MDOT

Office of Research and Best Practices

Transforming a State DOT Research Program

Michigan Department of Transportation

Peer Exchange Report

December 3–6, 2007

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Introduction

Introduction

The Michigan Department of Transportation's (MDOT's) Office of Research & Best Practices (ORBP) hosted a peer exchange on December 3–6, 2007, in Lansing, Michigan. Representatives from five state DOTs, the Federal Highway Administration (FHWA)–Washington, D.C., and Pennsylvania State University joined representatives from MDOT and FHWA–Michigan to share experiences and best practices in research program development and management. The meetings consisted of both formal presentations and round-table discussions.

This report highlights the key observations that came out of the peer exchange discussions and the opportunities identified for ORBP in further developing its research program. Participant presentation materials and a video of meeting highlights are available from MDOT upon request.

Objectives

The overall theme for the peer exchange was Transforming a State DOT Research Program. MDOT's Office of Research & Best Practices is in an exciting time of transition, aiming to expand its research coordinating role in the department and to refine its program to address the department's multi-modal research needs. The exchange began with a background presentation by Michigan and program overviews from the visiting team members. The panel addressed the following questions:

- How have you transformed your program and what caused you to make this transformation?
- How have you initiated and developed a move in a new direction?
- What obstacles did you face?
- What strategies did you find successful?
- What benefits do you see in managing your program the way you do?
- What challenges do you still face?
- What is your shining star, your most noteworthy program element?

The rest of the conference was structured around four main topic areas: Needs Identification, University Partnerships, Research Project Management, and Measuring and Reporting Results. Refer to Appendix B for list of questions addressed during each of these sessions.

ORBP staff hoped to leave the exchange with new tools and practices for further developing, managing and evaluating their research program.

Note: On December 18, 2007, the Office of Research & National Best Practices changed its name to the Office of Research & Best Practices, expanding its scope to embrace the transportation community worldwide.

Participants

Visiting team members

- Leni Oman, Washington State DOT (Chair)
- Mark Dunn, Iowa DOT
- Mark Morvant, Louisiana DOTD
- Marci Kenney, FHWA–Washington, D.C.
- John Mason, Pennsylvania State University
- Dave Huft, South Dakota DOT
- Blaine Leonard, Utah DOT

Peer exchange planning team

- Calvin Roberts, MDOT
- Angela Nelson, MDOT
- Sudhakar Kulkarni, MDOT
- André Clover, MDOT
- Tim Croze, MDOT
- Pat Casey, CTC & Associates LLC
- Kim Linsenmayer, CTC & Associates LLC
- Brian Hirt, CTC & Associates LLC

Other peer exchange participants

- Don Cameron, FHWA–Michigan
- Carl Johnson, FHWA–Michigan
- Mark Becker, MDOT
- Steve Bower, MDOT
- Alexandra Briseno, MDOT
- Dean Kanitz, MDOT
- Wen-hou Kuo, MDOT
- Mike Smith, MDOT
- John Staton, MDOT
- Roger Till, MDOT

MDOT Executive team for report out

- Kirk Steudle, State Transportation Director
- Larry Tibbits, Chief Operations Officer
- Leon Hank, Chief Administrative Officer
- John Polasek,
  Bureau Director of Highway Development
- Myron Frierson,
  Bureau Director for Finance and Administration

MDOT´s Strengths

MDOT´s Strengths

- Willingness to examine their program in depth and make changes.
- Proposed program is well thought out and provides a strong foundation.
- Emphasis on pursuing a broader range of research topics beyond just materials and construction.
- Core ORBP staff has a good mix of skills and is committed to responding to manager expectations for the program.
- Access to six excellent universities, including two University Transportation Centers (UTCs) with available funds, to conduct research and other activities for the DOT.
- Revitalizing the library will produce added value for the department.
- Support from the FHWA Division office for program changes.
- Strong interest in research among MDOT's technical staff outside of ORBP.
- Consistent stream of federal dollars.
- Reputation for credible research that is regularly used by other states. Good e-mail distribution of research reports.
- Michigan has a vibrant transportation research community which includes university, consultant and industry partnerships.

Opportunities for MDOT

Overall Opportunities

- Develop a culture of innovation, cooperation, and accountability in transportation research.
- Capitalize on research resources through a single DOT vision in which ORBP is a clearinghouse for research throughout the department.
  - Position ORBP to market research successes and become MDOT's research champion.
  - Demonstrate the role of ORBP in providing service and support for all agency research.
  - Understand work being done by the regions and the benefits they can provide to the process.
  - Effectively engage the bureaus, regions and Transportation Service Centers (TSCs) in defining research opportunities.
- Address ORBPs staffing needs to provide adequate oversight, quality assurance, and implementation tracking. Consider hiring in-house staff or outsourcing.
- Ensure that MDOTs research meets the strategic needs of the department.
- Maintain an emphasis on efficiency in fully defining the new program's management structure and cautious about creating too much process.
- Encourage ownership of the research program by senior management and recognition of the value of research.
- Include an introduction to research and library services in new employee orientation.

University Partnerships

- Educate the universities about MDOT's critical research needs as they relate to the strategic goals of the department. Invite researchers and university managers to meetings with MDOT staff to develop better mutual understanding of needs and discover opportunities. Invite Pennsylvania Transportation Institute to meet with Michigan universities in the late fall or early spring to broaden their views on collaboration.
- Develop a cooperative agreement that meets the needs of both the DOT and the university.
- Partner with departments beyond civil engineering to conduct a wide range of multi-modal research.
- Utilize universities as both educational/training and research partners. Take advantage of distance learning, such as at Pennsylvania State University or elsewhere, to help MDOT staff expand their expertise and maintain their technical skills.
- Leverage University Transportation Centers (UTCs) funding and cost-sharing opportunities.
- Provide some funding for basic research.
- Form a system of interface among stakeholders in Michigan research to best inform MDOT's multi-modal research program and communicate its results:
  - MDOT/ORBP
  - Michigan Transportation Research Boar and the Transportation Research Institute of Michigan
  - A consortium of research universities and UTCs
  - Local Technical Assistance Program (LTAP)
  - Consultants
- Consider forming a collective group of universities (PennDOT consortium).

Needs Identification

- Fund research projects based on strong proposals that address high-priority needs of the department rather than on equal distribution by program area.
- Serve in a research clearinghouse role for the department. Get a handle on research being done by regions and what benefits they can provide to the process. Effectively allocate funding to the TSCs and define their research opportunities.
- Don't program all dollars available. Maintain funding and decision-making flexibility in ORBP for responding to research requests throughout the year.
- Communicate broadly and often about MDOT research activities and how to participate, using state and national newsletters, listservs and Web sites.
- Pursue external funding and joint efforts with other states and federal agencies to leverage research dollars.
- Keep track of unfunded research projects and the evolving needs in the department.
- Hold a best practices workshop to capture best practices, research and innovation by TSCs.
- Be cautious about creating too much process (and work within the tolerance of your DOT community).
- Create and use a research-tracking database that includes unfunded projects. Consider offering an incentive to regional staff to encourage them to enter project information in the database, such as handling project administration, publishing the results, providing contract support, etc.
- Submit research projects to the Transportation Research Board (TRB) Research in Progress (http://rip.trb.org/) and the Transportation Research Information Services (TRIS) Online (http://ntlsearch.bts.gov/tris/index.do) databases.
- Seek external funding and consider joint efforts with other states and federal agencies, especially in new areas, to leverage funds.

Project Management

- Maintain an emphasis on efficiency in fully defining the new program management structure, being cautious about creating too much process.
- Establish dedicated research managers (additional staff needed) to provide oversight, quality assurance and implementation tracking.
- Develop a project tracking database of all research proposed, funded, in progress and completed.
- Include regional DOT staff and TSCs on project oversight committees.
- Enlist help in managing the timely submission of invoices and deliverables and in editing the final reports. Consider hiring staff or outsourcing work to the Centers of Excellence.
- Address how frequently invoices are submitted. Encourage monthly or quarterly receipt.
- Look for efficiencies in contracting to quickly bring in qualified principal investigators. Better coordinate research award cycle with the academic calendar. Consider programming in advance – placeholder projects that are ready to go when funding becomes available.

- Consider policies that encourage on-time completion of projects, such as withholding payments based on on-time receipt of deliverables and prohibiting external publication if the final report has not been submitted and approved.
- Consider how other states are handling project management to see what could apply to MDOT.
- Consider tying payments to receipt of deliverables throughout project.
- Encourage ownership of the research program by senior management; their recognition of the value of research will help make it a priority for the department.
- Look at project data retention schedules.

Performance Measures and Reporting

- Consider developing performance measures that support the business needs of the department.
  - Look to other states, such as Louisiana, for models.
  - Try out some aspect of the National Cooperative Highway Research Program (NCHRP) 20-63 Performance Measures Toolkit.
  - Survey department staff and legislators to find out what areas are most important to the department and legislature and implement the results.
  - Focus on areas to be improved and tracked.
  - Make sure measures are responsive to thought processes of policymakers during times of resource constraints.
  - Look at return on investment for the transportation library.
  - Fund a research project to conduct a benefit-cost analysis on the research program activities.
- Highlight research success stories for senior management and the public to demonstrate the value of research, raise the status of research in the department, and increase participation and support. Use one-page summaries of completed projects that are distributed widely by e-mail, online and in print.
- Know the status of all projects: throughout the department, in progress, and completed.
- Survey universities regarding what's working and not working in conducting research for MDOT and on how MDOT can better meet their needs.

Key Observations and Best Practices Discussed

Research Program Development

Successful approaches

- Collaborating with other state agencies, federal agencies, universities, and industry on developing research ideas and carrying out the projects.
- Securing external funds for research projects (such as UTCs, U.S. Geological Survey, National Concrete Pavement Technical Center, FHWA, Road Weather Management Office, private sector firms, etc.)
- Maintaining an inclusive, open process for soliciting and selecting research ideas. This builds support and encourages participation within the agency.
- Incorporating information services (such as WSDOT's synthesis reports) into the suite of services offered by the research program.
- Communicating research program activities, accomplishments, and processes on a regular basis to a wide audience in a variety of formats (electronic, print, formal, informal, in person).
- WSDOT's quick response program allows them to respond to high-priority needs that arise throughout the year.

Challenges

- Maintain technical expertise in-house.
- Track implementation.
- Identify and recruit strong project champions.
- Measure performance.
- Deliver project in a timely manner.
- Overcome a DOT culture that is resistant to change.
- Implement programmatic changes that take a lot of time and effort.
- Overcome resource constraints.

University Partnerships

Explore new ways of doing business and conducting research

- Partner with disciplines beyond civil engineering departments in order to address research beyond traditional infrastructure issues.
- Negotiate reduced indirect cost rates.
- Negotiate master agreements and collaboration agreements.
- Forge collaboration of outside partners with universities (such as consultants to write specifications for a project).
- Form collaborative research agencies, such as WSDOT's Transportation Center with University of Washington and Washington State University.
- Work with regional UTCs to address regional issues; this could be done through pooled fund studies.

Leverage resources

- Expand use of UTCs to leverage resources by sharing project funding.
- Leverage resources through pooled funding.

Enhance communication within DOTs

- Formulate and follow clear guiding principles behind research.
- Carefully define the DOT's research needs.

Enhance communication between DOTs and universities

- Invite a faculty member (on sabbatical or during the summer) to work within the DOT in order to better understand the agency's needs.
- Promote regional work through UTCs and other means.
- Universities should communicate the availability of their resources and expertise; DOTs should use these appropriately (Pennsylvania Transportation Institute).
- DOTs should regularly dialog with universities to communicate the DOT's needs.

Collaborate and develop mutually beneficial research scenarios

- Develop research that combines practical application with some theoretical—and publishable—component to help meet a university's needs for student theses and faculty publication.
- Involve universities in the ranking and prioritization process level as with Utah (a limited voting capacity as explained in Blaine Leonard's presentation).
- At the Pennsylvania Transportation Institute, UTC funding supports students, whereas DOT funding supports professors. This allows students to dig deeper in basic research while ensuring the DOTs receive practical results.
- Develop cooperative programs to provide practical work experiences for students and attract them to the transportation field.
- Closely integrate the DOT, UTCs and LTAP center.
- DOTs and university should jointly work to develop problem statements.

Needs Identification

Generating research ideas

- Identify strong project champions within the DOT to make sure the DOT's needs are being met and to support implementation efforts.
- Consider research ideas from both internal and external sources, but have DOT staff develop project scopes in detail.
- Keep track of unfunded needs and whether or not the research ideas remain important.
- Use an inclusive approach to project identification and project development. This builds confidence in the process and encourages participation.
- Hold a research summit with DOT staff (central office and regions), universities, and industry to brainstorm new ideas, celebrate successes, and better understand varying perspectives on research.
- Seek external funding and consider joint efforts with other states and federal agencies, especially in new areas, to leverage funds.

Prioritizing and selecting projects

- Address high-priority needs of the department by selecting projects that support the DOT's strategic or business plan and priorities defined by the director or CEO. Refer to current efforts under way at the Ohio DOT and Caltrans.
- Be proactive in pushing new initiatives, identifying emerging issues, and setting the research agenda.
- Maintain flexibility in the research office for making final funding decisions.

- Establish a balanced approach to project selection, considering projects based on performance needs and goals as well as program area needs.
- Don't program all available funding in each fiscal cycle. Leave a percentage of the budget available for unexpected, high-priority projects that arise throughout the year.
- Go after external funding and consider joint efforts with other state and federal agencies, especially in new areas, in order to leverage funds.
- Plan for the future by looking back at the research program's "strategic trail" – how research has supported and driven department priorities throughout the years.

Communicating about the process

- Communicate broadly and often with DOT staff about how to get involved, project funding decisions, accomplishments, etc.
- Communicate using a range of formats: e-mail announcements, internal newsletters, national newsletters, listservs, Web sites, print publications, staff meetings.
- Consider a database-fed Web site for publishing current project status and funding information (as used in SDDOT).

Focusing on implementation

- Plan for a project with the outcome in mind. What will you do with the results? How easily can they be implemented?
- Let senior leaders know in advance about research projects that will require their involvement/ permission for implementation.
- Create a proper expectation of what the outcome of a project will be (change in specification, confirmation of practice, product for distribution, etc.) so that projects that simply result in new knowledge haven't "failed".
- Identify an implementation "sponsor" on the front end.
- Identify implementation process/steps in the original problem statement.
- Require principal investigators to present opportunities for implementation at the end of a project.

Research Project Management

Add flexibility to the project initiation calendar

- Use methods to make DOT research funds available by the start of the university school year.
- Build flexibility into the program to allow for the addition of projects as needed.
- Be able to start a project at any time of the year.

Employ methods to encourage timely completion of research projects

- Put language into the contract precluding contractors from publishing if they fall behind schedule (or advise that their contract may be terminated if they still choose to publish).
- Retain the final payment until a final report is accepted.
- Use an invoice and payment structure based on milestones and task completion rather than time spent on a project.
- Increase the number of short-term projects to maintain interest in the projects and help keep them on schedule.

Employ methods to ensure quality results

- Have a dedicated editing and implementation staff.
- Keep a technical writer on staff for editing, or outsource the editing of the final report.
- Use a Report Quality Committee that includes engineers whose expertise is outside the technical area of the report.
- Allow electronic submission of progress reports.

Make research information and results widely available and accessible, both within and beyond the DOT

- Visually track projects using Gantt charts.
- Present research results to executive review board (SDDOT).
- Develop short, informational research notes (such as WSDOT – more information at http://www.wsdot.wa.gov/Research/Working/Notes.htm).
- Present papers at the annual TRB meeting.
- Use the transportation librarian to conduct literature reviews on research prior to initiating projects.
- Clearly articulate the roles in a research project for both the DOT and the contractor.

Formalize processes and roles to address closeout and implementation needs

- Include an implementation manager or implementation champions on the research team.
- Convene a Research Review Board to hear and respond to each recommendation for implementation.
- Hold a project closeout meeting with the head of the division.
- Formalize the implementation process with input from principal investigators and project managers.
- Include the implementation plan as part of the research project work plan.
- A highly involved technical panel will result in a high level of project success.

Measuring and Reporting Performance

Learn how to best measure performance

- Use just a few, simple performance measures.
- Assess the existing data at the DOT to see what can actually be measured for performance.
- Establish baseline measurements at the beginning of a project so that change at the end can be assessed.
- Use performance measurement to give the DOT tools for improvement and learn if the department's needs are being met; don't just measure for sake of measuring.
- Make use of the NCHRP Performance Measurement Tool Box (NCHRP 20-63).
- As one strategy, try to attain a target of improving "on time" and "within budget" performance by 10 percent each year, using the current FY as a baseline (LADOTD).
- Employ assessment, such as customer surveys evaluating the principal investigator, project manager and research office, as a means to improve the DOT.

Vigorously promote the value of research

- Select a small number of "winning" projects and publicize them widely.
- Report results with newsletters and Web sites.
- Demonstrate how library services pay off, such as cataloging DOT research reports and providing reference services, literature searches and news alerts.
- Show the economic value of the research to the state's economy.

Address implementation through the lifecycle of the project

- Identify in the implementation plan the criteria for measuring a project.
- Publish implementation bulletins.
- Use a project monitor to address implementation recommendations (SDDOT).
- Track the progress of implementation for a period of time after the research is completed.
- Involve industry stakeholders when forming implementation strategies.

Report Out to MDOT Executives

The peer exchange team wrapped up the conference with a report-out session with MDOT senior management. The following executives were present:

- Kirk Steudle, State Transportation Director
- Larry Tibbits, Chief Operations Officer
- Leon Hank, Chief Administrative Officer
- John Polasek, Bureau Director of Highway Development
- Myron Frierson, Bureau Director for Finance and Administration

Leni Oman briefly presented the visiting team findings from the exchange and invited questions from the management team. Refer to the two-page executive report in Appendix C.

Below are the questions raised by the management team, which provided a great opportunity for discussion with the visiting panel.

- What balance do you have in your research programs between "hard" side research (materials and construction) and "soft" side research (operations, policy, ITS, safety, etc.)?
- How do you manage the expectations of multiple universities in your state when all want to be prefe when the DOT wants research focused on its own needs?
- What are your thoughts on implementing Strategic Highway Research Program 2 (SHRP 2)?
- Do you have competition between universities and consultants for conducting research?
- How do you develop the programs in smaller universities and give them a share of the research dollars?
- What percentage of your program funding is with State Planning and Research (SPR) dollars?
- How large are your staffs that maintain your research programs?

Takeaways and Future Actions to Consider

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Marci Kenney, FHWA–Washington, D.C.

- Include statistical analysis training and professional/managerial development as part of the engineering curriculum; revamp NHI's scientific methods course with the help from the American Association of State Highway and Transportation Officials' (AASHTO's) Research Advisory Committee (RAC) and Standing Committee on Research (SCOR).

Mark Dunn, Iowa DOT

- Develop a "basic" research add-on to help meet university needs in a DOT project (Utah).
- Carefully match the project investigator and the research needs, using consultants where more appropriate (Pennsylvania Transportation Institute).
- Survey university faculty on whether the work the DOT provides is professionally rewarding (South Dakota).
- Prior to the RFP process, develop needs through the technical advisory committee.
- Create a proper expectation of what the outcome of a project will be. Don't fail to deliver what you never intended to.
- Publish a project capsule indicating approved projects and detailing their objectives, cost and duration.
- Tout a few "winning" research projects rather than trying to demonstrate great success in all projects.

Mark Morvant, Louisiana DOTD

- Explore prequalification of researchers.
- Investigate Pennsylvania State University's ITC program for master's degrees through distance learning.
- Provide research articles to the employee newsletter.
- Use Mn/DOT's list of implementation guidelines for project development.
- Consider task-dependent invoices and payments.
- Consider not allowing researchers to publish if their contracts are behind schedule.
- Try to use longer-term trends and running totals rather than single-year comparisons when comparing performance measurements.

Dave Huft, South Dakota DOT

- Look at the use of standard or cooperative agreements and reduced indirect cost rates.
- Further emphasize collaboration between state universities as well as with consultant and out-of-state universities.
- Ask SDDOT management what time horizon the research program should address.
- Review SDDOT's project selection process to identify unnecessary steps or approvals.
- Look at reporting program status by topical areas, to promote strategic perspective.
- Master agreement could help coordinate research.
- Inquire about the status of National Highway Institute's (NHI's) Scientific Methods course.
- Rather than a flat 10 percent retainage, consider 10 percent or $10,000.
- Develop "technical notes" describing what the DOT is planning on doing with the research.
- Build a stronger implementation plan with more detailed descriptions of implementation steps and resource needs.
- Improve quarterly program status reports by using a graphic format, such as Microsoft Project.
- Continue to transition to the NCHRP Performance Measurement Tool Box for performance measures.
- Improve the implementation plan format by including a task list, timeline and measurement criteria.

Blaine Leonard, Utah DOT

- Bring a faculty member into the DOT on sabbatical to undertake specific, focused work on a DOT need.
- Consider organizing brainstorming sessions around the department's strategic goals.
- Use the project database to find information on projects that were conceived but not executed.
- Senior leaders need to know in advance about research projects that will require their involvement/permission for implementation. Our approval process (or lack thereof) doesn't provide this information to them.
- Find outside help for the review and editing of reports.
- Consider creating "Research Notes" (WSDOT).
- Propose more formal procedures for the project closeout process.
- Survey the principal investigators to collect their input on the DOT's performance and learn how they think the DOT can improve.

Leni Oman, Washington State DOT

- Consider funding for basic research (Iowa) or seed money for topics on transportation innovation and research exploration ($30K maximum for LADOTD).
- Ensure the Washington Transportation Center (TRAC) agreement has clear guiding principles.
- Reminder to communicate the funding decisions (see South Dakota database-fed Web site).
- Require technical advisory committees.
- Closely track progress of committees and expert panels (LADOTD).

- Add the funding source and amount to research notes.
- Continue to investigate rotating DOT staff.
- Conduct formal closeout meetings, inviting research advisory council members. Document implementation intentions and the rationale behind them.
- Consider conducting a customer survey.

André Clover, Michigan DOT

- Look into possibilities for creating multi-state (Michigan universities and other state universities) and multiple in-state (State of Michigan) university collaboration agreements.
- Look into what key success factors should be considered when establishing performance measures.
- Determine and differentiate between those performance measures that should fall under "program administration/management" versus those under "project management".
- Determine each state university's current and/or future interest in research.
- Determine a model or plan for aligning department's research needs/interests to the research potentials/capacities of Michigan's many universities.
- Look at multi-state and university consortia.
- Consider developing performance measures relating to project and problem statement identification.
- Revisit MDOT's contracting processes, including: procurement (for materials, equipment and service), consultant services contracts and other research contract processes.
- Explore the idea of precluding researchers from publishing if their work is incomplete.
- Differentiate the criteria defining success at the program level versus the project level.

Sudhakar Kulkarni, Michigan DOT

- Consider a consortium between the DOT and the universities to secure additional funding sources (PennDOT, Louisiana's LTRC, Iowa).
- Look at how universities help manage research contracts (Iowa).
- Jointly fund faculty positions (50/50 funding between Iowa DOT and university).
- Engage in cooperative efforts between universities (Pennsylvania Transportation Institute).
- Encourage ongoing dialogue between the project manager and the principal investigator to generate new ideas for problem statements.
- Hold a broad-based call for research throughout the DOT and among stakeholders.
- Publish a list of all problem statements received and funded online.
- Keep the university business cycle in mind during the DOT's program and project approval cycle.
- Measure performance according to how well a project is on time and within its budget.
- Promote research as a tool to solve real problems and help staff with their day-to-day responsibilities.
- Enact demonstration implementation projects to further prove research results.
- Keep the university business cycle in mind during the program development and approval process.
- Plan for implementation of research results.

Angela Nelson, Michigan DOT

- Investigate collaborative efforts between universities and consultants.
- Evaluate whether or not the research is "applicable" rather than implementable.
- Include the potential for implementation as part of the problem statement. Set proper expectations of project outcomes.
- Consider providing an incentive to the Transportation Service Centers for inputting project data into a research database.
- Conduct regular customer satisfaction surveys at both the program and project level.
- Take credit for successful projects conducted over the past 3–5 years.
- Find the "common denominator" behind successful research projects.
- Pilot the use of the NCHRP Performance Measurement Tool Box.
- Look at the payoffs and benefits-to-costs of successful use of the library.
- Align research performance measures with policy measures.
- Add the DOT's intended use of a project to the project's scope.
- Add to the implementation plan how implementation performance will be measured.
- Market the DOT's successes at larger scale meetings.

Alexandra Briseno, Michigan DOT

- Work with universities for the mutual benefit of the DOT and the universities. For example, incorporate basic research components into projects to help meet the universities' research needs.
- Move toward electronic reporting and posting of data.
- Withhold funding for projects that are not completed on time or not up to MDOT standards.
- Recognize that challenges exist for all state research programs for measuring performance.
- Use Web statistics as a metric for performance (WSDOT).

Don Cameron, FHWA–Michigan

- Make sure the research program is responsive to strategic goals. It can help them to be more inclusive (get beyond materials) and help outside and internal proposals address items important to the state DOT.
- Communicate broadly.
- Have a strong internal champion.
- Find a good balance between simplicity and having control of program in approval process.
- Separate and define management functions: administrative, technical, implementation, publication, champion, etc.
- Specify in a contract that the final report is due three months prior to the project end date.
- Make expectations clear: a DOT will get quality if it demands it.
- Keep technical managers involved in operations in their functional areas.

Appendix A: *Agenda*

Monday, December 3

6:00 p.m.	Team dinner and introductions

Tuesday, December 4

7:30–7:50 a.m.	Breakfast provided in the meeting room	
7:50–8:00	Welcome and introductions–Calvin Roberts, Michigan DOT	
	Agenda overview–Leni Oman, Chairwoman	
8:00–12:00	**Panel Presentations on Research Program Development**	
	8:00–8:45	André Clover, Michigan DOT
	8:45–9:10	Dave Huft, South Dakota DOT
	9:10–9:35	Mark Dunn, Iowa DOT
	9:35–10:00	Mark Morvant, Louisiana DOTD
	10:00–10:15	Break
	10:15–10:40	Leni Oman, Washington State DOT
	10:40–11:05	Blaine Leonard, Utah DOT
	11:05–11:30	Marci Kenney, FHWA–Washington, D.C.
	11:30–11:55	John Mason, Pennsylvania State University
12:00–1:00 p.m.	Lunch as a group in the meeting room	
1:00–3:00	**Focus Area 1:**	**Needs Identification**
	1:00–2:50	Facilitated round robin questions and discussion with panel
	2:50–3:00	Break
3:00–4:30	**Focus Area 2:**	**University Partnerships**
	3:00–4:30	Facilitated round robin questions and discussion with panel
4:30–5:00	Recap of day including feedback and takeaways	
5:00	Adjourn	

Wednesday, December 5

7:30–8:00 a.m.	Breakfast provided in the meeting room	
8:00–8:15	Welcome and overview of agenda for the day	
8:15–12:00	**Focus Area 3:**	**Research Project Management**
	8:15–8:35	Sudhakar Kulkarni, Michigan DOT
	8:35–8:55	Mark Morvant, Louisiana DOTD
	8:55–9:15	Leni Oman, Washington State DOT
	9:15–9:35	Blaine Leonard, Utah DOT
	9:35–9:55	Dave Huft, South Dakota DOT
	9:55–10:10	Break
	10:10–10:30	Marci Kenney, FHWA–Washington, D.C.
	10:30–10:50	Mark Dunn, Iowa DOT
	10:50–12:00	Round-table discussion
12:00–1:00 p.m.	Lunch as a group in the meeting room	
1:00–3:30	**Focus Area 4:**	**Measuring and Reporting Performance**
	1:00–3:15	Facilitated round robin questions and discussion with panel
	3:15–3:30	Break
3:30–4:30	Recap of the two days, including feedback and takeaways for the report	
4:30–5:00	Discuss plan for report out to MDOT managers	
5:00	Adjourn	
6:45	Meet in the hotel lobby for driving to the team dinner	

Thursday, December 6

7:30–8:00 a.m.	Breakfast provided in the meeting room
8:00–8:15	Welcome and overview of agenda for the day
8:15–9:45	Finalize report and develop one-page summary
9:45–10:00	Break
10:00–11:00	Panel presentation to MDOT managers
11:00–11:30	Final thoughts
11:30	Box lunches for team in the meeting room

Appendix B: *Focus Areas and Questions*

Program Development (Presentations by panel members on day 1)

- How have you transformed your program and what caused you to make this transformation?
- How have you initiated and developed a move in a new direction?
- What obstacles did you face?
- What strategies did you find successful?
- What benefits do you see in managing your program the way you do?
- What challenges do you still face?
- What is your shining star, your most noteworthy program element?

Needs Identification (Round-table discussion with panel members on day 1)

Highest priority questions

- How do you apply your research funds? Who makes these decisions in your organization?
  - State/regional/national projects
  - Short-term vs. long-term projects
  - Projects on construction, policy, safety, operations, ITS, etc.
- How does your organization establish/develop its short-/long-term research strategic objectives?
- To what extent do your research projects align with your department's strategic needs?
- To what extent do you include implementation planning in your project development and funding processes?
- How do you communicate about your processes and programs?

Lower priority questions

- How do you select which projects to fund?
- Who do you go to for research ideas: DOT headquarters staff? Regional staff? Universities? DOT managers? Industry representatives? Others?
- At what time frequency (years) does your organization perform a formal solicitation for research? What is your rationale for this?
- What process do you follow for generating research ideas?
- To what degree does your organization give consideration to research projects initiated through a University Transportation Center (UTC) and/or a Transportation Pooled Fund (TPF) solicitation?
- How do you tap research expertise in your state, region and nationally?

University Partnerships

(Round-table discussion with panel members on day 1)

- What agreements do you have with your state universities for conducting research projects?
- Do you work only with universities in your state? Do you work only with universities and not consultants?
- How do you make sure you have a win-win working relationship?
- What rationale do you use to leverage (proper balance) program between university contracted research (Federal/State funds), UTC grants (Federal, and State/Local match), and TPF funds (100 percent Federal).
- What agreements do you have with your state universities for managing your research projects?
- How do you include the universities in your research process?
- What advantages do you see in working with your state universities?
- What challenges have you had in working with the universities?

Research Project Management

(Presentations by panel members on day 2)

- Who is responsible for overseeing your research projects?
- Do you handle contracts within your research program or with the help of another office in your department?
- How do you address ownership of the research reports and other products of the projects within your contracts?
- Who within your organization is involved in the technical oversight of the research? How is that person(s) selected? Does your research staff participate in project meetings?
- What software tools do you use to track the lifecycle of your projects?
- To what extent do you standardize the presentation of your final reports? Do you edit them once you receive them from the investigator?
- How do you select which investigator will conduct the research?

Measuring and Reporting Performance

(Round-table discussion with panel members on day 2)

- How do you know if your research project was successful? What performance measures do you use? What units of measure are considered for Cost/Benefit ratios?
- How do you define implementation?
- What steps do you take to implement the results of your projects? Is funding available for implementing research? If so, is it considered part of the original research project/contract or under handled under a separate project/contract?
- What is the average project life (yrs.) and cost ($) of your typical research project?
- What steps have you taken to improve on-time completion of your projects?
- How do you report on the results of your projects?

Appendix C: *Report Presented to MDOT Executives*

Visiting team members

- Leni Oman, Washington State DOT (Chairwoman)
- Mark Dunn, Iowa DOT
- Mark Morvant, Louisiana DOTD
- Dave Huft, South Dakota DOT
- Marci Kenney, FHWA–Washington, D.C.
- Blaine Leonard, Utah DOT
- John Mason, Pennsylvania State University

MDOT Strengths

- Willingness to examine its program in depth and make change.
- Proposed program is well thought out and provides a strong foundation.
- Emphasis on pursuing a broader range of research topics beyond just materials and construction.
- Core ORBP staff has a good mix of skills and is committed to responding to senior management expectations.
- Reinvigorating the library will produce added value for the department.
- Access to six excellent universities, including two UTCs with available funds, to conduct research and other activities for the DOT.
- Support of the FHWA Division office for program changes.
- Strong interest in research among MDOT's technical staff outside of ORBP.
- Consistent stream of federal dollars.
- Reputation for credible research that is regularly used by other states. Good e-mail distribution of research reports.
- Michigan has a very vibrant transportation research community that includes partnerships among MDOT, universities, consultants and industry.

Opportunities for MDOT

- Develop a culture of innovation, cooperation and accountability in transportation research.
- Capitalize on research resources through a single DOT vision in which ORBP is a clearinghouse for research throughout the department.
- Position ORBP to market research successes and become MDOT's research champion.
- Demonstrate the role of ORBP in providing service and support for all agency research.
- Understand work being done by the regions and the benefits they can provide to the process.
- Effectively engage the bureaus, regions and TSCs in defining research opportunities.
- Address ORBP staffing needs to provide adequate oversight, quality assurance and implementation tracking. Consider hiring in-house staff or outsourcing.
- Ensure MDOT research meets the strategic needs of the department.
- Maintain an emphasis on efficiency in fully defining the new program management structure, being cautious about creating too much process.
- Encourage ownership of the research program by senior management and recognition of the value of research.
- Include an introduction to research and library services in new employee orientation.

University Partnerships

- Educate the universities about MDOT's critical research needs as they relate to the strategic goals of the department.
- Develop a cooperative agreement that meets the needs of both the DOT and the university.
- Partner with departments beyond civil engineering to conduct a wide range of multi-modal research.
- Utilize universities as both educational/training and research partners.
- Leverage UTC funding and cost-sharing opportunities.
- To further define the role and mission of the Transportation Research Institute of Michigan, look to the successes and challenges of similar consortiums in other states.

Needs Identification

- Fund research projects based on strong proposals that address high priority needs of the department.
- Maintain funding flexibility in ORBP for responding to research requests throughout the year.
- Communicate broadly and often about MDOT research activities and how to participate, using state and national newsletters, listservs and Web sites.
- Pursue external funding and joint efforts with other states and federal agencies to leverage research dollars.

Project Management

- Establish dedicated research managers (additional staff needed) to provide oversight, quality assurance and implementation tracking.
- Develop a project-tracking database of all research proposed, funded, in progress and completed.
- Include regional DOT staff and TSCs on project oversight committees.
- Enlist help in managing the timely submission of invoices and deliverables and in editing the final reports. Consider hiring staff or outsourcing work to the Centers of Excellence.
- Look for efficiencies in contracting to quickly bring in qualified principal investigators. Better coordinate research award cycle with the academic calendar.
- Consider policies that encourage on-time completion of projects.

Performance Measures and Reporting

- Develop performance measures that work for the business needs of the department. Look to other states, NCHRP's Performance Measures Toolkit and input from department staff and other stakeholders.
- Highlight research success stories for senior management and the public to demonstrate the value of research, raise the status of research in the department and increase participation and support.

Appendix D: *Participant Contact List*

Visiting Team

Leni Oman (Chairwoman)
Director,
Office of Research and Library Services
Washington State
Department of Transportation
310 Maple Park Avenue S.E.
P.O. Box 47372
Olympia, WA 98504-7372
360-705-7974
OmanL@wsdot.wa.gov

Mark J. Dunn
Operations Research Engineer
Research and Technology Bureau
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010
515-239-1447
Mark.Dunn@dot.iowa.gov

Dave Huft
South Dakota Department of Transportation
Office of Research
Becker-Hansen Building
700 E. Broadway Avenue
Pierre, SD 57501
605-773-3358
Dave.Huft@state.sd.us

Marci Kenney
Federal Highway Administration
(recently retired)
820 W. Seminary Avenue
Lutherville, MD 21093
410-337-0896
bluejay7879@yahoo.com

Blaine D. Leonard
Research Program Manager
Utah Dept of Transportation
Research Division
P.O. Box 148410
Salt Lake City, UT 84114-8410
801-965-4115
bleonard@utah.gov

John Mason Jr.
College of Engineering
Office of Graduate Studies,
Research & Outreach
The Pennsylvania State University
101 Hammond Building
University Park, PA 16802-1400
814-865-4542
jmason@engr.psu.edu

Mark J. Morvant
Associate Director, Research
Louisiana Transportation Research Center
4101 Gourrier Avenue
Baton Rouge, LA 70808
225-767-9124
MarkMorvant@dotd.la.gov

MDOT Planning Team

Calvin Roberts
Engineer of Research & Best Practices
517-241-2780
ROBERTSC@michigan.gov

Sudhakar Kulkarni
517-322-5670
KULKARNIS@michigan.gov

André Clover
517-322-5683
clovera@michigan.gov

Angela Nelson
517-241-2780
nelsonan@michigan.gov

MDOT ORBP Mailing Address
Office of Research & Best Practices
Michigan Department of Transportation
State Transportation Building
425 W. Ottawa Street
P.O. Box 30050
Lansing, MI 48909

Patrick Casey, CTC & Associates LLC
608-345-8601
pat.casey@ctcandassociates.com

Kim Linsenmayer, CTC & Associates LLC
608-628-3806
kim.linsenmayer@ctcandassociates.com

Brian Hirt, CTC & Associates LLC
402-770-9067
brian.hirt@ctcandassociates.com

CTC Mailing Address
CTC & Associates LLC
Technical Communications Consultants
4805 Goldfinch Drive
Madison, WI 53714

Michigan Department of Transportation

Providing the highest quality integrated transportation services for economic benefit and improved quality of life.

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