quarter, at least every 6 months) to provide project updates and answer TRP members' questions about the project. If you would like help setting up a virtual meeting, ICT can help facilitate this. Provide any presentations in advance to the Research Project Coordinator at ICTProjectManagement@illinois.edu.

7. **Write project report:** A final research project report in accordance with ICT guidelines is required to complete your project. Reports should fulfill project objectives set forth in the work plan, show adequate documentation, and be presented clearly and concisely; **the maximum page length is 75 pages (~35,000 words) not counting appendices**. Specific report writing guidelines may be downloaded from the ICT website. Complying with these guidelines will minimize publication delays. Six months and four months prior to your project end date, you will receive reminders from ICT to draft your project report.

8. **Submit project report to ICT for editing three months prior to project's end date:** Three months before the project's end date, submit the draft report to ICT for editing (**prior to submission to the TRP**). The three-month editorial process is conducted in

three phases as follows:

- PRELIMINARY EDIT PHASE I (Month One — 30 days): The PI submits the completed report, formatted using the ICT report template, to ICTProjectManagement@illinois.edu. ***Reports that are not properly formatted or Section 508 compliant will be returned to the PI for reformatting and resubmission.*** Note that extensions will not be provided if the report is returned solely for formatting issues.

  A comprehensive technical edit of the report will be performed and returned to the PI for review and revision. The report template as well as additional useful documents and forms are on the Report Editing Process page.

- PI/TRP EDIT PHASE (Month Two — 30 Days): The PI reviews the ICT technical edits, accepts/rejects changes, addresses all comments, and forwards the edited report to the project's TRP Chair(s) for review. The **TRP reviews and provides comments to the PI within 21 days of receipt.** The PI incorporates the feedback and returns the report to the TRP Chair for approval before sending the final version to ICT Project Management for final editing. ***All discussion and updating of the final report between the PI and TRP Chair(s) should be complete at this time.***

- FINAL EDIT PHASE (Month Three — 30 days): When the PI sends the final version of the report to ICT Project Management, ICT will obtain the Final Report Approval Form from the TRP Chair(s). Upon receipt of the approval form, ICT Project Management performs a final editorial review and publishes the report. ***The TRP Chair(s) must sign the approval form prior to report publication.***

NOTE: The three-month report editing and review process must be built into your project timeline. That is, if your project ends on December 31, your report should be sent to ICT Project Management for editing no later than September 30.

9. **Obtain IDOT approval to release project information prior to publication of the final report. IDOT requires 21 days to review the approval request.** After 21 days, publication or public disclosure of non-confidential and non-patentable results in professional refereed or peer-reviewed journals or papers to be presented at professional meetings may proceed without interference. The publication or release of non-scholarly work products, any information that is deemed confidential by IDOT, or information which includes patentable results may not be published/released without IDOT's approval. *If the scheduled time for presenting project information previously reviewed by IDOT does not permit formal review of a complete publication or presentation, notify IDOT of the scheduled presentation on the study and provide an abstract, presentation title, or agenda for the presentation. Such publications and presentations must state that the paper/presentation has not been reviewed by IDOT, using the acknowledgement and disclaimer statements available on the ICT website.*

10. **Comply with the terms of the current ICT Intergovernmental Agreement, which IDOT approved July 2017 and amended effective June 30, 2020:** This agreement can be found on the ICT website on the ICT Resources and Guidelines page.

11. **Comply with the current ICT Operational Guidelines:** The current guidelines can be found on the ICT website on the ICT Resources and Guidelines page.