

## Research Process

Montana Department of Transportation’s (MDT’s) Research Program provides opportunities to creatively solve MDT’s transportation issues. The research MDT conducts is guided by its mission to plan, build, operate and maintain a safe and resilient transportation infrastructure to move Montana forward.

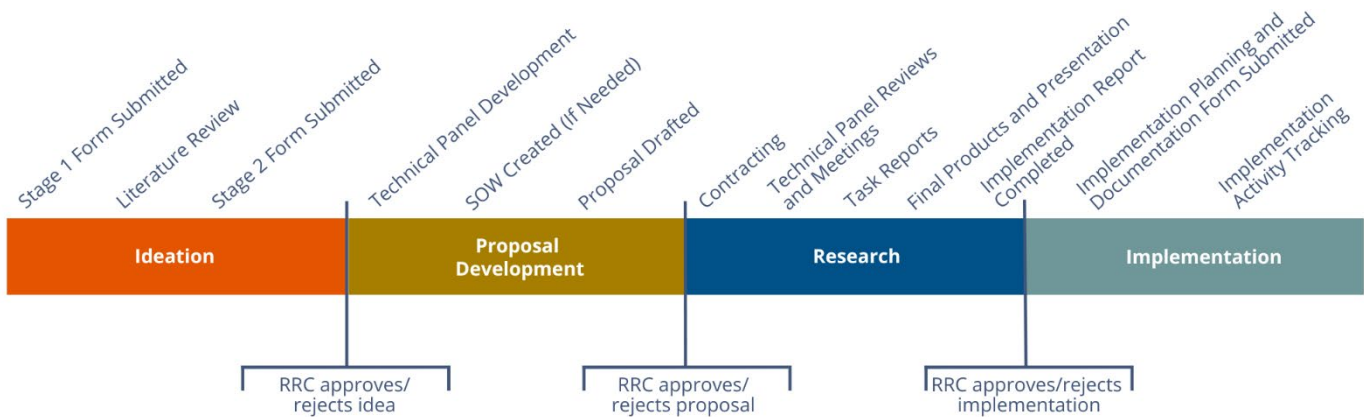
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**For More Information:** MDT’s Research Program includes two subprograms: [Research Projects](#) and [Experimental Features](#). The latter program encourages innovation in state highway design and construction by building experimental features that are eligible for federal funding participation.

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The Research Projects program is not a grant program. MDT contracts for the research it conducts using federal funding made available to the State of Montana under Title 23, U.S.C., with appropriate state matching funds.

The guidance below describes critical aspects of MDT’s research process, which is also graphically represented in Figure 1.



**Figure 1. MDT’s Research Process**

## Key Participants

**Champions** are MDT staff members with interest in a research topic. Champions may submit their own research ideas or collaborate with an external researcher to develop one. After the research idea is submitted, the champion plays a key role in evaluating the research idea and deciding to advance it within MDT. Once the research idea has moved past the ideation phase, the champion typically

becomes the Technical Panel chair to shepherd the project through the remaining phases of the research process.

**Sponsors** are MDT administrators who agree that the research is important to MDT and will ensure results are implemented. A sponsor is required for each research topic statement before it can be prioritized and considered for funding. The sponsor also approves a project's proposed implementation plan.

**Technical Panels (TPs)** oversee all MDT research projects from evaluation of the research topic statement to implementation. Composed of MDT staff and external stakeholders, TPs represent the technical breadth of the research topic and reflect a balance of viewpoints. In addition to the champion who typically chairs the TP, members include Federal Highway Administration and MDT Research Program staff, including a Research Project Manager, as well as MDT subject matter experts (SMEs) and other Montana state agency SMEs. TP members can be added at any point in the research process.

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***For More Information:** Learn more about [Technical Panels](#) and the critical role they play in MDT's research.*

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**Research Project Manager** serves as the liaison between the TP and the researcher, managing the information flowing among participants in the research effort and ensuring that the project stays within scope and budget. The Research Project Manager also manages contract compliance.

**Research Program Section Manager** is responsible for MDT's Research Program, supervising the Research Project Manager and coordinating engagement with the Research Review Committee.

**Research Review Committee (RRC)** advises the Research Projects program. Committee members assist in selecting the research topics that become research projects. The RRC also assists in the establishment of TPs and approves funding for all MDT research projects based on final proposals and TP recommendations.

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***For More Information:** Learn more about the [Research Review Committee's](#) role in MDT's research.*

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## **Four Phases of Research**

The four phases in MDT's research process include **ideation, proposal development, research and implementation.**

### **Ideation**

MDT solicits research ideas and coordinates a preliminary internal review of the submissions during this first step in the research process.

Research ideas are submitted by MDT staff and potential researchers using the [Stage 1: Research Idea form](#). Stage 1 forms submitted by people outside MDT must include the name of an MDT champion.

While MDT conducts an advertised research idea submission period each spring, research ideas can be submitted any time of the year.

A preliminary internal review is conducted for each research idea received by MDT. The MDT Librarian works with the research idea submitter (for MDT submitters) or the champion (for non-MDT submitters) to complete a literature review. If literature review results indicate that the research idea is unique to Montana, the MDT research idea submitter or champion completes a [Stage 2: Research Topic Statement form](#).

Submitting a Research Topic Statement form does not guarantee that a research topic will be selected for funding and contracting. The RRC considers all proposed research topics to determine their value to MDT and may approve a research topic to move on to the proposal stage, table it for possible future consideration or deny it. If funds are not available for all research topic statements submitted during a review cycle, the RRC ranks the research topic statements and selects those that can move forward with available funds.

## Proposal Development

The proposal development phase requires continued internal review and may involve development of a scope of work (SOW) that can be used by potential researchers in preparing their proposals. These proposals are then used to develop the project contract.

The RRC, MDT's Research Program Section Manager, and champions and their managers identify the TP members who will oversee the potential projects. (Members of the TP can also be added throughout the life of a project.) TPs meet to review the research topic statements and may prepare a SOW that describes the scope, objectives, tasks, budget and schedule for the proposed research.

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**For More Information:** A [scope of work template](#) provides a sample form and instructions for completing it.

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## Soliciting and Developing Proposals

MDT uses two options to obtain proposals for research ideas:

*Option 1:* Request one or more proposals from researchers associated with a public college or university. A SOW developed by the TP may be provided to potential researchers with a request for them to submit proposals.

*Option 2:* Issue a request for proposal (RFP). The TP uses the SOW it developed to prepare an RFP. This is the only opportunity for private consulting firms to submit a research proposal. MDT posts RFPs through the [State Procurement Bureau's eMACS portal](#).

RFPs can also be sent to members of the Council of University Transportation Centers (CUTC) if MDT wishes to expand the pool of potential bidders.

Researchers responding to MDT's requests for a proposal use the [research project proposal template](#) (also available as a [Word](#) document) to prepare their proposals. The proposal template includes instructions for completing it.

## Research

A project kickoff meeting is held after a contract is signed and the notice to proceed has been issued. This meeting ensures the TP and research team understand the research process and the contractual obligations, SOW, deliverables, project milestones, timetable, and appropriate office policies and procedures. This meeting also provides an opportunity to clarify technical issues or address concerns.

The TP chair leads panel meetings and helps the TP reach consensus on issues related to the project scope and the research team's activities. TP members carefully review all deliverables produced by the research team, ensuring completeness and accuracy. MDT's Research Project Manager serves as the liaison between the TP and the research team and ensures the project stays within scope and budget.

### ***Project Deliverables***

Most researchers will complete a range of communication products over the life of a research project—progress reports, task and interim reports, final, project summary, implementation and performance measures reports, and other deliverables that are identified in the project contract.

Task reports are critical project deliverables that describe the work that was done and how it was completed, and summarize task results. Researchers can use carefully prepared task reports to expedite production of the final report required by most research contracts.

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*For More Information:* MDT's [Report Writing Requirements](#) outline the key things researchers must know to ensure that the communication products they produce meet MDT requirements.

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In addition to preparing a final report, the research team delivers a final presentation during the project implementation meeting held as a project concludes.

## Implementation

### ***MDT's Role***

MDT considers how projects will be implemented (or results put into practice) from the beginning of the research process. Early on, considerations include who will be responsible for implementing results and potential barriers to implementation. Such critical thinking early in project development helps to shape the TP membership by making sure the right people are contributing to the research results.

The TP emphasizes implementation through proposal development and acceptance. The TP directs researchers to include criteria in submitted proposals for judging progress in implementing research results and how these results are expected to impact MDT. When a proposal is accepted by MDT, the implementation plan described in the proposal is reflected in the research project's contract.

Monthly or quarterly project summary reports offer the researcher an opportunity to communicate to the TP any insights or conclusions to support implementation ideas identified during the reporting period. Task reports and TP meetings offer other opportunities for critical review of project results and possible implementation steps.

For many projects, an Implementation Planning and Documentation (IPD) form is used to identify and develop specific implementable steps. This document is created and maintained by the MDT Research Section in collaboration with the TP, TP chair and MDT management, including the project sponsor.

***Role of the Research Team***

Researchers begin considering implementation with their project proposals. Once research is underway, the research team may work with the TP and MDT Research Project Manager to update the IPD form with implementation efforts spurred by interim research findings.

As the research concludes, the primary researcher facilitates a project implementation meeting and proposes a course of action to implement project recommendations. The research team develops an implementation summary and implementation report after the meeting that are submitted to the TP for review. If the TP agrees, the implementation report goes to the project sponsor for review and approval. The approved implementation steps are added to the IPD form used by the MDT Research Section to monitor ongoing implementation efforts.