

Research Management Peer Exchange
Hosted by the
Ohio Department of Transportation
August 5-7, 2002

Introduction

The Ohio Department of Transportation hosted a Peer Exchange of its research program August 5-7, 2002. Members of the peer exchange team were:

- Leona Kolbet, Research Coordinator, Nebraska Department of Roads - Team Leader
- Barbara Harder, Principal, B.T. Harder, Inc.
- David Lippert, Engineer of Physical Research, Illinois Department of Transportation
- David Martinelli, Chairman and Associate Professor, Department of Civil and Environmental Engineering, West Virginia University
Director of Mid-Atlantic University Transportation Center at WVU

The expressed objectives of the Peer Exchange were to:

- Enhance the overall research process
- Enhance implementation and tracking of research results
- Improve the quality and accuracy of preliminary research cost estimates prepared internally prior to soliciting RFPs
- Improve the definition and evaluation of performance measures
- Improve the integrity and equity of the selection process for researchers and proposals

To prepare for the Peer Exchange, the team reviewed documentation describing ODOT's research procedures and program. During the exchange, the team discussed ODOT's procedures and those used in other team members' respective agencies. The exchange team also received input from:

- Members of ODOT's Office of Research
- ODOT Technical Liaisons
- ODOT Deputy Director of Planning
- ODOT Administrator, Office of Urban and Corridor Planning
- OHIO Division of FHWA Personnel

GENERAL COMMENTS

Significant strengths of the Ohio research program identified by the peer team were:

The Research Program has substantial visibility and is enhancing its credibility with the department's senior managers. Senior management is involved and takes an active part in research efforts.

Monthly meetings with the Assistant Directors is an excellent means to assure the research program maintains its relevancy.

Committed and enthusiastic research staff has accomplished substantial results in developing a workable structure for research program management.

There is excellent support from highly qualified Ohio Division of Federal Highway Administration (FHWA) Office staff. The consistency of that support has fostered the redefinition of the ODOT research program management.

The FHWA Division Office research staff has a well-developed network that is a beneficial resource for the R&D Office. The experienced staff has supported Ohio's research efforts from both a technical and administrative perspective.

The R&D Office Administrator is involved with national and regional activities with her research management peers. Such involvement reduces duplication of effort for research projects and provides a means to be informed of best practices for program management

Having a liaison in each office provides an in-house contact for research issues.

An open and fair Request for Proposal process is being established which allows many university and consultants to compete for work.

The 10-year program will firmly establish the overall direction of the research program and annual projects.

ODOT'S OBJECTIVE AREAS TO BE ADDRESSED BY PEER TEAM

RESEARCH PROCESS:

Strengths

There is an effective working research process, which produces research results that contribute to accomplishing the agency's focus areas and strategic initiatives.

The well-received technical liaison training is a very good beginning to making the research process work for the Department.

The research office has considerable latitude in developing and refining its processes and procedures and tends to be relatively free of unnecessary bureaucratic limitations. This process is still evolving and needs high level support from senior management to be accomplished effectively.

The ability of the research program to execute contracts in a time frame that is responsive to the researcher organization is impressive. Many state DOT research units have unwieldy processes that prevent such responsiveness.

Key Issues and Opportunities

Training

Continue and Increase Technical Liaisons Role and Responsibilities Training
Opportunities: The R&D Office has a tremendous opportunity to get operational staff better informed about the new research process. Substantial effort needs to be committed to making sure that Technical Liaisons know what is in the manual and how to use it.

Conduct a Seminar on the Research Manual for Office Administrators and Division Directors: The R&D Office needs to provide, if necessary, for this level of manager to have the opportunity to learn what is expected from the Technical Liaisons and their critical role in achieving implementable research results.

Staffing

The new procedures for research project management are designed to accomplish research that is relevant to the department's strategic initiatives and focus areas and to produce research results that are implementable. To administer the work to achieve these outcomes demands substantial personal involvement by the research administration staff. There is a concern the staff will be so thinly spread over the research activities that quality will suffer. Based on other state research unit's experiences, such personal involvement

of the research administration staff has proven to be the successful approach. When quality of administrative support slackens, relevancy of the projects decreases, and the overall program loses its ability to contribute effectively.

Technical Panels

Technical panels could be used for a greater number of research projects. The team concept tends to reduce the amount of work expected solely from the Technical Liaison (delegation of some tasks to panel members), allows for those who will be potential implementers of the research results to be fully engaged with the research, and spreads the decision-making to a group of technical experts where individual biases can be mitigated (for example in recommendations of researchers to perform projects). Panel members can be drawn from other state DOTs, FHWA, researchers not competing on the project, and industry associations.

Research Management System

One of the most effective investments that could be made to enhance the effectiveness of the research program is to develop a research management system. Such a system that is networked among administrative, financial, and technical (operating) offices would eliminate many tedious and time-consuming manual duties. In particular, such a system would reduce the time commitments required from Technical Liaisons but increase the quality of their participation, would allow the department to get federal-aid reimbursements in a more timely fashion, and allow the research administrative staff to more effectively administer the research program.

Process Improvement – Small Scale Initiatives

There are some small scale initiatives that can be implemented immediately that can make a difference in administrative efficiency. These include:

- electronic distribution lists
- email attachments
- use of the intranet for shared documents

IMPLEMENTATION:

Strengths

There is department-wide, support and acknowledgment that implementation is a primary success criteria, and the Research Staff has placed a renewed emphasis on it.

Including a “Recommended Implementation Plan” in the Final Research Proposal demonstrates that implementation is a vital task and needs to be addressed throughout the research project.

The decentralized nature of the research process is conducive to implementation.

Tracking Implementation activities on a quarterly basis helps to ensure that progress is being made.

Key Issues and Opportunities

The new forms for Assessing and Tracking Implementation enhance accountability for application of research results.

Providing upper management with quarterly updates provides them an opportunity for continued involvement in Implementation.

There is an opportunity for the Research Staff to enhance the involvement of District technical personnel in implementing results.

Use of technical briefs can be very useful for distributing research results and implementation activities.

There appears to be an opportunity to develop products to market research results. The Research Staff might consider using the marketing expertise of FHWA and other sources.

COSTS/BUDGET

The peer exchange team was in general agreement that developing precise project cost was difficult at best. Some of the key issues and opportunities identified for this objective area were:

Key Issues

There is great desire to improve upon the current method of assigning cost estimates to projects.

Under current process of using a pre-proposals cost have a tendency to increase.

The funding amount assigned to a project often becomes the proposal bid if a researcher knows the level of funding.

Opportunities

From a recent history of a project proposals, it would be possible to develop broad groupings of project types with related cost. General groupings could be laboratory/field experiment, paper/data study, literature review, state of the practice and so on.

Flexibility is needed on a project by project basis so that the research office can exercise judgement on project cost.

Equipment cost can usually be determined accurately by those close to the project.

The cost could reflect the urgency and importance of the project.

PERFORMANCE MEASURES:

Strengths

ODOT has established Department-Wide Strategic Initiatives and the Research Program has established Goals against which performance of Research Projects and the overall Program can be measured.

Requiring Success Criteria to be included in the Problem Statement and Benefits to be included in Proposals provides expected outcomes by which the research results can be measured.

The Research process generates data for performance measures.

Access to top management provides an avenue for the Research Staff to disseminate information and receive feedback.

Key Issues and Opportunities

Performance Measurements of Research can be tied to Goals of the Research Program and to specific Research Objectives.

Success Criteria is now required in the Problem Statement. By also requiring Success Criteria in the Proposal, there is an opportunity to extend performance measures throughout the research project.

Input from "Project Wrap-Up Evaluation Forms" from Technical Liaisons and Principle Investigators can provide data for measuring results.

There is an opportunity for the Research Staff to select projects for quantitative measures of cost/benefit that will support the Research Program.

Conducting a Case Study of completed and implemented research is a method to show a return on investment.

SELECTION OF RESEARCH PROJECTS

Program Strengths

The process is open

- < there are several universities and consultants already involved in the program
- < newsletters and problem statements are distributed to a broad audience consisting of dozens of qualified organizations
- < the Cooperative Research Seminar will provide an open exchange of ideas where problems are identified and insights to their priority are derived.
- < proposals are reviewed on the basis of technical merit and qualifications of the research team
- < proposals are reviewed according to a set of clearly defined criteria

The process is well-defined

- < research manual explicitly lays out the steps from the solicitation of problem statements to entering into a contract with a university or consultant.
- < these steps are part of an overall strategic process that is well-documented

The process extends through several levels of the organization and multiple perspectives

- < engineers, office administrators, deputy directors, FHWA

The process seeks to establish mutual expectations between the PIs and the Research Office

- < initiating a program of startup meetings-both technical and administrative expectations
- < the topics to be covered in proposals are explicitly defined and cover the gambit of the Office's mission and objectives, including: Success Criteria, Benefits to the Agency, and Implementation.

The process is opportunistic

- < allows for pooled projects
- < allows for unsolicited ideas
- < can involve domains that extend beyond in-house expertise through external reviews of proposals

Opportunities

The process can include a mechanism for unsolicited projects while preserving the open, competitive process.

- < ODOT-IDEA program could set aside funds for a competitive process involving unsolicited ideas

The process can seamlessly incorporate pool-fund projects by including a “Pooled Fund” line item in the annual program.

The process may be expedited by initiating “letters-to-proceed” in those cases where the Office has committed to the project and a working contract exists.

Leona Kolbet
Research Coordinator
Nebraska Department of Roads (NDOR)

OBSERVATIONS:

ODOT's Research Program has strong support from top management.

Research Staff is very committed to the success of the Program, and they have an enormous amount of activities for which they are responsible.

FHWA personnel provide expertise, support, and assistance.

The Research Manual is detailed and very "user friendly". The required forms help to manage the program and provide a means to gather data for Implementation and Performance Measure.

OPPORTUNITIES:

NDOR will consider expanding its Research Management Manual by including the Project Wrap-Up Forms, Yearly Calender and Time-Line, and Revised Quarterly Report with names of Technical Advisory Committee members.

Expand NDOR's Research Proposals to include the requirements for an electronic copy of the report and a non-technical executive summary for use as a "marketing" tool, and reference the Research Management Manual in Research Contracts.

Establish some Performance Measures and tie them to NDOR's Mission and Goals.

Consider distributing Executive Summary to all states versus sending full research reports to select states OR post on Website.

Barbara T. Harder
Principal
B. T. Harder, Inc.

OBSERVATIONS:

Ms. Evans and her staff have made remarkable progress in redefining the research process in a very short period of time. The structure emerging is a solid workable process that will provide a sure foundation for ongoing efforts.

I am impressed with the relationship that is developing between the senior management and the Research Program. Creating trust between these entities is a primary factor for building a robust research program that significantly contributes to the goals of the organization.

The involvement of the FHWA Division Office Research Engineer (Mr. Rodrigo) is a particularly valuable asset for the research program.

The strategic initiatives and the focus areas provide excellent goals and objectives for the research program. The longer-term planning horizon is especially valuable for research because it can address a series of research efforts on a critical topic, accomplishing solutions with breadth and depth.

Some of the administrative issues the Research Program is facing are common to many research programs, e.g., estimating budgets for research problems, getting final reports from researchers in a timely fashion, reduction of the occurrence of time extensions to contracts, the disconnect between university project accounting and the State DOT procedures, and others. While these issues may present temporary hurdles, enhancing communications and interaction between the research office and the others involved generally presents an innovative solution.

Office Administrators and Division Directors may not have a full appreciation of the level of effort required by the operating personnel to adequately perform the technical management of a research project (especially considering the new/revised process being instituted). Having research project technical management (Technical Liaison duties and research project panel responsibilities) as a collateral duty for operating personnel is a general formula for neglect of the research effort, research responsibilities may be last to be done, if done at all. Including research project technical management as a job responsibility can ensure research is addressed as anticipated.

There are some potential risks associated with the manner in which researchers are selected to perform projects. Having only one individual such as the Technical Liaison or an Office Administrator recommend a researcher to be awarded a project presents an opportunity for biases to directly influence the recommendation. If researchers were recommended for project award by a panel of technical experts in the field in which the

research is proposed, the risk for bias will be minimized. Technical panels formed to advise the researcher, monitor progress, and facilitate implementation could be good candidates for review of proposals and successful proposal (researcher) recommendations.

OPPORTUNITIES:

As I work with state DOT research managers, encourage more peer review of high visibility publications such as research proposals, research final draft reports, or research strategic plans.

Such reviews enhance the quality of the document as well as increase the credibility of the overall program.

Increasing the capability for implementation of research results from NCHRP projects can be an initiative of the AASHTO Research Advisory Committee. More funding to accomplish implementation is probably the most practical avenue to facilitate implementation. Be a voice to promote this concept.

Get a copy of South Dakota's implementation process.

Do some research into the methods used by state research units to estimate costs for projects to be programmed.

Investigate what other states are doing to incorporate unsolicited research proposals for inclusion into their programs.

Recommend to other state DOTs the concept of developing a training seminar, based on the research program manual, for technical liaisons and others in operating divisions so that they can be properly prepared for their technical project management/advisory responsibilities.

Recommend to other state DOTs the monthly meeting schedule between the research program director, that person's manager and senior managers. Such meetings promote trust and provide a tremendously positive means for the research program's ability to be relevant.

David Lippert
Engineer of Physical Research
Illinois Department of Transportation

OBSERVATIONS:

Ohio has a large, well managed program of approximately 100 projects. To accomplish such a large program with very limited staff, the research section relies upon liaisons and administrators in each office to assist in developing managing research projects in their respective areas.

The identification of key focus areas and addressing these areas by use of a very long range plan (10 years) is unique. Such a plan will traverse administrations and federal funding acts.

The training of Technical Liaisons and their support is critical to the research program, however, this approach allows offices to control their own destiny with respect to research. What they put into an effort is what they will get out.

Upper management is very involved with direction of research program and supports efforts in line with the department's focus areas.

Found the "Project Wrap-up Evaluation" form to be very interesting and in line with what Illinois has been attempting to develop to provide communication between researchers and technical oversight panels.

OPPORTUNITIES:

Explore the use of a longer time horizons in developing research focus areas.

Will review with my staff to see how "Project Wrap-up Evaluation" form might be adopted by Illinois.

If Illinois were to adopt a decentralized model of research management, Ohio would be a good source of information on approach. Would like a copy of the Research Manual or web link to it once complete.

Will explore approach of including in contract a short - less technical summary that can be published in a national newsletter such as TR-News.

David Martinelli, Ph.D.

Chairman

Department of Civil and Environmental Engineering

West Virginia University

OBSERVATIONS:

The ODOT research program is ambitious, entrepreneurial, and highly productive. It serves the Department well and is a reflection on the buy-in of research along all levels of the agency.

The ODOT research program is highly functional in self-study as the Office has well-documented the procedures, progress, and issues facing the program.

The ODOT research program is continually seeking ways to better serve its constituents and have proposed several enhancements that are innovative.

The Research Office staff are highly receptive to new ideas.

Research operations are decentralized in order to access the appropriate technical expertise for identifying research needs and monitoring research projects. The program relies heavily in the active engagement of engineers and other professionals throughout the Department who serve as Technical Liaisons.

OPPORTUNITIES:

The greatest opportunity to grow and enhance ODOT's research program lies in the willing participation and engagement of the Technical Liaisons. The following practices will likely insure that the appropriate degree of engagement exists:

Research participation is made part of the official work responsibilities of the Technical Liaisons

- Technical Liaisons receive recognition for their contributions where ever possible, e.g. technical publications, promotional publications, and performance reviews.
- Technical Liaisons receive professional growth for participation in research through continuing education credits and similar recognitions
- Research Office documented policies and procedures and subsequent training should be as user-friendly as possible.
- Administration duties of project monitoring on the part of Technical Liaisons should be minimized.

Research Management Peer Exchange
Hosted by the
Ohio Department of Transportation
August 5-7, 2002

INTRODUCTION

The Ohio Department of Transportation hosted a Peer Exchange of its research program August 5-7, 2002. Members of the peer exchange team were:

- Leona Kolbet, Research Coordinator, Nebraska Department of Roads - Team Leader
- Barbara Harder, Principal, B.T. Harder, Inc.
- David Lippert, Engineer of Physical Research, Illinois Department of Transportation
- David Martinelli, Chairman and Associate Professor, Department of Civil and Environmental Engineering, West Virginia University
Director of Mid-Atlantic University Transportation Center at WVU

The expressed objectives of the Peer Exchange were to:

- Enhance the overall research process
- Enhance implementation and tracking of research results
- Improve the quality and accuracy of preliminary research cost estimates prepared internally prior to soliciting RFPs
- Improve the definition and evaluation of performance measures
- Improve the integrity and equity of the selection process for researchers and proposals

To prepare for the Peer Exchange, the team reviewed documentation describing ODOT's research procedures and program. During the exchange, the team discussed ODOT's procedures and those used in other team members' respective agencies. The exchange team also received input from:

- Members of ODOT's Office of Research
- ODOT Technical Liaisons
- ODOT Deputy Director of Planning
- ODOT Administrator, Office of Urban and Corridor Planning
- OHIO Division of FHWA Personnel

GENERAL COMMENTS

Significant strengths of the Ohio research program identified by the peer team were:

- The Research Program has substantial visibility and is enhancing its credibility with the department's senior managers. Senior management is involved and takes an active part in research efforts.
- Monthly meetings with the Assistant Directors is an excellent means to assure the research program maintains its relevancy.
- Committed and enthusiastic research staff has accomplished substantial results in developing a workable structure for research program management.
- There is excellent support from highly qualified Ohio Division of Federal Highway Administration (FHWA) Office staff. The consistency of that support has fostered the redefinition of the ODOT research program management.
- The FHWA Division Office research staff has a well-developed network that is a beneficial resource for the R&D Office. The experienced staff has supported Ohio's research efforts from both a technical and administrative perspective.
- The R&D Office Administrator is involved with national and regional activities with her research management peers. Such involvement reduces duplication of effort for research projects and provides a means to be informed of best practices for program management.
- Having a liaison in each office provides an in-house contact for research issues.
- An open and fair Request for Proposal process is being established which allows many university and consultants to compete for work.
- The 10-year program will firmly establish the overall direction of the research program and annual projects.

ODOT'S OBJECTIVE AREAS TO BE ADDRESSED BY PEER TEAM

RESEARCH PROCESS:

Strengths

There is an effective working research process, which produces research results that contribute to accomplishing the agency's focus areas and strategic initiatives.

The well-received technical liaison training is a very good beginning to making the research process work for the Department.

The research office has considerable latitude in developing and refining its processes and procedures and tends to be relatively free of unnecessary bureaucratic limitations. This process is still evolving and needs high level support from senior management to be accomplished effectively.

The ability of the research program to execute contracts in a time frame that is responsive to the researcher organization is impressive. Many state DOT research units have unwieldy processes that prevent such responsiveness.

Key Issues and Opportunities

Training

Continue and Increase Technical Liaisons Role and Responsibilities Training
Opportunities: The R&D Office has a tremendous opportunity to get operational staff better informed about the new research process. Substantial effort needs to be committed to making sure that Technical Liaisons know what is in the manual and how to use it.

Conduct a Seminar on the Research Manual for Office Administrators and Division Directors: The R&D Office needs to provide, if necessary, for this level of manager to have the opportunity to learn what is expected from the Technical Liaisons and their critical role in achieving implementable research results.

R&D Action Plan: Extensive revisions by the R&D staff are currently being incorporated into the Research Management Manual by the consultant hired to complete this task. A final draft is expected in October. The draft will be reviewed by ODOT and FHWA personnel before it is sent to Senior Leadership for review and approval in December. Training will be scheduled shortly thereafter for technical liaisons and others involved in the research process to provide an overview of the document.

Staffing

The new procedures for research project management are designed to accomplish research that is relevant to the department's strategic initiatives and focus areas and to produce research results that are implementable. To administer the work to achieve these outcomes demands substantial personal involvement by the research administration staff. There is a concern the staff will be so thinly spread over the research activities that quality will suffer. Based on other state research unit's experiences, such personal involvement of the research administration staff has proven to be the successful approach. When quality of administrative support slackens, relevancy of the projects decreases, and the overall program loses its ability to contribute effectively.

R&D Action Plan: Vikram Dalal will retire effective September 30, 2002. I am working with Personnel to develop a position description for a Transportation Engineer 3 to fill this vacancy. With the right person in this position, I believe we will be sufficiently staffed to handle our current work load.

Technical Panels

Technical panels could be used for a greater number of research projects. The team concept tends to reduce the amount of work expected solely from the Technical Liaison (delegation of some tasks to panel members), allows for those who will be potential implementers of the research results to be fully engaged with the research, and spreads the decision-making to a group of technical experts where individual biases can be mitigated (for example in recommendations of researchers to perform projects). Panel members can be drawn from other state DOTs, FHWA, researchers not competing on the project, and industry associations.

R&D Action Plan: The decision to form a panel (as opposed to appointing one or two technical liaisons) to guide a research project has historically been left up to the Administrator of the sponsoring office. The current process gives this responsibility to the Deputy Directors. The determination will be made in December when the problem statements for the next biennium are prioritized.

Research Management System

One of the most effective investments that could be made to enhance the effectiveness of the research program is to develop a research management system. Such a system that is networked among administrative, financial, and technical (operating) offices would eliminate many tedious and time-consuming manual duties. In particular, such a system would reduce the time commitments required from Technical Liaisons but increase the quality of their participation, would allow the department to get federal-aid reimbursements in a more timely fashion, and allow the research administrative staff to more effectively administer the research program.

Process Improvement – Small Scale Initiatives

There are some small scale initiatives that can be implemented immediately that can make a difference in administrative efficiency. These include:

- electronic distribution lists
- email attachments
- use of the intranet for shared documents

R&D Action Plan: These improvements are already in place for some documents such as quarterly reports. Efforts will be made to expand into other areas as resources and customer demand allow.

IMPLEMENTATION:

Strengths

There is department-wide, support and acknowledgment that implementation is a primary success criteria, and the Research Staff has placed a renewed emphasis on it.

Including a “Recommended Implementation Plan” in the Final Research Proposal demonstrates that implementation is a vital task and needs to be addressed throughout the research project.

The decentralized nature of the research process is conducive to implementation.

Tracking Implementation activities on a quarterly basis helps to ensure that progress is being made.

R&D Action Plan: We will continue with these efforts and provide additional emphasis by utilizing the new implementation tracking process defined in the Research Management Manual.

Key Issues and Opportunities

The new forms for Assessing and Tracking Implementation enhance accountability for application of research results.

Providing upper management with quarterly updates provides them an opportunity for continued involvement in Implementation.

There is an opportunity for the Research Staff to enhance the involvement of District technical personnel in implementing results.

Use of technical briefs can be very useful for distributing research results and implementation activities.

There appears to be an opportunity to develop products to market research results. The Research Staff might consider using the marketing expertise of FHWA and other sources.

R&D Action Plan: We are in the process of identifying an individual in each of the districts to act as a partner and advocate for research. These contacts will help pinpoint research needs and ensure that opportunities to participate in the research process are communicated to the appropriate district personnel in a timely manner.

The format for our executive summaries has been modified to actually provide information that a busy CEO may need in a format that he or she can quickly absorb. These will be posted on our web site to provide visitors with a brief but useful overview of completed research projects.

We also started a research project with OU's School of Journalism, in cooperation with the Mid-Atlantic University Transportation Center, to develop a plan for communicating ODOT's research results to our various constituencies. A template that could be used for developing communications plans by other states is another expected deliverable. The Office of Communications is so-sponsoring this project with R&D.

COSTS/BUDGET

The peer exchange team was in general agreement that developing precise project cost was difficult at best. Some of the key issues and opportunities identified for this objective area were:

Key Issues

There is great desire to improve upon the current method of assigning cost estimates to projects.

Under current process of using a pre-proposals cost have a tendency to increase.

The funding amount assigned to a project often becomes the proposal bid if a researcher knows the level of funding.

Opportunities for ODOT

From a recent history of a project proposals, it would be possible to develop broad groupings of project types with related cost. General groupings could be laboratory/field experiment, paper/data study, literature review, state of the practice and so on.

Flexibility is needed on a project by project basis so that the research office can exercise judgement on project cost.

Equipment cost can usually be determined accurately by those close to the project.

The cost could reflect the urgency and importance of the project.

R&D Action Plan: The department continues to struggle with developing accurate and reasonable cost estimates for our research needs. With better historic data, coded in electronic format, it might be possible to create some basic costing guidelines for various project types. A review of practices used by other DOT's with similar types of research programs did not produce usable results.

We have eliminated the pre-proposal portion of the process in favor of a standard RFP process. Recognizing the difficulty that the program offices have in estimating costs, R&D is paying very close attention to the preliminary estimates and proposed budgets. We have also begun to provide a "cushion" in our budget to take care of the inevitable overruns.

PERFORMANCE MEASURES:

Strengths

ODOT has established Department-Wide Strategic Initiatives and the Research Program has established Goals against which performance of Research Projects and the overall Program can be measured.

Requiring Success Criteria to be included in the Problem Statement and Benefits to be included in Proposals provides expected outcomes by which the research results can be measured.

The Research process generates data for performance measures.

Access to top management provides an avenue for the Research Staff to disseminate information and receive feedback.

Key Issues and Opportunities

Performance Measurements of Research can be tied to Goals of the Research Program and to specific Research Objectives.

Success Criteria is now required in the Problem Statement. By also requiring Success Criteria in the Proposal, there is an opportunity to extend performance measures throughout the research project.

Input from “Project Wrap-Up Evaluation Forms” from Technical Liaisons and Principle Investigators can provide data for measuring results.

There is an opportunity for the Research Staff to select projects for quantitative measures of cost/benefit that will support the Research Program.

Conducting a Case Study of completed and implemented research is a method to show a return on investment.

R&D Action Plan: Benefit/cost analyses will not be appropriate for each and every research project for several reasons: 1) the benefits and costs are often unknown for several years or are extremely difficult to quantify, 2) the time to conduct the analyses is frequently substantial and 3) the expertise to do this is lacking in many of the offices. However, there may be some advantages to using this tool on select projects.

While timeliness of project delivery and cost at first appear to be obvious performance measures, I'm not convinced that doing projects faster and cheaper will result in increased quality. I believe our most useful performance measures may actually be qualitative instead of quantitative.

We expect to utilize our Project Wrap-up Evaluation Forms to measure the performance as it relates to individual projects. We expect feedback from our primary customers, i.e. Senior Leadership, FHWA, and the sponsoring offices, to provide indicators of overall program performance.

SELECTION OF RESEARCH PROJECTS

Program Strengths

The process is open

- there are several universities and consultants already involved in the program
- newsletters and problem statements are distributed to a broad audience consisting of dozens of qualified organizations
- the Cooperative Research Seminar will provide an open exchange of ideas where problems are identified and insights to their priority are derived.
- proposals are reviewed on the basis of technical merit and qualifications of the research team
- proposals are reviewed according to a set of clearly defined criteria

The process is well-defined

- research manual explicitly lays out the steps from the solicitation of problem statements to entering into a contract with a university or consultant.
- these steps are part of an overall strategic process that is well-documented

The process extends through several levels of the organization and multiple perspectives

- engineers, office administrators, deputy directors, FHWA

The process seeks to establish mutual expectations between the PIs and the Research Office

- initiating a program of startup meetings-both technical and administrative expectations
- the topics to be covered in proposals are explicitly defined and cover the gambit of the Office's mission and objectives, including: Success Criteria, Benefits to the Agency, and Implementation.

The process is opportunistic

- allows for pooled projects
- allows for unsolicited ideas
- can involve domains that extend beyond in-house expertise through external reviews of proposals

Opportunities

The process can include a mechanism for unsolicited projects while preserving the open, competitive process.

- ODOT-IDEA program could set aside funds for a competitive process involving unsolicited ideas

The process can seamlessly incorporate pool-fund projects by including a “Pooled Fund” line item in the annual program.

The process may be expedited by initiating “letters-to-proceed” in those cases where the Office has committed to the project and a working contract exists.

R&D Action Plan: While establishing a long range research agenda based upon needs determined by the department is our main priority, a couple of mechanisms have also been established, which would allow for the consideration of unsolicited ideas: the Cooperative Research Seminar and the ODOT Partnered Research Exploration Program (OPREP). The seminar will be held in December 2002. Solicitations for OPREP problem statements will go out in January 2003. (See pages 16-19 for additional information on OPREP.)

Leona Kolbet
Research Coordinator
Nebraska Department of Roads (NDOR)

OBSERVATIONS:

ODOT's Research Program has strong support from top management.

Research Staff is very committed to the success of the Program, and they have an enormous amount of activities for which they are responsible.

FHWA personnel provide expertise, support, and assistance.

The Research Manual is detailed and very "user friendly". The required forms help to manage the program and provide a means to gather data for Implementation and Performance Measure.

OPPORTUNITIES FOR NDOR:

NDOR will consider expanding its Research Management Manual by including the Project Wrap-Up Forms, Yearly Calender and Time-Line, and Revised Quarterly Report with names of Technical Advisory Committee members.

Expand NDOR's Research Proposals to include the requirements for an electronic copy of the report and a non-technical executive summary for use as a "marketing" tool, and reference the Research Management Manual in Research Contracts.

Establish some Performance Measures and tie them to NDOR's Mission and Goals.

Consider distributing Executive Summary to all states versus sending full research reports to select states OR post on Website.

Barbara T. Harder
Principal
B. T. Harder, Inc.

OBSERVATIONS:

Ms. Evans and her staff have made remarkable progress in redefining the research process in a very short period of time. The structure emerging is a solid workable process that will provide a sure foundation for ongoing efforts.

I am impressed with the relationship that is developing between the senior management and the Research Program. Creating trust between these entities is a primary factor for building a robust research program that significantly contributes to the goals of the organization.

The involvement of the FHWA Division Office Research Engineer (Mr. Rodrigo) is a particularly valuable asset for the research program.

The strategic initiatives and the focus areas provide excellent goals and objectives for the research program. The longer-term planning horizon is especially valuable for research because it can address a series of research efforts on a critical topic, accomplishing solutions with breadth and depth.

Some of the administrative issues the Research Program is facing are common to many research programs, e.g., estimating budgets for research problems, getting final reports from researchers in a timely fashion, reduction of the occurrence of time extensions to contracts, the disconnect between university project accounting and the State DOT procedures, and others. While these issues may present temporary hurdles, enhancing communications and interaction between the research office and the others involved generally presents an innovative solution.

Office Administrators and Division Directors may not have a full appreciation of the level of effort required by the operating personnel to adequately perform the technical management of a research project (especially considering the new/revised process being instituted). Having research project technical management (Technical Liaison duties and research project panel responsibilities) as a collateral duty for operating personnel is a general formula for neglect of the research effort, research responsibilities may be last to be done, if done at all. Including research project technical management as a job responsibility can ensure research is addressed as anticipated.

There are some potential risks associated with the manner in which researchers are selected to perform projects. Having only one individual such as the Technical Liaison or an Office Administrator recommend a researcher to be awarded a project presents an opportunity for biases to directly influence the recommendation. If researchers were recommended for project award by a panel of technical experts in the field in which the

research is proposed, the risk for bias will be minimized. Technical panels formed to advise the researcher, monitor progress, and facilitate implementation could be good candidates for review of proposals and successful proposal (researcher) recommendations.

OPPORTUNITIES:

As I work with state DOT research managers, encourage more peer review of high visibility publications such as research proposals, research final draft reports, or research strategic plans. Such reviews enhance the quality of the document as well as increase the credibility of the overall program.

Increasing the capability for implementation of research results from NCHRP projects can be an initiative of the AASHTO Research Advisory Committee. More funding to accomplish implementation is probably the most practical avenue to facilitate implementation. Be a voice to promote this concept.

Get a copy of South Dakota's implementation process.

Do some research into the methods used by state research units to estimate costs for projects to be programmed.

Investigate what other states are doing to incorporate unsolicited research proposals for inclusion into their programs.

Recommend to other state DOTs the concept of developing a training seminar, based on the research program manual, for technical liaisons and others in operating divisions so that they can be properly prepared for their technical project management/advisory responsibilities.

Recommend to other state DOTs the monthly meeting schedule between the research program director, that person's manager and senior managers. Such meetings promote trust and provide a tremendously positive means for the research program's ability to be relevant.

R&D Action Plan: We are firm believers in avoiding the tendency to reinvent the wheel. We regularly investigate the practices of other states DOTs and other research agencies to identify good or best practices that might be beneficial in Ohio. We will continue this effort and share our discoveries at other forums such as the AASHTO RAC meetings, peer exchanges hosted by other states and conferences, such as the TRB annual meeting and OTEC.

David Lippert
Engineer of Physical Research
Illinois Department of Transportation

OBSERVATIONS:

Ohio has a large, well managed program of approximately 100 projects. To accomplish such a large program with very limited staff, the research section relies upon liaisons and administrators in each office to assist in developing managing research projects in their respective areas.

The identification of key focus areas and addressing these areas by use of a very long range plan (10 years) is unique. Such a plan will traverse administrations and federal funding acts.

The training of Technical Liaisons and their support is critical to the research program, however, this approach allows offices to control their own destiny with respect to research. What they put into an effort is what they will get out.

Upper management is very involved with direction of research program and supports efforts in line with the department's focus areas.

Found the "Project Wrap-up Evaluation" form to be very interesting and in line with what Illinois has been attempting to develop to provide communication between researchers and technical oversight panels.

OPPORTUNITIES FOR ILLINOIS DOT:

Explore the use of a longer time horizons in developing research focus areas.

Will review with my staff to see how "Project Wrap-up Evaluation" form might be adopted by Illinois.

If Illinois were to adopt a decentralized model of research management, Ohio would be a good source of information on approach. Would like a copy of the Research Manual or web link to it once complete.

Will explore approach of including in contract a short - less technical summary that can be published in a national newsletter such as TR-News.

David Martinelli, Ph.D.

Chairman

Department of Civil and Environmental Engineering

West Virginia University

OBSERVATIONS:

The ODOT research program is ambitious, entrepreneurial, and highly productive. It serves the Department well and is a reflection on the buy-in of research along all levels of the agency.

The ODOT research program is highly functional in self-study as the Office has well-documented the procedures, progress, and issues facing the program.

The ODOT research program is continually seeking ways to better serve its constituents and have proposed several enhancements that are innovative.

The Research Office staff are highly receptive to new ideas.

Research operations are decentralized in order to access the appropriate technical expertise for identifying research needs and monitoring research projects. The program relies heavily on the active engagement of engineers and other professionals throughout the Department who serve as Technical Liaisons.

OPPORTUNITIES FOR ODOT:

The greatest opportunity to grow and enhance ODOT's research program lies in the willing participation and engagement of the Technical Liaisons. The following practices will likely insure that the appropriate degree of engagement exists:

- Research participation is made part of the official work responsibilities of the Technical Liaisons
- Technical Liaisons receive recognition for their contributions where ever possible, e.g. technical publications, promotional publications, and performance reviews.
- Technical Liaisons receive professional growth for participation in research through continuing education credits and similar recognitions.
- Research Office documented policies and procedures and subsequent training should be as user-friendly as possible.
- Administration duties of project monitoring on the part of Technical Liaisons should be minimized.

R&D Action Plan: *In a decentralized management process the role of the technical liaison is crucial. Liaisons need to be qualified and actively involved in the technical aspects of their assigned projects, preferably from inception to implementation. Unfortunately, liaisons on many of our active projects have not been involved throughout the lives of their projects. In fact, a large number of projects have gone through multiple liaisons due to changes in office processes, staffing and priorities. As a result, several liaisons have expressed feelings of being overwhelmed with added research responsibilities. This coupled with an inadequate background on the projects has produced less than desirable support from these liaisons. We believe that as the older projects are completed and as the technical liaisons receive training and assistance from R&D, the difficulties they are experiencing will subside and support will improve. An added level of insurance could be provided by including research monitoring activities in the individual work plans of all technical liaisons.*

We now require that all technical liaisons be acknowledged in the final reports.

We also regularly use feedback from the liaisons to make improvements to our procedures.

3.5 - ODOT Partnered Research Exploration Program (OPREP)

Goals:

- Consider relevant research needs that may not have been identified by ODOT and included in our strategic research plan.
- Encourage genuine partnerships within the research community.
- Recognize that while our research needs are primarily of an applied nature, support of some basic research is critical to the long term success of transportation research.
- Provide an opportunity to demonstrate the viability of innovative concepts and their potential to address long range transportation needs.
- Leverage research funds and resources.

\$100,000 will be available from ODOT each FY. Funds can be awarded to one or more projects, depending on the estimated budgets. (Available funds may be adjusted in response to fluctuations in the overall research budget.)

Each project must be completed within 12 months. Time extensions can be granted, under special conditions, but no funding extensions will be approved.

Unsolicited problem statements will be accepted throughout the year; however, a formal solicitation will be distributed annually in January. Problem statements are due in March and evaluation and selection will occur in May.

The proposing research agency is required to provide a minimum 50/50 match of the funds requested from ODOT. No more than half of the matching funds can come from in-kind donations from the proposing agency. Must have at least one other partner unaffiliated with the proposing agency. All partnership agreements and funding commitments need to be established before the problem statement is submitted.

Projects screened by Advisory Board. Advisory Board sends recommendations to Senior Leadership for final selection.

Technical Advisory Panels, consisting of one representative from the Advisory Board, one representative from the Office of Research and Development and at least one representative appointed by Senior Leadership (who will also serve as the panel chairperson), will be responsible for monitoring the progress of OPREP projects.

The department reserves the right to reject any or all submittals.

See figure 3.17 for OPREP problem statement format.

**ODOT PARTNERED RESEARCH EXPLORATION PROGRAM (OPREP)
PROBLEM STATEMENT FORMAT**

PROBLEM TITLE

The title of the research study should be descriptive, but brief (10 words or less, if possible.)

PROBLEM STATEMENT

Describe the general problem or research need. Be explicit about how the intended research product will be used and by whom.

(Note: A TRIS Online literature search <<http://ntl.bts.gov/tris>> is encouraged to avoid duplication of existing or past research. If a literature search is performed, a bibliography and general comments on the results should be provided.)

RESEARCH OBJECTIVE

Provide a statement of the specific research objective, defined in terms of the expected final product. Describe the scope of work including specific tasks necessary to achieve the objective. Provide enough detail to clearly state the objective and expectations.

FUNDING AND PARTNERSHIPS

Provide an estimate of the funds necessary to accomplish the objectives stated above. The proposing research agency must provide a match of the requesting OPREP funds. This must be at least, but may be more than, a 50/50 match with no more than half of the matching funds coming from in-kind donations. The budget must clearly display the matching funds.

At least one other partner, unaffiliated with the proposing agency, must be identified and their role clearly defined. A letter on agency letterhead, signed by an individual authorized to contractually bind the partnering agency, must be included with the problem statement. This letter should describe the agency's partnership agreement, including funding commitments.

DURATION

An estimate of the number of months needed for the research effort. This cannot exceed 15 months, which includes three months for review of the draft final report and preparation of the final report.

URGENCY, PAYOFF POTENTIAL AND BENEFITS

Describe the urgency of this particular research in relation to highway transportation needs in general and the potential for payoff (in terms of benefits/costs, if possible) from achievement of the research objectives. Enumerate and discuss the benefits anticipated from the research findings, e.g. money saved; improved safety, quality or efficiency; advancement of the state of technology, etc.

IMPLEMENTATION

Describe the anticipated product(s) from the research, e.g. new or revised processes, policies, standards or specifications; product development, etc. This information should be as specific as possible, noting particular documents that may be affected, or techniques or equipment that may be made obsolete. Any institutional or political barriers to implementation of the anticipated research products should also be identified.

ANTICIPATED ADDITIONAL RESEARCH

Describe additional research that is required or may be needed after completion of this study.

INVESTIGATORS(S) FROM PROPOSING AGENCY

Include the name, title, address, telephone number, e-mail address, etc. of the person(s) who developed the problem statement and those who will be conducting the research.

INVESTIGATORS(S) FROM PARTNERING AGENCY(IES)

Include the name, title, agency name, address, telephone number, e-mail address, etc. of the person(s) from the partnering agency(ies) who will be conducting the research.

DATE AND SUBMITTED BY

Show the date of submission and the name, title, agency name, address, telephone number, e-mail address of the person authorized to contractually bind the proposing organization and submit the problem statement.

PREVIOUS SUBMISSIONS

Has this problem statement or a variation of it ever been submitted to ODOT or another agency for consideration? Yes No

If yes, please specify when the problem statement was submitted and to whom. Briefly describe the result of that submission.

Please submit completed problem statements to the following e-mail address. Questions on the process can be directed to the same address.

Research@dot.state.oh.us

Feedback and Conclusions
Ohio Department of Transportation
Office of Research & Development
Peer Exchange Meeting August 5-7, 2002
Personal Services Agreement #11639

The scope of work for the agreement included for items, three which were accomplished prior to and during the conduct of the exchange. These are:

- Answer questions and provide suggestions prior to and during the Exchange
- Assist in the organization of the agenda and focus area selection
- Actively participate in the Exchange and evaluate ODOT's R&D process along with the other participants

The remaining item in the scope of work is:

- Provide feedback at the conclusion of the Exchange on the overall format of the meeting. This will include comments on the strengths and weaknesses of the structure and provide suggestions for improvement for future Exchanges.

The following discussion is the requested post-exchange concluding feedback.

Overall Format, Including Strengths and Areas for Improvement in the Conduct of the Meeting

Pre-exchange Communications and Information Distribution

There was sufficient and informative pre-exchange communication between the Research Office Staff and the team members, particularly regarding logistics, e.g., hotel and arrangements. A team conference call could have been conducted to get all of the team acquainted prior to the Exchange. Three of the exchange team members knew each other, the fourth, perhaps was initially at a disadvantage. This team member, however, was quickly integrated into the team and there was little, if any, negative impact. A meal before the Exchange would have accomplished the same team-building result, yet travel schedules didn't allow the team to do this.

The internal approvals for conducting the meeting took a greater amount of time than were initially anticipated. The Office of Research & Development did a good job of contacting team members to let them know of the problem and to keep the team members informed.

**Feedback and Conclusions,
ODOT Office of Research & Development Peer Exchange Meeting
August 5-7, 2002**

The Office of Research & Development distributed materials for the Exchange prior to the meeting. The materials were well organized and in the appropriate detail. Charts such as the detailed research process flow chart and organization charts of the agency and the research office were provided at the exchange meeting. For future exchanges, it would be good to supply this information in the briefing materials distributed to the team prior to the Exchange.

It was very informative for the exchange team to have the draft language from the research manual distributed prior to the exchange. The material helped the team understand more about the program as well as provided some independent review of the draft materials for the Office of Research & Development.

Meeting Duration - 2.5 days

The length of the exchange meeting, 2.5 days, was very good. The exchange team accomplished what it set out to do and provided substantive information to the Office of Research and Development. This length of time is also helpful to attracting peers to serve on the exchange team. The time away from one's office is manageable.

FHWA Division Office Participation

It was impressive to have the FHWA Division Office personnel present for the entire exchange, and this participation was a significant asset to the Exchange. The knowledge and information Mr. Rodrigo brought to the Exchange assisted in the discussions. This is a very good practice and should be continued in future exchanges.

Location of Meeting

The department conference room was a fine facility in which to conduct the Exchange. There were computer hookups, plenty of room, flexibility in setting up the seating and tables – as nice a facility as ever would be needed. The conference room also was located in the ODOT building, facilitating the attendance of ODOT employees that would participate in the Exchange (a wise choice to make it easy for people to get to the meeting).

Peer Exchange Team Composition

The exchange team members were:

- a research manager from a large budget DOT research unit that performs substantial amounts of contract research;
- a research manager from a small budget DOT research unit that performs all of its research with a university within the state;
- a consultant that had managed a large budget DOT research unit that was very similar to ODOT's Office of Research & Development; and
- a university professor from the regional university transportation consortium.

Three of the four team members were well experienced with conducting peer exchanges and the fourth member was knowledgeable about peer review processes. Having a seasoned team was an advantage, and the diversity of the individual's experiences enhanced the quality of the Exchange.

Computer Resources Availability

Each exchange team member had access to a laptop computer, all of which were networked. This allowed team members to trade notes taken from the exchange discussion sessions and to participate in writing portions of the final report. The technology greatly enhanced the productivity of the exchange team.

Focus Areas

Five focus areas were identified as the primary discussion topics for the Exchange. This was probably as many as could be handled in the time allotted for the Exchange. All five areas were discussed in detail and concepts and processes were identified and exchanged among the team members. The first focus area addressed, "Research Process," tended to cover all aspects of the program. Dealing with this as a unique focus area tended to cause overlap of topics such as with project selection and implementation. Perhaps it would have been just as effective to have spent more time on the explanation of the process up front, discuss the other four focus areas (Implementation, Cost/budgets, Performance Measures, and Selection of Researchers/Proposals) and then have a general discussion on the overall process. By that time the exchange team members would have had a good understanding of the flow of the business conducted by the

**Feedback and Conclusions,
ODOT Office of Research & Development Peer Exchange Meeting
August 5-7, 2002**

Office. This suggestion is a minor reorganization – providing comments for improvements on an already productive discussion.

Written Survey of Customers Prior to the Exchange

Conducting a customer survey prior to the Exchange was very helpful. It provided a means for the Office of Research & Development to receive input on its current processes and to gain a better understanding of customer needs. The survey also was a marketing tool. It informed employees in operating divisions about the Office of Research & Development's interest to meet their needs, and that changes for their benefit were being considered. In addition, the survey responses were informative to the exchange team as they considered strategies for enhancing the service of the Office of Research & Development for its customers. This type of instrument is well worth the effort as a preparatory measure for an exchange. Such surveys should be conducted in future exchanges. Some attention should be given to the length of the survey. This particular survey was too detailed and very long. A shorter survey would provide as much or more information.

Summarizing results for the exchange team members should be done for subsequent peer exchange meetings. It would have been very much more helpful to have responses from each questionnaire respondent together on one page. This summary would have enhanced the value of the questionnaire substantially.

Having results of the Technical Liaison Training Evaluation Forms (February 26, 2002) were also informative; a summary of these would also be helpful if they are included in team briefing materials for future exchanges.

Agenda

The agenda was well organized and sufficient time was given to discuss each focus area. A more structured approach to presenting the research process as it currently exists and plans for the future could have helped solidify the team's understanding of the operations and functions of the Office of Research & Development (e.g., formal presentations). They would have helped provide this understanding earlier in the process of the exchange. Such an overview is very important and considerable attention should be given to assuring each exchange team member has a good grasp of how the office operates, what work it accomplishes, and how it deals with its customers.

Peer Exchange Team Discussions with Research Office Personnel and Customers

Discussions between the peer exchange team, the FHWA representative, and the Office of Research & Development personnel were the core of the peer exchange. These discussions were very productive and brought forth a wealth of information about the ODOT program as well as other programs with which the peer exchange team members were familiar. The discussions were particularly detailed and highlighted successful practices. Compared to other peer exchanges, the ODOT Office of Research & Development had a greater amount of input from the team because there were no customer interviews scheduled, leaving more time to address the focus areas. Exchanges often interview customers and stakeholders during the meetings and consequently do not have the time to commit to as much in-depth discussions with the research office personnel as desired. This format worked very well for this peer exchange experience, because the topics of discussion (reorganization of the program and project management processes) were well suited to such in-depth treatment.

Although what was accomplished met many of the needs of the Office of Research & Development, the meeting format showed one area that could be addressed differently in the next exchange. A number of operating managers and engineers were invited to participate in the discussions during various times of the meetings. They had no obligation to make presentations to the exchange team, and there were no prepared questions for them to answer. Because the discussions between the exchange team and the research office personnel dealt specifically with research management issues and centered on the reorganized research process, the customers or partners from other offices had little to contribute. The exchange meeting may have been a tedious time for these customers/partners. Either these customers/partners in the research process should be directly incorporated into the discussion, or they could have indicated their needs through the survey instrument only. The greatest impact this issue has is on the credibility of the research program within the department. The research function needs to maximize the effectiveness of the time spent with its customers/partners.