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Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

November 19, 2019

Dear Research Partner:

The Missouri Highways and Transportation Commission requests proposals from qualified organizations—namely private consultants, universities, and research organizations—to furnish professional services as described in the following request for proposal to be coordinated by the Research Unit of the Construction and Materials Division.

Please submit a proposal for project **TR202012** entitled, “**Evaluation of Missouri’s NBI Data to Predict the Deterioration of Bridges**”. Your submittal must include a work plan, the proposed project team and its background, and any related projects now active or recently completed by your firm. The project team must be led by a licensed professional engineer in the state of Missouri and the final report must be sealed, in accordance with the provisions of Chapter 327 RSMo.

The selection committee will use Qualification Based Selection. A “not to exceed” budget amount is included in the RFP to assist with the required scope, but budgets are not to be included with the proposal submissions, and will not be presented to the selection committee.

Please submit all proposals to MoDOTResearchRFP@modot.mo.gov by **January 9, 2020 10:00 AM (CST)**. More information about project contracting in general can be found at <https://www.modot.org/information-researchers> under RFP documents.

Sincerely,

Jen Harper
Research Director



Our mission is to provide a world-class transportation system that is safe, innovative, reliable and dedicated to a prosperous Missouri.

www.modot.org

Background

MoDOT is responsible for the inspection and maintenance of approximately 10,000 bridges and culverts on the state roadway system. These bridges and culverts are required to be inspected every two years and the inspection data is submitted to the Federal Highway Administration's (FHWA) National Bridge Inventory (NBI) Database. For certain bridge types and bridges with advanced deterioration the inspection cycle might be more frequent.

Missouri NBI for the past 27 years is available for downloading in a text format from FHWA's website. By using data mining techniques to retrieve and organize this data, information can be derived for the deterioration of different bridge systems that have been used over the years. Developing deterioration curves for the various rated items on bridges and culverts is also desired for use by MoDOT for their data driven asset management plan. Knowing approximately how many years each part of a bridge (deck, superstructure, substructure) or a culvert will be at a particular NBI rating can lead to more informed programming decisions within the asset management plan.

Over the 27 year period the formatting of the data files has been changed twice. Additionally, MoDOT changed the bridge numbering system for the NBI in 2002. The project will require data mining techniques to ensure that the data items for each year of the data are comparable as well as correlating of the newer bridge numbering system with the older bridge numbers. MoDOT has experience with data mining techniques and will be a resource for that portion of the project.

Objectives

The main objectives of the project are:

1. Develop deterioration curves for the different parts of a bridge broken out by the different types of materials used on bridges. The different parts would be the deck, superstructure, and substructure and the primary materials would be steel, reinforced concrete, and prestressed concrete.
2. Develop a deterioration curve for reinforced concrete box culverts.
3. Identify and quantify trends in the deterioration of different types of bridges MoDOT has built over the years. Some of the ways to analyze the data could include but are not limited to:
 - a. Structure type,
 - b. Age of the structure,
 - c. Era of construction,
 - d. Span length,
 - e. Condition assessment,
 - f. Material type,
 - g. Traffic volume, and
 - h. Location and environmental exposure.
4. Provide recommendations of cost effective bridge types identified in the previous objective.

Project Requirements

Task 1: Project Management

The contractor will facilitate a kick-off meeting with MoDOT to review the work plan, scope and schedule; and establish a protocol for regular ongoing communications and coordination with the team.

The finalized work plan will detail implementation of the following tasks as well as the resources and schedule required to carry them out.

Task 2: Develop a spreadsheet or database of the current approximately 10,000 bridges on the Missouri State System.

At the time the project starts, MoDOT will provide a spreadsheet listing the current MoDOT owned bridges on the NBI along with some other pertinent basic information that might be needed as part of this project.

Task 3: Trace each bridge number back to the time it was built or the beginning of the NBI data information.

This task will require data mining techniques since the data within the system has undergone changes in the data format since inception as well as the bridge numbering system. MoDOT will meet with the contractor to provide ideas on how this phase of project could be approached.

Task 4: Determine which information/fields within the NBI database are needed for this project for the general analysis as well as the creation of the deterioration curves.

This task will require downloading the available data files from the FHWA website starting with 1992 and working forward to the present year. This information can be retrieved from the Federal Highway Administration NBI website at <https://www.fhwa.dot.gov/bridge/nbi/ascii.cfm>.

Task 5: Analyze the data extracted from the NBI database to develop deterioration curves for the different parts of a bridge broken out by the type of bridge.

Curves for the deck, superstructure, and substructure would be expected for bridges and a curve for culverts would also be expected. The common material types used are steel, reinforced concrete, and prestressed concrete.

Task 6: Identify and quantify trends in the deterioration of different types of bridges MoDOT has built over the years. Some possible criteria are listed in Objective 3 in the section above.

Review the suggested criteria in Objective 3 and develop any other criteria that the contractor thinks might be informative and identify or quantify trends for the criteria that are analyzed.

Task 7: Provide recommendations of cost effective bridge types identified in the previous task.

Discuss the findings related to this analysis and make any recommendations for any changes that might be beneficial to MoDOT on future projects.

Task 8: Delivery of Final Report, Research Summary, Deterioration Curves, and Data Collected.

The contractor will develop a final report detailing the tasks completed during the project including any and all findings generated during the project's duration. The contractor will provide a 1-2 page research summary that states the project objectives and includes information on project conclusions. The deterioration curves and data collected shall be provided at the conclusion of the project in a format that is usable and documented. A presentation for MoDOT staff, summarizing important or significant details of the project, may also be required.

Project Deliverables

For templates and forms for reports and plans, visit <https://www.modot.org/information-researchers>.

Email Communications

E-mail and phone communications between the Principal Investigator(s) and MoDOT contacts as necessary are required to provide on-going updates of progress throughout the project

Data Management Plan

The plan is a formal document that describes the data that is acquired, created or produced during the project, specifies who owns it and who can access it as well as information on how it will be described, managed, analyzed, stored, shared and preserved during and after the project is over. Please refer to templates on the [website](#).

Quarterly Reports

Quarterly reports should be submitted throughout the project on the last day of March, June, September and December. The quarterly reports are not intended to replace any additional correspondence between the research team and MoDOT needed to keep the project moving. Please refer to template on the [website](#).

Interim Presentation

An interim presentation shall be scheduled near the mid-point of the project to update MoDOT on the progress and the direction of the project. The purpose of the interim presentation is to evaluate the progress and determine if any mid-project corrections are necessary.

Draft Final Report and Research Summary

These drafts should be final products except for revisions based on MoDOT's review. A final report must include a completed Technical Report Documentation page. Please refer to **Publication Guidelines** and summary template on the [website](#).

Final Report and Final Research Summary

After MoDOT's review is complete and documents have been edited to MoDOT's satisfaction, final documents should be submitted as Word documents (unless otherwise instructed). Please refer to **Publication Guidelines** and summary template on the [website](#).

Other Deliverables

The deterioration curves and data shall be provided to MoDOT at the conclusion of the project. The data must be in a format that is understandable including definitions for any variables, column headers and rows.

Final Presentation

May be required. The contractor will present the results, recommendations, and implementation ideas to MoDOT and other stakeholders. For stakeholder and agency participants, any travel and lodging fees are to be covered by individual attendees or their firms. MoDOT and stakeholders will provide feedback to the contractor, especially related to implementation.

Task-Specific Deliverables

Task	Deliverables
1	Schedule and conduct kickoff meeting. Kickoff meeting minutes. Draft and final work plans. Formation of Technical Advisory Committee (TAC).
2	Database of bridges on the Missouri System.
3 & 4	None.
5	Deterioration curves.
6 & 7	Provide analysis results in final report.
8	Final report and research summary. Deterioration curves and data. Possible presentation. Final project meeting.

Project Schedule

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts February 15, 2020. Proposals need to include a work plan with a proposed timeline. For a sample of a work plan template, see link below. Changes to our

estimated project timeline below will be considered, however, timeline extensions cannot be guaranteed. The project timeline will be discussed and finalized during the kickoff meeting.

For report templates and forms, visit <https://www.modot.org/information-researchers>.

Date	Milestone
2/28/2020	A kick off meeting with MoDOT will be scheduled to discuss project requirements and deliverables by this date. The dates of key milestones and deliverables will be determined from this meeting.
3/31/2020	First Quarterly Report due; these should be completed the last day of each quarter.
2/15/2021	Interim presentation must be done by this date.
2/1/2022	Draft final report, research summary, deterioration curves and project data are due. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.
4/1/2022	Final report, research summary, deterioration curves and project data are due. The final documents shall be due approximately one month before the end of the contract. This is to allow all billing to be completed prior to the end of the project.
5/2/2022	Final invoice due and contract ends.

Special Notes

Project budget is not to exceed **\$200,000**. A budget is not to be included in the proposal, but will be required for the contract and must be within this limit. For a sample budget template, report templates and forms, see <https://www.modot.org/information-researchers>.

RFP Requirements

- “Contracting Documents” provide further details and links to the required forms. They are available at <https://www.modot.org/information-researchers>.
 - **Organization’s Project Experience:** The proposal must clearly identify the Organization’s experience in offering the services requested in this RFP during the past three (3) years. The description should include a list of the agencies which your organization has served during this time period or currently serves. Please highlight any work you have done with other state agencies or local governments.
 - **Team Member Experience:** Please list all team members (including subcontractors) proposed to work on the project. Attach licenses, certifications, and resumes for key personnel.
 - **Organization’s Client References:** Proposals should indicate the name, title, and telephone number of at least three clients within the past three years.

- Proposals must be no more than **10** pages in length with a font size no less than 11 points. This length limit **does not include** the Proposal Submission Form, Organization's Project Experience, Team Member Experience, Organization's Client References and optional cover letter (if included, one page maximum).
- Proposals must be submitted as one combined PDF document. The submission should **only include the required documents** organized in the following order: 1) Proposal Submission Form; 2) Cover Letter (optional; 1 page maximum); 3) Body of Proposal (including work plan); 4) Organization's Project Experience; 5) Team Member Experience; and 6) Organization's Client References.
- The Offeror must respond to this RFP by submitting all the information required herein for its proposal to be evaluated and considered for award. Failure to submit all the required information shall be deemed sufficient cause for disqualification of a proposal from consideration.
- Proposals will be evaluated by an agency and stakeholder team with knowledge and backgrounds in relevant areas for this project. Selection of the successful Offeror will be based on the Offeror's demonstrated knowledge in the required areas, the merit of the proposed methods and approach in achieving the desired goals, the experience and qualifications of the team, the plan for ensuring implementation of results, and the adequacy and availability of team members to complete the work in a timely manner.
 - Correct proposal submission is one of the evaluation criteria. If submission instructions in this section are not followed, the **Offeror risks an automatic 10 point deduction (out of 100 total points)** when points are awarded during the Proposal Evaluation Process.

RFP Schedule

This document constitutes an RFP from qualified organizations to conduct the TR202012 "Evaluation of Missouri's NBI Data to Predict the Deterioration of Bridges" study for the MHTC and Missouri Department of Transportation (MoDOT). MHTC reserves the right to reject any and all proposals for any reason whatsoever.

The following RFP Schedule of Events represents MoDOT's best estimate of the schedule that shall be followed. The time of day for the following events shall be between 7:30 am and 4:00 pm, Central Standard Time unless otherwise noted. MoDOT reserves the right at its sole discretion to expand this schedule, as it deems necessary, without any notification except for the deadline date for submitting a proposal. Time is of the essence for responding to the RFP within the submission deadlines.

The following timeline must be met for a proposal to be accepted.

Date	Action
11/19/2019	MoDOT posts RFP to the website at https://www.modot.org/research-requests-proposal .
12/11/2019 4:00 PM (CST)	Written comments or questions must be submitted to Research Administrative Engineer .
12/18/2019	MoDOT will post written responses publicly on the website at https://www.modot.org/research-requests-proposal .
1/9/2020 10:00 AM (CST)	Written proposals must be submitted to Research Administrative Engineer .
1/31/2020	MoDOT will notify submitters about project selection, or if needed about interviews to finalize selection.

Contracting Requirements

The successful team will be required to complete additional documentation and enter into a contract such as a "Standard Research Agreement" or "Task Order." Applicants should be aware of these additional needs so contracting can proceed in a timely manner.

As part of the eAgreements process, MoDOT uses an electronic signature tool, DocuSign, for signing agreements electronically. All parties of the agreement must agree to sign electronically in order to utilize the electronic signature option. If your proposal is selected, you will be informed about how to obtain your credentials for electronic signatures (including how to become a MoDOT vendor if you are not already).

Standard contracts, forms, attachment templates and additional information are available from the website at <https://www.modot.org/information-researchers>.

Proposal Submission

Submission Deadline

Proposals must be emailed by **10:00 AM (Central Standard Time)** according to email time stamp by the submission date in the RFP Schedule to the Research Director's attention (Jen Harper) at: MoDOTResearchRFP@modot.mo.gov. Please reference the project title since more than one RFP may be due at one time. Electronic proposals are required.

Submission Confirmation

You will receive an email confirmation after your proposal has been received. If you do not receive such a confirmation by **12noon (Central Standard Time)** on the day of the deadline, please contact us at MoDOTResearchRFP@modot.mo.gov as soon as possible. Your submission should not be considered received until you have received your email confirmation.