

INDIANA DEPARTMENT OF TRANSPORTATION
Research Program Peer Exchange

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Indiana Department of Transportation
Research Division
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Introduction

BACKGROUND: This report summarizes the outcomes of a Peer Exchange conducted at the request of the Indiana Department of Transportation (INDOT) on June 17-20, 2002. Peer exchanges are required of State Departments of Transportation as a condition of receipt of federal funding for research activities. The “exchange” is not primarily a critique or audit of the INDOT program. Rather, it is an opportunity for panel members to learn about the program and to share experiences with INDOT staff. This learning-through-peers encourages all participants to apply the benefits and practices identified during the exchange to their respective research activities. This is the second peer exchange conducted by the INDOT Research Program. The first exchange was held in August 1998. Results of that exchange were well received and the recommendations resulting from that peer exchange have largely been implemented within the INDOT Research Program. The success of the August 1998 peer exchange provided a positive foundation for the rewarding experience of this current exchange.

PARTICIPANTS: Peer exchange panel membership included the following:

- Barbara T. Harder, Principal, B. T. Harder, Inc., Chairperson
- Donald G. Johnson, Program Manager, Institute for Safe, Quiet, and Durable Highways
- William E. Kelsh, Assistant Director, Virginia Transportation Research Council
- Clemenc Ligocki, Community Planner, Federal Highway Administration, Indiana Division
- Mark Morvant, Pavement and Geotechnical Research Administrator, Louisiana Transportation Research Center
- Kumares C. Sinha, Director, Joint Transportation Research Program, School of Civil Engineering, Purdue University
- Barry K. Partridge, Chief, Research Division, INDOT

This composition of the peer exchange panel was designed to provide continuity with the previous exchange as well as to introduce fresh perspectives in the research program. Dr. Sinha, Ms. Harder, Mr. Johnson, and Dr. Partridge were members of the first peer exchange panel. In addition representatives from Virginia’s and Louisiana’s research programs were

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invited to participate due to the similarity of their programs with the INDOT Research Program, specifically their close associations with university transportation programs. Other Research Division staff members participating in the exchange included:

- Tommy Nantung, Section Manager and Peer Exchange Coordinator
- Samy Noureldin, Section Manager
- David Ward, Section Manager

Additional peer exchange coordination was provided by Karen Hatke, Program Coordinator, Joint Transportation Research Program, School of Engineering, Purdue University.

OBJECTIVES: The Peer Exchange process is designed and intended to provide opportunities to improve the management of state DOT research programs and the research outcomes they deliver. Each state further identifies specific objectives or focus areas where they would like to concentrate efforts. INDOT identified five focus areas for special attention:

1. Program administration and project selection, including,
 - effectiveness of the Long Range Research Plan (LRRP) in identifying customer needs, and
 - effectiveness of Research Proposals and the resultant research in meeting customer needs.
2. Compatibility and coordination of the INDOT Strategic Plan with the Research Program's Long Range Research Plan.
3. Review of new initiatives, which were identified as opportunities in the first peer exchange report, including
 - effectiveness of the initiatives, and
 - how they could be enhanced.
4. Research Program support to major INDOT committees, programs, and policies, including
 - effectiveness of the support, and
 - satisfaction of the executive staff, committee chairs, and division and districts with the research support provided.
5. Research Program in-house staff support, including recommendations to attract and retain qualified research scientists/engineers and professional staff.

(See Appendix A – Peer Exchange Emphasis Areas for more thorough discussions)

PROCESS: Appendix B contains the Peer Exchange agenda. The exchange process began with a pre-exchange meeting on Monday, June 17, attended by members of the INDOT Research Division, Dr. Sinha, Mr. Ligocki, and Ms. Harder, the panel chairperson. This pre-meeting or orientation was held to review the agenda and discuss the expected outcomes of the exchange with the panel chairperson. Directly following this meeting, and via video teleconferencing Dr. Partridge reviewed the goals of the peer exchange with the INDOT Commissioner, Bryan Nicol. Commissioner Nicol answered questions from Ms. Harder which dealt with vision, communications, and research needs. Through his responses, the

Commissioner provided valuable strategic direction for the peer exchange meeting. High priority issues discussed by the commissioner were:

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- Emerging Technologies: The introduction and ramifications of emerging technology in the way INDOT does business – ten years in the future perspective.
- Application to practice of the most cost-effective, longest lasting materials (e.g., asphalt, concrete, steel) to allow delivery of enhanced services within the confines of a no-growth budget – three to five years in the future perspective.
- Improved marketing of research successes and accomplishments within and external to INDOT, including integrating the good news of research accomplishments with the commissioner's public appearances and events throughout the state.
- Transportation security and how the INDOT Research Program can assist in this critical and emerging area.

These issues, raised by the commissioner, supplied additional topics for discussion during the peer exchange, and, in fact, guided many of the interviews with INDOT personnel during the second day of the exchange. A reception on Monday evening provided time for introductions among the full exchange panel and final preparations for the exchange process.

A series of interviews comprised the fact-finding opportunities for the panel and provided opportunities to discuss program practices. First, division staff provided a more detailed explanation of the Research Program and the processes used to identify needs, administer the research, and to facilitate implementation and evaluation of the results. Dr. Sinha discussed the Joint Transportation Research Program (JTRP), and presentations were given regarding the Information Technology Initiative and the North Central Superpave Center. Tuesday afternoon was spent at JTRP in conversations with university faculty from structures, materials, geotechnical, construction, and environmental disciplines. The majority of the discussions focused on university faculty staff's involvement and critique of the research program activities and in particular the Long Range Research Plan and the process used to create it. Summary time and preparation for the following day occupied the last hour of the day and the time immediately after dinner.

Wednesday's discussions were held at INDOT headquarters in Indianapolis. Interviews and discussions were held with select division chiefs, district directors, Executive Staff, JTRP board members, LRRP focus group participants, industry representatives, and Federal Highway Administration Division Office representatives. Following the return to West Lafayette, panel members conducted a preliminary debriefing and began outlining their observations and suggestions for inclusion in the first draft of this report. Panel members continued discussions and exchange of information at dinner.

The first draft was completed and distributed at the start of the Thursday morning activities. Panel members reconvened in a work session for the purposes of refining the draft report before meeting with INDOT, JTRP, FHWA, and research program staff for the final discussion. The summary draft report was submitted to the INDOT Research Division at the end of this session.

The following comments summarize the panel's observations and suggestions for consideration by the INDOT Research Program as well as the ideas that panel members will consider for application in their own respective programs.



STRENGTHS OF THE PROGRAM

Following the completion of the interviews with program staff, department managers, academic partners, FHWA representatives, and industry representatives, the panel members discussed their observations about the information that had been shared. Following are key points that reflect the panel's consensus based on the interviews conducted:

2.1. QUALITY RESEARCH PROGRAM WITH EMPHASIS ON IMPLEMENTATION

The evidence of the quality of the research program is shown through the following characteristics:

- The Research Program addresses identified departmental needs.
- The Research Program is responsive to the needs and objectives of INDOT.
- The Research Program provides effective support to INDOT committees, programs, and policies.
- There are knowledgeable researchers in-house and available through the JTRP.
- External peer review of selected research proposals strengthens the quality of the proposal and the resultant research.
- There is a commitment to implementation, including dedicating resources and other support functions.
- Satisfaction with the Research Program was expressed by INDOT personnel at each level of the organization and by scientists involved with JTRP research.
- Many states follow INDOT/academia/industry model for effective research and implementation.
- The Research Program results in cost-effective research with an independently confirmed average benefit/cost ratio of 53:1, based on quantifiable costs of selected implemented research.

2.2. RESEARCH PROGRAM LEADERSHIP AND IN-HOUSE STAFF SUPPORT

The leadership and in-house research staff competency has been maintained or enhanced since the first peer exchange in Indiana convened. The current exchange panel agrees with the

earlier assessment that, “The success of the Research Program is due to the quality and expertise of the staff assigned to the research function. In particular, the consistency and talent of the research program leadership and staff provides outstanding program strength and credibility for research performance within INDOT.” The high quality of the leadership and researchers at the JTRP complements the INDOT leadership and creates a research program value beyond what either one organization alone could produce.

In-house research scientists/engineers are highly knowledgeable both technically and in their understanding of INDOT needs and operations. Eight research scientists/engineers on staff have earned PhD degrees in specific disciplines. These specific skill levels, which include significant research experience as part of the graduate process, appear foundational in the success of the program. In-house research staff are able to cost-effectively direct program resources to INDOT needs. Furthermore, the staff is well experienced in coordination and transfer of research findings into INDOT operations policies and practice.

2.3. LONG-ESTABLISHED PRESENCE, EXCELLENCE IN TRANSPORTATION RESEARCH, AND STABLE FUNDING YIELD RESPECT AND CREDIBILITY DEPARTMENT-WIDE AND NATIONWIDE

The long standing, legislatively mandated Joint Transportation Research Program provides the structure and basis for excellence in research. The continuous commitments from the partners of JTRP, coupled with stable funding from the INDOT, and federal legislation are essential elements for success. Users of research products and practitioners know who to contact and where to go for problem solutions. Stewardship of the respect and credibility earned from research efforts of the partnership is important.

With the variation over the years of federal-aid and state funding, the legislative mandate assures that the JTRP is able to continue even in the face of economic shortfalls or changes in management. The JTRP structure further incorporates and coordinates with the North Central Superpave Center (NCSC), the Institute for Safe, Quiet, Durable Highways (SQDH), and the Accelerated Pavement Testing (APT) Facility. Efforts are underway to incorporate the Local Technical Assistance Program (LTAP) under the JTRP umbrella. This is viewed as a positive step which will facilitate the transfer of research and implementation findings to the local level.

2.4. SUPERPAVE CENTER AND ACCELERATED PAVEMENT TESTING FACILITY

The North Central Superpave Center is a valuable resource for INDOT and the Research Program. Having the center at the research division facility enhances sharing of knowledge and various resources. In addition, the adjoining Accelerated Pavement Testing (APT) facility provides an important link in translating knowledge from the laboratory to field experience.

2.5. INSTITUTE FOR SAFE, QUIET, AND DURABLE HIGHWAYS

The Institute for Safe, Quiet, and Durable Highways (SQDH) is a University Transportation Center (UTC) located at Purdue University. The SQDH is organizationally located under the JTRP. This prompts cooperation and sharing of knowledge and resources to the benefit of the Research Program and the Indiana transportation community.

2.6. ACTIVE AND INVOLVED JTRP BOARD AND STUDY ADVISORY COMMITTEES (SAC)

- Provides opportunities for practitioners to learn about new technologies, methods, and products
- Provides a forum to meet with peers and exchange information
- Comprised of a diverse membership and specifically includes users of research results
- Is an open organization that allows for additional perspectives from the transportation community, regulatory agencies, and other affected parties
- Allows a means to facilitate the transfer of knowledge based on research results to local transportation professionals

The SACs are a valuable asset to the Research Program, they ensure quality products result from the conduct of the research and that research findings are readily implementable. SACs provide expert review of all aspects of a research project and in so doing enhance the prospects for successful implementation activities following the conclusion of the research. SACs provide an opportunity for practitioners and users, as well as industry and the FHWA, to interact and exchange ideas. Many SAC members have found their SAC involvement as an opportunity to enhance their skills by learning of new technology, ideas, and approaches to transportation problems. Furthermore, SACs promote a greater understanding by practitioners of the capabilities of the research function within the department. SAC participation is viewed positively by INDOT, industry, and academia. This participation is also seen as a challenging and useful assignment, creates buy-in, and allows for participation in improving a product or process.

2.7. STRUCTURE OF THE RESEARCH PROCESS

The structure of the research process provides broad support for the INDOT Research Program. This structure includes strategic selection of research needs; the involvement of a broad cross section of transportation managers and practitioners identifying and addressing INDOT's transportation needs; partnering with industry and other national and regional transportation agencies; and the ability to extend INDOT's capabilities by being able to "tap" into university knowledge pools, educational opportunities, and laboratory resources. The emphasis and commitment to implementation of viable research findings, together with program support for implementation activities, result in satisfied 'users' and repeat customers.

2.8. EXCELLENT NEEDS IDENTIFICATION PROCESS

The LRRP/focus group process is an excellent approach for needs identification. The process is forward thinking and visionary, it presents a very good opportunity for a comprehensive approach and broad based input and, as a result, it enjoys broad-based support. The focus groups, JTRP, and the SAC structure allow projects to advance only with very broad support, and thus the likelihood of project implementation is high.

2.9. INDUSTRY INVOLVEMENT

The strong presence of industry in the research program is a valuable asset, enhancing the relevancy of the research products, and expediting and facilitating practical application of research results. Industry representatives indicate that they are well satisfied with their input to and involvement in the research process. They consider themselves “the envy of other states” because of the established close partnerships for problem solving.

A noted strength is industry membership on the Board of the JTRP and, where appropriate, on Study Advisory Committees. The industry input to the selection of research projects, partnering and funding research, and implementation of research results is particularly valuable.

2.10. LONG RANGE RESEARCH PLAN LINK WITH DEPARTMENT STRATEGIC PLAN

The LRRP provides a means by which the research program can be more closely linked with the department’s strategic plan. A comprehensive, visionary LRRP helps to drive the strategic plan and provide answers to components of the strategic plan in a timely manner.

2.11. ACCESS TO INFORMATION AND TECHNICAL EXPERTISE

INDOT management and technical professionals continue to enjoy a remarkably open channel to information and technical expertise through a well-established link with the Research Program and JTRP at Purdue University.

- The technical staff in the Research Division is highly knowledgeable about the Department's business and is readily seen as a source of technical information.
- The long-standing relationship between INDOT and JTRP has built trust and open communications -- it was common for INDOT professionals to pick up a telephone and call a university professor for input to the issues at hand.
- The close working relationship supports a fast-track process for quick turn around projects.
- The Information Technology Initiative is well developed to facilitate technology transfer and foster greater understanding of research findings. Examples of outcomes

of the information technology initiative are the interactive training for bridge and road plan reading, controlling air content in concrete that is pumped, constructability lessons learned, CD software, and the JTRP web site

<http://rebar.ecn.purdue.edu/JTRP/>.

2.12. STRONG SUPPORT OF RESEARCH PROGRAM FROM SENIOR MANAGERS AND LINE MANAGERS, AND FROM INDOT COMMITTEES

The Research Program continues to enjoy strong support from senior department management. The willingness of senior managers to participate in research program activities such as the JTRP Board, the LRRP and its focus groups, study advisory committees, the peer exchange meeting, and other research related activities, clearly indicates a depth of commitment to the value of research. Similar indications of commitment from line managers are evidenced from their equally active role in the Research Program and their repeated requests for assistance from the research program. Furthermore, because the Research Program meets the needs of the INDOT committees, support is continuously fostered by these influential practitioners.

KEY ISSUES AND OPPORTUNITIES

3.1. IMPLEMENTATION OF RESEARCH RESULTS

The exchange panel recognizes the INDOT Research Program to be very effective at implementation of research results, nevertheless no matter how excellent current implementation efforts may be, implementation is such a complex process that it always can have improvements. The Research Program has an opportunity to enlist stronger upper management support for and commitment to implementation of research results. A number of INDOT practitioners expressed the need for policy documentation supporting implementation and ownership of research results. Furthermore, it is noted that implementation could benefit from consideration and utilization of some or all of the following strategies:

- Improved packaging of research and implementation results.
- Additional demonstration projects to “jump-start” implementation.
- INDOT policy directives or memoranda to effect implementation efforts where consensus exists.
- An even stronger Research Division role in promoting and guiding implementation efforts.

3.2. MARKETING AND COMMUNICATIONS

3.2.a. *INCREASE INTERACTIONS BETWEEN INDOT RESEARCH STAFF AND INDUSTRY TECHNICAL GROUPS*

As a means to enhance marketing of the successes and accomplishments of the INDOT Research Program to industry, research scientists/engineers need to develop opportunities to foster greater interaction with industry technical groups. For example, hosting industry technical groups’ meetings at the Research Division facility will assist in greater exposure of the industry member organizations to the INDOT research program activities and accomplishments; will build trust between the industry members and INDOT, thus enhancing the INDOT, industry partnership; and will provide additional motivation for industry representatives to provide input to the LRRP process. Presentations of on-going research and

implementation projects to industry technical groups as well as closer linkage, to industry research organizations, where applicable should be considered.

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3.2.b. *PROJECT IMPLEMENTATION SUMMARIES FOR INDUSTRY*

There is opportunity for enhancing distribution of short research project implementation summaries that are appealing to industry members, which clearly describe the outcomes and products generated by the research program, and that have been successfully implemented and deployed should be considered in lieu of or in addition to the annual implementation report.

3.2.c. *ENHANCE MARKETING CAPABILITIES OF RESEARCH PROGRAM*

Through expertise available at the FHWA Division Office, INDOT's Office of Communication, and from JTRP or other academic partners, coordinate resources to more effectively perform marketing of research and emerging technology including integrating the good news of research accomplishments with the commissioner's public appearances and events throughout the State. Investigate alternatives to prepare a strategic plan to address gaps in marketing capacity as well as for accomplishing various marketing efforts.

3.2.d. *STRENGTHEN AND MARKET THE NEW INITIATIVES BEGUN AS A RESULT OF THE FIRST PEER EXCHANGE*

As a result of the previous peer exchange, various new initiatives were started including fast track projects, informational summaries, electronic access to information, and synthesis studies. While these initiatives have proven successful, there is a need to continue to market these accomplishments, the resulting new capabilities, and their use.

3.3. DEVELOP/ENHANCE POLICY RESEARCH CAPABILITIES

Developing or enhancing policy research capabilities is a means to address more directly the needs of senior management. In order to position itself as a policy research organization, the INDOT Research Program must have expertise different from the traditional expertise required for pavement or structures research. Economists, statisticians, financial analysts, strategic planners, and experts in similar areas will be needed to strengthen and increase this aspect of the research business. Currently a limited amount of policy research for senior staff decision making is being performed. Examples are research for support of asset, pavement, and bridge management systems as well as innovative financing and cost allocation.

3.4. RESTRUCTURING AND REFINEMENTS FOR THE LRRP/FOCUS GROUP PROCESS

The end of the triennium which spans the first LRRP is approaching. The time is appropriate to consider restructuring and the addition of refinements to the LRRP/focus group process. Such changes would build on the solid base developed for the first LRRP. A number of recommendations for change are

- Enhance the standardization of the focus group decision making process.
- Consider merging of existing focus groups, where appropriate, and creating new focus groups as needed, e.g., transportation security, new technology, safety, or others.
- Restructure leadership of focus groups.
- Review feedback mechanism to focus groups from the JTRP Board.

3.5. ADDRESS TRANSPORTATION SECURITY RESEARCH

To prepare for entering the transportation security research arena, the INDOT Research Program has the opportunity to do the following:

- Develop capabilities to perform research – seek internal and external expertise.
- Link the Research Program with the two existing in-house committees that are dealing with internal security issues and external security issues.
- Link the Research Program with national efforts dealing with transportation security (e.g., AASHTO security activities).
- Tailor results of other states' research or national level security program technologies/elements to be applied to practice in Indiana.

3.6. STRENGTHEN THE ATTRACTION AND RETENTION OF IN-HOUSE RESEARCH SCIENTISTS/ENGINEERS

Recognizing the need for advanced skill levels, such as PhDs in the successful conduct of research, the Research Division has increased the number of in-house PhD staff from two to eight since the first peer exchange. These PhDs are in specific areas of discipline but these skill levels are not recognized by INDOT's current classification system. In order to maintain the quality and continuity of these in-house staff, there needs to be a strengthening of the attraction and retention of the in-house research scientists/engineers.

Noting that this is a best practice, the peer exchange panel recommends the research program establish, through a university contract, non-tenured research scientist/professor positions. Such a move would provide benefits to both the university and the department as well as the scientist. These positions would continue to report to INDOT's management, would be knowledgeable of INDOT's needs, maintain continuity of research initiatives in addressing INDOT's needs, serve as "gate-keepers" for INDOT interests, perform needed in-house research, provide coordination with INDOT operations, and serve as resource persons to INDOT staff and external researchers. In addition, this contract arrangement retains staff and reduces INDOT cost associated with hiring and training of new scientists. The contract scientist/professor would provide an enhanced expertise capacity for the university thus assisting in attracting larger research grants and funding. The scientists/professors could be available for participation in NCHRP studies, pooled fund studies, and may even assist in some teaching responsibilities. An academic appointment would be a career enhancement for a current INDOT PhD researcher. There would be greater opportunities to enhance a personal network of contacts in one's field of expertise, become more intimately

knowledgeable of INDOT research needs and potential solutions, a greater opportunity to publish results of research, and potential to receive remuneration more closely allied to one's training, skill and expertise. This best practice would provide a "win-win" opportunity for both INDOT, JTRP and the university and would maintain a level of expertise not currently sustainable in the INDOT Research Program. This DOT/university researcher relationship is currently employed by other state DOTs (e.g. Louisiana DOT and Louisiana State University) and has proven practical and beneficial in fulfilling research program needs.

3.7. USE JTRP TIES TO AUGMENT STAFF AND ENHANCE CAPABILITIES

INDOT and other state agencies face difficulties in augmenting staff and securing additional technical capabilities. The JTRP program in the past, as well as potentially in the future, can be a vehicle to facilitate these capabilities on as needed basis. The JTRP, on the other hand, requires University support for adequate office spaces and other facilities, so that it can continue to respond to the changing needs of the INDOT research program. With the increased JTRP involvement in Information Technology and related activities, it is imperative that the JTRP receive the necessary support infrastructure at Purdue. As current and new initiatives progress (including the need to add additional staff, equipment, and other resources) in the next 2-3 years this support infrastructure will become even more critical and require enhancement.

3.8. PERFORMANCE MEASURES

Develop and conduct a satisfaction survey for research customers to augment the benefit/cost calculations for a more comprehensive measure of research program performance. Adding the qualitative component of customer satisfaction to the quantitative measure of the benefit/cost will increase the effectiveness of the measure. These additional measures of performance will be integrated with other existing research program performance measures.

3.9. INTRODUCTION OF NEW TECHNOLOGY INTO INDOT PRACTICE

Appropriate roles for the Research Program to consider in the introduction of new technologies into INDOT practice are:

- Assist in the development of a process to facilitate the introduction of new technology currently developed and currently in practice in other organizations or agencies.
- Assist in the evaluation of potential of technologies and their applications as well as the marketing and "packaging" of these technologies for use by transportation practitioners.
- Create more face-to-face opportunities for scientists/engineers to interact with peers and technology experts.
- Provide support for the strategic selection of new technology.

- Provide support, guidance, marketing and “packaging” of new technology developed within the Research Program, to INDOT practitioners.

This process could potentially involve a specific INDOT-FHWA committee or team, and the process should incorporate the following elements:

- Identification of new technologies for possible deployment.
- Identification of support required, resources required, appropriate format and potential stumbling blocks.
- Prioritization of new technologies.
- Methods for technology deployment (i.e. steps) and marketing.
- Input from key experts (i.e. focus group members).

3.10. TOPICS FOR RESEARCH

During the course of discussions with representatives of INDOT operating offices, several specific research needs surfaced. The Research Program should consider investigating the potential for addressing the following items:

- Preservation needs as they relate to the budget – “What amount of life do we get/expect out of our bridge rehabs, pavements, etc. and what do we need to invest in to cost-effectively preserve the system? What are the costs of the needs today versus the needs in five years?”
- Construction project delay and cost over runs – the Research Program could investigate and identify the problem issues in more detail and potentially recommend a framework or process for beginning to solve this recurring problem.
- Evaluation of non-destructive methods for existing performance-related specifications.
- Synthesis study on approaches to strategic planning and performance measurement and how they relate to INDOT.

4

PEER EXCHANGE PANEL MEMBER REPORTS

The Peer Exchange Panel Member reports are as follows:

4.1. **Barbara T. Harder, B. T. Harder, Inc., Panel Leader**

Observations:

- The INDOT research program is a model for other state's efforts. As I come in contact with other states that are less sophisticated in their research activities, I will encourage use of the best practices exhibited by the INDOT Research Program. Several of the practices that I believe are key to the program success are the JTRP institution and its legislated mandate; the three year horizon for the Long Range Research Plan and the problem identification (focus group) process; and the stable funding and consistency in high quality scientists and excellence in program management.
- The professionalism and expertise exhibited by the research engineer/scientists associated with the JTRP are impressive. A truly noteworthy observation is the astute use of the talents of these individuals by the INDOT Research Program.
- The short time spent discussing priority issues with the commissioner proved to be very fruitful. Such conversations would be very productive for Barry Partridge and the research program if they could be regularly scheduled.

Planned Actions:

- Send Barry Partridge a copy of the draft OMB performance criteria for basic and applied research
- Request a copy of the performance measures presentation Mark Morvant gave to the recent RAC II meeting. Send a copy of this and other performance measures information to Mark Neave, Research Office, London Highway Agency.
- Pass along a copy to Clemenc Ligocki of the draft peer exchange brochure that discusses the applicability of peer exchanges to other functional areas within transportation agencies.

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- Keep posted on the progress Barry Partridge makes with his efforts in strengthening the attraction and retention of in-house research scientists/engineers. The approach he will be pursuing is potentially very useful for other agencies.
- Devote some time to investigating whether a concept exists elsewhere or to developing a concept for introduction of application-ready, new technologies into state transportation agencies and the role of the research unit in that process. This is a common problem for all states and should be useful to each one.
- Take the opportunity to learn more about the integration of training into the Louisiana research program.
- The value of the benefit/cost figures was dramatically apparent in the discussion with the commissioner. Get information from Tommy Nantung regarding the methodology used to calculate the benefits.

4.2. **Donald G. Johnson, Program Manager, Institute for Safe, Quiet, and Durable Highways**

Observations and/or Planned Actions:

- Customers, in particular INDOT customers, seemed to need a “stream of information” so access to the JTRP web site for more details of ongoing and completed work is essential. Furthermore, a newsletter of brief non-technical details of research results may be needed. The Institute for Safe, Quiet, and Durable Highways (SQDH) should revisit the publication of an occasional newsletter to direct interest to our web site and final research reports.
- Web sites and newsletters cannot totally replace face-to-face contact. Therefore, SQDH must continue to present its story and summarize research findings and implementation activities in both public and private discussions.
- While the SQDH web site pre-dates the JTRP web site, the SQDH site would be integrated with JTRP’s site if we were starting fresh today. Future integration of the web sites should be considered.
- Continue and enhance the use of Study Advisory Committees. Academics and industry representatives (public and private) seemed to want this continued interaction.
- Principal investigators should keep a high profile with users even after the final report is published.
- Both “bottom up” and “top down” efforts are needed for successful implementation of research results.
- Participation of private industry (and industry associations) is critical for the success of any research program.

4.3. **William E. Kelsh, Assistant Director, Virginia Transportation Research Council**

Observations and/or Planned Actions:

- Overall, INDOT Research Division has a very effective and well-managed research program.
- INDOT's research program is well regarded within INDOT, the academic community, and in private industry.
- Focus on implementation of research results is key to maintaining relevance of the research program to INDOT needs and maintaining customer satisfaction.
- The JTRP (Purdue University/INDOT Research Division partnership) is a model for University-DOT relationships in the transportation research area.
- Due to state-imposed staffing constraints the INDOT Research Division must take maximum advantage of JTRP relationship to ensure continued growth of the program.
- INDOT's Research Program would be strengthened and INDOT would benefit by the development of research expertise/capabilities in non-engineering disciplines such as economics, finance, policy analysis, and operations research to support senior management's needs in these areas.
- While JTRP is a valuable resource, additional expertise may be available at other Indiana universities that can support INDOT's research needs.

4.4. Clemenc Ligocki, Community Planner, Federal Highway Administration, Indiana Division

Observations:

- Commissioner Nicol's views regarding the Research Program will be important in the near term. These views include:
 - INDOT needs to tap into emerging technologies impacting us beyond five years.
 - We must consider what can be done in the near term to optimize basic highway materials.
 - Research results should be communicated (marketed) to INDOT leaders and others.
 - Security may be the topic of need now.
- JTRP research information technology is strong. The JTRP web site is well developed. On-line identification of safety issues is intriguing technology with potential application for MPOs and state DOTs both in public involvement and needs identification. CDs on road and bridge plan reading will be useful.
- It appears the employment of demonstration projects in Louisiana have been a key to "selling" implementation of research results and technology. This could be helpful for Indiana.
- A mechanism for deployment (and identification and prioritization) of new technologies is needed in Indiana. This includes new technologies from completed JTRP studies as well as new technologies from outside sources, such as FHWA, other states, etc. Perhaps focus group members should have input to this process, but a higher level group should be involved in prioritization. This should start "simple", with a few "success stories" first.

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- The peer exchange and benefit/cost analysis help to demonstrate the quality and value of the INDOT research program. However, the limited reach of these two efforts should be supplemented with a customer identification and survey tool, to measure performance/customer satisfaction more objectively.
- Research results implementation could be enhanced by: 1) better explanation and publication of results; 2) demo projects in the field; 3) official INDOT policy memoranda directing INDOT staff to implement results, change specifications, etc., and 4) a stronger research division role in communicating and “selling” INDOT staff on research results/products.

Planned Actions

- Work with FHWA Indiana Division, INDOT and Purdue on a mechanism to improve technology deployment with respect to the Research Program.
- Communicate JTRP web site and other JTRP information technology (for example, the safety issue identification tool) to MPOs, INDOT, etc.
- Talk with FHWA division staff about involvement of the marketing specialist in activities such as the technology deployment mechanism (team?) and the research oriented customer (satisfaction) survey.
- Consider use of peer exchange concept/process in other planning-related process reviews.

4.5. Mark Morvant, Pavement and Geotechnical Research Administrator, Louisiana Transportation Research Center

Observations and/or Planned Actions:

- I was very impressed with the independent review of the cost-benefit of implemented research. I will make this recommendation to the LTRC Director for inclusion in our performance measures process.
- JTRP has a strong initiative on going for development of information transfer through the web and development of software through university resources. This will be a very good model for LTRC.
- Concentrating resources for identification and implementation of emerging technologies also needs to be addressed at LTRC. The discussions I heard at the peer exchange will allow me to pursue the same initiatives at LTRC.
- LTRC’s process of research problem identification committees (analogous to INDOT focus groups) can be enhanced with preliminary brainstorming sessions for development of problem statements.
- Acquire sample implementation reports from JTRP as possible models for LTRC.
- I noticed a very strong parallel of JTRP research projects. In some cases, LTRC has recently completed projects that are currently on-going at JTRP or JTRP has on going projects that LTRC is about to start. This is certainly true with many other state programs. I plan to require review of other state research web sites for possible sharing of information and results.

- I plan to confer with LA Division of FHWA for technology transfer and marketing ideas presented here.



PEER EXCHANGE EMPHASIS AREAS

The Indiana Department of Transportation (INDOT) in conjunction with the Joint Transportation Research Program (JTRP) will be initiating its second Peer Exchange of the INDOT Research Program, as mandated by Federal statute. The emphasis of the Peer Exchange will be directed towards evaluation and recommendations for improvements and enhancements in the following areas of the INDOT Research Program:

1. Program Administration and Project Selection

Potential topics include:

- Effectiveness of the Long Range Research Plan (LRRP) in identifying customer needs.
 - How effective is the LRRP process in identifying the most important needs of the department and in the development of a comprehensive and coordinated triennium research plan?
 - Does the LRRP process effectively consider and incorporate external ongoing research; current technology; needs and interests of industry, academia and FHWA performance measure areas; and partnering opportunities?
 - What are appropriate measures of customer satisfaction in the LRRP?
- Effectiveness of Research Proposals (RP) and the resultant research in meeting customer needs.
 - Are appropriate Principal Investigators (PI) and Study Advisory Committees (SAC) selected?
 - Do RP have defined tasks, deliverables, etc. and address implementation of research results (including obstacles, costs, etc.)?
 - How effective is external review of RPs; are appropriate external reviewers being selected (e.g. academia vs. DOT practitioners)?
 - Is research conducted in a timely fashion?
 - How effective are the PI, SAC, PA, and FTC in fulfilling their roles and responsibilities?
 - Are research results effectively implemented and how can the process be improved?
 - What are appropriate measures of customer satisfaction in RP and the resultant research?

- Determination and acknowledgement of superior performance to ensure it is repeated.

2. Compatibility and Coordination of INDOT Strategic Plan with Long Range Research Plan

Potential topics include:

- Effectiveness the Research Program's LRRP in supporting and coordinating with the INDOT Strategic Plan (SP).
 - Timing issues.
 - Methods to improve research support and coordination (networking).
 - Champions in the Divisions and Districts.
 - Strategic mission, vision, and objectives vs. project based objectives (comprehensive and coordinated vs. piecemeal).
 - What are appropriate measures of success?

3. Review of New Initiatives

As a result of the previous Peer Exchange several new initiatives were identified. Some of these initiatives have recently begun and some initiatives are more utilized than others.

- Review of the initiatives, their effectiveness, and how they may be enhanced.
 - Implementation Support: departmental support, training, equipment/hardware and software, and resources.
 - JTRP Web Site: hit counts, content, report requests, events announcement, and search mechanism.
 - Electronic Flow of Information: e-mail, reports on-line, meeting schedules on-line, and project management on-line (e-project).
 - Fast Track Projects: resources issue (principal investigators and students), consultancy services, budget constraints, and familiarity to Divisions/Districts.
 - Informational Summaries: repeat customers, familiarity to Divisions/Districts and sources of information.
 - Synthesis Studies: research components, INDOT practices and needs, requestor's intention (research vs best practice) and resources.
 - What are appropriate measures of success?

4. Research Support to Major INDOT Committees, Programs and Policies

Potential topics include:

- Effectiveness of the Research Program's support for major INDOT committees (e.g. Pavement Design Committee).
 - Research needs and/or support identified and submitted from the committees.

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- Research staff included in committee memberships.
- Activities in the committees.
- Successful completion of research needs and/or support to the committees.
- Is the research and/or support timely?
- Improvement suggestions.
- What are appropriate measures of success?
- Programs (e.g. Design-Build Program and the Indiana Bridge Management Program).
 - Research needs and/or support identified and submitted from the programs.
 - Representation in other programs, such as the technician and certification programs.
 - Activities in the programs.
 - Successful completion of research needs and/or support to the programs.
 - Is the research and/or support timely?
 - Improvement suggestions.
 - What are appropriate measures of success?
- Policy development (e.g. innovative financing techniques) for the department.
 - Research needs identified and/or support identified and submitted from policy development.
 - Successful completion of research and/or support to policy development.
 - Is the research and/or support timely?
 - Representation in Standard and Specification Committee and other committees.
 - Improvement suggestions.
 - What are appropriate measures of success?
- How satisfied are the Executive Staff, Committee Chairs and Division and Districts with the research support provided.
 - What are appropriate measures of success?
 - Is there consistent management support?

5. Research Division Staff Support

Experience has shown research engineers with research experience and/or advanced degrees (thereby requiring exposure to research) are considerably more effective in conducting and overseeing quality research, both in the short-term as well as in the long-term. This need is further highlighted due to the large increase in the size and demands of the INDOT Research Program on research staff. Unfortunately, these unique skills are not reflected in the current departmental classification criteria.

Potential topics include:

- Recommendations to attract and retain qualified research engineers and professional staff.
 - Recognition of advanced skills being required in the conduct of research.
 - Research engineers (and other professional staff) classifications: scientist vs. engineer, research engineer vs. field engineer.

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- Management support: issues on reclassification, etc.
- Other state DOT (and other research entities) practices, Research Program Business Plan.
- Use of SPR funds to provide research division staff support.
- Research administration vs. conduct of research.
- Technical training, workshops, networking, conference attendance, etc.
- Recognition of quality researchers.
- Improvement suggestions.



PEER EXCHANGE AGENDA

Monday, June 17, 2002

Time	Place	Room	Meeting with	Topics
2:30 - 3:30	INDOT Research Division, West Lafayette	Conf. Room	Barbara Harder meets with INDOT, JTRP and FHWA Peer Exchange Representatives (Barry Partridge, Tommy Nantung, Prof. Kumares Sinha, and Clemence Ligocki)	Peer Exchange Preparation, Discussion of Specific Exchange Targets, and Expected Outcomes
3:30 - 4:00	INDOT Research Division, West Lafayette	Conf. Room	Barbara Harder with INDOT, JTRP and FHWA Peer Exchange Representatives meet Bryan Nicol (INDOT Commissioner) in a video conference	INDOT overview, Research Projects intended for the INDOT Executive Staffs and State Legislators (Asset Management, Heavy Truck Routes, Emergency Routes, etc.), Value added from research projects to the Department, and Research Division Staff Support.
4:00 - 4:30	INDOT Research Division, West Lafayette	Conf. Room	Barbara Harder meets with INDOT, JTRP and FHWA Peer Exchange Representatives (Barry Partridge, Tommy Nantung, Prof. Kumares Sinha, and Clemenc Ligocki)	Synthesis and Summary
6:00 - 7:30 PM	Meet at INDOT Research Division in West Lafayette		Peer Exchange Members	Reception

INDOT RESEARCH PROGRAM PEER EXCHANGE

Tuesday, June 18, 2002

Time	Place	Room	Meeting with	Topics
8:00 - 9:30	INDOT Research Division, West Lafayette	Conf. Room	INDOT Research Division Section Managers: Dave Ward, Tommy Nantung, and Samy Nouredin	Project administration and project selection, Long Range Research Plan (LRRP), Focus Groups, Support to committees, programs and policies, review of new initiatives, and INDOT Research Division Staff Support
9:30 - 11:15	INDOT Research Division, West Lafayette	Conf. Room	Prof. Kumares C. Sinha , Director, Dr. Bob McCullough , Information Technology Administrator, and Karen Hatke , Program Coordinator of the Joint Transportation Research Program (JTRP)	JTRP (Introduction, coordination, and activities), research projects administration and project selection, and LRRP.
11:15 - 11:45	INDOT Research Division, West Lafayette	Conf. Room	Prof. Jan Olek and Dr. Rebecca McDaniel , North Central Superpave Center	Coordination with other research entities, project administration, and research support to INDOT programs and policies.
11:45 - 12:00	INDOT Research Division, West Lafayette	Conf. Room	Mike Byers , American Concrete Pavement Association, Indiana Chapter	INDOT research support to related industries, new initiatives (fast track projects, implementation, and web/electronic information), project administration and industry representatives, and impact on the transportation communities.
12:00 - 1:30	Lunch and travel to Purdue University by Van			
1:30 - 2:00	Purdue University, School of Civil Engineering	G-212	Professors from Structures, Materials, and Geotech: Mark Bowman, Jan Olek, and Rodrigo Salgado	Research project administration, research support to INDOT committees and program, LRRP and focus group.
2:00 - 2:30	Purdue University, School of Civil Engineering	G-212	Professors from Transportation and Construction: Darcy Bullock and Dulcy Abraham	Research project administration, research support to INDOT committees and program, LRRP and focus group.
2:30 - 3:30	Purdue University, School of Civil Engineering	G-212	Professors from Environmental and Hydraulics: Kathy Banks and Inez Hua	Research project administration, research support to INDOT committees and program, LRRP and focus group.
4:00 - 5:00	INDOT Research Division, West Lafayette	Conf. Room	Peer Exchange Members	Synthesis and Preparation for the next day meeting
6:30 - 8:30	Dinner meeting	Lafayette	Peer Exchange Members	Synthesis and Summary

INDOT RESEARCH PROGRAM PEER EXCHANGE

Wednesday, June 19, 2002

Time	Place	Room	Meeting with	Topics
8:00 - 9:30	Travel to Indianapolis by Van			
9:30 - 10:15	Bay Window Conference Room, Indiana Government Center North, Indianapolis	N-755	Firooz Zandi , Chief, INDOT Materials and Tests Division; and Tim Bertram , Chief, INDOT Contract and Construction Division	Research support to INDOT Committees and related Divisions, new initiatives (fast track projects, implementation, and web/electronic information), project administration and project selection, and research division staff support.
10:15 - 10:45	Bay Window Conference Room, Indiana Government Center North, Indianapolis	N-755	Mark Newland (for Jim Poturalski , Chief, INDOT Operations Supports Division); and Bradley Davis , District Manager, INDOT Greenfield District	Research support to INDOT Districts and related Divisions, new initiatives (fast track projects, implementation, web/electronic information), ITS, and INDOT Operations.
10:45 - 11:30	Bay Window Conference Room, Indiana Government Center North, Indianapolis	N-755	Rick Whitney , INDOT Chief Financial Officer and Internal Operations; Gary Eaton , INDOT Budget and Fiscal Management Chief of Division, and Ron Thomas , INDOT Director of Special Projects	INDOT overview, Research Projects intended for the INDOT Executive Staffs and State Legislators (Asset Management, Heavy Truck Routes, Emergency Routes, etc.), Value added from research projects to the Department, Pooled Fund Studies, and Budget issues, and compatibility with INDOT Strategic Plan.
11:30 - 12:00	Bay Window Conference Room, Indiana Government Center North, Indianapolis	N-755	Phelps Klika ; Chief, INDOT Design Division; Phyllis Hockett (for Janice Osadczuk ; Chief, INDOT Environmental, Planning, and Engineering Division), Kirk Mangold , Highway Statistic Manager, and John Nagle , Safety/Congestion Management Engineer, INDOT Program Development Division	Research support to INDOT related Divisions, new initiatives (fast track projects, implementation, and web/electronic information), project administration and project selection, and research division staff support.
12:00 - 1:30	Lunch on your own at the Indiana Government Center South			
1:30 - 2:30	Bay Window Conference Room, Indiana Government Center North, Indianapolis	N-755	Paul Berebitsky , Indiana Contractors Inc. Lloyd Bandy , Director, Asphalt Pavement Association of Indiana, John Yzenas , The Levy Company (for Bruce Mason , Indiana Mineral Aggregate Association	INDOT research support to related industries, new initiatives (fast track projects, implementation, and web/electronic information), project administration and industry representatives, and impact on the transportation communities.
2:30 - 3:00	Bay Window Conference Room, Indiana Government Center North, Indianapolis	N-755	Gary White , Assistant Division Administrator, and Larry Heil ; Planning and Research Engineer, FHWA Indiana Division	Role of FHWA to the INDOT Research Program, value added to the research program, emphasis areas, review of new initiatives, and vital views.
3:00 - 4:30	Travel back to West Lafayette			
4:30 - 5:30	INDOT Research Division, West Lafayette	Conf. Room	Peer Exchange Members	Discussion and Report Preparation
6:30 - 8:30	Dinner meeting	Lafayette	Peer Exchange Members	Synthesis and Summary

INDOT RESEARCH PROGRAM PEER EXCHANGE

Thursday, June 20, 2002

Time	Place	Room	Meeting with	Topics
8:00 - 11:00	INDOT Research Division, West Lafayette	Conf. Room	Peer Exchange Members	Discussion and Report Preparation
11:00 - 11:45	INDOT Research Division, West Lafayette	Conf. Room	Barry K. Partridge, Prof. Kumares Sinha, and Clemenc Ligocki	Summary
11:45 - 12:00	INDOT Research Division, West Lafayette	Conf. Room	Karen Hatke ; Program Coordinator, JTRP	Travel Reimbursement
12:00	Dismiss			

