

**Arizona Department of Transportation  
2019 Research Peer Exchange**



**April 9-10, 2019  
Phoenix, Arizona**



**Host:**

Arizona Department of Transportation Research Center

**Participating Guest Agencies:**

Federal Highway Administration, United States Department of Transportation  
Iowa Department of Transportation  
Mississippi Department of Transportation  
Montana Department of Transportation  
North Carolina Department of Transportation  
Washington State Department of Transportation

**Final Report**

July 2019

Prepared by CTC & Associates LLC

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## Introduction

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The Arizona Department of Transportation (ADOT) Research Center hosted a peer exchange in Phoenix, Arizona, on April 9 and 10, 2019. The peer exchange was aimed at identifying exemplary practices for engaging internal DOT stakeholders throughout the entire research process. Representatives from five other state DOTs, the Federal Highway Administration (FHWA), and other ADOT business areas joined the Research Center staff to share experiences, lessons learned, and opportunities for ADOT.

## Objectives

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As reflected in the agenda (Appendix A), the peer exchange centered around three main topics:

### 1. Identifying Research Needs.

How are individuals and work groups within the DOT (stakeholders) guided to identify problems that research might solve?

What motivates stakeholders to see research as a practical approach to help improve the department's processes and products?

### 2. Collaborating on the Research Process.

During the conduct of the research project, how are stakeholders kept engaged in the study process?

How does a research program motivate stakeholders to review the technical content of research deliverables for accuracy and adherence to scope? How does it create a culture in which the stakeholders are engaged and provide comments and feedback on the project deliverables?

What aspects of the process help stakeholders feel an ownership of the project, its progress, its success, and its implementation?

### **3. Making Use of Research Findings.**

How are stakeholders brought into the critical step of using research results to effect beneficial change, wherever in the department it might apply?

How are findings best communicated to encourage their application to day-to-day activities?

Who tracks and measures the benefits of implementation, and how?

## **Peer Exchange Participants**

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The peer exchange brought together representatives from ADOT, five visiting state DOTs, and FHWA. The following individuals participated in the entire two-day event.

### **ADOT Research Center**

Dianne Kresich, Manager

Bernadette Phelan, Senior Project Manager

Bill Stone, Senior Project Manager

Evelyn Howell, Technical Editor

### **Visiting State DOT Research Programs**

Anne Freeman, Research & Library Services Program Administrator, Washington State Department of Transportation

John Kirby, Project Manager, North Carolina Department of Transportation

Sue Sillick, Research Programs Manager, Montana Department of Transportation

Cindy Smith, State Research Engineer, Mississippi Department of Transportation

Brian Worrel, Research Program Manager, Iowa Department of Transportation

### **FHWA**

John Moulden, National Partnership Program Manager, Office of Corporate Research, Technology, and Innovation Management at Turner-Fairbank Highway Research Center

Romare Truly, Community Planner, Planning Region 2, Planning, Environment, Air Quality, Realty, and Civil Rights (PEARC) Team, FHWA–Arizona Division



*Left to right:* John Kirby, Sue Sillick, Steven Cheshko, Bernadette Phelan, Romare Truely, Dianne Kresich, Brian Worrel, Evelyn Howell, John Moulden, Anne Freeman, Bill Stone, and Cindy Smith.

## **Format**

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The peer exchange began with 20-minute presentations from the manager of the ADOT Research Center (Appendix B), the five visiting state DOT participants (Appendices C through G), and the FHWA Turner-Fairbank Highway Research Center participant (Appendix H) on their research programs and how they address each of the topics above.

Following these presentations, time was dedicated to exploring each of these topics in greater depth. For each two-hour topical discussion, additional ADOT staff from throughout the department were invited to participate as guests to share their experiences and provide feedback.

During each session, the out-of-state participants were asked topic-specific questions related to activities at their agencies. The ADOT guests were also asked questions that focused on their experiences with the research process at ADOT. After guests were excused, the core group of participants wrapped up the topical discussion by sharing their insights and key takeaways.

The group discussion questions for each topical area discussion appear in Appendix I. Selected discussion topics, including opportunities for ADOT and takeaways for out-of-state participants, begin on page 5 of this report.

The core group of participants concluded the peer exchange by sharing what they think ADOT is doing well and where there may be opportunities for improvement in each topic area. The participants also identified takeaways for their agencies within each topic, including planned next steps upon return to their own organizations.

It is important to note that in some cases, peer exchange participants' recommended steps or practices for the ADOT Research Center *may already be established processes or activities offered by the center*. When this is the case, peer exchange participants' recommendations serve to reinforce the importance of such processes and activities and promoting their use.

## Topical Discussion Guest Participants

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The ADOT guest participants who participated in the three topical discussions are listed below.

### 1. Identifying Research Needs

David Benton, Assistant State Bridge Engineer, Bridge Group  
Jesse Gutierrez, Deputy Statewide Engineer of Operations  
Donna Lewandowski, Bike/Pedestrian Planner, Planning and Programming  
Clem Ligocki, Planning and Programming Manager, Planning  
Julia Manfredi, Environmental Program Manager, Environmental Planning  
Kismet Weiss, Continuous Improvement

### 2. Collaborating on the Research Process

Bret Anderson, Statewide Programming Manager, Planning  
Lori Baker, Communications,  
Keith Killough, Transportation Analysis Group Manager, Multimodal Planning Division  
Nye McCarty, Flagstaff Regional Material Engineer  
Patrick Stone, Federal Aid Administrator, Financial Management Services  
Justin White, Biology Team Leader, Environmental Planning

### 3. Making Use of Research Findings

Alicia Evans, Affirmative Action Program Manager, Civil Rights  
Mike DenBleyker, Assistant State Engineer, Roadway Engineering Group  
Chris Freitag, Financial Management Services  
Julie Kliewer, State Construction and Materials Engineer, Construction and Materials  
Jim Meyer, GIS Program Manager, Multimodal Planning Division  
Steve Olmsted, NEPA Assignment Manager, Environmental Planning  
Scott Weinland, Team Lead, Roadway Engineering  
Kerry Wilcoxson, Traffic Safety Engineer, TSM&O

## Peer Exchange Findings on Topic 1—Identifying Research Needs

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### Opportunities for ADOT

The following opportunities to foster the identification of research needs were among those offered by ADOT research staff, ADOT guests, out-of-state participants, and FHWA participants.

- Offer an online form that staff can fill out to submit research project ideas.
- Announce a call for research to the department via email (to all staff levels, not just the managers and up), newsletters, and online news stories.
- Put more information on the ADOT intranet about the value of research projects, including testimonials from those who have benefited from research projects.
- Implement “Research on Tour”: Meet with staff from various groups around the state to tell them about the Research Center and how research can help them improve processes and products relevant to their jobs. Ask to present at staff meetings.
- Hold focus groups throughout the department on various topics. Invite the “boots on the ground” staff to discuss specific topics to generate research ideas.
- Use a variety of marketing tools, including newsletters (ADOT as well as Research Center), email blasts, bulletin boards, posters, brochures, and marketing tables. Make your presence known throughout the department and clearly brand all products from the Research Center.
- Inform ADOT staff about the various forms a research study can take and other services that the Research Center can provide, such as literature searches, best practices from other states, and syntheses. Also inform them about the ability to survey other states through AASHTO Research Advisory Committee (RAC) surveys.
  - Syntheses allow staff to learn about recent research in a subject of interest to them.
  - Technical assistance and quick-response projects address issues that do not require a full research project.
- Reach out to new employees, either personally or as part of ADOT’s orientation program, to educate them about the Research Center’s program and processes.
- Hold a research summit to bring together a wide range of staff to generate research ideas.
- Find opportunities to present information on the Research Center’s products and services at in-state transportation-related conferences, such as Roads and Streets and the Rural Transportation Summit.

### Takeaways for Out-of-State and FHWA Participants

Participants outside of ADOT—representatives of other state DOTs and FHWA—shared takeaways about identifying research needs that they can consider at their own agencies.

- Have an official presence at other state conferences, particularly those that are not DOT-sponsored, to advertise open calls for research submission.

- Consider adapting and using Montana Department of Transportation’s statement of work development form.
- Investigate best practices from AASHTO RAC for research problem identification and portfolio creation. What does the Program Management & Quality Task Force offer?
- Provide training for individuals to participate as research champions, State Transportation Innovation Council members, and research advisory committee members.
- Educate project champions on their expected involvement.
- Engage in one-on-one outreach, which can be particularly effective.
- Balance managing up (or out) with managing down.

## Peer Exchange Findings on Topic 2—Collaborating on the Research Process

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### Opportunities for ADOT

The following opportunities to foster collaboration on the research process were among those offered by all participants.

- Stress to the project sponsor and technical advisory committee (TAC) that the research project is *theirs*, not the Research Center’s. Their review of deliverables is necessary to ensure that the study’s products meet their needs and provide benefits to ADOT.
- Ask the project champion to encourage TAC members to review deliverables and provide feedback on portions of deliverables that relate to their areas of expertise.
- Clearly outline the roles and responsibilities of TAC participants through written communication in advance of a project. Review roles and responsibilities at the project kickoff meeting.
- Seek and emphasize support of TAC participation by upper management.
- Explore using federal State Planning and Research, Part 2, funds to create a project against which staff may charge time spent on research-related activities.
- Acknowledge TAC members in the final report.
- Convey the benefits of TAC membership. Frame participation as an opportunity to gain knowledge, network within and beyond ADOT, meet experts, and engage in innovation.
- Engage or develop a TAC with stakeholders from outside of ADOT, such as local agencies, when appropriate.
- Clarify the funding mechanism in place for implementation activities.

## Takeaways for Out-of-State and FHWA Participants

Participants outside of ADOT shared takeaways about collaboration on the research process that they can consider implementing at their own agencies.

- Develop training for TAC participants.
- Define and differentiate the terms “project sponsor” and “project champion.”
- Clearly define and communicate the mission of the state research program.
- Review task reports for readability and clarity before they are sent to the TAC.
- Clearly define roles and responsibilities for TAC members.
- Communicate research efforts, project results, and research opportunities to a department-wide audience.
- Create a “problem register” where DOT staff can voice their problems. Consider whether research can address any of the issues.

## Peer Exchange Findings on Topic 3—Making Use of Research Findings

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### Opportunities for ADOT

The following opportunities to foster collaboration on making use of research findings were among those offered by all participants.

- Conduct a literature review and compile a synthesis report prior to beginning a research project to help clarify and focus a project scope.
- Discuss implementation with the TAC from the beginning of a research project, when the problem statement and scope of work (SOW) are developed. Engage the TAC in ensuring the SOW is clear and focused with implementable deliverables. Possible barriers to implementation should also be discussed.
- Create an implementation form to help keep the TAC and PI focused on implementation throughout the project. The PI can use the form as a basis for an implementation plan for the completed project. Continually reinforce ADOT’s needs to the PI to help ensure the project has practical applications.
- Track implementation of project recommendations, both quantitatively and qualitatively.
- Include “go/no-go” points in a project contract at specific stages to help determine if a project should continue. This may be helpful for complicated projects with many unknowns.
- Fund implementation projects as a follow-up to the initial research project.
- Consider creating a position dedicated to implementation.



- Find ways to keep TAC members engaged. This will make them more likely to implement project results.
- Create research briefs (two-page summaries of research projects) to disseminate project information to a wide and varied audience throughout ADOT.

### **Takeaways for Out-of-State and FHWA Participants**

Participants outside of ADOT shared takeaways about making use of research findings that they can consider implementing at their own agencies.

- Have defined implementation processes.
- Produce research briefs for all research projects.
- Produce implementation reports for research projects.
- Include an implementation plan and implementation activities in the project contract.
- Keep the TAC members engaged throughout the life of a research project.
- Insert “go/no-go” points in project contracts or have separate phases of a project, with a separate contract for the project and for implementation.
- Undertake more outreach to areas of the department that are not usually engaged with the research program.
- Provide implementation assistance to project champions and TACs.

## **Summary Findings**

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### **Guests**

For the wrap-up discussion, the following two guests from the FHWA–Arizona Division joined the discussion.

Alan Hansen, Team Leader, Planning, Environment, Air Quality, Realty, and Civil Rights (PEARC)  
Team

Anthony Sarhan, Assistant Division Administrator

### **Summary Roundtable Topics**

ADOT Research Center staff, out-of-state participants, and FHWA participants participated in a roundtable discussion to address the following three points based on all presentations and discussions during the two-day peer exchange:

- ADOT exemplary practices: What is ADOT doing well?
- Suggestions for ADOT for further improvements or growth
- Takeaways for my agency

Selected responses to each of these discussion points are presented below, first for ADOT Research Center staff and then for out-of-state participants and FHWA.

## **Responses from ADOT Research Center staff**

- **ADOT exemplary practices: What is ADOT doing well?**
  - Strong Research Center staff.
  - Engaged Research Advisory Committee. Good relationships with division heads and group managers who make up the RAC.
  - Good relationships with TAC members.
  - Improving final reports by requiring PIs to include technical writers on their research teams. Streamlined final reports, technical memos and research briefs to address customer needs.
  - Five-year implementation assessment provides valuable insight.
  - Emphasis on quality.
- **Suggestions for ADOT for further improvements or growth / Takeaways for my agency (ADOT)**
  - Get on agendas of transportation-related conferences or meetings, such as Roads and Streets, to inform practitioners about Research Center products and services.
  - Get on the agendas of ADOT Infrastructure Delivery and Operations regional meetings and Leadership Team meetings.
  - Issue informal calls for research: Ask for problems or challenges that could be addressed through research. Review Arizona Management System problem registers to identify issues.
  - Continue outreach to ADOT groups that have not traditionally been research customers.
  - Reach out to local agencies for research ideas.
  - Revisit research ideas from ADOT's most recent research summit and consider holding another summit.
  - Encourage ADOT staff to consider smaller, more focused research projects such as a synthesis on the state of a practice.
  - Invest in marketing the Research Center and the importance of research to the department.
  - Update an existing slide presentation on the roles and responsibilities of TAC members, particularly the project sponsor and champion.
  - Investigate setting up a project to which TAC members could charge their time on research activities using federal funds.
  - Explore offering quick-response research projects. This may require a new contracting approach.

- Review Montana Department of Transportation’s scope of work form (<https://www.mdt.mt.gov/other/webdata/external/research/forms/MDT-RES-002.pdf>) and implementation and documentation form (<https://www.mdt.mt.gov/other/webdata/external/research/forms/MDT-RES-007.pdf>) for ideas to use at ADOT. (Note that these PDFs must be downloaded and opened in Acrobat to view.)
- Provide an implementation form for project sponsors. At the conclusion of a study, consider meeting with the TAC to initiate the implementation of study recommendations, outlining roles and responsibilities and defining small-scale action items to get implementation started.

## **Responses from out-of-state participants and FHWA**

- **ADOT exemplary practices: What is ADOT doing well?**
  - Strong Research Center team with a commitment to quality.
  - Research Center staff reaches out to underserved staff.
  - Excellent engagement with the Research Advisory Committee.
  - Open-door policy for ADOT staff to get assistance from the Research Center.
  - Five-year research assessment.
  - Tracking implementation for 18 months or longer.
  - Streamlined final reports.
  - Requiring a technical editor on research teams.
- **Suggestions for ADOT for further improvements or growth**
  - Market the Research Center to all levels of the department so everyone knows what research can do for them.
  - Standardize the process for generating research ideas, such as with a periodic call for research.
  - Inform staff of a wider range of research activities available to them through the Research Center, such as literature searches, syntheses, AASHTO RAC surveys, etc.
  - TAC members had good things to say about the Research Center. Use them to help market the Research Center to their colleagues.
  - Request the opportunity to present at the new employee orientation and reach out personally to new employees.
  - More clearly define TAC roles and responsibilities.
  - Find ways to shorten contracting time.
  - Offer quick-response projects.
  - Contract and conduct large or uncertain projects in phases.

- Consider adding an implementation position to the Research Center.
- **Takeaways for my agency**
  - Engage younger staff at the department.
  - Conduct a five-year research assessment.
  - Revitalize the State Transportation Innovation Council.
  - Hold a half-day or daylong research summit.
  - Get on agendas of department or state conferences to talk about research.
  - Add benefits of TAC participation to the TAC roles and responsibilities document.
  - Ensure TACs have the appropriate members and are of a manageable size.
  - Create a research strategic plan.
  - Track implementation activities of closed research projects.
  - Offer quick-response projects.
  - Set up project where TAC members can charge time on research activities using federal funds.
  - Implement a Research Advisory Committee.
  - Consider an experimental features program.
  - Create a value of research display board.
  - Promote the library to the department.
  - Provide training for project champions and sponsors.
  - Hold webinars for closed research and implementation projects.
  - Find ways to further recognize research staff and TAC members.
  - Investigate Iowa DOT's Research Liaison Network.
  - Investigate Iowa DOT's Innovations in Transportation conference.
  - Investigate North Carolina DOT's Deliverable Review document.

## Appendices

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Appendix A. Peer Exchange Meeting Agenda

Appendix B. Presentation: Arizona DOT

Appendix C. Presentation: Mississippi DOT

Appendix D. Presentation: Iowa DOT


Appendix E. Presentation: Washington State DOT

Appendix F. Presentation: North Carolina DOT

Appendix G. Presentation: Montana Department of Transportation

Appendix H. Presentation: FHWA

Appendix I. Discussion Questions


**Arizona DOT Research Peer Exchange**  
 Engaging Internal DOT Stakeholders throughout the Research Process

## AGENDA

April 9 to 10, 2019

[Hilton Garden Inn Phoenix Midtown – Phoenix North Meeting Room](#)

4000 N. Central Avenue, Phoenix, Arizona

### Tuesday, April 9

<i>7:45 to 8:45 a.m.</i>	<i>Breakfast and networking in hotel – External participants and Research staff</i>
<b>8:45 to 9:00 a.m.</b>	<b>Welcome by ADOT</b> <b>Introductions and Agenda Overview</b>
<b>9:00 to 9:30 a.m.</b>	<b>ADOT Research Program Overview and Peer Exchange Goals</b> <ul style="list-style-type: none"> <li>• Dianne Kresich, ADOT Research</li> </ul>
<b>9:30 to 10:30 a.m.</b>	<b>Visitor Presentations – Program Overviews</b> <ul style="list-style-type: none"> <li>• MS DOT – Cindy Smith</li> <li>• IA DOT – Brian Worrel</li> <li>• WS DOT – Anne Freeman</li> </ul>
<i>10:30 to 10:50 a.m.</i>	<i>Break</i>
<b>10:50 to 11:50 a.m.</b>	<b>Visitor Presentations – Program Overviews (continued)</b> <ul style="list-style-type: none"> <li>• NC DOT – John Kirby</li> <li>• MT DOT – Sue Sillick</li> <li>• FHWA – John Moulden</li> </ul>
<i>11:50 to 1:00 p.m.</i>	<i>Networking lunch in meeting room</i>
<b>1:00 to 3:00 p.m.</b>	<b>Topic #1: Identify Research Needs</b> <ul style="list-style-type: none"> <li>• ADOT topic introduction</li> <li>• Roundtable Discussion with out-of-state visitors/Research Center staff</li> <li>• Questions/Comments from ADOT participants (Group 1)</li> </ul>
<i>3:00 to 3:15 p.m.</i>	<i>Break</i>
<b>3:15 to 4:30 p.m.</b>	<b>Topic #1: Identify Research Needs (continued)</b> <ul style="list-style-type: none"> <li>• Roundtable Discussion with Visitors</li> </ul>
<b>4:30 to 5:00 p.m.</b>	<b>Wrap up and Takeaways</b>
<i>6:00 p.m.</i>	<i>Meet in hotel lobby to go to group dinner</i> <i>Dinner at Tranquilo at 6:30pm (Short walk from the hotel)</i>



## Arizona DOT Research Peer Exchange

Engaging Internal DOT Stakeholders throughout the Research Process

### AGENDA

#### Wednesday, April 10


7:30 to 8:30 a.m.	<i>Breakfast and networking in hotel – External participants and Research staff</i>
8:30 to 8:40 a.m.	<b>Recap of Tuesday and Agenda Overview</b>
8:40 to 10:30 a.m.	<b>Topic #2: Collaborate on Research Process</b> <ul style="list-style-type: none"><li>• ADOT topic introduction</li><li>• Roundtable Discussion with Visitors</li><li>• Questions/Comments from ADOT participants (Group 2)</li></ul>
10:30 to 10:45 a.m.	<i>Break</i>
10:45 to 11:30 a.m.	<b>Topic #2: Collaborate on Research Process (continued)</b> <ul style="list-style-type: none"><li>• Roundtable Discussion with out-of-state visitors/Research Center staff</li></ul>
11:30 to 12:30 p.m.	<i>Networking lunch in meeting room</i>
12:30 to 2:30 p.m.	<b>Topic #3: Make Use of Research Findings</b> <ul style="list-style-type: none"><li>• ADOT topic introduction</li><li>• Roundtable Discussion with out-of-state visitors/Research Center staff</li><li>• Questions/Comments from ADOT participants (Group 3)</li></ul>
2:30 to 2:45 p.m.	<i>Break</i>
2:45 to 3:15 p.m.	<b>Topic #3: Make Use of Research Findings (continued)</b> <ul style="list-style-type: none"><li>• Roundtable Discussion with Visitors</li></ul>
3:15 to 4:30 p.m.	<b>Wrap up, Takeaways and Report Out</b>




# Research Peer Exchange: Engaging Internal Stakeholders

Dianne Kresich  
Arizona Department of Transportation  
Research Center  
April 9-10, 2019

ARIZONA DEPARTMENT OF TRANSPORTATION



## RESEARCH AT ADOT: AN OVERVIEW



ARIZONA DEPARTMENT OF TRANSPORTATION



## What is the Research Center?

A unit of the Multimodal Planning Division (MPD), the Research Center helps ADOT solve problems through studies designed to meet agency needs. MPD reports to the State Engineer.

Studies are managed by a research project manager (PM) and conducted by consultants.

The Research Center also administers the Product Evaluation Program and maintains the ADOT Approved Products List.



## Research Center Staff

- 1 manager
- 3 research project managers
- 1 technical advisor
- 1 product evaluation supervisor
- 2 product evaluation engineers

Experts in critical thinking.



## Finances and Products

- Annual budget: ~ \$2 million for research and product evaluation
  - Annual expenditures much lower (significant carryover to future fiscal years)
- ~ 25 studies programmed or ongoing
- ~ 8 studies completed annually



## Continuous Improvement

- ADOT standardizing improvements in all processes and products
- Research Center streamlined processes and developed a new streamlined final report format and research brief
  - Shorter, clearer, practitioner-oriented, results-focused

## IDENTIFYING RESEARCH NEEDS



ARIZONA DEPARTMENT OF TRANSPORTATION

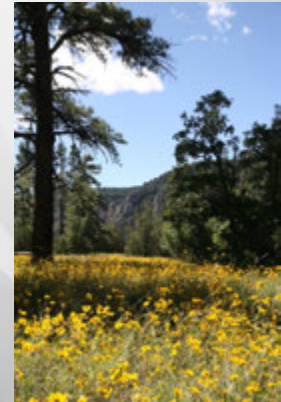
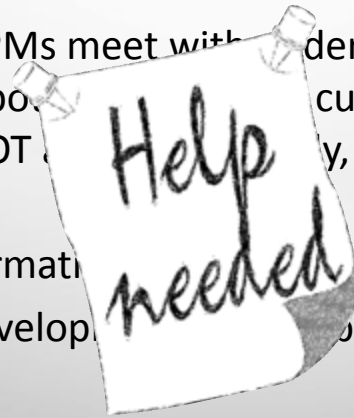
## Where do research ideas come from?



- Anyone may suggest an idea to the Research Center
- Most viable ideas originate with ADOT practitioners
- Ideas accepted year-round

## Creating customers

- Research PMs meet with under- or unserved populations within ADOT, other agencies
- Share information and possibilities
- Aim for development of a problem statement



## Which ideas does ADOT pursue?

Ideas that **address an ADOT need** and that:

- Will lead to practical application at ADOT
- Are supported by upper-level managers with the authority to implement recommendations (sponsors)



## What if an idea comes from outside ADOT?

- The interested party discusses it with the Research Center manager
- If the idea is viable as potential research, the manager assigns a project manager (PM).
- The PM contacts a potential sponsor to gauge interest



## Who is involved?

- The PM attempts to recruit an ADOT **sponsor** and a **champion**:
  - The sponsor supports the research and has authority to implement results
  - The champion is someone who is passionate about the study
- The PM will have **initial** discussions with the sponsor and champion
  - If the idea is suggested by someone external to ADOT, that person is involved in initial discussions



## What is the research problem statement?

It describes in 2 pages:

- The ADOT problem to be addressed
- The study's intended objectives (excludes method or envisioned findings)
- Possible benefits and beneficiaries
- Expected implementation of results
- Estimated budget and duration



## What happens to the problem statement?

- The Research Center meets with the **ADOT Research Advisory Committee (RAC)** ~ twice each year to present problem statements and requests for pooled fund contributions
- RAC comprises executives and managers representing nearly all ADOT functions
- RAC discusses and approves by consensus



## CONDUCTING THE RESEARCH STUDY

### What is the PM's role?

- Serves as the consultant's point of contact at ADOT
- Guides study from conception through publication of report
- Critically reviews deliverables; assembles the technical advisory committee (TAC) and solicits their input
- Directs consultant on required revisions (multiple cycles)
- Approves invoices upon approval of deliverables

## What is the TAC and its role?

- ADOT subject matter experts
- Conducts technical
- Advises the PM and throughout the stud

Includes the study spon  
customer whose needs r  
champion.

Meets at key decision points.



## IMPLEMENTING RESEARCH





## How does a study address implementation?

- Each study targets the implementation envisioned in the problem statement
- Ask consultant to include an implementation plan
  - Customers lose interest, consultant struggles
  - Anyone have a high-quality example to share?
  - How useful are these plans in practice?



## Tracking and documenting implementation

- ResearchTrack Access database includes fields to note discussions, general outcomes, participants in implementation
- PMs loosely responsible for monitoring up to 18 months after study conclusion
  - Staff turnover, demands on time



## ADOT Implementation Study

- Comprehensively documents and analyzes the implementation of research recommendations over previous 5+ years
- Yields insights, ideas for improved research processes and products
- Will soon commence an update to 2012 study

## Questions?

**Dianne Kresich**  
Research Center Manager

[dkresich@azdot.gov](mailto:dkresich@azdot.gov)

602-712-3134

206 S. 17<sup>th</sup> Avenue, MD 310B  
Phoenix, AZ 85007



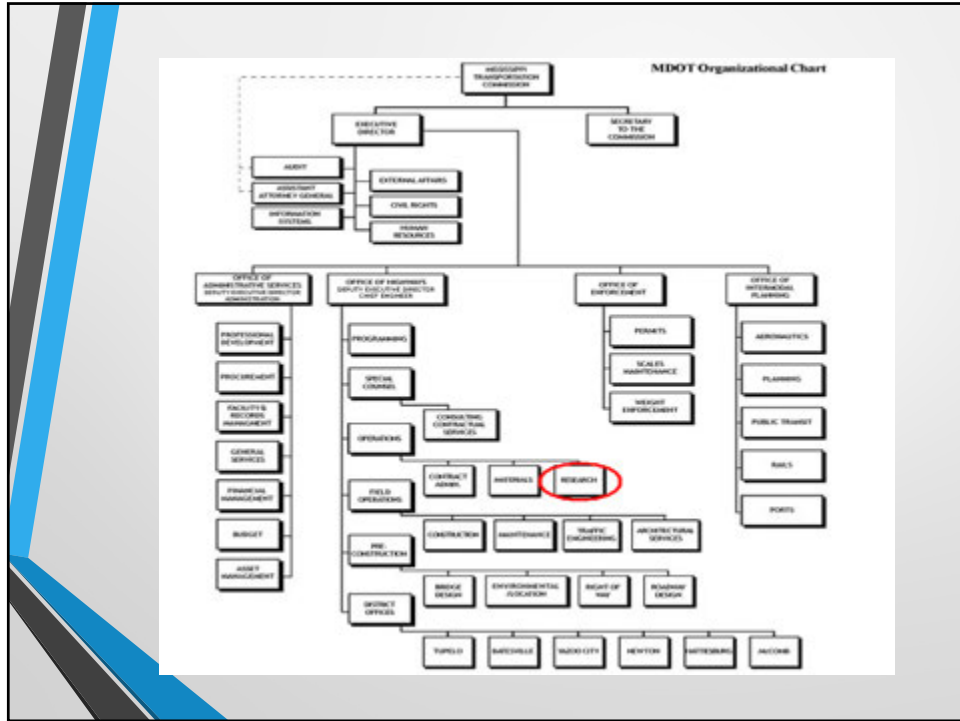
## Mississippi DOT's Research Program

Prepared for Arizona DOT  
Research Peer Exchange  
April 2019

Cynthia J. (Cindy) Smith, P.E.  
State Research Engineer

## General Information

- MDOT Research Division oversees research program
- Division reports to Assistant Chief Engineer—  
Operations
- 11-12 full-time employees, contract employees on  
as-needed basis
- Approximately \$2.3-\$2.4M research budget
- STIC/EDC elsewhere in MDOT
- Division is in charge of other operational duties



## Statistics (Approximate)

- \$2.3-\$2.4M/year
- 5-6 projects finished in a year (varies)
- 15-20 projects ongoing
- Universities and consultants

## Typical Work Program Breakdown

Cost Type	Amount
Total Federal Appropriation	\$2,300,000
NCHRP	\$ 550,000
TRB	\$ 120,000
Pooled Funds	\$ 600,000
AASHTO TSPs	\$ 180,000
Remaining After 100% Federal Costs	\$ 850,000
Plus 20% State Match	\$ 170,000
Remaining for 80/20 State Studies	\$1,020,000

## Program Oversight—MDOT Research Advisory Committee (MDOT-RAC)

- State Research Engineer-Chair
- 3 Assistant Chief Engineers (Operations, Field Operations, Preconstruction)
- Chief Engineer/Deputy Executive Director
- Deputy Executive Director/Administration
- Director--Intermodal Planning
- 1 District Engineer (rotating 2-year term)
- FHWA (non-voting)
- Anyone interested may attend and have input, but will be non-voting.

## MDOT-RAC (continued)

- Must approve annual work program, then send to local FHWA for approval
- Must approve any time and/or cost extensions or scope changes to existing projects
- Must approve pooled fund participation, NCHRP, TRB
- Approvals/changes can be done via email
- Once RAC has approved, local FHWA must approve.
- State Research Engineer must seek Commission approval on new state studies, extensions, and 100% federal payments (NCHRP, TRB, AASHTO TSPs, pooled funds, etc.)

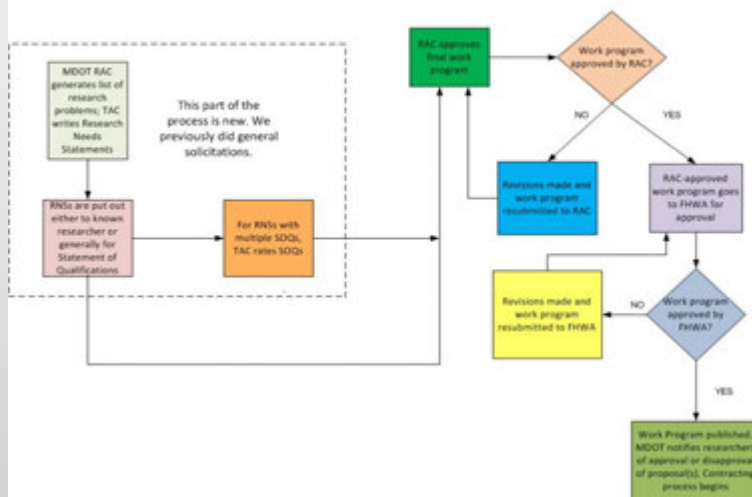
## Project Idea Generation

- Upper management generation of ideas/can begin in divisions
- Research and technical champions write RNSs in advance
- Each project idea must have a technical champion.
- Normally once a year, but can add studies during the year with MDOT-RAC approval.
- Pooled fund solicitations sent out
- Depends on available \$\$

# Project Selection

- MDOT-RAC generates ideas and selects projects.
- MDOT-RAC approves annual work program based on funding and importance to MDOT and FHWA.
- Pooled funds are evaluated by champions and approved by MDOT-RAC as part of the work program.

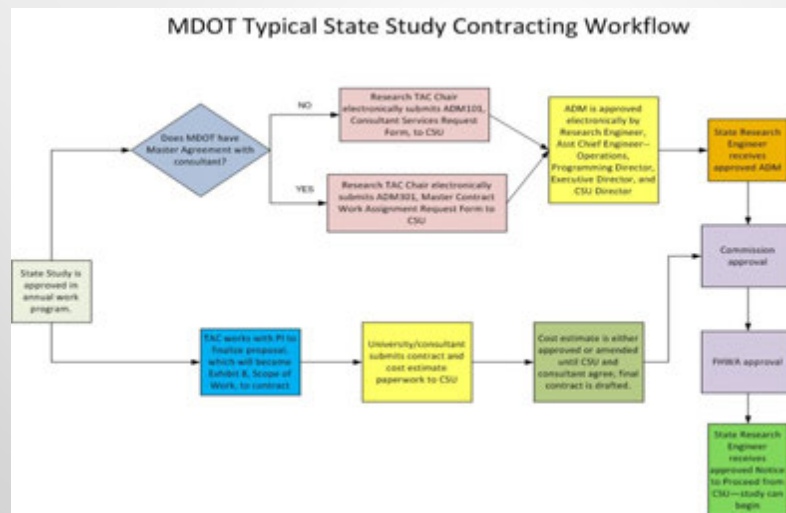
## MDOT Annual Research Work Program Workflow—Updated October 2015



## Contracting Process

- Consultant Services Unit (CSU) handles state study contracts.
- MDOT champion(s), Research Technical Advisory Committee (TAC) member will aid PI in preparing final Scope of Work.
- Master Agreements and projects not under MA, RFQs
- Obtain Commission approval and FHWA if needed
- Notice to Proceed (NTP)

## State Study (80/20) Workflow





## Project Oversight

- Technical Advisory Committee (TAC) for each project
- An engineer from Research chairs each TAC
- Technical champion(s), FHWA, PI, and (occasionally) other interested parties
- Research chair will facilitate invoicing, quarterly and annual progress reports, status meetings, and other issues.
- Implementation data-gathering handled by Research.

## Strengths

- Well-outlined proposal and invoicing process
- Work program generation and tracking database
- Research Division TAC member responsibilities clearly outlined
- Identification of technical champions up front
- Champions must state if a project has implementation potential and specify what benefits they expect from study before we will fund it
- Final report guidelines/template published
- Research Management System (RMS) recently implemented

## RMS Screen Capture

View	Status	Project Name	Project Type	Created At	Created	Funding Entry Type	Funded	Start Study	Responsible	Final Year Comments
		Data Collection for Local Calibration of the AQM2016s Payment M2 Design Performance Works for Mississippi	State Study	Vehicle	2011-2018	Contractual	<input checked="" type="checkbox"/>	201	Allen Conley	
		AQM20 Safe, Reliable, and Secure Transportation Operations (SARETS)	AQM20	Vehicle	2011-2018	Pocket Fund	<input checked="" type="checkbox"/>			
		Research Decision Support to Collection and Evaluation of Core Data for the AQM20 for Overlap and New Elements	State Study	Vehicle	2011-2018	In-Phase	<input checked="" type="checkbox"/>	201	Ann Whittaker	
		Traffic Control Device (TCD) Conversion	Pocket Fund	Vehicle	2011-2018	Pocket Fund	<input checked="" type="checkbox"/>			
		Develop and Support Transportation Performance Management Capacity Development Needs for State DOTs	Pocket Fund	Vehicle	2011-2018	Pocket Fund	<input checked="" type="checkbox"/>			
		AQM20 User and Use Cooperative Program (UCOP)	AQM20	Vehicle	2011-2018	Pocket Fund	<input checked="" type="checkbox"/>			
		AQM20 Transportation Corridor Coordination Council (TCC)	AQM20	Vehicle	2011-2018	Pocket Fund	<input checked="" type="checkbox"/>			
		Supersize Regional Center, Southeastern Region	Pocket Fund	Vehicle	2011-2018	Pocket Fund	<input checked="" type="checkbox"/>			
		Development of a Setup Prediction Method and Implementation into JSDO Drive-By Design in Missouri with	State Study	Vehicle	2011-2018	Contractual	<input checked="" type="checkbox"/>	201	Eric J. Stewart	
		MOOT Specific Design Procedure for Chip Seals	State Study	Vehicle	2011-2018	Contractual	<input checked="" type="checkbox"/>	212	Sean Howard	
		Update and Documentation of MOOT Warranty Provisions and Release Thresholds	State Study	Vehicle	2011-2018	Contractual	<input checked="" type="checkbox"/>	211	Forrest Hines	

## Strengths (continued)

- Implementation database in progress (helps with tracking which studies have been useful)
- More tracking of implementation and new requirement for implementation/T2 deliverables
- Taking steps toward better marketing
- Strong upper management buy-in and support to research program
- Focus on making research useable and functional

## Challenges

- Front-end screening helps to great degree but cannot anticipate all problems
- Sometimes useful results do not happen
- Measuring implementation accurately
- Champion leaving or PI change during project
- Shifting priorities
- Lean staff/turnover/loss of long-term employees
- Operational duties other than research

## Other Division Activities

- MDOT Library
- Non-destructive testing (friction, FWD, profiler)
- Pavement management (condition survey, PMS software, training, project recommendations)
- Warranty data collection/reporting
- Smoothness specification enforcement
- Knowledge management co-lead

## Other Division Activities (cont'd)

- Chair of Pipe/Culvert Subcommittee of Product Evaluation Committee
- MDOT Product Evaluation Committee
- Involved in asset management (TAMP) efforts
- MDOT GIS/Data Committee
- MEPDG implementation

## Engagement of Internal Stakeholders

- We rely on SME/champions heavily
- Tackling people at other conferences/seminars
- Engagement is largely informal
- Relationships and communication drive this
- Deep participation in research idea development
- Research needs workshops have been held in the past, but not since 2012

## Stakeholder Engagement Challenges

- Depends heavily on SMEs and informal relationships
- Everyone is busy and has limited staff/SME saturation
- No 100% dedicated research staff except one part-time contracted retiree
- Commission elections in November—2 out of 3 not seeking re-election

## Stakeholder Engagement Strengths

- Excellent upper management support
- Local FHWA office provides great guidance
- Enthusiastic SMEs, lots of energy
- Great partnerships with universities and consultants
- Ability to serve on TRB/AASHTO committees helps spur research within MDOT

## Next Steps

- Getting documentation revamped by CTC
- One deliverable will be training modules for TAC members, consultants, and Research staff
- Working with Public Affairs Division (new director) on marketing
- Pushing technology transfer/knowledge management via research
- Hope to learn better practices on any area of the program while here

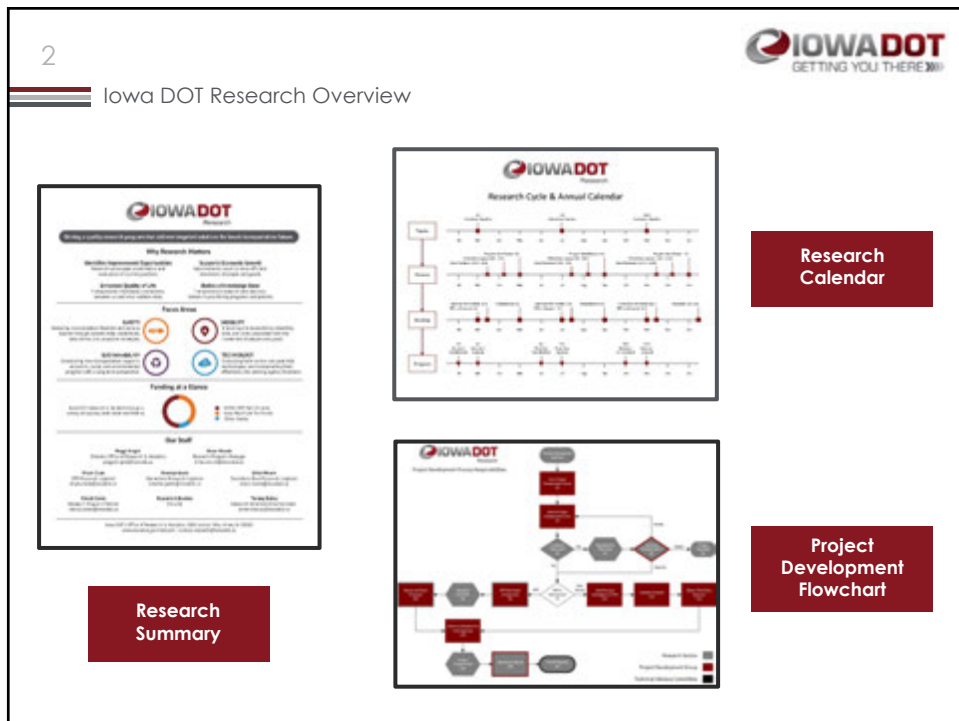
Thank you!

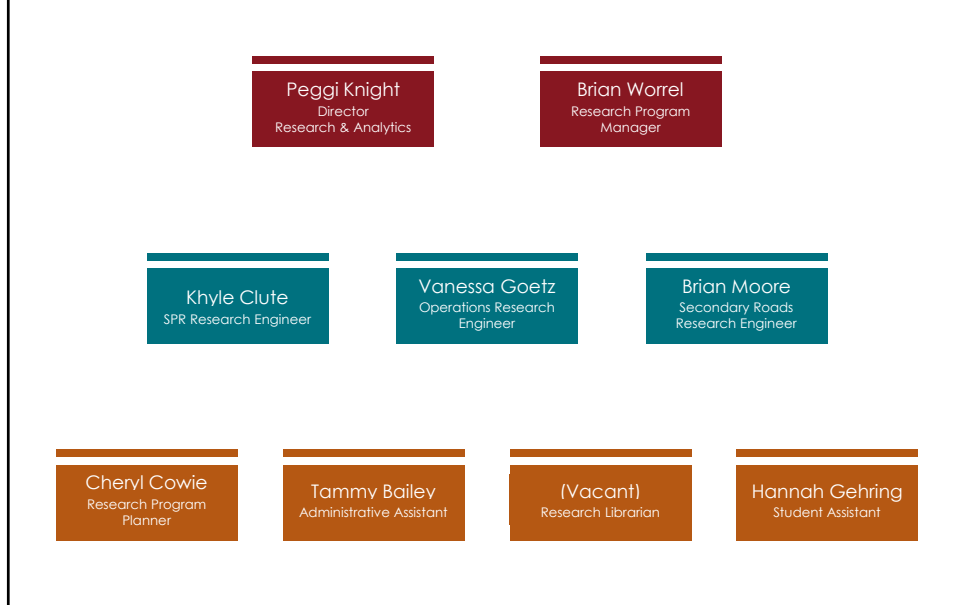
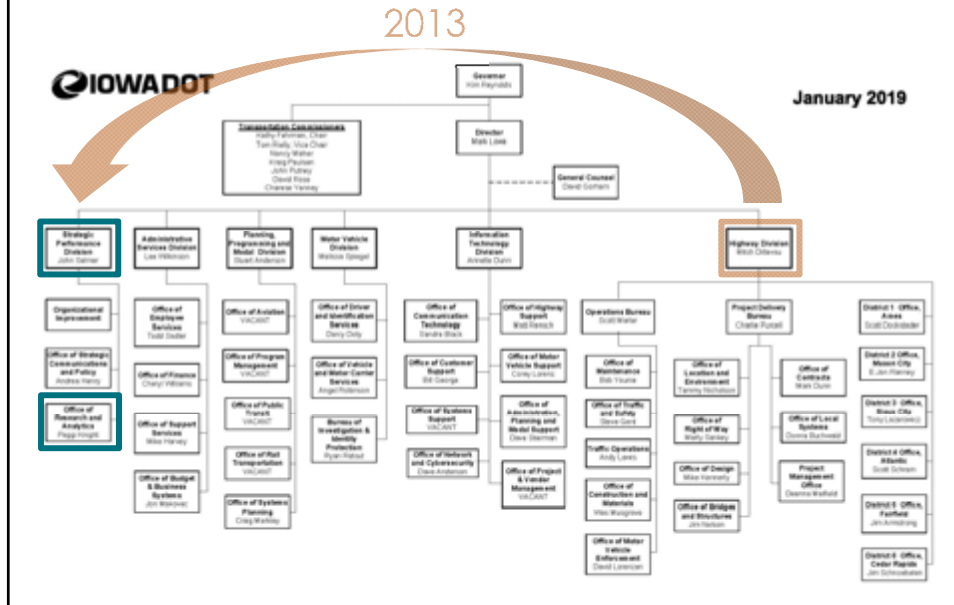
Cindy Smith, Mississippi DOT

[cjsmith@mdot.ms.gov](mailto:cjsmith@mdot.ms.gov)

601-359-7647 (office)

601-946-7734 (cell)





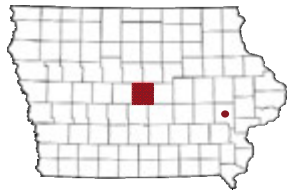


Iowa DOT Research Overview

Iowa Highway Research Board

IHRB

STATE  
COUNTY  
LOCAL



State Planning and Research

SPR

STATE  
REGIONAL  
NATIONAL



Other Partnerships

Other

AASHTO  
TRB  
USDOT / FHWA



Iowa DOT Research Overview

Annual Expenditures: \$7M+



Annual Projects in Progress: 190



(Additional 50+ for other DOT business units signed through research master agreements)

Annual Projects Completed: 50



## Structures

- Research Liaison Network
  - First point of contact in every DOT office
  - Selected by office directors
- Iowa Highway Research Board
  - Established in 1950
  - DOT, county, municipal, & university
  - Acts as Iowa STIC

## Events

- Focus groups
- Mid-continent research symposium
- Innovations in transportation conference
- University collaboration workshop

## Training

- Liaison & Champion Meetings
  - Scheduled for each trimester
  - Present changes in process, answer questions
- Network Resource Folder
  - Calendars, flowcharts, timelines, instructions
  - Contact info for other liaisons & champions
  - Status of proposed topics

	Outstanding (No Issues)	Good (Like to See More)	OK (Needs Improvement)
Propose Initial Research (Quantity)	✓		
Propose Initial Research (Diversity)		✓	
Participate in meeting(s) to brainstorm research needs		✓	
Serve on project committees to help oversee research and review deliverables	—	—	—
Evaluate performance of investigators/results			✓
Help disseminate research findings		✓	
Help implement research findings (new way)		✓	
Help Implement research findings (old way)			✓

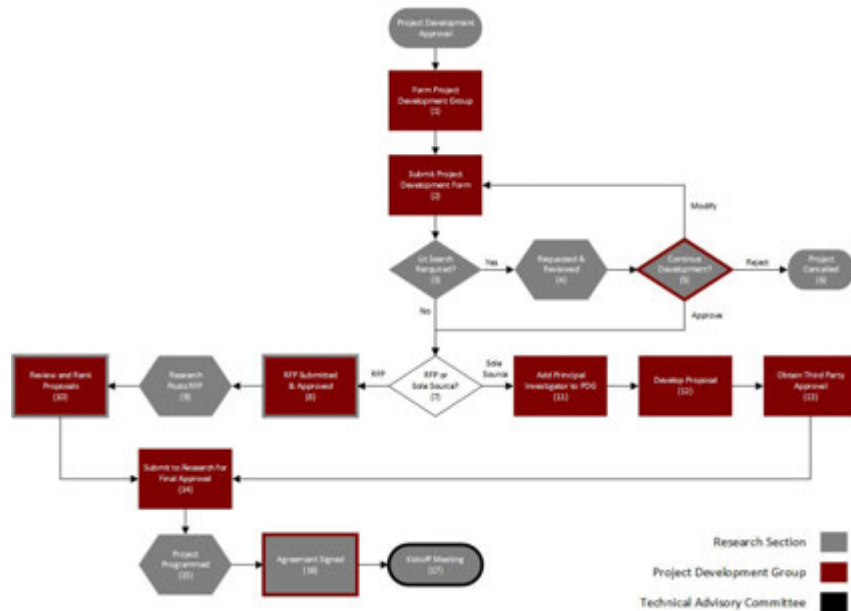
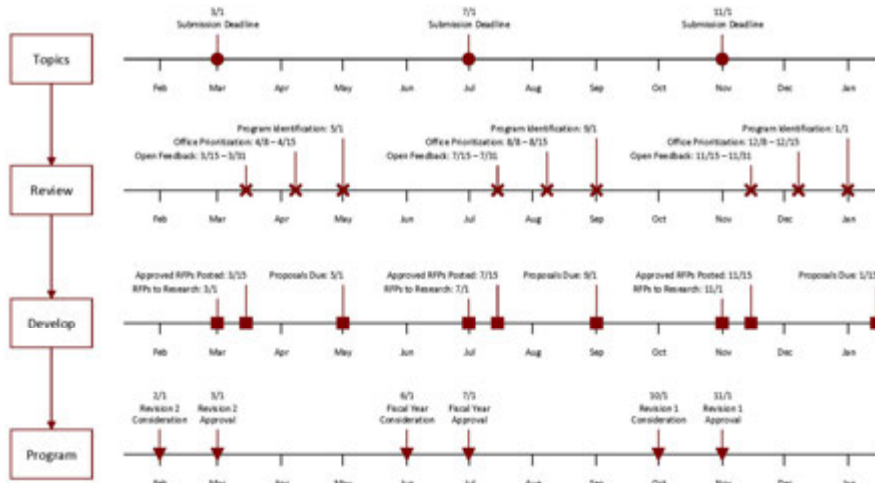
Idea



Close



### Research Cycle & Annual Calendar



## Success

### Making Research More Visible

- Active outreach
- Dedicated research liaisons
- Interactive processes
- Creation of program manager position

## Challenge

### Office-Level Relationships

- Importance/priority of research
- Introducing new SMEs to research
- Rating topics from other sources

## Learn

### Finding Balance in Correspondence

- Narrower target audience
  - Failure to distribute
- Wider target audience
  - Overwhelmed or ignored



THANK YOU FOR YOUR TIME AND ATTENTION



Brian Worrel, P.E.  
Research Program Manager  
Office of Research & Analytics  
800 Lincoln Way | Ames, IA | 50010  
brian.worrel@iowadot.us  
(515)-239-1471



# Peer Exchange 2019

## Research & Library Services (RLS) Brief

ANNE FREEMAN, RLS PROGRAM ADMINISTRATOR  
April 2019

### Freeman Facts

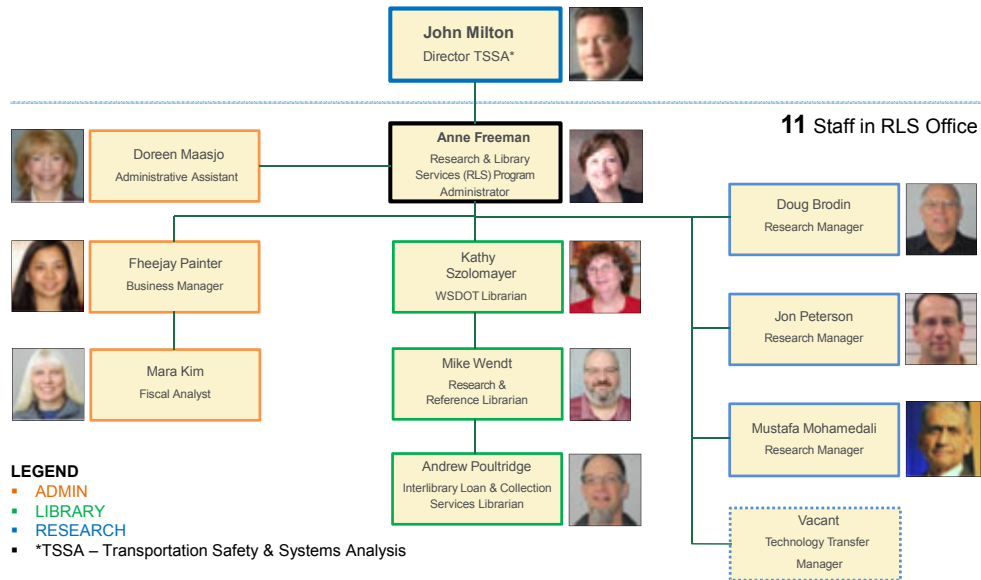
Olympia, WA !!  
(March 1, 2019)







# Research & Library Services Org Chart



## WSDOT Main Library

3 professional librarians responded to over **1100 requests in the last 12 months**, including literature searches required for research proposals

Launched in 2016, Digital Collections now contain **2500 documents** and over 75,000 scanned pages

Supports workforce development with a collection of over **500 books for PE exam preparation**

**WSDOT employees are the main clientele**; librarians also assist historians, academic researchers, genealogists and the general public



## Library: Engaging Stakeholders

### **Biggest success** engaging stakeholders:

The WSDOT Library delivers multiple current awareness news clipping services to keep decision makers informed

### **Biggest challenge** engaging stakeholders:

The Library is well-known and has an excellent reputation amongst headquarters staff, but is less well known in regional offices

**The library's Five Year Strategic Plan** was rolled out on July 1, 2018 based on an agency-wide survey of employees. Librarians are addressing challenges and opportunities to improve WSDOT's library services



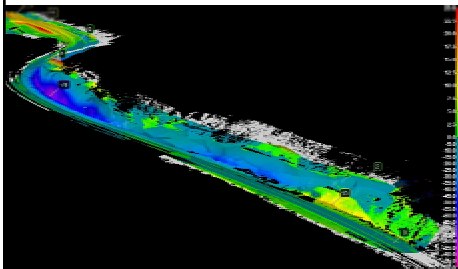
## WSDOT Research Office

3 research managers handle an average of about **100 projects every fiscal year.**

Areas of research covered include **planning, design, construction, operations, maintenance, environmental, multi-modal, ferries, etc.**

Undertaken under several research programs and funding sources: **SPR, FHWA/TPF, CSR, QR, CAI (AID, EDC, STIC)** etc.

Technology transfer activities included launch of the extremely successful bimonthly nationwide **Webinar Wednesdays** series and **TRAC e-News**



## Practical Solutions



I-5 Shoulder used as auxiliary lane



### Practical Solutions approach strategies include:

- Lowest lifecycle cost to preserve the system in a state of good repair
- Target Zero strategies for safety
- Transportation system management
- Engaging leadership
- Demand management; and
- Capital project investment

## A Sample of our Research Projects

### WSDOT's Flexible Bridge – The World's First

Innovative Materials for Bridge Design:

- Shape Memory Alloy and
- Engineered Cementitious Composite



### Cooperative Automated Transportation (CAT)

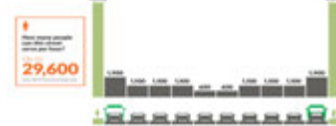
Automated technologies encourage all transportation modes to cooperate and communicate providing a **safe, sustainable, and integrated multimodal** transportation system



### Transportation Systems Management & Operations (TSMO)

- Smart Tech
- Managed Lanes
- Low-cost enhancements

The 20<sup>th</sup> century way



21st century needs

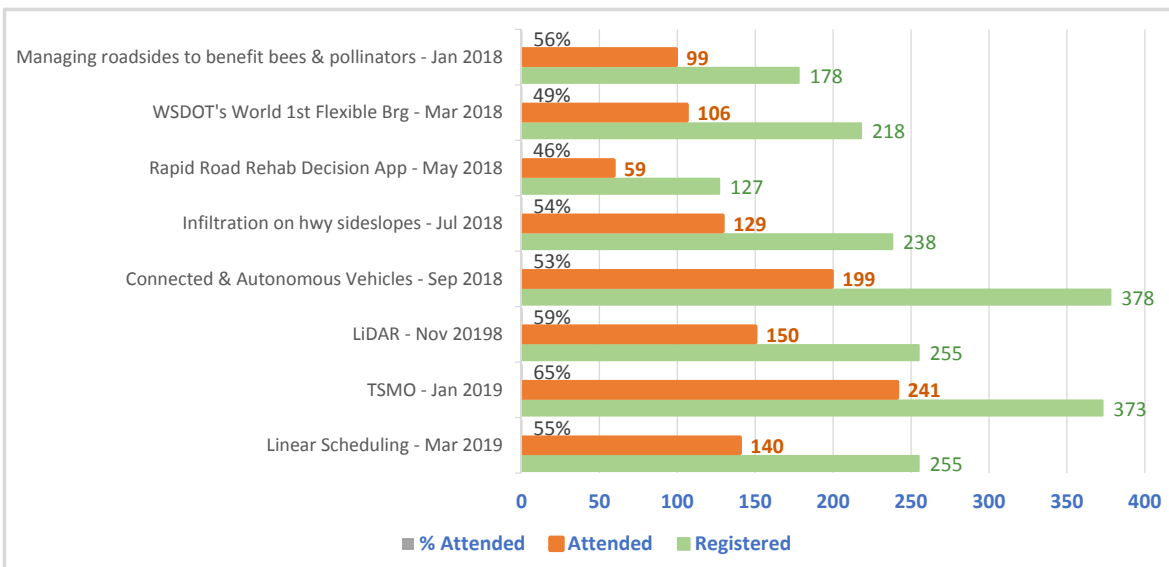


# SPR Program Project Development

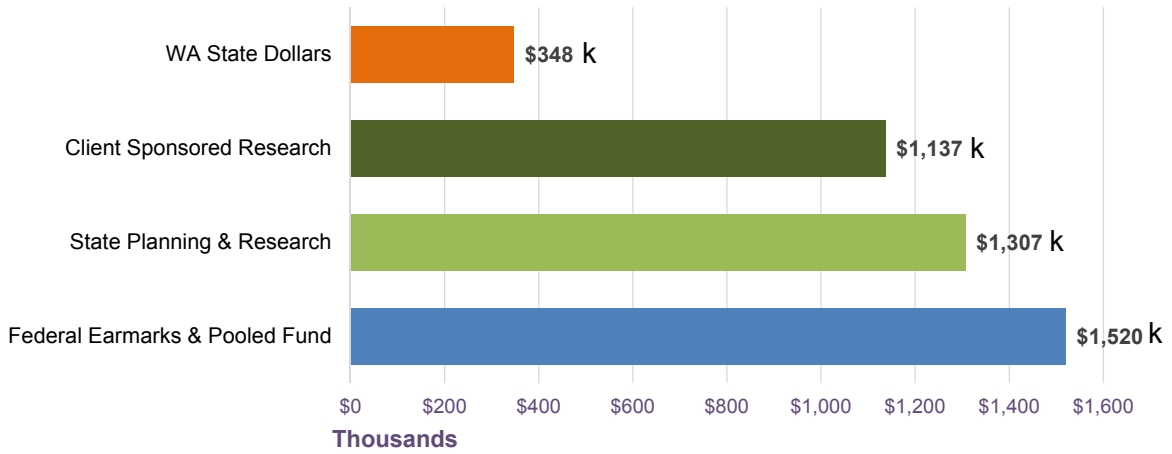
WHEN	PROCESS STEP
Spring 2018	RLS Initiates solicitation of research problem statements
Summer 2018	Needs assessment workshops with division staff & researchers
Oct 2018	Problem statement development & submission by WSDOT SME's
Oct – Nov 2018	Problem statements rating by RLS
Dec 2018	Problem statement selection and program approval by execs
Jan – Jun 2019	Project proposals and RFP solicitation from researchers
Jul '19 – Jun '20	Task order execution by RLS and project initiation



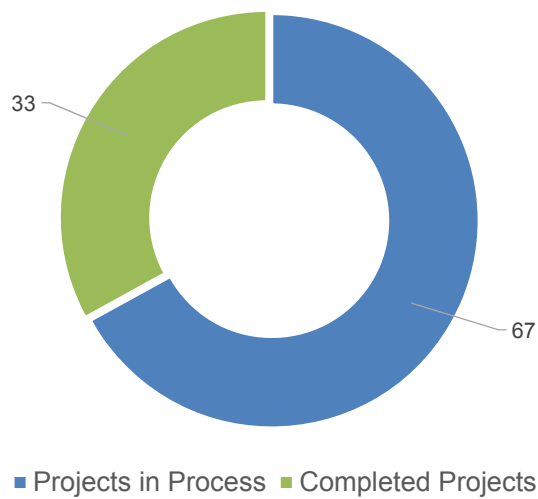
# Webinar Wednesdays Stats 2018-2019



## Average Annual Expenditures for Research Projects



## Average No. of Projects per Fiscal Year



## A glimpse of our successes

### Successes

#### Bimonthly **Webinar Wednesdays**

- Started internal at about 25 attendees in 2016
- Now a national success attracting well over **200 attendees**

#### Electronic research **newsletter**

- *TRAC eNews*
- **3-4 times per year**

**2 STIC** projects completed, **6 EDC-5** initiatives adopted, **2 AID** projects substantially complete

**11 projects adopted** for 2019-2021 SPR program

**7 High Value Research** (HVR Sweet Sixteen) projects submitted

**2019 NCHRP** ballot submitted

## Some of our challenges

### Challenges

- “No Cost” Time extensions
- Scope changes
- Implementation/Technology Transfer – documentation & tracking
- Engaging leadership and internal stakeholders
- TM’s/SME’s ability to find time for projects
- Managing pooled funds and juggling \$\$s between Master Agreement ceilings, Federal authority, local authority, pooled fund max, contracted amounts & end of fiscal biennia.

# THANK YOU!

**Anne Freeman** | RLS Program Administrator

WSDOT Research and Library Services  
310 Maple Park Ave SE, Room SLC-21  
PO Box 47372  
Olympia WA 98504-7372

360-705-7945  
[FreeAnn@wsdot.wa.gov](mailto:FreeAnn@wsdot.wa.gov)



**NORTH CAROLINA**  
Department of Transportation



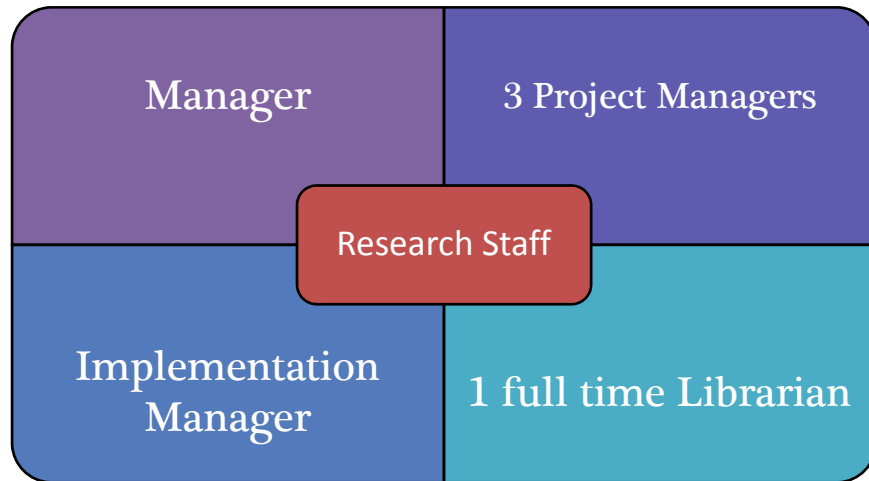
# NCDOT Research Program

John Kirby  
Project Manager  
Spring 2019

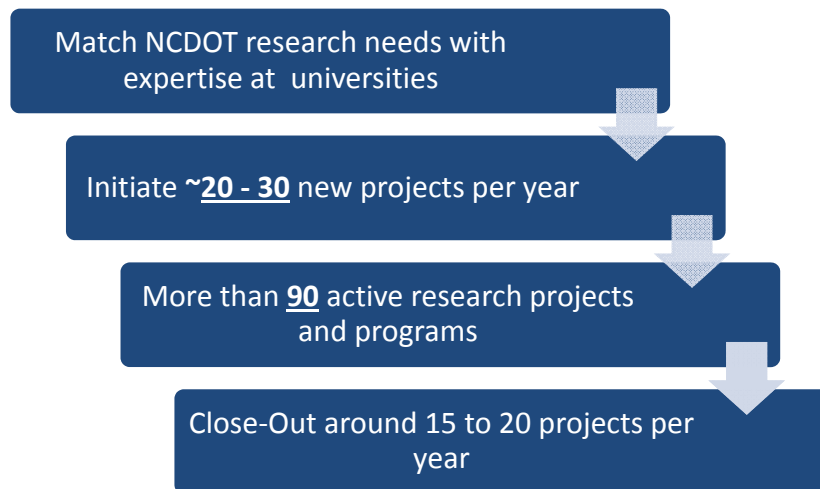




# NCDOT R&D



# Annual Research Program



## Annual Research Program Goals



Improve NCDOT Planning, Engineering and Business Practices



Support NCDOT Operations and Maintenance Activities

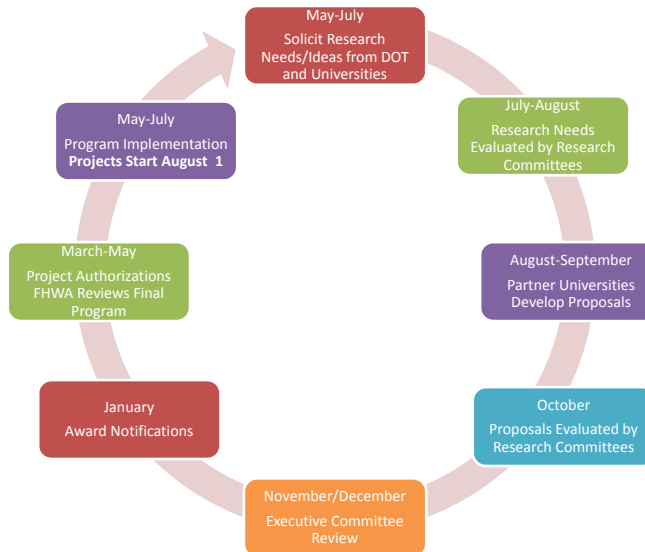


Conduct research that can be implemented



Develop relationships with researchers so they understand the needs and operations of NCDOT and our partners to maximize research benefits

## Research Program Annual Timeline



### Annual Program FAQ

Who typically submits Research Needs?

Anyone at NCDOT, with manager approval

University researchers in coordination with DOT business units

Outside groups in coordination with NCDOT Subject Matter Experts

How are projects selected?

Internal, multi-step committee process that includes review input by idea submitters

How long does it take for an Idea to become a project?

1 year from close of solicitation period

Contingency funds are available for off cycle needs.

When using alternative funds, can be less than 1 month

How long do Research Projects Last?

*Varies*

2 years is typical

Can be as short as 6 months or as long as 3 years

### Project Selection Oversight

Research and Development Unit Oversees Overall Program

Solicits Ideas

Research Engineers Manage Projects

Coordinates all Activities

Research Subcommittees Review and Recommend Proposals for Funding

Environmental

Structures and Geotech

Pavement, Materials, Maintenance

Planning, Policy and Transit

Traffic, Mobility and Safety

Research Executive Committee Approves Work Program

Senior Management

Executives

## Research Funding

- State Planning and Research (SPR) Part 2
  - 0.5% of total Federal Allocation ~ \$5.2M
  - Funds Annual Work Plan (80% Fed / 20% State Match)
  - Funds NCHRP\* and AASHTO TSP (100% Federal)
    - \*Split Planning/Research 75%/25%
  - Funds AASHTO Pooled Fund Program (100% Federal)
- Federal Discretionary Funds
  - Grants, AID, STIC, SHRP2, etc. (typically 100% Federal)
- State or Other Federal Funds (including TIP)
- Issue contracts each year for:
  - 20-25 projects
  - Total annual value between \$3 Million and \$4 Million
- 90+ Active Projects

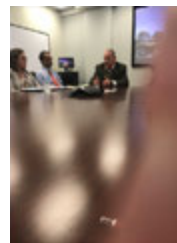
## NCDOT Research Committees

### Research Executive Committee

Chief Engineer, Deputy Secretaries, Director Field Support, State Traffic Engineer, FHWA, etc.

### Research Subcommittees

Planning, Programming, Policy & Transit  
 Environment & Hydraulics  
 Pavements, Maintenance & Materials  
 Structures, Construction & Geotechnical  
 Traffic, Safety & Roadway Design



## Internal Stakeholder Activities

### New Researcher(s) Introduction Presentation(s)

Consistent effort to reach out to new faculty  
Set up meetings with internal stakeholders  
Laboratory/Field Study Tours  
Faculty presentations  
Stormwater Researcher Enhancement



### Implementation Initiatives

Research & Innovation Summit  
Implementation Surveys  
Implementation Metrics  
Implementation Manual in progress  
Implementation KO, Progress and CO follow-ups



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### Research Steering & Implementation Committee (StIC) Make-up

- NCDOT
- DMV
- City/County
- FHWA
- US EPA, USFWS, USGS
- Other Federal/State Agencies
- Business Owners/Consultants
- Highway Patrol
- Railroad Companies
- National Park System
- Non-profit entities
- General Traveling Public

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# Online Research Form

US DOT  
Volpe Center:  
HBCU Capacity  
Assessment



The National Transportation Systems Center

Volpe Center is currently involved with NCDOT to assess and build research capacities at HBCUs and MSIs

## Research & Innovation Summit

**MARK YOUR CALENDAR**

**North Carolina Department of Transportation  
Research & Innovation Summit**

Tuesday, May 7, 2019 8:30 a.m. to 5:30 p.m.

Alumni-Foundation Event Center  
200 N. Benbow Road  
Greensboro, N.C. 27411

For additional information:  
<http://www.linvoel.com/NC-DOT2019RISummit>



RESEARCH & DEVELOPMENT



NORTH CAROLINA AGRICULTURAL  
AND TECHNICAL STATE UNIVERSITY  
Transportation Institute

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## Newsletter



**RESEARCH & DEVELOPMENT NEWS**

February 2019 Vol. 4, no. 1

### From the Manager

Welcome to the first issue of Research & Development News for 2019!

We want to let you know about updated Research and Development web content.

Research and Development is in the process of improving and modernizing our electronic presence. One of the first steps involved getting an updated content page layout. You can now find us right under the Projects tab on the public facing content site.

<https://connect.ncdot.gov/projects/research/Pages/default.aspx>

This has resulted in our Projects Page moving to a new address: <https://connect.ncdot.gov/projects/research/Pages/Default.aspx>

The website is chock full of useful research-related information.

- Interested in requesting funding for participation in a paid-for-road study? Info and forms is there.
- Have a short duration research or other need that can be handled as a single order? Check out the Turnkey Assessment Program.
- Want general information about the program? Check the Info and forms for submitting a research need for consideration during our next program cycle. Find it on the right side of the page.

Keep an eye out in the very near future as we begin working to enhance Research Needs Submittal, simplifying the process for everyone and keep reading to see highlights of recently completed projects and information from our Librarian.

Bud Monda  
Research & Development Unit Manager



**Photo Credits on IR** or

**Table of Contents**

From the Manager ... 1

Training and Integration of Assessment Vehicle System ... 4

Recently Completed Projects ... 4

Librarian's Corner ... 4

New TSD Publications ... 4

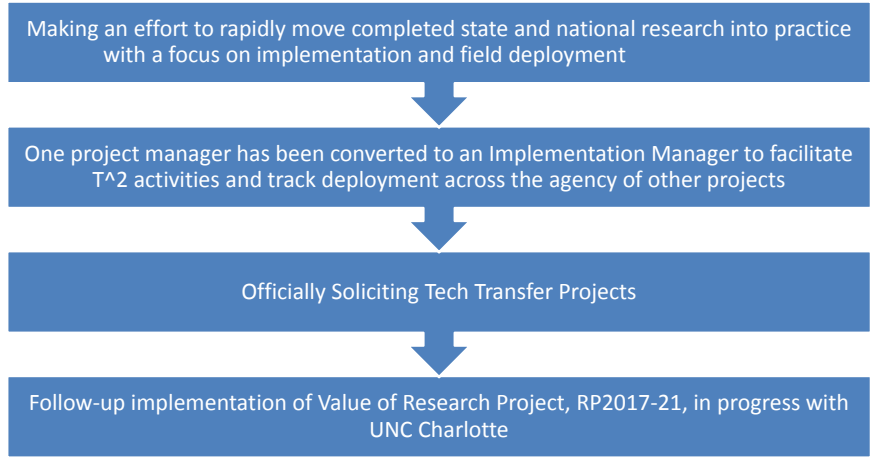
Events Calendar ... 4

Staff & Contact Information ... 4

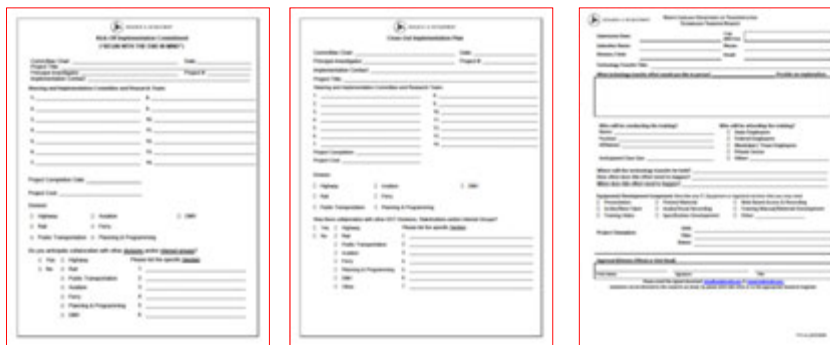
©2019 Research & Development NEWS February 2019 [Default](#)

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# Technology Transfer (T<sup>2</sup>)



# Implementation/T2 Efforts



Curtis Bradley, PhD – Implementation Manager



# Technical Assistance Requests

(~\$150k per year of state funds)

Need a quick hit project?

Lab testing?

White paper writing?

Survey conducted?



Try our technical assistance program

Managed by NCSU-ITRE

Easily contract with  
expertise across the state

Limited to 120 hours of  
investigator time

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# Research Library Services



Physically and Digitally Accessible Library

On-staff Librarian provides Research Services -  
Has access to national databases

Many engineering and transportation related  
books, journals, specs and other documents

Historical information to the 1920s

Board of Transportation Minutes

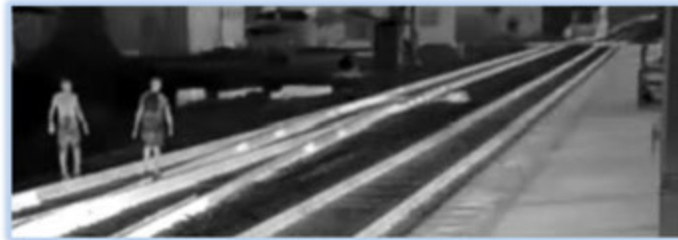
[Online Catalog: http://ncgov.nccardinal.org/eg/opac/home](http://ncgov.nccardinal.org/eg/opac/home)

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## Other Important Stuff:

- Implementation Manager Hire – 18 months
- FY2020 changes – cut PP, accepted RI externally
- Research & Innovation Summit
- Master Agreements revised
- Quarterly Newsletter – consistent for 4 years
- Now using Statewide Grants Management System
- Internal Database Upgrades
- Physical Office Move
- Updating Research Manual

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Thank You

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## Engaging Internal MDT Stakeholders throughout the Research Process and Beyond



Sue Sillick

Montana Department of Transportation

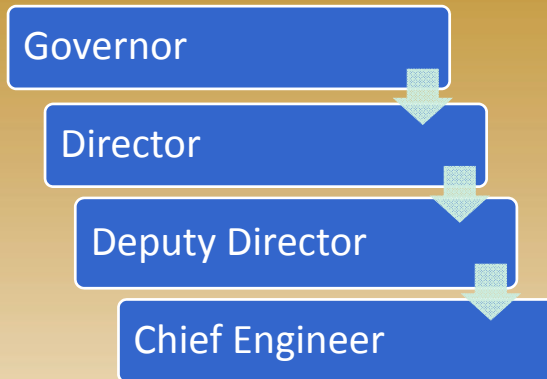
April 2019



RESEARCH PROGRAMS



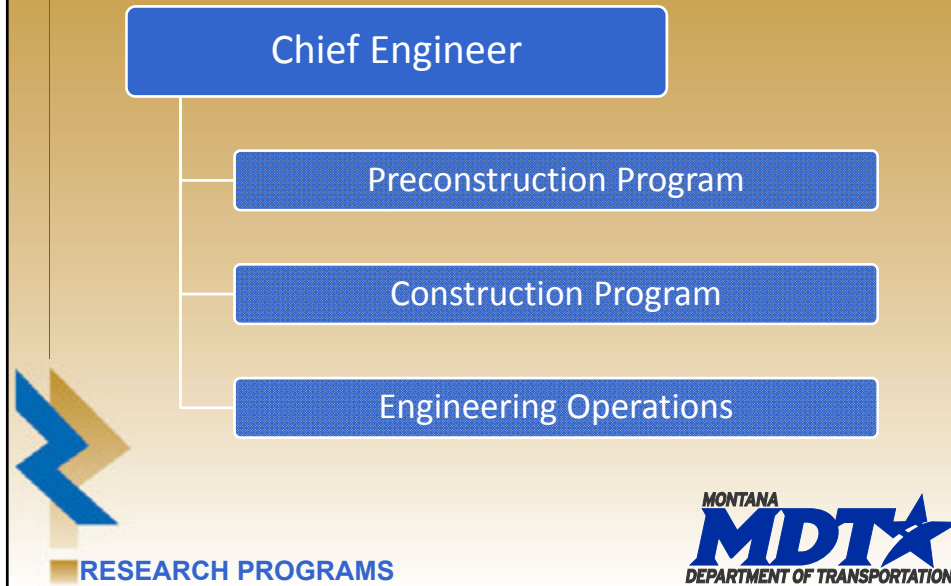
## Organizational Structure



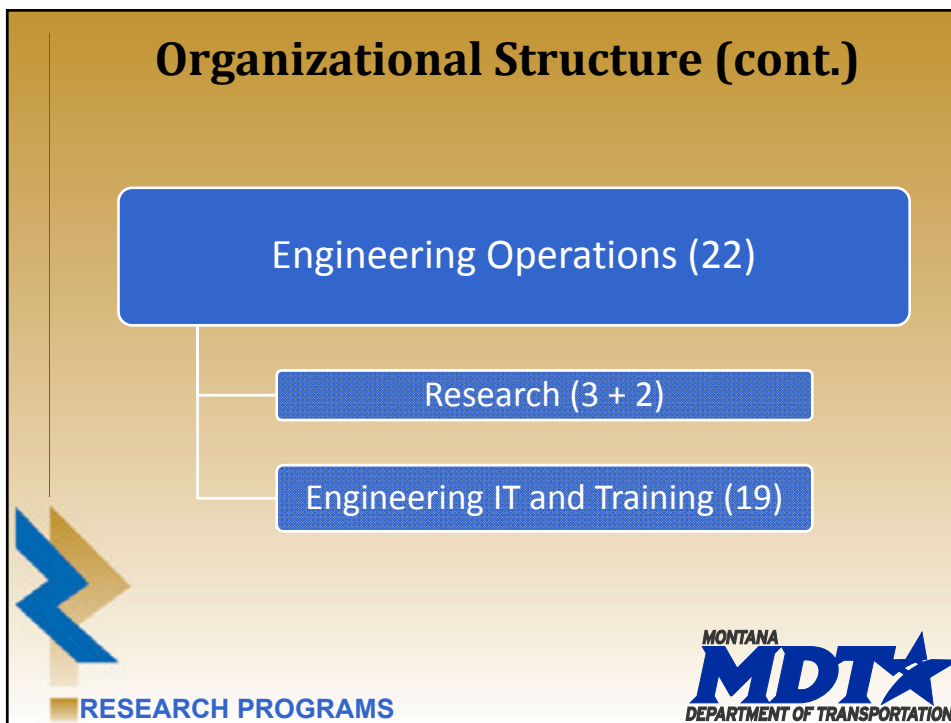
RESEARCH PROGRAMS



## Organizational Structure (cont.)



## Organizational Structure (cont.)



## Research Staff

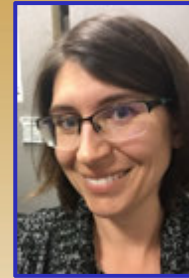
Research Programs Manager: Sue Sillick

MDT and CTC & Associates Research Project Managers



CTC Research Project  
Managers  
Will Kline & Kirsten Seeber

Experimental  
Project Manager  
Craig Abernathy



Technology  
Transfer/ Librarian  
Bobbi DeMontigny



RESEARCH PROGRAMS



## Funding & Expenditures

- ★ SPR
  - ★ 2019 Federal Funding \$2.2 M
  - ★ Planning – Project by Project
- ★ Pooled-Fund Studies
  - ★ Traffic Safety Culture - TPF-5(309): \$1.2 M, MDT \$80,000 – Initiated by MDT Director
- ★ State – As Needed, Equipment
- ★ Expenditures [not including TPF-5(309)]
  - ★ Expend ~ 1.8-2.8 M
  - ★ Contingency Hold ~ 15% (~\$400,000)



RESEARCH PROGRAMS



## Projects

- ★ Research (3 part-time staff)
  - ★ Active (contracted) – 17
  - ★ Pending Contracts – 6
  - ★ 2019 Solicitation ~ 7-8
  - ★ Completed Annually - 2015: 3, 2016 & 2017: 11, 2018: 2, 2019: 11
- ★ Experimental (1 full-time staff)
  - ★ Active – 19 (12 features)
  - ★ Pending – 9
  - ★ Proposed – 9
  - ★ Completed Annually ~ 3-9



RESEARCH PROGRAMS



## Guiding Principles

- ★ Target MDT Needs
  - ★ Department-Wide, incl., Inter-Modal
  - ★ Champions & Sponsors Required
- ★ Focus on Applied, Implementable Research, Deployment, Technology Transfer, and Facilitating Implementation
- ★ Direction Set by MDT's Executive Management
- ★ Strong Focus on Customer



RESEARCH PROGRAMS



## Guiding Principles (cont.)



- ★ Involve Stakeholders (Internal and External) to Buy-In and Facilitate Implementation
- ★ Provide Necessary Resources
- ★ Communication, Communication, Communication
- ★ Continuous Process and Program Improvement



RESEARCH PROGRAMS



## Engaging Stakeholders

- ★ Presentations
  - ★ New Employee Orientation
  - ★ Engineer Rotation
  - ★ New Managers
  - ★ Biannual Construction & Preconstruction Conferences
  - ★ As Requested
- ★ Project Posters – Research Deliverable Requirement
- ★ Large, Up-to-Date Online Presence



RESEARCH PROGRAMS





## Engaging Stakeholders (cont.)



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

www.mdt.mt.gov/research



RESEARCH PROGRAMS





## Engaging Stakeholders (cont.)

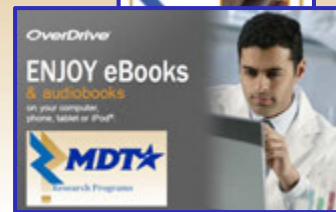
- ★ Brochures, Bookmarks, & Flyers...
- ★ MDT High Value Research Awards
- ★ Research E-Newsletter
- ★ Internal Biweekly MDT E-Newsletter
- ★ Staff Recognition
- ★ Collaborate w/ Trainers – Professional Development
- ★ Library Week Promotion (w/games & food)



RESEARCH PROGRAMS

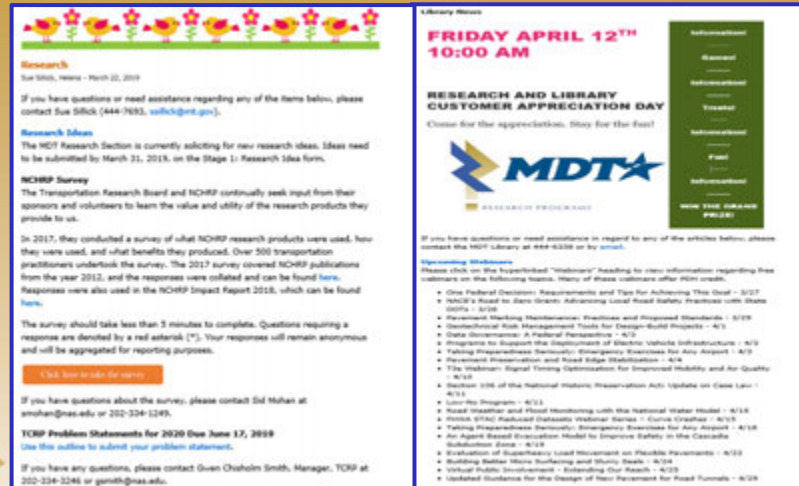


## Engaging Stakeholders (cont.)



RESEARCH PROGRAMS

## Engaging Stakeholders (cont.)



The screenshot displays two web pages from the Montana Department of Transportation (MDT). The left page is titled "Research" and contains information about research ideas, surveys, and problem statements. The right page is titled "Library News" and announces a "RESEARCH AND LIBRARY CUSTOMER APPRECIATION DAY" on Friday, April 12th at 10:00 AM. Below the announcement is a list of topics for a "Lunch and Learn" session, including Federal Decision Requirements, Road Design, and Risk Management.



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Training (in-person & Moodle on-demand)
- ★ Surveys (customer satisfaction, needs assessment...)
- ★ Annual Experimental Projects Meeting
  - ★ Design, Construction, Maintenance, & FHWA
- ★ Various Other Meetings



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

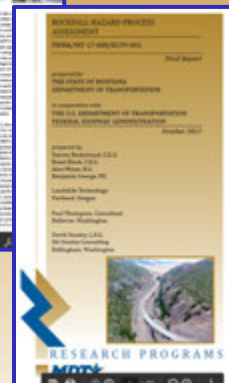
- ★ Technology Transfer Distributions
- ★ Branding
- ★ Bribery w/ Food
- ★ Tabling
- ★ Open-Door, Enthusiastic, Approachable Presence



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

**MDT**  
Home | About | Contact | News | Publications

### Evaluation of Wildlife Crossing Structures on US Highway 93 North

#### Phase 1 - Preconstruction

Final Report

#### Phase 2 - Post Construction

Final Report

#### Papers, Posters, and Presentations

Arlio, T. D., "Effectiveness of Wildlife Crossing Structures at Access Points," *Wildlife Society Bulletin*, Vol. 37, No. 1, p. 105.

Arlio, T. D., "Performance Measures of Road Crossing Structures From Relative Movement Rates of Large Mammals," *Environmental Science, University of Montana, Missoula, Montana, USA*.

Arlio, T. D., "Performance of Large Mammal Road Crossing Structures From Relative Movement Rates of Large Mammals," *Frontiers in Ecology and Evolution*, Vol. 10, doi: 10.3389/fecol.2019.00107.

Holzer, M. et al. 2018. "Effectiveness of Short Sections of Wildlife Crossing and Channel Structures Along Highways in Reducing Wildlife Vehicle Collisions and Providing Safe Crossing Opportunities for Large Mammals." *Biological Conservation* (in press), doi: 10.1016/j.biocon.2018.10.010.

#### Photos

Arlio, T. D., "Effectiveness of Wildlife Crossing Structures at Access Points," *Wildlife Society Bulletin*, Vol. 37, No. 1, p. 105.

Arlio, T. D., "Performance Measures of Road Crossing Structures From Relative Movement Rates of Large Mammals," *Environmental Science, University of Montana, Missoula, Montana, USA*.

Arlio, T. D., "Performance of Large Mammal Road Crossing Structures From Relative Movement Rates of Large Mammals," *Frontiers in Ecology and Evolution*, Vol. 10, doi: 10.3389/fecol.2019.00107.

#### Webinars

US State 2017 Wildlife Crossing Structures



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Research Review Committee
- ★ Project Champions & Technical Panels (TP)



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Engaging Champions & Technical Panels (TP)
  - ★ Participation is good, but can always improve.
  - ★ Connect Champions and Researchers – Internal Focus
    - ★ ID MDT Problems
    - ★ Determine Which May Have a Research Solution
    - ★ Researcher Develops Both Stage 1 and Stage 2 Research Topics
  - ★ Training for Champions/TP Chairs
  - ★ TP Orientation



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Engaging Champions & Technical Panels (TP) (cont.)
  - ★ TP Roles & Responsibilities Doc
    - ★ This is your project, not Research's.
    - ★ You will get out of it what you put into it.
    - ★ You must be active to ensure you get what you need.
    - ★ If it is important enough to fund, it's important enough to participate fully



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Engaging Champions & Technical Panels (TP) (cont.)
  - ★ Research Project Manager (RPM) Does Most of the Work for TP Review – Encourages Participation
    - ★ Schedules Meetings
    - ★ Prepares Meeting Notes Prior to Contracting
    - ★ Writes Scope of Work (SOW development form)
    - ★ Writes RFP
    - ★ Writes Implementation Planning and Documentation (form)



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Engaging Champions & Technical Panels (TP) (cont.)
  - ★ Proposal & Product Review – Importance Reminder
  - ★ Project Kick-Off Meeting
  - ★ Periodic Project Progress/Issues Meetings
  - ★ Project Close-Out Meeting
  - ★ Implementation Meeting
  - ★ Implement Results



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ Engaging Champions & Technical Panels (TP) (cont.)
  - ★ Project Exit Surveys – Research & Researcher and Implementation Evaluation
  - ★ RPM Performance Survey
  - ★ Give Presentations
  - ★ Kudos for Participation, Awards...



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ For Experimental Projects – Experimental Project Manager Does All (mostly) the Work
  - ★ Involved in Design
  - ★ Writes Work Plan
  - ★ Attends Project Meetings
  - ★ Observes Construction
  - ★ Writes Construction Report
  - ★ Performs Evaluations



RESEARCH PROGRAMS



## Engaging Stakeholders (cont.)

- ★ For Experimental Projects – Experimental Project Manager Does All (mostly) the Work
  - ★ Writes Evaluation Reports
  - ★ Shares Reports Widely
  - ★ Schedules and Runs Annual Feedback Meeting
    - ★ Involves Design, Construction, Maintenance, & FHWA
    - ★ Shares New Project Information
    - ★ ID New Projects
    - ★ Shares Results of Active Projects
    - ★ Discusses Ramifications and Implementation



RESEARCH PROGRAMS



### Biggest Success?

Difficult to say, it's cumulative

### Biggest Challenge?

Resources, esp. time

### Hope to Learn?

What else we can do to improve.



RESEARCH PROGRAMS







thank you!



RESEARCH PROGRAMS

MONTANA  
**MDT**★  
DEPARTMENT OF TRANSPORTATION



## FHWA Research and Technology

- **Staff**
  - 95 Federal
  - National Research Fellows, visiting researchers
- **Research Areas at TFHRC**
  - Safety, Operations, Infrastructure and Human Factors
  - Exploratory Research Coordination
- **Facility**
  - 20+ Labs
  - \$70M per year
  - Off-site collaboration

**Turner-Fairbank Highway Research Center, McLean, VA**




 US Department of Transportation  
 Federal Highway Administration



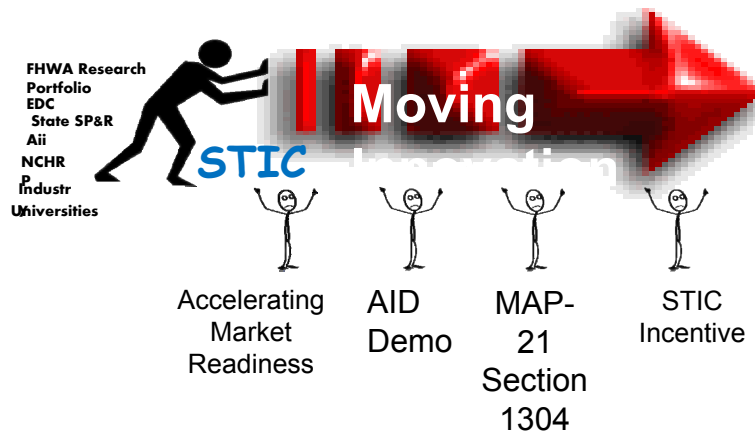


## Outreach Programs

- EDC
- STICs
- Top 3
- Pooled Fund
- NCHRP
- Other R&T collaboration – Visiting Professors, onsite post-docs, state & university R&T joint research



## Every Day Counts



Federal Highway Administration Research and Technology



**every day counts**   
An Innovation Partnership with States



U.S. Department of Transportation  
Federal Highway Administration

Federal Highway Administration Research and Technology



- Engage States & Local Governments
- Engage Industry
- Engage Academia

[https://www.youtube.com/watch?v=gVCK4E\\_YASE&list=PL5B4D3A38490692](https://www.youtube.com/watch?v=gVCK4E_YASE&list=PL5B4D3A38490692)

<https://www.youtube.com/watch?v=1HvHN5jq9I0&amp;=t=1s>

• <https://www.youtube.com/watch?v=roN1jUPpxyk&amp;t=25s&list=PL5B4&amp;index=23>



U.S. Department of Transportation  
Federal Highway Administration



## Accelerating Market Readiness

- Broad Agency Announcement out now
- <https://www.fhwa.dot.gov/innovation/amr/about.cfm>
- Accelerating Market Readiness Program Overview Webinar -- April 8<sup>th</sup>, 2-3pm EST
- \$200-500K awards



## FHWA R&T Top Three Initiative Process

- Divisions meet with State DOTs
- Determine Top Three Challenges for the State
- 154 submissions (all States and DC)
- Organize by theme
- Review by Research Oversight Committee
- Assess “Researchable” Challenges not yet underway
- Add to Roadmaps
- Feedback to Division Offices and State DOTs





## Items added to Roadmaps

- Infrastructure
  - Extend Lifecycle of Materials
  - Systematic Approach for Asset preservation
  - Real Cost of Accepting Deficient Materials
  - Use of Low Quality Aggregates for Paving
  - Test Method for Durability of Hot Mix Asphalt (2)
  - Lower Cost High Friction Surface Treatment
  - Preservation Techniques for Assets
  - Bridge Load Posting
  - Dust Control



## Items added to Roadmaps

- Safety
  - Safely Accommodate Bicyclists and Pedestrians
  - Improve Bike/Ped Facility Connectivity
  - Strategic Highway Safety Plan Impact
- Alternative Finance
  - Alternatives to Fuel Tax





## Added to R&T Plans

- Early Detection of Bridge Deck Deterioration
- Drones for Traffic and Incident Management
- Tech. Transfer and Outreach on Connected Vehicle Research (V2V, V2I, etc.)
- Remote Inspection and Monitoring of Assets
- Conduct Strategic/Visionary Research (not reactionary)
- Systems Approach, Performance-Based View for Investing in Transportation



## Ohio ORIL Program

- Oril is a collaborative program focused on counties, townships, cities, villages
- Research Advisory Board - receives & reviews ODOT district/offices recommendations



RAB Roster (as of September 2018)  
 Chris Hankins, Geotechnical Engineering  
 Craig Lancaster, Pavement Engineering  
 Dan Wise, District 6  
 Dave Gardner, Technical Services  
 Doree Halstern, Roadway Engineering  
 Dennis O'Neil, District 12  
 Derek Troyer, Program Management  
 Fred Judson, IAS Center  
 Jamie Hendershot, District 10  
 Jason Yeray, Traffic Operations

Jonathan Prier, Hydraulic Engineering  
 Jan Weller, Materials Management  
 John McKnabb, Traffic Management  
 Josh Powers, District 7  
 Layth Izzafan, District 2  
 Matt Perle, Environmental Services  
 Miky Avnerie, Information Technology  
 Nick Hegomier, Drive Ohio  
 Scott Lucas, Maintenance Administration  
 Tim Keller, Structural Engineering



## Ohio Stakeholder Partnering

- <https://www.youtube.com/watch?v=AnvZIKK9ncA&index=8&list=PL5B4D3A3849069225>







**Arizona DOT Research Peer Exchange**

Engaging Internal DOT Stakeholders throughout the Research Process

**Identify Research Needs – Questions for Visitors**

- What are some of your successful strategies to encourage submission of research ideas from all the divisions of the department (planning, design, construction, operations, maintenance, safety, environment, etc.)?
- In what ways does your Research Program market itself to internal stakeholders, such as stakeholder workshops or outreach events?
- How aware do you think internal staff are of your Research Program, its services and products? Is this based on survey data, individual feedback, other?



**Arizona DOT Research Peer Exchange**

Engaging Internal DOT Stakeholders throughout the Research Process

**Identify Research Needs – Questions for ADOT Staff**

- What do you think are effective avenues currently in place for ADOT staff to propose topics for research?
- What approaches did you hear from other states that you think could be applied at ADOT?
- What ADOT research solicitation processes would you like to learn more about?



## Arizona DOT Research Peer Exchange

Engaging Internal DOT Stakeholders throughout the Research Process

### Collaborate in the Research Process – Questions for Visitors

- What are some of your successful strategies to engage technical experts to critically review research deliverables? How do you keep internal stakeholders engaged in the research process?
- To what extent are department technical experts empowered and encouraged by management to serve on research panels?
- How are DOT staff members of technical committees encouraged to feel an ownership of the research study?
- How do you blend the complementary roles of Research Program staff and technical staff from within the department?
- In what ways is your research process (at both program and project level) documented and communicated to internal stakeholders?



## Arizona DOT Research Peer Exchange

Engaging Internal DOT Stakeholders throughout the Research Process

### Collaborate in the Research Process – Questions for ADOT Staff

- What do you think are effective ways ADOT staff are currently engaged in technical review of research deliverables?
- What approaches did you hear from other states that you think could be applied at ADOT?
- What ADOT technical review processes would you like to learn more about?



## Arizona DOT Research Peer Exchange

Engaging Internal DOT Stakeholders throughout the Research Process

### Make Use of Research Findings – Questions for Visitors

- How is implementation made a priority for internal stakeholders as they participate in the research process?
- In what ways are internal stakeholders responsible for implementing research?
- How do you help internal stakeholders succeed in implementation of research?
- What successes and challenges have you experienced in trying to implement research results?



## Arizona DOT Research Peer Exchange

Engaging Internal DOT Stakeholders throughout the Research Process

### Make Use of Research Findings – Questions for ADOT Staff

- What do you think are effective ways ADOT staff are currently involved in implementing research findings?
- What approaches did you hear from other states that you think could be applied at ADOT?
- What aspects of ADOT's implementation of research findings would you like to learn more about?