

A large, light green silhouette of the state of Michigan is centered on the page. A blue arc, resembling a road or a bridge, curves across the lower portion of the map. The text is overlaid on this graphic.

# **BRIDGING THE GAP:**

## **Implementing Research Results**

**Michigan Department of Transportation  
Peer Exchange Report**

**December 7-9, 2010**

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# Michigan Department of Transportation Research Peer Exchange

## Bridging the Gap: Implementing Research Results

December 7-9, 2010

### Introduction and Summary

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The Michigan Department of Transportation (MDOT) Office of Research and Best Practices (ORBP) hosted a peer exchange December 7-9, 2010 in Lansing, Michigan. Representatives from MDOT, five state DOTs, The Turner-Fairbank Highway Research Center, the Federal Highway Administration (FHWA) – Michigan Division, and four Michigan universities met to share experiences and best practices in research implementation. The exchange consisted of formal presentations, roundtable discussions and working groups.

This report highlights the key observations that came out of the peer exchange discussions and the opportunities identified by ORBP for further improving their research programs.

### Objectives and Structure

ORBP recently developed a new process for implementing the results of research projects and used this peer exchange as an opportunity to get feedback on the new process, discuss effective practices used by other states, and learn from experiences of others in developing and measuring the results of an implementation program.

The exchange began with a background presentation by Calvin Roberts and program overviews from the visiting team members. The panel members were asked to present on the following:



- Basic research program overview (location within state's department, staff, funding).
- Steps in each DOT's research life cycle (from solicitation through implementation and evaluation).
- Key highlights of each DOT's implementation program that you plan to share in detail throughout the exchange.
- Key challenges DOTs face with regard to implementation.

The afternoon of the first day and morning of the second day were structured around four main topic areas: Defining Implementation;

Components and Structure of a Successful Implementation Program; Funding Implementation Activities; and Measuring Implementation Impacts. Panel members discussed the following discussion questions for each of these topics.

## Introduction and Summary (cont'd)

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### Defining implementation

- What qualifies as an implemented project?
- What forms can implementation take?
- How do implementation programs consider the full range of implementation, from projects that require internal support and staff action to make policy or procedure changes, to those projects that require a pilot study with a contractor?

### Components and structure of a successful implementation program

- Where in a project's cycle should implementation be considered?
- Is it best to fund implementation projects or incorporate implementation into the research projects?
- Who should be involved and responsible?
- How do you motivate participants?
- How do you encourage the communication of results that could lead to changes in the agency's policies or procedures?
- What practices encourage a culture of innovation?
- What role should ORBP play in facilitating implementation?

### Funding implementation activities

- How much do you set aside for implementation? What funding sources do you use?
- How do you prioritize implementation projects for funding purposes?
- Is funding part of the research project or for separate implementation activities?

### Measuring implementation impacts

- What performance measures should apply?
- How is implementation progress tracked on projects that require action (e.g., change in design standards or safety device)?
- What tools do you use to track and report on implementation activities?
- How do you report on implementation efforts within your agency, to managers, to legislators, etc.?

The group shifted gears in the afternoon of the second day and expanded the participants to include research project managers and focus area managers within MDOT, along with representatives from Michigan universities. Joe Conway from the Turner-Fairbank Highway Research Center presented a national perspective on the keys to implementation success, Calvin Roberts provided an overview of ORBP's proposed implementation process, and Steve Palmer, an MDOT focus area manager, presented on the successes and challenges that he has experienced with implementing research at MDOT. These presentations served as an introduction to the breakout group activity. The participants discussed successes and challenges with ORBP's new implementation program and opportunities for collaboration between researchers and MDOT staff in bringing innovations to the field.

The peer exchange ended with a report-out to MDOT's senior executives on the third day. The visiting team presented the group's observations using a one-page summary report they prepared that morning (Appendix B).

## Introduction and Summary (cont'd)

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### Participants

#### Visiting team members

- Rhonda Brooks, Washington State DOT
- Joe Conway, Turner-Fairbanks Highway Research Center
- Bonnie Fields, Pennsylvania DOT
- Mark Morvant, Louisiana Transportation Research Center (Chair)
- Amy Schutzbach, Illinois DOT
- Sue Sillick, Montana DOT

#### Other peer exchange participants

- Haluk Aktan, Western Michigan University
- Don Cameron, FHWA – Michigan Division
- André Clover, MDOT ORBP
- Beckie Curtis, MDOT
- Tapan Datta, Wayne State University
- Mike Eacker, MDOT
- Terry Frake, MDOT
- Beth Hoy, Michigan Technological University
- Elin Jensen, Lawrence Technological University
- Steve Kahl, MDOT
- Kim Lariviere, MDOT
- Steve Palmer, MDOT

#### Peer exchange planning team

- Angela Nelson, MDOT ORBP
- Calvin Roberts, MDOT ORBP
- Trudy Schutte, MDOT ORBP
- Michael Townley, MDOT ORBP
- Pat Casey, CTC & Assoc.
- Chris Kline, CTC & Assoc.
- Kim Linsenmayer, CTC & Assoc.

#### Senior Management Report-Out Team

- Ted Burch – FHWA Michigan Division
- Gregory C. Johnson, Chief Operations Officer
- Bill Tansil, Asset Management Administrator
- Mark Van Port Fleet, Bureau Director, Highway Develop.
- Randy Van Portfliet, Superior Region Engineer



**Back row:** Don Cameron, André Clover, Trudy Schutte, Bonnie Fields, Amy Schutzbach, Sue Sillick  
**Front row:** Michael Townley, Joe Conway, Calvin Roberts, Mark Morvant, Angela Nelson

# Overview of ORBP Implementation Process

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## Key Roles in the Research and Implementation Process

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 applicable results have been implemented. Implementation is the most tangible means of measuring the effectiveness of the research program.

Implementation is addressed throughout the entire cycle of the research process:

- 1) Tiered structure of committees to oversee, advise, and manage the research process.

### Research Executive Committee (REC)

- Top-tier committee responsible for setting the strategic direction, defining research goals, and giving final approval for the implementation plan.
- Composed of the chief operations officer, chief administrative officer, agency bureau directors, a region representative, and the engineer of ORBP.

### Research Advisory Committees (RACs)

- Receive direction from the REC to prioritize research needs and make sure that research projects are aligned with MDOT's strategic direction.
- Advise the REC on decisions by providing background and technical information.
- Convened in four functional areas:
  - Programs/Project Development
  - Delivery and Operations
  - Multimodal
  - Planning and Finance

### Research Advisory Panels (RAPs)

- Formed for each project and chaired by a project manager.
- Ensure that the projects run smoothly, meet the needs identified by the RACs and the REC, and produce results that MDOT can consider for implementation.

- 2) Individuals assigned to support and guide the implementation process.

### Focus Area Managers (FAMs)

- MDOT staff designated by appropriate bureaus for their subject-area expertise.
- Sit in an advisory capacity on RACs.
- Select the project manager and other MDOT staff who serve on each project's RAP.

### Research Managers (RMs)

- ORBP staff who manage the administrative tasks of each research project.
- Support the implementation coordinator and project manager with facilitating, evaluating, and documenting research implementation activities.

## Overview of ORBP Implementation Process (cont'd)

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### Implementation Coordinators (ICs)

- Facilitate research to meet needs and communicate intended uses of research results.
- Recommended by the FAM and supported by the RM; responsible for working with the RAP to develop an implementation plan.
- Manages the implementation project.

### Technical Monitors (TMs)

- MDOT users/experts in the project topic area.
- Focuses project team on user needs.

### Project Managers (PMs)

- Assess the implementation plan throughout the project's life cycle.

### Principal Investigators (PIs)

- Encouraged to understand how the research results will be used.
- Include an implementation plan their project proposals.

3) ORBP facilitates the entire research and implementation process through the following key functions:

- Approves new projects and revisions to projects.
- Reviews research activities.
- Implements the REC's strategic priorities for research.
- Tracks implementation.
- Supports the IC and PM.

## **Steps for Implementing Research Results**

### Step 1: Initial implementation plan included in research proposal.

- How research results will be used.
- Cost/benefit analysis of implementing.
- Barriers to implementation and possible solutions.
- Methods of implementation (training, specifications, demonstration project, revised standards).

### Step 2: Implementation action plan developed as project nears completion.

- PM, RM, and IC concur that research results are ready for implementation.
- Recommend implementation level.
  - Could be implemented at division, Transportation Service Center (TSC), region, or office level.
  - Trial project/test sections.
  - Region-wide or statewide use.
- Establish a work plan with tasks and deliverables (reports, guides, specifications, training materials, etc.).
- Develop budget and funding sources.
- Determine if PI involvement is needed.
- With approval signatures from PM, RM, and IC, the IC obtains approval from the following:

## Overview of ORBP Implementation Process (cont'd)

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- Bureau, division, office, TSC, and/or region depending on the jurisdiction of implementation.
- Engineer of ORBP, who will forward to deputy director.
- The REC provides final implementation approval.
- With final approval, implementation of results in the field or a pilot study can begin.

### Step 3: Implementing research results.

Implementation can be small-scale or large-scale. With small-scale implementation efforts the IC can begin implementation as follows:

- Changes in practice can be immediately implemented.
- After REC approval in Step 2 outlined above, MDOT formally announces these changes.
- It is the IC's responsibility to manage the implementation project.

More examination or a pilot study may be needed with large-scale implementation efforts. In the case of large-scale projects, Step 2 outlined above has additional steps for considering pilot projects and large-scale implementation. Additional cost and relevant data is gathered and submitted to the REC to make a decision on how to proceed:

- *STEP A: Strategic assessment.* RAC considers implementation recommendations and makes recommendation to REC.
  - Not implement.
  - Implement limited-scale pilot project.
  - Implement change on a large-scale basis.
- *STEP B: Limited-scale pilot.* If recommended by REC, IC formulates pilot implementation plan and executes it.
  - When the pilot project concludes, REC considers results to determine whether to implement change on a large-scale basis.
- *STEP C: Adoption of practice.* REC determines if strategic assessment or pilot project warrants adoption of change in practice.
  - If yes, MDOT adopts and formally announces change.
    - It is the IC's responsibility to manage the implementation project.
  - If no, based on results, another pilot may be recommended or further research may be required to identify another solution.

## Topic #1: Defining Implementation

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The group discussed how to define implementation so that it can be used to drive project tracking, performance measures, and reporting.

There's no one-size-fits-all approach, but below are several definitions that states have used within their own programs.

- Research that results in knowledge to aid management decisions, a manual change, a policy development or change, technological application, or a new process.
- Results that are used, adopted, or standardized.
- Results that affect a change – save time, money, improve efficiency, or become another tool in our toolbox.
- Recommendations coming out of a research project with the potential for implementation. Perhaps “implementable” is as significant for determining program success as “implemented.”
- Validating current practice with research results.



### Common Challenges

- Defining implementation so as to provide meaningful reporting of program achievements.
- Classifying projects that may validate practice versus provide specific implementable deliverables.
- Classifying projects that are ready for implementation but don't have funding to proceed, such as for large, new equipment purchases.
- Handling projects for which implementation is out of control of the program due to budget, political, or other issues.
- Defining the true value of a research project.
- How to handle projects that don't go well, don't yield expected results, and don't produce an implementable idea or product.
- Not limiting a program's definition of success to projects that have been implemented. Consider project value overall and knowledge gained. How did the project benefit your customer?
- Defining expected implementation products or plans before the research results are known.

### Effective MDOT Practices

- Consider implementation at the start of the project with the problem statement and include it throughout (in the Request for Proposal, in the work plan, in the report, at the end).
- Get buy-in early from senior managers and others in MDOT who will need to support implementation.
- Recognize that implementation steps and needs vary depending on the type of result. A quick small-scale effort may be effective or a large-scale effort with a follow-up project may be necessary.
- Consider separate research funding and implementation activities.
- Meet quarterly with REC members and invite their input throughout the research process.

## Topic #1: Defining Implementation (cont'd)

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### Other Effective Practices

- Implement innovations from outside of the research program or outside of the agency. Take credit for these implementations and the positive impact they have. (Pennsylvania)
- Fund some projects without implementation as the intended outcome — basic, exploratory research. This gives the universities a chance to explore a new topic and learn DOT business practices that will better qualify them for future research. Don't count these projects against a program's measurement of implementation success. (Louisiana)

### Opportunities for MDOT

- Define implementation in the new procedures manual but be flexible with the definition. Consider if the results were implementable, useful, or had a positive impact.
- Assist in implementing new product ideas generated from outside the research program (as in Pennsylvania).
- Communicate within the agency that some research does not result in implementation. There's more to judging a program's overall success and agency impact.
- Review definitions of a success or failure when talking about project outcomes.
- Track and document the implementation process.
- Get senior management buy-in for what's considered implementation.
- Encourage managers to include research efforts in performance evaluations.

## Topic #2: Components of a Successful Implementation Program

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### Common Challenges

- Determining who has the authority and responsibility for implementation.
- Finding ways to fund implementation.
- How to accurately anticipate implementation costs at beginning of research project.
- Not having dedicated resources for managing implementation activities and seeing them through, within the research program or among technical experts within the agency.



### Effective MDOT Practices

- Ensure senior management buy-in for implementation from the beginning since they are the ones determining the research needs and should be willing to undertake implementation.
- Document implementation and technology transfer processes like Chapter 6 of the MDOT Research and Implementation Manual.
- Include implementation planning at the beginning of a project.
- Develop an implementation action plan for each project.
- Define key roles for implementation responsibilities and make sure they are realistic.
- Dedicate funding for implementation to produce implementation products.

## Topic #2: Components of a Successful Implementation Program (cont'd)

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### Other Effective Practices

- The research program needs to make implementation simple for its department stakeholders. Provide whatever support in time and money is possible to make sure it happens. Hire out the work if you don't have the staff in house. (Montana)
- Rate projects on their implementation potential when selecting them for funding. (Louisiana)
- Track implementation activities during the research phase as well as after. Use an online database that can produce reports of achievements across the program. (Louisiana)
- Consider adding implementation products or related activities to a project after it is already under way and the need becomes apparent.
- Plan for implementation funding, by using a dedicated source for follow-up activities, building it into the research work plan, or by leaving some flexibility in your overall program budget.
- Plan for implementation staff to make it happen. Pennsylvania has a dedicated implementation arm within their program.
- Make sure everyone who will be needed for implementation is involved in the research project panel. Use that panel to oversee both the research and the implementation activities.
- Have senior managers share the risk of pursuing research in order to drive innovation in the department. If senior managers assume that risk with you, they'll support you when the project is a big win or when it doesn't meet expectations.
- Don't fund research projects unless they have strong project champions. A project won't be successful and the results are hard to implement if the customer isn't willing to be involved.
- Include marketing and communications professionals on your implementation planning team. (FHWA)
- Market your research program to new managers and get involved in meetings of technical experts throughout the department. Get to know staff, their problems, and their needs.

### Opportunities for MDOT

- Add dedicated staff to implementation.
- Get ORBP research managers involved in everyday business. Sit on committees, attend meetings to know staff, their issues, and their problems.
- Use marketing and communications staff to communicate program services, effectiveness, and implementation.
- Make implementation easy for staff outside of ORBP by providing extensive support.
- Get research activities added to the individual performance evaluations of technical staff outside of ORBP involved in research.

## Topic #3: Funding Implementation

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### Common Challenges

- Determining the benefit cost ratio of implemented research activities to support implementation decisions and measure success of research program.
- Determining how much funding to plan for implementation and whether to set aside this next phase project funding or incorporate it into the project.
- Prioritizing which projects to fund based on need and value of implementation.
- Meeting implementation needs with minimal resources available.

### Effective MDOT Practices

- Set aside dedicated funding for implementation with a formal approach to assigning funds to projects.
- Identify IC at the start of a project and involve through the entire research effort.
- New implementation process will identify those implementation activities that can move forward quickly and will be given funding to achieve results.

### Other Effective Practices

- Require a cost/benefit analysis from every PI when the research is completed, even if it's a best guess at what benefit the implementation will yield. (Louisiana)
- Consider pooled fund studies with other states to implement research results of common interest.
- Consider developing a separate contract to measure long-term benefits and costs of implementation and the success of the program as a whole. (Louisiana)

### Opportunities for MDOT

- Take advantage of presenting the new implementation process as a way to get buy-in from senior managers.
- Get distinct feedback from management about priorities on high-value projects.
- Work to identify the long-term benefits and costs of implementation.
- Don't make the implementation funding set-aside too fixed. Maintain flexibility and leverage funding from other sources within the state or nationally.
- Look for opportunities for others within the DOT or externally to share the implementation costs.

## Topic #4: Measuring Implementation Impacts

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### Common Challenges

- Finding a common denominator for measuring effectiveness of research. It might be helpful if the American Association of State Highway Transportation Officials (AASHTO) Research Advisory Committee weighed in on this.
- The best approach to performance measures is not the same for every agency.
- Determining whether to focus on output or outcome in performance measures.
- Avoiding scope creep when determining how many performance measures and data are necessary to capture.

## Topic #4: Measuring Implementation Impacts (cont'd)

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### Effective MDOT Practices

- *Research Spotlights* (project summaries) are a good way to show the value of the research and implementation effort.
- Track output management measures currently.
- Implementation plans will collect information needed for reporting measures on the effectiveness of the research program.

### Other Effective Practices

- Louisiana uses the following categories for recording project status: 1) project in progress; 2) implementation recommended; 3) implementation complete; 4) project not implemented (unsuccessful project); and 5) no implementation results expected (basic research). These categories are used to track projects over a five-year period.
- Louisiana is finalizing a web-based system for tracking all aspects of research and implementation activities. The system synchronizes with department financial systems, allows simple creation of work program and other reporting documents, and facilitates communication with project managers about their expected activities and deadlines.
- Incorporate research projects into the strategic plans and performance measures of other department offices to keep visibility and priority for research high.
- The Research Performance Measures (RPM) database developed through National Cooperative Highway Research Program (NCHRP) 20-63 contains a useful tutorial and definitions of performance measures.
- Think about what measures will need to report on before a project begins so that data can be collected during a project.
- Consider the audiences receiving the program measures report and limit measures based on the audiences' needs. Keep it simple.
- Conduct surveys of customers to get feedback on research and implementation process. (Montana)
- Implementation brochure that highlights the impacts of implemented research projects. (Pennsylvania).
- Post short articles and pictures on the DOT Web site quarterly that highlight high-value projects of broad interest.
- Submit articles about high-value projects to *TR News* Research Pays Off.

### Opportunities for MDOT

- Combine approval of research and implementation projects in the same process so as to reduce additional workload for committees.
- Market the results of implementation projects.
- Determine what is important to upper management and build your performance measures and data collection means accordingly.
- Welcome the ability to create performance measures that aren't dictated by others.
- When moving to a database tool for tracking projects, include implementation activities.

## National Trends in Implementation

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Joe Conway gave a presentation from a national research perspective that highlighted strategies for successful implementation/technology deployment and national trends in research development. Below are a few of his key observations.

- There needs to be some acceptance of risk with research. Not all projects will succeed.
- There are four key components for effective implementation: leadership, commitment, resources, and accountability.
- Always be on the lookout for implementable research from sources outside your program. Research programs lead innovation in their department and should do so through all possible resources.
- Nationally, research has moved away from focusing only on infrastructure and more towards customer congestion, environmental, and economic impacts of customers.

## Implementation Opportunities for MDOT

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ORBP invited MDOT research project managers and focus area managers, as well as representatives from Michigan universities to participate in a working session aimed at understanding and improving MDOT's approach to research implementation. Calvin Roberts kicked off this session with background on ORBP's new implementation processes.

### MDOT Focus Area Manager Presentation

Steve Palmer, an experienced MDOT focus area manager, presented on the challenges and opportunities he has observed with implementing research in the past. Below are some of the observations he shared with the group.

#### Implementation challenges

- Technical documents and specifications can be a challenge to change, requiring internal approvals and staff buy-in.
- Cost can be a barrier. Contractors are risk averse and may not be willing to make changes to their processes.
- Lack of industry familiarity with the expected changes.
- Getting internal and external stakeholders support for the changes.
- Research results may need to be refined for simplicity in field/operational applications.
- Consistently implementing the changes in the field and developing needed standards and guidelines. Staff resources are needed to support this transition.
- Tracking impacts requires databases and staff or consultant resources that are dedicated to the effort. Follow-up on the success of the implementation is crucial: Did it work they way we thought it would?

#### Implementation successes

- Research that is unique to Michigan or tailored to MDOT's needs will be most successful. Identify in your scope if similar work has already been done nationally and then focus on the state specific projects.
- Get buy-in from upper management from the beginning and make this part of your process for successful implementation.
- Identify the funding source in the implementation plan.

## Implementation Opportunities for MDOT (cont'd)

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- Get good estimates for materials, equipment, operational costs, and maintenance. Be honest about the fact that we have a lot of institutional knowledge that universities don't have. Work with them on this.
- Hold tech transfer meetings with DOT staff to pare down the findings for them.
- Identify a DOT implementation coordinator by project who will work through all details to get a final product ready for use at MDOT.

### Breakout Groups

Following Palmer's presentation, all peer exchange participants were divided into three working groups to brainstorm MDOT's current implementation strengths (based on past experience or the new procedures currently being rolled out), challenges experienced in implementing projects, and strategies for addressing those challenges that MDOT could consider. Each group included a facilitator, note taker, and reporter who shared the group's findings with the full group of participants. Report-out highlights are below.

#### Group 1 Report

##### *Strengths*

- Strong implementation coordinator role.
- Tiered structure of support/review.
- Technical experts have the ability to get involved early on (bring ideas to the table, highlight technologies out there).

##### *Challenges*

- How to handle the handoff—transfer from research to real world practice.
- Ensure that the implementation coordinator has the resources they need for implementation as well as commitment from management.
- Identify all stakeholders who will be involved in implementation.

##### *Strategies*

- Identify the right implementation coordinator who has both the needed technical expertise and the business knowledge of MDOT.
- If possible, maintain the same implementation coordinator on a project for an extended period of time.
- ORBP needs to provide as much support as it can for implementation coordinators. Provide guidelines and training and consider having them mentor each other.
- Identify the stakeholders up front. Investigate the potential impact of the research on them and consider when it's most appropriate to involve them in the project.

#### Group 2 Report

##### *Strengths*

- Well documented, comprehensive, flexible process.
- Good management and stakeholder involvement.
- Implementation is included in the research RFPs.

## Implementation Opportunities for MDOT (cont'd)

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### *Challenges*

- Identifying where projects fit into MDOT's system. It's not one size fits all.
- Getting top managers involved early on.
- Having enough resources to support the implementation coordinators.

### *Strategies*

- Have the principal investigators give brief project updates to senior managers, especially when recommendations go against standard practice.
- Consider expanding ORBP staff to adequately support implementation efforts.

### Group 3 Report

#### *Strengths*

- Implementation action plans define roles and responsibilities, deliverables, and products.
- Problem statements have expected implementable results that would solve a problem for department. Current project committee structure includes technical experts interested in implementation – those who are knowledgeable and end users.

#### *Challenges*

- Implementing results of basic and applied research. Some research should be exploratory.
- Large problem statements that require multiple projects or phases — there won't be implementation after each phase.
- Inconsistency of project managers through implementation.
- Fewer human resources to handle implementation activities.
- Time and effort required for implementation management.
- Staff juggling of priorities for research versus their regular duties.
- Timing of available funds.

#### *Strategies*

- Encourage principal investigators to think about implementation at the beginning of a project by asking that implementation be included in proposal.
- Incorporate implementation strategies for projects into the funding cycle.
- Allow approval for phased projects that require additional validation or demonstration.
- Allow research funding for deliverables.
- Formalize the implementation planning process.
- Restructure Centers of Excellence so they can be utilized as tech transfer.

## Report-Out to MDOT Executives

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ORBP invited senior executives within MDOT to participate in a one-hour report-out meeting to hear the highlights and recommendations from the peer exchange. This meeting was a great opportunity for MDOT executives to hear from visiting team members about how implementation is handled in their states and what they learned from MDOT during the exchange.

Before the presentation got under way, Amy Schutzbach presented Calvin Roberts with a gift of appreciation from the Region 3 state DOT research directors to thank him for his great contributions to the research community during his years as ORBP's Engineer of Research and Best Practices.



Following Schutzbach's presentation, Roberts provided an overview of ORBP's new implementation program and Mark Morvant presented an overview of the group's observations from the two-day event. The visiting team and ORBP staff created a one-page report of the exchange findings and recommendations (Appendix B), which Morvant presented at the report-out meeting.

Following is a snapshot of the discussion that took place between the MDOT executives and the peer exchange visiting team.

**Question: How do your states make sure that your regions and operational arms are aware of the research before it needs to be implemented?**

Sue Sillick (Montana DOT)

We stress from beginning that it's critical to involve all stakeholders. They need to help shape the research and what they need out of it in order to implement it. Their involvement helps create buy-in. MDOT's new process is very inclusive in involving stakeholders.

Amy Schutzbach (Illinois DOT)

We're decentralized as well. We also try to be inclusive up front. If it's truly a need of the executive committee, hopefully it's a need for regions as well. Choose individuals for panels with interest in areas of research. Research can help provide training to get results of research out to people so they're hearing about it and how it will benefit them.

**Make sure you don't have undo influence by any group of stakeholders. Is there balance between top management and implementation stakeholders?**

Sue Sillick (Montana DOT)

You don't need everyone from every organization. Representatives need to keep their groups informed of what's going on.

## Report-Out to MDOT Executives (cont'd)

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### Mark Morvant (Louisiana Transportation Research Center)

We're blessed with more staff than most. Lots of in-house staff to do research and implementation. Staff are involved in regional meetings. Present new research and results to these groups first and explore potential barriers. The first rollout goes to them for feedback. Also try to include representatives from associations on committees.

### Joe Conway (Turner-Fairbank Highway Research Center)

FHWA is challenged to disseminate research across all states. It requires extensive communication and outreach. Don't oversell it, though. Inform people what's coming and give them chance to comment on it. Build relationships. Bring others into implementation.

### **Several of our folks have multiple projects to manage or panels to be on. How will this play out in implementation?**



### Sue Sillick (Montana DOT)

We don't have an implementation manager, but our process is bottom up where staff say what they need to do their jobs more efficiently. This is important to me in my area, and they'll see the project through the process. Staff present to executives on why the project is important. You get the best results when there are active, committed people in the process.

### Mark Morvant (Louisiana Transportation Research Center)

Bonnie Fields (Pennsylvania DOT – unable to be present) manages an implementation program to fund small projects – and some large - to help staff. She helps create implementation products for staff and provides technical and marketing support.

### **We've recently started talking about reaching out to regions and TSCs to pull people into the role of project manager and implementation champion. How do you spread the word around?**

### Amy Schutzbach (Illinois DOT)

After prioritizing our research ideas, we try to provide names of project managers. This will factor into the voting of which projects to fund by our executive committee.

### Mark Morvant (Louisiana Transportation Research Center)

We won't start a project unless there's a project champion for it who wants the expected deliverables – it keeps them going.

## **Report-Out to MDOT Executives (cont'd)**

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**How can ORBP's new implementation coordinator position in the central office position have a lot of influence in regions?**

Sue Sillick (Montana DOT)

We have a field research coordinator (assigned by the district engineer) who is our contact for research. We work with them to help get the word out.

Calvin Roberts (Michigan DOT)

The implementation coordinator from Lansing has to be someone who is respected in Lansing and in the regions. It should be a technical expert in the research that results from the project. A research manager from ORBP will work with and support the implementation coordinator.

**What percent of your research is done internal by research staff?**

Mark Morvant (Louisiana Transportation Research Center)

LTRC is a DOTD/LSU combination. We have contracts with LSU researchers and professors to do work for us (acting as employees). All of our SPR dollars goes to in-house staff (\$3.5M/year). The rest (\$11M) comes from other sources. Half of our projects are internal. DOT staff spends most of the time implementing research, doing demonstrations, and collecting data. They support other researchers and provide technical assistance to the department (such as writing specifications). Our policy committee includes representatives from each Louisiana university.

**Talk about performance measurement.**

Mark Morvant (Louisiana Transportation Research Center)

We've been doing it several years. Now they're related to making sure I have information like cost/benefit analysis. Make sure implementation plans are getting done, etc. From an implementation standpoint, we categorize projects by projects in progress, implementation recommendations, etc. An implementation engineer is responsible for tracking this. Seventy-five percent of our projects are recommended for implementation.

This output-based measurement goes to the chief engineer. But if he comes back to ask about what we're getting out of it (value), then we have that return on investment information as well so we're ready, as much as possible. Do it on the winner projects. Ask professors to try to give cost/benefit in their reports as a starting point. Rely on project review committee to review numbers to make sure they're good. Only use numbers if they agree to it. Not all projects have numbers.

## Visiting Team Takeaways

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### Mark Morvant

- ORBP has defined a nicely detailed and structured implementation process. I plan to review that document with our staff and incorporate many of the defined responsibilities as applicable into our research manual.
- Implementation recommendations are prioritized at regularly scheduled meeting with the executive committee. I will discuss with our chief engineer his desire to also have regularly scheduled implementation meetings.
- Develop an implementation bulletin to highlight successful research project impacts.
- Define accountability for research implementation beyond the research staff.
- Consider funding formal projects to track and determine implementation impacts (3-5 years).
- Implement process to collect innovations developed by other DOT employees to enhance knowledge sharing throughout the department.
- Begin categorizing projects for which sole objective is to enhance implementation efforts of new technologies or from previous research result recommendations.

### Amy Schutzbach

- Implementation should be a process. Commitment from upper management is critical to implementation.
- There is a difference between “implementable” and “implemented.” Implementable research recommendations that are not implemented may be a result of factors beyond our control: politics, budget constraints, etc.
- Need willingness to take risk in order to foster innovation.
- Consider including marketing/communications staff in the implementation effort – key is to know your audience.
- Consider requiring some kind of cost/benefit analysis from every PI. Analysis may be somewhat preliminary, but this info. can be used to push implementation.
- Pooled fund studies can be used to fund and push implementation efforts.
- Consider developing a separate contract to measure long-term impact and benefit of implementation. This can be a way to measure the success of the research program.
- Research efforts support other bureau’s/office’s efforts to meet the department’s strategic goals. Make this known.
- The existing RPM tools database has a good tutorial on performance measures.
- Consider using LTRC’s performance measures: For ongoing projects, look at percentage of:
  1. Projects in progress,
  2. Projects where implementation has been recommended,
  3. Projects where implementation is complete,
  4. Projects where findings were not implemented (project was a bust),
  5. Projects where no implementation results are expected (i.e., basic research).
- PENN DOT’s implementation brochure is a way to market the research program.
- Consider posting highlights of high-value/high-interest research on IDOT’s internal Web page.
- Needs to be some tolerance/acceptance of risk. Not all research will succeed.
- Four key components of technology deployment (AKA research implementation): Leadership; commitment; resources; and accountability.

## Visiting Team Takeaways (cont'd)

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- Implementable research can include outside research – FHWA, other states. These efforts should be tracked and included in performance measures as well as in-house contract research.

### Handouts to use/consider

|          |   |
|----------|---|
| PENN DOT | <i>Checklist for Winning Innovations Implementation</i> brochure.   |
| MT DOT   | Exit survey, research project statement (info on implementation), project kickoff check list.                           |
| MI DOT   | Implementation plan/draft CH6 from Research Manual on Implementation and T <sup>2</sup> /Research Implementation Guide. |
| LTRC     | Research Assessment and Implementation report.  |

### **Sue Sillick**

Michigan DOT has developed a formal, comprehensive, well-documented inclusive implementation process and is developing the tools with which to carry it out. In Montana, most of our research projects result in implementable action items and we have a formal process to consider implementation through the conduct of a research project. However, we do not have a formal process to follow-up on implementation actions.

- Develop a formal process and associated tools to facilitate the implementation of research results.
- Research facilitates various other departmental offices in achieving their goals.
- Defining implementation is not always easy. Is it enough to develop a tool for the toolbox, or must the tool be used once or more (if so, how many?) to be considered truly implemented?
- Not all projects result in implementation. This may be a matter of design in that they were not expected to yield implementable results. I would like to distinguish and determine which of the following measures make sense to track and use as performance measures for MDT:
  - Implemented;
  - Implementable;
  - Project value;
  - Project success; and
  - Knowledge gained.
- MDT tracks various outputs as performance measures, but needs to look at including outcomes, as well as how to effect this change.
- LTRC has a clear classification system for research project status that MDT will consider using.
  - Project in progress;
  - Implementation recommended;
  - Implementation complete;
  - Not implemented; and
  - No implementation results expected.
- Review implementation tools provided by peer exchange team members for possible incorporation into MDT's process.

## Visiting Team Takeaways (cont'd)

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- We need to remember that in addition to our own research projects, we also advance transportation by sharing information gathered and developed by others through technology transfer. Likewise, we need to remember to celebrate and share our successes through technology transfer with others and use of tools, such as *TRNews Research Pays Off*, and *High Value Research* summaries.
- To help ensure implementation happens, it needs to be made as easy as possible. Research staff has the opportunity to facilitate this.
- Consider hiring marketing professionals to develop tools showing the value of research.
- MDT needs to implement a program and project management database and determine whether it is most efficient to implement one used at another state or to create our own. This database needs to provide for the tracking of implementation.



## APPENDIX A - AGENDA

### Monday, December 6, 2010

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**6:00 – 8:00 p.m.**      **Welcome reception for visiting team at the Lexington Lansing Hotel (hors d'oeuvres only)**

### Tuesday, December 7, 2010

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**7:30 – 8:00 a.m.**      **Registration and Breakfast**

**8:00 – 8:15**              **Welcome Messages and Introductions**

**8:15 – 9:15**              **Background on New ORBP Implementation Program**

**9:15 – 10:30**            **Implementation Program Presentations (20 minutes each)**

- Sue Sillick, Montana DOT
- Rhonda Brooks, Washington State DOT
- Bonnie Fields, Pennsylvania DOT

Brief question-and-answer session to follow.

**10:30 – 10:45**            **BREAK**

**10:45 – 12:00**            **Implementation Program Presentations (20 minutes each)**

- Mark Morvant, Louisiana Transportation Research Center
- Amy Schutzbach, Illinois DOT
- Joe Conway, FHWA Office of Technical Services

Brief question-and-answer session to follow.

**12:00 – 1:00 p.m.**      **LUNCH**

**1:00 – 2:30**              **Defining Implementation**

- Brief introduction by ORBP staff.
- Facilitated round-table discussion.

**2:30 – 2:45**              **BREAK**

**2:45 – 4:15**              **Components of a Successful Implementation Program**

- Brief introduction by ORBP staff.
- Facilitated round-table discussion.

**4:15 – 5:00**              **Recap Discussions and Takeaways**

**5:00**                      **Adjourn for the Day**

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## Wednesday, December 8, 2010

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- 7:45 – 8:15 a.m.**      **Networking and Breakfast**
- 8:15 – 8:25**              **Welcome**  
Recap of Tuesday meeting and overview of goals for the day.
- 8:25 – 10:00**          **Funding Implementation**
- Brief introduction by ORBP staff.
  - Facilitated round-table discussion.
- 10:00 – 10:15**         **BREAK**
- 10:15 – 12:00**        **Measuring Implementation Impacts**
- Brief introduction by ORBP staff.
  - Facilitated round-table discussion.
- 12:00 – 1:00 p.m.**    **LUNCH**
- 1:00 – 1:15**            **Welcome Additional Exchange Participants**
- 1:15 – 2:15**            **National Trends in Research Implementation**
- Presentation by Joe Conway, FHWA Office of Technical Services.
  - Facilitated question-and-answer discussion.
- 2:15 – 2:30**            **BREAK**
- 2:30 – 4:30**            **Implementation Opportunities for MDOT**
- Presentation by Steve Palmer, MDOT Focus Area Manager, on current implementation activities and challenges.
  - Presentation by Calvin Roberts, MDOT Engineer of Research and Best Practices, on implementation background.
  - Breakout groups to discuss potential modifications to ORBP's new implementation program.
  - Report out and discussion of results.
- 4:30 – 5:00**            **Recap Discussions and Takeaways**
- 5:00**                    **Adjourn for the Day**
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**Thursday, December 9, 2010**

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|-------------------------|---|
| <b>7:30 – 8:00 a.m.</b> | <b>Networking and Breakfast</b>   |
| <b>8:00 – 8:10</b>      | <b>Welcome</b><br>Recap of Wednesday meeting and overview of goals for the day.   |
| <b>8:10 – 10:30</b>     | <b>Group Development of Executive Summary Report</b><br>Prepare brief (one-page) reporting document on peer exchange highlights, participant takeaways and next steps for MDOT. |
| <b>10:30 – 11:00</b>    | <b>BREAK and Report Printing</b>  |
| <b>11:00 – 12:00</b>    | <b>Report to Executive Management Team</b><br>Facilitated report to MDOT executive management team.   |
| <b>12:00 – 12:30</b>    | <b>Closing Remarks and Box Lunches</b>  |

## MDOT ORBP Peer Exchange Bridging the Gap: Implementing Research Results December 7-9, 2010

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### Visiting Team Members

- Mark Morvant, Louisiana DOTD (Chair)
- Rhonda Brooks, Washington State DOT
- Joe Conway, FHWA, Washington, D.C.
- Bonnie Fields, Pennsylvania DOT
- Sue Sillick, Montana DOT
- Amy Schutzbach, Illinois DOT

### MDOT Strengths

ORBP has developed a comprehensive new process for implementing the results of research projects at MDOT. Participants at this peer exchange noted the following key strengths of the new plan:

- The process is well documented in ORBP's Research and Implementation Manual and is designed to communicate, facilitate, and guide the research and implementation stakeholders through the process of developing projects that address department priorities.
- The research program advances MDOT's strategic initiatives and responds to agency needs by including internal and external stakeholders.
- ORBP strives to provide applied research that is implementable. Involvement and commitment by the Research Executive Committee (REC) throughout the research and implementation process make this possible.
- The REC's identification and prioritization of the research and implementation program provides direction and support throughout the agency.
- ORBP's plan provides flexibility to quickly move forward with small-scale efforts and has a defined process to advance implementation of large-scale projects.
- Implementation is considered at the beginning of the research process and throughout the project lifecycle.
- An implementation plan is developed for each project that outlines the budget, participants in the process, timeline, and expected outcomes. This document will serve as a basis for performance measures reporting.
- Roles and responsibilities for the implementation coordinator, project manager, and research manager are designated at the beginning of the research project for effective oversight and management of implementation activities.
- Tools are being developed to support the new process, including implementation forms, plans, and guidelines.

### Keys to Success Moving Forward

- Set aside funding for optimizing success of implementation projects.
- Active REC support is necessary to encourage stakeholder participation on Research Advisory Panels, ensuring effective implementation of results.
- Encourage MDOT managers to include research and implementation efforts in employee performance evaluations and priorities.
- Add a new ORBP position dedicated to leading implementation and managing research.
- ORBP research managers will provide critical administrative support, ongoing communication, and coordination for all stakeholders involved in research and implementation.
- Build research and implementation performance measures around the priorities of MDOT executives.
- Provide funding for the development and dissemination of marketing materials to communicate program services, effectiveness, and impacts.
- Incorporate implementation project selection and prioritization into the research process to reduce the amount of additional work required of the REC and Research Advisory Panels.
- Be mindful of the impacts of implementation on all parts of MDOT and external stakeholders.
- ORBP research managers will become involved in everyday MDOT business by sitting on committees, attending meetings, and getting to know staff and their issues and needs.
- Include projects to identify the long-term impacts and benefits of implementation.
- Look for implementation funding sources elsewhere within MDOT or externally, such as FHWA.
- Include implementation activities, products, and results in project tracking databases.

# APPENDIX C

## Participant Contact Information

### Visiting Team

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