MoDOT

105 West Capitol Avenue
P.O. Box 270
Jefferson City, Missouri 65102

Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

November 18, 2021

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 **TR202214** entitled, **"Hazard Detection and Alert System to Prevent Incidents."** 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 20, 2022 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

Background

Backing accidents can happen for a variety of reasons. Drivers may not be able to see a worker in their blind spot or a worker may not hear backup alarms because of other worksite noises or because the alarms are not functioning. Drivers may assume that the area is clear and not look in the direction of travel. A combination of factors can also lead to back-over incidents. Sometimes, it is unclear why a worker was in the path of a backing vehicle. Some industry statistics suggest that backing incidents account for up to half of all on-the-job accidents along with motor vehicle accidents being the number one cause of workplace fatalities. Backing incidents continue to be a major problem in the construction and maintenance industries.

Many solutions exist to prevent back-over incidents. Drivers can use a spotter, backup camera with in-vehicle video displays, proximity detection devices, etc. The Missouri Department of Transportation (MoDOT) is committed to decreasing or eliminating backing incidents within the department. The department is looking for new innovative solutions or any existing solutions to aid in preventing backing incidents.

This project will focus on providing MoDOT with a reliable system that detects the proximity of backing heavy fleet vehicles or equipment in construction sites to workers or other objects. The system will be capable of alerting workers in close proximity to the backing vehicle along with the vehicles operator.

Objectives

The objective of this project is to provide MoDOT with a reliable hazard detection and alert system to "connect" heavy fleet vehicles to the workers outside the vehicle. There shall be a wearable proximity sensor, so workers receive an alert when the vehicle is backing up to help prevent backing incidents. The system shall be able to detect the proximity of workers or other objects behind a backing vehicle and instantly alert the driver of the vehicle along with alerting workers in close proximity.

After performing a literature search along with a search of existing commercial alert systems, the researchers shall deliver a presentation to MoDOT on the findings of the research. The team will give recommendations from the results of the investigations along with pricing and availability of any commercial hazard detection and alert systems.

After the presentation and recommendations from the research team, MoDOT will decide whether to pursue a commercial alert system or proceed to *task 4 Contractor Develops a Hazard Detection and Alert System.*

After developing a work plan, scope, schedule and facilitating a kick-off meeting the contractor will:

- Perform a literature search for any research performed on hazard detection and alert systems used to prevent backing incidents.

- Research any existing hazard alert systems being used on heavy fleet vehicles to prevent backing incidents by other state DOT's.
- A presentation will be given on the findings of the literature search and information obtained on any existing hazard alert systems available.
- If MoDOT does not pursue a commercial alert system, the contractor will develop a hazard detection and alert system
- Alert system features may include, but are not limited to;
    - A system capable of being mounted to heavy fleet vehicles.
    - The system should be able to detect workers or other objects in proximity to vehicle.
    - Capable of alerting driver when workers or objects are detected.
    - Includes a wearable device for workers outside of vehicle that is capable of connecting with the vehicles system and alerts worker of the vehicles close proximity.
    - Wearable device will alert worker with sound or vibration.

Project Requirements

Task 1: Project Management

The research team 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 search of past research performed along with any new technology being used for hazard detection and alert systems. Also, an investigation of any hazard alert systems currently being used by other state DOTs and the construction industry will be performed.

Task 3: Presentation of Findings

A presentation will be given on the findings of the literature search and information obtained on any existing hazard alert systems available. The team will give recommendations from the results of the investigations along with pricing and availability of any commercial hazard detection and alert systems.

After the presentation and recommendations from the research team, MoDOT will decide whether to pursue a commercial alert system or proceed to task 4 *Contractor Develops a Hazard Detection and Alert System.*

Task 4: Contractor Develops a Hazard Detection and Alert System

The contractor will develop a hazard detection and alert system to be used with heavy fleet vehicles. The system shall meet or exceed all specifications provided by MoDOT.

Alert system features may include, but are not limited to;

- A system capable of being mounted to heavy fleet vehicles.
- The system should be able to detect workers or other objects in proximity to vehicle.
- Capable of alerting driver when workers or objects are detected.
- Includes a wearable device for workers outside of vehicle that is capable of connecting with the vehicles system and alerts worker of the vehicles close proximity.
- Wearable device will alert worker with sound or vibration.

Task 5: Develop Interim Report, Research Summary and Hazard Detection and Alert System

Task 6: Delivery of Final Report, Research Summary and Hazard Detection and Alert System

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 a Word documents (unless otherwise instructed). Please refer to **Publication Guidelines** and summary template on the website.

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 for the kick-off meeting Finalize work plan
2	Perform a literature search along with search of new technology and systems currently being used by other DOTs
3	Presentation of findings from literature search and current commercial systems examination
4	If needed; develop a hazard detection and alert system
5	Draft final report and summary, develop hazard detection and alert system

Task	Deliverables
6	Final report and summary, presentation on the hazard detection and alert system

Project Schedule

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts **February 28, 2022**. 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
3/15/2022	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.
7/15/2022	Presentation of findings from literature search and current commercial systems examination
12/15/2022	Interim presentation must be done by this date.
5/29/2023	Draft final report, draft summary report and hazard detection and alert system are due. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.
7/28/2023	Final report, summary report and a presentation on the hazard detection and alert system 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.
8/28/2023	Final invoice due.
8/28/2023	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 this project the budget will be required to be broken into tasks so that if *task 4* is omitted that task will not be billed. 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.
    - **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 **TR202214 Hazard Detection and Alert System to Prevent Incidents** 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
11/18/2021	MoDOT posts RFP to the website at https://www.modot.org/research-requests-proposal.
12/9/2021 4:00 PM (CST)	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.
12/30/2021	MoDOT will post written responses publicly on the website at https://www.modot.org/research-requests-proposal.
1/20/2022 10:00 AM (CST)	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.
2/10/2022	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.