Peer Exchange
Final Report

Missouri Department of Transportation
Research Peer Exchange
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Organizational Results Unit
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Introduction

Under 23 Code of Federal Regulations 420.209 (a)(7), as a condition for approval of FHWA planning and research funds for research activities, state transportation agencies are required to conduct peer exchanges on a periodic basis. The objective of the peer exchange program is to give these agencies a means to improve the quality and effectiveness of their research management processes. A peer exchange is a practical and effective tool to foster excellence and provide an opportunity for panelists to share best practices and management innovations with each other.

The basic approach is to invite an outside panel of managers to meet with the host agency to discuss and review its management process or a specific focus area. Information on the host agency's policies and procedures is shared with panel members in advance of the meeting. During the peer exchange, panel members may meet with managers, staff, stakeholders, and customers to gain further insight into the host agency's program. The information gathered from the exchange is documented in a written report and presented to agency management.

Peer Exchange Process

The Missouri Department of Transportation (MoDOT) hosted a Research Peer Exchange March 5-7, 2007. The invited members of the Peer Exchange Team included:

- Ms. Mara Campbell-Director Organizational Results Director, Missouri Department of Transportation
- Ms. Sue Lodahl-Director of Research Services, Minnesota Department of Transportation
- Ms. Leni Oman-Director, Office of Research & Library Services, Washington State Department of Transportation
- Mr. Andrew C. Lemer, Ph.D-Cooperative Research Programs Transportation Research Board
- Mr. Gary Frederick-Director, Transportation Research and Development New York State Department of Transportation
- Ms. Angela B. Rolufs-Interim Director, Missouri Transportation Institute University of Missouri-Rolla
- Dr. K. Krishnamurthy-Vice Provost for Research University of Missouri-Rolla
- Mr. Mark R. Virkler-Professor and Chair, Department of Civil and Environmental Engineering University of Missouri-Columbia
- Mr. Peter Clogston-Federal Highway Administration-Missouri Division
- Mr. Timothy Klein- USDOT/Research and Innovative Technology Administration

To prepare for the peer exchange the team received documentation describing MoDOT's research procedures:
- various MoDOT Organizational Results (OR) documents, newsletters, and annual report for 2006,
- a tentative meeting agenda, and
- travel details.

After the team arrived, they received the following information:

- a detailed agenda,
- a packet containing project information for MoDOT's research program,
- general information on MoDOT's research program,
- a midyear progress report for MoDOT's research program,
- MoDOT's Strategic Research Vision,
- a partnering newsletter, and
- a copy of MoDOT's Missouri Quality Award Application.

During the exchange, team members shared information about their programs. Time was provided for independent observations and discussion with the following MoDOT staff and researchers via group interviews:

MoDOT Executive Leadership

- Pete Rahn-Director,
  Missouri Department of Transportation
- Kevin Keith, P.E.-Chief Engineer

Other Participants

- Dr. Ernie Perry-Organizational Performance Administrator
  Missouri Department of Transportation
- Mr. Bill Stone-Organizational Performance Administrator
  Missouri Department of Transportation
- Dr. John Meyer-Interim Director, University Transportation Center
  University of Missouri-Rolla

Organizational Results Overview

MoDOT's Organizational Results is responsible for working with department managers to close performance gaps. This includes coordination of research, development and implementation of business, policy and engineering solutions from strategic direction to individual processes. Special attention is given to identifying best practices, technologies and new products to drive organizational performance.

Focus Issues

MoDOT's Organizational Results identified four critical focus issues for this peer exchange:

- identifying research needs,
- conducting external research and the role of the Missouri Transportation Institute,
- implementing research results throughout the DOT, and
- partnering with national university transportation centers, especially the newly-designated National UTC at the University of Missouri-Rolla (UMR)

Findings

From its review of documentation and group interview process, the peer exchange team made numerous observations regarding the four focus areas. In addition, the team offered the following general observations.

- The research program at MODOT has been reengineered over the last two years and is clearly tied to continued organizational development and logical, rapid changes in programs.
- The unique combination of best practices, performance measures, market research, quality innovations and basic and applied research in one office facilitates this philosophy and practice. This demonstrates the opportunity to leverage the benefits of strong linkages between these functions in organizations.
- Program staff are engaged and excited about the program.
- The Organizational Results staff is recognized as the "go to" people for assistance with change.
- There is executive level leadership, direction and involvement in Organizational Results.
- There are clear organizational expectations and incentives for performance.
- The program has done substantial work to market research activities and accomplishments in the context of department needs. Publication readability has improved.

Focus Issue 1 – Identifying Research Needs

<u>*Strengths*</u>
- The buy-in from executive management for research need identification is in alignment with the MoDOT mission.
- There is a clear Strategic Research Vision.
- There is a strong prioritization process.
- Senior management champion is required for research projects and the senior management team drives prioritization of research projects.

<u>*Weaknesses*</u>
- The current commitment is to short-term research projects, which causes university concern over the lack of traditional long-term research opportunities.
- Communication between researchers and end-users is limited.
- Limited methods to institutionalize program processes.
- Research staff are limited as other OR activities increase.

<u>*Opportunities*</u>
- Research need identification can improve as the research plan is further refined for the next several years.
- Research need identification can improve as MoDOT expands its use of research forums with private industry, FHWA, universities, and others to brainstorm research ideas and identify gaps.
- Research identification can improve as MoDOT develops statewide meetings within MoDOT to reach target audience and all staff.
- There is limited communication with research proponents on research timelines.

Focus Issue 2 – Conducting External Research and the Role of MTI

<u>*Strengths*</u>
- The facilitation and administrative role of MTI is intended to be a one-stop shop for MoDOT for connecting with researchers.
- MTI links the right people together.
- MTI provides third party 'neutral' contractor selection.
- MTI is developing an expertise directory.
- MTI provides one administrative organization to reach out to nine different universities.

<u>*Weaknesses*</u>
- Universities are not structured to address quick turnaround research.
- While there are provisions for recalling work to MoDOT and soliciting researchers from other states or organizations, the MTI process stays within Missouri.
- The process is for the most part untested. It is also unclear how MTI helps facilitate a best fit to meet this need or the established process for 'quick hit' problems/projects.
- Current limited staff to administer MTI is a risk to program success.
- While MoDOT is supportive of the concept of MTI, there is very limited funding committed to MTI to support research activities to fit university capabilities.

Opportunities
- Partners within the consortium need to find benefit from the MTI process.
- Consortium members should maximize their research expertise and leverage national research funding/partnering opportunities.
- MTI needs to seek out other sources of revenue so that the organization is not solely dependent upon MoDOT's research program for funding of MTI's administrative costs.
- MTI and MoDOT should investigate how research is funded at other state DOT's in order to set a benchmark for successful delivery of MoDOT's research program at the most efficient cost.
- MTI should clearly demonstrate success by solving transportation problems.
- There is an opportunity to establish a strong working partnership between MTI and the UTC at UMR to leverage resources.
- MoDOT could reach out to students through MTI to stimulate workforce development.
- MTI could conduct technical synthesis projects for MoDOT.
- External research could improve by developing an expertise directory for quick response and longer range research
- MTI could expand its development of MTI assistance in workforce development, professional development and training.
- Use MTI as a source to envision the workforce of the future. Consider how to get educational opportunities to students to attract them to the field of transportation.

Focus Issue 3 – Implementing Research Results Throughout the DOT

Strengths
- TRACKER includes an update on performance of Organizational Results progress. MoDOT's TRACKER is a document that is produced quarterly and is a tool to assess how well MoDOT is delivering products and services.
- Research projects have a champion who can help facilitate implementation.
- Buy-in on research from top management helps facilitate implementation.
- Criteria for project selection includes consideration of whether results are likely to be implementable.

Weaknesses
- Communication of research outcomes may not be reaching technical staff.
- Implementation plans and potential funding needs are not identified at the beginning of the research process.
- The effect of quick research on the long-term program outcomes is not monitored or documented.

Opportunities
- Develop more buy-in from upper level management on implementation recommendations and recognition of results.
- Develop more opportunities to market implemented research.
- Use past research as a marketing opportunity (even if it wasn't strategic, it may have been relevant and show success).
- Develop implementation plan element for research problem statements.

Focus Issue 4 – Partnering with National University Transportation Centers

Strengths

- Missouri has a National UTC located at UMR, one of MTI's partner universities.
- It is clear to the Peer Exchange Team that the MoDOT, MTI, FHWA, and UMR National UTC partners are talking about collaborative opportunities.
- The UTC at UMR currently matches LTAP funding in Missouri.

Weaknesses

- Communications between MoDOT and UMR need to be improved.
- Transition and turnover at UMR and MTI has slowed working relationships from developing.
- Projects/program have not been initiated under the UMR National UTC, US DOT RITA is currently reviewing the strategic plan.

Opportunities

- Recent program and staff changes provide an opportunity to establish a better partnership between FHWA, MoDOT and UMR National UTC.
- Consider developing a formal partnership to document expectations and processes.
- MTI has leverage to partner with the UMR National UTC.
- Collaboration can help Missouri pursue major projects, including conducting Transportation Pooled Fund (TFP) projects of MoDOT interest, funding from which would apply to the UTC match requirement.
- MoDOT, UMR and MTI collaboration may streamline research selection and contracting processes.
- This collaboration could enhance workforce development.
- Missouri Economic Development Department should be included to evaluate the benefit of the National Center and other transportation research funding to Missouri.

Opportunities for Application by Team Members

New York State Department of Transportation
- Emphasize the importance of executive level support and direction (MODOT).
- Pursue LTAP funding from other sources (MNDOT).
- Consider using the NCHRP scoring format (0-5) for NYSRAC ranking of research proposals (WSDOT).
- Look into quick response research as a formal part of the university research process (MODOT).
- Review workings of NYSDOT consortia against the workings of MTI (MODOT).

Minnesota Department of Transportation
- Discuss with Division Directors the unique organization of Performance Measures, Market Research, and Best Practices teaming with RSS.
- Promote positive results from research. Become an office that people come to solve problems.
- The research section in Mn/DOT is buried in the Mn/DOT organization. Need to emphasize the need for executive level and support and direction in Mn/DOT.
- Consider internal RSS review of research proposals before office reviews.
- Encourage innovation by industry and contractor groups without necessarily providing increased funding.
- Improve working relationship with UTCs beyond state boundaries.
- Look into more quick hit research – solve short-term problems.
- Share the fundamental need for long-term research at a national level compared to the need for short–term research at a state level.
- Take from MoDOT, biannual reporting in addition to the annual reporting.

Washington State Department of Transportation
- Add the value of NCHRP projects to agency participant's spreadsheet (NYDOT).
- Increase the internal review (Research Staff review) of research ideas before submitting them for final review by RACs/REC (NYDOT).
- Formatting for annual accomplishments (MODOT).
- Develop incentives program for innovative ideas (MODOT).
- Seek support of Leadership Team in directing staff to ORLS for investigative support (MnDOT).
- Development of an expertise directory – ask Vice Provosts (MTI).
- Develop list of faculty interested in quick turn around research (MTI).
- Use MnDOT LRRB experience to reconsider local government involvement (MnDOT).
- Revisit the 'simplified' goal statements, such as those of MnDOTs, with the REC (MnDOT).

National Cooperative Highway Research Program/Transportation Research Board
- The NCHRP (and other CRPs) and other national programs are most useful as means for addressing longer term research questions, e.g., looking at more fundamental questions. DOT research programs are necessarily dealing with short-term (6 months and less) questions involving selecting new technologies and adapting them to the state's needs. There is then an important role to be played by the national programs and university researchers in assessing the outcomes of states' actions to advance the aggregate state of knowledge.
- The CRP process has been useful to MODOT (and others), as a model for soliciting research needs, developing research project ideas from those needs, prioritizing among project ideas to develop annual and longer-term programs, and implementing those programs.
- There is a concern regarding the appropriate redundancy of research being conducted in various places, e.g., the degree to which any particular question has already been addressed or is currently being addressed by others. The TRIS system, for example, helps to address this concern, as does personal contact with staff at TRB and other states' agencies, but the concern lingers. There may be value to a national-level assessment of the redundancy in transportation research and the consequences of this redundancy.

Missouri Transportation Institute
- Reassuring to see that all have similar concerns about differing expectations between research institutions and state DOT's – defining the problem will help lead to solutions.
- Include implementation plan in project needs statement – begin with the end in mind.
- Investigate an incentive program for researchers whose research projects are implemented by MoDOT.
- Incentives for MoDOT Technical POCs when their research idea is implemented – "buy in".
- Interesting to note that WSDOT is engaged in 27 pooled fund projects, and is project lead on 9 projects – learn how MTI can help MoDOT play a larger role in pooled-fund projects.
- Interesting range of sole-source work limits – explore whether the $25,000 limit identified by MTI is the correct limit.
- Surprising range of dollar investment in research from state-to-state – can MTI play a role in the future in expanding dollars set-aside for research?
- Synthesis projects vs. research projects – how can MTI help handle these requirements separately and most efficiently?
- Minnesota Local Roads Research Board – what can MoDOT, MTI, LTAP learn from Minnesota's program?
- Explore how MTI can play a larger role in bringing training to the MoDOT work force – expand LTAP training programs?
- Minnesota's Academic Research RFP – could MTI use this for assistance in identifying strengths of consortium members?

University of Missouri-Columbia
- Perhaps we can encourage faculty to meet MoDOT's needs for implementing results by creating an award (certificate) when research results are implemented and positively affect MoDOT's performance by reducing costs or improving system performance. Every faculty member wants resume items to place under "Honors and Awards." Having a positive impact on the profession (e.g., in engineering) can have a positive impact on promotion and tenure and other evaluation settings. This award should be for a significant contribution, not just because the final report was submitted.
- Perhaps MoDOT can reward MoDOT staff who succeed in implementing research results that add value to MoDOT performance. These employees might be technical liaisons or those who were not directly involved in the research but have to take significant steps, or go out on a limb, to implement results.
- Future staffing decisions for MTI will be critical to success. What skills and personnel need to be added?
- Keeping the university research process open, fair, and on a level playing field is critical to university cooperation through MTI.
- For longer-term research problems, having the long-term plan for research filled out as much as possible will be helpful

National University Transportation Center, University of Missouri-Rolla
- MoDOT's interests are in fast, practical research projects; long-term research projects are more suitable at the national level.
- State DOTs represented at Peer Exchange use different mechanisms to collaborate with University Transportation Centers.
- New processes being planned by MTI were well received by Peer Exchange members.
- Develop incentives for success.
- Pursue collaborating opportunities with MoDOT and FHWA.

Research and Innovative Technology Administration
- State DOT and university frustration over unclear/sometimes conflicting roles of national, state and university researchers continues; need to work at national level to define scope of various programs and avoid real/perceived "overlap."
- Education, training and workforce development continues to be a significant need for state DOTs, seen as an unmet opportunity for many UTCs. Consider how to encourage the "other" goals of the UTC Program (education, technology transfer) in support of system improvements.
- Range of definitions of "research" continues to cause confusion – problem solving, literature searches, syntheses, evaluation, technology transfer and implementation, process improvement, long term studies (basic), "hard" v. "soft" – which are "legitimate?" Does it matter?
- Consider roles of UTCs as "extension of DOT staff." Is there a role for the National UTCs as resources conducting ongoing syntheses? How could this be funded?
- Can RITA and FHWA utilize FHWA Division Office experts to help guide/oversee UTC activities?

Federal Highway Administration – Missouri Division

- The value of the Pooled Fund Program was highlighted. WSDOT has a good method of showing how their relatively small investments in numerous pooled fund projects leverage significant research investments when combined with the other participating entities. FHWA should strive to continuously improve the administration of the program. The states would like to see the full implementation of the new funding process that FHWA developed into a draft process. The pooled fund program may provide a means for MTI, working with MoDOT, to expand their reach beyond Missouri.
- Concerns were expressed about the broad variation among FHWA Division Offices in how they provide guidance and interpretation to the states in carrying out the SPR Part II. It would be beneficial for FHWA to provide more consistent guidance. One suggestion is to have a series of FHWA-initiated web meetings involving FHWA and state personnel.
- FHWA's new efforts to coordinate more closely with the UTC program and individual centers, seems to be welcomed. The FHWA Division Offices may be able to assist RITA in the oversight of the individual UTCs. The FHWA Missouri Division Office would be willing to try this if RITA is interested in pursuing.
- Technology transfer, including research implementation, is very important to MoDOT, FHWA, MTI, the UTC at UMR, and the LTAP at UMR. If all of these entities could work together in a more unified fashion, the results for the transportation system in Missouri could be very significant.
- Concern was expressed that technology transfer discretionary funding from FHWA, e.g. Highways for LIFE, doesn't come with additional obligation authority. The result is that the states don't really get additional federal funding.
- There is a desire from the states that the FHWA have a single point of contact for FHWA-led research activities in both HQ and Division Offices. STEP was given as an example of a new FHWA research program that didn't come through the normal FHWA research channels.
- There was a consensus feeling that some very important national transportation issues seem to get researched too long before some of the emerging technologies are actually tried or demonstrated in real transportation applications. Congestion and value pricing were given as examples. Can't some of the significant research funding be used for early implementation and demonstration projects?
- The FHWA Missouri Division Office values the close working relationship with MoDOT's Organizational Results unit and highly commends Mara Campbell's leadership of the unit.

Missouri Department of Transportation
- In order to ensure continuity of operations, OR should consider supplementing management support and direction with a senior advisory panel that buys-in on the program and brings support to the program in addition to individual project support.
- Because our research is driven from management, OR should also consider other sources of problem identification such as mid-level managers who may bring a different perspective to research needs. There is also an unmet need at the MPO and RPC level (local) to utilize MTI and the UTC to support research and development at these levels.
- MoDOT is fortunate to have such fantastic management support for our research program. OR should capitalize on this support by moving part of this focus to implementation efforts and funding.
- OR should begin identifying implementation plans at the beginning of a research project.
- OR should better define criteria for success on each research project. This will allow university staff to address criteria beyond publishing a report.
- A rewards program (certificate or plague) for PIs with successful projects could help bring about greater acceptance of transportation research in the academic world. OR is setting this up now.
- OR should further investigate the issues associated with implementable short-term research needs of MoDOT and the interest of universities to conduct more long-term research projects.
- At MTI and MoDOT - professional staff size will eventually limit program size; both groups are operating near capacity.
- MoDOT is not utilizing our UTC to the degree we should. MoDOT, MTI and the UTC should explore and expand partnering activities immediately.
  - OR should evaluate the UTC role in pooled fund study as participant and researcher.
  - OR should evaluate the possibility of cross-funding more projects with the UTC.
- OR should look into more training and continuing education opportunities with the UTC and MTI
- OR should use the UTC and MPO and RPC levels to expand the reach of our research.
- Utilize universities for more of our training.
- The peer exchange process was worthwhile for all involved. In as much as MoDOT derived value, the other participants were most intrigued by our mix of research and performance related activities, and how OR has blended them to increase organizational performance. The four focus areas helped drive the success of this event.