

Chapter 6. Implementation and Technology Transfer

6.1 Implementation

The objective of MDOT’s research program is to produce findings that significantly enhance the operations of the department. In many cases, research reports include specific recommendations for altering procedures or practices. In other cases, the findings contribute to the body of knowledge that serves as the basis for daily operational decisions, planning decisions and/or the prioritizing of future research options. In any case, the research process is not complete until the implementation of applicable results has been accomplished. Implementation of research results is the most tangible means of measuring the effectiveness of the research program.

Implementation is addressed throughout the entire cycle of research process:

- Manual section 4.1.1.2: As a part of project selection, the consultant includes anticipated implementation in the proposal’s required Implementation Plan.
- Manual section 4.3.6: During the research process, the RAP’s Implementation Manager:
 - Facilitates, evaluates, and documents agency-wide implementation based on implementation plan
 - Directs consultant activities related to implementation
 - Oversees development of research spotlights and implementations summaries
- Manual section 5.2: “Recommendations for Implementation” is a mandatory component of the consultant’s final research report.

This chapter further defines responsibilities, guidelines and processes related to implementation.

6.1.1 Responsibilities for Implementation

6.1.1.1 Implementation Manager (IM)

As described in section 4.3.3.7, for a research project, the Research Manager within the ORBP is the designated Implementation Manager and is responsible for facilitating, evaluating, and documenting research implementation activities. The IM is responsible for communicating intended uses of research results and helping to manage the research to meet those needs.

Each Research Manager is responsible for working with the Principle Investigator, Project Manager and Technical Monitors to develop an Implementation Plan for SPR projects in their subject area.

The IM may also serve as a Technical Monitor for implementation (see below)

6.1.1.2 Technical Monitor (TM)

The probability of relevant findings increases greatly when the users are involved in the research process. The Technical Monitor is an MDOT user/expert in the technology under investigation, and it is the Technical Monitor’s responsibility to ensure that the research project team continuously considers the unique requirements of the functional area throughout the active stages of a project. It is the responsibility of the IM to not only ensure that the Technical Monitor clearly understands this aspect of the role from the outset, but also to create a working format in which this is possible.

Depending on the IM's other duties within MDOT and technical expertise, the IM and TM may be the same person. Otherwise, additional MDOT staff with the necessary background and expertise may be called upon as needed to serve as a Technical Monitor.

6.1.1.3 Project Manager (PM)

Each Project Manager is responsible for working with the RAP members to assess the Implementation Plan and implementation aspects of a project throughout its life cycle: from inception, during execution, and upon completion.

6.1.1.4 Principal Investigator (PI)

While the Principal Investigator will not be responsible for implementation of research results, the research approach and products influence the ability to implement the findings of a research project. Therefore, the PI is encouraged to understand how research results are intended to be used at completion of the project. For example: will the results be incorporated into a department policy, procedure, manual or existing data system? Will the product be use by department staff in one program only, throughout the department, or by users outside of MDOT as well. The PI will work with the Implementation Manager and Technical Monitor to understand these intended uses and prepare recommendations for appropriate use of research results at the completion of the project.

As discussed in section 4.1.1.2 ("Proposals for new research"), the PI will include an Implementation Plan as a part of all research proposals.

6.1.2 Implementation Guidelines

The precise roles of the Implementation Manager and Technical Monitor, and the functions of the Implementation Plan, will depend greatly upon the nature of the research project. To help direct the research project, the following items should be considered by MDOT and the PI and when developing the problem statement and research proposal.

1. **Think about the end results.** Know what is hoped to be gained from the project when it is done. Work with colleagues and RAP members to spell it out in concrete terms.
2. **Understand the environment.** No project exists in a vacuum. Gather as much information as possible about steps that will need to be taken to implement results. Ask questions such as: Will the project require specialized computer software or hardware? Who has to approve a decision to implement a result? What will the costs of implementation be?
3. **Describe the potential benefits.** Work with the Research Advisory Panel established for the project to identify the potential benefits and how this will help address the need.
4. **Know the customers.** List everyone who might benefit from the project and include others who may influence those who benefit. Divide the list into two categories – those who benefit most and others. Spend more time reaching out to the first category.
5. **Involve the right players.** Don't go too far without making sure that the right team is assembled. Include representatives of the groups who benefit the most helping plan the course of action. If they aren't on the RAP, consider expanding it or find another way to gather their ideas.

6. **Explore the most appropriate method for technology transfer.** The methods of technology transfer may include the development of formal training programs, workshops, publications and one-on-one outreach efforts. Steps 1-5 help in gathering information about what tool might be most effective for the project.
7. **Define implementation.** Be specific. As much as possible, write down expectations of anticipated uses for research results, which documents a finding might need to be included in, whether software deployment will be needed, etc. Define what needs to happen to get there, how it will happen, when it will happen, and who will be involved.

6.1.3 Implementation Action Plan

When an SPR project is nearing completion and a draft report is available, the Implementation Manager will complete an Implementation Action Plan. The Technical Monitor will assist as necessary. The Implementation Action Plan will contain the following information:

- **Project title.**
- **Project number.**
- **RAP members involved in implementation:**
 - Principal Investigator
 - Project Manager
 - Research Manager
 - Implementation Manager
 - Technical Monitor (if different from IM)
- **Brief description of problem.** What important problem or opportunity was this research intended to solve and why is it a priority?
- **Major discovery.** What new information, procedure or knowledge was gained from this research? Did this research solve the identified problem or advance the state of knowledge?
- **How the information will be used in MDOT?** Who in the department, such as regional materials engineers, department engineers and planners or metropolitan planning organization staff will use this information? How will the findings be fully implemented in the department? This could include further research, field tests, training programs, manual revisions, specification changes, policy recommendations, or the purchase of equipment and software.
- **Value Added to MDOT.** What are the tangible benefits of this research to the department? Has it resulted in a new product or procedure that is more cost effective than current practice? Has it improved the capability of department staff? Has it advanced the state of practice in an emphasis area? Did it result in a measurable cost benefit?
- **Implementation Action Plan Checklist.** What are the results achieved through this research and what action is needed to implement the results?

Results achieved through this research (check all that apply)		Items/Actions needed to implement results (check all that apply)	
<input type="checkbox"/>	Knowledge to assist MDOT	<input type="checkbox"/>	Management decision
<input type="checkbox"/>	Manual change	<input type="checkbox"/>	Funding
<input type="checkbox"/>	Policy development or change	<input type="checkbox"/>	Training
<input type="checkbox"/>	Development of software/computer application	<input type="checkbox"/>	Information technology deployment
<input type="checkbox"/>	Development of new process	<input type="checkbox"/>	Information sharing
<input type="checkbox"/>	Additional research needed	<input type="checkbox"/>	Other (specify)
<input type="checkbox"/>	Project produced no usable results	<input type="checkbox"/>	
<input type="checkbox"/>	Other (describe)	<input type="checkbox"/>	

Figure 6.1.3.1. Implementation Action Plan checklist.

The Implementation Action Plan will help guide the Research Advisory Committee and MDOT executives in changing department policy or practices (see section 6.1.4, Implementation Process). In addition, ORBP will use the Implementation Action Plan to develop communication and marketing tools to disseminate information gained through research to a broad audience.

6.1.4 Implementation Process

At the conclusion of the study, MDOT may immediately implement small-scale changes in practice as warranted by research results. These are formally announced by MDOT.

For potentially large-scale changes in practice, MDOT conducts the following process to determine whether the research results will be implemented. The steps are as follows:

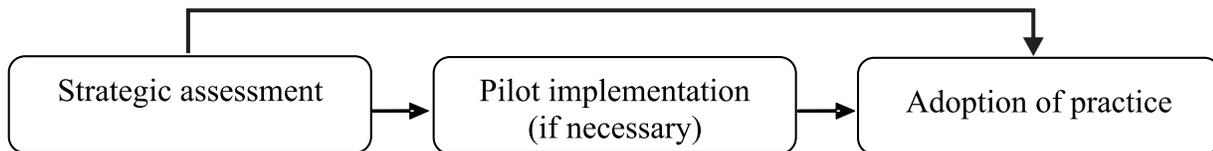


Figure 6.1—Three steps of implementation

The steps are elaborated upon in the following paragraphs.

6.1.4.1 Strategic Assessment

The Research Advisory Committee considers the implementation recommendations made by the consultant, as well as additional recommendations and analysis offered by the Implementation Manager and the Implementation Action Plan. Based on this information, the RAC makes a recommendation to the Research Executive Committee whether to:

- not implement changes,
- implement a change in practice on a limited-scale “pilot” basis, or
- implement a change in practice on a large-scale basis.

6.1.4.2 Pilot Implementation

If the REC determines that the strategic assessment warrants a pilot project, then the IM will formulate a pilot implementation plan. MDOT will conduct the pilot implementation through the appropriate department or bureau.

At the conclusion of the pilot program, the REC will consider its results to determine whether or not to implement a change in practice on a large-scale basis.

6.1.4.3 Adoption of Practice

If the REC determines that either a strategic assessment or a pilot project warrants a change of practice, MDOT will formally announce the adoption of a change in practice.

Process maps for Strategic Assessment and for Adoption (including a possible pilot implementation project) are included as [Appendix D1](#) to this report.

6.2 Research Spotlights

Research Spotlights are a two to four page communication and marketing tool for the purpose of disseminating information gained through research to a broad audience. They are intended to provide a non-technical overview of the research project to attract broader awareness ([Appendix D2](#)).

Most SPR, Part II, projects will be developed into a Research Spotlight. The Research Spotlight should be drafted to include the following information:

- Background
- The problem
- What we did
- What we learned
- What the researchers recommend
- How MDOT plans to use the results
- Contact information for the Principal Investigator and Research Manager

Research Spotlights are distributed to the MDOT Executives, members of the sponsoring Research Advisory Committee, relevant technical specialists within MDOT, the FHWA Division Office, the Principal Investigator, the AASHTO Research Advisory Committee, and others identified by the Technical Monitor and Research Manager.

6.3 ORBP Newsletters

ORBP Newsletters are a four-to-six page communication and marketing tool that disseminates the progress and accomplishments in transportation research throughout MDOT ([Appendix D3](#)). This publication started as the Materials and Technology Engineering and Science Newsletter (MATES), which was first published in October 1986. These provided a record of the research conducted by and for MDOT. They were produced and published in-house through the summer of 1994. In 1995, MDOT enlisted the help of the Local Technical Assistance Program (LTAP) at Michigan Technological University to publish and print the new Research Record. When ORBP was established in late September 2005, the Research Record became the ORBP Newsletter. The changing focus and direction of research throughout the department created the need to communicate a broader view of transportation research activities at MDOT.

6.4 Technology Transfer

The SPR, Part II, Program requires robust technology transfer activities. Technology transfer methods include:

- Literature dissemination
- Training
- Demonstration and pilot projects
- Conferences and other presentations
- Library displays
- Pooled-fund activities—Regional
- National pooled-fund studies
- Entry of results into department and national databases
- Other technology transfer activities