

Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

February 1, 2023

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 **TR202311** entitled, “**Asset Characterization Using Automated Methods.**” 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 **April 5, 2023 10:00 AM (Central)**. 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

The Missouri Department of Transportation (MoDOT) has adopted a transportation asset management approach to make the best decisions with transportation investments. MoDOT is focused on preserving Missouri's state highways and bridges, so they are safe and reliable today and for future generations. This is a daunting task as Missouri has the seventh largest state highway system in the nation totaling 33,825 miles. The state highway system, which includes 10,387 bridges and culverts along with an estimated 167 low water crossings around the state, is critical to Missouri's economic competitiveness and quality of life.

MoDOT's Transportation Asset Management Plan (TAMP) aids in identifying potential risks the agency faces related to pavement and bridge condition and how to prevent or mitigate these risks. This is a valuable tool, but MoDOT is also interested in producing a similar system to catalog specific assets more precisely, such as bridges, culverts and low water crossings. A system for identifying and cataloging Missouri's bridges and culverts along with various data characteristics, would be invaluable to the department to provide a safe transportation system that ensures the mobility of people and goods.

MoDOT would like to explore the possible ways of using existing LiDAR and/or other third-party data to identify and catalog these assets along with identifying various data attributes about them. Identifying such attributes such as elevations, lengths, widths, etc. would be valuable information for flood prediction, emergency planning, etc. This information would benefit MoDOT and numerous other counties, federal agencies and planning partners.

Manually obtaining this information is costly and time consuming, an automated method of obtaining asset information using LiDAR or other third party data would be a cost effective way to compile this data.

Objectives of this project are to supply the department with an automated asset monitoring system for the cataloging of bridges, culverts and low-water crossings.

The anticipated asset monitoring/characterization system would be an automated system using LiDAR and/or third party data for characterizing bridges, culverts and low water crossings.

This project will include the cataloging (with characterizations) of a minimum of (5) bridges and (5) culverts along with a minimum of (1) low-water crossing from one county in Missouri. County will be chosen after project is awarded. Counties may be suggested in research proposals.

Objectives

MoDOT would like to explore the possible ways of using existing LiDAR and/or other third-party data to identify and catalog various assets such as bridges, culverts and low water crossings along with identifying various data attributes about them. Researchers will provide an automated Asset Characterization and Cataloging system.

Objectives of the project/system will include, but are not limited too;

- Cataloging of assets (Bridges, culvert, low-water crossings)
- Asset characterization—identify various data attributes that should be produced from the research (length, width, span, etc.)

- Amount of water asset will hold before overtopping
- Evaluate the minimal level of accuracy of the data required for it to be usable.
- Identify first-party and third-party data that are available to produce the data.
- Develop a machine learning algorithm to extract the relevant data.
- Test the algorithm for select locations and evaluate if the results meet the need.
- Interactive maps
- System compatible with MoDOT systems

This project will include the cataloging (with characterizations) of a minimum of (5) bridges and (5) culverts along with a minimum of (1) low-water crossing from one county in Missouri. County will be chosen after project is awarded. Counties may be suggested in research proposals.

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 contractor will also develop minutes for the kick-off meeting and any status meetings that may be held during the project.

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: Research and Literature Review

The Researchers shall perform a literature review of recently completed research relating to the use of LiDAR and/or other data to identify and catalog various assets such as bridges, culverts and low water crossings along with identifying various data attributes about them.

Task 3: Asset Monitoring/Characterization System Presentation and Identification of a Minimum of (11) Structures

Researchers will present to MoDOT an existing or custom designed Asset Monitoring/Characterization System for use in identifying and cataloging various assets such as bridges, culverts and low water crossings along with identifying various data attributes about them. Researchers will also identify a minimum of (5) bridges, (5) culverts along with a minimum of (1) low-water crossing from one county in Missouri that will be cataloged, with MoDOT approval.

Task 4: Asset Cataloging and Characterization

Researchers will catalog a minimum of (11) assets described in task 3. Data attributes and informational items to be considered and included in cataloging will be, but not limited too;

- Cataloging of assets (Bridges, culvert, low-water crossings)
- Asset Characterization - Identify various data attributes that should be produced from the research (length, width, span, etc.)
- Amount of water asset will hold before overtopping
- Evaluate the minimal level of accuracy of the data required for it to be usable.
- Identify first-party and third-party data that are available to produce the data.
- Develop a machine learning algorithm to extract the relevant data.
- Test the algorithm for select locations and evaluate if the results meet the need.
- Interactive maps
- System compatible with MoDOT systems

Task 5: Develop Draft Final Report, Research Summary and Asset Cataloging System Summary

The draft final report and other documents shall be submitted to MoDOT approximately two months prior to the final report.

Task 6: Delivery of Final Report, Research Summary and Asset Cataloging System Summary

The final documents shall be due approximately one month before the end of the contract.

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

An asset cataloging system summary shall be delivered with draft final report and summary.

Final Presentation

May be required. The Contractor will present the results, recommendations, and implementation ideas to MoDOT and other stakeholders. The Contractor will coordinate location, date, and meeting fees with MoDOT. 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	Facilitate a kick-off meeting. Develop minutes from the kick-off meeting. Finalize work plan.
2	Perform a literature review of recently completed research relating to the use of LiDAR and/or other data to identify and catalog various assets such as bridges, culverts and low water crossings along with identifying various data attributes about them.
3	Present to MoDOT an existing or custom designed Asset Monitoring/Characterization System.
4	Catalog a minimum of (11) assets described in task 3.

Task	Deliverables
5	Draft Final Report, Research Summary and Asset Cataloging System Summary.
6	Final Report, Research Summary and Asset Cataloging System Summary.

Project Schedule

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts **May 15, 2023**. 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. If the Contractor believes the project can be completed sooner, please include a revised schedule with the proposal. 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
5/29/2023	A kick off meeting with MoDOT will be scheduled to discuss project requirements and deliverables. The dates of key milestones and deliverables will be determined from this meeting.
8/30/2023	Researchers will present to MoDOT an existing or custom designed Asset Monitoring/Characterization System along with identifying a minimum of (5) bridges, (5) culverts along with a minimum of (1) low-water crossing from one county in Missouri that will be cataloged.
11/15/2023	Interim presentation must be done by this date.
5/15/2024	Draft final report, draft summary report, other deliverables are due. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.
7/15/2024	Final report, summary report, presentations, other deliverables 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.
8/15/2024	Final invoice due.
8/15/2024	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>.

All questions, information, data and/or manual requests regarding any aspect of the RFP details or process for submissions should be submitted to MoDOTResearchRFP@modot.mo.gov by the date and time listed in the "RFP Schedule" section of the RFP. This is the only acceptable method for contact regarding the RFP and contacting MoDOT employees via other methods is prohibited. Not adhering to this rule is cause for disqualification of the proposal.

RFP Requirements

- "Contracting Documents" provide further details and links to the required forms. They are available at <https://www.modot.org/information-researchers>.
 - **Contractor'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.
 - **Contractor'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, Contractor's Project Experience, Team Member Experience, Contractor'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 and project schedule); 4) Contractor's Project Experience; 5) Team Member Experience; and 6) Contractor'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 Contractor will be based on the Contractor'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 Contractor **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 **TR202311 “Asset Characterization Using Automated Methods”** 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 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
2/1/2023	MoDOT posts RFP to the website at https://www.modot.org/research-requests-proposal .
2/22/2023 4:00 PM (Central)	Written comments or questions must be submitted to MoDOTResearchRFP@modot.mo.gov . This is the only acceptable method for contact regarding the RFP and contacting MoDOT employees via other methods is prohibited. Not adhering to this rule is cause for disqualification of the proposal. This includes all requests for information, data, and manuals.
3/15/2023	MoDOT will post written responses publicly on the website at https://www.modot.org/research-requests-proposal .
4/5/2023 10:00 AM (Central)	Written proposals must be submitted to MoDOTResearchRFP@modot.mo.gov . Do not consider your proposal submitted until you receive notification of receipt. A notification should be sent by noon of the same day.
4/26/2023	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 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 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.