

NEW MEXICO DEPARTMENT OF TRANSPORTATION

# RESEARCH BUREAU

## Innovation in Transportation

### PEER EXCHANGE

April 10-11, 2013

Albuquerque, New Mexico

Prepared by:  
Cambridge Systematics

Prepared for:  
New Mexico Dept. of Transportation  
Research Bureau

In cooperation with:  
The US Department of Transportation  
Federal Highway Administration

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16. Abstract <p>This report documents the NMDOT Research Peer Exchange held April 10-11, 2013 in Albuquerque, New Mexico in accordance with the requirements of 23 CFR 420. It involved NMDOT staff and representatives from the state DOTs of Arizona, Ohio, Texas, Washington, and Wisconsin. The two key objectives of the peer exchange were to identify steps toward creating a Strategic Research Program that supports the Department's Strategic Plan and to develop strategies for overcoming operation obstacles. It included a review of the NMDOT research program and presentations from the other peer states on their programs. The peer exchange found that the NMDOT research program had made significant progress since the last peer exchange in 2008. The peer exchange recommended that the NMDOT should develop a Strategic Research Plan to guide their research project selection process; expedite the overall research project development process by conducting some steps simultaneously; develop a "Quick-Response Program" to address high-priority research needs; strengthen the implementation process for completed projects and develop outcome performance measures; develop a communication and marketing plan to transmit the value of the research program; and build productive partnerships with senior managers, customers, and stakeholders.</p>					
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# PEER EXCHANGE

Journey from Adequate to Vital: The Pathway to Excellence

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Report NM12SP-07-003

A Peer Exchange Sponsored by

New Mexico Department of Transportation  
Research Bureau

In Cooperation with  
The U.S. Department of Transportation  
Federal Highway Administration

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Arizona Department of Transportation  
Ohio Department of Transportation  
Texas Department of Transportation  
Washington Department of Transportation  
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## **PREFACE**

The research reported describes the results of a research peer exchange conducted April 10-11, 2013 in Albuquerque, New Mexico.

## **NOTICE**

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## **DISCLAIMER**

This report presents the results of research conducted by the author(s) and does not necessarily reflect the views of the New Mexico Department of Transportation. This report does not constitute a standard or specification.

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## **EXECUTIVE SUMMARY**

A Research Peer Exchange is required under the Federal Highway Administration's (FHWA) guidelines every five years. The event is intended to assist and support state departments of transportation (DOT) by inviting states and their research personnel the opportunity to revise, assess, and provide feedback on the status of New Mexico's research activities under FHWA guidelines. The previous Peer Exchange was conducted May 12 and 13, 2008.

This Peer Exchange was held April 10 to 11, 2013 in Albuquerque, New Mexico. It involved New Mexico Department of Transportation (NMDOT) staff; FHWA New Mexico Division staff; and representatives from the States of Arizona, Ohio, Texas, Washington, and Wisconsin. This Peer Exchange Final Report includes comments and feedback on a variety of topics discussed during the exchange, including strategic planning, compressing the research project delivery timeline, building productive partnerships, maintaining enthusiasm, and establishing performance measures for the research program. The objective of the exchange was to move beyond the "adequate" status of the Research Bureau to become more "vital" to the function and operations of NMDOT. Key findings and recommendations are listed below.

### **KEY FINDINGS**

- The Research Bureau has made significant improvements since 2008, including the establishment of the Research Advisory Committees (RAC) and Chairpersons Committee (C-RAC), project evaluation committees, research procedures manual, financial accountability, participation in national activities, outreach to universities and other agencies, and maintenance of the State's only full-service transportation research library.
- All five visiting state DOTs have a departmental strategic plan that their research programs follow in developing research categories that add overall value to the organization. In some peer states, research staff take a proactive approach to target research to issues where the Secretary has interest.
- Other peer states have "set-aside" research funding for providing quick responses to policy issues or other high-priority research needs.
- Peer states such as Texas and Washington have research communication plans to promote a more active approach to communicating with executive staff. These plans include strategies such as asking advocates to speak up for research and share their experiences. They also provide periodic briefings to executive staff on resources available through the research program.
- The peer exchange determined that the NMDOT research program timeline could be shortened if some of the steps were done in parallel, similar to how Ohio DOT conducts their research program. One example would be to develop the scope of work and request for proposals at the same time as ROC and FHWA approval is requested. Another example is to conduct Research Project Solicitation in August, rather than November.

- The Research Bureau uses “output” performance measures to track implementation of completed research projects. The peer exchange participants discussed the value of using a tracking system with “outcome” performance measures to ensure that the measures demonstrate the impacts of completed research projects.

## RECOMMENDATIONS

- **Develop a Strategic Research Plan and Program.** NMDOT should develop a Strategic Research Plan with goals and objectives that establish broad research categories and guide individual project selection. The plan should support overall departmental priorities to ensure a strong, focused, valuable *Strategic* Research Program that improves the performance of the entire department. This is the most important recommendation to move the Research Bureau from adequate to vital.
- **Refine Research Process.** NMDOT should expedite the overall research project development process by developing the scope of work and requests for proposals in parallel with FHWA and ROC program review and approval. One specific suggestion was to delegate project approval from executive staff to the C-RAC. The Research Bureau should focus on tracking the research process as a whole by implementing tracking software that can monitor research from conception to implementation. This will enhance the Bureau’s ability to calculate return on investment.

The Research Bureau should strengthen the implementation process for completed research projects by developing strong implementation plans, publicizing the research results, and tracking not only outputs, but also outcomes. Through outcomes performance measures, the Bureau will more readily demonstrate the value of research to others.

- **Develop a “Quick Response Program”.** The Research Bureau should develop a “Quick-response Program” to address high-priority research needs, including policy issues of paramount importance to executive staff. Quick-response funding should be a component of the research program’s budget used to address issues of immediate importance to executive staff. In addition, signature authority should be delegated to the Research Bureau Chief to approve Task Orders performed under On-Call Research contracts.
- **Develop and Implement a Communication and Marketing Plan.** The Research Bureau should develop a communication and marketing plan, including strategies to transmit the value and importance of the research program. The Plan should express the value of completed research in qualitative and economic terms so that research can be seen as a worthwhile investment. The research staff should take a more proactive approach and target research issues where the Secretary has an interest.
- **Build Strong Partnerships.** The Research Bureau should build productive partnerships with senior managers, customers, and stakeholders. They should invite other bureaus to discuss their activities and issues with research staff and attend senior management meetings to provide briefings on research successes and resources provided by the Research Bureau. The Research Bureau staff could encourage department staff to get involved with AASHTO,

Transportation Research Board, National Cooperative Highway Research Program committees, and other organizations to collaborate on research ideas and findings.

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In accordance with the requirements of 23 CFR 420, the NMDOT Research Bureau conducted a Research Peer Exchange on April 10-11, 2013 in Albuquerque, New Mexico. FHWA defines a Peer Exchange as “a focused collaboration among transportation research colleagues through which a host state may find the means to restructure or merely fine-tune research program processes.” (FHWA 2010).

All states receiving Federal State Planning and Research (SP&R) funds are required to hold periodic Peer Exchanges. The FHWA publication *State Planning and Research: Guide for Peer Exchanges* (FHWA-HRT-10-048; June 2010) provides guidance in the administration of research Peer Exchanges in order to maximize the effectiveness of these events.

The theme for the Peer Exchange is *Journey from Adequate to Vital: The Pathway to Excellence*. This theme is in recognition of the evolution of the NMDOT Research Program since a major reorganization of policies and procedures began in 2006. Since that time, the NMDOT Research Bureau has implemented policies that address findings and recommendations resulting from a thorough financial audit of Research Bureau transactions over a five-year period as completed in 2008. In response to the audit, the Bureau established a Research Development program with reasonable countermeasures against some of the deficiencies identified during the audit.

While new policies and procedures constitute a dramatic departure from past practice, the Research Bureau has since moved from the “revolutionary” stage of the process to the “evolutionary” stage. The Research Bureau’s desire at this point is to establish and maintain a robust research program that is not considered simply adequate, but rather vital to the fulfillment of agency goals and strategic objectives. To this end, the Research Bureau invited counterparts and representatives from other states and agencies that constitute a diverse, experienced, and knowledgeable body of industry practitioners who have expressed a commitment to share their expertise to further reach its objectives.

The last Research Peer Exchange conducted by NMDOT was held on May 12-13, 2008. In consideration of the significant changes underway in the administration of the Department’s research program at the time, the focus of that Exchange was general *Research Program Administration*. Representatives from research divisions at state DOTs in Colorado, Oklahoma, Texas, and Washington participated in this event. During this meeting, participants assessed the effectiveness of NMDOT’s research program, and provided a perspective of how these agencies approach the administration of important research initiatives.

Meeting participants provided a frank and candid critique of the NMDOT research program as it was administered at the time, and offered several suggestions for improvements. These comments are incorporated into the *NMDOT Research Bureau 2008 Peer Exchange Report*. On review and consideration of comments and suggestions by meeting participants, the NMDOT completed an *Action Plan Deployment*.

The Research Bureau has made substantial progress in improving and refining its policies and procedures for the purpose of improving service, responsiveness to customer needs, financial

oversight, project management, and transparency. Since the last Peer Exchange was conducted in 2008, the number of active projects administered annually has quadrupled. Some of the more notable improvements in the administration of the NMDOT research program include the following:

- **Establishment of Research Advisory Committees (RAC)** – A suggestion from the 2008 Peer Exchange was to establish an intermediate level of management participation between the Research Bureau and the Research Oversight Committee, which is composed of executive staff. A Research Advisory Committee was established under each of the three Deputy Cabinet Secretaries and each RAC is led by an appointed chairperson.
- **Consultant Evaluation Committees** – Another recommendation was to evaluate proposals and select consultants using independent, ad hoc Consultant Evaluation Committees drawn from a particular project's Technical Panel.
- **Documented Policies and Procedures** – Policies and procedures are now documented in a manual, which is periodically reviewed and approved by agency management and FHWA.
- **Project Management Database** – The Research Bureau developed a database application to capture, track, and report vital project information. Plans are currently underway to replace this application with a more efficient, industry-standard application.
- **Financial Accountability** – The Research Bureau has implemented a three-tiered system for approving contractor invoices that provides a very high level of confidence in the accuracy and legitimacy of invoiced costs. Program expenditures are reviewed and approved by both internal and external committees, and these are documented in annual Research Work Programs and Performance and Expenditure reports. The result is a highly transparent system that clearly documents Bureau activities, funding, and expenditures.
- **Participation in National Activities** – Research Bureau staff, to the greatest possible extent, continue to participate in national research activities as organized by the Transportation Research Board (TRB), AASHTO, and others. Since the last Peer Exchange, Research Bureau staff have attended all of the summer joint TRB/AASHTO RAC meetings, and have submitted four technical papers for consideration by TRB, all of which were favorably peer-reviewed and invited for publication and/or presentation at various national and international conferences.
- Most recently, in 2012 a research project sponsored by the NMDOT Bridge Bureau and conducted by New Mexico State University was recognized by AASHTO as being among the most high-value research currently underway in the nation.
- NMDOT staff conducted three presentations on research projects at the most recent TRB conference in January 2013, and another project presentation has been accepted by the International Conference on Ecology and Transportation.
- **Outreach to Universities** – In order to foster a better working partnership with the State's research universities, the Research Bureau has conducted three workshops since the last Peer

Exchange to familiarize university personnel with Bureau policies and procedures, and has visited with university officials in person during visits to each university. Research Bureau staff also regularly conducts pre-proposal meetings to remind prospective proposers of policies, procedures, and other requirements. In Fiscal Year (FY) 2013, the Research Bureau provided letters of support from agency management to two research universities for their efforts to establish University Transportation Centers.

- **Outreach to the Public and Agency Personnel** – The Research Bureau established an annual workshop, the Research Project Solicitation, which is designed to solicit problem statements and ideas for high-value research from subject matter experts within the agency. The Research Bureau maintains a Products Room that displays the results of many of the agency’s research initiatives. Research Bureau staff maintain a presence at the agency’s two major annual engineering conferences – the Paving Conference sponsored by the University of New Mexico and the Engineering Conference sponsored by New Mexico State University – and encourages Technical Panel members and Principal Investigators to present research projects at these events. Research Bureau staff are regular contributors to the Department’s newsletter, and participate in other events as requested, including the annual School to World event and Transportation Day at the State Capitol.
- **Knowledge Management** – The Research Bureau maintains the State’s only full-service transportation research library, with access to thousands of publications and resources on site, and access to searchable databases that store hundreds of thousands of relevant research materials. Since 2009, the Research Bureau has participated in a Transportation Pooled Fund study that provides an unprecedented level of cooperation between transportation knowledge management professionals across the country. These resources provide the tools for engineers and other industry practitioners to conduct independent research into a virtually unlimited number of subject areas.

Since its reorganization beginning in FY 2007, during which only one research project was awarded, the NMDOT Research Bureau now administers a robust program of award-winning research, technology transfer, and development that serve the needs of practitioners both within the agency and in other states. Some of the product development initiatives include in-house development of a simple-to-use bridge information system currently being evaluated by approximately three dozen national and international entities representing industry, academia, and all levels of government; an application that independently processes and evaluates traffic data collected from the State’s weigh-in-motion equipment; a GIS application that provides a simplified means to identify routes and mileposts on a stylized New Mexico state road and county map; and an engineering application that compares shear and bending moment stresses imposed by overweight commercial trucks as identified through the State’s weigh-in-motion equipment with a bridge’s allowable loads as identified through the National Bridge Inventory database. Many of these research projects, technology transfer initiatives, and software applications are designed to work together to provide a more comprehensive understanding of the State’s increasingly complex transportation system.

The following sections describe the findings of the two-day Peer Exchange, and provide new recommendations to move the Research Bureau in the direction of being increasingly vital to the DOT.

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## 2.0 Objectives

In accordance with the requirements of 23 CFR 420, the NMDOT conducted a Research Peer Exchange on April 10-11, 2013 in Albuquerque, New Mexico.

The theme of the April 2013 Peer Exchange is to advance the NMDOT Research Bureau's *Journey from Adequate to Vital: Pathway to Excellence*. There are two key objectives of this effort:

1. To identify concrete steps toward creating a Strategic Research Program that supports the Department's Strategic Plan; and
2. To develop strategies for overcoming operational obstacles.

To achieve these objectives, the Research Bureau selected Peer Reviewers from states that have already developed strategic research programs. Moreover, four of the five invited peers serve as the Director or Bureau Chief of their respective State DOT research program and are directly responsible for their program's operations. The invited peers are also active in regional and national AASHTO Research Advisory Committees, TRB committees, and NCHRP projects.

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### 3.0 List of Participants

In total, 26 participants attended the Peer Exchange, with representatives from state DOTs in New Mexico, Arizona, Ohio, Texas, Washington, Wisconsin; and the staff from the FHWA New Mexico Division New Mexico. The list of participants is shown in Table 3.1. Full biographical details for each participant can be found in Appendix A.

**Table 3.1 Summary List of Participants**

	<b>Name</b>	<b>Title</b>	<b>Affiliation</b>
1	Shannon Crum	Director of Research and Technology Implementation	Texas DOT
2	Anne Ellis	Research Director	Arizona DOT
3	Kelly Nye	Research Contract Manager	Ohio DOT
4	Leni Oman	Director of Research and Library Services	Washington State DOT
5	Daniel Yeh	Research & Library Program Manager	Wisconsin DOT
6	Greg Heitmann	Research Engineer	FHWA
7	Monica Jurado	Field Operations Engineer	FHWA
8	Don Martinez	Division Administrator	FHWA
9	Luis Melgoza	Safety and Pavement Engineer	FHWA
10	Yamayra Rodriguez	PDP Structures Engineer	FHWA
11	Kathryn Bender	Deputy Secretary	NMDOT
12	Dee Billingsley	Research Bureau Administrator	NMDOT Research Bureau
13	Krystyna Cherry	Librarian	NMDOT Research Bureau
14	Keli Daniell	Project Manager	NMDOT Research Bureau
15	Amy Estelle	Engineer Coordinator	NMDOT Research Bureau
16	Tamara Haas	Executive Manager of the Office of Strategic Planning and Asset Management	NMDOT
17	Michelle Langehennig	IT Applications Developer	NMDOT Research Bureau
18	Scott McClure	Bureau Chief	NMDOT Research Bureau
19	Robert McCoy	Research Implementation Engineer	NMDOT Research Bureau
20	Hien Phung	Financial Specialist	NMDOT Research Bureau
21	Lee Rosen	Business Support Research Advisory Committee, C-RAC	NMDOT
22	Michael Sandoval	Director, Transportation Planning and Safety Division, C-RAC	NMDOT
23	Virgil Valdez	Management Analyst Supervisor	NMDOT Research Bureau
24	Ken Leonard	Facilitator	Cambridge Systematics, Inc.
25	Wendy Tao	Facilitator	Cambridge Systematics, Inc.



Front Row (L-R): Hien Phung, Krystyna Cherry, Leni Oman, Yamayra Rodriguez, Monica Jurado, Wendy Tao, Ken Leonard.

Second Row (L-R): Michelle Langehennig, Shannon Crum, Lee Rosen, Dee Billingsley, Robert McCoy, Luis Melgoza, Virgil Valdez, Amy Estelle, Michael Sandoval.

Back Row (L-R): Greg Heitmann, Scott McClure, Kelly Nye, Keli Daniell, Daniel Yeh.

Not Pictured: Anne Ellis, Kathryn Bender, Tamara Haas, Don Martinez.

Photo: Jake Schoellkopf, NMDOT Photographer.

**Figure 3.1 Photo of Peer Exchange Participants, Albuquerque, New Mexico**

## 4.0 Peer Exchange Agenda

The Peer Exchange took place over two days on April 10-11, 2013. The first day was focused on developing a strategic research program, and the second day was focused on overcoming operational obstacles.



Photo: Michelle Langehennig, NMDOT.

**Figure 4.1 Participants in Facilitated and Roundtable Discussion**

The agenda for each day is shown in Tables 4.1 and 4.2.

**Table 4.1 Participants' Agenda – Day 1**

<b>Time</b>	<b>Agenda Item</b>
<b>Wednesday, April 10, Developing a Strategic Research Program</b>	
<b>8:00-8:30</b>	Welcome (FHWA and NMDOT)
<b>8:30-9:00</b>	Introductions (All Participants)
<b>9:00-9:45</b>	Research Program Overview: Keli Daniell (New Mexico), Daniel Yeh (Wisconsin), and Anne Ellis (Arizona)
<b>9:45-10:00</b>	Break
<b>10:00-10:45</b>	Research Program Overview: Shannon Crum (Texas), Leni Oman (Washington), and Kelly Nye (Ohio)
<b>10:45-11:30</b>	Activity – “Four Word Guide to Strategic Planning” (Wendy Tao and Amy Estelle)
<b>11:30-1:00</b>	Lunch
<b>1:00-1:45</b>	Developing a Strategic Research Program – Best Practices: Discussion with Ohio and Texas DOTs (Wendy Tao, Kelly Nye, and Shannon Crum)
<b>1:45-2:15</b>	Lessons Learned: Obstacles and Successes in Creating a Strategic Research Program (Ken Leonard and Wendy Tao)
<b>2:15-2:30</b>	Break
<b>2:30-3:00</b>	Activity – “Get in Line! The Journey from Adequate to Strategic” (Amy Estelle and Wendy Tao)
<b>3:00-4:00</b>	Identifying Concrete Next Steps (Ken Leonard and Keli Daniell)
<b>4:00-4:10</b>	Break
<b>4:10-5:00</b>	Reflection and Reporting on Day 1 (Ken Leonard and Wendy Tao)
<b>5:30 p.m.</b>	Dinner

**Table 4.2 Participants' Agenda – Day 2**

<b>Time</b>	<b>Agenda Item</b>
<b>Thursday, April 11, Overcoming Operational Obstacles</b>	
<b>8:00-8:30</b>	Recap of Day 2 (Ken Leonard and Wendy Tao)
<b>8:30-9:30</b>	Activity – “Diagnosis and Treatment, Active Listening Exercise” (Amy Estelle and Keli Daniell)
<b>9:30-9:45</b>	Break
<b>9:45-10:15</b>	Activity – “How Long Does It Take from Concept to Execution?” (Wendy Tao)
<b>10:15-11:30</b>	Compressing the Timeline (Wendy Tao and Amy Estelle)
<b>11:30-1:00</b>	Lunch
<b>1:00-1:30</b>	Building Productive Partnerships (Ken Leonard and Keli Daniell)
<b>1:30-2:45</b>	Maintaining Enthusiasm (Ken Leonard and Keli Daniell)
<b>2:45-3:00</b>	Break
<b>3:00-3:50</b>	Establishing Outcomes-Based Performance Measures and Facilitating Implementation (Ken Leonard and Robert McCoy)
<b>3:50-4:00</b>	Participant Evaluation of Event (All Participants)
<b>4:00-5:00</b>	Reflection and Reporting on Day 2 (Ken Leonard and Wendy Tao)
<b>6:30 p.m.</b>	Dinner (optional for those available)

## **5.0 A Review of State Research Programs from Peer States**

This section provides an overview of the six state programs represented in the Peer Exchange, including New Mexico, Arizona, Ohio, Texas, Washington, and Wisconsin. Each state's research program is described briefly in this section and the full presentations are provided in Appendix B.

### **5.1 New Mexico**

#### ***Research Guidance***

- The mission of the NMDOT Research Bureau is:
  - To perform high-quality transportation research that provides innovative solutions to transportation problems confronting our customers.
  - To accomplish this mission through close coordination with our partners and customers, while adhering to the strategic goals and key principles established by the Department.

#### ***Internal Operations and Programming***

- There are nine full-time staff.
- Funding:
  - SP&R funding only.
  - \$1.8 million budget per year.
  - Thirty-four active projects.
  - NMDOT's main university partners include The University of New Mexico, New Mexico State University, and New Mexico Institute of Mining and Technology.
  - FY 2013 contract research project was provided by private vendors (21%), universities (50%), in-house (24%), and pooled fund studies (6%), although this distribution does change from year to year.
- History:
  - Major revisions and reorganization of policies and procedures in 2008 in response to a Federal audit.
  - Major procedural and operational improvements began in FY 2007 and a series of countermeasures were put into practice in FY 2008.
  - The procedures manual gives clear expectations for Principal Investigators, Project Advocates, and Technical Panels.

- Master contracts (two with universities) have been eliminated, and the program now has a more project-focused contracting structure.
- Project management duties are placed solely on Research Bureau staff.
- Contract development has been improved.
- An annual Research Project Solicitation process was adopted that brings together about 70 Department staff to generate research requests.

***Strengths and Opportunities/Weaknesses***

**Table 5.1 NMDOT Program Strengths and Opportunities**

<b>Strengths</b>	<b>Opportunities</b>
Knowledgeable and diverse staff. Positive working relationship with advocates, technical panels, and FHWA.	Reduce project development and contract execution time. Establish written policies and procedures that govern daily research activities. Conduct research that supports Department’s strategic priorities. Improve implementation tracking process.

Source: NMDOT Research Bureau.

**5.2 Arizona**

***Research Guidance***

- Mission and Vision:
  - Research, Library, Product Evaluation.
  - Our mission is to create, share, and apply knowledge in transportation systems and programs.
  - Our vision is to excel in our service to the State as a trusted information resource.

***Internal Operations and Programming***

- Budget and Funding:
  - All State Planning and Research (SPR).
  - Annual project budget of \$1.6 million.
  - Most work is contract research.

- Universities do 15 to 20 percent of research.
- 75 Projects under contract.

- Research Strategic Plan (2013 Update):

The Research Center is a catalyst for innovation at the Arizona Department of Transportation. The Research Center engages in three major functions: administering the Department's research program, managing the product approval program, and maintaining a transportation library. Our **mission** is to create, share, and apply knowledge in transportation systems and programs. Our **vision** is to excel in our service to the State as a trusted information resource.

- **Goal 1** – To create and promote an enabling and innovative environment for ADOT Research Services (*PEOPLE*).
- **Goal 2** – To ensure that research topics reflect implementable statewide needs (*PEOPLE and PROCESS*).
- **Goal 3** – To deliver high-quality published reports and research results to the sponsor's satisfaction and within the timeframe specified in the work program (*PROCESS*).
- **Goal 4** – To integrate the library into the mainstream of business at ADOT (*PERFORMANCE/TOOLS*).
- **Goal 5** – To make the Product Evaluation Program and APL a valuable resource to ADOT engineers and contractors while being responsive to vendors (*PERFORMANCE/TOOLS and PEOPLE*).
- **Goal 6** – To use SPR Part 2 funding in the most efficient and effective manner (*PROCESS*).

- Other Research Program Documents:

- Research program manual.
- Problem statement form.
- Writing specifications and guidelines.

## *Strengths and Opportunities/Weaknesses*

**Table 5.2 ADOT Program Strengths and Opportunities**

<b>Strengths</b>	<b>Opportunities</b>
Good relationship with FHWA Division Office.	Projects always take too long.
Skilled and diverse staff.	Behind on spending.
Editing process <sup>a</sup> .	Editing process.

Source: ADOT Research Center.

<sup>a</sup> The editing process was formerly a challenge, but in the last year many new measures have been implemented to make this a strength.

### **5.3 Ohio**

#### ***Research Guidance***

- Mission and Vision:
  - Provide easy movement of people and goods.
  - Take care of what we have.
  - Make our system work better.
  - Improve safety.
  - Enhance capacity.
- ODOT Research’s mission is to *invest* in innovative research that develops, maintains, and assists Ohio in establishing a world-class transportation system.
- How can the research program assist ODOT’s mission?
  - Develop strategic focus areas.
  - Expand access to the Program.
  - Minimize time from ideas to results.
  - Emphasize implementation.
  - Be mindful of the return on investment.

### ***Internal Operations and Programming***

- Research budget:
  - Research uses SP&R<sup>2</sup> funds only.
  - FY 2013 Research Funding Allocation (\$8,129,583).
- Research projects:
  - Active projects:
    - » Funding varies from project to project.
    - » Currently 56 active projects:
      - ✓ Twenty-nine strategic research projects (52 percent).
      - ✓ Fourteen ODOT-partnered research exploration programs (25 percent).
      - ✓ Eleven student studies (20 percent).
      - ✓ Two in-house (3 percent).
    - » Forty-seven projects assigned to universities (84 percent).

### ***Strengths and Opportunities/Weaknesses***

**Table 5.3 ODOT Program Strengths and Weaknesses**

<b>Strengths</b>	<b>Weaknesses</b>
Responsive to customer needs (In-house research, research on-call).	Information management (dated, inefficient project management system, retiring knowledge).
Fiscal flexibility.	Minimal (departmental) cultural acceptance of research (hindrance versus advantage).
Competitive program:	Timeliness of projects (state roadblocks).
• Ohio has 14 universities and numerous engineering firms.	
• Collaboration among universities and private agencies.	
• Seventh largest research program in the nation.	

Source: Ohio DOT.

## 5.4 Texas

### *Research Guidance*

- Mission and Vision:
  - Provide organizational support by ensuring best ideas and innovations inside TxDOT are funded and researched for large-scale implementation, projects are conducted by the right researchers, producing timely results for evaluation.
- Goals:
  - Develop an effective Research and Technology Implementation (RTI) Office work force:
    - » *Objective:* Identify necessary skill sets and appropriate FTE number.
    - » *Objective:* Identify necessary training.
    - » *Objective:* Be fully staffed with the right people.
  - Use the right process to select projects:
    - » *Objective:* Projects closely align with TxDOT goals.
    - » *Objective:* Projects with high dollar value are vetted and approved by the appropriate District/Division/Office/Region Director (DDOR), and Deputy Executive Director (DED), and Chief Strategy and Administration Officer (CSAO).
  - Develop a process to implement research results:
    - » *Objective* – Adhere to a plan to assure research results are systematically reviewed and implemented in a timely manner, thoroughly vetted by the appropriate DDOR, approved by the DED, and the CSAO.
    - » *Objective* – Present research results through distribution or symposiums to TxDOT and research community.
    - » *Objective* – Regularly communicate with customers, working with the Chief Communications Officer staff, for effective dissemination of research results.
    - » *Objective* – Projects results are timely, and results in good implementation.
  - Effectively manage our activities to deliver high value to TxDOT:
    - » *Objective* – Manage projects resulting in high-value effectiveness and outcome.
    - » *Objective* – Reduce the number of active research and implementation projects to no more than 150.

- » *Objective* – Maintain the percentage of overdue deliverables that are older than one month to under 5 percent.
- » *Objective* – Maintain the percentage of on time project technical memos to over 95 percent.
- » *Objective* – Conduct at least one district visit per month.
- » *Objective* – Identify a replacement for the research management system software.

### ***Internal Operations and Programming***

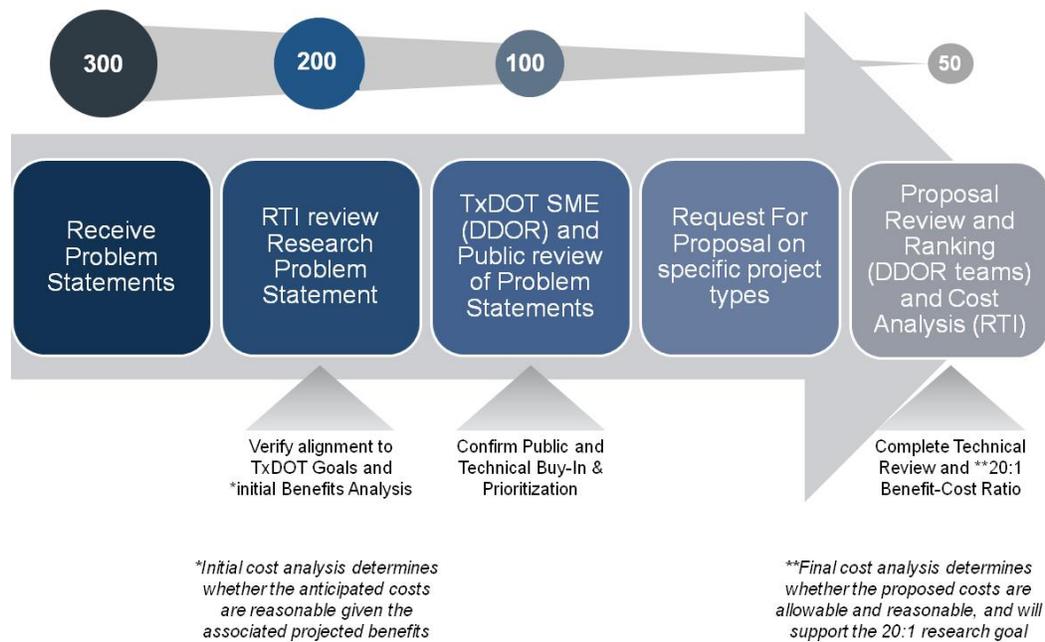
- Staff includes five project managers, managing over 140 active projects.
- Clients:
  - Districts, divisions, offices, regions, administration, and engineering staff or other professional staff seeking to make the agency better.
- Funding:
  - Annual research budget: \$21.5 million.
  - Annual implementation budget: \$3.5 million.
  - Total size of FY 13 program (152 projects): \$64 million.
  - Program administration (11 staff): \$0.83 million.
  - All funding goes to about 15 state-supported universities.
  - Only funding projects that contribute to a program goal or 20:1 benefit/cost ratio.
  - Implementing a blind review process.

Figures 5.1 and 5.2 provide the current process for how Texas DOT conducts and executes research from project selection to implementation.



Source: TxDOT RTI Office.

**Figure 5.1 Three Ways to Execute Research Projects at TxDOT**



Source: TxDOT RTI Office.

**Figure 5.2 TxDOT RTI Annual Program Project Selection Process**

### ***Strengths and Opportunities/Weaknesses***

- Strengths: Has a new problem statement form that aligns projects to agency goals. Includes goals, a benefit/cost analysis, and the right signatures of support. (ensures sponsorship at the executive level)
- Opportunities: The program has seen significant changes over the last six months. The implemented changes have only taken place for the last four months and are evolving.

## **5.5 Washington**

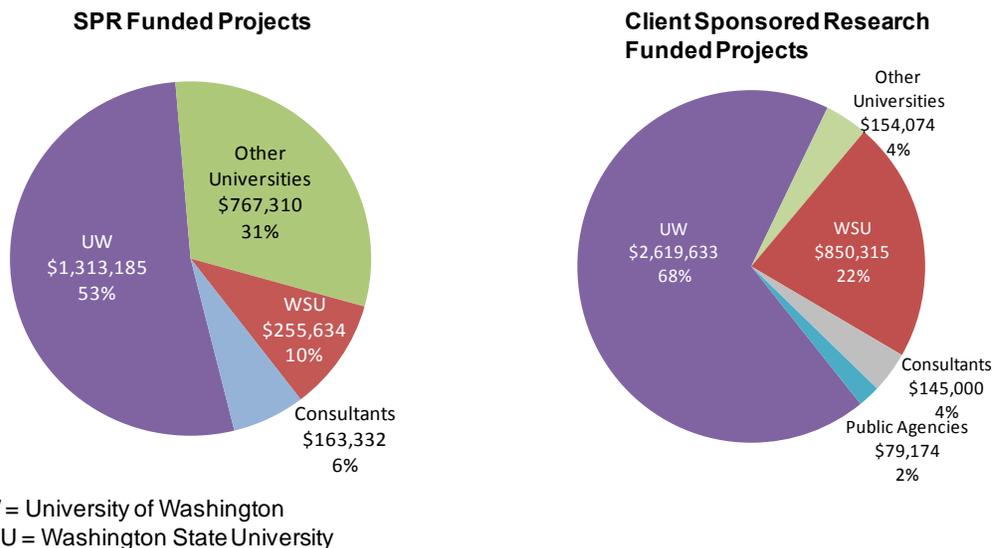
### ***Research Guidance***

- WSDOT Research Policy Goals through the management of the Office of Research and Library Services (ORLS):
  - Research project inquiries align with the WSDOT Strategic Plan and support the strategies of *Moving Washington*.
  - We strive to avoid duplication of research.
  - Research needs are identified through a collaborative process directed by business needs.
  - We partner with TRB, Washington State Transportation Center (TRAC), University Transportation Centers, and other organizations.
  - We help attract student interest in the transportation sector as a possible career.
- Examples of WSDOT Research values that provide greater efficiency and benefits:
  - Implemented national best practices, such as expedited bridge delivery, concrete pavement dowel bar retrofits, and low-cost safety investments reducing run-off-the-road fatalities.
  - Made investments for the greatest benefits to stream habitats when transportation projects impact the natural environment.
  - Adopted new technology for optimum freeway operations efficiency:
    - » Automated traffic management, electronic tolling, and ramp metering.
    - » Real-time traveler information and mobile apps.

- Augmented performance-based management of preservation and maintenance:
  - » Used technology and research advances on high-performing, lower-cost pavement preservation and repair.

**Internal Operations and Programming**

- The research budget and contract value has been about \$13.8 million, which includes around 100 projects.
- Research project contracts awarded mostly to University of Washington and Washington State University, although there is funding to public agencies, consultants, and other universities. Figure 5.3 shows the research breakdown.
- Many WSDOT employees involved in TRB:
  - Fifty-six on 79 Cooperative Research Project panels.
  - Forty-two on 62 TRB standing committees.
  - Nine on 12 Strategic Highway Research Program 2 panels.
  - Three on 4 other TRB committees.
  - Eighty-two unique WSDOT employees participate in 236 committees, panels, and task groups.



Source: Washington DOT.

**Figure 5.3 Who Does the Research at WSDOT?**

## *Strengths and Opportunities/Weaknesses*

**Table 5.4 WSDOT Program Strengths and Weaknesses**

<b>Strengths</b>	<b>Weaknesses</b>
A strong ethic of customer service in all staff. General awareness, support, and appreciation for the services of the office. An understanding that research adds value. A spirit of innovation in the department culture. Access to Executive Staff and Senior Managers. An engaged Research Executive Committee. A diverse portfolio of services and project subjects. Advocates within the technical programs. Strong partnerships inside the department and beyond. Involved employees.	Funding: buying power is down due to cost increases. Have not been able to reinstitute programs cut during recent budget constraints. Documentation of hand-off to sponsor/user, information from technical offices about value of products. Tools to manage the unique nature of the work – too much is hand labor. Workflow not well aligned, which creates bottlenecks. Too much variation in practice amongst individual research managers. Heavy workloads (25-48 projects per manager). Information management lacks clarity within and between paper and electronic files. Web site is weak. Resources needed for knowledge and information management.

Source: Washington DOT.

## **5.6 Wisconsin**

### ***Research Guidance***

- Goals and objectives:
  - Wisconsin Highway Research Program has a five-year strategic plan (2010-2015).
  - Other program goals derived through WisDOT.
  - Department strategic plan.
  - Department performance measures.
  - Research and Library Advisory Committee.
- The research program is housed within the Division of Business Management.

### ***Internal Operations and Programming***

- Funding for FY 2013 – \$4.1 million/90 percent SPR-funded.
- 2003-2013, \$13.9 million in individual projects.

- Who performs WisDOT research?
  - In-state universities (67 percent):
    - » Four engineering-based, one nonengineering-based university.
  - Out-of-state university (9 percent).
  - Public agency (4 percent).
  - Consultant (20 percent).
- Research activities in research during FY 2012:
  - Individual state-based projects:
    - » Eighteen projects completed.
    - » Nineteen projects continuing.
    - » Seventeen projects started.
  - Pooled funds.
  - Three topical Peer Exchanges.
- Program metrics/measures:
  - SPR track database allows program to track all financial and contract-related issues.
  - Annual report provides key program information and top stories of successful research.
  - Evaluation of researcher conducted after each project is completed (pilot in 2012).
- “Working list” of project implementation measures:
  - Implemented – new/changed practice.
  - Implemented – supports existing practice.
  - Implementation pending internal action.
  - Implementation pending external action.
  - Requires additional research.
  - Research for information only, no implementation.

- Not implemented – canceled or terminated project.
- Not implemented – all other.

***Strengths and Opportunities/Weaknesses***

- Challenges:
  - Not directly related to highway or modal functions.
  - Not directly related to SPR-1 functions.
  - Part-time program manager.
- Opportunities:
  - Solely responsible for development SPR-2 program.
  - Not tied to a specific mode or function.
  - Secretary serves on AASHTO Standing Committee on Research (SCOR).

**Table 5.5 WisDOT Program Strengths and Weaknesses**

<b>Strengths</b>	<b>Weaknesses</b>
Strong support for innovation and research from WisDOT management, including Secretary.	Diminishing Federal dollars and lack of any state dollars beyond minimal match.
Direct involvement from department managers in research committees.	Lack of engineering expertise permanently assigned to the Research Program.
Direct involvement from industry and academia in Wisconsin Highway Research Program.	Inability to influence processes or maintain consistent performance from major universities.
Program management staff and tools.	

Source: WisDOT Research Bureau.

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## 6.0 Session-by-Session Findings

This section provides a detailed summary of findings from each session of the agenda. These session findings are then translated into recommendations for Section 7.0.

### 6.1 Strategic Research Best Practices

The goal of this session was to hear from two DOTs that have most recently conducted a strategic planning effort. Both Ohio and Texas have been in the midst of this transitional effort. Each program described their own journeys to develop a strategic research plan and program.



Shannon Crum (middle) and Kelly Nye (right) speak about their experiences with strategic planning in their research programs with Wendy Tao (left).

Photo: Jake Schoellkopf, NMDOT Photographer.

**Figure 6.1 Experiences Shared by Peer States Texas and Ohio**

### *Experience from Ohio*

- Ohio started by collaborating with divisions to develop a set of goals.
- At first, the strategic planning effort received resistance. For good projects, the research group needed people to put more thought into the proposals.
- In terms of upper management, it was hard at first to get them to sit down with the research group and get involved in the process. The overall goal is that the research group would like the Director to be able to tell people what the research group does.
- ODOT updates their research plan every two years.
- ODOT now produces a quarterly newsletter to describe what research has been completed and what they are currently working on.

### *Experience from Texas*

- The change agent towards strategic planning came from the top down. The new Executive Director brought in people from the private sector. He and his immediate reports have business backgrounds and degrees, and wanted the research department to show a return on investments. In response, RTI created a process for ensuring the research would produce a measureable benefit to the department.
- Communication with executives is critical. One of the best tools on the list was for the research department to be ready to give 90-second “elevator talks” regarding research to any executive staff on topics of interest to them.
- The research staff actively identifies research work on the issues the Secretary is interested in and filters the information up to him. This is a proactive strategy rather than a reactive one.
- The research group sends research information to the Public Affairs officers, up to three e-mails a month on targeted issues selected from current events, the legislative calendar, or other topics that are “in the news”. The goal is to give the perception that the research is timely.
- TxDOT developed a communication plan, including a quarterly internal newsletter. In addition, a ROI was implemented: the overall program has to have 20:1 benefit/cost ratio. In future years, the staff will come back afterwards to determine if research results were implemented and to calculate the final ROI.
- TxDOT uses a Microsoft Excel worksheet to estimate the research cost and benefits. Non-revenue related externalities are included in benefits estimates.
- TxDOT’s research plan is high level and targeted to agency strategic goals. Research strategic plan is updated continually to reflect agency needs and goals.

## 6.2 Concrete Next Steps for NMDOT's Research Program

NMDOT Research Bureau already has defined processes and has successful projects that meet customer needs, but they are interested in selecting projects that support the overall Department's strategic goals.

Currently, NMDOT is developing a Department-wide strategic plan. This session considered ways for the Research Bureau to operate while the Department is also undergoing strategic planning.

## 6.3 Mapping Out a Project Timeline

The overall objective of this session was to determine how long it takes for a research request to evolve from conception to executed contract, to compare and contrast the experiences of peer DOTs, and to determine how NMDOT can improve response time and offer better and faster research service to the Department.

### *Best Practices Managing the Timeline from Concept to Execution*

In this session, the participants compared and contrasted the experience of all six DOTs and the time it took for taking a research request through project development, development of an RFP, project solicitation, and contracting to conduct the research.

### *Compressing the Timeline for NMDOT*

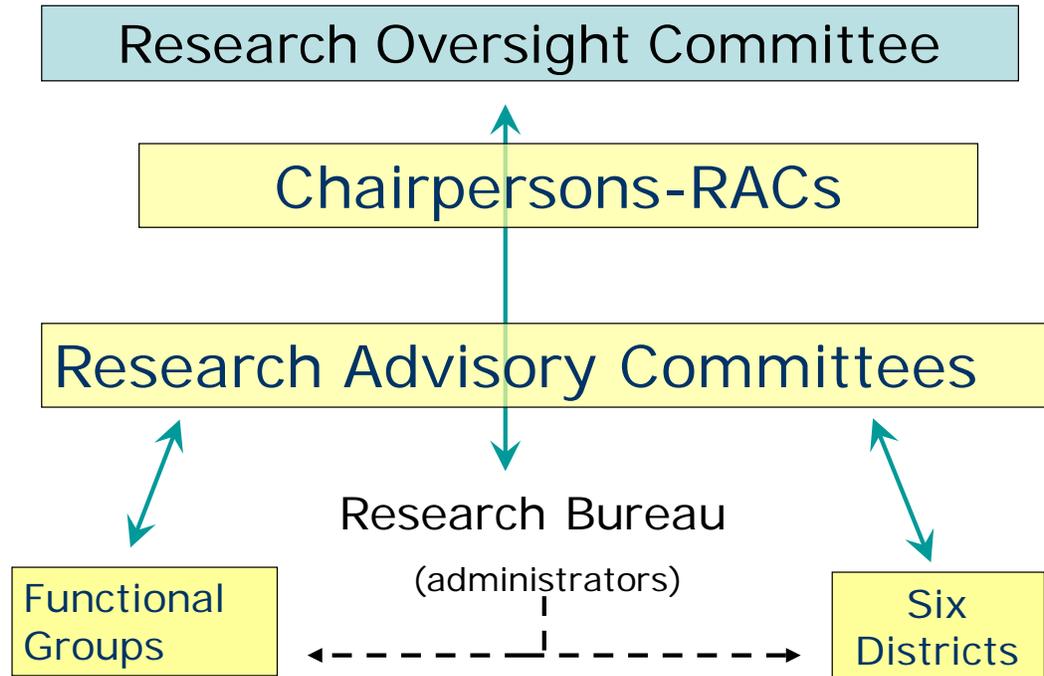
NMDOT is currently concerned about the overall timeline for a research project to be developed and a contract executed so the research can begin. Senior management and researchers have critiqued the process as too lengthy and thus nonresponsive to the customers' needs. This session focused on describing the NMDOT research approval process and timeline. Participants provided a short list of recommendations to improve the overall process. To better understand the challenges NMDOT is currently facing, Figure 6.2 shows the current process from research request solicitation to contract execution. This process was implemented after the financial audit was completed in 2008.

Countermeasures were developed against some of the deficiencies identified during the audit. Thus, the current milestones in project selection lie within three main decision-making bodies: the RAC, the C-RAC, and then the ROC.

- **Research Advisory Committee (RAC)** – Middle management-level committees established to guide the Research Bureau in soliciting, reviewing, prioritizing, and recommending projects to the C-RAC and then the ROC. There are currently three RACs, one for each Deputy Secretary, and thus one for Highway Operations, one for Programs and Infrastructure, and one for Business Support.
- **Chairpersons-Research Advisory Committee (C-RAC)** – Each RAC has a Chairperson, appointed by its Deputy Secretary, to represent its functional groups, divisions, and bureaus. Collectively, these chairpersons constitute the C-RAC. The RAC members review and

prioritize the research requests within their respective areas, and the C-RAC prioritizes all these requests in their entirety for consideration and approval by the ROC.

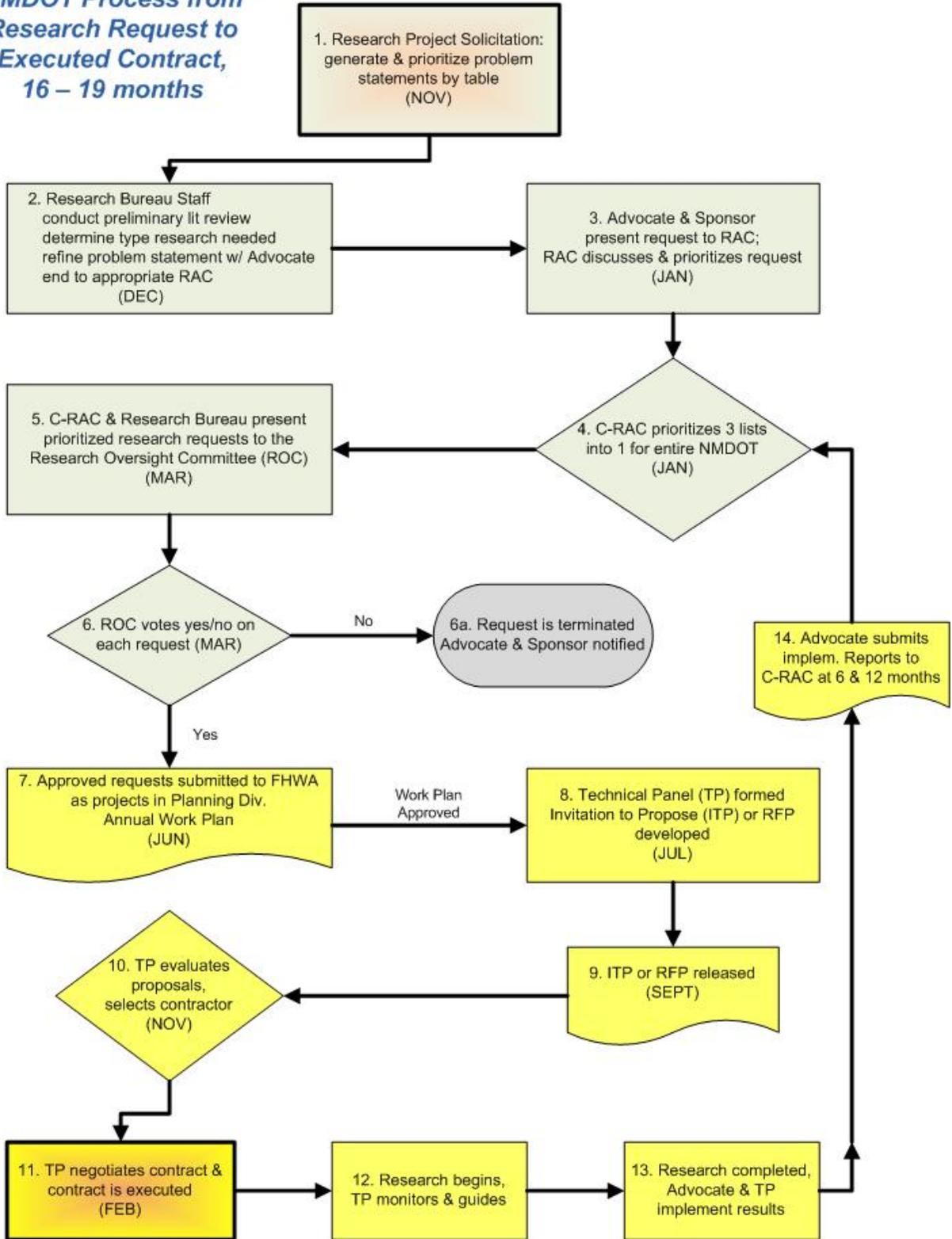
- **Research Oversight Committee (ROC)** – Composed of three deputy secretaries and the FHWA Research Engineer. The ROC sets research priorities, policies, and procedures in administering the Research Program and votes on each project recommended by the C-RAC.



**Figure 6.2 NMDOT Committees Involved in Approving Research Requests**

Figure 6.3 maps out the project schedule from start to finish, totaling 16 to 19 months. There are 14 key steps that were described during the Peer Exchange. Now that the Research Bureau has five years of positive track record in completing research projects under this new structure, the staff are interested in executing contracts in a more timely fashion to better serve their customers.

**NMDOT Process from Research Request to Executed Contract, 16 – 19 months**



**Figure 6.3 NMDOT Process from Research Request to Executed Contract**

## 6.4 Building Productive Partnerships

In this session, participants discussed how to build productive partnerships, focusing on proactively briefing new Senior Managements and engaging with NMDOT Executive Staff. The goal was to develop both informal and formal relationship to break down the hierarchies in communication.

## 6.5 Maintaining Enthusiasm

In this session, participants focused on ideas to maintain enthusiasm with the public as well as the technical panels. Participants developed a number of ways to ensure that the role of a Technical Panelist is prioritized and seen as a value added in a person's professional career, and that it can contribute to the greater goals of NMDOT.

## 6.6 Information Technology Issues

New Mexico has been having challenges in cultivating support from the Department's Information Technology Division (DOIT). This session discussed way to broker an agreement to exempt research projects from NMDOT IT and State DOIT approvals. This session provided some recommendations from participants on how to manage this relationship.

## 6.7 Implementation of Performance Measures

This session discussed establishing outcomes-based performance measures and facilitating implementation of research. With MAP-21, there is increasing importance for state DOTs along with their Research Bureaus to move toward outcome-based performance measures. To date, New Mexico has been focused on output-based performance measures. In this session participants discuss an outcomes-based method of tracking, evaluating, and reporting performance; they determine which states are using this method and the new performance measure requirements of MAP-21. The session concluded with brainstorming ways that NMDOT can better facilitate the implementation of research and can better track implementation and outcomes.

- There are two types of performance measures:
  - **Output Measures** – Tabulation, calculation, or recording of activity or effort, e.g., “tons of salt applied.”
  - **Outcome Measures** – An assessment of the results of a program activity as compared to its intended purpose, e.g., “reduction in ice-related fatalities.”



(L-R): Greg Heitmann, Hien Phung, Scott McClure.

Photo: Wendy Tao.

## **Figure 6.4 FHWA Participation Supported the Explanation of MAP-21**

### ***New Mexico Research Bureau's Output-Based Performance Measures***

The New Mexico Research Bureau currently has output-based performance measures. They are as follows:

- Percent of recommendations implemented or adopted within two years of final research report:
  - Comment: Ideally, these should not be monitored in research. Advocates should be the ones responsible for this.
  - Percent of projects deemed successful by the Department is a suggestion.
  - Percent of projects with implementation plan complete is a suggestion.
  - An “explanatory measure” could be used to reflect your Department as a whole, but that does not necessarily reflect on the success or deficiencies of the research program.
- Percent of available budget expended:
  - One year (2009) only 77 percent was expended.

- Percent of available budget expended or obligated against work plan may be a better measure.
- Percent of work plan funding expended is a suggestion.
- Percent of projects in work plan actually contracted.
- Percent of projects completed on-time and on-budget.

### ***MAP-21 Discussion***

- MAP-21 delegates most of the decision-making to the state DOTs. FHWA is there for oversight and the penalty is withdrawing Federal funds.
- Because FHWA is slowly moving away from many of the former responsibilities, they need performance measures to ensure the money is being used in the best way possible.
- The intent to focus more on where the needs are rather than spreading all money equally across districts.
- The states are meant to set their own targets and FHWA will hold the DOT to those targets.
- Performance measures for Research are different from the performance measures for the DOT operations.
- NMDOT may want to be introspective about whether to stay with output-based performance or whether to move toward outcome-based performance measures. The outcome-based performance measures may not be as applicable to research and one should be cautious about moving in this direction.

### ***What Are Other Research Bureaus Doing with Performance Measures?***

- Ohio has a series of output-based performance measures and return on investment analysis but ODOT is not moving toward outcome-based performance measures. The reason is that research is not easily translated into outcomes and Ohio does not want to have their feet metaphorically held to the fire. Not meeting targets could mean having funding rescinded.
- Texas does have a series of performance measures (mostly output-based) that is tracked on a spreadsheet on a regular basis. Measures include the benefit/cost of individual projects, dollar values of process innovation activities, research benefits in dollars, etc. Consider a project tracking device (spreadsheet) with all projects that will report on measures (dashboard/status).
- Washington does not believe there are performance measures specific to Research. MAP-21 does have a lot of targets for the DOT as a whole; but the interpretation is not that research would be indebted to this because research does not have the authority to implement the research results. Output measures can be helpful for tracking progress, but outcome

measures have not been seen as critical or even desired. Washington does keep information about use, but has not taken the formal ROI approach.

- Arizona feels they need to be at the table to guide whether the Research Bureau should even be indebted to certain performance measures. Some of the measures may be irrelevant or unhelpful.
- FHWA's web site has a lot of information on performance measures but it is still uncertain about research's responsibility in performance measurement.

#### ***What Methods Are You Using to Track Performance?***

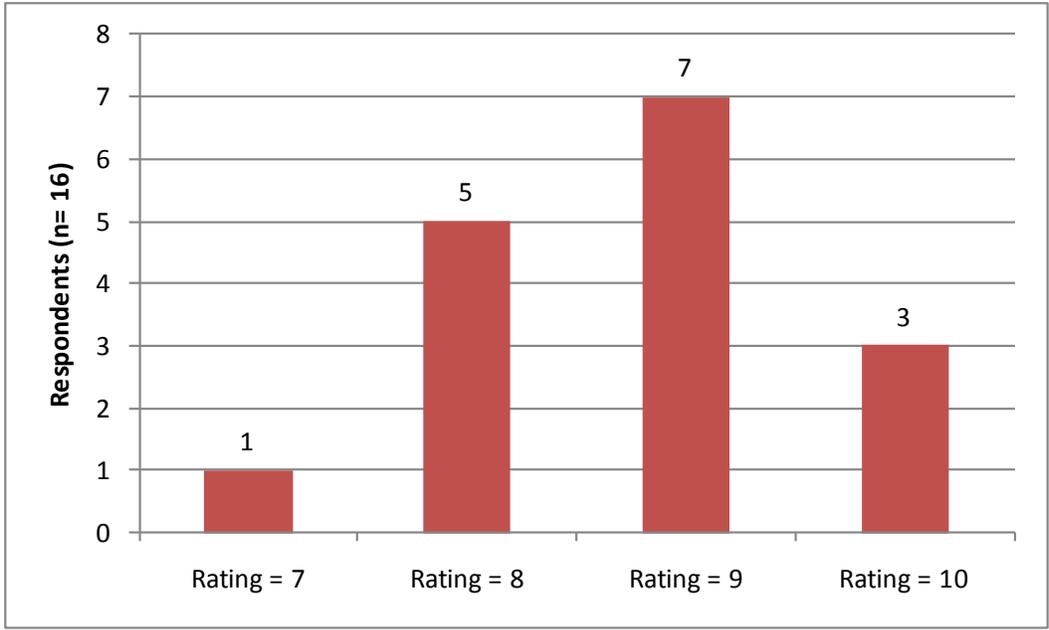
- Washington has a Gray Book and reports to the Research Executive Committee on financials and output-based performance measures.
- Arizona reports to the Executive Committee and sends the Annual Work Plan to FHWA.
- Texas uses a spreadsheet tracker (Excel and SharePoint) and each month meets to track performance.
- Wisconsin uses MAPSS (mobility, accountability, preservation, service, safety), a department-wide performance measurement.
- Ohio uses the quarterly reports received from each project to ensure tasks are being completed in accordance with the contracted timeline.

#### ***How Can NMDOT Better Facilitate Implementation of Research?***

- Build in a close-out checklist for the Technical Panel.
- When NMDOT finishes a project and comes up with the implementation plan (15 pages or less), send it to the sponsors (RAC, C-RAC, ROC).
- When a project is finished, make a two-page document for executive staff, summarizing all projects, including the method of implementation and the advocate and sponsor - responsible.

### **6.8 Evaluation Summary**

At the end of the two days, a participant evaluation form was provided to all participants to give feedback on the Peer Exchange. Overall 16 attendees of the total 26 completed a survey. On a scale of 1 to 10 with 10 being the highest, participants rated overall quality of the Peer Exchange with a range from 7 to 10 with 9 being the mean score (see Figure 6.5).



**Figure 6.5 Participants' Evaluation on Overall Quality of Peer Exchange**

## **7.0 Overall Findings**

The ideal outcome for the two-day Peer Exchange is to provide NMDOT Research Bureau with a list of recommendations they can consider to achieve the goal of moving from adequate to vital/strategic. This will lead into supporting the performance measures work to be conducted in the next month triggered by MAP-21 and will also provide a framework for the Research Bureau to develop a strategic research program.

### **7.1 Day 1 Summary: Developing a Strategic Research Program**

#### ***Start with Goals and Objectives***

- Even if the DOT itself does not yet have a Strategic Plan in place, the Research Bureau can focus on national needs such as safety, mobility, infrastructure preservation, etc.
- Federal priorities and other strategic planning priorities from peer states can help guide the planning process.
- The Research Bureau can consider hot-button research topics (e.g., in Washington, the three areas are sustainable transportation, revenue and road usage charges, and preservation and efficient use of roadways). However, supporting other policy issues is also critical as the foundation of the research services.
- Make sure the categories are flexible and broad so they can incorporate a number of issues.

#### ***Make a Case for Research***

- Show why the Research Bureau is important and bring ideas to the upper management and executive staff. Examples include:
  - Cutting down timeline for research project development.
  - Reducing overall life-cycle costs.
- Make sure all parts of the process are accountable.
- Prepare for a 90-second elevator talk for major topics of interest by the executive staff.

#### ***Support Executive Staff and Senior Management***

- Tailor programs to meet the needs of the Secretary or Legislature, and the critical operations of the DOT and the staff.
- Reserve some funding for one-month turn-around research projects done for executive staff under an on-call contract.
- Find ways to meet management/legislative turnover (two- to four-year cycles).

- Explore ways to have one-on-one meetings with executive staff.
- Attend staff meetings and look at other division newsletters for high-priority topics.

### ***Initiate Quick-Response Program***

- Initiate a pool of money for quick-response. Texas maintains two contracts for quick-response projects. They are on a task order basis and the Bureau Chief has sign-off authority. Washington and Ohio both have \$200,000 set-asides for legislative research or synthesis reports. In Washington the maximum expenditure for these smaller projects is \$20,000.
- The key to making this program effective is time: departmental approval processes must be streamlined so that quick-response task orders can be issued expediently.



(L-R): Amy Estelle, Scott McClure, Krystyna Cherry, Anne Ellis, and Keli Daniell.

Photo: Jake Schoellkopf, NMDOT Photographer.

### **Figure 7.1 Peer Exchange Participants – Day 1**

#### ***Develop a Communications and Marketing Strategy***

- Build strong relationships with public affairs officers at the General Office and the Districts.
  - Use their expertise to help publicize successful research projects within the Department.
  - Ask them what the Research Bureau can do to assist them.

- Consider providing a news clip service to identify specific topic areas of importance (e.g., public-private partnerships, HOT lanes, revenue). This is a way to be seen and an opportunity to show a constant presence and a likely channel for engaging executive staff. This is sometimes done through the legislative affairs or communications offices, but in Washington it is done through the library services. The libraries have the subscriptions for full access articles and the library can often assist. This is an opportunity for viral messaging.
- Market accomplishments through subtle channels (speeches and presentations).
  - Use pie charts, trends, policy angles for emphasis.
- Stay ahead of the game in managing knowledge.
  - Some topics such as finance are always an issue; be ready to provide information on core topics when NMDOT staff or executive staff ask.
  - On the engineering side, standards and specifications are always called into question or need to be evaluated; know the reason these were developed.

### ***Use a Proactive Approach***

- Use a proactive approach with executive staff. Understand the issues; put a strategic research program together; and make a recommendation to Executive Staff that they approve it.
- Ask Advocates and Sponsors to speak up for Research and share their experience with executive staff and others who have the ear of leadership.
- Be ready to respond to executive staff or legislative research inquiries.
- Stay in touch with the public information officer.

### ***Consider Stakeholders and Customers***

- All the research bureaus and programs believe their customers find them valuable. Customers include DOT employees.
- Consider other stakeholders such as:
  - Commissioners, associations, legislators etc.
  - Contractors, Association of General Contractors
  - MPOs
  - Universities

- Meet with Districts and Management regularly, even when separated by distance. Make sure there is face-to-face interaction.

### ***Raise the NMDOT Staff's Overall Awareness and Understanding of Research***

- Expand internal marketing.
- Raise the profile at a national level.
  - Encourage NMDOT staff to join NCHRP panels. Technical experts are welcome on panels. Travel expenses for panel participation are paid for when attending national conferences.
  - Participate in external panels; offer membership to national committees.
  - Submit papers to conferences.
  - Fund a trip to TRB for Most Outstanding Technical Panel Member each year.
- Convince - NMDOT staff that attending TRB or NCHRP/AASHTO meetings provides opportunities to network, to access funding, and to shine a spotlight on the State.

## **7.2 Day 2 Summary: Overcoming Operational Obstacles**

### ***Compress the Timeline***

- NMDOT could start research (e.g., have universities or consultants begin their research) closer to the fiscal year start, - July 1 (or October 1 when the Bureau changes over to the federal fiscal year).
- Contracts should be negotiated before the start of a FY and include a research start date after the fiscal year begins.
- Technical Panel can be formed earlier. This could be helpful and expedite the overall process. The scope of work and RFP could be developed starting in August in parallel with the FHWA approval and overall approval by the ROC.
- Since it is difficult to convene the entire ROC, either consider getting the ROC approval for new projects by memo or by the C-RAC and RB staff meeting with individual ROC members.
- ROC approval could also be delegated to C-RAC membership; however, it is important to consider balancing the interest of having increased opportunity for face-to-face meetings with executive staff with expedited approval processes.
- Consider more frequent ROC meetings with shorter timeframes. During these meetings, spending some time (five minutes per project) highlighting up to three key finished products

could show the value of the research to the Department. Another idea is have separate meetings with each of the ROC, one-on-one rather than all three at once.



(L-R): Lee Rosen, Anne Ellis.

Photo: Wendy Tao.

## Figure 7.2 Peer Exchange Participants in Interactive Session – Day 2

### *Build Productive Partnerships*

**Brief New Senior Managers.** Whenever new senior managers or deputy secretaries start their new positions, send them an e-mail as a one-on-one introduction to talk about what resources the Research Bureau can offer. Washington DOT does this and then suggests a face-to-face meeting as a follow-up several months later.

### **Do Some “Housekeeping”**

- The upcoming MAP-21 implementation will trigger a FHWA process review. NMDOT could use this opportunity to re-evaluate the countermeasures implemented in response to the 2008 audit, and consider relaxing some of these as a means to streamline Bureau operations.
- Find a way to improve the web site for the Research Bureau by providing more direct links from the NMDOT website homepage and providing more examples of relevant current projects.
- Engage NMDOT Management and Executive Staff.

- Find out what the executive staff care about and be specific about what the Research Bureau is doing to support that effort.
- Form relationships with mentors that can advocate for you.
- Find stats and trends that can speak to the staff.
- Verify whether executive staff wants more than half the research budget directed to pavement design and materials.
- Take advantage of already established planning efforts such as working with the ROC.
- Get on the agenda of other major meetings in the department such as the Transportation Commission meetings to speak about NMDOT's research (may be through the Division Director).

### **Provide Training to Build Partnerships with Department Staff**

- Reinstate the guest lecture series – inviting different bureaus to talk with Research Bureau – both listening and describing their needs.
- Figure out who in the NMDOT staff might attend AASHTO, Statewide Meetings, and TRB, and start encouraging them to go. Currently there are seven people on NCHRP panels from NMDOT.
- Film short instructional videos on research results, technology transfer, or the instructions manual. This could even be done on YouTube for public viewing.
- Set up “lunch-and-learns” to keep up the credits for the PDH credits for their professional engineering license. You can market other PDH credits from other venues to assist the staff. This could be done at the end of the project as a deliverable (although not for every project). The NMDOT could also offer to provide a venue for PE exam preparation.

### ***Maintain Enthusiasm with Technical Panels***

- Always have Technical Panel members designate an “alternate” or someone who could be trained to take someone's place if this person is overburdened or changes jobs.
- Reviews quarterly reports along with the Technical Panel.
- Sit down with the Principal Investigator and Advocate to make sure they are still engaged with each other.
- Build in intermediate checkpoints or milestones for decision-making review. This could ensure continuous engagement by the researcher to the Technical Panel.
- Make the role for technical panelists transparent: Developing goals, taking stock of what has already been done, and identifying people who would be involved and remind managers of

their role as technical monitors. It can also be useful to help the members of the Technical Panel have visibility with the C-RAC as it might help advance their careers as well.

- If Technical Panelists are spread too thin or retire, there are challenges. Options include the recruitment of new staff, hiring back individual temp employees, hiring consultants to fill these posts (this would not be an ideal scenario).

### ***Maintain Relationship with Information Technology***

- In the idea stage, it can be important to bring in an IT person early to engage in the process and document in writing the next steps and timeline. No matter what, the State Department of Information Technology (DOIT) has to be involved (bypassing them is not an option).
- Invite IT to be part of the Technical Panel.
- Create an agreement with DOIT to clarify expectations. Washington has separate agreements just for IT (called K agreements).
- Encourage the Advocate's department to step up and defend the use of databases or IT software. Talk to the Chief Information Officer (or someone with that authority) to understand the rules from the beginning. Unfortunately sometimes these "rules" are not documented.
- It may be worthwhile to think about the issues from the IT perspective; for them any decision may be wrapped up in more than one challenge – they also have to deal with IT platform, application, legacy systems, rapidly evolving technology, etc.
- Build relationships over time (continual) may be the best approach; many of these issues with IT are not easily remediated with easy solutions.
- Some states avoid IT projects. Texas and Arizona both choose not to do IT projects – they do not try to host data locally.

### ***Facilitate Better Implementation of Research***

- Build in a close-out checklist for the Technical Panel.
- Consider a project tracking device (spreadsheet or project management program) with all projects that will report on measures (dashboard/status).
- Send the implementation plan (15 pages or less) to the C-RAC when a project is finished. Prepare a two-page summary document for the executive staff, when a project is finished; the summary should include research question, results, implementation plan, and the names of the responsible - advocate and sponsor.
- Consider revising some of the performance measures. Suggestions that came out of the workshop include:

- *Percent of projects deemed successful by project sponsor.* (Note that NMDOT may be revising this measure and others in the upcoming month during the performance management process).
  - Percent of work plan funding expended.
  - Percent of projects in work plan actually contracted.
  - Percent of projects completed on-time and on-budget.
- NMDOT may want to be introspective about whether to stay with output-based performance or whether to move toward outcome-based performance measures? The outcome-based performance measures may not be as applicable to research and one should be cautious about moving to this direction.

## 8.0 Conclusions

At the end of the two day peer exchange, the participants developed the following conclusions.

- NMDOT Research Bureau has made significant improvements since 2008, including the establishment of the RAC, project evaluation committees, research procedures manual, financial accountability, outreach to universities and other agencies, and the maintenance of the State's only full-service transportation research library.
- The NMDOT Research Bureau has developed a staff with outstanding expertise and work ethic - so they are able to serve the department at the highest level.
- All five visiting state DOTs have a departmental strategic plan that their research programs follow in developing research categories that add overall value to the organization. . In Texas, the research staff takes a proactive approach and targets research work to the issues where the Secretary has an interested.
- The other peer exchange states have "set-aside" research funding programs - for quick-response research to address quick responses to policy issues or other high-priority research needs.
- The peer states at the exchange such as Texas have research communication plans which serve to promote a more active approach to communicating with executive staff. These plans include strategies such as asking advocates to speak up for research and share their experiences. They also provide periodic briefings to executive staff on resources available through the research program.
- The peer exchange determined that the NMDOT research program timeline could be shortened if some of the steps were done in parallel similar to how Ohio DOT conducts their research program. One example would be to develop the scope of work and request for proposals at the same time as FHWA approval is requested. Another example is to conduct Research Project Solicitation in August, rather than November.
- The NMDOT Research Bureau uses "output" performance measures to track implementation of completed research projects. The peer exchange participants discussed the value of using a tracking system with "outcome" performance measures to ensure that the measures demonstrate the impacts of completed research projects.

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## 9.0 Recommendations

Based on the conclusions from the Peer Exchange, the participants developed a short list of recommendations or action steps for the NMDOT Research Bureau to move the program from adequate to vital/strategic.

- **Develop a Strategic Research Plan and Program.** NMDOT should - develop a Strategic Research Plan with goals and objectives that establish broad research categories and guide individual project selection. The plan should support overall departmental priorities to ensure a strong, focused, valuable Strategic Research Program that improves the performance of the entire department. This is the most important recommendation to move the Research Bureau from adequate to vital.
- **Refine Research Process.** NMDOT should - expedite the overall research project development process by developing the scope of work and requests for proposals in August in parallel with FHWA and ROC program review and approval. One specific suggestion was to delegate project approval from executive staff to the C-RAC. The Research Bureau should - focus on tracking the research process as a whole by implementing a tracking software that can track research from conception to implementation. This will enhance the Bureau's ability to track return on investment.

The Research Bureau should strengthen the implementation process for completed research projects by developing strong implementation plans, publicizing the research results, and tracking not only outputs, but also outcomes. Through outcomes performance measures, the Bureau will more readily demonstrate the value of research to others.

- **Develop a “Quick Response Program”.** The Research Bureau should develop a “Quick-Response Program” to address high-priority research needs, including policy issues of paramount importance to executive staff. Quick-response funding should be a component of the research program budget and used to address issues of immediate importance to executive staff. In addition, signature authority should be delegated to the Research Bureau Chief to approve Task Orders performed under On-Call Research contracts.
- **Develop and Implement a Communication and Marketing Plan.** The Research Bureau should develop a communication and marketing plan, including strategies to transmit the value and importance of the research program. The Plan should express the value of completed research in qualitative and economic terms so that research can be seen as a worthwhile investment. The research staff should take a more proactive approach and target research work to the issues where the Secretary has an interest.
- **Build Strong Partnerships.** The Research Bureau should build productive partnerships with senior managers, customers, and stakeholders. They should invite other bureaus to discuss their activities and issues with research staff and attend senior management meetings to provide briefings on research successes and resources provided by the Research Bureau. The Research Bureau staff could encourage department staff to get involved with AASHTO, TRB, NCHRP committees, and other organizations to collaborate on research ideas and findings.

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## **A. Participant Biographies**

**Kathryn Bender** has been the NMDOT Deputy Secretary for Programs and Infrastructure for the last 2 years. Prior to this she had retired from the NMDOT with more than 25 years of service and was working for an Engineering Consulting firm doing Environmental Site Assessments. She retired from the NMDOT in 2006 as the Environmental Design Division Director. She had been the Environmental Geology Manager prior to that. She began her career at the Materials Lab as a geologist working in a variety of areas, including material pit location, foundation drilling and geotechnical. Deputy Secretary Bender serves on the Research Oversight Committee.

**Dee Billingsley** has been employed by the NMDOT Research Bureau for 16 years. She started as the Bureau's Financial Specialist in 1997 and was promoted to her current position as the Bureau's Administrator in 2006. She holds an Associate's degree in Pre-Management from the Central New Mexico Community College and is currently pursuing her Bachelor's degree in Accounting from the University of New Mexico, Anderson School of Management.

**Krystyna Cherry** has been employed by the NMDOT LTAP/Research Bureau for 10 years as the only librarian in the Department. Krystyna is a graduate of Oxford University, UK, majoring in Art Education; Arizona State University as a guest student earning a Bachelor's degree in Elementary Education; and a Master's degree in Library Science from University of Northern Colorado. After 10 years of teaching K-12, Krystyna took paralegal training and became a law librarian specializing in environmental law and a records manager where she designed a records management system.

**Shannon Crum** began her career with TxDOT in September 2004 when she joined the Transportation Planning and Programming Division's County Road Inventory program. She was promoted to Director of Data Management in February 2005. In 2009 she assumed responsibility for coordinating the preparation of the annual listing of most congested roadways in Texas. In 2012, she became the director of TxDOT's Research and Technology Implementation office. Before joining TxDOT, Crum was on the faculty of the Political Science and Geography department at the University of Texas at San Antonio. While there, she supervised graduate student research in both political science and environmental science. Crum graduated from The University of Texas at Austin in 1992 and received a Ph.D. in geography in 2000.

**Keli Daniell** has been employed by the NMDOT Research Bureau for 7.5 years. Keli has a Master of Arts in Communication Studies and Management from New Mexico State University. She has served as a Management Analyst/Project Manager for the Research Bureau for four years on projects related to safety, pavement design, materials, structures, and administration.

**Anne Ellis**, Ph.D., Director of the Arizona DOT Research Center oversees research and innovation at ADOT. She has more than 20 years' experience in research, new product development, and program management in the public, private, and academic sectors. She holds a Bachelor's degree in Chemistry, an MBA in Strategic Marketing (both from State University of New York/Buffalo), and a Ph.D. in Public Policy – Transportation and Environment from ASU.

**Amy Estelle** has worked in transportation research for 15 years: 5 as the Engineering Coordinator for the NMDOT Research Bureau; 5 as a Management Analyst in the Department's Planning and Transit and Rail Divisions; and 5 as Research Scientist for the University of New Mexico Alliance for Transportation Research. She currently manages environmental research projects and coordinates project solicitation and approval. Amy holds a Bachelor's degree in Microbiology from the University of Georgia, a Master's degree in Natural Resource Management and Administration from Antioch University, and a Ph.D. in American Studies (Environment, Technology, and Culture) from the University of New Mexico. Earlier in her career she was a naturalist/interpreter for the National Park Service and an environmental educator/wild animal caretaker on the Georgia coast.

**Tamara Haas** came to the NMDOT in 1995 after 12 years with the FHWA. She has had numerous positions with the NMDOT, most recently as the District 3 Engineer. She is currently the Executive Manager of the Office of Strategic Planning and Asset Management which includes the Research Bureau. Tammy has a Master's degree in Civil Engineering from the University of New Mexico and Bachelor's degree in Civil Engineering from Oklahoma State University.

**Greg Heitmann** is a Research Engineer for the New Mexico Division of FHWA where he has polished his NEPA skills over the last nine years. Greg began his career with FHWA in 2000 and has held assignments in the Iowa Division Office and the Texas Division Office prior to joining the New Mexico Division. While in college, Greg worked for the South Dakota Department of Transportation each summer. In 1994, he began his civilian Federal service working for the Department of Interior, Bureau of Indian Affairs (BIA). Here, Greg worked specifically with the BIA Branch of Roads in South Dakota as a construction engineer primarily on the Cheyenne River Sioux Tribe Indian Reservation. He holds a Bachelor's degree in Engineering from South Dakota State University. Greg was honorably discharged as a Captain from the U.S. Air Force Reserves and was formerly a member of the Civil Engineering Squadron of the 114<sup>th</sup> Fighter Wing in the South Dakota Air National Guard.

**Monica Jurado** is the FHWA New Mexico Division Area Engineer for Districts 1 and 2. She is currently working on the I-10/I-25 Interchange, serving as the Local Public Agency coordinator and the International Border Technology Transfer Program contact for the Division Office. She also educates and informs statewide local public agencies of the Federal aid requirements. She holds Bachelor's and Master's degrees in Civil Engineer from the University of Texas at El Paso. Monica is pursuing a Ph.D. in Civil Engineering at the University of Texas at El Paso and the Engineer in Training Certification.

**Michelle Langehennig**, MSCE, CCNA, has been employed by the NMDOT for 13 years and the State of New Mexico for 19 years. Michelle holds degrees in Criminal Justice and Business Administration from the University of Phoenix. She has served in many capacities during her tenure, including Research Planner, IT Computer Specialist, and IT Applications Developer. Michelle has served as the Research IT Applications Developer since 2011.

**Kenneth Leonard**, a Principal with Cambridge Systematics, Inc. (CS), has more than 35 years of experience in the fields of statewide and metropolitan transportation planning and programming, environmental analysis, integration planning and environmental review, corridor

planning, climate change, public involvement and congestion management. Prior to joining CS, Mr. Leonard served as Director of Planning for the Wisconsin DOT for 24 years with responsibility for planning and programming. Mr. Leonard is listed as an expert on management and public involvement with the AASHTO Center for Environmental Excellence. Mr. Leonard has a Bachelor's Degree in Geography from University of Wisconsin-La Crosse and a Master's Degree in Urban and Regional Planning from Southern Illinois University.

**John Don Martinez** has 24 years of experience with the Federal Highway Administration. Since October 2002, Don has been the Division Administrator of the New Mexico Federal Highway Administration Division Office in Santa Fe, New Mexico. Prior to coming to New Mexico, Don was the Division Administrator for the Commonwealth of Puerto Rico and the U.S. Virgin Islands. Other assignments included Assistant Division Administrator, Columbus, Ohio; Transportation Specialist, Austin, Texas; Division Right-of-Way Officer, Austin, Texas; Realty Specialist, Springfield, Illinois; Realty Specialist, Madison, Wisconsin. Prior to joining FHWA, Don worked for the New Mexico Department of Transportation Bureau of Right-of-Way as an appraiser and review appraiser. Don was drafted during the Viet Nam Conflict and served two years in the U.S. Army and was honorably discharged in October 1974. He is a native New Mexican, born and raised in Taos, New Mexico. He is a graduate of New Mexico Military Institute, Roswell, New Mexico and Oral Roberts University, Tulsa, Oklahoma where he received a Bachelor's degree in Business Administration.

**Scott McClure** has been employed by the NMDOT for 23 years. Scott holds degrees in Physical Science from the University of Kansas and Civil Engineering from the University of New Mexico. He has served in many capacities during his tenure, including staff bridge design engineer, state bridge management engineer, warranty engineer and pavement design engineer. Scott has served as the Research Bureau Chief since 2006.

**Robert McCoy** is a professional engineer at New Mexico Department of Transportation in Albuquerque. He received his Bachelor of Science in Civil Engineering from the University of New Mexico and eventually landed a position at NMDOT. Mr. McCoy has worked in project development, construction, traffic engineering, and pavement design and exploration. After a 20-year career as a supervisor and manager, he was offered a position as the State Research Implementation Engineer at the Research Bureau on February 4 of this year. In addition to engineering, Robert is an avid UNM Lobos and Green Bay Packer fan. Mr. McCoy recently attended the TRB Meeting in Washington, D.C., where he gained a greater enthusiasm for working in research. He enjoys building relationships and acting as a catalyst in team environments.

**Luis Melgoza** holds a Bachelor's degree in Civil Engineering from California State University, Sacramento. He joined FHWA in the California Division Office as a student intern in the Student Career Experience Program in October 2008. During his tenure Luis assisted in performing bridge inspections. In the summer of 2009 Luis completed a construction assignment with Western Federal Lands Highway Division (WFLHD) in Sunriver, Oregon. In June 2010 Luis started the FHWA Professional Development Program. He was assigned to the DelMar Division Office (Maryland Division) under the supervision of Ian Cavanaugh. Luis's PDP assignments included Highway Design in Lakewood, Colorado and Construction in Fairplay, Colorado with Central Federal Lands Highway Division. Luis also completed a Materials

project with Maryland State Highway Administration. He joined the New Mexico Division Office in June 2012 as a Safety and Pavement Engineer.

**Kelly Nye** is the Research Contract Manager for the Ohio Department of Transportation. She has been with ODOT for almost four years; two of those years have been spent with the Research Section. Her previous experience includes office management, and accounting and financial reporting experience. Kelly has a Bachelor's degree in Business Administration.

**Leni Oman** has been employed by the Washington State Department of Transportation for 16 years; she has served as Director of the WSDOT Office of Research and Library Services since 2003. Leni is also the Executive Director of the Washington State Transportation Center (TRAC), a consortium of governmental agencies and research universities. She is a member of the Pacific Northwest Transportation Consortium (PacTrans) External Advisory Board and the Board of Advisors for the National Institute for Transportation and Communities. She is also the Chair for the AASHTO Research Advisory Committee Task Force on Transportation Knowledge Network; a member of the AASHTO Standing Committee on Research; RAC Region 4 representative; the RAC Task Group on Collaboration and Coordination; and the RAC-CUTC Liaison Group.

Leni is the TRB State Representative for WSDOT and serves on the State Representative Advisory Panel. She chairs the TRB Task Force on Knowledge Management and is a member of the Policy and Organization Group and Conduct of Research Committee. She is a member of the panel for the National Cooperative Highway Research Project titled *Improving Management of Transportation Information* (NCHRP 20-90). She holds a Bachelor's degree in Liberal Arts from Goddard College and a Master of Veterinary Science degree from the University of Idaho.

**Hien Phung** holds a degree in Business Administration from the University of Baltimore. Hien has been operating small businesses for over 20 years in addition to helping the community as an interpreter. Hien is new to the NMDOT; she has been working as a Financial Specialist since March 2013.

**Yamayra Rodriguez** joined the FHWA Professional Developmental Program in July 2012, where she was assigned to the New Mexico Division. Yamayra has a Master Degree in Geotechnical Engineering from the Polytechnic University of Puerto Rico. Prior to joining New Mexico Division, Yamayra was part of Student Career Experience Program in the FHWA Puerto Rico Division for 11 months.

**Lee Rosen** has worked at the NMDOT for five years as a Strategic Planning and Performance Management Specialist. She is currently responsible for performance data gathering and reporting to various stakeholders and for the Stewardship and Oversight Agreement with FHWA. Lee has developed numerous strategic plans and been involved in accreditation activities for healthcare systems prior to coming to NMDOT. As Chairperson of the Business Support Research Advisory Committee, she works closely with the Research Bureau. Lee received a Bachelor's degree in Political Science/International Law from the University of Arizona.

**Michael Sandoval** has been employed by the NMDOT for 15 years and is currently the Director of the Transportation Planning and Safety Division. He is Chairperson of the Programs and

Infrastructure Research Advisory Committee. Michael holds a degree in Civil Engineering from New Mexico State University. In addition to his time with the NMDOT, Michael was also the Director of the Motor Vehicle Division, under the Taxation and Revenue Department.

**Wendy Tao**, AICP, LEED AP is an Associate of Cambridge Systematics, Inc. with eight years of experience at the cross-section of transportation planning, research and environmental analysis. She has experience convening senior-level stakeholders and summarizing challenges and opportunities around research and other thematic topics with NCHRP, Arizona, and Idaho. She has Master's degrees in Transportation Engineering and City and Regional Planning from the University of California, Berkeley.

**Virgil Valdez** is a Management Analyst Supervisor and Project Manager who has been employed by the NMDOT for 23 years. During his tenure he has served in six positions:

1. Chemistry Technician I – five years;
2. Traffic Design – two years;
3. Field Inspector – two years;
4. Pavement Designer – five years;
5. Management Analyst – four years (Research Bureau); and
6. Management Analyst Supervisor – five years (Research Bureau).

**Daniel Yeh** has served as the Chief of the Research and Communication Services Section for the Wisconsin DOT since 2008. In his current position he oversees research programs, the department library, and the agency's graphic and visual arts services. He has worked at WisDOT since 1991 in the Bureau of Planning; the Office of Public Affairs; and the Office of Policy, Budget, and Finance. He holds a Bachelor of Arts degree in Economics from Carthage College in Kenosha, Wisconsin.

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**B. State DOT Research Program Overview Presentations**

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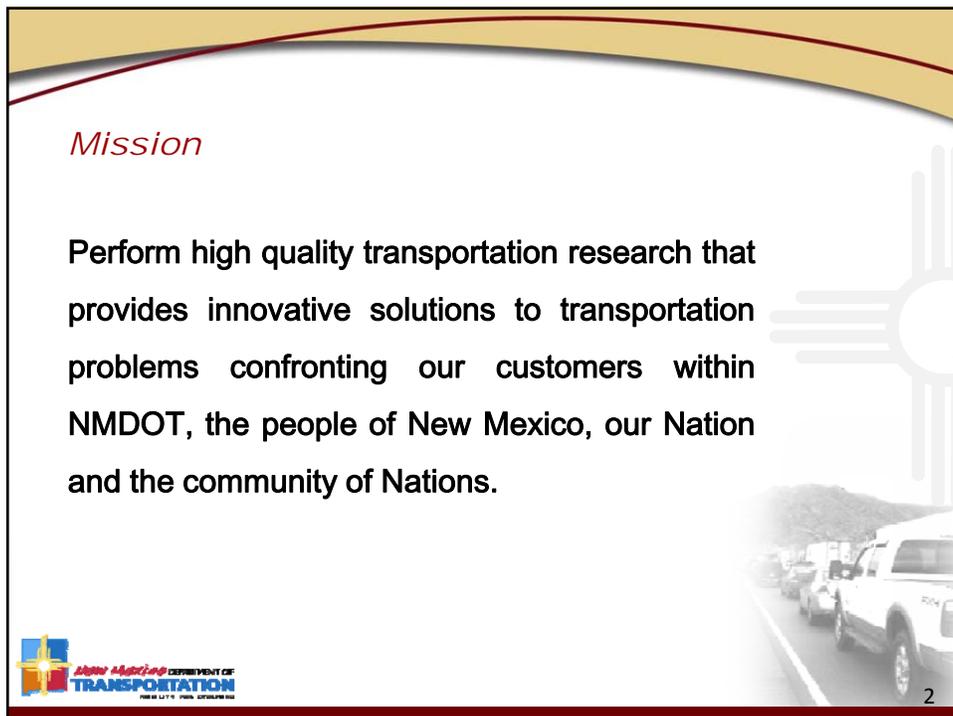


***NMDOT  
RESEARCH BUREAU  
OVERVIEW***

*"Journey from Adequate to Vital:  
The Pathway to Excellence"*

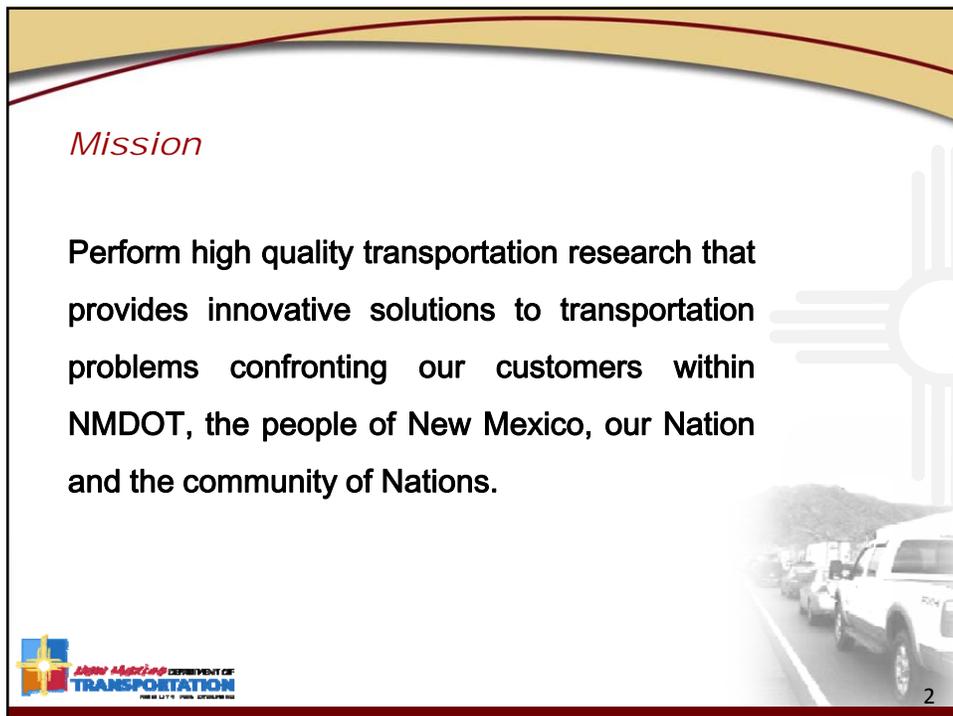


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*Mission*

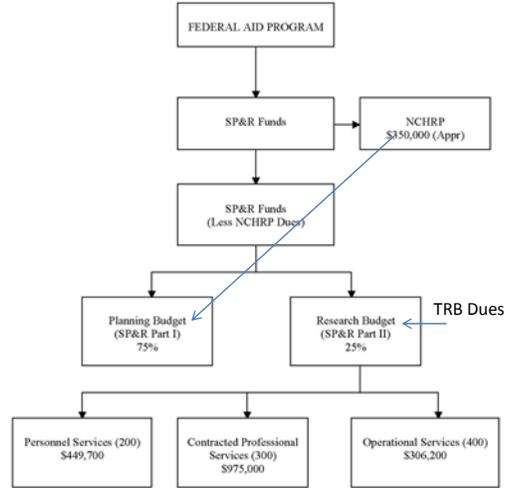
**Perform high quality transportation research that provides innovative solutions to transportation problems confronting our customers within NMDOT, the people of New Mexico, our Nation and the community of Nations.**



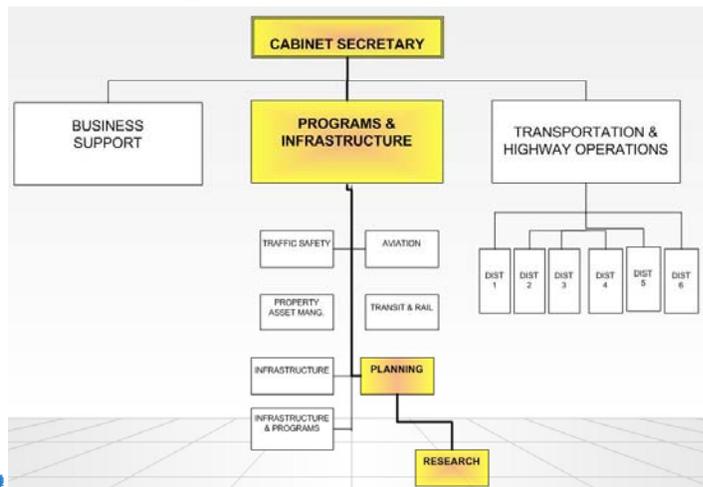
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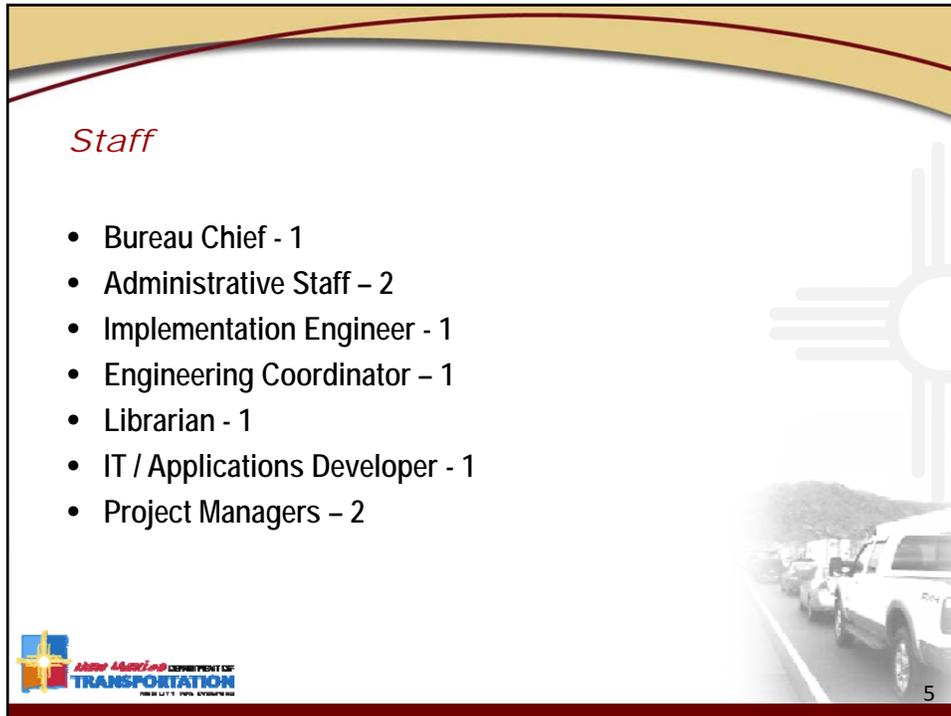
### State Planning and Research Funding

- All SP&R Funding
- Total Program Budget \$1,766,833
- Contracted Research approximately \$1 million / yr.
- 34 Active Projects:
  - 7 (21%) Private Vendors
  - 17 (50%) Universities
  - 8 (24%) In-house
  - 2 (6%) Pooled Fund



### NMDOT Organizational Chart





*Staff*

- Bureau Chief - 1
- Administrative Staff – 2
- Implementation Engineer - 1
- Engineering Coordinator – 1
- Librarian - 1
- IT / Applications Developer - 1
- Project Managers – 2



5



*Adoption of New Operating Procedures*

- Major Program Improvements began FY07
- Documented Policies and Procedures
- Eliminated Master Contracts – Project-Specific Contracts
- Project Management duties were placed on Research Bureau staff
- Improved Contract Development
- Adopted Research Project Solicitation process – Sponsors, Advocates and Technical Panels



6

## *Adoption of New Operating Procedures*

- Invitation to Propose (ITP) – Creating a Competitive Proposal Process
- Independent Selection Panels – Select most meritorious proposal according to objective evaluation criteria
  - Specialized Research and Technical Competence
  - Technical and Financial Resources
  - Quality and Content of Proposal
  - Past Performance
- Research Advisory and Oversight Committees
- Information and Instructions Manual



7

## *Performance Measures*

Fiscal year 2008 marks the starting year for reporting performance measures



8

### *Performance Measures*

Serve as indicators of the success of the research program.

- Percent of recommendations implemented or adopted within two years of final research report (Status Reports)
- Percent of available budget expended or obligated
- Percent of projects in work plan actually contracted
- Percent of projects on-time and on-budget



9

### *Research Program Strengths*

- Established policies and procedures that govern daily research activities.
- Knowledgeable and diverse staff
- Positive working relationship with Advocates and Technical Panels



1

## *Research Program Opportunities*

- Reduce Project Development and Execution Time
- Conduct research that supports Department and Research Strategic Priorities
- Improve Implementation Process



1

## *Thank You!*

*Keli Daniell  
Research Project Manager  
505.798.6742  
Keli.daniell@state.nm.us*



1

## Arizona Department of Transportation Research Program

Anne Ellis, Ph.D.  
New Mexico Peer Exchange  
April 10-11, 2013

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013

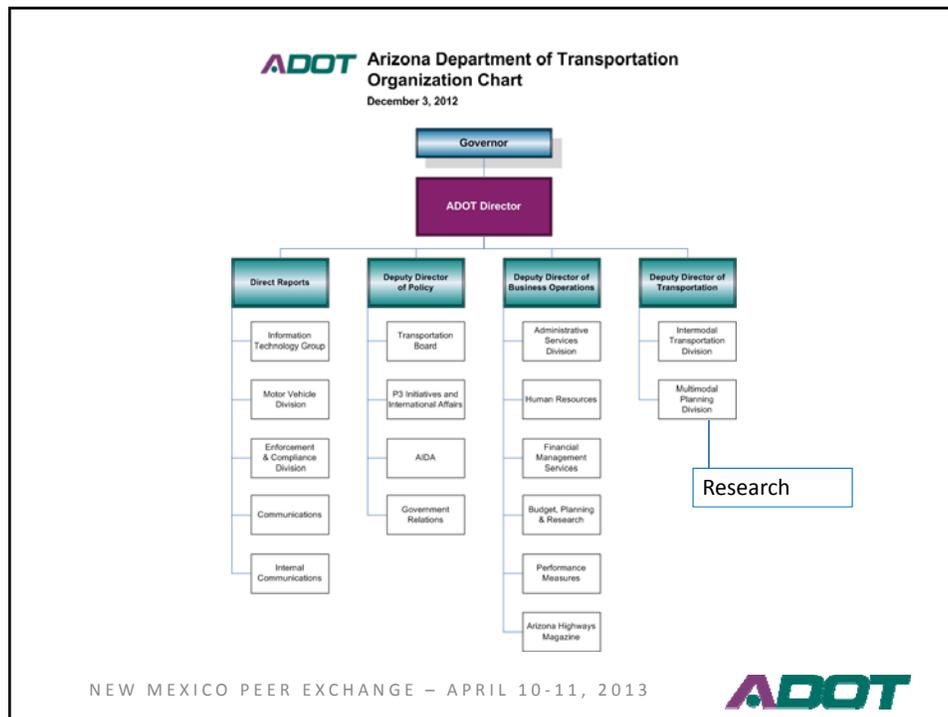


## Since you asked. . .

- ADOT Research Director since 2009
- In research for 20+ years
  - New product development and program management
  - Public, private, and academic sectors
- Education
  - Bachelor's degree – Chemistry
  - MBA – Strategic Marketing/Communications
  - Ph.D. – Public Policy: Transportation and Environment

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013





## Functions, Mission, Vision

- Research, Library, Product Evaluation
- Our **mission** is to create, share, and apply knowledge in transportation systems and programs.
- Our **vision** is to excel in our service to the state as a trusted information resource.

## Budget & Funding

- All State Planning & Research (SPR)
- Annual project budget ca. \$1.6 million
- Most work is contract research
- Universities do 15 to 20 % of research
- 75 Projects under contract

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013



## Program Strengths & Opportunities

### Opportunities

- Projects always take too long
- Behind on spending
- Editing process >>>

### Strengths

- Good relationship with FHWA Division Office
- Skilled and diverse staff
- Editing process

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013



## Performance Measures

- Percentage of studies completed within the approved schedule of the work program
- Percentage of completed studies deemed satisfactory by the project Sponsor (survey)
- Average length of time to get new product applications assigned into evaluation

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013



## Research Strategic Plan

Goal 1. To create and promote an enabling and innovative environment for ADOT Research Services. (*PEOPLE*)

Goal 2. To ensure that research topics reflect implementable statewide needs. (*PEOPLE and PROCESS*)

Goal 3. To deliver high-quality published reports and research results to the sponsor's satisfaction and within the timeframe specified in the Work Program. (*PROCESS*)

Goal 4. To integrate the library into the mainstream of business at ADOT. (*PERFORMANCE / TOOLS*)

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013



## Research Strategic Plan

Goal 5. To make the Product Evaluation Program and APL a valuable resource to ADOT engineers and contractors while being responsive to vendors. (*PERFORMANCE / TOOLS and PEOPLE*)

Goal 6. To use SPR Part 2 funding in the most efficient and effective manner. (*PROCESS*)

2013 Research Strategic Plan - 2013 Update  
The Research Strategic Plan (RSP) is a document that outlines the research priorities and goals for the New Mexico Department of Transportation (ADOT). It is a key document for the research program and is used to guide the selection and funding of research projects. The RSP is updated annually and is available on the ADOT website.

NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013



## Other Research Program Documents

Research Program Manual

Problem Statement Form

Research Program Manual  
2011

Research Program Manual  
2011



Writing Specifications and Guidelines



NEW MEXICO PEER EXCHANGE – APRIL 10-11, 2013



## Did I miss anything?

- Anne Ellis, Ph.D.  
Research Director  
ADOT Research Center  
206 South 17th Avenue, MD 075R  
Phoenix, AZ 85007  
(602) 712-6910  
[aellis@azdot.gov](mailto:aellis@azdot.gov)

Thank you :)

# Ohio Department of Transportation Research Program



**New Mexico DOT Peer Exchange  
April 2013**

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# Research Placement in ODOT

Ohio Department of Transportation

Ohio Rail Development Commission  
Location: 190 W. Broad St., 2nd Floor

<b>Director</b> Jerry Wray 16 100 491																							
<b>Assistant Director/Field Operations</b> Mike Pivon 16 122 491		<b>Districts</b> 1 - 12		<b>Assistant Director/ Business &amp; Finance</b> Mike Cape 16 122 491		<b>Assistant Director/ Transportation Policy &amp; Chief Engineer</b> Jim Burns 16 122 491		<b>Policy &amp; Legislative Affairs</b> Andrew Bremer 16 115 491		<b>Chief of Staff</b> Greg Memphis 16 122 491		<b>Chief Information Officer</b> Stephanie 16 329 411											
<b>Division of Operations</b> Steve Simpson 22 581 431		<b>Division of State</b> Nick Nicholson 17 220 491		<b>Division of Finance</b> Julie Ray 18 210 491		<b>Division of Facilities</b> R. Ryan, Mgrt. David Cagle 19 250 491		<b>Division of Information Tech.</b> Spencer Ward 28 240 491		<b>Division of Planning</b> Jonathan Towlesky (Acting) 20 320 411		<b>Division of Evaluation</b> James Young 21 400 421		<b>Division of Construction Administration</b> Megan O'Callaghan 27 510 421		<b>Division of Communications</b> Melissa Ayers 14 142 491		<b>Division of Chief Land Counsel</b> Patrick Proffers 15 150 491 15 151 491 (AG's)		<b>Chief Operating Officer</b> Kim Watson (Acting) 32 327 491		<b>Executive Director</b> James Riley 34 430 421	
Jodi Long Dove Holman 514 471 (Tech) 917 431 (Sign) 527 431 (Misc) 392 431 (CMCA)		Lance Robinson Jim Miller 222 491		Assistant Thomas Dyer 211 491		Equipment/Signs Mark Gasswill 231 431 236 431 (Work) CC 2000 402 (5) Overlook 201		Maintenance Management Charles Ash 242 491		Traffic Andrew Williams 321 411		Transit Marianne Freed 311 405 (GRF) EA 7001		Construction Services Lyle Flower 410 421		Construction Administration Gary Angles 519 421		Maintenance Management Lloyd Walker 515 421		Contract Vincent		Research - CC 238	
Mike Burns 251 491 255 421 (ETW)		Fiscal Policy & Capital Acquisition Matt Downes 212 491		Information Dwight Dwyer		Systems Planning R. Brian, Mgrt. Jonathan Hughes (Acting) 326 411		Research & Planning 329 411 329 491 (Library)		GAO & Mapping Sharon Richard Lewis (Acting) 413 421		Construction Vincent		Contract Vincent		Contract Vincent		Contract Vincent					

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## Research Budget

- Research uses SP&R<sup>2</sup> funds only
- FY 2013 Research Funding Allocation (\$8,129,583):
  - Federal: \$5,547,001
  - State Match: \$1,336,750

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April 2013

## Research Projects

- Active Projects
  - Funding varies from project to project
  - Currently 56 active projects
    - 29 Strategic Research Projects (52%)
    - 14 OPREP (25%)
    - 11 Student Study (20%)
    - 2 In-House (3%)
  - 47 projects assigned to Universities (84%)

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## Project Response and Funding Trends

### Strategic Research



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## ODOT's Mission

- Provide easy movement of people and goods from place to place

- Take care of what we have



- Make our system work better

- Improve safety



- Enhance capacity

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## How can the Research Program Assist ODOT's Mission?

- Develop strategic focus areas
- Expand access to the Program
- Minimize time from ideas to results
- Emphasizing implementation
- Being mindful of the return on investment

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April 2013

## Research Mission

**Invest** in innovative research that develops, maintains and assists Ohio in establishing a world class transportation system.



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April 2013

## Focus Areas



- Transportation Asset Management
  - *Take care of what we have*
  - *Make our system work better*
  - *Enhance capacity*
- Transportation Safety
  - *Improve Safety*
- Organizational Transformation
- Customer Connections

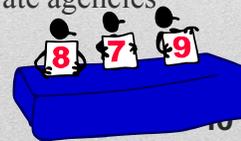
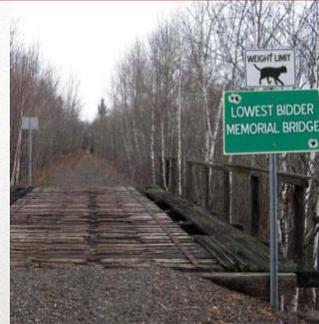
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## Strengths

- Responsive to Customer Needs
  - In-House Research
  - Research on Call (ROC)
- Fiscal Flexibility
- Competitive Program
  - Ohio has 14 universities and numerous engineering firms.
  - Competitive program
  - Collaboration among Universities and private agencies
  - 7th largest Research program in the nation



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April 2013

## Weaknesses



- Information Management
  - Dated, inefficient project management system
  - Retiring knowledge
- Minimal Cultural Acceptance of Research
  - Hindrance vs. Advantage
- Timeliness of Projects
  - State roadblocks

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## ODOT's Strategic Research Plan

Questions?



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April 2013



TEXAS DEPARTMENT OF TRANSPORTATION

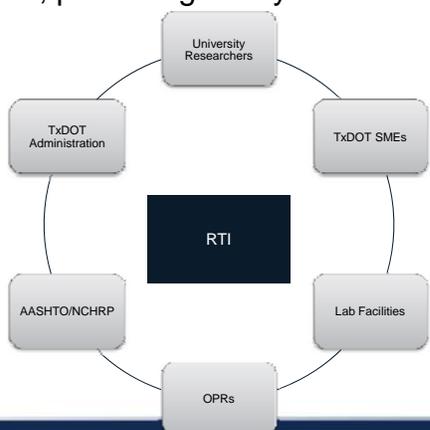


**TXDOT  
RESEARCH  
PROGRAM**

**Research and Technology Implementation Office** 

**Mission Statement**

Provide Organizational Support by ensuring best ideas and innovations inside TxDOT are funded and researched for large scale implementation, projects are conducted by the right researchers, producing timely results for evaluation



```
graph TD; UR[University Researchers] --- RTI[RTI]; TSME[TxDOT SMEs] --- RTI; LF[Lab Facilities] --- RTI; OPRs[OPRs] --- RTI; AASHTO[AASHTO/NCHRP] --- RTI; TA[TxDOT Administration] --- RTI; UR --- TSME; TSME --- LF; LF --- OPRs; OPRs --- AASHTO; AASHTO --- TA; TA --- UR;
```

Peer Exchange 2



Peer Exchange

3

- **Clients**
  - Districts, Divisions, Offices, Regions, Administration, and Engineering Staff or other Professional Staff seeking to make the agency better



Peer Exchange

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## RTI Goals

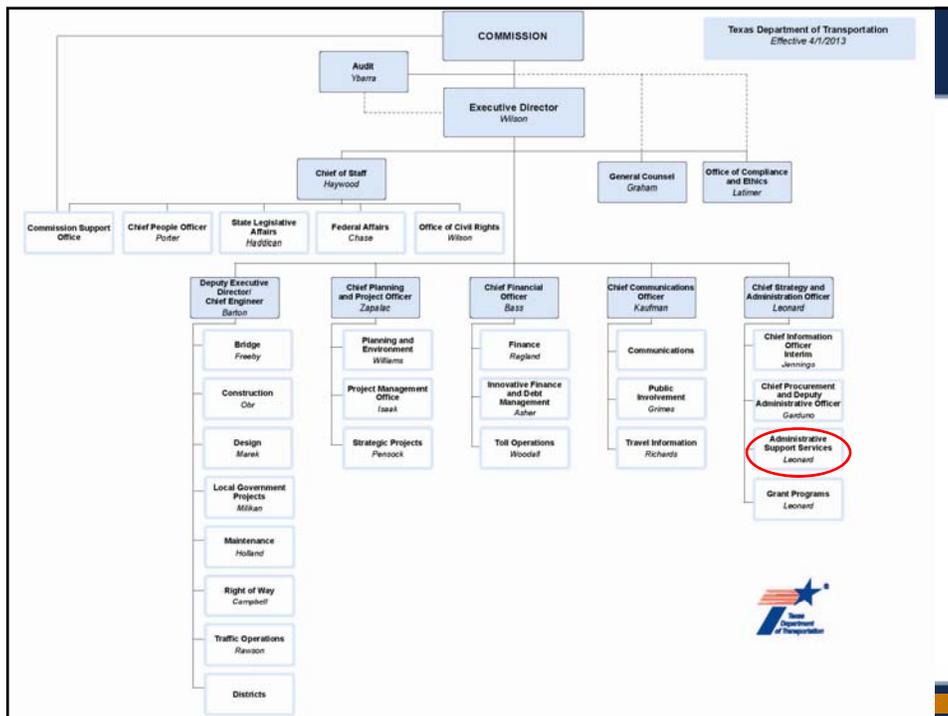
- **Develop an effective RTI Work Force**
  - *Objective:* Identify necessary skill sets and appropriate FTE number
  - *Objective:* Identify necessary training
  - *Objective:* Be fully staffed with the right people
- **Use the right process to select projects**
  - *Objective:* Projects closely align with TxDOT goals
  - *Objective:* Projects with high dollar value are vetted and approved by the appropriate DDOR, and DED, and CSAO
- **Develop a process to implement research results**
  - *Objective:* Adhere to a plan to assure research results are systematically reviewed and implemented in a timely manner, thoroughly vetted by the appropriate DDOR, approved by the DED, and the CSAO
  - *Objective:* Present research results through distribution or symposiums to TxDOT and research community
  - *Objective:* Regularly communicate with customers, working with the Chief Communications Officer staff, for effective dissemination of research results
  - *Objective:* Projects results are timely, and results in good implementation

## Goals, cont.



– Effectively manage our activities to deliver high value to TxDOT

- Objective: Manage projects resulting in high value effectiveness and outcome
- Objective: Engage the Audit Office to evaluate RTI's billings process
- Objective: Reduce the number of active research and implementation projects to no more than 150
- Objective: Maintain the percentage of overdue deliverables due that are older than one month to under 5%
- Objective: Maintain the percentage of tech memos on a monthly basis due that have been received and reviewed to over 95%
- Objective: Conduct at least one district visit per month
- Objective: Identify a replacement for the Research Management System (RMS)



## At a Glance...



**TxDOT Research**

- Annual research budget\* \$21.5 million
- Annual implementation budget\* \$3.5 million
- Total size of program (152 projects) \$64 million

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- Program administration \$0.83 million
  - 4 Project Managers
  - 1 Implementation Project Manager
  - 1 Program Manager
  - 2 Contract Administrators
  - 2 Accounting Specialists

\* SPR-Part II

Peer Exchange 7

## Current Active Institutions



**State-supported Universities**

- University of Texas at Austin Center for Transportation Research
- Sam Houston State University
- Texas AgriLife Research
- Texas A&M University – Kingsville
- Tarleton State University
- Texas Tech University Center for Multidisciplinary Research in Transportation
- Texas Southern University

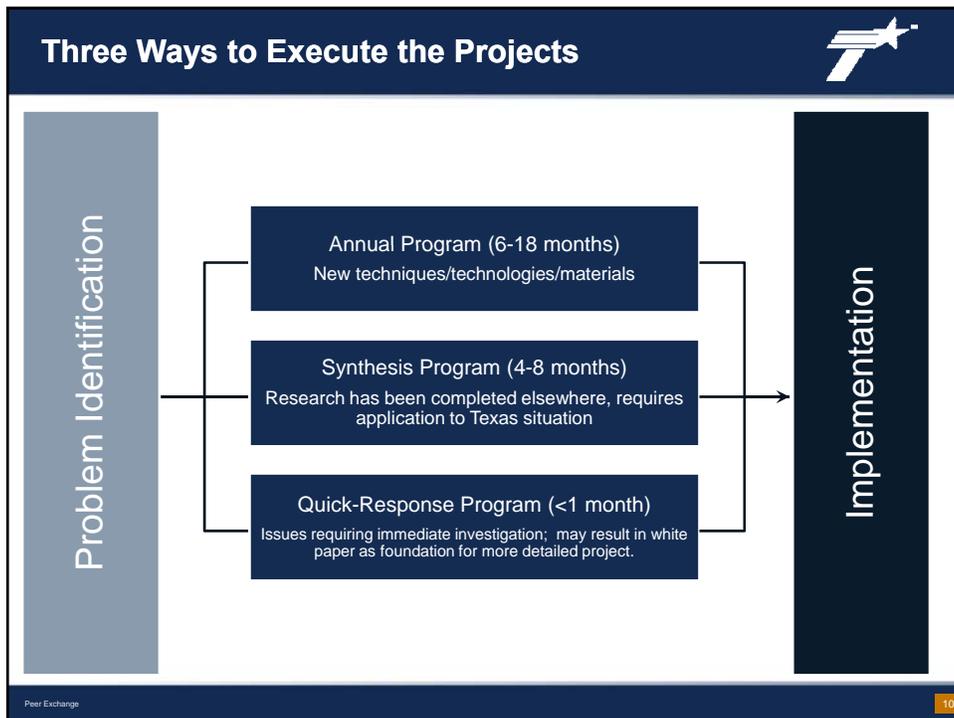
- Texas State University – San Marcos
- Texas A&M Transportation Institute
- University of Houston
- University of North Texas
- University of Texas at Arlington
- University of Texas at El Paso
- University of Texas at San Antonio
- University of Texas at Tyler
- USGS (under sub-contract)

Peer Exchange 8

## Focus Research on TxDOT's Strategic Goals

<p><b>SAFETY</b></p> <ul style="list-style-type: none"> <li>• User Behavior</li> <li>• Run-off-road</li> <li>• System Users</li> </ul> <p>Program Commitment: \$5 Million (25%) Benefits: 100 lives annually, \$100 Million in insured losses prevented annually</p>	<p><b>PROTECTING/MAINTAINING INFRASTRUCTURE</b></p> <ul style="list-style-type: none"> <li>• Materials</li> <li>• Methods and Practices</li> <li>• Structures</li> </ul> <p>Program Commitment : \$7 Million (35%) Benefits: \$150 Million reduction in construction costs, 5% reduction in construction cycle</p>
<p><b>CONNECTING COMMUNITIES</b></p> <ul style="list-style-type: none"> <li>• Freight</li> <li>• Planning</li> <li>• Innovative Projects</li> </ul> <p>Program Commitment : \$3 Million (15%) Benefits: \$250 Million of Gross Domestic Product enablement</p>	<p><b>CONGESTION</b></p> <ul style="list-style-type: none"> <li>• Non-recurring</li> <li>• Traveler "Choices"</li> <li>• Technology</li> </ul> <p>Program Commitment : \$3 Million (15%) Benefits: \$100 Million of avoided fuel expense, 1 million avoided "lost" man hours in traffic</p>
<p><b>BEST IN CLASS</b></p> <ul style="list-style-type: none"> <li>• Development of future professionals</li> <li>• Stewardship</li> <li>• Policy</li> </ul> <p>Program Commitment : \$2 Million (10%) Benefits: Academic sponsored projects funded by TxDOT to develop academic thinking/individuals</p>	

Peer Exchange 9



## A New Problem Statement Form Aligns Projects to our Goals

### Key Elements

- Must identify the TxDOT goal(s) supported by the proposed research.
- Must indicate the length of the project, as well as a preliminary cost estimate.
  - Used in B/C calculation
- Must receive signatures of support from OPR/C-suite/ROC chair before project begins.

### Research Project Summary and Evaluation Form

Title:	
TxDOT Goal:	<input type="checkbox"/> Maintain a Safe System <input type="checkbox"/> Connect Texas Communities <input type="checkbox"/> Address Congestion <input type="checkbox"/> Best in Class State Agency <small>Click here to enter text.</small>
The Problem:	<b>What is the problem you want to address? What is the significance and scope of the problem?</b> <small>Click here to enter text.</small>
Idea to Test:	<b>State the hypothesis. This is not a problem or a question, but a statement for the researchers to test.</b>
Proposed Work:	<b>The technical objectives are to:</b> <small>Click here to enter text.</small>
Proposed Deliverables:	<b>Describe the specific knowledge/products this project should provide to TxDOT.</b>
Expected Value:	<b>What benefits would this project deliver, and how would the results be used within TxDOT? Quantify with simple analytics.</b>
Original Submitter:	<b>Name and contact information for individual who submitted the research idea(s).</b> Name: <small>Click here to enter text.</small> Phone Number: Email address:
Preliminary Evaluation:	<ol style="list-style-type: none"> <li>1. What is the cost to conduct project?</li> <li>2. Time to complete project?</li> <li>3. Impact to TxDOT if project is successful?</li> <li>4. What is the cost/benefit?</li> <li>5. Does this project align with TxDOT priorities?</li> <li>6. Has other research been conducted on this topic? Is similar research underway elsewhere?</li> </ol>

Peer Exchange
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## Project Sizing (initial B/C) Examples

### Stretch & Flex

**Supports the Safety Goal**

- Average cost per year of sprain/strain injuries was \$740K from 2008-2012
- Goal of program is to introduce a Stretch & Flex program to reduce injuries
- Assuming a 10% per year (from base) decrease in injuries over the first 5 years, the cost of sprain/strain to TxDOT will be reduced by \$1.1 million. Over 10 years a \$118K project leads to a B/C of 25:1.

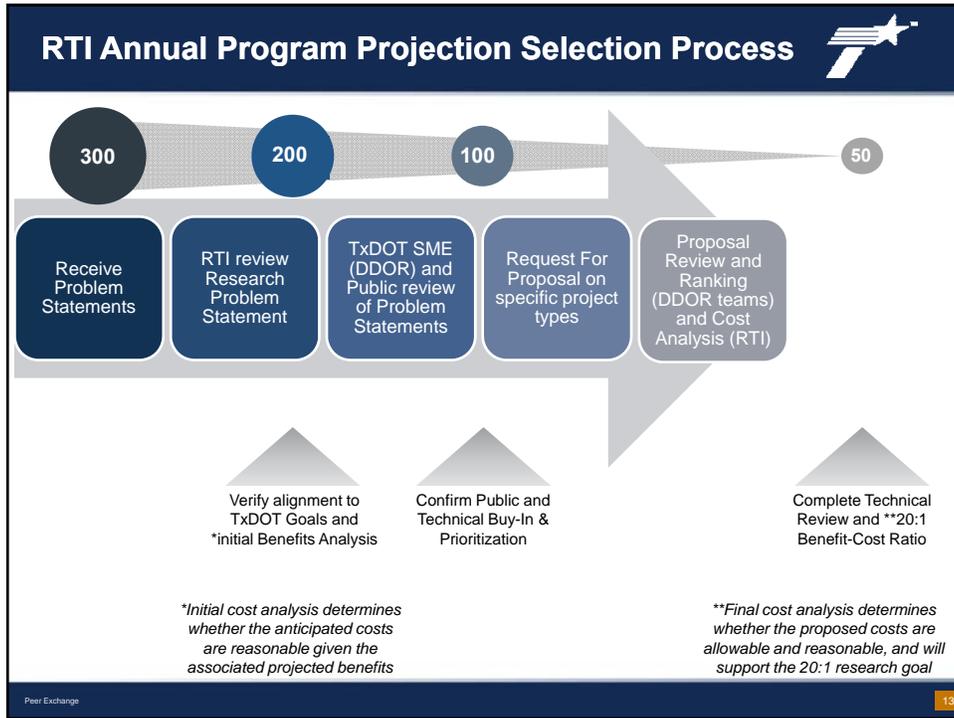
Year	Sprains (Dark Blue)	Cost Savings (Light Blue)
1	8	0
2	7	1
3	6	2
4	5	3
5	4	4
6	3	5
7	2	6
8	1	7

### Precast Concrete Bent Caps

**Supports the Safety and Best in Class Goals**

- Traditionally, bent caps were constructed of cast-in-place reinforced concrete
- Goal of project was to develop connection details and specification to allow increased use of pre-cast bent caps
- Cost of project: \$300K
- Estimated construction time savings: 5-7 days per bent cap
- Estimated construction cost savings: \$1M per year
- Estimated reduction in work zone traffic delays: 950K hours annually (\$18M annually)
- Estimated B/C over 10 years: 30:1 (direct cost savings); 633:1 (including constituent savings)

Research Program Update
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**THANK YOU**



# Research Investments

*People, time, and money*

**Leni Oman**  
Director, Office of Research & Library Services

**New Mexico DOT Research Peer Exchange**  
Albuquerque, NW  
April 10-11, 2013

Washington State Department of Transportation

**CONTEXT:**  
*Funding is declining and our workforce is shrinking*

**Less time and money for research activities**

37<sup>1</sup>/<sub>2</sub>¢ per-gallon Washington state gas tax rate as of July 1, 2008

- 9<sup>1</sup>/<sub>2</sub>¢ 261 specific transportation projects statewide\* (2005 Transportation Partnership Projects) Funded 421 projects, 10,000 jobs annually
- 5¢ 160 specific transportation projects statewide (2003 Nickel Package projects)
- 23¢ Base gas tax
- 11¢ Supports cities and counties for local roads
- 4¢ Supports debt service to reduce bond debt that funded post highway and ferry projects
- 8¢ Remains for maintenance and operations, as well as preservation, safety improvements and congestion-relief projects for state highways and ferries

\* Of the 9<sup>1</sup>/<sub>2</sub> cents, 8<sup>1</sup>/<sub>2</sub> cents is used by the state for highway projects, 1 cent goes to cities and counties for improvements to streets and roads.

Legislative mandate to reduce 800 FTEs in engineering and technical services by 2015

**Dollars in Millions**

**Source: WSDOT**

Washington State Department of Transportation

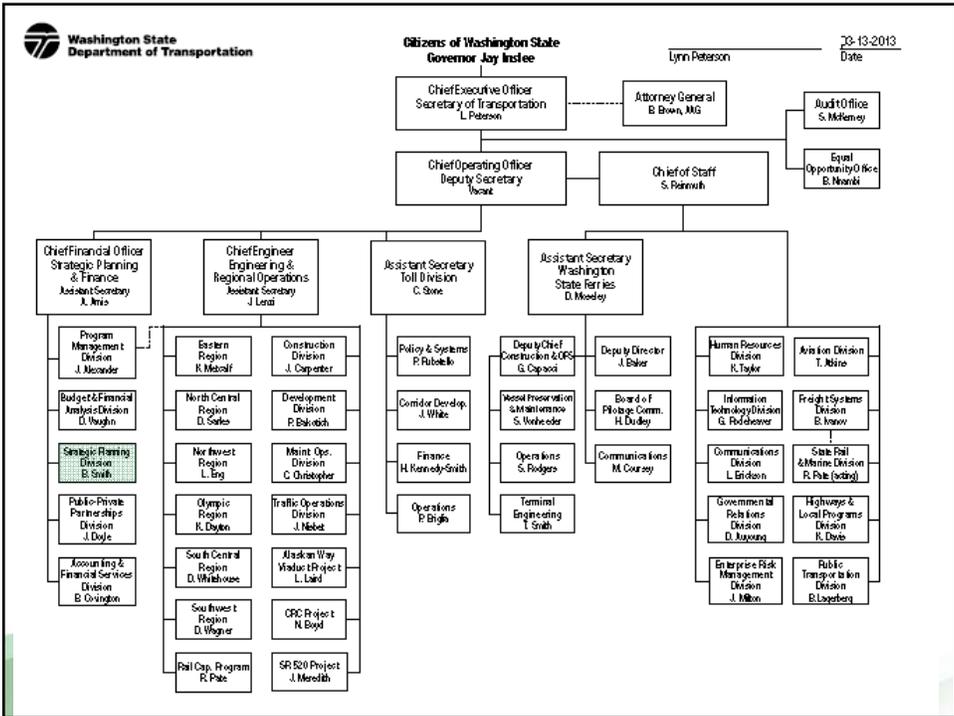
Squeezing the most value out of every penny

Ensuring transportation investments are delivered with high quality and value

### WSDOT innovations provide greater efficiency and benefits

- Value engineering efforts provide the optimum solution at the least cost. Project cost estimates reduced by \$375 million in the last two years.
- Implemented national best practices, such as expedited bridge delivery, concrete pavement dowel bar retrofits and low-cost safety investments reducing run-off-the-road fatalities.
- Making investments for the greatest benefits to stream habitats when transportation projects impact the natural environment.
- New technology for optimum freeway operations efficiency
  - Automated Traffic Management, electronic tolling and ramp metering
  - Real-time traveler information and mobile apps
- Performance-based management of preservation and maintenance
  - Using technology and research advances on high-performing, lower-cost pavement preservation and repair.
  - Maintenance tracking system and mobile data collection

Source: WSDOT 3



## Research Executive Committee Role

REC Chair : Assistant Secretary, Engineering & Regional Operations (Chief Engineer)

Members: *Division Directors of:*

- Strategic Planning
- Capital Program Development & Management
- Development
- Construction & Materials
- Traffic
- Public Transportation
- Highways & Local Programs
- Aviation
- Ferries

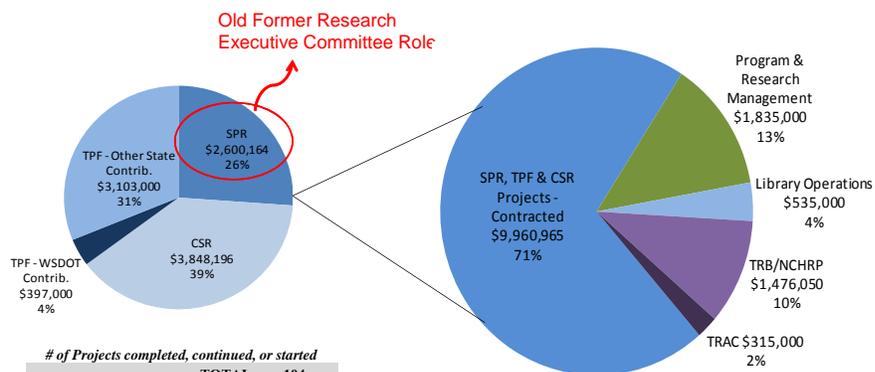
- Define research goals that are the basis for project selection
- Establish the selection committees
- Approve the funded research program
- Review key research findings
- Evaluate and finalize recommendations for implementation of research findings

### Expectations still evolving

- Review of Client Sponsored Research funding
- Review of transportation pooled fund project contributions
- Identification of WSDOT objectives for national research programs
  - Problem statements submitted
  - Supporting what we submit
  - Pilot Tests and Demonstration Projects
  - Participation in national research committees and panels.



## 11-13 BN Current Budget & Contract Value \$13,782,399



# of Projects completed, continued, or started

	TOTAL	Count
State Planning and Research projects		46
Client-Sponsored research projects		32
Transportation Pooled Fund projects		17
Synthesis projects		9
<b>TOTAL</b>		<b>104</b>

TRB: Transportation Research Board  
 TRAC: Washington State Transportation Center  
 NCHRP: National Cooperative Highway Research Program  
 SPR: State Planning and Research  
 TPF: Transportation Pooled Fund Program  
 CSR: Client Sponsored Research



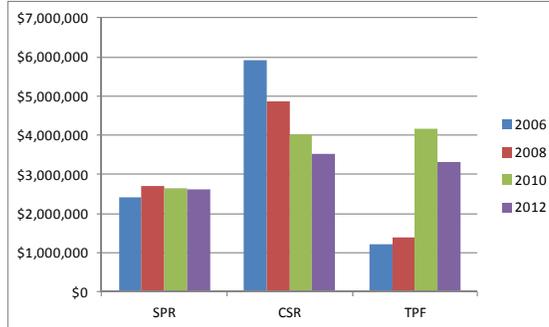
## More Budget Context



Transportation Pooled Fund Project Value by Contribution Source

Total Value \$27,330,000  
Leveraging just under \$10 for every WSDOT dollar spent.

## Program Funding Trends

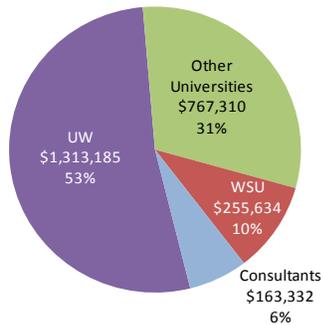


SPR: State Planning and Research  
TPF: Transportation Pooled Fund Program  
CSR: Client Sponsored Research

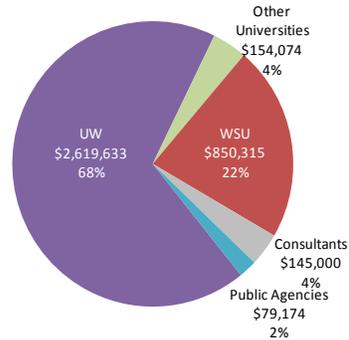


## Who Does the Research?

### SPR Funded Projects



### Client Sponsored Research Funded Projects



UW = University of Washington  
WSU = Washington State University



# Washington State Transportation Center (TRAC)



- TRAC is a partnership between WSDOT, University of Washington, and Washington State University
- TRAC provides a link among government, university researchers, and the private sector
- TRAC acts as a liaison, connecting those who need applied research with those best suited to conduct it

Partners since 1983



## WSDOT Research Investments

### WSDOT Funding and Employees

#### State Planning & Research (SPR) Projects

- 46 Projects (Regular & Quick Response)
- \$2,601,876 to date
- 30 Technical Monitors

#### Transportation Pooled Fund projects

- 17 WSDOT-led projects
- 27 Projects led by others
- ~27 Technical Monitors
- \$3,252,345 to date

#### Client Sponsored Research

- 32 Projects
- \$3,562,356 to date
- ~17 Technical Monitors

#### Synthesis Studies

- 9 conducted to date for 9 different offices

#### Washington State Transportation Center

- \$313,000/BN ORLS funding, \$75K WSU, \$238K UW
- \$ 461,000/BN Congestion Analysis & WSDOT Support

#### National Cooperative Highway Research Program Contribution

- %100 unbudgeted Federal SPR
- \$ 1,431,000/BN

#### TRB Core Services

- %100 unbudgeted Federal SPR
- \$ 275,000/BN

### WSDOT Employees

#### TRB Standing Committees

- Sec. Hammond on TRB ExComm
- 46 Committee Members
- 2 Meetings/yr
- Chair travel sponsored for one meeting/yr

#### TRB Cooperative Research Project Panels

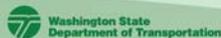
- 64 Panel Members (104 Panels)
- 2 or 3 days of sponsored travel over 2 years/project

#### TRB SHRP2

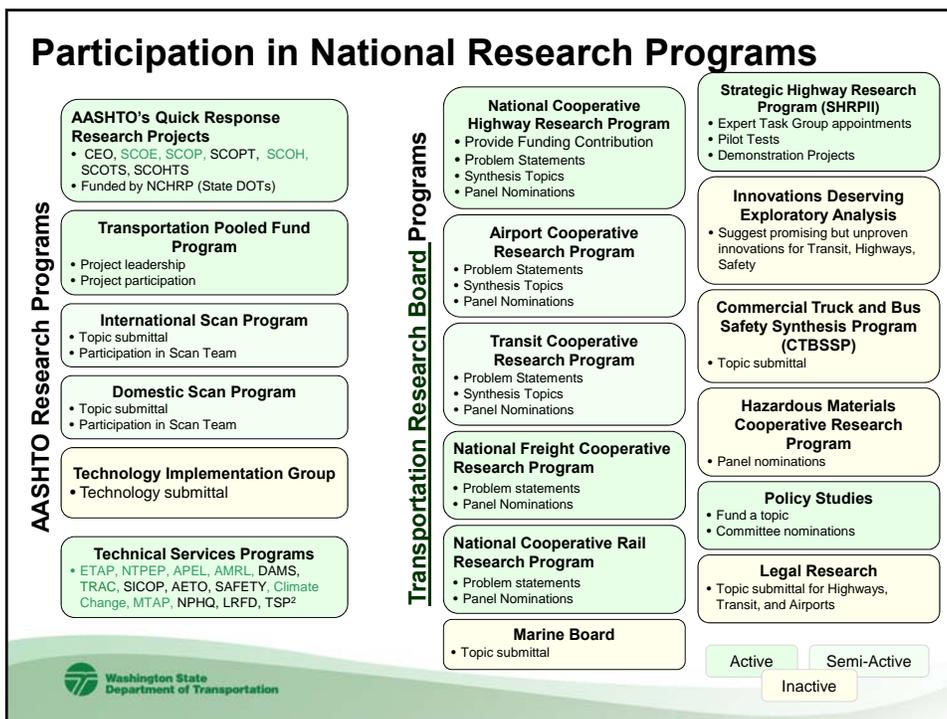
- 9 Program & Panel Oversight Members
- Beta tests
- Pilot Projects

#### Other Activities

- 1 TRB Policy Study Member
- 1 Special Study Member (LTPP)
- 1 TRB State Rep/Advisory Panel Member



Data through May 31<sup>st</sup>, 2012



## WSDOT Employees involved in TRB

- 
  - 56 Employees on 79 Cooperative Research Project panels.
  - WSDOT employees Chair 14 panels
- 
  - 42 WSDOT Employees on 62 TRB Standing Committees.
  - WSDOT employees Chair or Co-Chair 7 committees.
- 
  - 9 WSDOT Employees on 12 SHRP2 Panels.
  - WSDOT employees Chairs 2 Expert Task Groups.
- 
  - 3 WSDOT Employees on 4 Other TRB Committees.
  - A WSDOT employee is Vice-Chair of one.



82 unique WSDOT Employees participate in 236 committees, panels and task groups

*Data from May 2012*



# ORLS Calendar

ORLS Calendar of activities

	January	February	March	April	May	June	July	August	September	October	November	December
<b>RESEARCH PROGRAMS</b>												
<b>Priority 1</b> Programs we work with regularly	NCHRP rating process begins ICRP Panel nominations	NCHRP Synthesis Topics Due WSDOT Responses to RTDQ High Value Research	ICRP Synthesis Topics Due WSDOT Synthesis Topics Due	NCHRP Problem Statements Due NCHRP 20-24 CED Problem Statements Due	WSDOT TRF Travel Plan Due NCHRP 20-24 CED Problem Statements Due	NCHRP 20-25 SCOTIS Problem Statements Due NCHRP problem statements	NCHRP 20-25 SCOTIS Problem Statements Due July 15 NCHRP 20-25 SCOTIS Problem Statements due July 15	TBS Annual Meeting Paper Submission Due Aug 1 NCHRP 20-25 SCOTIS Problem Statements due Aug 15	WSDOT SPR Research Problem Statements Due Oct 1 NCHRP problem statements due Sept 15	ICRP Synthesis topics due NCHRP 20-25 SCOTIS Problem Statements due Sept 15	ICRP Synthesis topics due NCHRP 20-25 SCOTIS Problem Statements due Sept 15	WSDOT SPR Research Problem Statements due Nov. 15
<b>Priority 1, may occur anytime</b>	WSDOT Quick Response Research Transportation Project Fund Contributions SHRP 2 Plus Tests & Demonstration Projects SHRP 2 Implementation WSDOT Client Sponsored Research WSDOT Synthesis Requests											
<b>Priority 2</b> Programs we work with periodically or have opportunity to work with	ICRP Panel nominations SCOTIS Panel nominations			TRB A-Environment Research topic discussion ICRP Panel nominations Multiple Corridor Operations Program	HS Technology Partnership proposals due CTBSP Topics Due	National Cooperative Rail Research Program Due June 15	ICRP problem statements due July 20		NCHRP 20-24 CED Problem Statements Due NCHRP 20-25 SCOTIS Problem Statements Due			HS Technology Partnership proposals due
<b>Programs our Partners may request assistance for</b>			NCHRP DEEA Due Mar 1		Panel DEEA Due May 1							
<b>That vary in timeline</b>	Federal Technology Programs due - include research activities NCHRP DEEA Due Sept 1 Panel DEEA Due Sept 15 WSDOT TRF contribution plan prepared WSDOT DEEA Due Sept 15 Panel selection for other DEEA University Transportation Center proposal and match discussion State, Dept. Clients Submittals Cooperation Advancement Research											
<b>OTHER ACTIVITIES</b>	TBS Annual Meeting TRB Executive Committee Meeting Annual due dates reviewed		SCOR Meeting to select NCHRP projects Joint contribution for ASHTO "Flex Bus" Update ASHTO Reference Guide	Interactions must have plan to pilot research ASHTO "Flex Bus" ASHTO and 20-24 projects selected ASHTO President's awards due	ASHTO Spring Meeting ASHTO and 20-24 projects selected ASHTO President's awards due	ASHTO Spring Meeting ASHTO and 20-24 projects selected ASHTO President's awards due	TBS Executive Committee Meeting TRB SPR Work Program Due ASHTO CED NCHRP Panel Due TBS Annual Meeting Travel Plan (preferred method)	TRB Executive Committee Meeting TRB Annual Meeting paper submission due August 1 TRB Annual Meeting Paper Submission Due Aug 1	TBS Annual Meeting WSDOT BAC meets to develop recommended program and plan items identified WSDOT BAC meets to develop recommended program and plan items identified	TBS Annual Meeting WSDOT BAC meets to develop recommended program and plan items identified WSDOT BAC meets to develop recommended program and plan items identified	WSDOT BAC meets to develop recommended program and plan items identified WSDOT BAC meets to develop recommended program and plan items identified	WSDOT BAC meets to develop recommended program and plan items identified WSDOT BAC meets to develop recommended program and plan items identified
	Legislative Session					End of Fiscal Year/End of Biennium close-out						



## Moving Washington is our three-pronged approach to fight congestion and combat climate change



**Adding capacity strategically**

Adding new capacity to our currently over-stressed transportation system removes choke points and bottlenecks, completing critical corridors; improve reliability, throughput for freight, commuters and transit partners.



**Operating roadways efficiently**

Maximizing the use of the existing system and using available technology to communicate with and direct traffic, improves the system's performance and generates revenue through variable pricing and other traffic management tools.



**Managing demand**

Providing more travel choices and options for people and freight helps improve the efficiency and effectiveness of our transportation system.



## Strategic research goals

### Safety

Design safety  
Driver behavior  
Vulnerability to risks  
Accident analysis  
Pedestrian/bicycle safety  
Construction safety

### Preservation

Highway pavement preservation  
Bridge preservation and replacement  
Highway and bridge maintenance  
Ferry maintenance and preservation  
Airport runway preservation  
Legacy computer systems

### Environment

Highway practices  
Fish passage through culverts  
Wildlife connectivity  
Protecting species  
Cultural resources  
Climate change  
Noise reduction

### Mobility

Traffic management  
Traveler information  
Variable tolling  
Demand management  
Highways and ferries operations  
Non-motorized transportation

### Stewardship

Project management and delivery  
Advocate for system needs  
IT and decision support  
Accountability and communications  
Workforce  
Enterprise risk management  
Planning and prioritization  
Equitable access and ADA  
Sustainability

### Economic Vitality

Freight mobility  
Public private partnerships  
Contracting  
Intercity, rural and special needs

## WSDOT Research Policy Goals

Research is a Strategic Objective

- Research project inquiries will align with the WSDOT Strategic Plan and support the strategies of Moving Washington
- We strive to avoid duplication of research
- Research needs will be identified through a collaborative process directed by business needs
- We will partner with TRB, TRAC, UTCs and other organizations
- We help attract student interest in transportation

**Objective 3.10 Performance measures:**  
• Implementation of research needs

**Objective 3.10 Research and Knowledge Management:** Support cutting-edge research and seek innovative solutions to transportation system issues. Acquire key information and knowledge needed to support ongoing transportation system management within WSDOT.

2009-15 Strategies:  
• Conduct short- and long-term research to support critical agency functions and emerging needs.  
• Improve retention and dissemination of key information and knowledge within WSDOT, particularly in areas of high risk of losing knowledge and agency expertise through retirements.

### RESEARCH EXECUTIVE COMMITTEE RESEARCH POLICY STATEMENT

March 5, 2010

WSDOT's transportation research program addresses specific needs, opportunities and priorities that improve the agency's ability to deliver transportation projects and operate a safe and efficient system. The following policies control the identification of priority research needs, the procurement and management of research projects and the implementation and sharing of research results.

1. Research project requests will align with the WSDOT Strategic Plan and support the strategies of Moving Washington.
2. WSDOT will conduct or contract research and help shape the research needs agenda by participating in the National Research Council's Transportation Research Board (TRB) activities. We coordinate requests and responses to request research conducted by the National Cooperative Highway Research Program (NCHRP) and the American Association of State Highway Transportation Officials (AASHTO). WSDOT also partners periodically with other state departments of transportation to research topics that are of common interest. WSDOT encourages an encouraged to pursue innovative ideas and solutions by participating in their research programs and other research activities.
3. WSDOT conducts research activities that are not duplicative of other efforts and that have a reasonable likelihood of producing useful results. The research covers a wide spectrum of topics that range from the adoption of a new process, involving equipment and basic research, to seeking new ideas and knowledge. Research encourages and promotes information to support the understanding and use of transportation projects and technologies. WSDOT reserves the right to cancel or suspend research projects that do not meet the criteria and health upon the knowledge gained as each useful item.
4. Research projects that are funded by WSDOT are obligated to create a dissemination process that is shared by WSDOT business needs. Even though confidentiality is maintained, cooperation for finding or solving real-world transportation issues, and report resulting in the best interest of people engaged in projects.
5. WSDOT is a member of and works closely with our partners in the Washington State Transportation Center (TRAC), a cooperative transportation research organization. Its members, the University of Washington (UW), Washington State University (WSU) and the Transportation Research Board (TRB), support TRAC to coordinate both public and contract transportation research efforts and to develop research opportunities internally and externally. TRAC provides a collaborative environment for the use and application of research, technical information, and the project results. TRAC's research results have been used and applied across WSDOT with member data from the universities, as well as other agencies. TRAC also provides a venue for members to the agencies and the information remains shared at WSDOT.
6. WSDOT also partners with University Transportation Centers, other state DOT's, and state universities with specialized expertise in facilities, behavior and other operations, and provide responses to requests when state and to their funding resources and/or expertise.
7. The WSDOT Research Program helps attract student interest in transportation-related issues through research activities conducted by graduate and master level students. When possible the research provides a "signature" project for the student's academic program.

## ORLS Performance Metrics

Use and value of the product is documented about specific activities or groups of activities when it is provided by the business unit applying the product.

Conduct research that addresses priority research needs within each goal area.

- # research projects, # of research activities for each goal area
- Influence national & state policy and programs through participation in state and national research panels and committees. Support participation in research conferences and national communities of practices.
- # employees submitting papers to the TRB Annual Meeting.
- # employees on serve as WSDOT Technical Monitors on # projects
- # employees on # Cooperative Research Project Panels
- # employees on # TRB Standing Committees
- # employees on other national research panels



## ORLS Performance Metrics

Leverage research funding from other organizations to address WSDOT's research needs.

- # WSDOT funded research projects under contract this BN
- # WSDOT-led Transportation Pooled Fund project contracts underway this biennium
- # Problem statements submitted to national programs. # selected for funding
- WSDOT participating in # Transportation Pooled Fund projects led by others
- WSDOT funds leveraging # University Transportation Center projects
- Conduct quick response research, student studies, and synthesis studies on high priority issues such as transportation finance and climate change.
- # Quick response research projects funded (in addition to other projects listed)
- # Synthesis Reports prepared
- # Evans School Intern project initiated



## ORLS Performance Metrics

Maintain access to emergent research and state of the practice information through library services and surveys of other transportation agencies.

- # surveys conducted
- # surveys received/distributed
- # library resources borrowed from other libraries
- # library materials LOANED to other transportation libraries

Continually scan for and disseminate information on current and emerging practices that address the strategic priorities of the department.

- Daily News Clips – # of subscribers
- Special News Alerts – # of subscribers
- Publication Alerts
- Research list serve - # of subscribers

Implement enterprise strategies that capture explicit and tacit knowledge and access to that information.

- # pilot projects
- # practices disseminated



## Strengths & Weaknesses

### Strengths

- A strong ethic of customer service in all staff
- General awareness, support and appreciation for the services of the office
- An understanding that research adds value
- A spirit of innovation in the department culture
- Access to Executives and Senior Managers. An engaged Research Executive Committee.
- A diverse portfolio of services and project subjects
- Advocates within the technical programs
- Strong partnerships inside the department and beyond
- Involved employees



## Strengths & Weaknesses

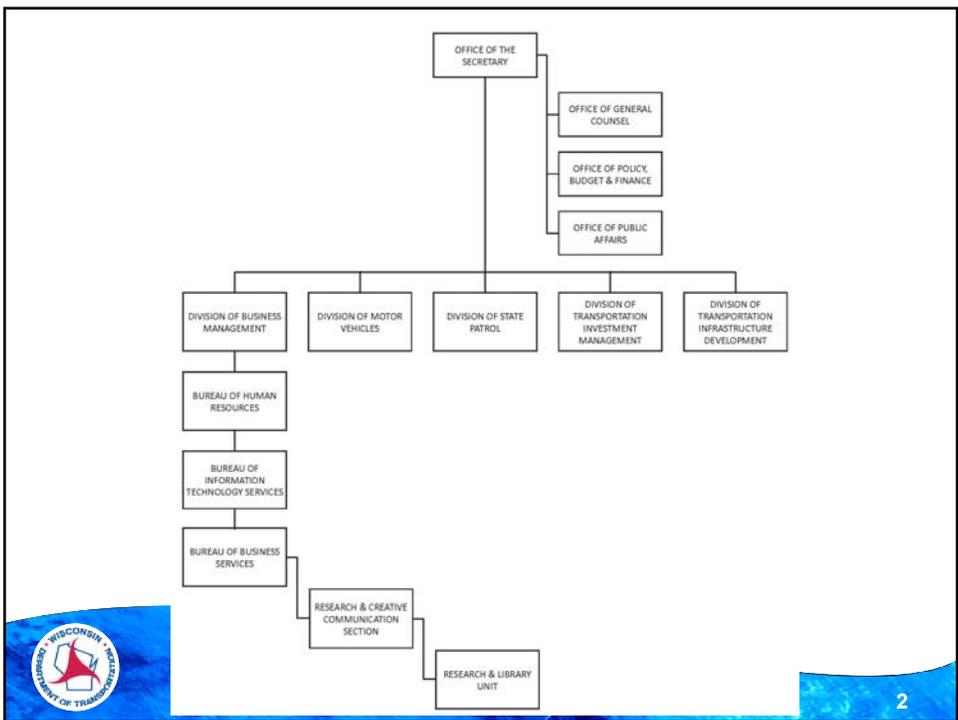
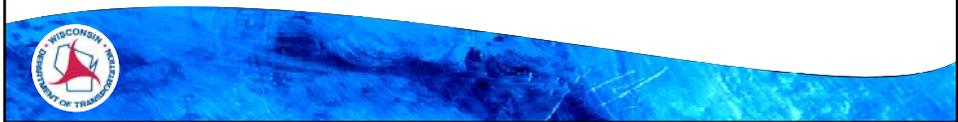
### Weaknesses

- Funding: buying power is down, have not been able to reinstitute programs
- Documentation of hand-off to sponsor/user, information from technical offices about value of products
- Tools to manage the unique nature of the work – too much is hand labor
- Workflow not well aligned creating bottlenecks. Too much variation in practice.
- Heavy workloads
- Information management lacks clarity within and between paper and electronic files.
- Website is weak
- Resources needed for knowledge and information management as well



# Overview of Wisconsin DOT Research Program

New Mexico Research Program Peer Exchange  
April 10-11, 2013

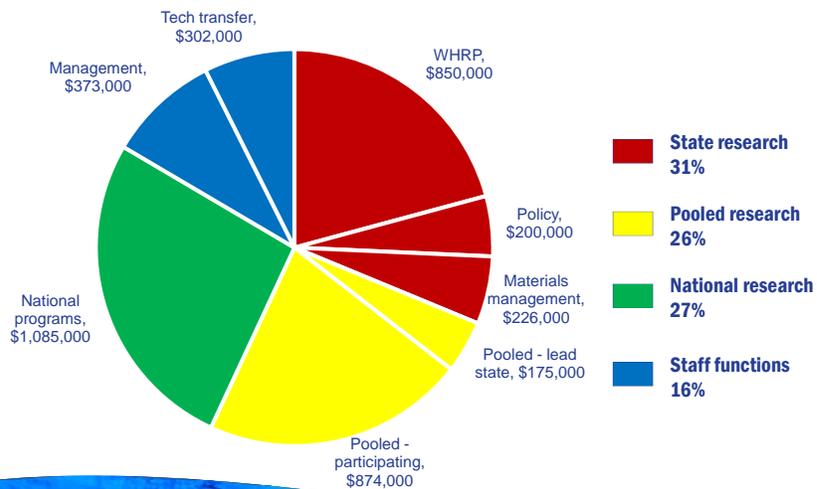


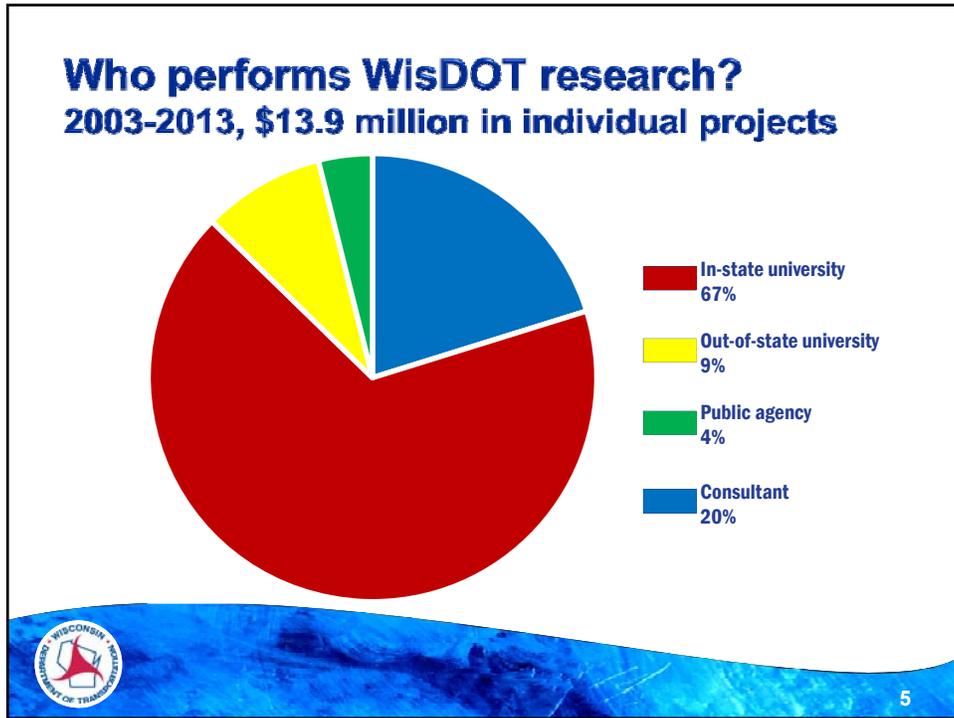
## Research in WisDOT organization

- ▶ **Challenges**
  - Not directly related to highway or modal functions
  - Not directly related to SPR-1 functions
  - Part-time program manager
  
- ▶ **Opportunities**
  - Solely responsible for development SPR-2 program
  - Not beholden to a specific mode or function
  - Secretary serves on AASHTO SCOR



## FFY2013 - \$4.1 million / 90% SPR funded





- ### WisDOT research in FFY2012
- ▶ Individual state-based projects
    - 18 projects completed
    - 19 projects continuing
    - 17 projects started
  
  - ▶ Pooled funds
    - Started 2 lead-state pooled funds
    - Participated in 48 other pooled funds
  
  - ▶ Three topical peer exchanges
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## **Program metrics / measures**

- ▶ **SPR Track database allows program to track all financial and contract related issues**
  - **MS Access with Visual Basic front end**
  - **Updated and improved in 2012**
- ▶ **Annual report provides key program information and top stories of successful research**
- ▶ **Evaluation of researcher conducted after each project is completed (pilot in 2012)**



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## **“Working list” of project implementation measures**

- ▶ **Implemented – new / changed practice**
- ▶ **Implemented – supports existing practice**
- ▶ **Implementation pending internal action**
- ▶ **Implementation pending external action**
- ▶ **Requires additional research**
- ▶ **Research for information only, no implementation**
- ▶ **Not implemented – canceled or terminated project**
- ▶ **Not implemented – all other**



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## **Program strengths**

- ▶ **Strong support for innovation and research from WisDOT management, including Secretary**
- ▶ **Direct involvement from department managers in research committees**
- ▶ **Direct involvement from industry and academia in Wisconsin Highway Research Program**
- ▶ **Program management staff and tools**



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## **Program weaknesses**

- ▶ **Diminishing federal dollars and lack of any state dollars beyond minimal match**
- ▶ **Lack of engineering expertise permanently assigned to the Research Program**
- ▶ **Inability to influence processes or maintain consistent performance from major universities**



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## Goals and objectives

- ▶ Wisconsin Highway Research Program has a 5-year strategic plan (2010-2015)
  
- ▶ Other program goals derived through WisDOT
  - Department strategic plan
  - Department performance measures
  - Research & Library Advisory Committee



## APPENDIX C. Participant Evaluation Form

NMDOT Research Bureau Peer Exchange

Participant Evaluation

April 10-11, 2013 in Albuquerque, New Mexico

1. Did the peer exchange meet its purpose and objectives? Please explain.
2. What was most beneficial about the peer exchange?
3. What was the least beneficial about the peer exchange?
4. What is the most important next step for NMDOT to make their research program vital?
5. What are your takeaways from the peer exchange?
6. Please rate the overall quality of the peer exchange on a scale of 1 to 10, with 10 being the highest (please check). Excellent – <input type="checkbox"/> 10 <input type="checkbox"/> 9 <input type="checkbox"/> 8 <input type="checkbox"/> 7 <input type="checkbox"/> 6 <input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 – Poor Please explain your rating here:
7. Please share any additional comments or thoughts you have about the peer exchange.

