

Iowa DOT Research Request for Proposal (RFP)

It is the intent of Iowa DOT Research to enter into agreement with the responsible bidder whose submitted proposal is the most advantageous, cost and other factors considered. Other factors include but are not limited to meeting or exceeding mandatory requirements, proposed staffing, and meeting required time schedule.

- Original RFP is posted at [the Iowa DOT Research Requests for Proposal page](#).
- Questions should be submitted to the project manager, identified below.
 - o Questions are due no later than 14 calendar days prior to the proposal due date. Questions and responses will be posted on [the Iowa DOT Research Requests for Proposal page](#) no later than 7 calendar days prior to the proposal due date.
- Responses must be submitted in pdf form to Proposal.Research@iowadot.us.
 - o Use the following naming convention for the PDF submission:
 - o **ResearchRFPNumber_Agency_PrincipalInvestigatorLastName.pdf**
- Responses must comply with the proposal guidelines in “Required Format for Iowa DOT Research Proposals.” Please refer to [the Iowa DOT Research Proposal & Deliverable Guidelines page](#).

RFP #: TMRC-2027a

RFP Title: Development of a Risk-Based Acceptance Procedure for Recycled Concrete Aggregate and Reclaimed Asphalt Pavement in Unbound Base Layers

RFP Posted: September 15, 2026

Proposals Due: On or Before November 1, 2026 at 12:00 Noon Central Standard Time.

Project Manager: Khyle Clute, khyle.clute@iowadot.us, (515)-239-1646

Budget

- ☒ Funding limitations have been established. Proposed budgets shall not exceed \$200,000.
- ☐ Proposed budgets are not limited. They will be considered during the evaluation process.

Timeline

- ☒ Timing limitations have been established. Proposed timelines shall not extend beyond 24 months.
- ☐ Proposed timelines are not limited. They will be considered during the evaluation process.

Literature Review

- ☐ A Literature Review has been performed as part of project development and should not be included as a task in the proposal. The Literature Review is available for download here:
- ☒ A Literature Review has not been performed and may be included as a task in the proposal.

Data Management Plan

- ☐ Development of a Data Management Plan (DMP) is a required task in the proposal.
Refer to [Iowa DOT DMP guidance](#) section for more information.
- ☒ Development of a Data Management Plan is not a required task in the proposal.
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Problem Statement

Recycled concrete aggregate (RCA) and reclaimed asphalt pavement (RAP) can reduce material cost, haul distance, and disposal volume when used in unbound base layers, and they lower the demand for natural aggregate. Their composition and mechanical behavior, however, vary between sources, between production lots from the same source, and within a single stockpile. [NCHRP Report 598 Performance-Related Tests of Recycled Aggregates for Use in Unbound Pavement Layers](#) recommended performance-related tests for selecting recycled asphalt and concrete materials for unbound pavement layers, and pooled fund study [TPF-5\(129\) Recycled Unbound Pavement Materials](#) characterized the properties of RCA and RAP base materials that control pavement performance. Research in Virginia evaluated the lightweight deflectometer and the nuclear gauge for quality control of base course containing RAP. These studies help agencies qualify a material source and check the compacted layer, but they do not provide a procedure for accepting an individual production lot before placement with a known chance of making the wrong decision.

Routine tests alone cannot support lot acceptance, because gradation and density tests do not measure changes in asphalt content, attached mortar, weak or deleterious particles, moisture response, or particle breakdown during compaction. Repeated-load and durability tests capture how these changes affect performance, but they take too long and cost too much to run on every production lot. Agencies need a procedure that sets where and how many samples to take from a stockpile, which rapid measurement to run next, and when the results are sufficient to accept or reject the lot.

No validated multi-state procedure currently links source qualification, variability within stockpiles, rapid measurements, and the probability of a wrong acceptance decision. Such a procedure must also keep separate requirements for stiffness, permanent deformation, moisture response, and durability, so that good results in one property cannot make up for poor results in another.

Objectives

The objective of this research is to develop and validate a two-tier acceptance procedure for RCA and RAP used in unbound base layers. Tier 1 qualifies a material source through full mechanical and durability testing, which defines the performance range that material from the source must stay within. Tier 2 uses rapid measurements and a stockpile sampling plan to check whether each production lot from a qualified source stays within that range. For each lot, Tier 2 shall lead to one of three decisions: accept the lot, reject the lot, or collect another sample or measurement. Testing shall stop when two probabilities fall below limits set by the agency: the probability of accepting a lot that does not meet requirements and the probability of rejecting a lot that does. The study should deliver source-qualification requirements, a stockpile sampling plan, written protocols for the selected rapid tests, and a calculation tool that carries out the Tier 2 decision.

Stiffness, permanent deformation, moisture response, and durability shall each have a separate requirement, and a lot shall meet all four to be accepted. The risk limits shall be inputs to the procedure, so that each partner state can choose limits that fit its own specifications. The procedure shall be documented in a form that a partner state can later add to its quality assurance program under [23 CFR 637 Subpart B](#) for federal-aid projects. The Research Implementation Plan shall identify the work still needed before the procedure can be written into a specification, including multi-laboratory precision testing of the selected rapid tests and validation during construction.

Proposals shall include material from at least three TMRC partner states and shall set aside stockpiles for validation that are not used to develop the procedure. Each proposal shall state how many production lots the validation will include and explain why that number is enough to estimate how often the procedure makes a wrong decision. The calculation tool shall run without proprietary software.

Minimum Project Tasks

1. Collect samples from at least ten RCA and RAP stockpiles in at least three TMRC partner states. Sample each stockpile at different locations, depths, and production intervals, and set aside at least three stockpiles for validation only.
2. Measure how much of the total variability comes from the source, the production lot, the location within the stockpile, field sampling, and laboratory testing.
3. Establish Tier 1 source-qualification requirements based on repeated-load resilient modulus and permanent deformation tests, shear strength tests, particle breakage measurements, and moisture and durability conditioning.
4. Evaluate candidate rapid measurements against the Tier 1 results and select the smallest set of measurements that provides the needed information on Tier 1 properties without duplication. Determine the single-laboratory repeatability of each selected measurement from replicate testing.
5. Develop the Tier 2 lot acceptance procedure and a calculation tool. The tool shall separate material variability from testing variability, calculate the probabilities of wrongly accepting and wrongly rejecting a lot, recommend the next sample or measurement, and stop testing when both probabilities fall below the agency limits.
6. Before validation begins, work with the Technical Advisory Committee to set the risk limits to be used in validation and the success criteria for wrong acceptance, wrong rejection, repeatability of the selected rapid tests, and the time and cost of routine testing.
7. Apply the procedure to the stockpiles set aside for validation and compare its decisions with full Tier 1 test results to determine how often it accepted or rejected a lot incorrectly.

Products and Deliverables

1. Quarterly Progress Reports
2. Draft Final Report
3. Final Report
4. Technology Transfer Technical Brief
5. Research Implementation Plan(s)
6. Photo or Image Files
7. Tier 1 Source-Qualification Protocol
8. Stockpile Sampling Plan, including production lot definitions, sample locations, initial sample numbers, rules for additional sampling, and risk limits
9. Rapid-Test Protocols with Single-Laboratory Repeatability Estimates
10. Calculation Tool, with Source Code and User Documentation

Note: All products and deliverables shall comply with ADA accessibility and Section 508 requirements, regardless of funding source. Section 508 is an amendment to the federal Rehabilitation Act of 1973 mandating that all electronic and information technology developed, procured, maintained, or used by the federal government be accessible to people with disabilities. Refer to 29 U.S.C 794d for additional information.

Additional Information

- This RFP is funded through the Transportation Materials Resource Center (TMRC) under a multi-state pooled fund led by Iowa DOT as TPF-5(546). Information about the current TMRC pooled fund is available on [the Transportation Materials Resource Center pooled fund page](#).

- Proposals should show the teams' experience in repeated-load testing of unbound materials, characterization of recycled materials, experimental design, and statistical decision methods.
- Proposals should respond to the identified budget, timeline and project goals. Additional project tasks, beyond those outlined in the solicitation, may be identified by the principal investigator if deemed useful in improving the general objective of the project. All additional tasks, budget items and timelines should be clearly identified in the proposal as extra work and shown separately from the project tasks and budget items associated with the RFP's objectives.
- ****Proposal Restrictions****
 - o Proposals are limited to 10 pages. Resumes of the principal investigator and other named team members, along with other relevant materials, may be provided for additional information in appendices, but the proposal itself shall be a stand-alone document. The proposer should not expect the reviewers to read appendices to be able to evaluate the merit of a proposal.
 - o Proposals submitted by current TMRC principal investigators that have projects one year or more behind their originally contracted end date will not be considered.
 - o Individual respondents are limited to submitting on only one TMRC proposal per year as either a principal investigator or co-principal investigator.

Non-Discrimination Statement

Iowa DOT ensures non-discrimination in all programs and activities in accordance with Title VI of the Civil Rights Act of 1964. Any person who believes that they are being denied participation in a project, being denied benefits of a program, or otherwise being discriminated against because of race, color, national origin, gender, age, or disability, low income and limited English proficiency, or needs more information or special assistance for persons with disabilities or limited English proficiency, please contact Iowa DOT Civil Rights at 515-239-7970 or by email at civil.rights@iowadot.us.