

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.
 - 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.
 - Use the following naming convention for the PDF submission:
 - **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-2027c

RFP Title: Development of a Standardized Material Data Framework Linking Material Records to Pavement Assets

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.
-

Problem Statement

State transportation agencies already hold extensive material records. Mix designs, mill certificates, source approvals, acceptance test results, and production records are generated on every project and retained in construction and materials systems. Asset management systems hold a separate set of records covering inventory, condition, and maintenance history. The two sets are rarely joined, so an agency that observes early distress on a pavement section usually cannot retrieve the properties of the material placed there, and an agency choosing a material for a new project cannot check how the same material performed on sections built five or ten years earlier.

The obstacle is structural rather than a lack of data. Material properties are recorded under different names and units in different systems, test results are stored without the metadata needed to interpret them, source and supplier identification is inconsistent, and material records often carry no reference that ties them to the asset built from them. Records from two states, or from two districts within one state, frequently cannot be compared.

National research has addressed agency data practice without resolving this problem. [NCHRP Synthesis 508 Data Management and Governance Practices](#) documented how agencies access, manage, use, and share data, and [NCHRP Report 814 Data to Support Transportation Agency Business Needs: A Self-Assessment Guide](#) provides a self-assessment guide for evaluating data quality and data management practices. Both treat agency data broadly. Neither defines how material records should be structured so that a material property measured during construction can be linked to the asset it was placed in and to the condition that asset develops over time.

Objectives

The objective of this research is to develop a standardized material data framework that allows material records to be linked to the pavement assets built from them and to the condition and maintenance records those assets accumulate. The framework shall define a material taxonomy and data dictionary, a data schema with metadata requirements, data quality rules, and governance recommendations covering who enters each record, who owns it, how long it is retained, and what triggers an update. A material taxonomy and data dictionary, a data schema and metadata specification, data quality and governance recommendations, and implementation guidance should be outcomes of the study.

The framework will be judged by whether it answers questions agencies need answers to. Early in the project, the research team will work with the Technical Advisory Committee to write between eight and twelve such questions, and the framework shall be demonstrated by populating the schema with existing records from at least three TMRC partner states and answering them. The demonstration shall report which questions the framework answered, which it did not, and what record, field, or link was missing in each case that it did not.

The project is limited to pavement assets and to material records that partner-state agencies already collect, so that the demonstration uses records in hand rather than new data collection. The schema shall carry a location reference and an asset identifier in a form that lets a record be joined to an agency geographic information system, although building that integration is not part of this project. Developing deterioration models, life-cycle cost methods, or material selection optimization is outside the scope. The framework shall be non-proprietary and shall be documented so that it can be implemented in more than one commercial asset management system.

Minimum Project Tasks

1. Document how each participating partner-state agency currently records pavement material data, including the systems used, the fields captured, the retention period, and whether and how a material record can be traced to the pavement section it was placed in.
2. Work with the Technical Advisory Committee to write between eight and twelve questions that the framework must be able to answer, covering material selection, performance review after construction, and source or supplier evaluation.
3. Develop a material taxonomy and data dictionary for pavement materials, defining property names, units, the test method and version behind each reported value, the conditions under which it was measured, and how a material source, supplier, and production period are identified.
4. Develop a data schema that links each material record to the pavement asset, its location reference, the construction date, and the condition and maintenance records the asset accumulates, and define the metadata required for a record to be interpretable by an agency other than the one that created it.
5. Define data quality rules and validation checks for entries in the schema, and develop governance recommendations covering record ownership, entry responsibility, retention, and update triggers.
6. Populate the schema with existing records from at least three TMRC partner states for an agreed set of pavement projects, and answer the questions written in Task 2. Report which questions the framework answered and, for each question it did not answer, identify the missing record, field, or link.
7. Revise the taxonomy, schema, and governance recommendations based on the demonstration, and prepare implementation guidance that maps the framework fields to the fields in the systems TMRC partner states currently use and sets out the steps for an agency to adopt the framework.

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. Material Taxonomy and Data Dictionary
8. Data Schema and Metadata Specification, in a machine-readable form
9. Data Quality Rules and Governance Recommendations
10. Demonstration Dataset and Results, including questions answered and gaps identified
11. Implementation Guidance, including field mappings to pooled fund state systems

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](#).

- Access to pavement management and treatment records may require a data-sharing Memorandum of Understanding with each partner state. Proposals should allow time for these to be executed before record assembly begins.
- Proposals should show the team's experience in transportation asset management, data modeling and schema design, materials engineering, and work with agency data systems.
- As the Framework is developed within the project, the Technical Advisory Committee may determine that a formal Data Management Plan is necessary. If so, an additional budget and scope of work will be pursued to encompass this extra work. Refer to [Iowa DOT DMP guidance](#) section for more information.
- 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.