OKLAHOMA DEPARTMENT OF TRANSPORTATION
2023 RESEARCH PEER EXCHANGE

FINAL REPORT
ODOT TASK ORDER NUMBER 2160-23-02

Submitted to:
Office of Research and Implementation
Oklahoma Department of Transportation

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September 2023

DISCLAIMER

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ABSTRACT

The Oklahoma Department of Transportation (ODOT), in collaboration with the Southern Plains Transportation Center at the University of Oklahoma, hosted a virtual peer exchange on May 23, 24 and 25, 2023, to discuss topics related to transportation research with other state departments of transportation (DOTs). The meeting and the subsequent publication of this report fulfill the agency's obligation to conduct a periodic peer exchange as part of the federal State Planning & Research (SPR) program. The event focused on two primary topics: engagement and participation in research by agency stakeholders, and Impacts and Effect of the federal Infrastructure Investment and Jobs Act/"Bipartisan Infrastructure Law" (IIJA/BIL) on SPR Programs. Participants of the three-day event included staff from ODOT, four other state transportation agencies (Idaho, Kansas, Montana, Vermont), three universities (Oklahoma State University, the University of Oklahoma and the University of Washington), the Transportation Research Board, and the Federal Highway Administration. Based on presentations and group discussions, participants shared what they saw as ODOT's strengths and challenges, opportunities for ODOT in the areas discussed, and takeaways for their home agencies.

PEER EXCHANGE AT-A-GLANCE

Host Agency: Oklahoma Department of Transportation

Participating Agencies: Idaho Transportation Department, Kansas Department of Transportation, Montana Department of Transportation, Vermont Agency of Transportation, the University of Oklahoma, Oklahoma State University, the Pacific Northwest Transportation Consortium, the Transportation Research Board, and the Federal Highway Administration.

PEER EXCHANGE TOPICS

Engagement and Participation in Research by Agency Stakeholders: In this first session, attendees shared where ideas for potential research projects come from, and how their research staff engages stakeholders and subject-matter experts to identify problems that might be solved through research.

Impacts and Effect of the IIJA/BIL on SPR Programs: Attendees discussed the new federal legislation and how it has already or may affect their research programs in the future.

TOP FINDINGS AND TAKEAWAYS

Engagement and Participation in Research by Agency Stakeholders

- A hosted event, like ODOT's Transportation Research Day, can **increase awareness** of the research program and highlight ways that research can solve problems that others in the agency are experiencing.

- **Developing an "elevator speech"** that is targeted to different types of agency colleagues can help research program staff maximize opportunities when interactions are brief.

- Promoting research results through webinars, videos and summary briefs can disseminate research while **showcasing potential and encouraging participation** from others in the agency.

- **Investing in easy-to-use tools,** such as online submission forms, style guides and 508-compliant report templates, provides efficiencies that improve stakeholder experiences and ultimately reduce the burden on research staff.

- **Evaluating the performance** of a project's team members, including investigators and project managers, can provide metrics that support and reward this important work.

Impacts and Effect of the IIJA/BIL on SPR Programs

- The effects of these laws are developing, and everyone at the state, local and federal levels are continuing to learn together.

- Though needs are still evolving, **there may be opportunities** for research staff to support new agency initiatives.

MEETING INTRODUCTION AND OVERVIEW

In this Task Order, the Oklahoma Department of Transportation (ODOT), in collaboration with the Southern Plains Transportation Center at the University of Oklahoma, hosted a virtual peer exchange meeting on May 23, 24, and 25, 2023, to discuss topics related to transportation research engagement strategies, processes and challenges with other state DOTs, university researchers, a transportation consortium, the Transportation Research Board (TRB) and the Federal Highway Administration (FHWA). The meeting and the subsequent publication of this report fulfill the agency's obligation to conduct a periodic peer exchange as part of the federal State Planning & Research (SP&R) program (per Title 23, Part 420 of the Code of Federal Regulations).

The peer exchange focused two broad topics:

- Engagement and Participation in Research by Agency Stakeholders
- Impacts and Effect of the IIJA/BIL on SPR Programs

During course of the event, several other important topics were raised and discussed by participants. These are addressed in a separate chapter of this report.

PEER EXCHANGE PARTICIPANTS

The peer exchange included representatives from the state and federal government as well as academia in order to represent a variety of interests and perspectives. Participants included ODOT, four state DOTs, three universities, a transportation research consortium, TRB and FHWA. Unique to this peer exchange was the fact that invitations were also extended to each guest state's FHWA Division Office.

The following individuals participated in one or more of the sessions.

Oklahoma Department of Transportation

> Sheree Black, Administrative Assistant
> Tara Brown, Deputy Chief Innovation Officer
> Bryan Cooper, Transportation Manager
> Ron Curb, Engineering Services Branch Manager
> Gary Hook, Engineering Manager
> Bryan Hurst, Administrative Programs Officer
> Beckie Lyons, SPR Manager
> Jerry Rice, Transportation Manager
> Joni Seymour, Chief Innovation Officer
> Teresa Stephens, Engineering Manager
> Andreas Weber, Advanced Mobility Coordinator

Guest State DOT Research Programs

> Idaho Transportation Department
> > Ned Parrish, Research Program Manager

Kansas Department of Transportation
    Audrey Atkinson, NHI and Research Coordinator
    Marie Manthe, Librarian
    Sally Mayer, Assistant Bureau Chief of Research
    Brenna Saville, Administrative Specialist in Research
    Dan Wadley, Bureau Chief of Research
    Randee Wisdom, Publications Writer

Montana Department of Transportation
    Rebecca Ridenour, Research Supervisor

Vermont Agency of Transportation
    Ashlie Mercado, Research Engineer
    Emily Parkany, Research Manager

Guest Universities

Oklahoma State University
    Joshua Li, Associate Professor, Transportation Engineering
    Kelvin Wang, Professor, Transportation Engineering

The University of Oklahoma
    Michael Molina, Librarian, Oklahoma Transportation Library
    Musharraf Zaman, Professor, Director of Southern Plains Transportation Center

University of Washington
    Yinhai Wang, Professor, Director of the Pacific Northwest Transportation Consortium (PacTrans)

Transportation Research Board
    Waseem Dekelbab, NCHRP Program Manager

Federal Highway Administration
    Souzan Bahavar, Oklahoma Division Office
    Jacqueline DeMent, Vermont Division Office
    Waseem Fazal, Oklahoma Division Office
    Maureen Gresham, Idaho Division Office
    Chris Jolly, Vermont Division Office
    Gus Loeffelholz, Idaho Division Office
    Patricia Sergeson, Transportation Pooled Fund Manager
    Jill Stark, National Partnership Program Manager
    Matthew Strizich, Montana Division Office

FORMAT

To accommodate participation from agencies across the country, ODOT conducted the peer exchange virtually. Participants shared their cameras when possible (Figure 1) to support face-to-face discussion in the virtual setting.
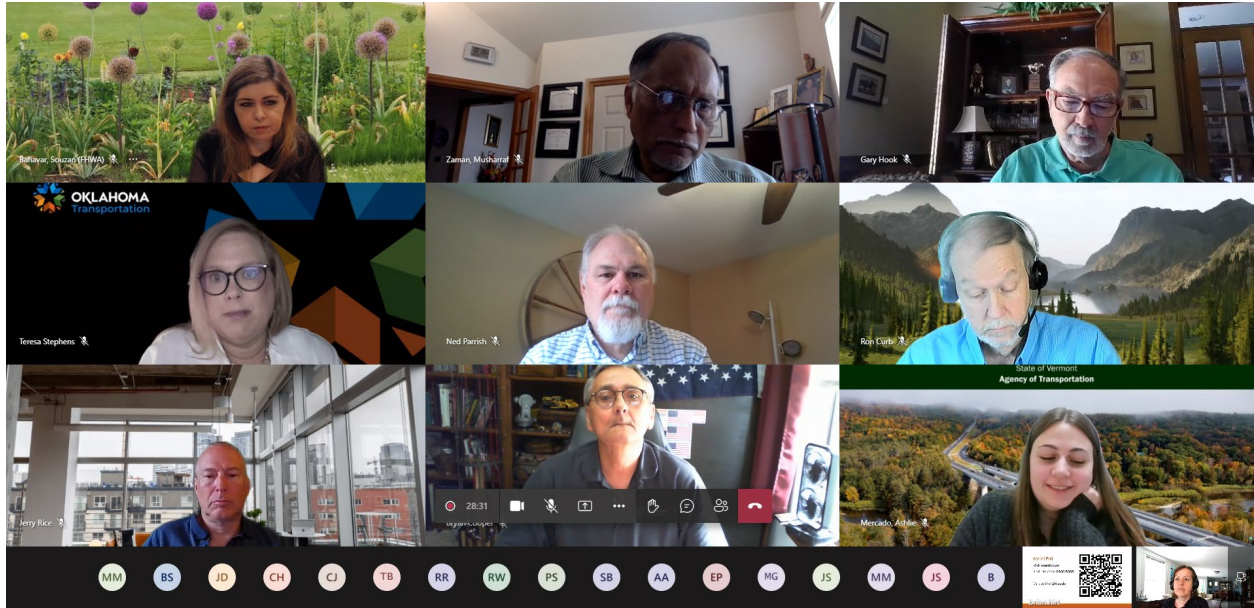
Figure 1. Some of the Meeting Participants

During each session, participants discussed research-related topics of specific interest to ODOT. Each session included prepared presentations from ODOT, as well as additional presentations from participating states and invited guests.

The meeting agenda for the three-day event is included as Appendix A to this report. Each of the main topics was further divided into two parts or subtopics. Prior to the meeting, participants provided questions of top concern to help drive discussions. These questions appear in the agenda.

Topic 1. Engagement and Participation in Research by Agency Stakeholders

Subtopic 1: Research Development

Subtopic 2: Research Execution, Completion and Implementation

Topic 2. Impacts and Effect of the IIJA/BIL on SPR Programs

Subtopic 3: Support of Agency's BIL Priorities

Subtopic 4: Impact on Research Program

PRESENTATIONS

To establish mutual understanding among participants and prepare for topic discussions, the four guest state DOTs and ODOT gave prepared presentations to share details of the size and structure of their research programs and their successes and challenges in generating research ideas and developing projects that produce meaningful results. Materials for the five presentations are reproduced in the appendices to this report.

PEER EXCHANGE TOPIC 1—ENGAGEMENT AND PARTICIPATION IN RESEARCH BY AGENCY STAKEHOLDERS

SUBTOPIC 1. RESEARCH DEVELOPMENT

Oklahoma DOT framed the issue and discussion for this subtopic as follows:

> *A research program can be a valuable resource to help solve transportation-related problems – but only if agency staff and other stakeholders are aware of the program and its potential. In this session, DOT research program staff and invited guests discussed the various challenges involved with soliciting and responding to research ideas and providing results that are useful and representative of the functions and interests of the agency.*

DISCUSSIONS AND FINDINGS

Attendees discussed the differences and similarities of their own programs, as well as the ideas and strategies that have worked well within their own agency. These comments were collected during discussions and in report-out forms that participants completed and submitted after the session.

Comments are grouped by topics discussed. Opportunities for ODOT are described below, as well as additional best practices and ideas that attendees noted for potential use within their home agencies.

TOP IDEAS are those that were highlighted by several participants.

Engagement and Participation in Research by Agency Stakeholders

From whom does your program receive ideas for potential research projects? What level of detail do you get in defining the research question and support contracting of the research?

- Vermont AOT accepts ideas that come from anyone, but these must be matched with a project manager before development can begin.

- Idaho sends out a broad solicitation for project ideas and includes links to related research projects that were conducted previously.

- Several states use online forms to collect and track research idea submissions.

- ODOT intentionally keeps its forms short to deter respondents from providing too much information.

TOP IDEAS:

- A 15-minute webinar can **show the value and benefits of research** with relatively minimal effort. The recording can then be used in a variety of ways to provide long-term value.

- Consider developing an **"elevator speech" that targets different agency colleagues** and describes what a research program can offer.

- Even long-term partners can enhance their engagement and collaboration through **informal meetings and increased communications.**

Potential Barriers to Engagement and Participation

What are the challenges associated with soliciting research ideas, recruiting and maintaining engaged project stakeholders, and the research process in general?

- **Over-extension.** Project managers serve an important role, but staff may be hesitant to take on additional work or may face burnout if they accept too much responsibility.

- **Lack of awareness.** If others in the agency don't know what the research office does, they won't know to ask for help or submit ideas.

TOP IDEAS:

- Look for ways to **recognize and reward** highly engaged project managers.

- **A special event dedicated to showcasing research projects and results** can serve to demonstrate a research program's value to the agency, recognize stakeholder participation and identify new research needs and partnerships.

Additional Opportunities for Increasing Engagement

What are states doing to encourage engagement and participation in research?

TOP IDEAS:

- ODOT may **consider past performance** when awarding contracts and choosing members of a research team.

- Idaho collects and tracks project-related information so that project managers **receive credit during performance reviews.**

- Vermont AOT **held a peer exchange on this topic last year.** The [final report](#) highlights states' responses and the executive report-out portion provides leadership perspectives on this issue.

FEEDBACK

Before the conversation continued with the second part of this topic, ODOT posed three questions to attendees through the Mentimeter online polling tool. The questions were designed to capture attendees' thoughts regarding the peer exchange so far, and attendees' responses revealed their

interests and highlights for further discussion. (Note that open-ended responses are lightly edited for clarity.)

Question 1. Based on what you heard on Day 1, which best describes your DOT with respect to Engagement and Participation in Research by Agency Stakeholders? (multiple choice)

> We are generally behind our peer DOTs – 0 responses
> We are generally ahead of our peer DOTs – 1 response
> We are behind in some areas and ahead in others – 14 responses

Question 2: Please name one tool, process or idea from another agency you plan to take home and explore further. (open-ended)

- Short list of approved researchers.
- The 15 minute webinar.
- Really liked the idea of an innovation symposium (Vermont presented on that).
- 15 minute webinar of external research process!
- Research Benefits and Implementation survey/discussion.
- Start soliciting ideas earlier.
- Collaboration among and between state DOTs.
- Look into using simple online form for collecting research needs throughout the year.
- Look at accepting problem statements throughout the year.
- Agree with "short list of approved researchers."
- Idaho report template with accessibility guidelines.
- Start solicitations earlier.
- Working on research program mission with staff.

SUBTOPIC 2. RESEARCH DEVELOPMENT

Oklahoma DOT framed the issue and discussion for this subtopic as follows:

> *Once a research project has started, it can require substantial time and significant effort from everyone involved. Attendees discussed the strategies they use to keep a project's technical experts and committee members actively engaged throughout the process.*

UNIVERSITY PRESENTATIONS

Three university representatives shared details of their partnerships with agency research programs. The University of Washington is also home to the Pacific Northwest Transportation Consortium, while the University of Oklahoma houses the state's transportation library and the Southern Plains Transportation Center. Complete presentation materials are reproduced in the appendices to this report.

DISCUSSION AND FINDINGS

Following the presentations, attendees were invited to discuss how they interact and partner with researchers and other external stakeholders.

Report-out forms, which participants completed and submitted at the end of the day, also contributed to the summaries below.

TOP IDEAS are those that were highlighted by several participants.

Research Execution, Completion and Implementation

How does your program engage project stakeholders?

- Kansas DOT engages upper management by being visible – attending meetings helps keep communications open and ensures research staff are aware of potential research opportunities.

- Idaho holds regular technical advisory meetings that include the project manager, project requester, subject-matter experts, end-users and external parties.

- ODOT communicates monthly with project investigators to preempt issues and keep deliverables on track.

- Idaho pays for an expert to peer review the research and findings of a project's investigator.

Potential Barriers to Research Implementation

What can make it difficult to implement or even complete a research project?

- **Missed deadlines.** Reports and other deliverables that are late can delay a project and increase frustration among stakeholders.

- **Undefined project goals and plans.** Committee members who aren't actively engaged may not appreciate the research's value or put the results to use.

TOP IDEAS:

- Maintain an activities timeline and share it with others on the project so that everyone is aware of **upcoming events and deadlines.**

- Before a meeting of technical panel members, **send out a survey and action-oriented agenda** to increase participation and encourage conversation. Ask about the benefits of the project and how the results will be used.

- Evaluate a project manager's or investigator's performance to encourage adherence and help when choosing team members for future projects or for supporting pay increases or other rewards.

PEER EXCHANGE TOPIC 2—IMPACTS AND THE EFFECT OF THE IIJA/BIL ON SPR PROGRAMS

SUBTOPIC 3. SUPPORT OF AGENCY'S BIL PRIORITIES; SUBTOPIC 4. IMPACT ON RESEARCH PROGRAM

Oklahoma DOT framed the issue and discussion for the two subtopics as follows:

> Subtopic 3. *A research program can be a valuable resource to help solve transportation-related problems – but only if agency staff and other stakeholders are aware of the program and its potential. In this session, DOT research program staff and invited guests discussed the various challenges involved with soliciting and responding to research ideas and providing results that are useful and representative of the functions and interests of the agency.*

> Subtopic 4. *Many states rely on funds from the federal government to support research. While the full effects of the IIJA and BIL are not yet known, attendees described their research program budgets and staffing considerations and how the new legislation may affect an agency's limited resources.*

Participants ended up discussing these two subtopics together.

PRESENTATIONS

To kick off discussion of the effects of the new federal legislation on May 24, ODOT guests provided presentations on two programs that are new at ODOT and outside of the Research office.

> [Appendix J. Carbon Reduction Strategy Development](#), Sarah McElroy, ODOT
> [Appendix K. National Electric Vehicle Infrastructure](#), Andreas Weber, ODOT

DISCUSSION AND FINDINGS

The attendees then discussed the anticipated and likely outcomes of these programs, and how research may be involved.

An example of a new ODOT program webpage that was created as part of the new IIJA effort is provided in Figure 2.
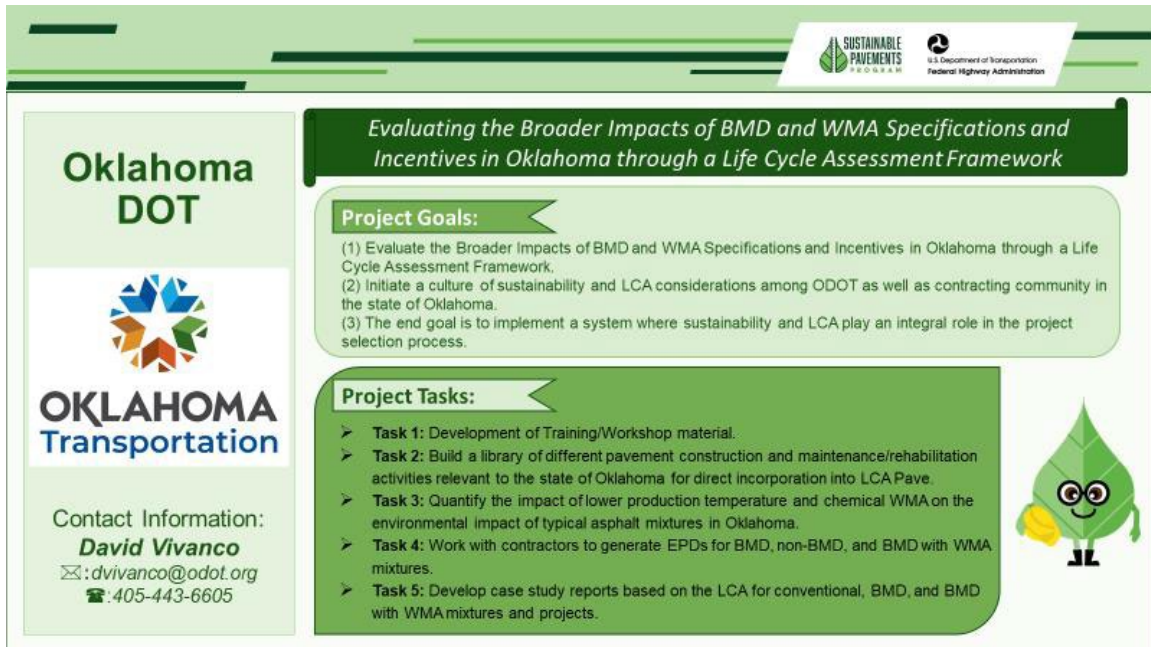
Figure 2. An Image of an ODOT Webpage Developed in Support of IIJA

Most research offices are not yet involved with the new programs and don't know how funding and priorities will be affected. This is likely due to the fact that the programs are still being developed and opportunities haven't been identified. As more time passes and additional guidance is issued, there will likely be ways that research offices across the country can support these initiatives. FHWA will also provide guidance and support as it becomes available. In the meantime, the FHWA's Bipartisan Infrastructure Law webpage currently offers a variety of online resources.

Report-out forms, which participants completed and submitted at the end of the day, also contributed to the summaries below.

TOP IDEAS are those that were highlighted by several participants.

Impacts to Research and Opportunities for Support

How is your research office supporting (or how will it support) your agency with new programs and priorities?

- Idaho DOT asks probing questions that may lead to research projects, such as whether standards or designs will be needed for charging stations and whether research can assist.

- ODOT offers research help whenever it learns of a new program.

Potential Barriers Created by the New Laws

What are issues that may prevent research from providing support?

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- **Lack of awareness.** There may be lots of opportunities for collaboration, but if a research office isn't involved in early discussions they may not know what problems exist.

- **Differing procedures.** A research office's established processes and a new program's needs may not align well yet.

TOP IDEAS:

- The effects of these laws are developing, and everyone at the state, local and federal levels are **continuing to learn together.**

- Though needs are still evolving, **there may be opportunities** for research staff to support new agency initiatives.

Other Thoughts and Observations

- All of the attendees' research offices are **generally in the same position** when it comes to their level of involvement with their agency's new BIL and IIJA-related programs.

- A research office may need to **proactively seek out opportunities** to support the agency's efforts and identify research needs.

- ODOT's research office is asking important questions on these issues, which illustrates its **willingness to understand the issues** and its devotion to the agency as a whole.

- Each agency's FHWA Division office will be a **valuable resource** for identifying developments, providing guidance and interpreting how the new laws affect new and ongoing research efforts.

- Though each state is unique, **the challenges faced by research staff are often similar**. Ongoing communications among these offices may provide much-needed support and offer strategic solutions as the legislative impacts are explored.

ADDITIONAL CRITICAL TOPICS

Throughout the three-day peer exchange, discussions among the attendees were wide-ranging and included several important topics outside of the established agenda. These topics included:

Local Technical Assistance Programs (LTAPs) and relationship to state DOT research

- Oklahoma maintains a close relationship with its LTAP.
- Ohio DOT held a peer exchange on the topic of LTAPs in November 2022.
- State LTAPs may have an equipment sharing program to allow smaller transportation agencies to procure costly equipment for temporary use.

Can federal funds be used for administrative expenses?

- Vermont AOT uses federal funds toward program coordination and most research staff time is billed to SPR-B.
- Idaho's research staff bills time to SPR.

Quantifying the value of research

- Kansas DOT completes a benefit-cost analysis for each project, then rolls those into a five-year moving average.
- Vermont's storytelling approach is its best way to show value.
- Idaho presents an annual report on the research program and shows results of research projects in the past year. Project sponsors and managers are involved in presentations to give them credit for their work and share their results.
- Oklahoma encourages project investigators to calculate and compare the conventional way of doing something and the new way of doing it as a cost-per-unit measurement.

The role of research in maintaining approved products lists

- Kansas has a new products committee and one member of the research team serves on that.
- Vermont's research office used to be in charge of the agency's Approved Products List but it's now in the Materials Bureau.

Regional transportation libraries

The value of a transportation library is widely accepted. But states that don't have their own librarians may be at a disadvantage. One solution could be a regional transportation library that serves multiple state DOTs.

Tools for marketing research

Many research offices lack the resources to develop materials to support their own marketing efforts. A pooled fund or similar effort – where states could share and customize general materials – would especially help smaller states with limited staff, time and funds.

ADDITIONAL RESOURCES

Throughout the peer exchange, attendees also shared links to a variety of online resources. These include:

Research program pages

- Kansas - https://www.ksdot.gov/bureaus/burresearch/default.asp
- Oklahoma - https://oklahoma.gov/odot/programs-and-projects0/ori.html
- Vermont - https://vtrans.vermont.gov/planning/research

Idea submission forms

- Kansas - https://kdotapp.ksdot.gov/ResearchProjectIdeas/
- Oklahoma - https://oklahoma.gov/odot/programs-and-projects0/ori/interactive-forms.html
- Vermont - https://vtrans.vermont.gov/planning/research/research-ideas

Research communications products

- Highlighters – Two-page research summaries produced by the Oklahoma Transportation Library at the University of Oklahoma for ODOT: https://oklahoma.gov/odot/programs-and-projects0/ori/highlighters.html
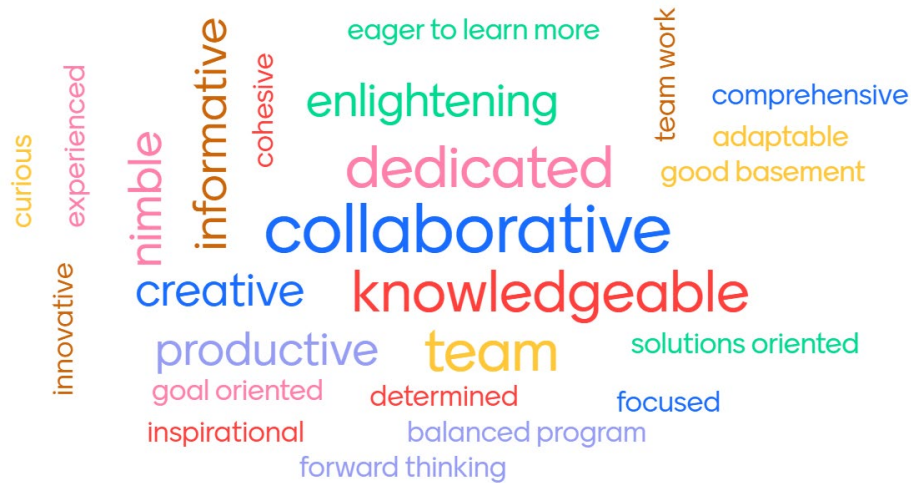
OPPORTUNITIES FOR OKLAHOMA

A hallmark of any successful peer exchange is learning from other states and identifying the tools and practices that may enhance the host state's existing program. Throughout the peer exchange and in submitted report-out forms, attendees praised ODOT's program and highlighted strategies to address the challenges the agency had presented. A question posed through the Mentimeter polling tool also illustrated attendees' perspectives on ODOT's program, as shown in Figure 3.

ODOT'S STRENGTHS

Attendees noted the many ways that ODOT's research program excels:

- ODOT's research office staff consider themselves a team and work well together to achieve their shared goals.

- The two-page research summaries that ODOT produces, *Highlighters*, are well done and provide an excellent example for other programs to follow.

- ODOT's Innovation Discovered form is a great way to use research funds to bring ideas to Oklahoma.

- ODOT's Transportation Research Day is a successful event that works well to engage stakeholders and encourage participation.

- ODOT has an inclusive approach to soliciting research ideas.

- ODOT's efforts to engage with its field districts helps it identify emerging research needs that will make an impact.

- ODOT's system of collecting monthly reports and invoicing helps the research office identify and address potential issues before they become a problem.

- The staff in ODOT's research office are clearly dedicated to their work in supporting the agency and being Masters of Facilitation.

- ODOT's research program is managed efficiently and effectively with available staff.

- ODOT's research office is eager to increase engagement and welcomes feedback.

- ODOT's research office uses a calendar of events to successfully track and manage research throughout the year.

- ODOT has a good understanding of the issues and challenges all research offices face regarding the new IIJA and BIL programs.

Question 3: Please provide two or three words or short phrases to describe ODOT's research program.

Figure 3. Attendees' Responses to a Word Association Exercise

OPPORTUNITIES FOR ODOT

Attendees also offered suggestions to enhance ODOT's research program:

- Providing written feedback on research proposals that were not selected for funding would help proposers understand ODOT's reasoning and may result in better proposals in the future.

- Engaging industry groups, such as the Oklahoma Asphalt Pavement Association and Concrete Pavement Association, could help ODOT implement its research results.

- Supplying Section 508-compliant templates will help researchers and others to submit accessible final documents.

- Documenting and publicizing the benefits that ODOT receives from pooled funds can help the agency choose where funds should be appropriated for maximum effect.

- Broadening ODOT's pool of project champions could reduce burnout and increase engagement from other areas within the agency.

- Producing a brief webinar can help to promote completed research and solicit future ideas.

- Developing workforce development camps and activities geared toward high school students can help to identify the next generation of ODOT staff.

- Showcasing ODOT's research successes may help increase awareness of the research office and help staff learn about upcoming initiatives and opportunities to support federal programs.

- ODOT could set aside funds for small research projects that address problems arising mid-year.

- Better communication throughout the agency about the programs resulting from IIJA and BIL could increase awareness of research needs and opportunities.

- ODOT's interactive online forms may not be easy to download for everyone.

APPENDIX A. OKLAHOMA DOT 2023 PEER EXCHANGE AGENDA

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

Day 1: Tuesday, May 23

Day 1 Microsoft Teams Meeting ID: 292 432 179 427, Passcode: 5fVQcS
[Click to join the meeting](#)

Morning Session

10:00 a.m.   **Welcome, Meeting Goals and Agenda Review**
Joni Seymour, Oklahoma DOT
Souzan Bahavar, FHWA
Brian Hirt, CTC & Associates

10:10 a.m.   **Introductions**

- Name, Agency, Role
- What you hope to learn at this peer exchange - Menti
- Ice breakers/Get-to-know-you questions – Menti

10:45 a.m.   **State Research Program Presentations** (90 minutes — 20 minutes each plus Q-and-A)

- Vermont AOT
- Montana DOT
- Kansas DOT

12:15 p.m.   **FHWA Perspective**

- Chris Jolly, FHWA Vermont Division

12:30 p.m.   Adjourn morning session

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

Day 1: Tuesday, May 23, 2023 (continued)

Day 1 Microsoft Teams Meeting ID: 292 432 179 427, Passcode: 5fVQcS
[Click to join the meeting](#)

Afternoon Session

1:30 p.m.   **State Research Program Presentations** (60 minutes — 20 minutes each plus Q-and-A)

- Idaho TD
- Oklahoma DOT

2:30 p.m.   **Topic 1. Engagement and Participation in Research by Agency Stakeholders**

Part 1. Research Development. Questions include:

1. From whom does your program receive ideas for potential research projects?
2. How does your research office actively engage subject matter experts and practitioners from across the agency to identify problems that research might solve?
3. What are your agency's biggest challenges in this area?
4. How often does your agency's senior staff engage and direct research program development each year? When does your agency determine the available funds for each upcoming FFY SPR program?
5. Does your state get enough variety of projects?
6. How does project scope/size affect what projects are chosen for funding?
7. What level of detail do you get in defining the research question and support contracting of the research? Is having three forms that are completed before the idea becomes a research proposal overkill?

- All attendees
- Group discussion
  - Roundtable and Q-and-A
  - Menti Poll

3:45 p.m.   **Complete Day 1 Report Out Worksheet**

4:00 p.m.   Adjourn afternoon session

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

Day 2: Wednesday, May 24, 2023

Day 2 Microsoft Teams Meeting ID: 268 268 743 513, Passcode: E6VDr3
Click to join the meeting

Morning Session

10:00 a.m.   **Review of Peer Exchange to Date; Goals**

Introduce new attendees.

10:05 a.m.   **University Presentations** (15 minutes each)

- Musharraf Zaman, University of Oklahoma
- Kelvin Wang, Oklahoma State University
- Yinhai Wang, University of Washington

11:00 a.m.   **Topic 1 (continued). Engagement and Participation in Research by Agency Stakeholders**

Part 2. Research Execution, Completion and Implementation. Questions include:

1. How are stakeholders (sometimes research committee members) kept highly engaged during the study process, including providing comments and feedback on project deliverables?
2. How are stakeholders brought into the critical step of using research results to effect beneficial changes and practices within the agency?
3. What are your agency's biggest challenges in this area?
4. What is your project champion's role in relation to execution and implementation?
5. How do other states do to keep technical panel (TP) meetings with PIs forward-thinking and action-oriented?
   - What are thoughts on a survey to jump-start each meeting—2-3 questions to get everyone critically thinking about progress and implementation?
   - How can the panel be kept engaged and interested in the research and its outcomes (and not multitasking).

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

- All attendees and discussion topic guests
  - Research customers from state DOT business areas who can provide their perspective on this
- Group discussion
  - Roundtable and Q-and-A
  - Menti Poll

12:30 p.m.   Adjourn morning session

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

Day 2: Wednesday, May 24, 2023 (continued)

Day 2 Microsoft Teams Meeting ID: 268 268 743 513, Passcode: E6VDr3
Click to join the meeting

Afternoon Session

1:30 p.m.   **Topic 2: Impacts and effect of the IIJA/BIL on SPR programs**

- ODOT Guest Presenters
    o Carbon reduction, Sarah McElroy
    o National Electric Vehicle Infrastructure, Jared Schwennesen
- FHWA perspective, Patricia Sergeson

Part 1. Support of Agency's BIL Priorities. Questions include:
1. How is your research office supporting (or how will it support) your agency in undertaking the priorities outlined, and grant programs included, in BIL?
2. How is your research office supporting implementation of new programs created by the IIJA (e.g., Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program, National Electric Vehicle Infrastructure (NEVI) Formula Program, Carbon Reduction Program (CRP), etc.). Identify projects and activities your program is actively engaged in, or planning, to support IIJA programs.
3. Has your office taken on BIL responsibilities without additional resources?
4. What are your agency's biggest challenges in this area?

- All attendees and discussion topic guests
    o Leadership and upper management from state DOTs; those involved in long-term planning

- Group discussion
    o Roundtable and Q-and-A
    o Menti Poll

3:40 p.m.   **Complete Day 2 Report Out Worksheet**

4:00 p.m.   Adjourn afternoon session

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

Day 3: Thursday, May 25, 2023

Day 3 Microsoft Teams Meeting ID: 228 000 889 219, Passcode: LGYwkx
Click to join the meeting

Morning Session

10:00 a.m.   **Review of Peer Exchange to Date; Goals**

10:05 a.m.   **Topic 2 (Continued). Impacts and effect of the IIJA/ BIL on SPR programs**

Part 2. Impact on Research Program

- o How does BIL affect SPR Part B programming, management, and spending?
- o Does your state conduct research related to the new programs?
- o Do you have the resources (staff, consultant support, etc.) to use the new BIL funding?
- o Is there pressure to select/fund research related to the new programs?
- o What can the FHWA Division Office do to help support state DOTs' research programs?
- o What are your agency's biggest challenges in this area?

- All attendees and discussion topic guests
  - o Research project managers
  - o Research program support staff

- Group discussion
  - o Roundtable and Q-and-A
  - o Menti Poll

12:30 p.m.   Adjourn morning session

ODOT 2023 Research Peer Exchange

Final Meeting Agenda — Updated May 19, 2023

All times are Central – Breaks will be taken as needed/fit

Day 3: Thursday, May 25, 2023

Day 3 Microsoft Teams Meeting ID: 228 000 889 219, Passcode: LGYwkx
[Click to join the meeting](#)

Afternoon Session

1:30 p.m.	**Complete Day 3 Report Out Worksheet**
1:50 p.m.	**Oklahoma ORI Staff**

- What Oklahoma is doing well
- Opportunities for improvements
- Great ideas from peers

Peer Agencies

- Where Oklahoma excels
- Where Oklahoma can grow
- "Aha moments" and ideas to take home

4:00 p.m.	Adjourn meeting

APPENDIX B. VERMONT – VERMONT AOT RESEARCH PROGRAM

Oklahoma DOT Research Peer Exchange

VERMONT RESEARCH PROGRAM

MAY 23, 2023

Program mission

Vermont doesn't have one but one of my biggest takeaways from the March 2023 Colorado Peer Exchange was that it was exciting to see how other state research programs have Visions or Mission statements and how they mesh with their Agency's Vision

"Swiping and adapting" Colorado's statement, maybe Vermont should be thinking about: *To conduct a program of high-quality, applied research, advancing solutions to the increasingly complex needs confronting Vermont's transportation future.*

My former boss was very interested in whether our projects addressed VT AOT's Strategic Plan and our proposal template still has language about this but I feel that this has limited value, anyone can make the argument that any project can contribute to "growing the economy" or "better use of state resources".

Program responsibilities

- When Research was part of the Materials Lab, there was more staff and more field and internal research.

- Now, two staff and greater emphasis on research management
  - External research projects led by VTrans
  - Maximizing utilization of external payments
    - Pooled funds including NETC
    - National Cooperative Highway Research Program/TRB
  - Regional University Transportation Center?

VERMONT
AGENCY OF TRANSPORTATION

Organizational placement – Location in the agency, reporting to what level of management, etc.

- The two of us (Research Manager and Research Engineer) are part of the Policy, Planning and Research Bureau (15 staff) which is part of the Policy, Planning and Intermodal Development Division

- My boss is the Bureau Director who reports to the Division Director who reports to the Secretary

- It's hierarchical but people are friendly and supportive of research

VERMONT
AGENCY OF TRANSPORTATION
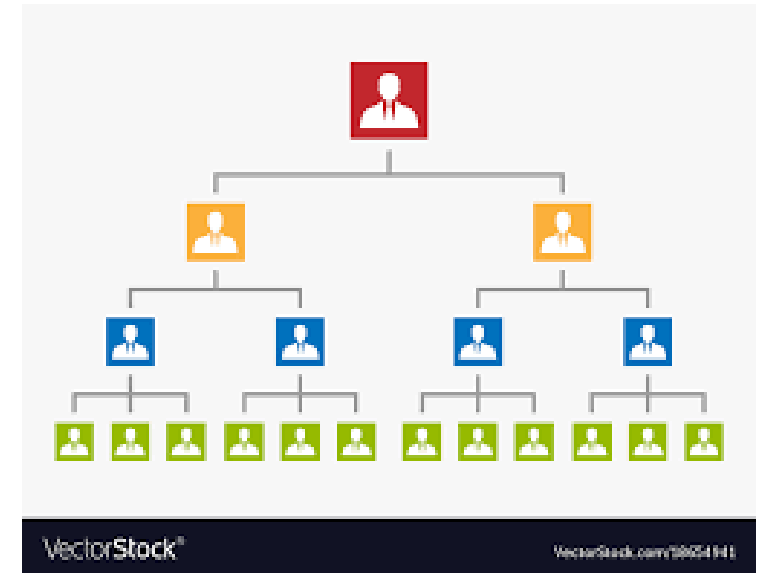
By the numbers: Size, research projects, budget, etc.

SPR-B in FFY23: $1.206M

Total Research Budget: $1.362M
(90% or more of staff time in Work Program)

External Research Program:

3-4 projects a year; 10 active projects; FFY23 $509,744*

*In FFY23 I was able to use $100,000 in unspent funds from previous fiscal years but that's unusual

Recent Successes

- Project Champions from across the Agency

- Variety of projects: materials, structures, snow and ice, environmental, etc.—directly and indirectly research funded, other

- Annual Research and Innovation Symposium
  - 2023 will be the 7th!!
  - People's Choice Award worked well in 2022 (first attempt)
  - Can use federal funds for food!

- Benefits and Implementation Survey and Discussion

- Virtual AASHTO RAC in 2020

- Thrived during the pandemic—lots of virtual learning opportunities

Biggest Challenges

Contracting for Symposium support
- New location
- Hybrid/IT success may be challenging at new location
- Failed to get recordings in 2022

Transitioning from Quarterly Newsletter to Just in Time Announcements
- How can we maximize contractor support
- Much of the content comes from Research staff

VERMONT
AGENCY OF TRANSPORTATION

EXTERNAL RESEARCH PROCESS (VTRANS-LED)

◦ Solicit research ideas by December each year

◦ Match with VTrans technical Champions by early January

◦ Champions prepare Research Project Statements in January

◦ Solicit Letters of Interest from Qualified Researcher List in February

◦ Qualified Researchers responded to RFP in December

  ◦ 12 selected: 5 universities and 7 consultants

◦ Champions select research teams based on Letters of Interest

◦ Proposals due March 15

◦ Champions present to Bureau Directors (March 31) who decide on projects to fund

VERMONT
AGENCY OF TRANSPORTATION

ACTIVE EXTERNAL RESEARCH PROJECTS

- 20-3 Rectangular Rapid Flashing Beacons—HVR!!!

- 21-1 Traffic Safety Toolbox

- 21-2 RFID

- 21-3 Rapid Setting Concrete

- 22-2 BMD Round Robin

- 22-3 Phosphorus Removal with DWTRs

- 22-4 SmartGrowth, VMT and GHG
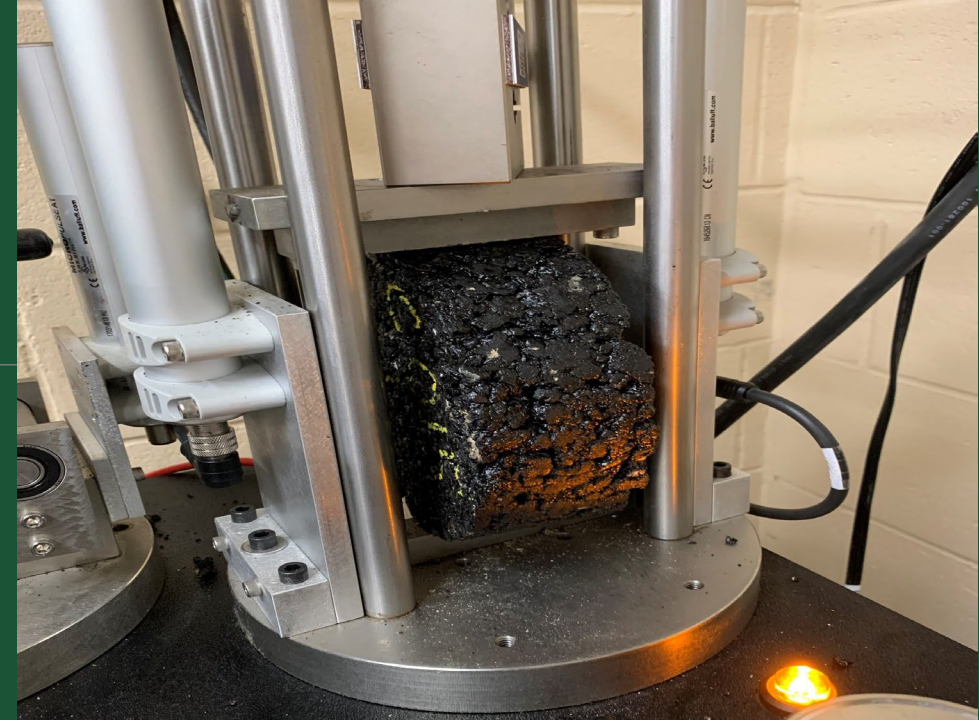
2023 EXTERNAL RESEARCH PROJECTS (Potential and **Funded**)

- Using DCP in Preliminary Design – Geotech

- New UAS Technology Public Sector Impacts – Aviation

- **Small Culvert Performance Monitoring – District Maintenance**

- **Travel Time Data from Work Zones – Proj Dev/Traffic Design**

- **Pavement Performance Models – Asset Manaement**

- **RAS as an FDR Mechanical Stabilizer – Asphalt Materials**

- Phosphorus Removal from Stone-Lined Ditches – Stormwater Mntce

- Laboratory Aging Procedures for Asphalt Mixtures – Asphalt Materials

- Rural GHG Reductions Toolbox – Planning

10

VERMONT
AGENCY OF TRANSPORTATION

CHAMPIONS—Before Project is Funded

Large Champion lift to get project funded

- Ideas from anyone but have to be matched with enthusiastic Champion
- Champion develops Research Problem Statement distributed to Qualified Researcher List
- Champion selects research team based on two-page Letters of Interest
- Champion works with research team to get 10 page project proposal they want to advocate for
- Champion presents project description and benefits in four minutes at decision-making meeting
- Funding for "half" of the projects

VERMONT
AGENCY OF TRANSPORTATION

Technical Advisory Committee

- Champion suggests TAC members
  - Research Staff
  - AOT staff from different Bureaus, Divisions
  - Technical staff from other Agencies
  - RPC Staff

- Research prefers larger TACs—more people to guide the project; more people to use the project

- Benefits/implementation Survey and Discussion since July 2022

Benefits/Implementation Survey and Discussion

Before kickoff, mid-project, end of project

Sent to TAC and researchers before the meeting

Results aggregated into four slides to facilitate a during-meeting discussion

Get people thinking about why they're in the meeting (to support the project) and how they will use the project results

Get people on the same page

VERMONT
AGENCY OF TRANSPORTATION
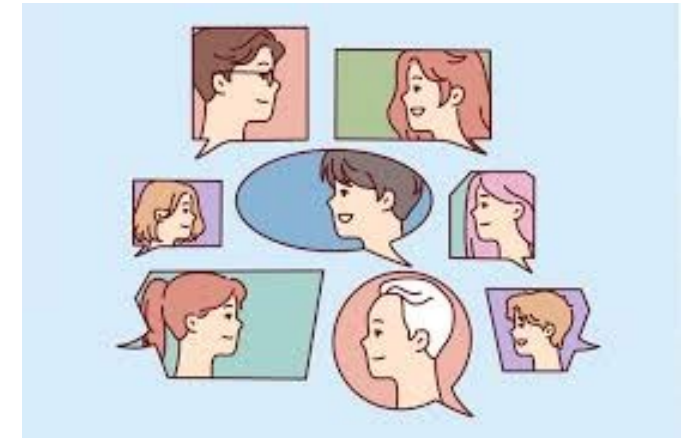
2022 AOT Research and Innovation Symposium

- 26-30 Projects in Four Groupings:
  - Asset Management and Maintenance
  - Materials
  - Environmental, Resilience, Planning and Public Transportation
  - Structures and Construction

- Virtual 2020, 2021, Hybrid 2022

- Each project includes
  - Web page—permanently available!
  - Fact Sheet
  - Poster
  - 3-5 Minute Recording (support team failed in 2022)
  - Half of the projects in 2022 included table demos

APPENDIX C. MONTANA – MDT RESEARCH PROGRAM

Program Mission

The MDT Research Section exists as a cornerstone transportation knowledge center. We provide resources and connections to empower innovation, creativity, and effectiveness to Montana.

Program Responsibilities

- SPR-B funded activities

- Library management & support

- Experimental features

- Participate and advise Montana's LTAP expenditures

Where is Research within MDT?

Director

Chief Operations Officer

Division Administrator — Highways & Engineering

Bureau Chief — Engineering Operations

Section Supervisor — **Research!**
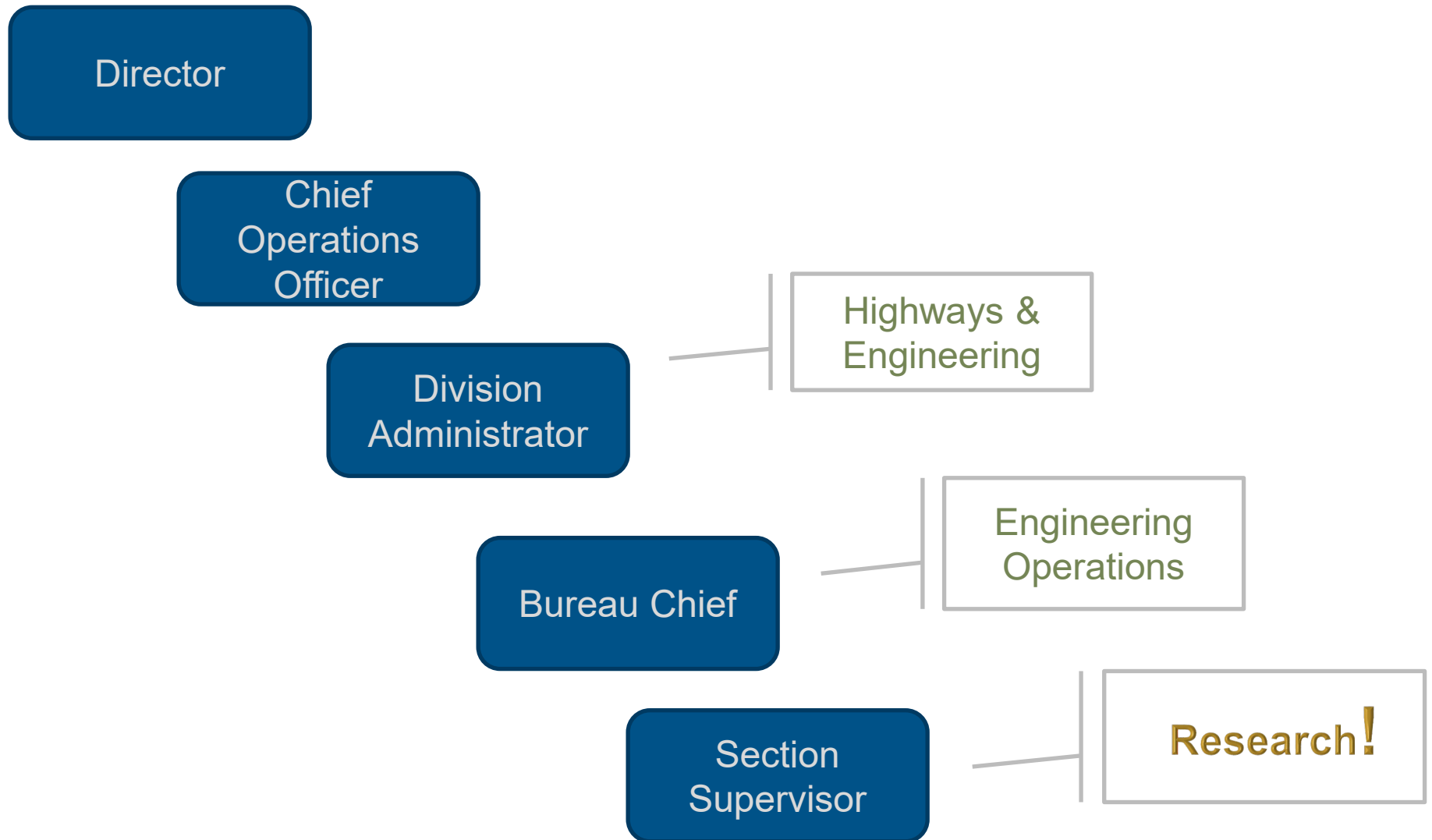
Research Section Staff
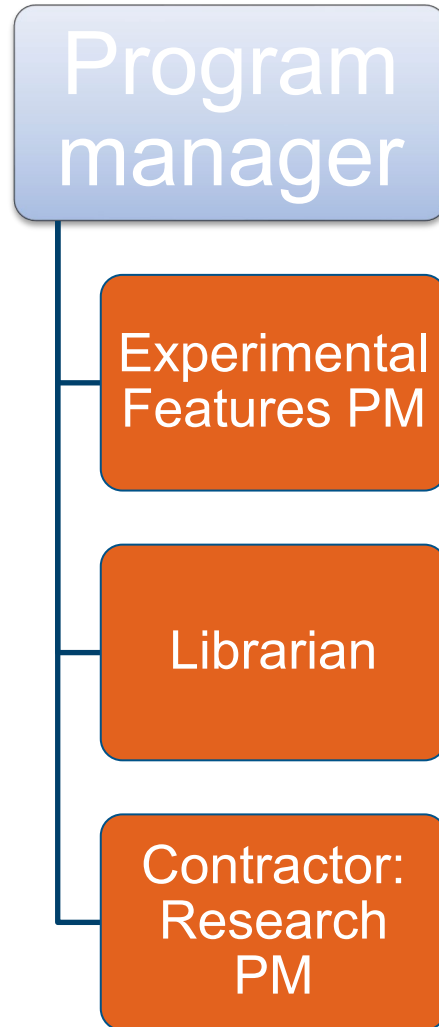
MDT Research by the numbers

- Budget: About $2.7 M/year – 100% SPR-B

- Research projects
  - Approx. 12-15 active research projects
  - Complete approx. 4/year
  - Receive about 15-20 new ideas/year
  - Approx 4-6 new projects/year

- Etc –
  - pooled funds (12-15)
  - AASHTO TSP (8)

Recent Successes

- I made it through my first year as a research section manager.
- Business improvements – guidance updates or creation
- Marketing
- Web-updates

Biggest Challenges

- Getting and Keeping interested, energized, and engaged idea champions and Technical Panels.

- Full-time project manager for research projects located within the department.

Other interesting information….

- Montana is a huge rural state
- We have 7 tribal reservations

Rebecca Ridenour
Research Section Manager
(406) 444-7203
rridenour@mt.gov

MONTANA
Department of Transportation

APPENDIX D. IDAHO – IDAHO TRANSPORTATION DEPARTMENT RESEARCH PROGRAM

Oklahoma DOT Research Peer Exchange

IDAHO TRANSPORTATION DEPARTMENT RESEARCH PROGRAM

MAY 23, 2023

Program mission

- Support research, development, and technology transfer activities addressing the Department's strategic goals and initiatives.

- Enhance ITD's ability to deliver efficient and effective transportation services.

- Offer practical solutions to problems facing the Department.

- Develop new tools/technologies and facilitate their implementation.

Program responsibilities

- Identifying ITD research needs and priorities.
- Administering SPR funds received for ITD research, development, and technology transfer.
- Overseeing ITD-funded research performed by universities and consultants.
- Coordinating Department involvement in multi-state pooled fund projects.
- Coordinating ITD involvement in national and regional transportation research with TRB, AASHTO, the PacTrans (regional UTC), etc.
- Helping staff locate transportation research information.

Organizational placement – Location in the agency, reporting to what level of management, etc.

- The Research Program is located in the Planning and Development Section

- P& D is part of the Highways Development Division, one of two Highways Divisions at HQ

- ITD Research Advisory Council
  - Comprised of:
    - Chief Operations Officer
    - Highways Development Administrator
    - Highways Construction and Operations Administrator
    - District Engineer
    - Planning & Development Manager
    - Representatives from DMV, Admin, & Workforce Development
    - Representative from FHWA Idaho Division Office
    - Research Program Manager
  - Reviews research funding requests and sets funding priorities

4/8/2023
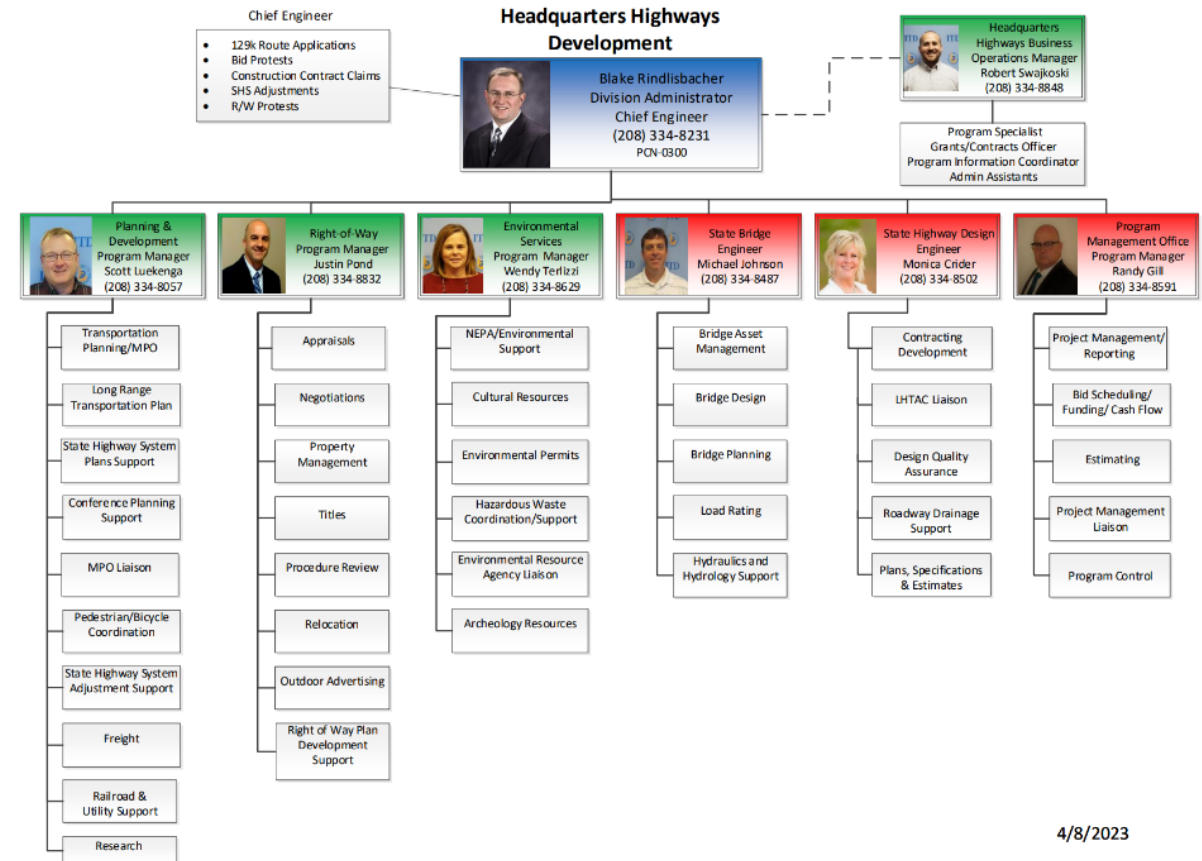
By the numbers: Size, research projects, budget, staff, etc.

- 2.0 FTEs
  - Research Program Manager
  - Sr. Research Analyst

- Research projects overseen by:
  - Project Sponsors and Project Managers from sections requesting projects
  - Technical Advisory Committees
  - FHWA Project Advisors

- In FFY 2023
  - 23 active and new research projects
  - 37 pooled fund projects
  - 14 AASHTO Technical Service Programs

- Total Budget = $2.38 million

Research Administration, 9.0%

AASHTO Special Programs, 7.3%

NCHRP, 16.8%

Research Projects, 39.9%

Pooled Fund Projects, 27.0%

Total Budget = $2.38 million
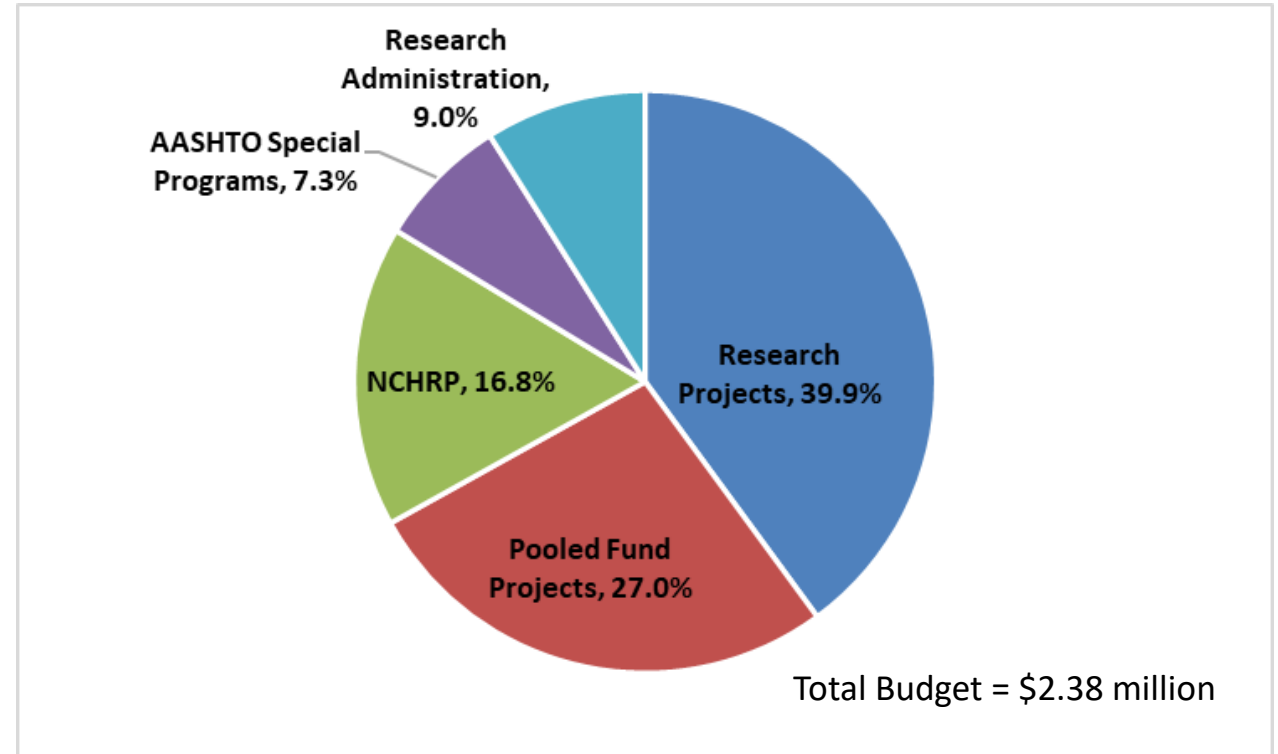
Recent Successes

- Successfully completed FHWA Program Review
  - FHWA found ITD has well-documented research management process
  - Also noted that the department has a robust process for final reports and meeting Section 508 requirements for report accessibility

- Implemented RFP process for researcher selection
  - Developed in-house process for developing and advertising RFPs and selecting researchers.
  - Have received minimum of three proposals for each project advertised, even for small projects (budget less than $50,000)

- Implemented pre-project surveys to better understanding expectations and needs

- Recent Project Successes
  - Completed study that identified practical, implementable method for estimating Average Annual Daily Traffic (AADT) for local roads
  - Completed study that assessed the automated system used for tracking federal funds and to support STIP development

Biggest Challenges

- Determining "top down" priorities of research
  - Meet with ITD strategic goal teams annually
  - However, most ideas generated "bottom-up"

- Competitively bidding research projects
  - Requires substantial time from both Research Program staff and project requestors

- Lack of dedicated research project managers
  - Rely on staff on the areas requesting research projects to serve as project managers
  - Adds to their work responsibilities

- Moving research into practice
  - Build implementation support (training, draft specifications, etc.) into project tasks and deliverables
  - Rely on project sponsors to champion implementation

Other information to share

- Research Program Manager coordinates ITD's State Planning and Research (SPR) Program
  - Oversees annual SPR budget and work program development process
  - Coordinates development of SPR Annual Performance and Expenditure Report (APER)
  - Also responsible for obligating funds, facilitating discussion of budget reallocation needs during the year, and preparing work program amendments for FHWA review and approval

- Research Program staff actively involved in ITD Innovation Initiative
  - Research Program Manager has been part of the strategic team that oversees Innovate ITD since 2014.
  - Sr. Research Analyst currently serves as the Innovation Steward for the Highways Development Division

APPENDIX E. KANSAS – KANSAS RESEARCH PROGRAM

Oklahoma DOT Research Peer Exchange

KANSAS DOT RESEARCH PROGRAM

MAY 23, 2023

Program mission

The mission of the Bureau is:

To support and encourage innovation throughout the Department by promoting research, development, technology transfer (RD&T) and implementation activities.

To evaluate problems as they arise during standard construction and maintenance field operations and provide timely responses.

To serve as an information resource for agency management.

While in-house RD&T activities of the Bureau are primarily focused on highway construction and maintenance materials, products, and procedures, the Bureau supports all functional areas through general administration of the K-TRAN Research Program and provides technical information to management and other Divisions of the agency. The goal of the Bureau is to be service oriented and provide timely responses to the wide array of questions and requests.

Program responsibilities

The Bureau of Research is responsible for the oversight of federal and state funds dedicated to transportation research, K-TRAN projects, KDOT library, and assisting in forensic investigations of prematurely failed transportation projects.

- Facilitate identification and prioritization of projects for KDOT's Research program
- Administer research projects approved by the Research Technical Committee and agency management.
- Administer LTAP program.
- Administer participation and/or act as lead state in Transportation Pooled Fund Projects.
- Provide technical information services, NHI technical training, and plan and host conferences and workshops.
- Fund, help staff, and facilitate KDOT's Certified Inspection Training.
- Maintain a KDOT library and provide transportation library services internally and externally

Program responsibilities

- Provide for research development and utilization of new highway construction materials and procedures.
- Report research findings in various categories including asphalt materials, concrete materials, pavement surfaces, geology, and chemistry.
- Develop new KDOT Specifications in concert with Materials personnel.
- Develop the equipment and procedures necessary to implement research findings.
- Provide forensic evaluation of unusual situations encountered during standard construction and maintenance field operations and recommend corrective actions.
- Chair the New Products Committee and administer new product evaluations.
- Serve as KDOT's TRB and AASHTO RAC representatives

Organizational placement – Location in the agency, reporting to what level of management, etc.

Reports to Director of Division of Project Delivery
◦ Division includes Bureaus of Research and Construction & Materials

Library, Contracts, and Tech Transfer staff located at agency Headquarters

Engineering and Technical staff located at Materials and Research Center, KDOT's Central Lab

By the numbers: Size, research projects, budget, staff, etc.

SPR Budget: Approx. $4M - Funds in-house research, Transportation Pooled Funds, NCHRP and TRB contributions, LTAP match

State Budget: Approx. $1.5M – Funds Research with Universities

Staff:
- Currently 7 Research Engineers (+3 vacancies) – Bureau Chief, Asst. Bureau Chief, Technology Transfer, Concrete (vacant), Asphalt, Chemical, Advanced Technology (vacant), Research Operations, Research Development (vacant), 1 Staff Engineer
- 2 Geologists
- 6 Engineering Technicians
- NHI and Research Coordinator
- Librarian
- Publications Writer/Editor
- Administrative Specialist

Recent Successes

Pulled off a joint Research Peer Exchange with Missouri DOT (a first for this Research management team)

◦ Representation from 8 states in Midwest AASHTO Region 3

◦ FHWA – Tricia Sergeson, Jeff Zaharewicz

◦ USDOT – Tim Klein

◦ 2 Partnering Kansas Universities – University of Kansas, Kansas State University

Biggest Challenges

Workload and staffing continue to be our biggest challenges– 3 engineering positions have been vacant for an extended period of time.

Field/Construction issues – IL cement, low strength breaks, staffing challenges resulting in lack of field construction engineers with experience and expertise.

Turnover agency-wide affects management and implementation of research projects.

Other information to share

We are very fortunate in that we still have a physical library and librarian.

We are also fortunate to have State funding in addition to SPR to support our research program.
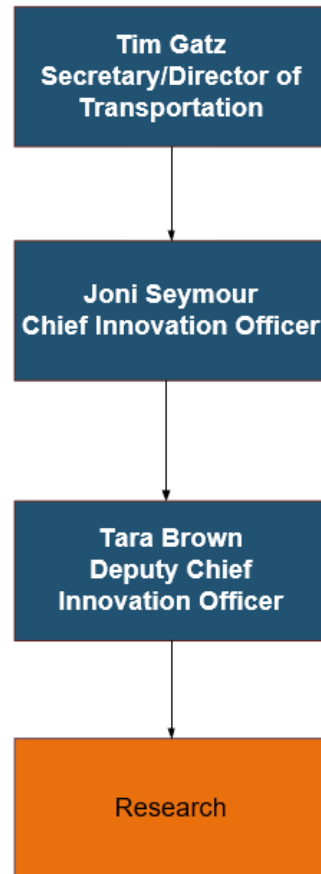
APPENDIX F. OKLAHOMA – OKLAHOMA RESEARCH PROGRAM

Oklahoma DOT Hosted Research Peer Exchange

MAY 23-25, 2023

OKLAHOMA RESEARCH PROGRAM: MAY 23

Organization Reporting Levels
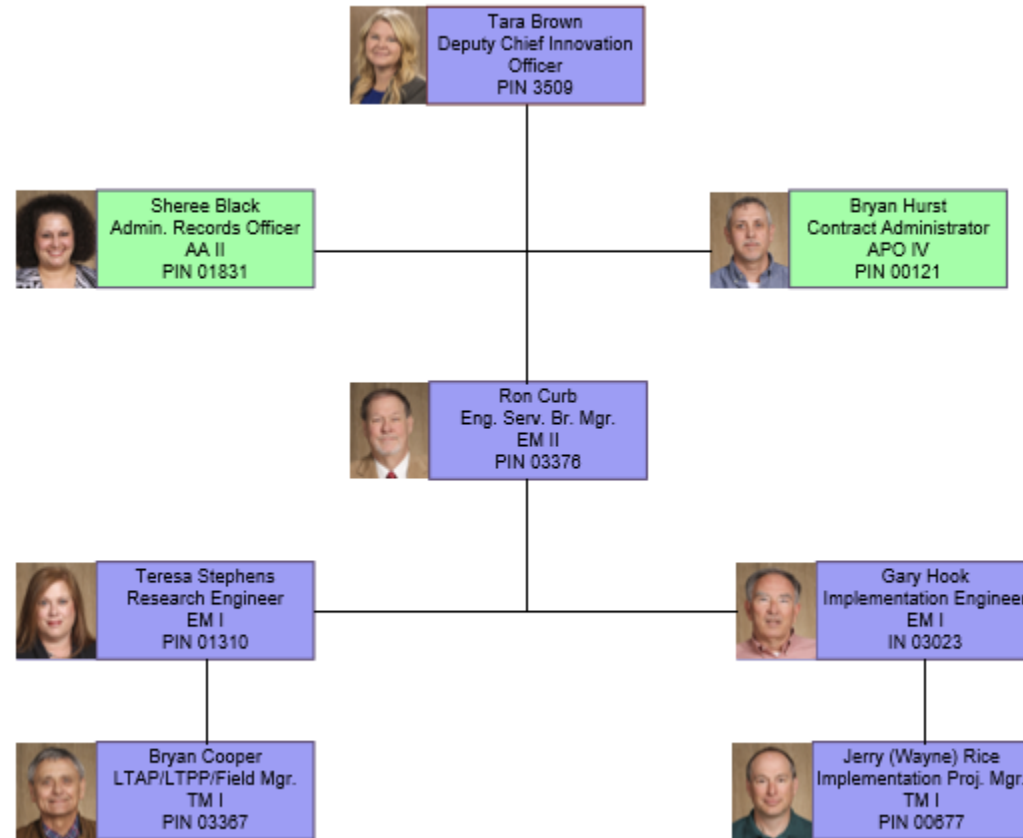
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┌─────────────────────────┐
│       Tim Gatz          │
│  Secretary/Director of  │
│     Transportation      │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│     Joni Seymour        │
│ Chief Innovation Officer│
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│      Tara Brown         │
│     Deputy Chief        │
│   Innovation Officer    │
└─────────────────────────┘
            │
            ▼
┌─────────────────────────┐
│       Research          │
└─────────────────────────┘
```

➢ Office Size: 9 FTE positions (7 currently filled)
   ➢ 5 Project Managers
   ➢ 2 Administrative Staff
➢ Oversight by Chief Innovation Officer and Deputy Chief Innovation Officer

Research & Implementation Team

Program Values

Research and Implementation support ODOT and transportation community

- ➢ State Planning and Research (SPR) Part 2 and other funds provide transportation research for Oklahoma Transportation

- ➢ Research Values:
  - ◦ Safety
  - ◦ Economics
  - ◦ Time Efficiency
  - ◦ Environment

Program Responsibilities

With direction from Oklahoma Transportation (OT)'s Executive Staff and the Research Steering Committee, Research and Implementation (ORI):

➢ Establishes and facilitates the process to identify, select, program, manage, and implement research

➢ Meets all federal-aid program requirements, including the preparation and maintenance of:

  ◦ OT's Annual State Planning and Research (SPR) Part 2 Annual Work Program (AWP)

  ◦ An Annual Performance & Expenditure Report (APER) for SPR Part 2 AWP

  ◦ Hosts periodic Research Peer Exchange

  ◦ Updates OT's Research Guidance documents

  ◦ OT also coordinates implementation of STIC, EDC and AID projects

ORI:

➢ Establishes the research agenda based on the involvement and participation of its customers

➢ Develops and performs applied transportation research for all modes of transportation

  ◦ Provides technical assistance to its customers to implement transportation research products

➢ Engages in both short-term and long-term research

  ◦ Allocates funding for research that leverages national research funding from other transportation organizations and pooled funding opportunities

Budget

SPR Part B (2) Budget FFY23: $5,029,092

Listed by priority:

- ➢ General Annual Items
- ➢ Continuing Research & Implementation Projects
- ➢ Continuing Pooled Fund Projects
- ➢ Oklahoma's Lead Pooled Fund Projects
- ➢ New Pooled Fund Projects
- ➢ New Research & Implementation Projects

Recent Successes

Evaluation of Ultra-High Performance Concrete, Fiber Reinforced Self-Consolidating Concrete, and MALP Concrete for Prestressed Girder Repair

FINAL REPORT ~ FHWA-OK-21-03 / ODOT SPR ITEM NUMBER 2284

Flood Monitoring and Prediction System Development

FINAL REPORT ~ FHWA-OK-22-06 / ODOT SPR2 ITEM NUMBER 2314
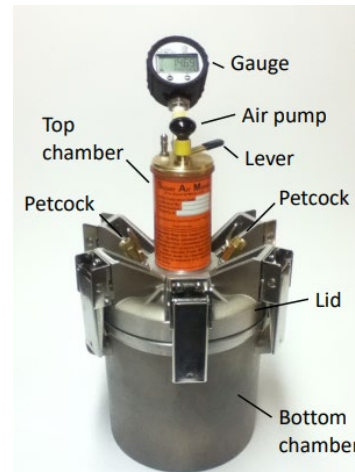
Improving Specifications to Resist Frost Damage in Modern Concrete Mixtures

FINAL REPORT TPF-5-297

Biggest Challenges

➢ Sponsor Engagement (need more engagement, quicker reviews)

➢ PI Meeting Deadlines for Interim and Final Report Submissions (may need to implement PI performance tracking for future award decisions)

➢ Meeting Internal Target Dates for Annual Activities Timeline (need quicker turnaround for each step's completion)

➢ Agency-wide Standard Operating Procedure for non-SPR Funded Projects (special funding/programs need separate SOPs)

URLs: Home Page and Summaries

Office of Innovation / Research & Implementation (OOI/ORI)
https://oklahoma.gov/odot/programs-and-projects0/ori.html

HIGHLIGHTER

ODOT Research & Implementation Summaries

RESEARCH
https://oklahoma.gov/odot/programs-and-projects0/ori/highlighters.html

IMPLEMENTATION
https://oklahoma.gov/odot/programs-and-projects0/ori/implementation-highlighters.html

? Questions ?

MAY 23-25, 2023

OKLAHOMA RESEARCH PROGRAM: MAY 23

APPENDIX G. THE UNIVERSITY OF OKLAHOMA'S TRANSPORTATION RESEARCH

The University of Oklahoma's Transportation Research and Partnership with the Oklahoma Department of Transportation

Musharraf Zaman

Musharraf Zaman[1] and Michael Molina[2]

[1]David Ross Boyd Professor and Aaron Alexander Professor of Civil Engineering and Alumni Chair Professor of Petroleum and Geological Engineering
Director, Southern Plains Transportation Center

[2]Librarian II, Oklahoma Transportation Library
The University of Oklahoma, Norman, Oklahoma 73019

Motivation: Southern Plains Transportation Center
Enhancing Economic Prosperity and Safety through Durable and Climate-Resilient Transportation Infrastructure

OU Transportation Research: Southern Plains Transportation Center

➤**Context:** Rapid upsurge in frequency and severity of extreme weather events

➤Accelerated pace of climate change

➤Five of top 7 cargo transp. ports in Region 6 states

➤$25B spent annually to combat climate extremes (2012-2021)

➤Disproportionate impacts on tribal, rural, low-income, and underserved communities

➤**Strategic goals:** Integrate climate-change related issues with solutions related to infrastructure durability and resilience in an inclusive, sustainable, and affordable way

➤Mitigate threats through innovative research, effective implementation, knowledgeable workforce, and well-organized programs

OKLAHOMA
Transportation

OU Transportation Research: Southern Plains Transportation Center

•Consortium Members:

- ➢The University of Oklahoma (Lead)
- ➢University of Texas at El Paso (HSI)
- ➢University of New Mexico (HSI
- ➢University of Arkansas
- ➢Texas Southern University (HBCU)
- ➢Texas A&M University/Texas Transportation Institute
- ➢Oklahoma State University
- ➢Navajo Technical University (Native American)
- ➢Louisiana State University
- ➢Louisiana Tech University
- ➢El Paso Community College (HSI)

➢Strengths:

- ➢ Three HSI;
- ➢ One HBCU;
- ➢ One Native American Institution;
- ➢ One Community College
- ➢ Seven Carnegie R1 research universities (LSU, OSU, OU, TAMU, UARK, UNM, UTEP)

Diversity and Strength

➤ Collaboration with tribal governments and communities

➤ Choctaw Nation (UAS and US-69; WFD/training)

➤ Citizen Potawatomi Nation (CPN) (Iron Horse Industrial Park; Hydrogen transport; WFD/training)

➤ Navajo Nation (translation, WFD/training)

➤ Career Tech (e.g., Metro Tech Centers); WFD
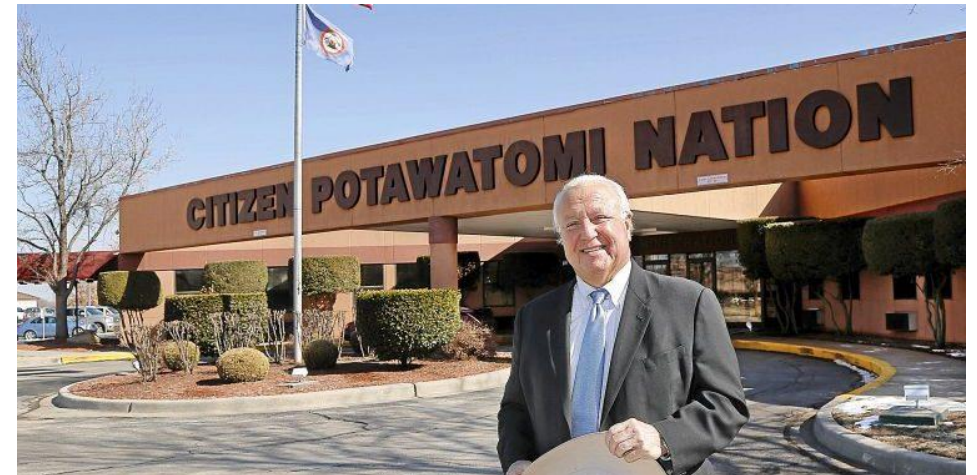
OU Transportation Research: Facilities and Program Elements

➤ **Facilities**
- ➤ South Central Climate Adaptation Science Center
- ➤ National Severe Storms Laboratory
- ➤ National Weather Center
- ➤ Oklahoma Climatological Survey
- ➤ Oklahoma Mesonet
- ➤ Advanced Radar Research Center
- ➤ Broce Asphalt Laboratory
- ➤ Donald G. Fears Structural Engineering Lab
- ➤ Oklahoma Transportation Library (one of top 5 state libraries in the country)

➤ **Program Elements**
- ➤ Research   Workforce Development
- ➤ Outreach   Collaboration
- ➤ Diversity, Equity, Inclusion (DEI)
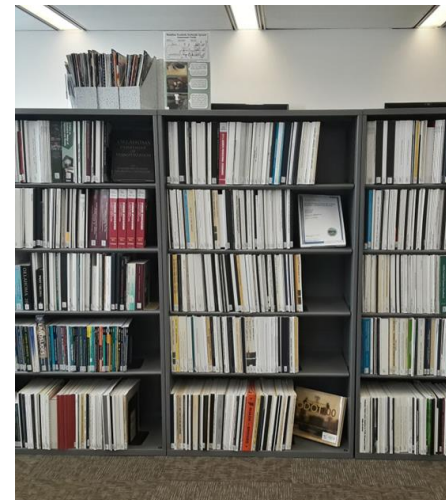
Proposed Research Topics

OKLAHOMA Transportation

➢ **Topic 1:** Novel Technologies & Tools for Extreme Weather Prediction & Assessment of Impact on Infrastructure Durability [3 projects]

➢ **Topic 2:** Novel Materials & Emerging Technologies to Enhance Durability, Sustainability, & Extend Infrastructure Life [5]

➢ **Topic 3:** Innovative & Cost-Effective Methods to Improve Durability of Coastal, Rural, & Tribal Infrastructure [3]

➢ **Topic 4:** Performance-Based Infrastructure Life-Cycle & Asset Management [2]

➢ **Topic 5:** Vulnerability Assessment & Safety Enhancement of Interdependent & Multimodal Transportation Infrastructure Systems [3]

October 20

May 2

Question: How do "weather whiplash" events affect infrastructure design and durability?
Outcomes: Novel data-driven flood forecasting models; updated flood-plain maps
Impact: Significant improvement in resiliency when planning and designing transportation infrastructure

Project Example: Novel Tools (P1-2)

Question: How can we rapidly assess conditions and remaining life of pavements?

- ➤ Extreme heat events as well as frequent & intense flooding threaten pavement performance & service life.

- ➤ Apply novel hybrid technologies, including air-coupled ground penetrating radar, laser-based surface imaging, & electromagnetic induction imaging for drainage.

- ➤ **Outcomes:** Rapid assessment of extreme weather impacts on pavements; increase drainage performance and impact on service life; rapid deployment by state DOTs

- ➤ **Impact:** Rapid and cost-effective assessment of damage; measures to return infrastructure to service
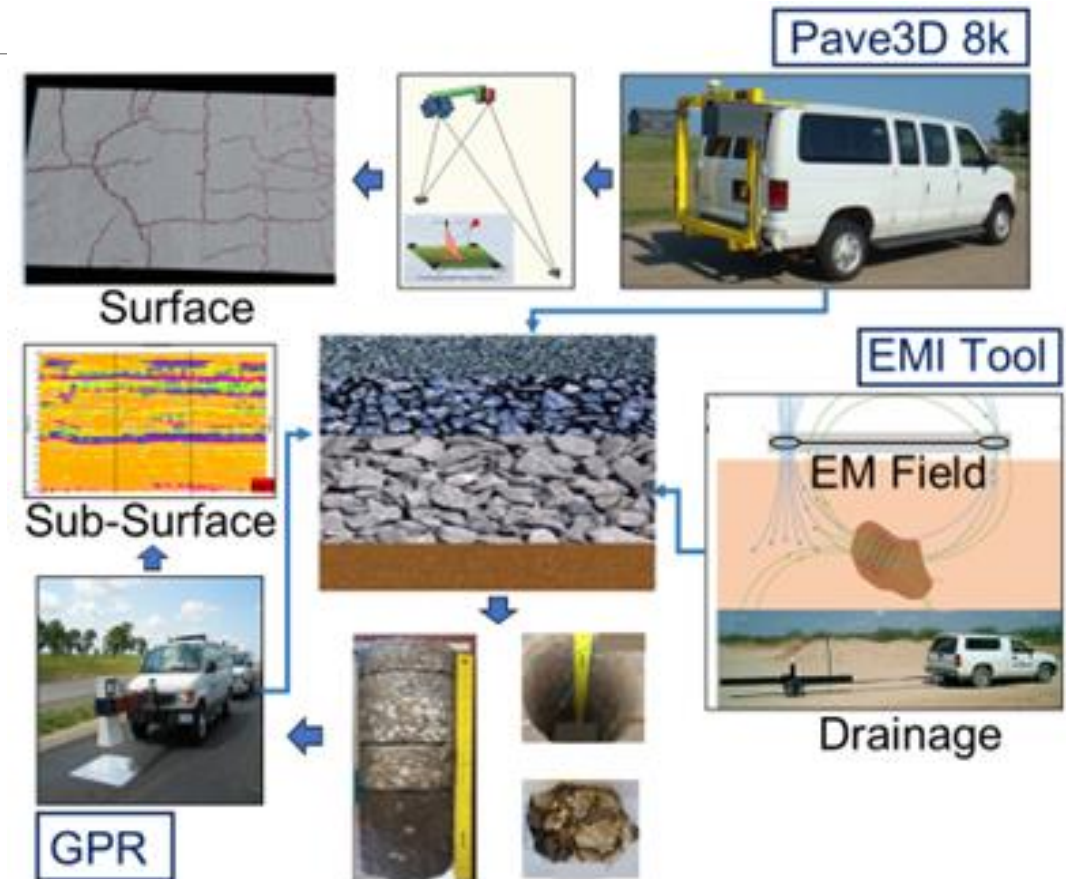
Project Example: Advanced Cementitious Materials (P2-2)

How can we rapidly repair and retrofit transportation infrastructure?

➤ Calcium sulfoaluminate cement concrete
- Significant reduction in carbon dioxide emissions
- Rapid setting, low shrinkage, and limited cracking

➤ Ultra-high performance concrete
- High strength and excellent durability (100 years life)
- Impermeable barrier when used for repair/retrofit
- **Outcome:** Improved durability of new construction and repair and retrofit of existing infrastructure; increased service life

➤ **Impact:** Accelerated and durable repair/rehab. of concrete structures in extreme environment

Steel fibers in ultra-high performance concrete lead to superior characteristics (Video credit: Royce Floyd)

Leadership Structure and Example Activities

Leadership Activities Examples
Transportation Leadership Council (TLC): TLC chapter at each partner institution
TLC Forum: Annual event involving overview of TLC activities, leadership lectures, competition, networking

- **Leadership Webinar Series**: Online event featuring recognized leaders who moderate discussions on critical transportation topics
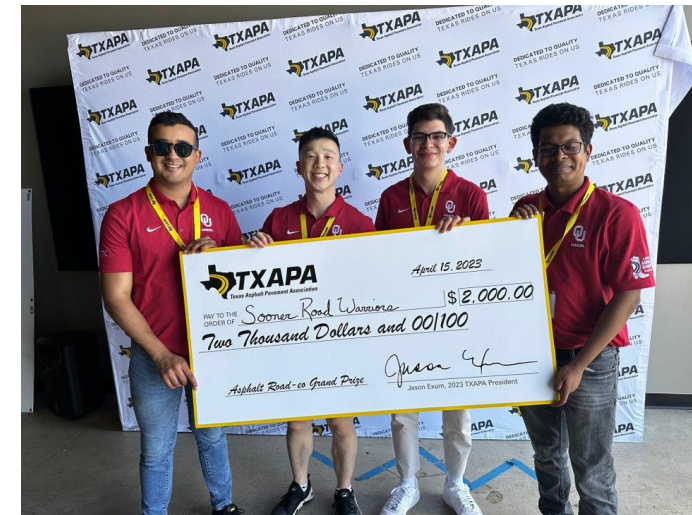
- **Asphalt Road-eo:** Annual competition organized by Texas Pavement Association, Texas DOT, and UT-Austin (2023 competition - OU Team first place

Workforce Development and Training

➢ **Transportation Regional Internship Program (TRIP):** 10 to 12 weeks of real-world experience for students through working at companies, state DOTs, and other places (30 to 60 interns per summer)

➢ **Design Competitions:** Concrete canoe, Steel bridge, geo-challenge, Asphalt Road-eo (All)

➢ **Undergraduate Research Opportunity:** $2,000 per winning undergraduate team; develop "regional topic bank"

➢ **Annual Symposium and Workforce Summit:** student poster/podium presentations, networking with industry and transportation agencies

➢ **Industry Transportation Day**: Hybrid event for networking, understanding needs, strengthening collaboration

Examples of 2022 Interns (20+)

Ways to Enhance Collaboration/Partnership

OKLAHOMA
Transportation

➢Excellent history of partnership
➢Continuous engagement
➢Understanding agency needs
➢Collaborations between OSU and OU
➢ ODOT Design Squads at OU and OSU
➢ Knowledge Management
➢ Pooled Fund Study
➢SPTC can be a great resource
➢More coffee together … we can do it

APPENDIX H. OKLAHOMA STATE UNIVERSITY – TRANSPORTATION RESEARCH PROGRAM AT OSU

Oklahoma DOT Research Peer Exchange

TRANSPORTATION RESEARCH PROGRAM AT OSU

MAY 24, 2023

Program mission

Leading edge research in transportation infrastructure to support the state, nation and the world

Program responsibilities

- Structures and Materials

- Evaluation

- Management

- Safety

Organizational placement – Location in the agency, reporting to what level of management, etc.

- **Civil Engineering at Oklahoma State University**
  - Primary organization to conduct transportation research
  - Past National UTC at OSU
  - Partner of OU and SPTC

- **Oklahoma DOT**
  - Key funding agency to provide long-term support of transportation research at OSU

- **Other Funding Agencies in Transportation Related Areas**
  - NCHRP, FHWA, FAA, FRA, Pooled Funds, and others

By the numbers: Size, research projects, budget, staff, etc.

OSU Transportation Related Research
- $2 million external expenses per year, Approximately
- ODOT SPR Projects & Task Order Program

Total # of Faculty Conducting Transportation Related Research
- 10 professors, more than 50% of all faculty in civil & environmental engineering at OSU

Lead Coordinator of the Program
- Kelvin C.P. Wang

Recent Successes

- Task Order Program Funded by ODOT in the Last Five Years
  - Implementation and Production Impact for ODOT Operation

- Established Annual SPR Mechanism

- New Projects Funded by NCHRP, FHWA, & FRA

- New UTC at OU: SPTC

Biggest Challenges

- Sustainability & Resiliency
  - Both funding levels & transportation infrastructure

- Talents

- Implementation in Field Operations

Transportation Research at Oklahoma State

Capabilities

Pavement/Bridge/Rail/Safety Evaluations

Transportation Materials

Workforce Development & Training

Facilities

Cooper Structural Lab

Sub-mm 3D Laser Imaging Vehicle

Deep-Learning Experimental Lab

Asphalt & Concrete Testing Labs
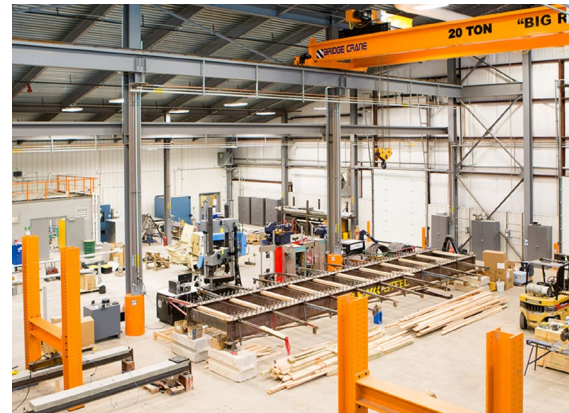
Other information to share

APPENDIX I. UNIVERSITY OF WASHINGTON – PACTRANS COLLABORATIONS WITH STATE DOTS

PacTrans Collaborations with State DOTs

Yinhai Wang, PhD, PE, Dist.M.ASCE, F.IEEE, F.ITE

PacTrans, University of Washington

For Oklahoma DOT Peer Exchange

MAY 24, 2023

PacTrans Introduction

Pacific Northwest Transportation Consortium (PacTrans) is the USDOT UTC for Federal Region 10 which comprises of the following consortium members:

http://depts.washington.edu/pactrans/

- Portland State University

- University of Alaska Anchorage

- University of Idaho

- University of Washington (lead)

- Washington State University

- Northwest Indian College

UW PacTrans Staff

Yinhai Wang, Director

Jeff Ban, Associate Director in Research

Jon Froehlich, Associate Director in Tech Transfer

Linda Boyle, Associate Director in Education

Christina Yarbrough, Fiscal Manager

Cole Kopca Assistant Director

Melanie C. Paredes Program Coordinator

Other PacTrans Staff

Jennifer Dill, Associate Director at PSU

Osama Abaza, Associate Director at UAA

Ahmed Abdel-Rahim, Associate Director at UI

Xianming Shi, Associate Director at WSU
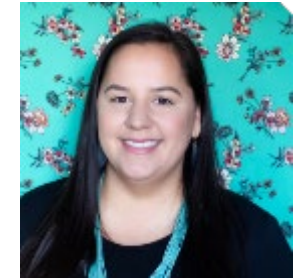
Victoria Retasket Associate Director at NWIC

PacTrans Theme and Goals

PacTrans theme:

Developing human-centered and transformative multimodal mobility solutions for an equitable Pacific Northwest

PacTrans makes its best effort to serve as Region 10's
- Research Engine
- Applied Technology Showcase
- Workforce Development Base
- Education Leader
- Collaboration Platform

Management Structure
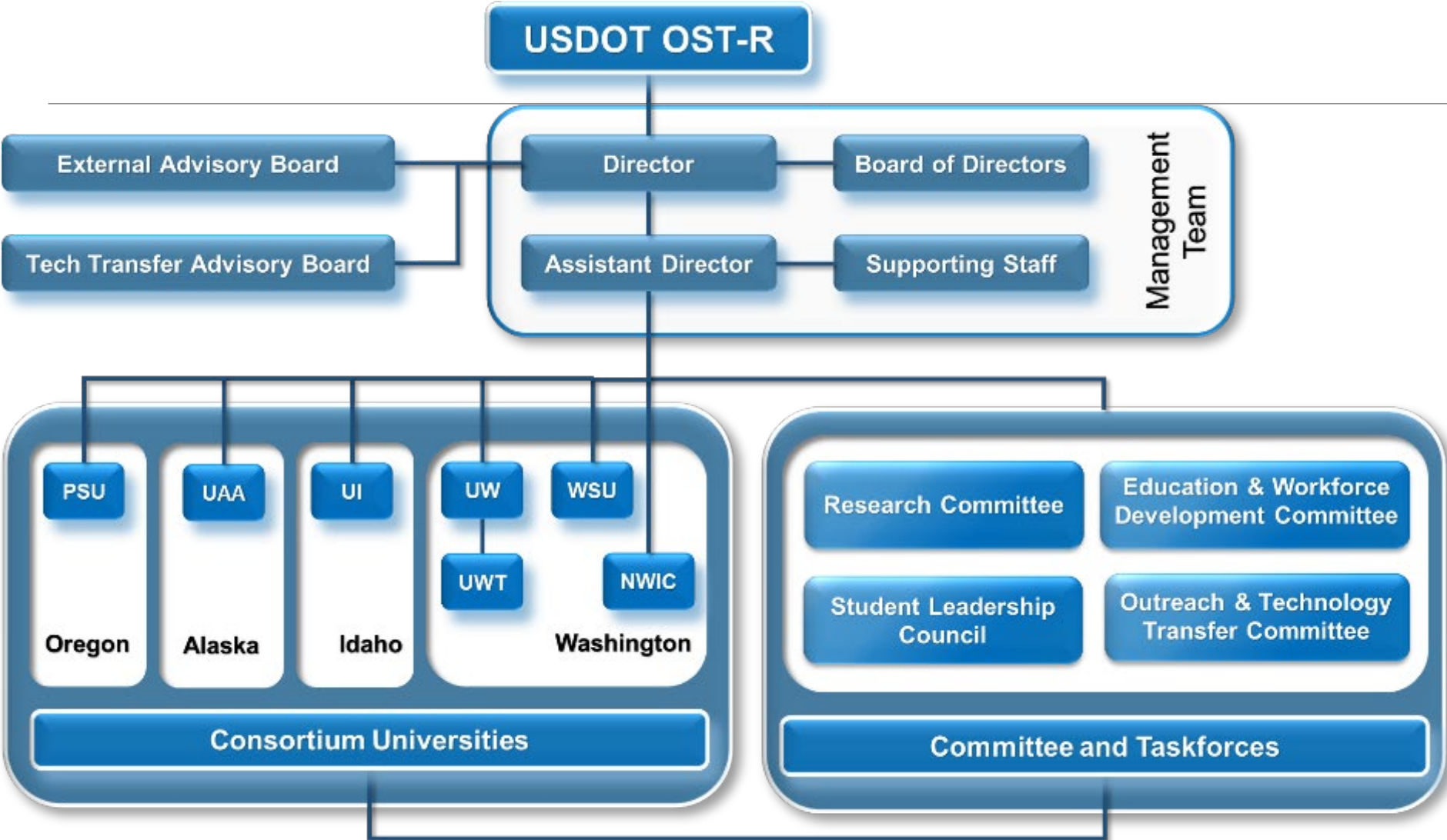
PacTrans External Advisory Board (EAB)

Anna Bosin
Alaska Department of Transportation & Public Facilities (AKDOT&PF)

Anne Freeman
Washington State Department of Transportation (WSDOT)

Michael Bufalino
Oregon Department of Transportation (ODOT)

Ned Parrish
Idaho Transportation Department (ITD)

PacTrans External Advisory Board (EAB)

Anna Zivarts
Disability Mobility
Initiative

Mubbassira Khan
USDOT Highly Automated
Systems Safety Center of
Excellence

James Amundsen
Alaska Native Tribal
Health Consortium

Lewison Lem
Port of Portland

PacTrans External Advisory Board (EAB)

Scott Drumm
CPCS Transcom

Wayne Kittelson
Kittelson & Associates, Inc.

Randell Iwasaki
Iwasaki Consulting
Services, Inc.

Jerry Whitehead
Western Trailers

PacTrans Tech Transfer Advisory Board

Bruce Haldors
CEO, Transpo Group

Shin-Che Huang
EDC/STIC Coordinator
FHWA-Washington
Division

Diane Grant
President, Coral Sales
Company

Carmen Achabal
IGEM Program Manager,
Idaho Department of
Commerce

PacTrans Tech Transfer Advisory Board

Laila Kral
Deputy Administrator at
Local Highway Technical
Assistance Council
(LHTAC)

Ryan Anderson
Commissioner, Alaska
Department of
Transportation and Public
Facilities

Hamed Benouar
Principal at Connected
Transportation Systems
and Networks (CTSN)

Chris Hermon
Director of Trade and
Transportation,
Washington Port
Association

PacTrans Research Thrusts

Transportation equity and accessibility

Multimodal system and connectivity

Safety, reliability, and resiliency

Human-system integration; and

Developing transformative solutions.

Research Budget and Project Types

PacTrans receives $3 million per year from USDOT and same amount of match from local agencies and industry.

Highlights: multi-institutional collaboration and exploratory investigation

Multi-institutional collaborative projects ($1.95 million)

Small exploratory investigation projects ($1.50 million)

Research Budget

43%

57%

■ Multi-institutional

■ Small
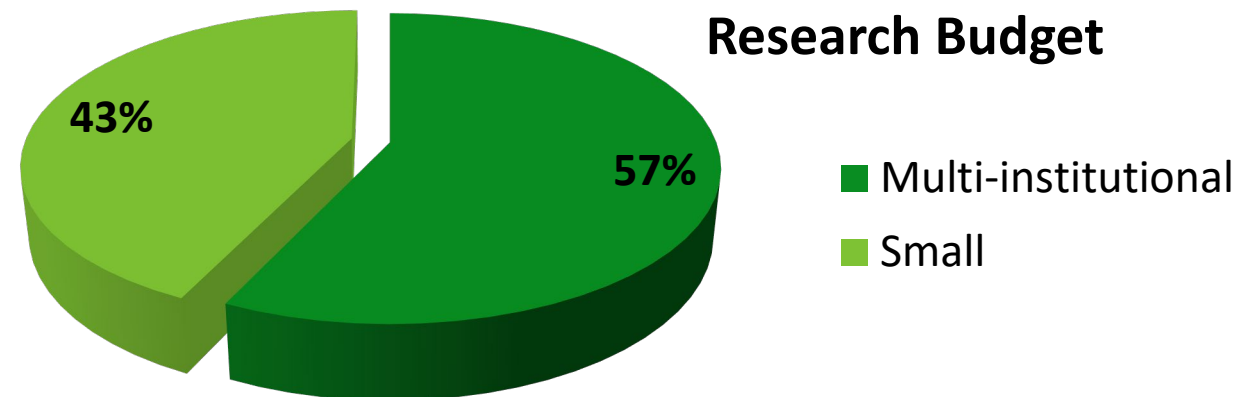
PacTrans Research Program

Our Process Is Open and Transparent
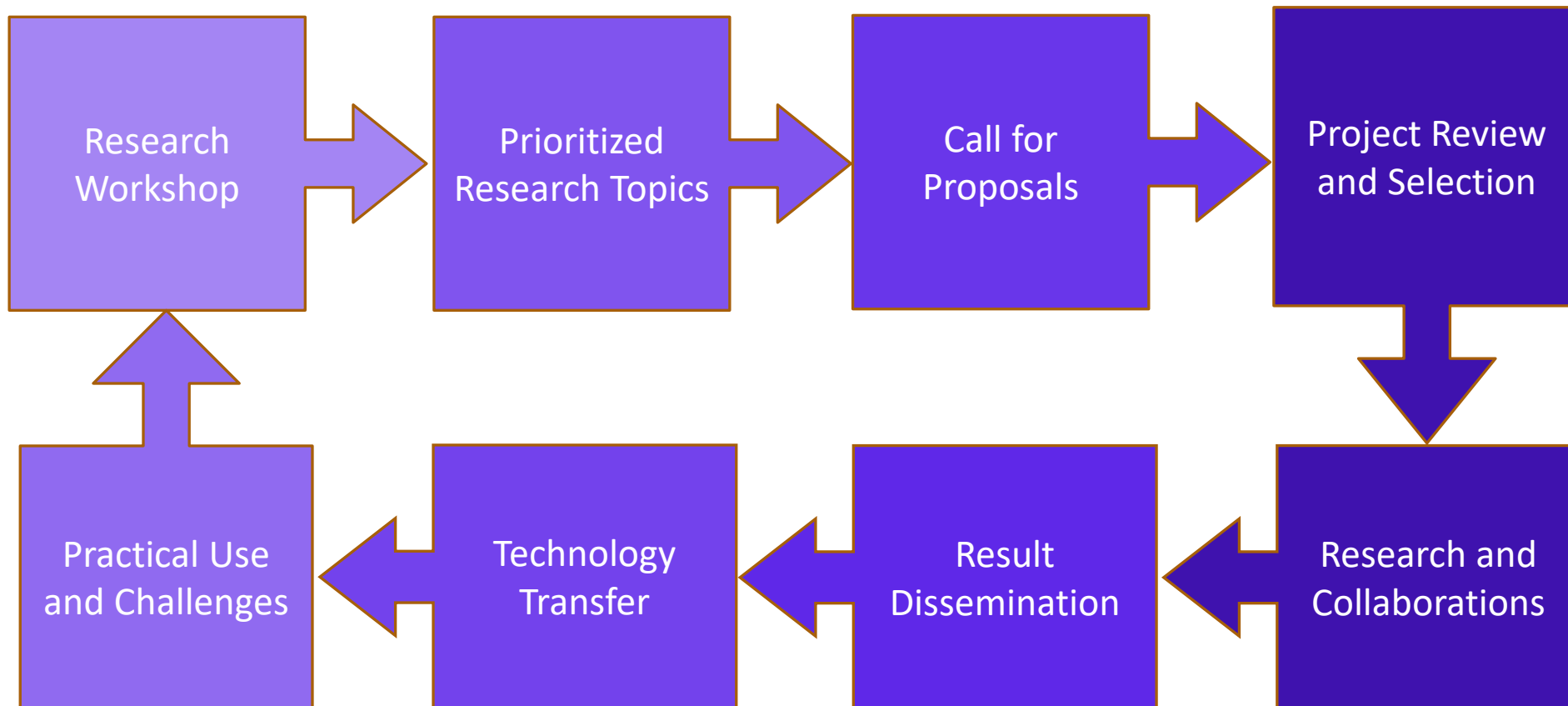
PacTrans Research Workshop

We host research workshop periodically to identify important research issues for Region 10. State DOTs' inputs are critical for us to identify critical regional transportation challenges.
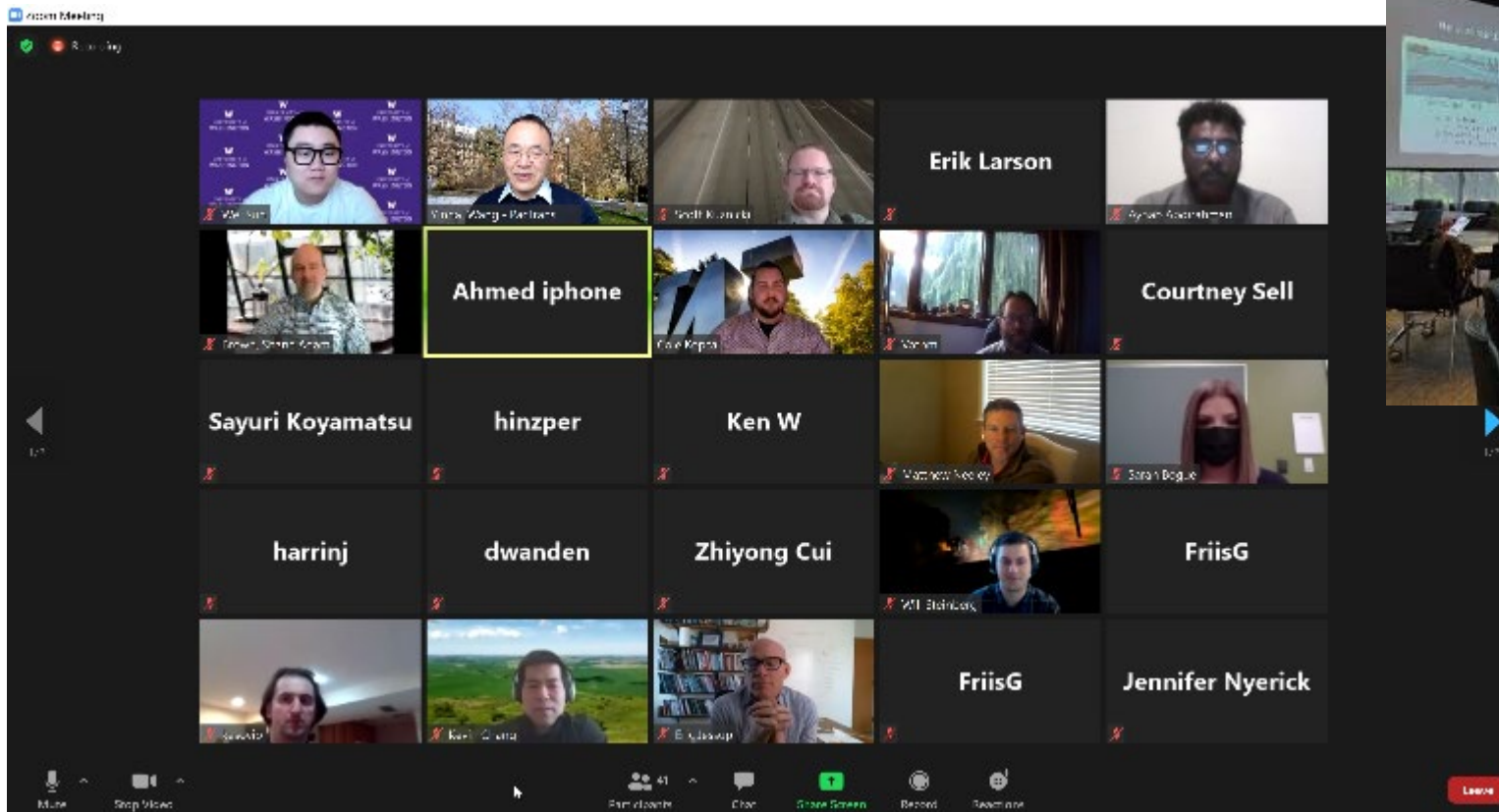
Example Technology Transfer Activity

Example Technology Transfer Activity

Example Workforce Development Activities

PacTrans Workforce Development Institute

Example Workforce Development Activities

PacTrans Summer Transportation Camps

Example Workforce Development Activities

WSDOT-PacTrans Intern Programs

Example Outreach Activities

PacTrans' Introduction to Autonomous Cars for Middle School Students

PacTrans Conference

PacTrans hosts Region 10 Transportation Conference each year, typically the second Friday of October.

PacTrans Conference

PacTrans Collaborates with WSDOT for the ASCE ICTD 2022

Biggest Challenges

❑ Matching Funds

❑ Staff Turnovers

❑ Funding Cycle Differences

❑ Practical Research vs. Theoretical Research

❑ …

Thank you!

APPENDIX J. OKLAHOMA – CARBON REDUCTION STRATEGY DEVELOPMENT

Oklahoma Carbon Reduction Strategy

Carbon Reduction Strategy (CRS) Development

May 24, 2023

Carbon Reduction Program

What is it?
New formula program established by the Bipartisan Infrastructure Law (BIL)

Purpose
Provide funding for projects designed to reduce transportation emissions, defined as carbon dioxide (CO_2) emissions from on-road highway sources.

Requires development of Carbon Reduction Strategy

Funding suballocation according to population

For more information: https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

OKLAHOMA
Transportation

CRP – Funding Suballocation

CRP TOTAL FUNDING

Any area 35%
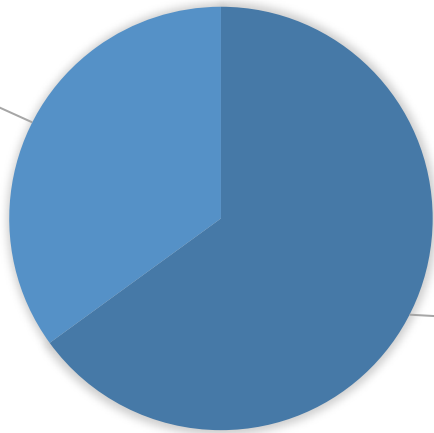
Allocated by population **65%**

$106 million over 5 years

Suballocation Areas

- Urbanized areas with population 5K to 50K
- Urbanized areas with population 50K to 200K
- Urbanized areas with population > 200K

Tulsa

Oklahoma City

Frontier MPO

Lawton

N

0 25 50 100 Miles

OKLAHOMA Transportation

Timeline

We are here

MPO Meeting #1
- CRP Program Overview
- Solicit Information

Feb (2/6/2023)

Internal ODOT/Tribal Stakeholder Meeting #1
- CRP Program Overview
- Solicit Information

May (5/8/23 & 5/9/23)

MPO Stakeholder Meeting #2
- Carbon Reduction Strategy Framework

June (6/27/23)

Internal ODOT CRS Review
- Draft Carbon Reduction Strategy & Implementation

Aug/Sept

Submit Draft Carbon Reduction Strategy
- Draft Carbon Reduction Strategy to ODOT for review

Oct

External Review
- MPO Review

Oct

Final Carbon Reduction Strategy
- Present final Carbon Reduction Strategy to FHWA

November (11/8/2023)

OKLAHOMA Transportation

Vision Statement

Oklahoma will continue to strive for a multimodal transportation system that reduces emissions and supports an improved natural environment and enhanced quality of life for residents.

OKLAHOMA
Transportation

Preliminary Goal Examples

Goal Area 1: Safety and Security

Ensure a safe and secure transportation system for all users and modes.

	CRS Project Categories
Reduce traffic-related fatalities and serious injuries sustained on Oklahoma's multimodal transportation system **by encouraging alternative modes of transportation that reduce transportation related carbon emissions.**	
Improve the safety and efficiency of freight movement and its interaction with other vehicles, **to reduce transportation related carbon emissions**.	

* Modified language from the LRTP, OFTP, or OPTPP that supports a reduction in transportation emissions

Goal Area 2: Infrastructure Preservation

Preserve and maintain the condition of Oklahoma's multimodal transportation system in a state of good repair through a process that considers lower emission construction practices.

	CRS Project Categories
Move toward construction practices that result in reduced emissions when improving and maintain pavement and bridge conditions on the state highway system.	
Improve and maintain the condition of **the freight rail system** and public transit vehicles, equipment, and facilities.	
Protect existing and design new transportation infrastructure to meet travel needs in response to extreme weather events and other environmental conditions.	
Support the preservation of Oklahoma multimodal freight networks through appropriate policies and initiatives.	

OKLAHOMA Transportation

Carbon Reduction Strategy
Fact sheet | Spring 2023

Transition to Cleaner Transportation

Under the Infrastructure Investment Jobs Act (IIJA), states are allocated funding for several transportation projects including those that reduce transportation carbon emissions. Under this law, Oklahoma Department of Transportation (ODOT) will develop and adopt a statewide Carbon Reduction Strategy (CRS).

Reducing carbon emissions will require partnerships from local, state and federal governments and private industries. Collaboration is necessary to identify multiple strategies and resources to create and execute safe, effective and affordable solutions through existing and emerging technologies.

What is a Carbon Reduction Strategy (CRS)?

States must submit a Carbon Reduction Strategy that will outline how they plan to approach and incorporate carbon reduction efforts into their statewide transportation planning processes.

What should be included in the CRS?

Each state is required to develop a plan in consultation and coordination with Metropolitan Planning Organizations (MPOs). The plan must identify projects and strategies each state will implement to reduce transportation carbon emissions. The Strategy must be relevant and contextual according to each state's population density. The plans will be updated every 4 years.

Congestion Management and Mitigation

Alternative Fuels/Energy Efficiency

Emerging Technology

Active and Alternative Modes

Other Mobility Solutions

OKLAHOMA Transportation

Existing & Future Projects Identified in Survey

- Natural Gas Fleet
- FHWA Climate Challenge
- Congestion Management and Mitigation Technology
- Balance Mix Design Asphalt
- ITS
- Alternative Fuel Fleets

Other Ways to Reduce Carbon Within ODOT

- Integrate into planning processes and documents
- Prioritize investments that support carbon reduction.
- Sustainable materials (Construction & Maintenance)

Menti Results

Please share what division you represent

communications
environmental programs
innovation   strategic
            planning   odot
its
local government
maintenance
    fleet maintenance   tap coordinator
traffic
        project management
            multi-modal
    local government division

Choose the top 2 project categories that your department is most prepared to implement

Bar chart:
- Traffic/Congestion Management: 11
- Alternative Modes: 5
- Alternative Fuels/Energy Efficiency: 3
- Technology Solutions: 6
- Other: 0

Next Steps

We are here

MPO Meeting #1
- CRP Program Overview
- Solicit Information
Feb (2/6/2023)

Internal ODOT/Tribal Stakeholder Meeting #1
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- MPO Review

Oct

Carbon Reduction gy
final Carbon Reduction y to FHWA
ber (11/8/2023)

OKLAHOMA Transportation

Questions?

Sarah McElroy

Planning Coordinator

Government Affairs

Oklahoma Department of Transportation

SMcElroy@odot.org

APPENDIX K. OKLAHOMA – OKLAHOMA NATIONAL ELECTRIC VEHICLE INFRASTRUCTURE PLAN

Oklahoma National Electric Vehicle infrastructure Plan

The State's Plan to be the Leader in Electric Vehicle Infrastructure Deployment

$7.5B in IIJA/BIL Funding for Charging Infrastructure

$5B National EV Infrastructure (NEVI) Formula Program

- First, Interstate Highways & Alternative Fuel Corridors (AFCs) must be "fully built out" to the following standard:
  - Charging Stations installed every 50 miles
  - Charging Stations within 1 travel mile of exits

- Becomes discretionary for publicly accessible EV charging on any public road once AFCs are fully built out

$2.5B in Discretionary Grants

- $1.25B for Corridor Charging/Fueling
- $1.25B for Community Charging/Fueling
- For electric, hydrogen, propane, and natural gas fueling infrastructure

FEDERAL REGISTER

The Daily Journal of the United States Government

NATIONAL ARCHIVES

80% federal funds with 20% match

97% charger uptime 24/7/365 availability

Justice40 compliance (40% of benefits to Disadvantaged Communities)

Quarterly and annual reporting

- **Procurement Process Transparency**

- **State DOT Annual NEVI Plan Updates**

- **Long-term Stewardship: 5-year**

- **Use of Program Income**

- **Payment Methods**

- **Interoperability of EVSE**

- **EVSE Network Communication**

- **Communication of Price**
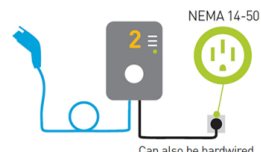
- **Third-Party Data Sharing**
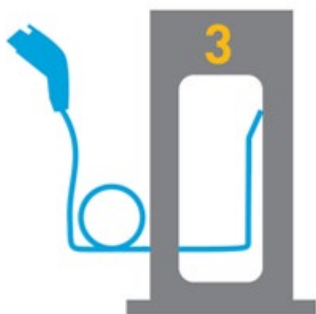
DC FAST CHARGING
Approximately 100 to 200+ miles of range per 30 min. of charging

CCS Connector
CHAdeMO Connector
Tesla Connector

NEMA 5-15

NEMA 14-50
Can also be hardwired

LEVEL 1 CHARGING
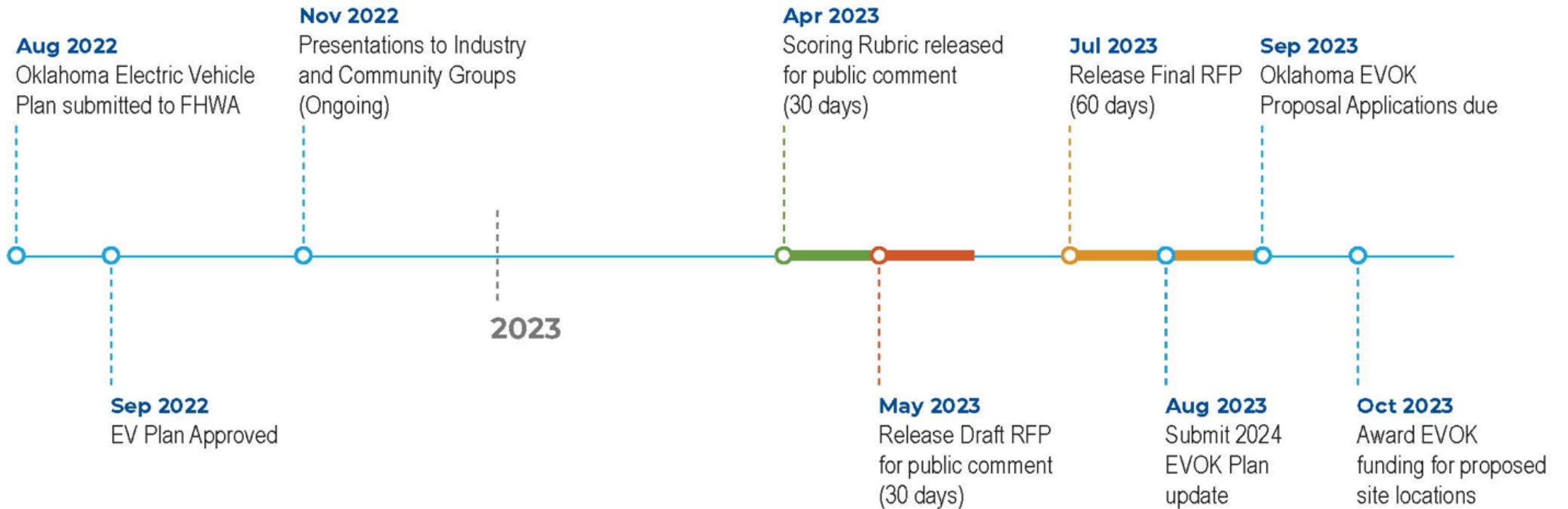Approximately 5 miles of range per 1 hour of charging
J1772 Connector

LEVEL 2 CHARGING
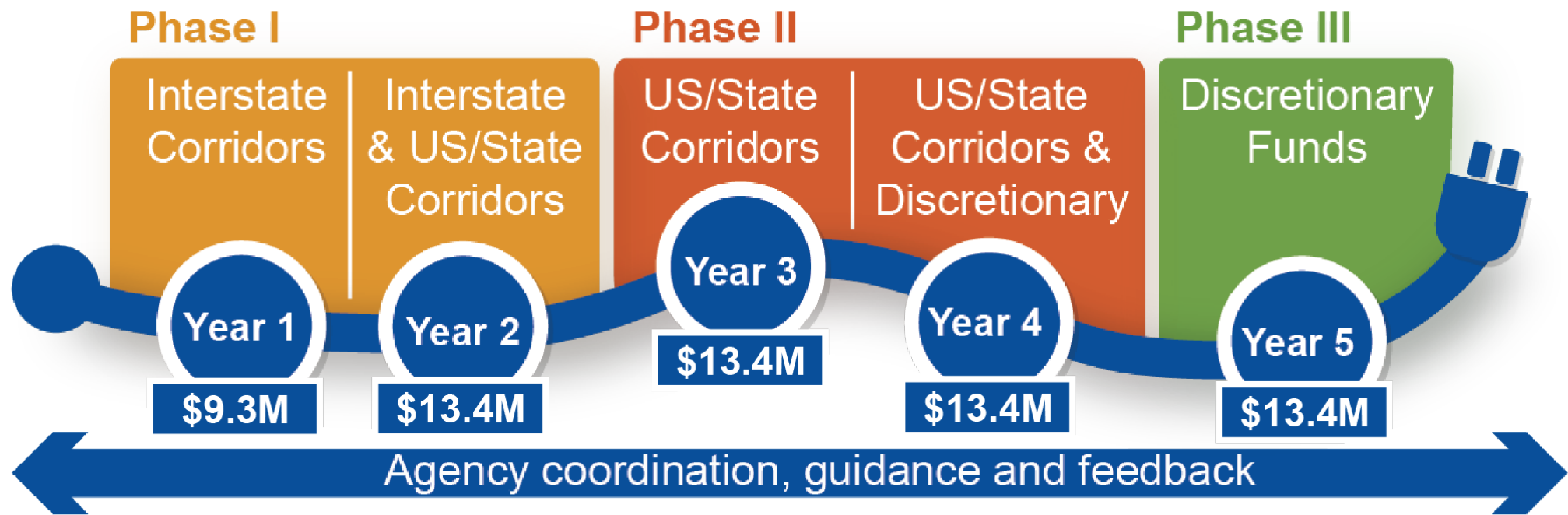Approximately 25 miles of range per 1 hour of charging
J1772 Connector
Tesla Connector

- First, Interstate Highways & AFCs must be "fully built out" to the following standard:
  - Charging Stations installed every 50 miles
  - Charging Stations within 1 travel mile of exits
- Must be publicly accessible DC Fast Charging Stations with:
  - At least Four 150kW DC Fast Chargers
  - Must have Combined Charging System (CCS) ports
  - Must simultaneously DC fast charge four EVs at 150kW continuously for 600kW total power

Deployment Phases & Timeline

Aug 2022
Oklahoma Electric Vehicle Plan submitted to FHWA

Sep 2022
EV Plan Approved

Nov 2022
Presentations to Industry and Community Groups (Ongoing)

2023

Apr 2023
Scoring Rubric released for public comment (30 days)

May 2023
Release Draft RFP for public comment (30 days)

Jul 2023
Release Final RFP (60 days)

Aug 2023
Submit 2024 EVOK Plan update

Sep 2023
Oklahoma EVOK Proposal Applications due

Oct 2023
Award EVOK funding for proposed site locations

Source: ODOT

*Does not include Project Management