Transportation Research Glossary

Montana Department of Transportation's (MDT's) Research Program supports internally driven applied research, development and technology transfer activities in connection with the planning, design, construction, management and maintenance of Montana's transportation systems.

This guidance document explains key terms and concepts used in the work of the MDT Research Section. The terminology defined below is intended to broaden a reader's understanding of how MDT perceives the role of research and applies research results to support and improve the state's transportation systems. Some definitions are taken from 23 CFR Part 420, Planning and Research Program Administration, while others are defined from MDT's perspective. The intended audience for this document includes researchers, Technical Panel members and administrators.

Key Terminology

Research means a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. MDT funds research projects to solve transportation problems and improve efficiency and effectiveness of operational activities. Research can be applied or basic:

> **Applied research** means the study of phenomena to gain knowledge or understanding necessary for determining the means by which a recognized need may be met; the primary purpose of this kind of research is to answer a question or solve a problem.
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> **Basic research** means the study of phenomena, and of observable facts, without specific applications toward processes or products in mind; the primary purpose of this kind of research is to increase knowledge. (Typically, MDT does not conduct basic research; however, basic research can be a component of a research project if there are matching funds to conduct this research.)

Experimental feature is any material, method and/or process that is deployed in the field through an MDT project (for example, construction, maintenance or safety) for the purpose of evaluating the material, method and/or process.

Implementation means the widespread use of research results and innovations. Implementation activities can occur throughout the research process.

Technology transfer includes all activities designed to help ensure that technologies created or improved through research and development (R&D) are widely adopted for use outside or within the organization producing the research. A March 2016 primer on technology transfer, prepared by the U.S. Department of Transportation (DOT), notes that technology transfer should be integrated into each phase of a research effort. To be effective, technology transfer activities should aim to accomplish four critical objectives:

- Understand potential adopters' needs
- Understand how the technology being developed could meet those needs

- Address potential barriers to adoption
- Communicate the value of adopting the technology

While technology transfer and R&D are distinct and different processes, they are complementary. A technology transfer process should run in parallel with every research project and be managed like any other project—create a plan, engage stakeholders, secure resources, and execute the plan and manage the process. Adopters' needs should drive the technology transfer process. When it's successful, technology transfer results in positive change.

MDT disseminates information about its research to MDT staff and the wider transportation community through the research reports and other final deliverables MDT researchers produce, the MDT Library and its services, MDT newsletters and other activities. Interested parties can register to receive information about experimental features and research project reports, requests for proposals and research project solicitation.

The MDT Research section also assists and supports the Montana Local Technical Assistance Program (LTAP) with its technology transfer.

Transportation pooled fund (TPF) studies have existed for more than 20 years and enable public and private entities to combine resources to conduct high-priority research on a wide variety of shared highway-related problems. By pooling funds and expertise, participants develop innovative solutions at a lower cost than an individual research project and extend the reach and impact of the research. The TPF program is administered by the Federal Highway Administration (FHWA). State and federal transportation agencies may initiate pooled fund studies. Local and regional transportation agencies, private industry, foundations, and colleges and universities may partner with any or all sponsoring agencies to conduct pooled fund projects.

Technical Panels (TPs) are composed of transportation professionals, both internal and external to MDT, who monitor and guide the research and are key to implementing research results. Typically, the project champion—the person introducing the research idea—is the TP's chair. The project champion and TP chair must be MDT employees.

Approaches to Transportation Research

MDT conducts research using several mechanisms:

Individual Research Projects start as ideas submitted by MDT employees or outside highway research professionals. MDT formally requests research ideas early in the calendar year but may accept ideas throughout the remainder of the year. Developed research ideas are approved and funded by MDT's Research Review Committee (RRC).

***For More Information**: Learn more about the research process and participating in the research projects MDT funds by reviewing these guidance documents: Research Process and Guidance for Researchers.*

Experimental Features are new products or approaches that MDT includes in its federal aid highway projects. Experimental features are the means to develop, track effectiveness and evaluate various

materials and methods that are new or cutting edge. FHWA supports the use of experimental features in federal aid projects, and an experimental feature is part of the preconstruction design phase of such projects.

Partnering Projects leverage resources to reach common goals. They create research or innovation opportunities that allow MDT to pool funds and expertise with other highway professionals. The two most commonly used partnering projects are TPF studies and AASHTO Technical Service Programs.

MPART agreements can be used for quick response to a targeted issue or to conduct research for small projects. The Montana Partnership for the Advancement of Research in Transportation (MPART) agreement established by MDT with Montana's public colleges and universities—University of Montana, Montana Technological University and Montana State University—is used for projects requiring less than $50,000 in funding that will be completed within 12 months. MDT's RRC reviews and approves proposals for MPART projects.

MDT also conducts other targeted efforts to support the research it conducts:

Literature reviews seek to determine the presence and extent of completed or in-progress research in a topic area and will support next steps by MDT. The typical literature review includes a list of recent, relevant and authoritative citations on the stated topic that are organized by category. A summary of findings that begins each literature review is supplemented by a brief introduction to each category of citations.

Synthesis projects are quick-turnaround, limited-scope research efforts that address a specific transportation topic for which MDT is seeking current state-of-the-practice information. The typical synthesis report includes findings from a national survey of state DOTs and a summary of completed and in-progress research. Interviews with selected experts or agencies offering particularly compelling survey responses may supplement other findings.

For more information, please contact the MDT Research Section at mdtresearch@mt.gov.