MoDOT

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

Missouri Department of Transportation
Ed Hassinger, P.E., Director

1.888.ASK MODOT (275.6636)

October 1, 2025

Dear Research Partner:

The Missouri Highways and Transportation Commission (MHTC) 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 **(TR202615)** entitled, **"Frictional Properties of Balanced Mix Design Asphalt Mixtures."** The 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 professional engineer licensed in the state of Missouri 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 **December 3, 2025** at **10 a.m. (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

Attachment

RFP Schedule

The following Request for Proposal (RFP) Schedule of Events represents the Missouri Department of Transportation's (MoDOT) best estimate of the schedule that shall be followed. The time of day for the following events shall be between 7:30 a.m. and 4:00 p.m. (Central) unless otherwise noted. MoDOT reserves the right at its sole discretion to expand this schedule, as it deems necessary, without any notification except for change in 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
10/1/2025	MoDOT posts RFP to the website at https://www.modot.org/research-requests-proposal.
10/22/2025 4 p.m. (Central)	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.
11/12/2025	MoDOT will post responses (to any questions or comments submitted) publicly on the website by this date at https://www.modot.org/research-requests-proposal.
12/3/2025 10 a.m. (Central)	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.
12/23/2025	MoDOT will notify submitters by this date about project selection or if needed, about interviews to finalize selection.

Background

Maintaining the appropriate amount of pavement friction is critical for safe driving. Although aggregate characteristics have the primary impact on frictional properties, asphalt content and type can also play a secondary role in the overall frictional properties of the asphalt mix. With the implementation of Balanced Mix Design (BMD) specifications, different amounts of asphalt content, grades of asphalt, and types of asphalt additives have varied from conventional asphalt mixtures. Frictional properties have not been measured to document the effects of BMD mix design changes in Missouri.

BMD asphalt mixtures are designed to "balance" between the two primary distress thresholds of rutting and cracking. Conventional Stone Matrix Asphalt (SMA) mixes have always had a set asphalt content which may have led to higher asphalt content than needed based upon the aggregate quality being used. Conversely, conventional SuperPave (SP) mixes have often had deficient asphalt content and are also dependent on the aggregate quality. Setting the asphalt content of SMA and SP mixtures by using BMD performance measures should lead to a "balanced" mixture with the optimum asphalt content as well as optimum frictional properties for a given aggregate source.

The objective of this study is to continue BMD implementation efforts with current performance testing, measure in-place frictional properties and evaluate the impact of BMD performance data to pavement friction. In addition, new draindown performance tests may be developed that can be added to the BMD testing regime to optimize frictional performance.

Objectives

The paving contractor will construct seven different test sections (six test sections and one control section located on Interstate 55 in Cape Girardeau County, Project J9I3838) and will be responsible for meeting the performance measures required by contract. The research entity will be required to conduct testing and collect additional information to meet the research goals. This project has several objectives that will fill research gaps in the following areas: (a) BMD testing and specification development, (b) draindown testing on SMA mixtures along with a new test method for a better indication of a mixture's susceptibility to flushing/bleeding, and (c) measure frictional characteristics of each test section after the asphalt mixture has been placed.

Project Requirements

Project budget is not to exceed **$350,000**.

Within the proposal, identify the team members assigned to each task. Refer to the example shown on the website.

Task 1: Project Management

The Contractor will 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. The Contractor will schedule and conduct quarterly project status meetings to review progress of the previous period and anticipated work for the next period. Meetings can be in-person or online. The Contractor will also develop minutes for the kickoff meeting and each of the quarterly status meetings. The finalized work plan will detail the implementation of the following tasks as well as the resources and schedule required to carry them out.

The Contractor is required to submit a Data Management Plan (DMP) to MoDOT two weeks after the project kickoff meeting. The plan will describe the anticipated format(s) of the Contractor's data and related files they will use. The DMP should address how the Contractor will use platform-independent and non-proprietary formats to ensure maximum utility of the data in the future. Please refer to the DMP fillable form on the website. The DMP can be modified, as needed, throughout the life of the contract.

Task 2: Sampling, Testing and Develop Draft Specification

A designated work area will be dedicated to the research team at the asphalt plant. The work area will be large enough to set up a mobile trailer with two parking spaces. The paving contractor will provide three separate 20-amp electrical circuits with four 120-volt electrical receptacles on each circuit at the designated work area; the paving contractor will also provide traffic control for one 12-hour day to the research team within the test sections. This project is unique in that it combines multiple tasks to fill several research gaps regarding asphalt properties. Each area of sampling and testing is outlined in this section as follows:

Task 2a: BMD Sampling, Testing, and Specification Development

The objective of Task 2a is to sample asphalt plant mixtures during construction from each of the test sections testing volumetrics and the suite of BMD performance tests that include: CT_{Index}, RT_{Index}, and Hamburg testing. In addition, loose mix and/or fabricated specimens shall be taken on the SMA test mixtures to perform draindown test and for developing a new performance test that better predicts bleeding/flushing potential of an SMA mixture described in Task 2b.

Task 2b: Draindown Performance Testing

Draindown testing in accordance with AASTHO T 305 is currently being used for SMA mix design approval. This test has had issues with determining the SMA's susceptibility in mitigation flushing/bleeding issues. As part of Task 2b, the research entity shall develop and submit a draft specification of a new test method along with protocols and criteria to better predict the flushing/bleeding characteristics of SMA mixes. In lieu of production testing, this task may be better suited for laboratory mixing and testing. Materials from the SMA mixtures shall be collected so that Task 2b can be done later at the convenience of the researcher.

Task 2c: Pavement Friction Testing

Pavement friction testing shall be conducted for each test section after a minimum of 30-days of traffic has been completed. Traffic control for the testing will be supplied by MoDOT. The following friction testing methods shall be conducted: Locked-Wheel Skid Trailer (ASTM E274) using ribbed tire, Dynamic Friction Tester (ASTM E1911), British Pendulum Tester (ASTM E303), and other friction testing devices to evaluate the different frictional properties of each test section. All friction tests shall be done in the right wheel path of the driving lane. The

researcher will submit a summary report of frictional characteristics of all test sections using the three test methods listed above and additional test methods set forth by the researcher.

Task 3: Provide Interim Presentation of Research Findings

The contractor will hold an interim presentation.

Task 4: Data Analysis

The subtasks of Task 2 fill in the research gaps on a variety of asphalt issues. The BMD test results obtained in Task 2a shall be collected and analyzed to provide information on the following:

- Setting new CT_{Index} and RT_{Index} criteria for HiMod mixtures.
- Establishing revised RT_{Index} for SMA mixtures compared to SuperPave mixes.

Task 2b is for the research entity to develop or propose a current test method for predicting an SMA mixtures susceptibility for flushing/bleeding. This task is important in the continued use of SMA mixes in Missouri.

Task 2c is considered the main objective of this investigation. Determining the effects of BMD in relation to frictional properties in our SMA mixtures is currently needed. Establishing frictional properties of SMA mixes with and without ground tire rubber in combination of with and without cellulose fibers have been of upmost discussion points to supplying the most practical asphalt mix.

Task 5: Develop Draft Report and Research Summary

The Contractor will prepare a draft Synthesis Report and Research Summary along with all accompanying documentation identified as beneficial during the study. These drafts should be a complete Report and Summary except for revisions based on MoDOT's review. A final report must include a completed Technical Report Documentation page. Please refer to the Publication Guidelines and summary template on the website.

Task 6: Develop Final Report, Summary, and Presentation

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, findings and conclusions. A presentation for MoDOT staff summarizing important or significant details of the project must be provided. Please refer to the Publications Guidelines for the report and research summary, which can be found on the website.

Project Deliverables

For templates and forms for reports and plans, visit https://www.modot.org/information-researchers. All documents must be Section 508 compliant (https://www.section508.gov/ and https://www.access-board.gov/ict.html).

Communications

E-mail and phone communication between the Principal Investigator(s) and MoDOT contacts 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. It specifies who owns it, who can access it, and explains how it will be described, managed, analyzed, stored, shared, and preserved during and after the project is over. Please refer to the DMP fillable form on the website. The DMP can be modified, as needed, throughout the life of the contract.

Quarterly Reports

Quarterly reports should be submitted throughout the project on the 15th of April, July, October and January. 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 the template on the website. Quarterly reports must be submitted as Word documents.

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.

Other Deliverables

Revised BMD specifications for setting new BMD criteria for SMA and HiMod asphalt mixtures.

Draft specification of a new draindown test procedure.

A report summary of frictional characteristics of all test sections using the three methods and additional test methods set forth by the researcher.

Draft Final Report and Research Summary

Draft documents must be submitted as Word documents. These drafts should be complete except for revisions based on MoDOT's review. A final report must include a completed Technical Report Documentation page. Please refer to the Publication Guidelines and summary template on the website.

Final Report and Research Summary

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

Final Presentation

The Contractor will present the results, recommendations, and implementation ideas to MoDOT and other stakeholders. The Contractor will coordinate the meeting location and date 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, especially comments about implementation, to the Contractor.

Task-Specific Deliverables

Task	Deliverables
1	Meeting agenda, minutes, and data management plan.
2	Sampling and testing.
3	Interim presentation.
4	Other deliverables.
5	Draft final report and research summary.
6	Final report, research summary, and presentation.

Project Schedule

The following is an estimate of the project timeline and information on key dates within the project, presuming the project starts **March 2, 2026**. Proposals must include a work plan with a proposed timeline. For an example of a work plan template, see the link below. Changes to the 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
4/15/2026	A kick-off meeting with MoDOT will be scheduled by this date to discuss project requirements and deliverables. The dates of key milestones and deliverables will be determined from this meeting.
4/29/2026	The data management plan is due by this date.
10/28/2026	An interim presentation must be done by this date.
10/28/2026	Sampling and Testing completed by this date.
3/3/2027	Data analysis completed.
4/28/2027	Draft final report, draft summary report, other deliverables are due by this date. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.
6/30/2027	Final report, summary report, presentations, other deliverables are due by this date. The final documents shall be due approximately two months before the end of the contract. This is to allow all billing to be completed prior to the end of the project.
7/29/2027	Final invoice is due by this date and the contract ends.

Special Notes

- This document constitutes an RFP from qualified organizations to conduct the **TR202615: Frictional Properties of Balanced Mix Design Asphalt Mixtures** study for the MHTC and MoDOT. MHTC reserves the right to reject any and all proposals for any reason whatsoever.
- The use of graduate students is allowed on the project; however, the Offeror must maintain supervision of all research and show that they are conducting a majority of the work. If a graduate student wishes to use the research as part of a thesis or dissertation prior to any publication, the Contractor must obtain written permission from the MHTC and MoDOT. Additionally, the graduate student's manuscript may not be published until after the MHTC and the Federal Highway Administration's acceptance of the final report.
- Before MoDOT enters into a contract with an Offeror for Engineering or Non-Engineering research services, the Offeror must be on MoDOT's Approved Consultant Pre-Qualification list. If the Offeror is not on the list, but desires to be considered for future research projects, follow the instructions on the Consultant Prequalification website, https://www.modot.org/design-related-consultant-services.
- Before project invoices can be processed, the Offeror must be registered with MissouriBUYS. Follow the instructions on https://missouribuys.mo.gov/supplier-registration# to get registered (if not already).
- 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 "Project 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.
- All information technology applications must be developed using one of the approved technologies below. Contractors may not use third-party tools or software that would place a licensing responsibility on MoDOT without prior review and approval of the tools and/or software by MoDOT's Information Systems Best Practices Review Team (BPRT) and IS management:
    - Application Runtime/Framework
        - .NET 6.0 or .NET Framework
            - A currently supported .NET 6.0 or above release should be used unless there is a specific need for .NET Framework. If a .NET Framework is needed, a currently supported 4.8 release or above must be used. (See .NET and .NET Core official support policy (Microsoft.com))
            - Web applications must use either the MVC, Razor Pages or Web API framework.
            - Library dependencies used in the application should be reviewed/updated on an annual basis.
        - .NET and .NET Core Official Support Policy - Learn about .NET and .NET Core support policies, which refer to several technologies including the runtime, ASP.NET Core, and Entity Framework Core.
    - Programming Languages – The following are the approved programming languages that should be used for new developments:

    - C#
    - JavaScript
    - CSS
    - HTML
    - Python* (Python is reserved for use in ESRI scripts and other small one-time uses. Large scale use of Python requires approval from BPRT. The Python programming language is incorporated into the setups of ArcGIS Desktop, ArcGIS Pro, and ArcGIS Enterprise. For other platforms a version 3.x of Python from www.python.org should be used.)
- Client-Side Software Packages
    - All customer applications should be Web Based, browser applications. Applications should be tested and designed to use the latest IS approved browser(s) at a minimum.
    - No client-side software, other than a modern browser, should be required to run the web application. Examples:
        - No Java Applets
        - No Silverlight
- On Premise Database Deployments – These shall be run on:
    - Oracle 19C; or
    - The application should be designed and maintained to run on the latest supported version of SQL server. In certain cases, Microsoft SQL Server 2016 or higher can be used if approved by the MoDOT IS Data Service Management team.
- Personal Identifiable Information (PII): No PII can be stored in any database table unless the application has a specific business need to use that data. All PII data that is stored must have approval from MoDOT's IS Cyber Security Team.
- Accessibility: All web applications must meet the standards established in State of Missouri's Accessibility Standard, which is based on Section 508 of the Rehabilitation Act (as amended) and Web Content Accessibility Guidelines. (See Accessibility (mo.gov).) All web applications must adhere to the W3 Web Content Accessibility Guidelines 2.1 with an "AA" level of conformance (WCAG 2.1 AA).
- Copywrite and Attribution: Never use text, diagrams, photographs, audio, multimedia, program source code, script, or graphics from another author's web pages unless the author explicitly states that it may be freely copied, or you make appropriate arrangements with the author. Vendor logos, branding, or other company endorsements must not appear if there is a supported option and there is a licensed way to eliminate them from the display.

Proposal Requirements

- 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.
- **"Contracting Documents"** provide further details and links to the required forms. They are available at https://www.modot.org/information-researchers.
- **Offeror's Project Experience:** The proposal must clearly identify the Offeror'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.
- **Offeror's Other Commitments:** The proposal must demonstrate that the organization and all members of the research team, including subcontractors identified in the proposal, will be able to meet the commitments of the proposal. A comprehensive listing of commitments to other work shall be provided. This shall include staff-hour commitments and/or percentage of time committed to other work for each member of the proposed research team. If the Offeror's research team has university faculty, the proposal must show any anticipated or planned sabbaticals. Refer to the example shown on the website.
- **Team Member Experience:** Please list all team members (including subcontractors) proposed to work on the project. Attach licenses, certifications and resumes for key personnel.
- **Offeror'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 12 points. This length limit does not include the Proposal Submission Form, Offeror's Project Experience, Team Member Experience, Offeror's Client References, and may include an optional cover letter (if included one (1) page maximum).
- Proposals must be submitted as one combined 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) Offeror's Project Experience; 5) Offeror's Other Commitments; 6) Team Member Experience; and 7) Offeror'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, 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.

Proposal Scoring Criteria

These are criteria used by the Technical Advisory Committee to review proposals.

- Expected development and outline of research problem is understood and expressed clearly in the response. The language of the narrative is straightforward and limited to facts, solutions to problems, and plans of action. Does the Offeror understand what MoDOT is asking for and provides an implementable solution?
- The proposed approach to the research problem appears feasible. Is the proposed solution doable?
- The proposal results in a sense of confidence that the Offeror could complete the task.
- An overall qualifications review provides the sense that the Offeror possesses the necessary experience, reliability and organizational expertise and personnel.
- MoDOT has experienced acceptable previous performance from the Offeror's personnel and/or organization.
- Additional value provided (offering more than RFP requires).

Contracting Requirements

The award of this RFP is subject to a post-award negotiated contract. If the parties are unable to agree to terms in the post-award contract, MHTC shall reserve the right to cancel the award of the RFP and contract and select a different Offeror.

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. A copy of the Standard Research Agreement can be found on the website at https://www.modot.org/information-researchers. In order to be considered by the Commission, any Offeror desired modifications to the Standard Research Agreement / contract must be submitted with the Offeror's proposal.

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 at https://www.modot.org/information-researchers.

Proposal Submission Information

Submission Deadline

Proposals must be emailed by 10 a.m. (Central) according to the time stamp on the due date indicated. Any form containing a signature line in this RFP and any amendments, pricing pages, etc., can be electronically signed or manually signed and scanned and returned as part of the proposal. Please reference the project number and title since more than one RFP may be due at a time. They are to be emailed to the Research Director at MoDOTResearchRFP@modot.mo.gov.

Submission Confirmation

You will receive an email confirmation after your proposal has been received. If you do not receive such a confirmation by noon Central 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.

Public Inspection

The Offeror is hereby advised that all proposals and the information contained in or related thereto shall be open to public inspection. MHTC does not guarantee nor assume any responsibility whatsoever in the event that such information is used or copied by individual person(s) or organization(s). Therefore, the Offeror must submit its proposal based on such conditions without reservations.

Clarification of Requirements

Any and all questions regarding specifications, requirements, competitive procurement process, or other questions must be directed to the Research Director at MoDOTResearchRFP@modot.mo.gov by the date and time listed in the project schedule.