

**Missouri Department of Transportation**  
*Patrick K. McKenna, Director*

1.888.ASK MODOT (275.6636)

May 24, 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 **TR202123** entitled, “**Assessing Guard Cable Life Expectancy in Missouri.**” 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](mailto:MoDOTResearchRFP@modot.mo.gov) by **July 8, 2021** before **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](http://www.modot.org)

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## Background

Guard cable, also referred to as cable barrier, is a type of roadside or median safety barrier, designed with the intent of mitigating and controlling the effects of traveling vehicles leaving the travelway, otherwise risking the impact with oncoming vehicles, stationary objects and roadside terrain. The basic design has been around for over 50 years although it wasn't until the mid- to late-1990s that a number of state Departments of Transportation started regular deployment. In most cases, cross median crashes and fatalities have seen a significant decrease where guard cable has been installed.

The Missouri Department of Transportation (MoDOT) began utilizing guard cable along interstate routes in the early 2000s, and since that time has installed more than 800 miles of guard cable on divided highways. Of the cable barrier installed, a variety of manufacturers and designs, including low-tension and high-tension, have been deployed along Missouri travelways. Even with different manufacturers, the basic design of guard cables is typically three steel wire ropes (cables), tensioned at different heights from the ground, with mounting posts installed into the ground at a specified spacing, which maintain the distance between the cables over long runs. The cable system absorbs impact energy and dissipates it laterally, which reduces the forces transmitted to the vehicle's occupants.

For this project, MoDOT aims to take a deeper dive on the life of these systems, installation and repairs, and material characteristics after impact(s), among other items, to better understand this type of asset as it has been utilized by the Department for almost 20 years.

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## Objectives

The objectives of this project are, but not limited to, the following:

- Analyze material properties and capabilities after an impact (and repeat impacts), with regards to wire cable stretching/yielding, spring stretching/yielding, cable splices (quantity, lap and adequate distance between splices), along with other vital safety components of the system.
- Review installation and repair procedures of various manufacturers for common/best practices.
- Review past research and collection efforts to quantify the expected life of guard cable systems and individual components, along with identifying policies and standards that may be related to the repair and maintenance, including but not limited to tension and component inspection, erosion, collision damage and so on, of these systems.
- Observe and inspect guard cable system conditions in the field at selected locations.
- Review installation inspection and maintenance records, along with available crash reports for selected locations, highlighted by the Technical Advisory Committee, to identify common issues or patterns.
- Conduct a life expectancy analysis of guard cable systems in Missouri.

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# Project Requirements

## Task 1: Project Management

The Contractor shall facilitate a kickoff meeting with MoDOT to review the work plan, scope, and schedule; and establish a protocol for regular ongoing communication and coordination with the team. This proposal will serve as the Draft Work Plan, to be discussed in the kickoff meeting. Upon comments received during the meeting and/or in writing, the Contractor will incorporate those comments into a Final Work Plan.

The Contractor will schedule and conduct a quarterly status meeting to review progress for the previous period and anticipated work for the next period. Contractor will also develop minutes for the kickoff meeting and each of the quarterly status meetings. If additional meetings are deemed beneficial or necessary for continued development of the project, the Contractor may arrange and conduct more frequent update meetings.

## Task 2: Literature Review and Personnel Interviews/Survey

The Contractor shall conduct a literature review of state DOT guard cable policies regarding materials, installation and repair, along with recent research conducted on guard cable. Added information, including but not limited to the following, shall be reviewed:

- anticipated or realized life expectancy;
- materials and coatings inspection;
- other related quality control/quality assurance items;
- how variations in geometrics, of both the guard cable system (cable, posts, etc.) and the surrounding topography (slopes, erosion, etc.) affect the proper function of the system; and,
- protection of guard cable systems from recurring maintenance (vegetation management), erosion, standing water and other events.

The Contractor shall conduct personnel interviews of MoDOT Staff and Job Order Contracting (JOC)-related Staff who have performed guard cable repairs, to explore the need for additional maintenance and potential enhancements to extend the life of these systems. A minimum of ten (10) phone-interviews shall be conducted.

## Task 3: Analysis of Material and System Properties Before and After Impact(s)

The Contractor shall collect known material properties and specifications for the components involved in the applicable guard cable systems. Known impacted segments of guard cable will be identified, and components will be collected for material testing. Components to be inspected and tested include, but are not limited to the following:

- steel cable
- springs
- mechanical splices

Proposed testing and analysis methods to evaluate the material properties of guard cable and other system components, both before and after impact(s), shall be detailed in the Offerer's proposal.

#### **Task 4: Laboratory Simulation of Repeated Impacts to Guard Cable Systems**

The Contractor shall conduct laboratory analysis on the materials simulating repeated impact to the system. Analysis will evaluate the strength of the system materials after repeated hits without failure to assess material performance and validate integrity of materials that are reused.

Analysis shall be performed on new (recently installed or purchased for installation) materials, known installations with materials that have not yet been impacted, and known impacted materials, as available.

The proposed testing and analysis methods to simulate and assess repeated impacts to guard cable systems, shall be detailed in the Offerer's proposal.

#### **Task 5: Field Observations and Testing**

The Contractor shall observe and inspect up to fifteen (15) different locations (limit 1.0 mile per location), as selected by the TAC in consultation with the selected Offerer.

Field observations, testing and inspection, including but not limited to the following, should be captured at each location identified:

- Posts, cables, splices, anchors, concrete or asphalt aprons and other components for alignment, oxidation, coating condition, deterioration, damage, etc.;
- Post placement and cable tension;
- Soil quality and grading/earthwork for proper cover, slope, anchorage, etc.; and,
- Geometrics of cable system and surrounding topography.

All fieldwork shall be conducted with proper safety protocols scheduled and in place, including traffic control per MUTCD specifications. MoDOT will not provide personnel or equipment. The Contractor shall enlist their own qualified traffic control contractor/entity for the fieldwork portion of this project. MoDOT maintains a list of [approved subcontractors](#), a number of which are experienced in providing traffic control. An abbreviated list of contractors who have provided traffic control on recent MoDOT projects is attached to this document.

Considerations for other items to be explored during this task, along with any other pertinent information related to the analysis, should be laid out and explained in the proposal.

#### **Task 6: Collect and Review Records and Crash Data**

The Contractor shall collect and review manufacturer installation and maintenance documentation for the systems that MoDOT has installed along Missouri travelways. Expected life, if available from manufacturers shall be collected for reference.

Installation records, including inspection reports shall be collected and reviewed for the locations selected in Task 5, as available. Maintenance records, as available for the same selected areas will be collected, and both installation and maintenance records will be compared to the manufacturers documentation to account for any irregularities. Crash reports will also be collected to account for any abnormalities in the impacts (18-wheeler or large truck impacts).

The installation, maintenance and crash records, along with field observations/inspections, shall be compared and analyzed together to help bring clarity to the performance of these systems and the realized life expectancy in the selected areas.

## **Task 7: Perform Life Expectancy Assessment of Low-Tension and High-Tension Guard Cable Systems and Implications for Extending Life of Systems and End-of-Life Replacement**

The Contractor shall utilize findings from the previous tasks to perform a life expectancy assessment of guard cable in Missouri, aiding MoDOT in being able to better manage this asset. Given that MoDOT possesses both low-tension and high-tension systems, both should be considered in this assessment.

The Contractor shall provide suggestions on how to potentially extend the life of these systems, through scheduled maintenance and/or inspection, protection of components, and so on. Benefit-cost analysis or other evaluation methods should be used and presented to further substantiate any suggestions.

Lastly, the Contractor shall provide an engineering assessment, based on the findings of the previous tasks, as to when a system has reached the end of its life cycle and should be considered for replacement.

## **Task 8: Develop Report, Research Summary and Presentation**

The Contractor shall develop a final report detailing the tasks completed during the project, including any and all findings generated during the project's duration. The Contractor shall provide a 1-2 page research summary that states the project objectives, findings and conclusions. A presentation for MoDOT and stakeholders, summarizing important or significant details of the project, may also be provided at MoDOT's request.

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## **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](#).

## 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](#).

## Other Deliverables

Examples include construction reports, interim reports, annual reports, maps, brochures, Include descriptions, criteria, and frequency.

## 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	Schedule and conduct kickoff meeting. Kickoff meeting minutes. Draft and final work plans. Quarterly project status meetings.
2	None.
3	None.
4	None.
5	None.
6	None.
7	None.
8	Final report and research summary. Presentation. Final project meeting.

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## Project Schedule

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts **August 20, 2021**. 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
On or before 9/3/2021	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.
9/30/2021	Quarterly report.
12/31/2021	Quarterly report.
3/31/2022	Quarterly report.
6/30/2022	Quarterly report.
9/30/2022	Quarterly report.
11/23/2022	Draft report and draft research summary are due. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.
1/23/2023	Final report and final research summary 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. If determined necessary by MoDOT, a final presentation may also be due at this time.
2/23/2023	Final invoice due and contract ends.

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## Special Notes

Project budget is not to exceed **\$300,000**. 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>.

The research and data gathered, as well as any report or deliverable provided by the Contractor, shall be subject to the provisions of 23 U.S.C. Section 409, and cannot be released without the express written permission of the Missouri Highway and Transportation Commission.

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## 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 12 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.

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## RFP Schedule

This document constitutes an RFP from qualified organizations to conduct the TR202123, Assessing Guard Cable Life Expectancy in Missouri 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
5/24/2021	MoDOT posts RFP to the website at <a href="https://www.modot.org/research-requests-proposal">https://www.modot.org/research-requests-proposal</a> .
6/8/2021 4:00 PM (CST)	Written comments or questions must be submitted to <a href="mailto:MoDOTResearchRFP@modot.mo.gov">MoDOTResearchRFP@modot.mo.gov</a> .
6/18/2021	MoDOT will post written responses publicly on the website at <a href="https://www.modot.org/research-requests-proposal">https://www.modot.org/research-requests-proposal</a> .
7/8/2021 10:00 AM (CST)	Written proposals must be submitted to <a href="mailto:MoDOTResearchRFP@modot.mo.gov">MoDOTResearchRFP@modot.mo.gov</a> .
7/23/2021	MoDOT will notify submitters about project selection, or if needed about interviews to finalize selection.

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## 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>.

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## 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](mailto: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 **12:00 PM (noon, Central Standard Time)** on the day of the deadline, please contact us at [MoDOTResearchRFP@modot.mo.gov](mailto:MoDOTResearchRFP@modot.mo.gov) as soon as possible. Your submission should not be considered received until you have received your email confirmation.

<b>VENDOR NAME &amp; ADDRESS</b>	<b>Telephone</b>	<b>Fax</b>	<b>Email</b>
ATK Safety Supply Inc. 6352 Cedar Springs Road Cedar Hill Cedar Hill MO 63016	(636)274-0802	(636)274-1301	Becky@atksafetysupply.com; atksafetysupply@atksafetysupply.com
IBC Traffic Inc. P.O. Box 411405 Kansas City MO 64141	(816)220-0812	(816)295-0668	Joe@IBCINC.BIZ
Keith Contracting, LLC 1906 Old US Highway 40 Columbia MO 65202	(573)474-1450	(573)256-7304	brice@keithcontracting.com
Morgan Contractors, Inc. 929 Locust Hill Circle Belton MO 64012	(816)313-5721		admin@morgancontractors.com
Quality Traffic Control, Inc. P.O. Box 16238 Des Moines IA 50316	(515)289-1824		jjirak@q-t-c.net
Road Runner Safety Services, Inc. 6228 N State Highway H Springfield MO 65803	(573)833-8155		liz@roadrunnerss.com
Southwest Missouri Traffic Management, Inc. 5863 Lark Road Diamond MO 64840	(417)437-0285		sdavis@Joplin.com
STF, LLC dba Traffic Control Company 601 N 8th Street Valley Park MO 63088	(636)225-7800	(636)225-3460	jackit@trafficcontrolcompany.com
Streetwise, Inc. 4600 E. 142nd St. Grandview MO 64030	(816)331-2355	(816)331-1355	shettinger@streetwise-inc.com
Traffic Zone Services, Inc. 626 N 47th Street Kansas City KS 66102	(913)428-2585	(913)428-2590	bill@twintraffic.com; Annette@twintraffic.com
TraMar Contracting, Inc. 3051 Mercantile Industrial Drive St. Charles MO 63301	(636)255-0808	(636)255-0719	pmcgrath@tramarcontracting.com
Twin Traffic Marking Corporation 626 N 47th Street Kansas City KS 66102	(913)428-2585	(913)428-2590	bill@twintraffic.com; Annette@twintraffic.com
Warning Lites of Southern Illinois 9441 Lebanon Road East St. Louis IL 62203	(618)397-5565	(618)397-5747	dorothy.soria@warninlitesil.com