AASHTO REGION 3
RESEARCH PROGRAM PEER EXCHANGE

Co-Sponsored by Illinois DOT and Wisconsin DOT

Hosted by Wisconsin DOT

Madison, Wisconsin

May 14 to 16, 2024

Prepared By:
Applied Pavement Technology, Inc.
115 West Main Street, Suite 400
Urbana, IL 61801
217-398-3977
www.appliedpavement.com

August 2024

AASHTO Region 3 Research Peer Exchange Summary

- Research helps to support agency goals.
- Research staff skills include research project management and subject matter expertise. The current trend is toward more project management.
- Research ideas can generally come from anyone but most often a champion is needed to lead. Some agencies host a focused research needs day where research topics are reviewed with the submitters or where potential topics are reviewed and discussed with prospective proposers.
- Research teams are often separate from other groups in the Department, which can challenge coordination and communication with SMEs.
- Most research is completed by external partners, including universities and consultants.
- Keys to research staff hiring and retention include:
  - Pipelines with local universities.
  - Career paths.
  - Varied and interesting assignments.
  - Work flexibility.
  - Access to new technology and innovations.
  - Ability to participate in field work.
- Professional development of workforce is important and can be done both internally and externally; example training opportunities include:
  - Classes on communication.
  - PM training.
  - Leadership.
  - Public speaking.
  - Conferences for networking.
  - 508 training.
  - Diversity events.
- Knowledge Management System benefits include:
  - Contribute to monitoring and planning of research.
  - Facilitates sharing information.
- Implementation, planning, and consideration of ROI of research are all important and many different approaches are used to measure those parameters.
- Implementation considerations should be worked into the RFP and assessed throughout the course of the project.
  - Specific products or deliverables should be included to help facilitate/support implementation (e.g., draft specs).
  - A DOT champion can help with the implementation process.
  - A range of other products can help promote and publicize the results of the research (e.g., Tech Briefs, infographics, short 2- to 3-minute videos, etc.).
- Implementation should be tracked and its impact quantified. However, measuring ROI is not always just about costs, as other factors (safety, sustainability, longevity) may be of value and are not always cost calculable.
- The ability for research groups to also execute contracts adds flexibility and responsiveness to special or emerging needs.
- Researcher timeliness in meeting project deadlines seems to be a recurring issue. Some strategies used to address timeliness include provision of upfront summary of budgets, and deliverables to the researcher at the beginning of the project; hosting of regular meetings (as frequently as monthly) with the researcher; generation and monitoring of Gantt charts; and alerts from their research project management systems.
- The value of research project management systems includes the ability to share information across a larger group of interested staff and the ability to track most aspects of a research project (e.g., budget, schedule, deliverables).

Introduction

On May 14-16, 2024, the Illinois and Wisconsin Departments of Transportation (DOTs) jointly hosted a peer exchange (PE) focusing on DOT research programs. The purpose of the peer exchange is to share experiences, practices, and ideas that can be used in the effective administration and management of DOT research programs. Research staff from the Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Ohio, and Wisconsin DOTs, representing American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC) Region 3, participated in the 2.5-day, in-person event held at the Department of Administration Building in Madison, Wisconsin. FHWA representatives from Wisconsin and Illinois also attended. The list of meeting attendees is provided in Appendix A, while the meeting agenda is presented in Appendix B. The presentation slide decks featured throughout the meeting are available in Appendix C, while select photographs from the event are provided in Appendix D. Some of the major topics covered in the peer exchange included:

- Workforce development.
- Knowledge management.
- Research project development.
- Research project management/tracking.
- Implementation strategies, tracking, and return on investment.

This document summarizes key discussions and key takeaways from the peer exchange.

Tuesday, May 14, 2024

Opening Session

Ryan Spaight, Wisconsin DOT, welcomed the group on behalf of the Department and introduced Mr. Craig Thompson, the Secretary of the Wisconsin Department of Transportation and the newly elected President of AASHTO. Mr. Thompson emphasized the importance of research in contributing to a safe and efficient transportation system and pointed out that the results from research have big impacts that lead to more data-driven procedures and decisions (Figure 1). He highlighted that safety is the top priority as the Department takes specific action to reduce traffic fatalities for drivers, road users, and pedestrians. Mr. Thompson encouraged the open sharing of information and ideas among the representatives over the 2.5-day meeting.

Figure 1. Secretary Thompson provides opening remarks.

Introduction to State DOT Research Groups

Each participant provided introductory information on their research group and what they hoped to get out of the PE; this expanded upon the responses that each DOT had previously provided in response to a solicitation that was sent out prior to the meeting. Specific topics identified include:

- Size of the research group.
- Research group location within the DOT.

- Strengths.
- Challenges.
- Future training opportunities or needs.
- Peer exchange interests.

Table 1 summarizes the responses provided by the various agencies.

Current Practice (CP) Discussion

Following up on the introductory presentations, targeted discussions were held on selected topics.

CP Question 1: How does the location of the program impact how the research program works?

Several DOTs commented that they are separated from other groups in the Department, and therefore have to reach out and meet with the other groups to solicit and coordinate research and to make sure they are meeting the diverse needs of their organizations. The subject matter experts (SMEs) are in other areas so that requires additional coordination. The researcher selection process often includes representatives from other divisions and/or district personnel.

CP Question 2: What is the research program's annual research budget?

Figure 2 depicts the range in the annual research budgets for the represented DOTs. Ohio commented that all of their funding is SPR money, and further noted that there is a local roads program that is also supported. Minnesota indicated that their Local Roads Research Board (LRRB) funding comes from the county and municipal state aid fund totaling about $3M. Iowa remarked that their local research board funding is about $2M, with parts of that funding coming from cities and counties.

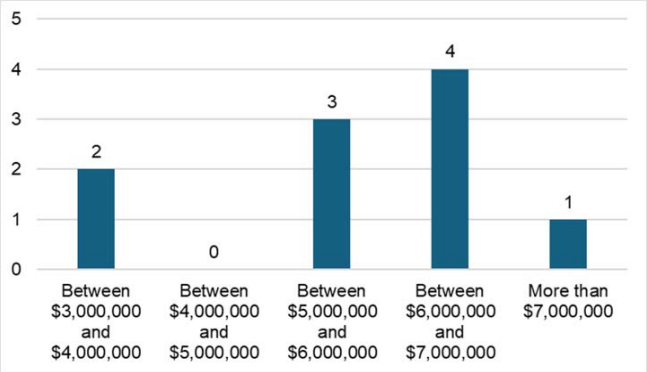


Figure 2. Annual research budgets.

CP Question 3: How would you assess the staffing for your research program?

The staffing for each DOT is shown in the third column of Table 1. General discussions related to staffing levels and composition are summarized below.

- Engineers on the research teams seem to be doing more administrative and management work than actual research. Minnesota has reduced the number of engineers on the research team, while Kansas maintains engineers on staff as they do a fair amount of research in house.
- Missouri has to secure waivers to get non-engineers on staff and expressed a concern that engineers commonly may not have the needed project management experience to administer projects.
- Ohio noted that their research group previously included a lot of engineers but that has changed. The administrative staff does most of the project management and administration while the engineers in the department provide technical reviews.

Table 1. Summary of agency-reported responses.

Agency	Research Group Location in DOT	Staff	Strengths	Challenges	Future Training Opportunities or Needs	Peer Exchange Interests
Ohio	Office of Statewide Planning and Research	4 (+ intern joining in June)	• Opportunities to connect with the entire agency. • Research is a go-to resource. • Small but mighty. • Cradle-to-grave research oversight (RFP to wrap up).	• Technical champions. – No SMEs on staff. – SME management. – SME turnover. • Agency can get in its own way when implementing research results. • Research section staffing (losing 35 years of experience in a few months). • Cradle-to-grave oversight. – A challenge for 4 people and 60 active contracts, 20 RFPs, and PF studies.	• Developing training videos. • Developing a Resource Guide on internal processes. • How to best utilize new technology (e.g., AI/ML). • Finalize implementation tracking process. • Identify method for ROI. • Hire more staff.	• Collect ideas on how to address our challenges. • Collect ideas on workforce development. • Network with Region 3 colleagues.
Kansas	Division of Project Delivery (shares the lab with Materials)	16 (with 4 vacancies)	• In-house professional and technical staff. • State funding in addition to SPR. • Supportive executive staff. • Cooperative and supportive FHWA. • Physical library and librarian.	• Staffing/retention. • Workload. • Work backlog. • Antiquated document management/storage/ tracking system. • Loss of institutional knowledge. • Field construction issues. – New materials, lack of experienced engineers.	• AI in research and research pubs. • Better project management tracking systems. • Promote project quality and timeliness. • More streamlined procurement. • Quality meetings with the “right” people. • Recognize high-performing employees. • Contracting with out-of-state researchers.	• Workforce development. – Attract/retain quality staff. – Prioritize workload. • Knowledge management. – Mitigate loss of institutional knowledge. – Document/share current knowledge.
Missouri	Central Office—Construction and Materials	4	• Increased budget in recent years. • High profile with MoDOT. • Close relationships with Executive Team. • Dedicated staff. • Been within research longer than most.	• Workforce throughout DOT. • Increased program at DOT. • Internal budget processes. • Researcher timeliness and quality. • Implementation.	• Promote project management and leadership. • Develop formal. • Strategic Plan. • Push divisions for implementation.	• Implementation. – Struggling with divisions having the bandwidth to implement.
Iowa	Transportation Development Division	7 (including 2 augmented staff and 2 shared staff)	• Lead the largest number of pooled funds (with 0.5+0.5 staff). • Small staff means we can pivot easily to changing needs of department. • Small staff means we have to focus on projects rather than superfluous management items.	• Small staff limits the program exploration of flavors of the month. • Have to focus on projects of need rather than projects of want.	• Hire more people. • Do more pooled funds (maximize funding). • Explore project management tools.	• Research project management –Systems that others are using. • Identify low resource research implementation activities. • What is workforce development when it comes to research?

Table 1. Summary of agency-reported responses (continued).

Agency	Research Group Location in DOT	Staff	Strengths	Challenges	Future Training Opportunities or Needs	Peer Exchange Interests
Michigan	Bureau of Field Services	10	• Strong, experienced team with good relationships throughout the Department. • Established and defined program with effective processes.	• Loss of funding. • Loss of expert staff. • Balancing SME workloads.	• Orient new staff to program and processes. • Continued growth of experienced staff (DEI, innovation, PowerApps). • Develop the innovation and implementation programs. • Document best practices with the UTC program. • Maintain service in the research program.	• Share knowledge and experience. • Program manager training opportunities. • Strategies to solicit participation in research activities. • Addressing DEI elements. • Knowledge management practices, tools, communication. • Management of research project information. • Tools for communicating information.
Minnesota	Office of Research and Innovation in the Sustainability, Planning, and Program Management Division	23	• Research is highly values (heavy TRB and NCHRP involvement). • Strong partnerships (city/county, CTS at UM, and internal partnering). • Funding is available and can be used for both basic and applied research. • Funding is provided to LRRB as road research extends beyond the state highway system.	• Resistance to change or new ideas. • Emerging topics (equity, sustainability) may get overlooked for more conventional topics (pavements, bridges). • Process to get a project funded and contracted is often slow. • Implementation can be slow. • No road map to guide research.	• Conduct research to inform decision making. • Proactively identify and address emerging issues to adapt to rapid change. • Expedite research implementation. • Deploy new and better ways to share research. • Use research to cultivate a skilled workforce. • Engage in strategic partnerships to maximize the impact of research.	• Expedite research to address time-critical opportunities. • Participate in forums on emerging research topics. • Foster stronger connections with academia, industry, practitioners, and community members. • Identify implementation potential throughout the research process. • Streamline process for implementation. • Explore and pilot communication tools for dissemination. • Include diverse perspectives in the research process. • Recruitment and retention, changing workforce. • Impact of new technologies (e.g., AI) on research management and communications.
Illinois	Office of Planning and Programming	4 (including secretary and librarian)	• Fresh start (looking at things with a new set of eyes). • Lots of SPR funding to support internal research and pooled fund studies. • Very supportive executive staff.	• Lack of personnel (for both in-state and national research). • Lack of involvement from the rest of the department.	• Once we hire more staff, we want them to take all the training they can. • Draw more IDOT personnel into the research program. • Consider possible initiatives: – Hold statewide call for projects (to improve daily work). – Hold a research day to generate interest in the program. – Bring back awards to recognize contributions.	• Ideas to better track implementation. • Recruitment ideas for research staff. • Knowledge management tracking and distribution ideas. • Contacts for future questions.

Table 1. Summary of agency-reported responses (continued).

Agency	Research Group Location in DOT	Staff	Strengths	Challenges	Future Training Opportunities or Needs	Peer Exchange Interests
Wisconsin	Division of Budget and Strategic Initiatives	8	• New staff (diverse background and energy). • Program management (strong SMEs, ability to support research projects). • Library and information services (expanded services beyond literature searches).	• Staff turnover. • Reviewing and reestablishing processes. • Budget limitations. • Seeing more end date waiver requests.	• Implementation best practices and tracking. • Tools to manage research projects. • Digitization, data base management, web/computer programs. • Showing value of library, information services, and research ROI. • Make project management more streamlined. • Update procedure and process documents. • Using Access or other programs for project management and reports. • Improve project tracking system. • Promote and showcase the program benefits.	• Discuss topics with everyone and see where we can make improvements. • Hear how other states manage their research programs. • Discuss knowledge management best practices. • Discuss the work that goes into creating information access and products. • Learn how are other research departments are responding to staff turnover.

- Wisconsin noted that they are well staffed for the first time in a long while and agreed that most engineers typically do not have the necessary training in management or communication.
- Minnesota includes both engineers and non-engineers performing project management duties.
- Most research in Kansas is managed by a champion or SME, but the research program provides support and guidance in project management and administration.
- The presence of a technical review panel is a common element in the conduct of DOT research programs.

CP Question 4: What staffing gaps are easier to fill?

- Illinois remarked that both technical and administrative positions are equally hard to fill.
- Missouri had an engineer posting for several years and was unable to fill it. Salaries in the private sector are much higher.
- Wisconsin is currently doing a project on engineering workforce, which emphasized the importance of establishing a pipeline with the universities and portraying the DOT as a viable employer.
- Ohio remarked that non-engineers can fulfill the roles in the research program but must have a strong organizational skill set and the willingness to learn.

CP Question 5: Who performs the research for your agency?

Figure 3 presents a summary of the groups that perform research for the DOTs. Discussion topics are presented below.

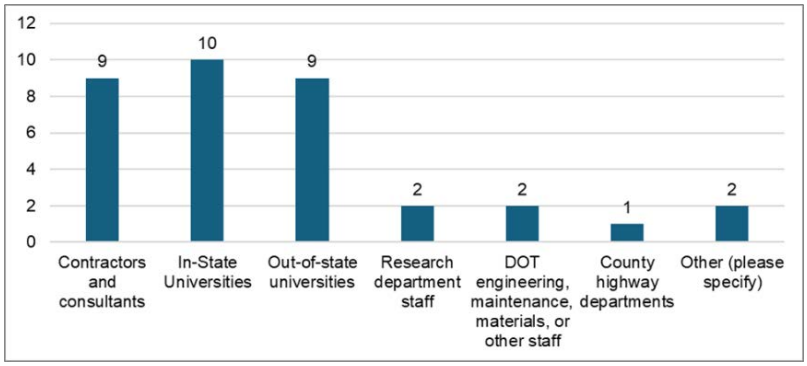


Figure 3. Organizations performing DOT research.

- For projects more than $50k, Ohio must get board approval if the project is going to a firm outside of Ohio. Additionally, if it does go to a firm outside of Ohio, there still must be an in-state partner with at least 20 percent of the budget. In the last round of projects, they saw more responses from consultants than from universities.
- Wisconsin does not have a requirement to perform research in state, but they commonly get questions on it.
- Missouri requires that the contractor have a Missouri PE if they are doing engineering work.
- In Kansas, traditionally the work has gone to state universities, and they do research in-house, but it is not clear if they have the opportunity to go out of state.
- Illinois has no restrictions but does impose a cost share component on its research, which is much easier for universities to secure than private consultants.
- Iowa does not have a cost share requirement, but they have been asked to lead a few pooled-fund studies for other DOTs, as some have restrictions.

CP Question 6: Where do your research ideas come from?

Figure 4 presents the major sources of research topics for DOT consideration. Supplementary discussions are provided below.

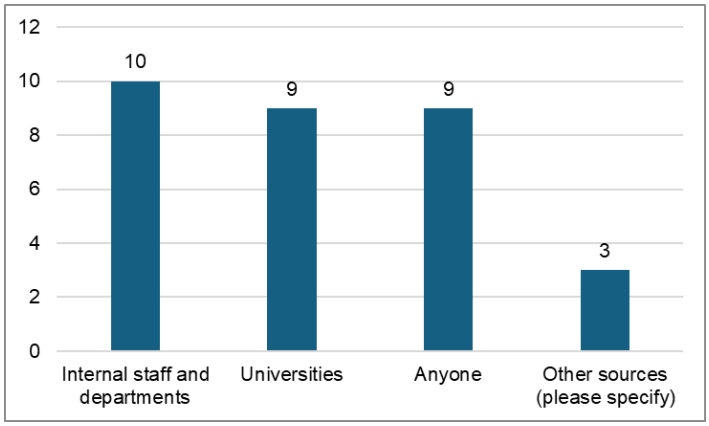


Figure 4. Sources of research topics.

- Michigan indicated that anyone can submit an idea but they all go to a committee for review. They may reach out to Executives in the DOT to get input on specific focus areas. A review meeting is held where the research ideas are discussed.
- Wisconsin has oversight committees representing different organizations (academia, consulting) to help identify and target specific research needs.
- Minnesota accepts research ideas from anyone, but they require a champion to lead the project. For the local roads group, a private consulting firm will attend meetings throughout the state to collect ideas.

- Kansas sends out an email blast (to the DOT, universities, industry, counties, etc.) to solicit ideas and then holds a research needs day to meet with the submitters to review and discuss. The research needs are then scored and go to the next level of review.
- Missouri holds a similar meeting where specific needs from the various areas are voiced and prospective proposers can attend and learn more about the projects. This helps provide better, more responsive proposals.

The opening session concluded with a brief exercise in which participants were asked to provide broad responses on what elements of the research process could be improved in their organization. The results were categorized and reviewed in the end-of-day round robin session.

Workforce Development

Missouri DOT

Jen Harper delivered a presentation on workforce development in Missouri (see slides 67 to 78). The following are some highlights from that presentation:

- Missouri went through a major reorganization, which reduced the research staff from 11.5 FTE to 3 FTE. This led the group to drop in-house research, pavement studies, and field work.
- The research group adapted in a number of ways:
  - Movement away from specialty areas (everyone works on any type of project).
  - Incorporation of contract employees.
  - Reliance on others to facilitate field work.
  - Adjustment of the skill set needs (no longer providing technical content; instead, focusing on management and administration).
  - Building of relationships with researchers/SMEs for guidance (set up Missouri Center for Transportation Innovation).
- Focus on professional development:
  - Classes on communication.
  - Pavement Management (PM) training.
  - Leadership.
  - Public speaking.
  - Conferences for networking.
  - 508 training.
  - Diversity events.

Workforce Development (WF) Discussion

Discussions on workforce development continued using a series of Mentimeter polls.

WF Mentimeter Poll 1: Do you feel you're getting good candidates for research positions?

- Five agencies responded yes, four no, and five said sometimes.
- Having carefully structured/framed job postings to attract specific hires was cited as being helpful.
- There was sometimes frustration with HR in terms of what criteria were used in the evaluation and which candidates would be shortlisted.
- Some candidates may be merely collecting unemployment and are not really looking for a job.

- Sometimes good or interested candidates are not aware of the posting.
- Higher pay in the private consulting sector is an issue.
- Sponsorship for international applicants is a challenge. One agency has overcome this by seeing if a university will sponsor that applicant and then the DOT will use that person as a contract employee.
- There is a concern that many applicants look at the position as a stepping stone and may leave within a few years.
- For some positions, there are ceilings in which no more advancements or raises are possible.
- There are not always awards or recognition for doing good work.

WF Mentimeter Poll 2: What type of training do you offer new employees for research?

- Seven agencies reported on-the-job training and eight indicated both formal and on-the-job training.
- There is an ongoing pooled-fund study on technical training solutions (TPF-5(536)).
- The NHI offers several relevant training courses:
  - NHI Course 151057, FHWA Planning and Research Grants: Program Administration.
  - NHI Course 310124A, Highway Research 101.

WF Mentimeter Poll 3: How long does it take to train a new employee in research?

- The majority of the responses were for more than 1 year, which was felt to be the absolute minimum needed just to get exposed to all aspects of the position.
- Many felt that 4 to 5 years is often needed to learn everything involved in the program, particularly for smaller groups where an individual must be able to cover multiple responsibilities.

WF Mentimeter Poll 4: Is the research program area considered as a stepping stone or a place for a long-term career?

- One agency responded that it was a stepping stone, three responded that research positions offered a good opportunity for a long-term career, and eleven said that it depends.
- Most likely staff would need to go elsewhere for advancements, but this also depends on the size of the research group.
- There is a career path in some of the organizations.
- The position does serve as a stepping stone as it touches on so many different areas and divisions within the Department.
- Things that make staff remain in the research group:
  - Variety of work.
  - Networking.
  - Work is aligned with the agency's mission.
  - Work is appreciated.
  - The results of the work can be seen.
  - Ability to participate in field work.
  - Flexibility and work-life balance.

- Things that may drive staff from the research group:
  - Low pay.
  - Insistence on working in the office.
- Staying connected and maintaining performance is important (Teams chats, monthly work meeting luncheons, periodic field trips/tours). This is easier for smaller teams.

WF Mentimeter Poll 5: How do you motivate staff to develop and continue to stay motivated in their position?

- Identify new opportunities, stretch assignments, or special items that they may be interested in.
- Provide a variety of work assignments.
- Keep them involved in all of the activities of the group.
- Institute an awards and recognition program (after a project or report is finished, have a celebration and recognize accomplishments).
- Remove roadblocks and streamline processes.
- Provide technologies, equipment, and amenities to help them do their jobs.
- Provide flexibility in work schedules, taking into account each individual's needs (some may prefer personal interaction, others may prefer virtual).
- Provide professional development and training opportunities.
- Stay connected with remote staff.
- Provide perks (e.g., ice cream socials, candy bowls) and outlet vents (e.g., throwing water ballons at signs capturing areas of frustrations).

WF Mentimeter Poll 6: Do you think there is a perception of Research within DOTs that has made it more or less difficult to get and retain employees?

- Most participants said no.
- Many indicated that the broad range of topics and high interest level in research make it attractive within the DOT.
- New technology and innovations are of interest to the younger staff.

WF Mentimeter Poll 7: What strategies have you used to ensure knowledge capture when an employee leaves?

- Exit interviews or exit memos.
- Cross training.
- Research and process manuals:
  - Make sure it is inclusive, does not leave out key steps, and is regularly updated.
  - Clearly date each version of the documents or consider making them "living" online documents.
  - Make it visual and incorporate video clips.
- An AI program is available that will "watch" you do something and then write out the process that you followed (www.scribehow.com). However, most state DOTs do not have access to AI programs due to IT security features.

Knowledge Management

Michigan DOT

Jennifer Heron and Mary Hoffmeyer delivered a presentation on the Michigan DOT research administration (RAd) knowledge management system (see slides 79 to 101). The following are some of the highlights of their presentation:

- The goal is to develop a database for collecting, maintaining, and tracking information on research projects (including implementation).
- Key factors that entered in the decision for developing/selecting a knowledge management (KM) system include its longevity, its ease of use, and its shareability.
- The RAd app was built using a combination of three programs: Microsoft Lists, Power Apps, and Power Automate.
- The RAd project database features modules on Project Status Meetings, National Projects, Expired Projects, Implementation Plans, and User-Specific Screens.
- Implementation of research findings is a crucial aspect of the research process, and the system helps contribute to that. Significant benefits to sharing research findings include:
  - Ensures long-term preservation of research data.
  - Provides increased impact and recognition.
  - Facilitates validation and replication by others, which fosters usability.
  - Allows building on the research by others.
  - Streamlines the processes.
  - Increases efficiency.
  - Improves the use of resources.
- RAd captures those benefits by using a strong knowledge transfer plan featuring:
  - A clearly outlined process on how findings are documented and distributed.
  - An improved organization of research projects to help identify when to prepare communications.
  - Proven communication methods.
  - Dedicated staff in charge of developing and circulating these communications.
  - Strategies that help facilitate the distribution of research findings.
- Communication methods include:
  - Research Spotlight newsletter.
    - A research distribution strategy is developed for each newsletter publication (considering audiences, platforms, message, etc.).
  - Research Spotlight Video.
    - 2 to 3 minutes.
    - Both internal and external releases.
  - ArcGIS StoryMaps.
    - Web-based application developed through ESRI.
    - Allows integration of live maps, real-time data, multimedia, etc. within a slide-based format.

There are templates available, but Michigan has found that creating components from scratch allows more customization to their specific needs.

Knowledge Management (KM) Discussion

A facilitated discussion followed on issues and strategies related to various aspects of knowledge management systems. Approximately half of the DOTs were noted to be using a KMS.

KM Question 1: How are agencies managing SMEs and keeping them engaged? What steps are taken to replace SMEs?

- Engagement:
  - Ohio holds monthly meetings (typically 30 minutes) with the researchers, SMEs, and research administrators to review project status and make everyone aware of pending project needs and deadlines. This includes a presentation by the researcher and has been found to help keep things on track. With 50 active contracts and another 20 to 30 pending, they often have 5 or 6 calls in one day. They used to hold the meetings at 6-month intervals but that was too long to wait between check-ins.
  - Kansas holds meetings with the Principal Investigator (PI) once a month to check on progress.
  - Michigan hosts regular internal meetings to identify upcoming project needs, pending deliverables, etc. to make sure they can accommodate the needs of the researchers.
  - Minnesota has a management database that can be used to generate a number of different reports to check the status of a project.

- Replacing SMEs:
  - Michigan responded that others in the technical area or group are asked for replacement suggestions. They are also well engaged with their SMEs, so they often are aware of upcoming changes or departures.
  - Ohio has at least two SMEs assigned to any project and others are often added from other areas; this helps deal with any impacts of unexpected departures.

KM Question 2: What about national-level research engagement?

- Ohio does not directly engage at the national level but does encourage its SMEs to participate in national panels and in TRB and other organizations.
- Missouri does not do much at the national level, primarily because of the small staff. They do share any relevant information from the national stage within the agency.

KM Question 3: What about the implementation segment of KMS?

- Michigan works with the SMEs in developing implementation plans. If the research is not implemented within 3 years they will stop tracking.
- One of the SMEs in Missouri meets with the Divisions to go over recently completed projects and to review the steps taken on implementation.

KM Question 4: What steps are taken to transfer knowledge?

- Ohio has used job shadowing within the research group to help gain insight into the broad range of work activities. They also meet with the research panels, the research team, universities, and other key players to educate, share information, and establish lines of communication.
- Kansas attends meetings with the various groups in the organization (e.g., materials, design, bridge) to share information. There is also a rotational program at DOT to give exposure to different areas.

KM Question 5: Is any training done on an annual basis?

- Ohio previously required that SMEs had to take a technical liaison training course before they could serve on a panel, but they removed that requirement as they were afraid it would diminish interest in serving. They are now leaning to the use of short video clips, typically 2 minutes long and with heavy graphics. They also produce one-page documents that are highly visual and graphic, or simple checklists.
- Missouri has a team site that is called "How To," which anyone can submit to and provide brief guidance on how to perform different activities (e.g., how to upload to SharePoint, how to include screenshots, etc.). These tips are often first tested with others before being posted to the site.

Round Robin Discussion 1

Day 1 concluded with a round robin discussion reviewing the earlier responses on what elements of the research process could be improved. The results were organized into six broad categories and are captured below.

Communication

Table 2 presents the responses related to communication, along with some additional ideas and suggestions that came out during the discussions.

Table 2. Improving communication.

Responses For Improving Communication	Additional Ideas/Suggestions
• Making sure the information gets into the hands of the users. • Expediting the research process and moving things more quickly. • Moving more quickly on emerging and time-sensitive areas. • External communication on project status, budget, milestones, etc. • Internal/External communication: We could better advertise completed projects and sort research reports by subject. • Better communicating the value of research internally and externally.	• Use Tech Briefs and final summary pieces for each project. Set up a template to facilitate completion. • Prepare simplified, non-technical versions with graphics and quotes from the researchers. • Consider the use of newsletters, blog posts, webinars, and short videos. • Organize reports like TRB research in progress and use meaningful key words to better drill down to the specific topic. Add appropriate metadata as well. • Tie-in the release of project reports and Tech Briefs to relevant national days or events (e.g., Bike to Work Day, Work Zone Awareness Week, etc.). • Perform initial literature search during project development stage to help kick-start the project.

Implementation and Outreach

Table 3 presents the responses related to implementation and outreach, along with some additional ideas and suggestions that came out during the discussions.

Table 3. Improving implementation and outreach.

Responses For Improving Implementation and Outreach	Additional Ideas/Suggestions
• Project tracking implementation. • Implementation return on investment (ROI). • Measuring the success of implementation: How can we define and promote the importance of research? • Implementation tracking. • Project tracking and sharing info throughout the organization. • Implementation.	• Need a way to measure and assess ROI. What should be considered and included? • What to include in an ROI may depend on the audience and must be aware of potential political overtones. • Make sure the SMEs support the ROI determination. • An older study in Minnesota showed that the savings from 11 research projects was enough to fund research for 7 years.

Miscellaneous

Table 4 presents miscellaneous comments that did not fit into a specific category, along with some additional ideas and suggestions that came out during the discussions.

Table 4. Miscellaneous comments.

Miscellaneous Comments	Additional Ideas/Suggestions
• Fewer files submitted. • Already submitted and agreed-to budget. • Improve timeliness and quality of research projects and deliverables. • Reduce the red tape for project launches. • Reduce oversight of executive(?) leadership.	• Illinois has different contracting mechanisms for doing work; for example, special projects for immediate needs can get signed off and initiated quickly (up to $75k). Off-cycle research can also be done to meet needs. • Iowa has several on-call research professors who are able to do a quick project or quick review as needed (no paperwork). • Ohio has the project panel conduct PI evaluations at the end of the project, and that information is shared in future project submission. Michigan does something similar, and Iowa maintains “blacklist” letters until current projects are completed.

Staffing/SMEs/Training

Table 5 summarizes the responses related to staffing/SMEs/training, along with some additional ideas and suggestions from the discussions.

Table 5. Improving staffing/SMEs/training.

Responses For Improving Staffing/SMEs/Training	Additional Ideas/Suggestions
• Job aids and training tools. • Training or process document for project oversight committee on how to be a project monitor (not a project manager). • Staffing. • Staffing improvement. • Adjustment of job duties to address workforce shortage. • Research managers assisting project managers (i.e., experts) should not be restricted to the projects they assist on. Expanding research managers' exposure to other areas in the department provides better understanding of the department and how all areas work or can better work together. • Avoid bottlenecks created by subject matter experts that aren't reliable when responding. • More project champions with the proper experience and desire for participation. • Collaboration between technical areas.	• Project champion must be picked before starting a project, otherwise the idea dies. That champion will come up with the needs that are necessary for implementation. • It can be challenging to accommodate the schedule of SMEs, as they are often overloaded with their primary work responsibilities. • SME commitment is important to successful projects and implementable products. Major responsibilities include reviewing the proposals, participating in interim and progress meetings, providing agency support as needed, and reviewing the final report. • Ability to staff projects is an issue. Industry and other outside groups are brought in to help serve on the panel. Younger SMEs are being brought in to chair the meetings and gain experience.

Adjourn

The first day adjourned at 5:10 pm.

Wednesday, May 15, 2024

A review of the suggested improvements to the agency research programs continued on Day 2.

Round Robin Discussion 1 (continued)

Research Needs/Ideas

Table 6 presents the responses related to research needs/ideas, along with some additional ideas and suggestions that came out during the discussions.

Table 6. Improving research needs/ideas.

Responses For Improving Research Needs/Ideas	Additional Ideas/Suggestions
• Our research development process is complicated and could probably be streamlined and simplified. • More participation in research idea/needs development from internal staff. • Promote research results better. • Outreach—Communicate what we do in research and what has been improved as a result of our projects. • Outreach—showing value, perhaps via a dashboard or ROI measurement. • Increased documentation of implementation and outcomes. • Less reactionary project development and more targeted efforts. • Shorten time from idea submission to project start date. • Research ideas—opening up our research ideas to a bigger group. • Host a research needs day to get ideas; host a presentation day to share results. • Sources for ideas, want to hear from other areas in DOT. • Potentially work with entities outside the state with capacity and/or expertise to do the work.	• Several agencies emphasized the need to streamline the overall process, including the time it takes for a project to get under contract. • The importance of showing the value of research was also discussed, perhaps through the use of dashboards or other means. • Be sure to tie the research to the mission of the DOT.

Project Management/IT

Table 7 presents the responses related to project management/IT, along with some additional ideas and suggestions that came out during the discussions.

Table 7. Improving project management/IT.

Responses For Improving Project Management/IT	Additional Ideas/Suggestions
• Better project document management system. • Adopting a formal project management process. • Research project management system/data and document management for projects. • IT solutions: 1) app/web content, 2) new tech management, 3) participation, communication, process to follow. • More diligent on getting partner funds transferred. • Finance project closeout through FMIS.	• Regular meetings with IT help in dealing with various challenges. • IT-related decisions often come from legal counsel and not from the IT group.

Research Project Development (RPD)

Wisconsin DOT

Shari Krueger delivered a presentation on research project development in Wisconsin (see slides 106-116). The following are highlights from the presentation:

- WisDOT total research funding for 2023 was $4.47M. Projects developed by WisDOT total $1.5M.
- There are three different WisDOT research project development tracks:
  - Wisconsin Highway Research Program (26 percent of budget).
    - $95 to $250k per project.
    - 1- to 3-year projects.
    - 4- to 6 new projects per year.
    - Generated by WisDOT Technical Oversight Committee (TOC).
    - Project Oversight Committee (POC) assigned to each project.
  - Policy and Safety First Research Program (5 percent of budget).
    - $90 to $150k per project.
    - 1-year projects.
    - 0 to 7 new projects per year.
    - Requested by any WisDOT section.
  - Materials Management Section (MMS) (3 percent of budget).
    - Typically up to $50k per project.
    - Short term.
    - Requests by WisDOT engineers.
- The project development process varies for each category.
- Shari has started to attend all POC/project meetings, which keeps her aware of progress and any budget or scheduling concerns. Typically, these meetings are held every 4 to 6 weeks.

Illinois DOT

John Senger provided an overview of research project development in Illinois (see slides 150 to 159). Some of the highlights from the presentation are captured below.

- Major players in the research program include:
  - Technical Advisory Group (TAG): SMEs responsible for vetting ideas and needs.

  - Executive Committee: Executive leadership, FHWA, and TAG chairs responsible for approving each full-size project for funding.
  - Technical Review Panel Chair: Individuals responsible for leading the project.
  - Technical Review Panel Members: SMEs from industry, FHWA, academia, central office staff, and district staff.

- The process is open to all research ideas and begins with the TAG meeting in the summer. Needs statements are posted in August/September, and the TAG meets in November to vote on the ones to move forward. After an Executive Meeting in February, the Request for Proposals (RFPs) are posted in April. However, any idea brought forth by a University of Illinois professor automatically goes to them. Projects are awarded in June.
- Special projects can also be awarded; these are short, immediate-need projects with a maximum budget of $75k that can be quickly awarded with minimal paperwork.
- Off-cycle research projects (outside of the normal research sequence) can also be prepared; this is a normal project size and duration but comes from a TRP chair and PI.
- A formal research idea decision chart (see slide 158) outlines the process to be followed.

Research Project Development (RPD) Discussion

A facilitated discussion followed on the processes on research project development.

RPD Question 1: What are the advantages/disadvantages of the WI and IL approaches?

- Ryan commented that the smaller, focused groups used by Wisconsin (on pavements, safety, materials, etc.) help to predefine the allocation of research funding. John noted that they have not run into the issue of having to focus funding in one particular area.
- Ryan also remarked that, during the WisDOT idea generation stage, there are connections made between the research topics and their ability to support DOT goals and objectives. If a project did not align it would not be pursued.
- John acknowledged a similar approach used by IDOT, and further stated that TAG chairs are at the level where they are aware of what new legislation may be under consideration.
- There were comments on the number of groups and committees involved, and whether that created any management and administration issues. John replied that it does create some challenges but helps ensure that all needs are represented.
- An additional concern was the time to go from the initial idea to project funding. The IDOT process is about 1 year, while for WisDOT the WHRP process can take up to 18 months but for their Policy and Safety projects only 3 to 4. Minnesota commented that their process is also about 18 months, which has been identified as a drawback.
- Shari emphasized that the WHRP process is set up such that RFP development work was done only on research ideas that have been approved.
- IDOT's ability to fast-track research through the special projects avenue was touted by several agencies. John reiterated that it is limited to $75k as a check on spending.
- Kansas indicated that they have a process similar to IDOT's, including an "ad hoc" category that allows them to meet immediate needs identified by division directors or bureau chiefs.

- Most states go through a formal RFP process, although there are situational exceptions (e.g., IDOT, Ohio).
- There were some concerns about in-state universities expecting to automatically receive all DOT research; this is what prompted Minnesota to go to competitive RFPs. Several DOTs require justification or have qualifiers to go with out-of-state researchers (e.g. cost sharing).

RPD Question 2: Do you consider research done by neighboring or other states?

- Much of it depends on the applicability of the work to the agency; for example, are the reported findings or results for similar soils, materials, or exposure conditions?
- Literature searches done at the beginning of the project will help identify any similar or relevant work, as most agencies do not want to duplicate research that has already been conducted.

Implementation Best Practices

Iowa DOT

Khyle Clute presented information on research implementation in Iowa (see slides 119 to 122). Topics covered and discussed in the presentation included:

- Implementation is built into the development of the research project, including what documents/activities are needed for implementation and how those translate to deliverables.
- All implementation materials are prepared and paid for within the research project.
- The implementation itself is led by the project champion, so there is limited work done by the research group post-project. This puts the onus for implementation on those that would most strongly benefit from it.
- The implementation potential/likelihood may be considered when evaluating which research projects to develop.
- John Senger inquired if there are more teaming partnerships (e.g., universities and consultants) when implementation plays a particularly key role (as consultants are typically more versed than universities). Khyle has not seen that, but Jen Harper noted that some of their researchers serve on AASHTO and other national committees and are good at drafting specifications. They can produce an initial draft that the DOT can then edit for their unique conditions (which is easier than starting from scratch).

Missouri DOT

Jen Harper described the work being done in Missouri on research implementation, focusing on the following topics:

- Implementation is considered a critical component of research, and they do not want to see the significant investment of time and effort in the research study go to waste.
- About 2 years ago, the DOT started to follow up on completed research and see how the implementation activities were proceeding. They are developing methods of tracking and illustrating implementation progress and achievements, but they still have a backlog of projects to work through.

- They do work in some aspects of implementation in the RFP, but that is something that they could try to incorporate more completely.
  - For example, some deliverables (e.g., draft set of specifications) would help make the results more implementable.
  - There is a desire to focus resources on those projects that will be implemented.
- Retired DOT employees may be a source of assistance in some of the implementation work. These former employees can work for the Department up to 1000 hours a year.

Minnesota DOT

Katie Walker delivered a presentation on MnDOT's implementation program (see slides 124 to 131). Key highlights from the presentation are summarized below:

- Project criteria for implementation:
  - Submitted by a MnDOT employee.
  - Supported by a management-level champion.
  - Demonstrate, test, or advance national, state, or local research findings or test a new practice, idea, equipment, or process.
  - Include a publishable final report and evaluation.
  - Share knowledge and learning through training, webinars, lectures, handbooks, manuals, training videos, etc.
- Implementation process (see Figure 5).
  - Proposal must be linked to a research project.
  - Proposals are accepted on an ongoing basis.
  - Proposals require a MnDOT Project Champion.
  - Proposals are approved by the MnDOT Research Steering Committee.
  - Approved proposals proceed into workplan development.
  - Approved workplans proceed into contracting.
  - Final step is a Notice to Proceed.

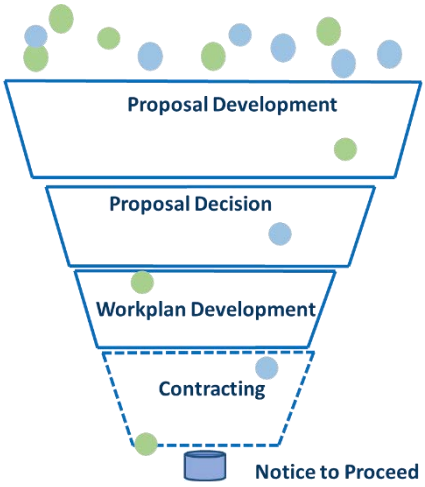


Figure 5. MnDOT implementation process (*courtesy Minnesota DOT*).

- The benefits of the implementation program include the continuous acceptance of ideas, the expedited approval process, and the dedicated funding.
- Challenges in the administration of the implementation program include the diversion of funding from other projects, the potential redundancy in proposals, and prolonged contracting arrangements that can delay the start.
- Suggestions for expediting research implementation include:
  - Proactively identify implementation potential throughout the research process.
  - Streamline the process for transitioning research into implementation.
  - Promote the implementation program to raise awareness and encourage participation.
  - Explore national funding opportunities to support piloting innovations.
  - Identify and pursue industry partnerships to facilitate implementation and pilots.

Ohio DOT

Vicky Fout shared the Ohio DOT's approach to implementation (see slides 132 to 142), with highlights reported below.

- Implementation is emphasized throughout the proposal and project process, from the idea development through the project closeout. The anticipated use of the results coming out of the project is highlighted in the RFP.
- In the project closeout meetings, the needed implementation is reviewed with the DOT program area lead. A research implementation summary (see slide 134) or a research implementation plan (see slides 135 to 136) is produced as a result of those discussions.
  - The *implementation summary* is for projects in which the research is completed, and no additional implementation steps are needed.
  - The *implementation plan* is to outline additional research or the next steps to implement the findings.
- An in-house implementation progress report (see slide 137) is prepared for each project that documents key implementation action items and the progress accomplished to date.
- An implementation retrospective report (see slide 138) is periodically prepared that summarizes the number of projects by technical area, their influence by key impact area (enhancing knowledge, cost savings, time savings, leverage), their return on investment, and their impacts on policies, specifications, student support, and partnership development.
  - The challenge is that all of this requires a full-time person to access the project information, develop the documentation, and manage and coordinate the implementation.
  - To help with this, a new process is being introduced that includes adopting a decision-tree type tool (see slides 140 to 142) to help identify those projects and those areas to focus on.
  - This tool is still being evaluated and refined, and it will be tested on some current projects.
- Ryan inquired if there are accountability measures to ensure that project leads are filling out the reports. Vicky responded that the research group completes the spreadsheets with input from the project leads.

Implementation Best Practices (IBP) Discussion

A free-flowing discussion followed on various aspects of research implementation:

- Most agencies indicated that they were considering implementation at the front end but to varying degrees. The Iowa DOT was recognized for the amount of up-front work that they put into implementation.
- Ohio does a 1-year checkup with the research teams on implementation. Those meetings are scheduled in advance so the research teams are aware and can adequately prepare. The number of project implementation checkups will depend on the type of project. The overarching purpose is to document and highlight the positive impact of research on agency practices. Ohio also remarked that return on investment (ROI) metrics are valuable to communicate the value of research to administrators and politicians but there was recognition that political factors can come into play in terms of what areas are to be a focus.

- Minnesota evaluated data from 2012 through 2018 and found that in 78 percent of the projects the research resulted in a change to policies, procurement procedures, technical practices, etc. They also recognize that it is acceptable to have projects that do not yield meaningful results or products. Missouri concurred that it is valuable to learn that something may not work or to determine that current practices are still effective.
- Minnesota reiterated that they have a dedicated fund for research project implementation (about $1M per year). Not every research project will get implemented, as some may not be useful or may be more theoretical. Depending on the type of implementation, they determine whether they can use SPR funding or State funding.
- Kansas asks all researchers to include an implementation plan and works to track the implementation of every project. The project manager is responsible for overseeing the implementation efforts. They try to calculate the ROI but that can sometimes be challenging depending on the project.
- For pooled-fund projects, the responsibility for tracking implementation typically falls with the lead state. Soliciting interest in pooled-fund projects typically involves emails to targeted staff and determining the level of involvement. Administering pooled-fund projects as the lead state requires a more significant level of effort.

Truax Lab Tour 1 to 4 pm

After a lunch break, the group boarded a bus to the Wisconsin Department of Transportation Truax Lab, located at 3502 Kinsman Boulevard. Hosts Erik Lyngdal and David Layton provided an overview of some of the work activities performed at the facility, which was followed with a tour of the cement/concrete, asphalt, and aggregate labs.

Round Robin Discussion 2

After returning from the laboratory tour, a round robin discussion was held on selected topics.

RR2 Question #1: What is the status of your libraries? How are literature searches performed?

- Most groups indicated that their physical libraries are closed, and they maintain mainly digital collections. Some have a program in which they continue to scan some of the older materials to integrate them in the digital collections, but much of those older sources were either thrown away, donated, or moved elsewhere in the State.
- The research groups are often asked to do literature searches, which their librarians can perform using specialized subscription services. In the absence of those services, literature searches may just be limited to Google and TRID. Michigan found that subscription to a business library helped in their searches. Missouri generally focuses on RIP and TRID.
- If needed for an upcoming RFP, Iowa sends its literature search requests out to a consultant to look through TRID and RIP. And upon project completion, they also enlist a consultant to enter the project into those databases.

RR2 Question #2: How do agencies manage requests looking for technical expertise in specific topic areas?

- Minnesota maintains a list of SMEs and they work to keep it updated by periodically asking the SMEs to self-select their areas of knowledge or expertise. At the same time, they try to identify new emerging topics and designate contacts in those areas.

- Missouri relies significantly on a long-time experienced engineer to help guide and direct inquiries, but they are looking for an automated process that would direct incoming email requests to designated individuals with appropriate expertise.
- Kansas has a master list that is updated once a year to identify interest and expertise by technical area.

RR2 Question #3: What additional comments are there on research funding?

- Minnesota indicated that they get all of the SPR Part B funding. MnDOT allocates 25 percent of the SPR-B funds for the state research program and uses state funds from the trunk highway account for the local match. In preparing their budgets there is a line item for SPR-B funds that are used for participation in pooled fund studies.
- Missouri indicated that not all SPR Part B funding comes through the research group; some goes to other divisions to administer the Bridge Engineering Assistance Program and Traffic Engineering Assistance Program. Staff funding for the Research Section comes out of the SPR Part B funding. There has been an increase in SPR since the passage of the IIJA.
- Ohio gets SPR Part B funding that is used to pay all of TRB. But the salary to pay the research staff is outside of the Part B budget.
- Iowa's Part B funding can be assigned as desired between research and pooled fund allotments. They are not responsible for handling the NCHRP and TRB costs.
- Illinois pays all of its NCHRP and TRB requirements from Part B.
- Wisconsin said that NCHRP and TRB can consume a significant amount of funding.

RR2 Question #4: Does any of the research funding lapse?

- Illinois and Ohio both indicated they have had funding lapse in the past. Ohio has looked at ways to expend that extra funding such as providing project-related grants to students.
- Illinois had a pooled fund project where IIJA funding was sought, and old funding sources would not be accepted. Wisconsin had experienced something similar.

RR2 Question #5: How do agencies handle intellectual property?

- In Ohio's contract language, the intellectual property reverts to the researcher, but the DOT maintains a right to it.
- Iowa has a form that researchers complete when they submit their proposals, stipulating that the work becomes the property of the Iowa DOT.
- Wisconsin does not put that restriction as they were seeking specific details and work approaches in the proposals.
- Missouri notes that some researchers claim their ideas as intellectual property, but they advise all proposers that the proposals become public domain.
- Minnesota does not let received proposals become public domain until after the award.
- There were some discussions on patent issues, and two examples cited in which an agency (Minnesota) prevailed in one case while a separate agency (Florida) lost in another.

RR2 Question #5: What are the agency responses to time delays or cost overruns?

- Wisconsin requires that researchers include Gantt charts (showing actual dates) in their monthly reports, and those are closely monitored by the Department to assess progress. If there are signs of delays or limited progress they will follow up with the researcher.
- Missouri expects the researcher to note any problems/concerns in the quarterly progress report (QPR), but at the same time the Department wants to hear about any issues as soon as they come up.
- Kansas noted that nearly every active project they have is currently behind schedule. They have asked to get monthly updates from the project monitors and are looking to limit time extensions to no more than two to better maintain control.
- Ohio shares a start agenda for their projects that summarizes critical project information including budget, deliverables, and deadlines. This is shared at each regular meeting with the researcher as a way of keeping everyone apprised of the status and to identify potential issues early on. Ohio also noted that some project requests must go to the control board for review or approval, and if they decline the request the project gets cancelled.
- Michigan and Missouri both commented that there can be legitimate reasons for time extensions, such as waiting on construction projects or coordinating with the DOT. Michigan prefers a minimum extension of 3 months, but it does create a bit more work for the contracting group.

Adjourn

The second day adjourned at 5 pm.

Thursday, May 16, 2024

The third and final day of the meeting started with a few additional round robin questions.

RR2, Question #6: How do agencies cover State in-house research?

- Kansas indicated that they use SPR Part B, with much of the in-house work involving the monitoring of new pavements, projects, or products. The project development does not go through the same cycle as the universities. The research group works in the same building as the materials researchers who perform the in-house projects, and they also rely upon the AASHTO Product Evaluations and Audit Solutions (formerly NTPEP) for many product evaluations.
- Minnesota does a significant amount of work at MnRoad, and they also have a laboratory where some research is performed. Some of the MnRoad staff positions are funded by SPR, but they are not supervised outside of the research group.
- Other states indicated that they do not do in-house research.

RR2, Question #7: Have there been any changes brought about by diversity, equity, and inclusion (DEI) considerations?

- Minnesota has done some research on equity and the planning area has produced an equity road map (using their own funding). In addition, the research group has developed a procedure for integrating DEI in the proposal and research process. Still, the DEI projects tend to not score well against bridge or pavement projects. This has raised the question as to whether emerging topics such as DEI, sustainability, resilience, etc. should be in a separate category so they don't compete against more "conventional" projects.
- Wisconsin asserted that separating out the projects is a good way to address DEI and other emerging topics, but with the expectation that there would be different people with the appropriate levels of expertise providing review and oversight.
- Michigan commonly brings in other groups (e.g., information technology, information management) as appropriate to assist in project development and management.

Research Project Management Systems

Ohio DOT

Vicky Fout provided a quick historical review of their system. She noted that they started with Quattro Pro as the first means for project management and then later migrated to an Access database. Since 2009, they have been using an automated research management system (ARMS), which is a web-based, customizable database. This operated as an ORACLE platform but is no longer supported and can be unstable at times. Consequently, they are working on an updated version of ARMS.

Jen Spriggs followed with a quick demonstration of the ARMS; some of the capabilities of the system include:

- Users can search by project number or key word, which goes to a landing page for the project that includes an overall summary (status, research, dates, etc.).
- A budget "snapshot" is available that is useful to help identify potential issues before they become more acute.

- Everyone in the research group has access to project invoices, which is helpful if someone is out or unavailable.
- The system tracks all modifications, including a description of the changes that were made, the justification, personnel changes, etc. It also allows document storage, including a summary of deliverables.
- The contact page not only includes the PI but also lists the members of the technical project committee.

Vicky indicated that the next version of ARMS (ARMS 3.0) is being developed in house and is coming soon. Highlighted features include:

- An alert feature that flags past due deliverables and approaching deadlines, upcoming meetings, etc. There are numerous sorting and filtering options available for this.
- Access to the actual project data, with the goal being for this to be viewable by the panel members and PIs for the projects they are involved in.
- Ability to track projects by phases.
- Ability to track subcontracts.
- An internal ODOT link is provided to an appropriations and accounting system.
- This is expected to be in full use by July 2024.
- Possible future enhancements may include the ability for researchers to submit invoices directly and for the auto generation of notification emails.

Vicky noted that there are issues with pulling information from the old version of ARMS into the new version, and consequently they will be hiring an intern to manually enter the old ARMS data into the new system. She further commented that the old version of ARMS won't be disbanded, and they will still be able to access it if needed. They will work to bring in as many of their older projects into the new version but eventually they will pick an arbitrary cutoff date for projects to bring in.

Illinois DOT

Kristi Anderson, Illinois Center for Transportation (ICT), described the research project management system for IDOT (see slides 160 to 185). The ICT (part of the University of Illinois at Urbana-Champaign) administers the project management system and provides other transportation engineering research support to IDOT through a multi-year contract agreement. This builds on a long history of support that the University has provided the Department dating back to the 1940s.

- ICT has a suite of three different tools that are used in the management of the project: Excel, QPR System, and ProjectManager.com.
- Excel includes a master financial project list, a dashboard for performance metrics, PI/Student database, and monthly status report to IDOT with significant events on each project.
- The QPR System is a tool that provides project overview information, tracks project details (personnel, financial, meetings, tasks, publications, implementation, etc.), stores projects files, and feeds automatic email reminders, all of which is accessible to the project PIs and the technical panels via a QPR Dashboard.

- ProjectManager.com is an online, third-party project management system that requires a user-based subscription. It was tailored to meet the specific ICT project needs. Features include:
  - Custom project templates.
  - Custom columns.
  - Custom project status.
  - View tasks by project, team member, notifications, list, or Gantt chart.
  - Dashboard views by individual, teams, and portfolio level.
  - Custom reporting.
  - Exports to CSV and Excel.
- Kristi next provided a quick demonstration of both the QPR and ProjectManager.com systems.
  - QPR system:
    - Can see all projects since 2005.
    - PIs and the technical panels can only edit certain fields/items.
    - This was built internally by their IT group, and several revamps and improvements have been made over the years.
  - Project Manager.com system:
    - This has been in use for about 3 years.
    - It was attractive because of its powerful tools and ability to be customized.
    - It is for internal ICT use only.
- Beyond Excel, QPR, and ProjectManager.com, other tools and methods that are used by ICT in the management and administration of research projects include Doodle, DocuSign, Outlook (including general ICT management email), and project meetings.
- Future efforts include looking for improvements in the dashboards for PIs and panel chairs, enhancements to the QPR system, and streamlining of review process to automate or simplify tasks.
- Responding to a question on development costs, Kristi noted that the QPR component was developed in house but ProjectManager.com has a subscription fee of $5,000/year. However, there is different pricing depending on the number of users, projects, features, etc.

Q&A Session

The Peer Exchange concluded with a Q&A session in which final discussions were held around a series of review questions and open topics.

QA Question 1: How do you handle research project management?

- Wisconsin currently uses Excel, but is currently engaged in pooled-fund study TPF-5(467), which is looking to develop common functional requirements and a software solution for research project tracking systems.
- Kansas also uses Excel but is intrigued by both the ARMS (Ohio) and QPR (Illinois) systems as currently all of their information is scattered. A concern is the amount of data entry and record keeping that is required, which may necessitate the hiring of additional staff. Kansas is also part of the research project tracking system pooled-fund study.
- Michigan uses ProjectWise for project tracking and management.
- Ohio's system (ARMS) was presented earlier.
- Iowa uses a third-party online system called Cognito. It costs $35/month and is customizable to meet specific needs.

- The Illinois system was presented earlier (QPR and ProjectManager,com). Aubrey noted that the initial set up of these systems can take a lot of time depending on how far back you go to incorporate older projects.
- Minnesota developed an in-house database called ARTS (Automated Research Tracking System). This database provides information on all sponsored research projects (as well as the City/County projects) and is connected to two other systems, one financial and one contractual. The tool is highly customized and tailored to produce a number of specific reports, but it is built on an older platform. As a result, the Department is looking at a $1M re-build on a new platform that will take about 18 months to complete. The development cost comes from a centralized IT source and not from the research office.

QA Question 2: With respect to the TPF-5(467) study, how do the participating agencies feel they will use the results to help meet their specific needs?

- Ryan remarked that they need to move beyond the current use of the spreadsheet but acknowledged that the new product may not be able to connect with other systems in the Department.
- Evelyn added that part of the project is determining what elements of a system are absolutely needed and what items may be considered discretionary. There was some prework that was done to identify common elements needed by the various DOTs.
- Kansas joined right after the first phase of the work, and what had been developed met most of their needs. It was noted that the second phase of the study issued an RFP seeking a vendor for the platform development and the proposal responses are now being reviewed. The work on the platform should begin in the late summer or early fall of 2024.

QA Question 3: How are decisions made on the level of engagement on pooled-fund studies?

- In Ohio, Vicky stated that they will engage if there is interest in the topic and available budget. Jen Spriggs added that sometimes it is difficult to replace people on pooled-fund studies (e.g., retirements).
- Kansas generally agrees to those that are of interest, and budget has not been a problem. They typically have about $950k budgeted on an annual basis but are spending about $600k.
- Iowa noted that about half of their budget goes to pooled-fund projects, but there is now earmarked funding for the pooled-fund program. They are involved in about 60 to 70 projects and lead about 20.
- Michigan is also very active in pooled-fund projects, and if they have the budget and internal buy-in they will participate.

Closing Remarks

In closing the meeting, Ryan thanked the agency representatives for traveling to Madison and participating in the program. A report will be prepared and shared with all participants. The meeting adjourned at 11:30 am.

APPENDIX A. ATTENDEE LIST

Name	Affiliation	Email
Kristi Anderson	Illinois Center for Transportation	kgeoro1s@illinois.edu
Carter Angelo	Wisconsin DOT	carter.angelo@dot.wi.gov
Dennis Bachman	FHWA Illinois	dennis.bachman@dot.gov
Evelyn Bromberg	Wisconsin DOT	evelyn.bromberg@dot.wi.gov
Karl Buck	FHWA Wisconsin	karl.e.buck@dot.gov
John Cherney	Wisconsin DOT	john.cherney@dot.wi.gov
Khyle Clute	Iowa DOT	Khyle.Clute@iowadot.us
Vicky Fout	Ohio DOT	Vicky.Fout@dot.ohio.gov
Jen Harper	Missouri DOT	Jennifer.Harper@modot.mo.gov
Jennifer Herron	Michigan DOT	HerronJ1@Michigan.gov
Mary Hoffmeyer	Michigan DOT	HoffmeyerM@michigan.gov
Shari Krueger	Wisconsin DOT	shari.krueger@dot.wi.gov
Joy Loomis	Wisconsin DOT	joy.loomis@dot.wi.gov
Sally Mayer	Kansas DOT	Sally.Mayer@ks.gov
David Peshkin	Applied Pavement Technology, Inc.	dpeshkin@appliedpavement.com
LaDonna Rowden	Illinois DOT	LaDonna.Rowden@illinois.gov
Susie Seefelt Lesieutre	Wisconsin DOT	susie.seefeltlesieutre@dot.wi.gov
John Senger	Illinois DOT	John.Senger@Illinois.gov
Kurt Smith	Applied Pavement Technology, Inc.	ksmith@appliedpavement.com
Ryan Spaight	Wisconsin DOT	ryan.spaight@dot.wi.gov
Jennifer Spriggs	Ohio DOT	Jennifer.Spriggs@dot.ohio.gov
Katie Walker	Minnesota DOT	Katie.Walker@state.mn.us
Penny Yanke	Wisconsin DOT	penny.yanke@dot.wi.gov
Abrielle Zinkl	Illinois Center for Transportation	aejosep2@illinois.edu

APPENDIX B. AGENDA

Research Peer Exchange Summary Agenda

May 14-16, 2024

Day 0: Monday, May 13, 2024

Attendee Travel Day

Day 1 - Tuesday, May 14, 2024

7:30-8:00 AM Check In & Networking

Note: All participants must sign-in at the Front Desk of the building. It is suggested participants target a 7:30 AM arrival to allow sufficient time to sign-in. Doors at the facility open at 7:00 AM.

Meeting hosts and facilitators will be on site to provide badges and name tents as participants arrive.

8:00 – 10:00 AM Opening Session

8:00 – 8:10 AM	WisDOT Welcome	WisDOT Secretary's Office
8:10 – 8: 20 AM	Host Welcome	WisDOT/IDOT Hosts
8:20 – 9:10 AM	Introductions	State Participants

- OH
- KS
- MO
- IA
- MI
- MN
- IL
- WI

9:10 – 9:55 AM	Current Practice Discussion	Facilitators
9:55 – 10:00 AM	Activity	Facilitators

10:00 -10:15 AM Break

10:15 – Noon Workforce Development

10:15 – 10:35 AM	Missouri DOT Presentation	Jen Harper
10:35 – Noon	Facilitated Discussions	Facilitator

Noon to 1:00 PM Lunch

1:00 – 3:00 PM Knowledge Management

1:00 – 1:40 PM	Michigan DOT Presentation	Jennifer Herron & Mary Hoffmeyer
1:40 – 3:00 PM	Facilitated Discussions	Facilitator

3:00 – 3:15 PM Break

3:15 – 5:00 PM Day 1 Round Robin Facilitators

6:00pm: Group Dinner at The Old Fashioned, 23 N Pinckney St #1, Madison, WI 53703

1

Day 2 - Wednesday, May 15, 2024

8:00 – 8:15 AM Day 1 Recap Facilitators

8:15 – 10:00 AM Research Project Development

8:15 – 8:35 AM	Wisconsin DOT Presentation	Evelyn Bromberg
8:35 – 8:55 AM	Illinois DOT Presentation	John Senger
8:55 – 10:00 AM	Facilitated Discussions	Facilitators

10:00 – 10:15 AM Break

10:15 – Noon Implementation Best Practices

10:15 – Noon	Panel Discussion	Khyle Clute, Jen Harper, Katie Walker, Vicky Fout

Noon – 1:00 PM Lunch

1:00 – 4:00 PM Field Trip to Truax Labs

Wear closed-toe shoes

4:00 – 5:00 PM Day 2 Round Robin

*****Individual Dinner Plans***

Day 3 - Thursday, May 16, 2024

8:00 – 8:15 AM Day 2 Recap Facilitators

8:15 – 10:00 AM Research Project Management Systems

8:15 – 8:40 AM	Ohio DOT Presentation	Vicky Fout and Jennifer Spriggs
8:40 – 9:05 AM	Illinois DOT Presentation	Kristi Anderson, ICT
9:05 – 10:00 AM	Facilitated Discussion	Facilitators

10:00 – 10: 15 AM Break

10:15 – 11:45 AM Q&A Session Facilitators

11:45 – Noon Closing Session Illinois and Wisconsin DOTs

2

APPENDIX C. PEER EXCHANGE PHOTOS

Figure C-1. Arriving at the Administration Building for a day of meetings.

Figure C-2. Participants listen to opening remarks by Wisconsin DOT Secretary Thompson.

Figure C-3. Secretary Thompson discussed research and Wisconsin DOT priorities.

Figure C-4. John Senger, IDOT, presented on Illinois' research project development process.

Figure C-5. Participants at a tour of WisDOT's materials lab at the Truax Center.

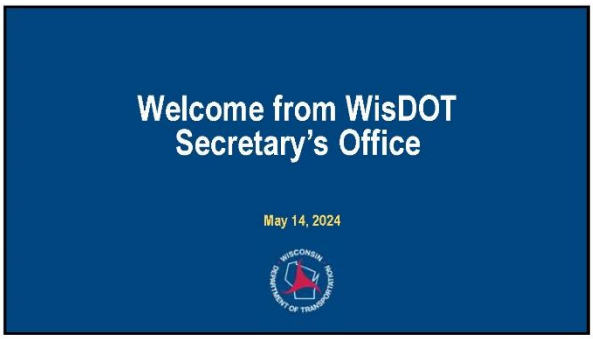
Figure C-6. WisDOT Truax Center staff make a presentation to participants.

Figure C-7. Truax Center staff answer participant questions.

Figure C-8. Peer exchange participants. Back row (from left): Dennis Bachman, Abrielle Zinkl, Vicky Fout, David Peshkin, Carter Angelo, John Senger, Jen Harper, Shari Krueger, Sally Mayer, Jennifer Herron, Ryan Spaight, Karl Buck. Front row (from left): Khyle Clute, Joy Loomis, Katie Walker, LaDonna Rowden, Jennifer Spriggs, Mary Hoffmeyer, Susie Seefelt Lesieutre, Penny Yanke, Evelyn Bromberg, John Cherney.

APPENDIX D. PRESENTATION SLIDES

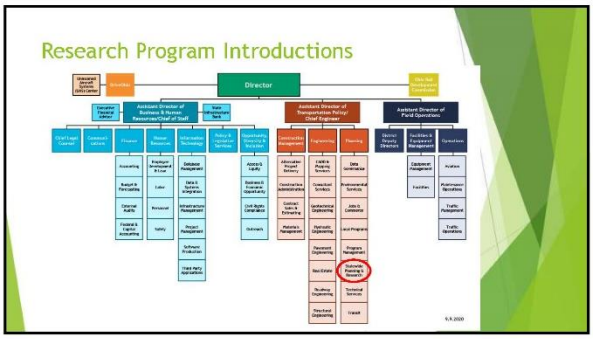
1



2

3

4



5

6


Research Program Strengths and Challenges
Strengths
Opportunities to connect with the entire agency
ODOTers view Research as a go-to resource
Small but mighty
Cradle to grave research oversight
Challenges
Technical champions (turnover, participation)
Agency can get in its own way when it comes to fully implementing research results
Research Section staffing
Cradle to grave research oversight

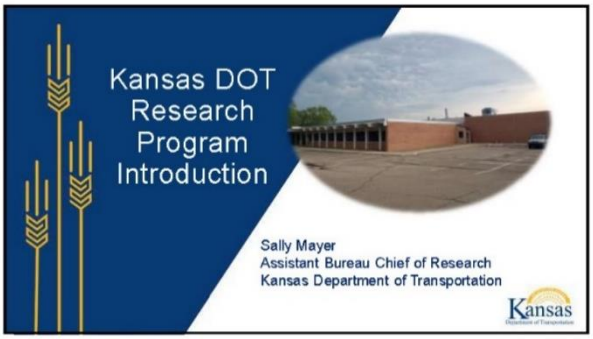
7


Plans for Future Growth
What training/learning opportunities would you like for your team?
Developing training videos for ODOT, ORIL and Researchers
Developing a Resource Guide for Research Section staff on internal processes
Identifying and learning how to best utilize new technology for project and program management (e.g., AI/ML)
What would you like to do to improve/expand your program?
Finalize the updated implementation tracking process
Identify clear, repeatable and manageable method for ROI
Hire more staff - not going to happen, but one can dream

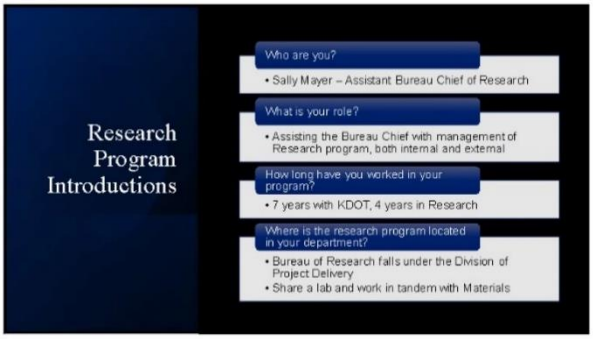
8


Peer Exchange Interests
What are you hoping to gain from your time at the peer exchange?
Ideas from participants for addressing our challenges
Ideas on workforce development that could be incorporated into the training we are working on for both users and managers of the program
Networking with Region 3 colleagues

9


Kansas DOT Research Program Introduction
Sally Mayer
Assistant Bureau Chief of Research
Kansas Department of Transportation
Kansas

10


Research Program Introductions
Who are you?
• Sally Mayer – Assistant Bureau Chief of Research
What is your role?
• Assisting the Bureau Chief with management of Research program, both internal and external
How long have you worked in your program?
• 7 years with KDOT, 4 years in Research
Where is the research program located in your department?
• Bureau of Research falls under the Division of Project Delivery
• Share a lab and work in tandem with Materials

11


Research Program Introductions
Current staff in our Research program:
6 Research Engineers (+4 vacancies)
Bureau Chief
Assistant Bureau Chief
Technology Transfer
Concrete (vacant)
Asphalt
Chemical
Advanced Technology (vacant)
Research Operations
Research Development (vacant)
Staff Engineer (vacant)
2 Geologists
6 Engineering Technicians (currently 2 vacancies)
NHI and Research Coordinator
Librarian
Publications Writer/Editor
Administrative Specialist
Kansas

12

Research Program Strengths

- In-house professional and technician staff
  - Ability to do our own testing of new/experimental materials
  - Support for field/construction issues
- State funding in addition to SPR
- Supportive executive staff
- Cooperative & supportive FHWA
- We have a physical library and librarian

13

Research Program Challenges

- Staffing/retention
- Workload
- Digging out of backlog due to COVID and ongoing staffing issues
- Antiquated document management/storage/project tracking system
- Loss of institutional knowledge
- Field/Construction issues
  - Transition to IL cement
  - Transition to other low carbon materials
  - Persistent concrete issue with low compressive strength breaks
  - Lack of experienced field engineers

14

Plans for Future Growth

- **Training/learning opportunities we would like for our team:**
  - AI in research and research publications
  - Ahead of the Curve

- **Improvements to our program:**
  - Better project management tracking system
  - Working with university partners to promote project quality and timeliness
  - More streamlined procurement and contracting
  - Higher-quality meetings with the right people rather than more meetings with the wrong people
  - Meaningful recognition of high-performing employees
  - Spotlights on Grad Students doing the work
  - Ability to contract with out-of-state vendors or researchers
  - Hot water in our breakroom, wifi, air conditioning and heating system that works

15

Peer Exchange Interests

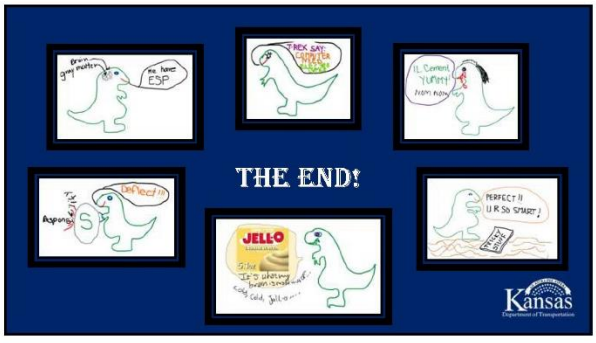
Workforce Development

- Strategies for attracting and retaining quality staff despite the elephant in the room
- Prioritization (and/or elimination) of workload in the absence of staff

Knowledge Management

- How to mitigate the vast loss of institutional knowledge as experienced staff retire
- Documenting and sharing knowledge and processes of those still with us

16



17

MoDOT

Missouri Research Program Introduction

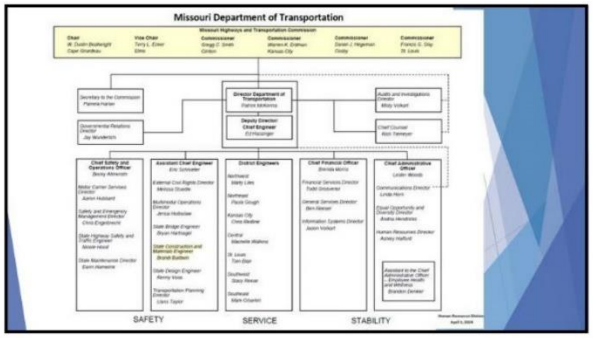
Jen Harper, Research Director

18

Research Program Introductions

- Jen Harper, Researcher Director
  - Been in research for 18 years
  - Research Director since 2019
- Research Staff
  - Lauren Bielecki-approx. 5.5 years
  - Brent Schulte-approx. 5 years
  - Jenni Hosey and Scott Breeding-2.5 years

19



20

Research Program Strengths and Challenges

- Strengths
  - Increased budget in recent years
  - High profile within MoDOT
  - Close relationships with Exec Team
  - Great, dedicated staff
  - Been within research longer than most
- Challenges
  - Workforce throughout DOT
  - Increased program at DOT
  - Internal Budget processes
  - Researcher timeliness and quality
  - Implementation

21

Plans for Future Growth

- Struggling to keep head above water!
- Continue promoting project management and leadership
- Would like to do formal Strategic Plan
- Continue pushing divisions on implementation and develop ways to help

22

Peer Exchange Interests

- What are you hoping to gain from your time at the peer exchange?
  - Implementation! We are seriously struggling with divisions having the bandwidth to implement.

23

IOWA | DOT

Iowa Research Program Introduction

Khyle Clute

24

Research Program Introductions

- Who are you? What is/are your role(s)? How long have you worked in your program?
  - Rhyle Clute, SPR Research and Pooled Fund Programs Manager
  - Role since September 2017
- How many staff work in your research program?
  - What are their roles? How long have they been in your program?
    - Seven total staff, includes two augmented staff and two shared staff
    - Peggi Knight, Research & Analytics Director, 9 years
    - Vanessa Goetz, State Research Program Manager & Team Lead, ~3 years
    - Linda S., Research Implementation and Marketing Programs Manager, ~1 year
    - Rhyle Clute, SPR Research and Pooled Fund Programs Manager, 7 years
    - Michele Weiland, Research Financial Specialist, Less than 1 year
    - Tammy Bailey, Research & Analytics Secretary, 9 years
    - Lee Bjorke, Secondary Roads Research Engineer, 1 year
- Where is the research program located in your department?
  - Transportation Development Division (Systems Planning, Modal, Location/Environment, Design, ROW, Bridge, etc.)

25

Research Program Strengths and Challenges

- List your biggest strengths or opportunities as a program
  - Lead the largest number of pooled funds (with .5-.5 staff)
  - Small staff means we can pivot easily to changing needs of department
  - Small staff means we have to focus on projects rather than superfluous management items
- List your biggest challenges as a program
  - Small staff limits the program exploration of flavors of the month
  - Have to focus on projects of need rather than projects of want

26

Plans for Future Growth

- What training/learning opportunities would you like for your team?
  - Yes, don't know what though.
- What would you like to do to improve/expand your program?
  - Hire more people
  - Do more pooled funds (maximize funding)
  - Explore other project management tools

27

Peer Exchange Interests

- What are you hoping to gain from your time at the peer exchange?
  - Research Project Management Systems that other states are using
  - Low resource intensive research implementation activities
    - How do you define implementation? What activities are included in your implementation program? Do you have a formal program? Are you already doing implementation activities through project management workflow?
  - What is workforce development when it comes to research?

28

29

Who We Are

Mary Hoffmeyer
Research Program Specialist
5 Years with RAd
517.281.3441
hoffmeyerM@Michigan.gov

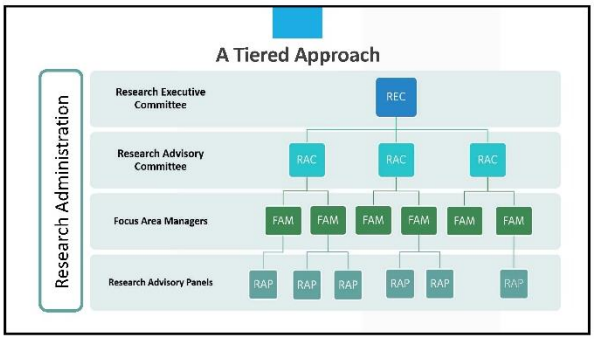
- Coordinate project development, management of contracts, and implementation of research innovations for the Bureau of Multimodal and Finance and Planning and Workforce Development.
- University Transportation Center (UTC) Coordinator.
- Facilitate Research Administration's (RAd) biannual program cycle for project development.
- Manage communication reporting and outreach efforts for RAd through newsletters, videos, and ArcGIS Storymaps.

Jennifer Herron
Librarian
6 Years with RAd
517-230-5103
HerronJ1@Michigan.gov

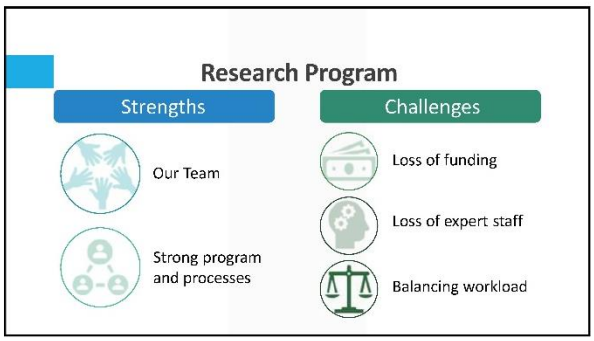
- Review incoming reports for accessibility compliance and publish online.
- Maintain RAd Repository for continued access to past research reports and related publications.
- Review incoming reports for accessibility compliance.
- Complete literature searches and compile resource lists for department working groups.
- Contribute to the Research Administration website.

30

31

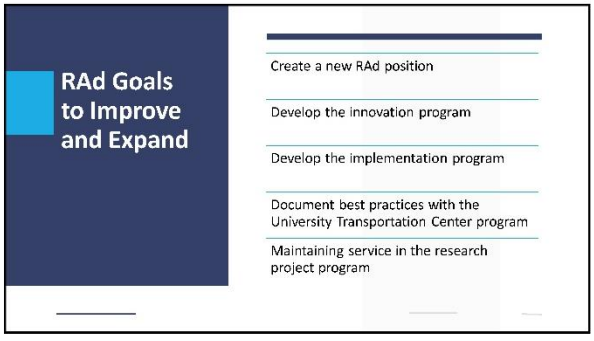


32

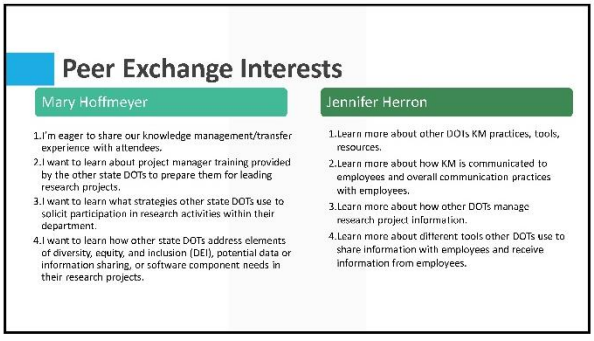


33

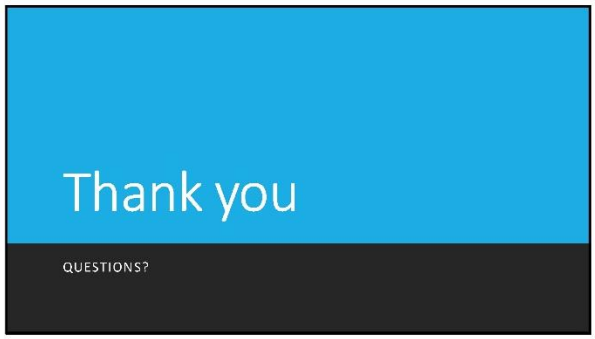
34



35



36

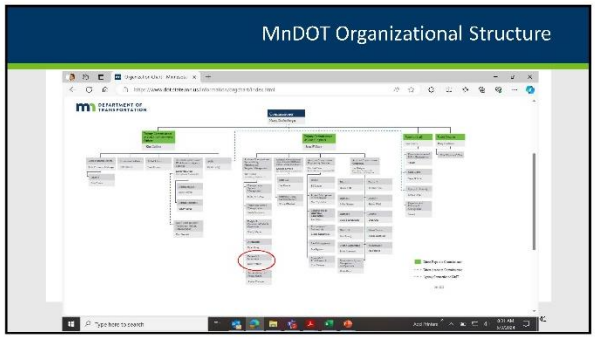


37

38

39

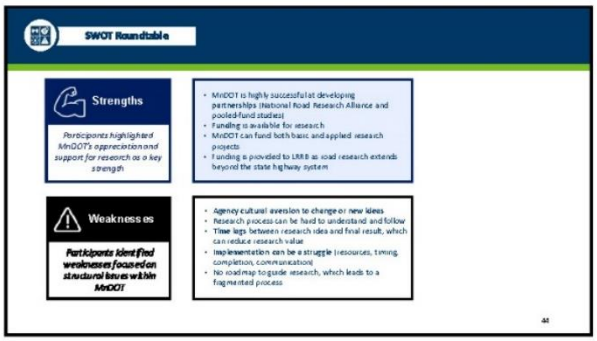
40



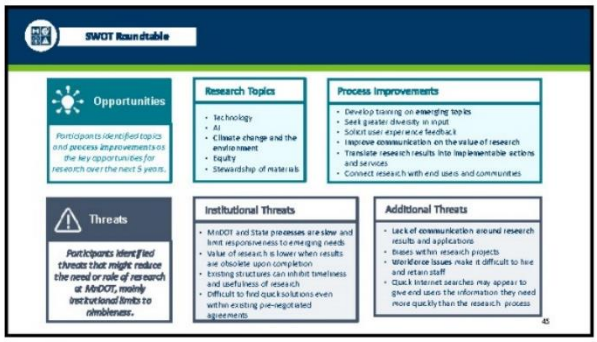
41

42

43



44

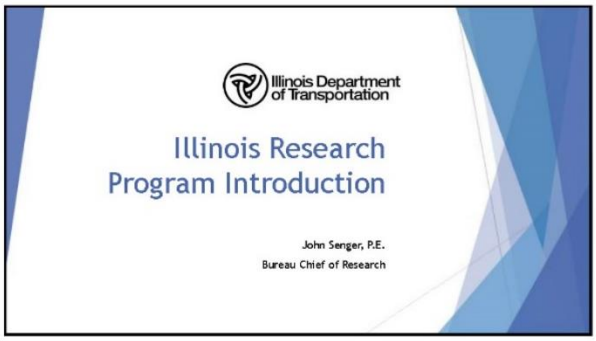


45

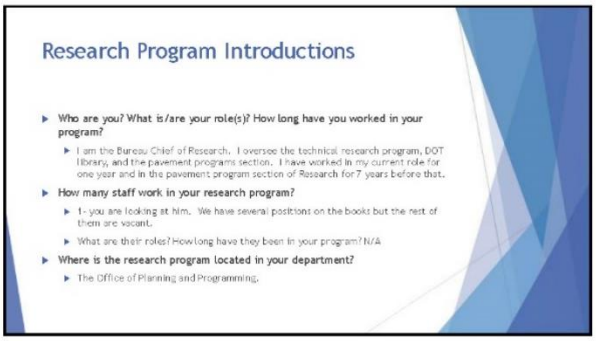
46

47

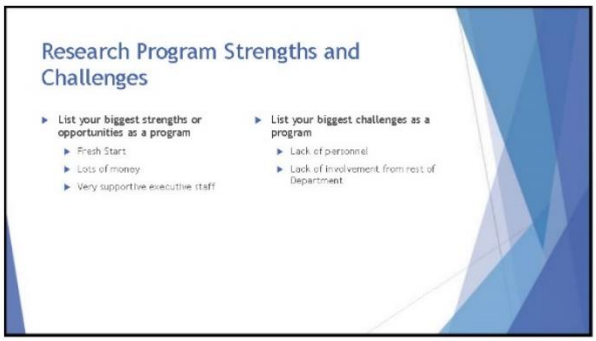
48



49



50



51

52

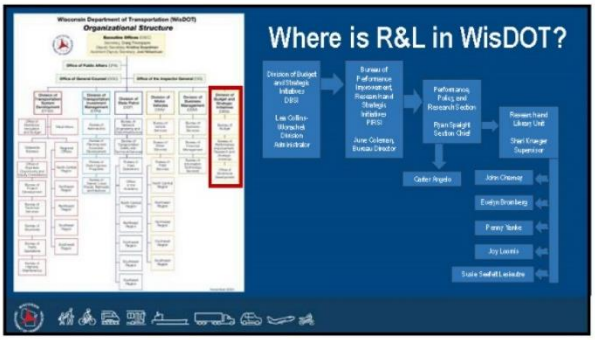
53

54

Research Program Introductions

Hello, I am:	My role is:	I've been here:
Evelyn Bromberg	National Research Programs Coordinator	2 years
Carter Angelo	Research Communications Coordinator	1.5 years
John Chemey	Chief Libranian	24 years
Susie Seefelt Lesieutre	Assistant Libranian	10 months
Penny Yanke	WHRP Contracts Specialist	6 months
Joy Loomis	Research Program Budget Coordinator	4 months
Ryan Spaight	Performance, Policy, and Research Section Chief	5 years with WisDOT 1.5 years as Section Chief
Shari Krueger	Research & Library Unit Supervisor	2 years with WisDOT 9 months as Supervisor

55



56

Research Program Strengths and Challenges

Strengths

- New Staff
  - We have new staff with a variety of work experiences that invigorate our program
  - Great hardworking team with a "can-do" attitude
- Program Management
  - We have a variety of programs to support research projects of different types, sizes and duration
  - We have great diversity of Subject Matter Experts
- Library and Information Services
  - We are good at offering requested information in desired formats when fulfilling literature searches
  - Continually expanding services – 24/7 on-demand access via Library Portal, History Corner

Challenges

- Staff Turnover
  - We are now at full staff for the first time since the pandemic started
  - Currently reviewing and reestablishing processes
  - We are all new to our jobs, except for John!
- Budget Limitation Issues
  - Due to state biennial base budget we are not able to utilize our full federal allocation under BIL
- End Date Waiver Requests
  - The program has seen an increase in EDWR
  - We are emphasizing "on budget and on time"

57

Plans for Future Growth

- What training/learning opportunities would you like for your team?
  - Learn about implementation best practices and tracking.
  - Learn about tools used to manage research projects.
  - Anything about digitization, database management, web/computer programs.
  - How to show value of library, info services, research ROI using statistical reporting.
- What would you like to do to improve/expand your program?
  - Make project management more streamlined.
  - Update procedure and process documents so we are prepared for staff turnover.
  - Using Access or other programs for project data management and pulling reports.
  - Improve our project tracking system to be easier to use and reduce potential for error.
  - Promoting our program, showcasing the benefits we bring to the people of Wisconsin.

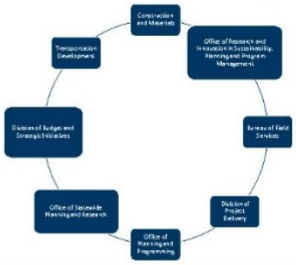
58

Peer Exchange Interests

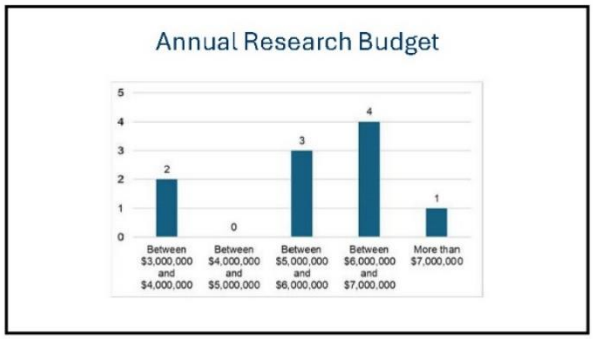
- What are you hoping to gain from your time at the peer exchange?
  - Looking forward to discussing these topics with everyone and seeing where we can make improvements within our own program.
  - Chance to hear how other states manage their research contracts /programs.
  - Discuss knowledge management best practices.
  - Discuss the detailed and often unnoticed work that goes into creating information access and products for the department.
  - How are other research departments preparing for or responding to staff turnover that is industry-wide: research dept staff, budget and related staff, engineers, researchers.

59

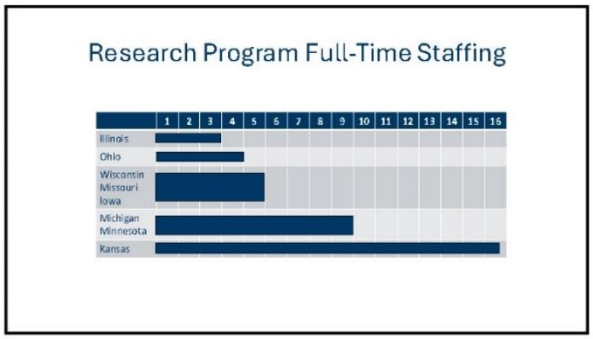
Research Team Location in Organization



60

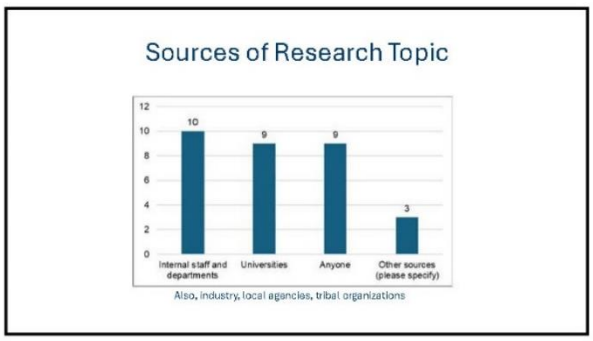


61



62

63



64

65

66

67

68

69

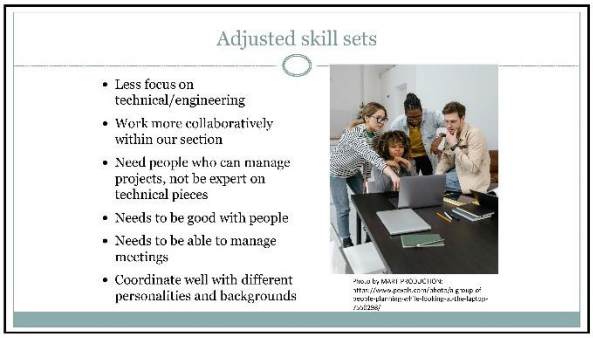
70

71

72

73

74

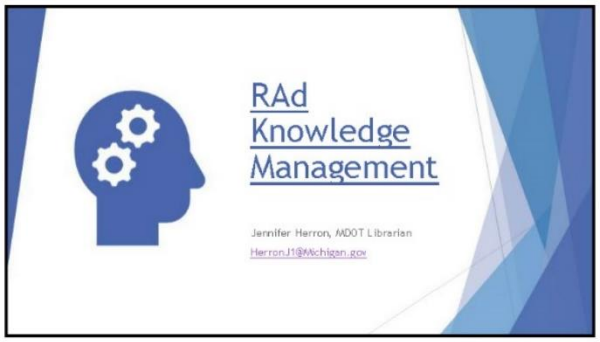


75

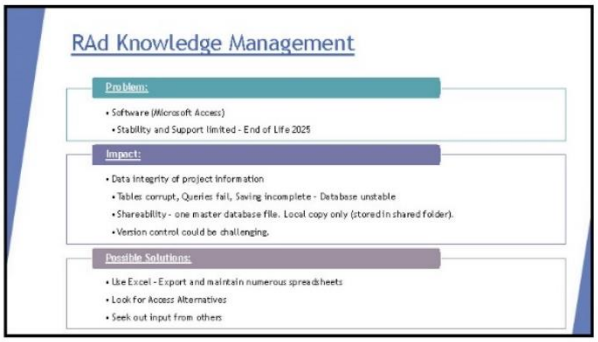
76

77

78



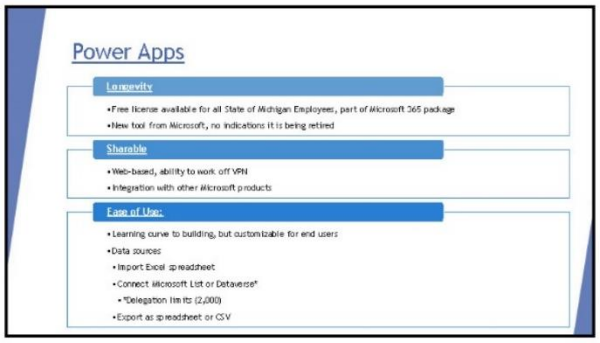
79



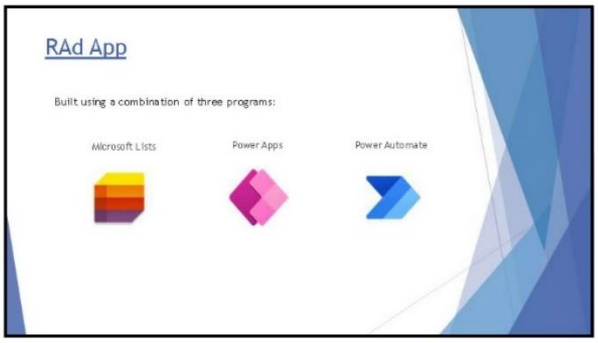
80

81

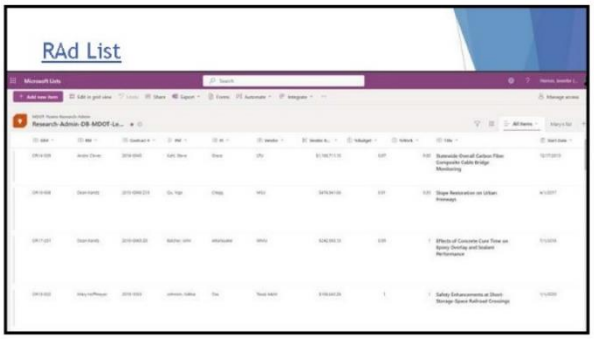
82



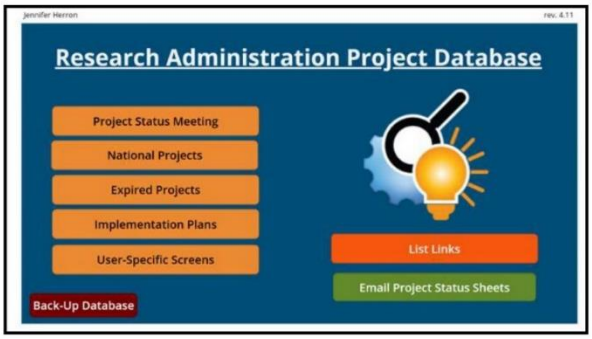
83



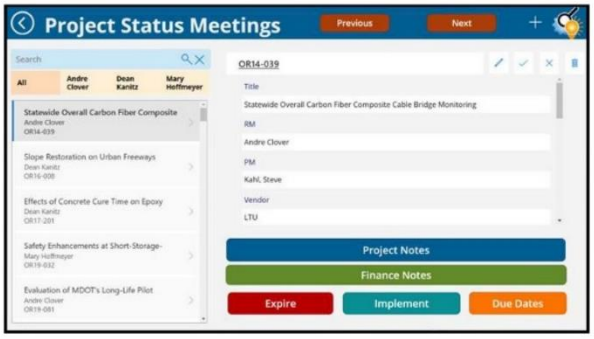
84



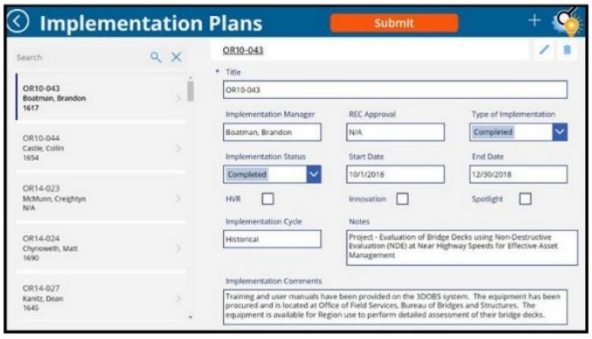
85



86



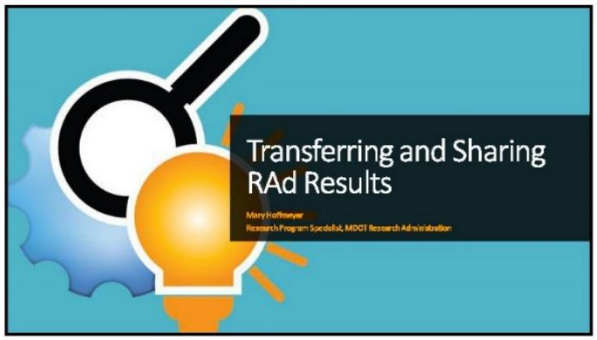
87



88

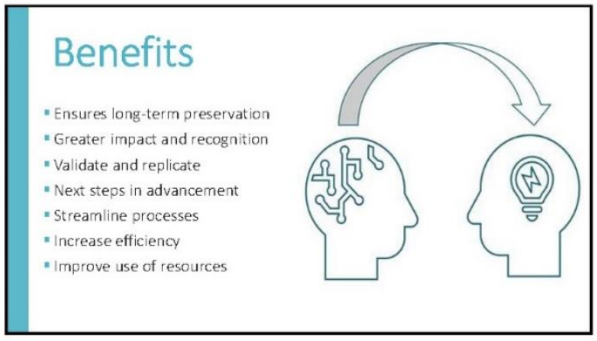
89

90

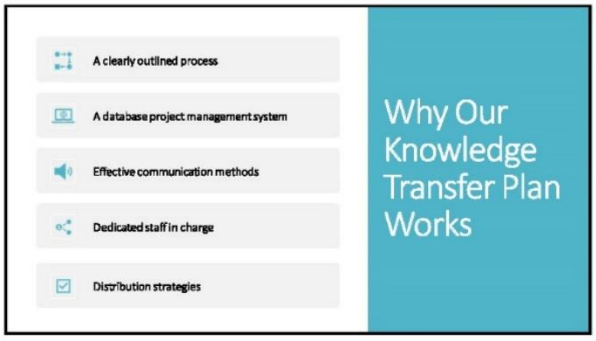


91

92



93



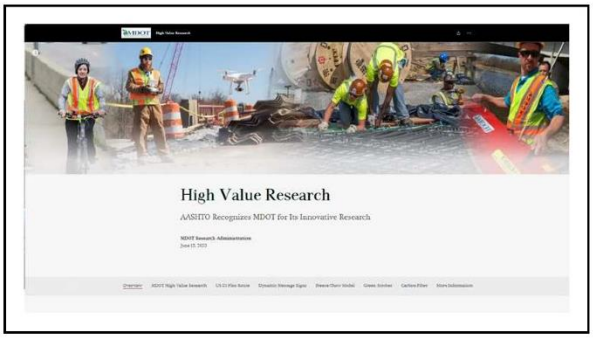
94

95

96

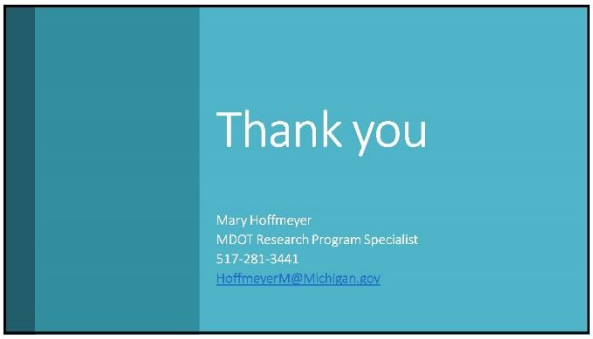
97

98



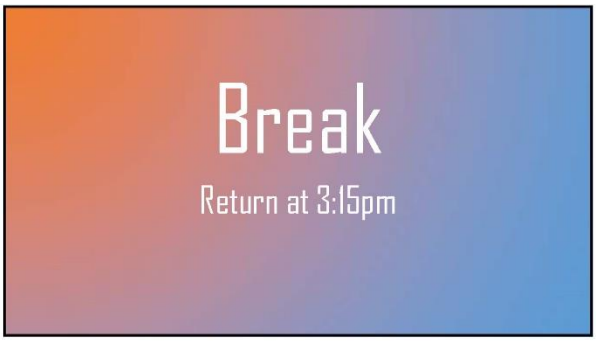
99

100



101

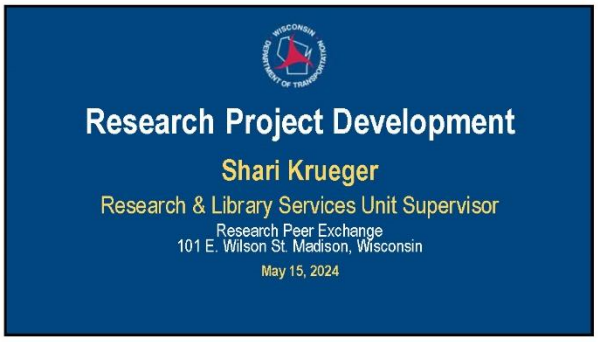
102



103

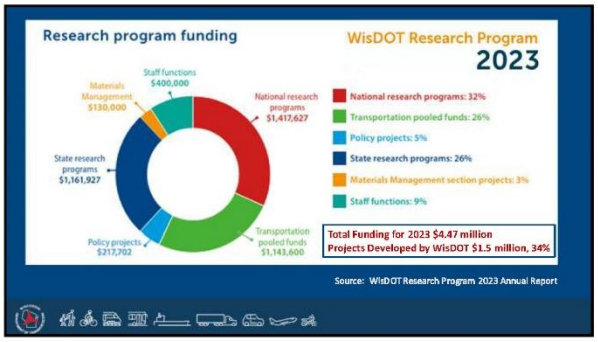
104

105

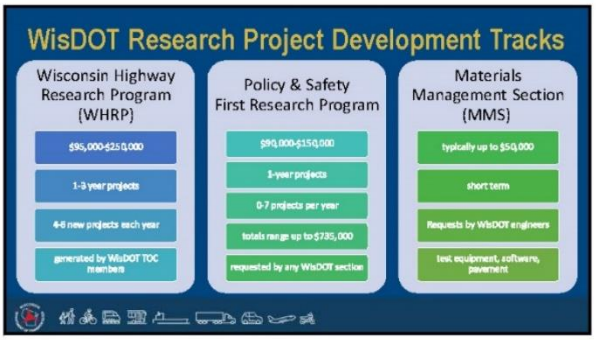


106

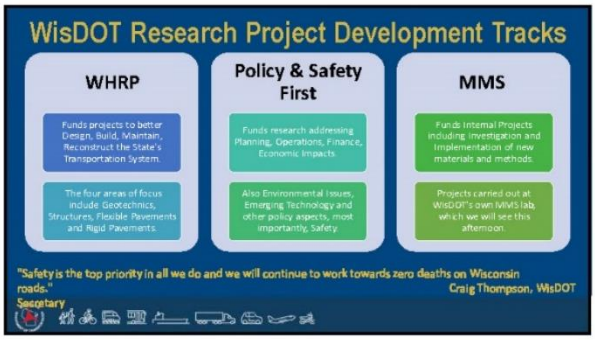
107



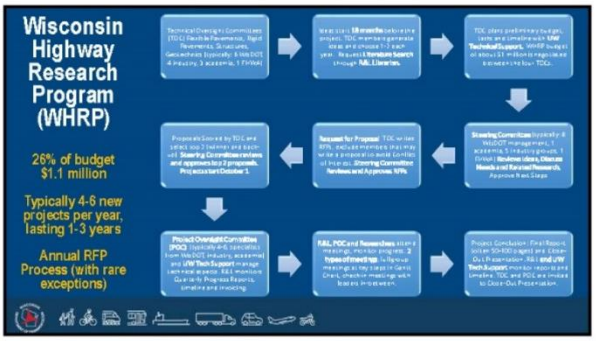
108



109

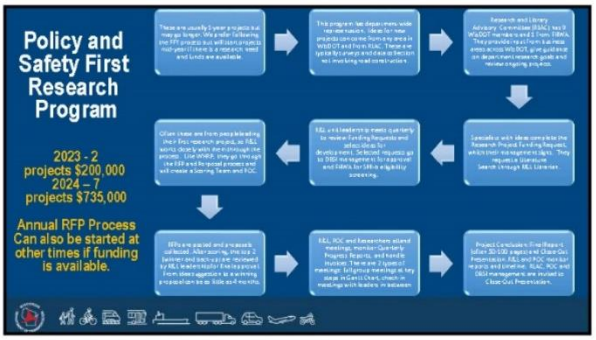


110



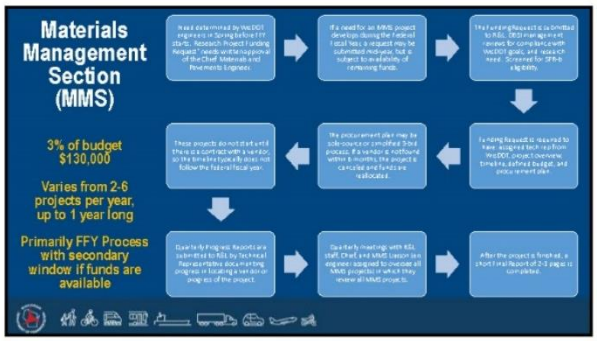
111

112

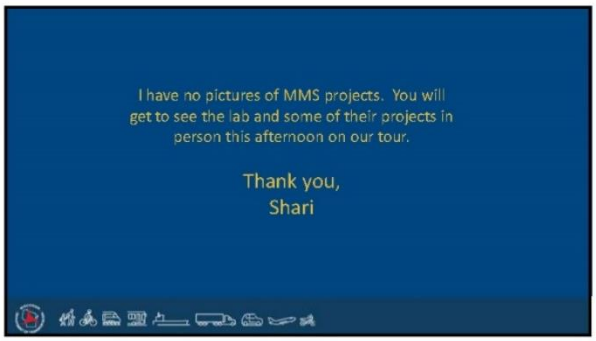


113

114



115

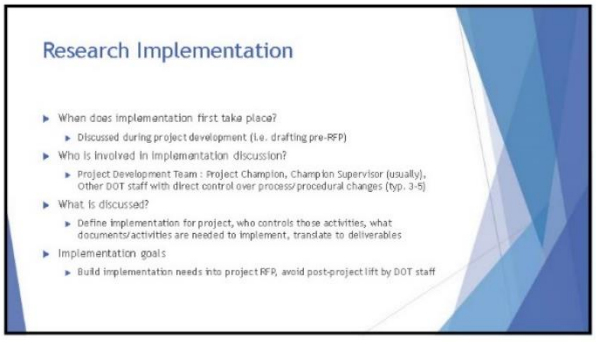


116

117

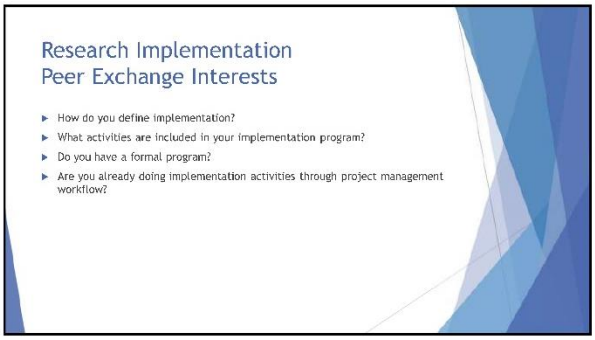
118

119

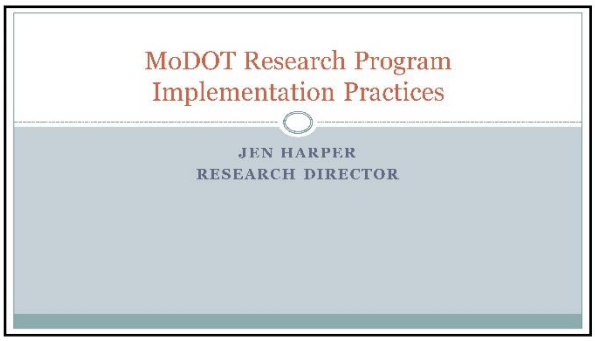


120

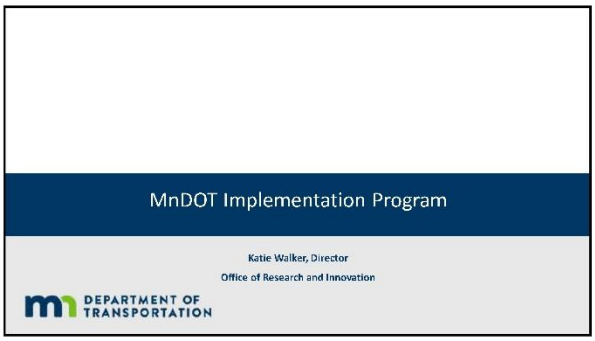
121



122

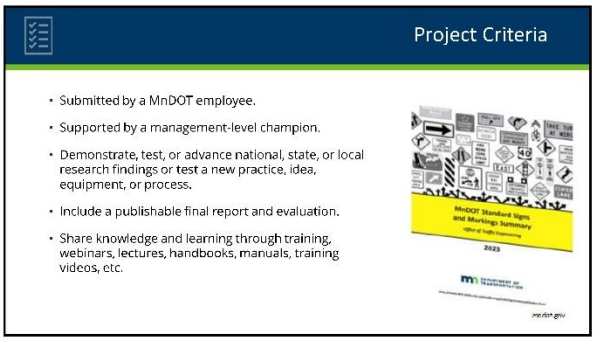


123

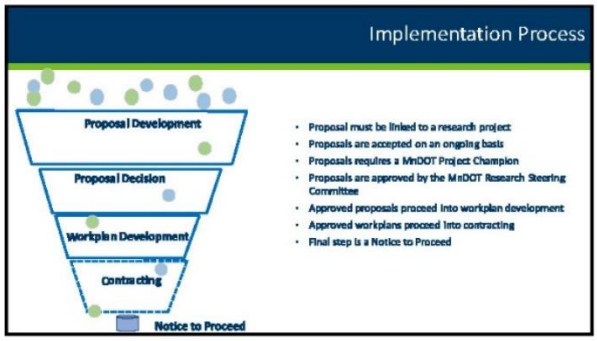


124

125



126



127

128

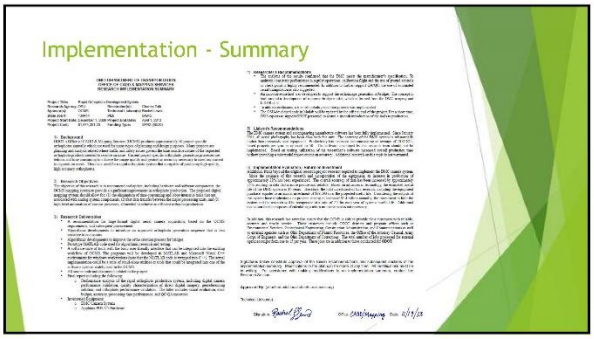
129

130

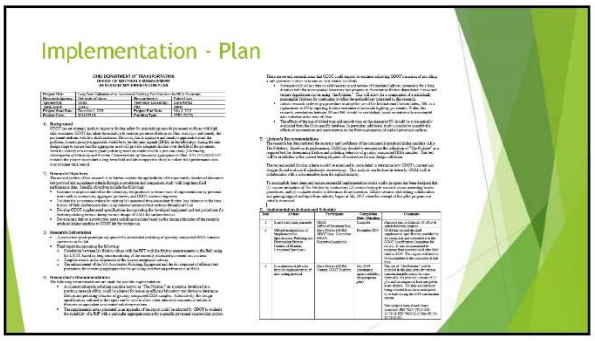
131

132

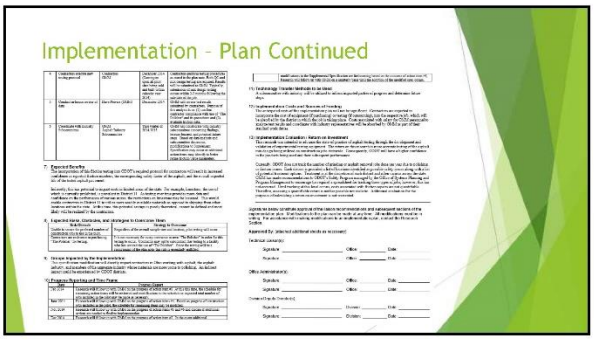
133



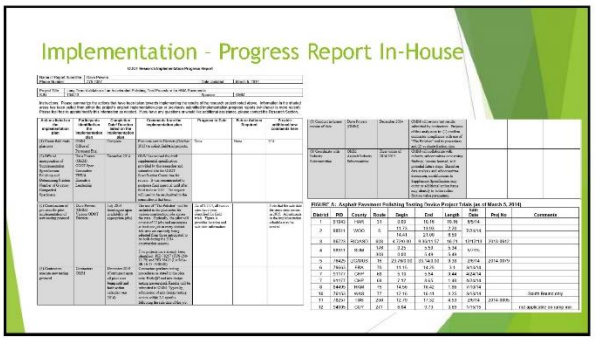
134



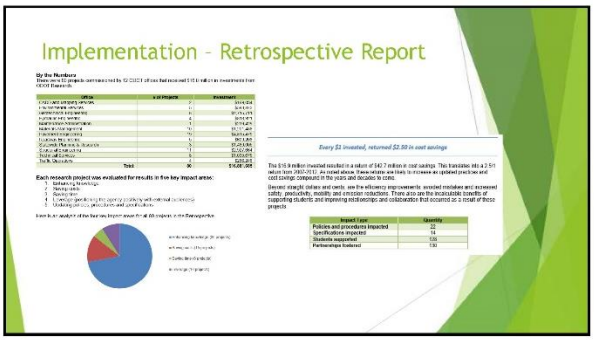
135



136

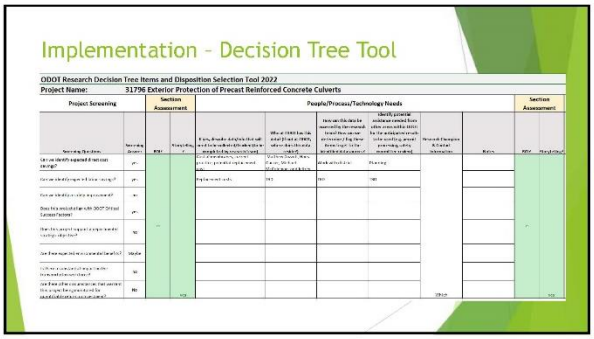


137

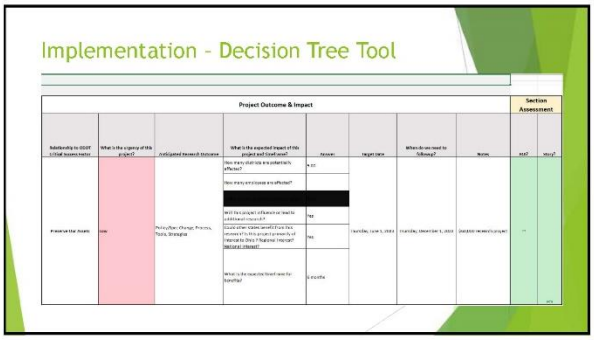


138

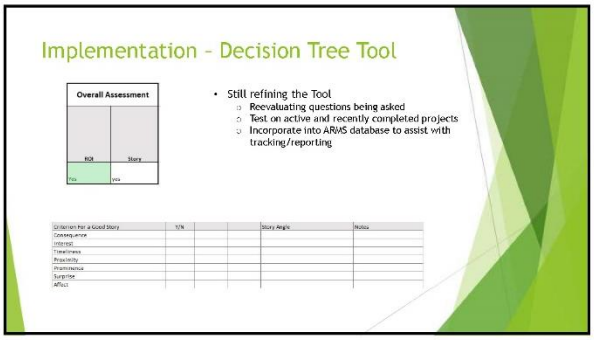
139



140



141



142

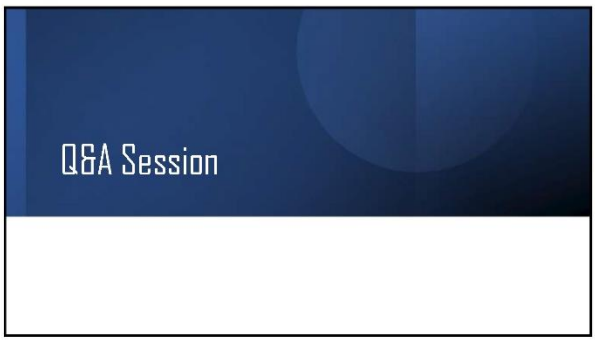
143

144

145

146

147



148

149

150

Pieces to the Puzzle

Technical Advisory Group	Executive Committee	Technical Review Panel Chair	Technical Review Panel Member
Technical Advisory Groups are comprised of subject matter experts for various areas and are responsible for vetting ideas and needs to send to the executive committee for funding consideration.	The Executive Committee is comprised of executive leadership, FHWA, and the TAG Chairs. This group is responsible for approving each full-size project for funding.	This individual(s) is/are charged with leading the project as the SME. They coordinate with the project managers to determine meeting times, review minutes, QPRs, and implementation planning worksheets (IPW).	These panels are composed of SME from industry, FHWA (at least one on each project), academia, central office staff and district staff.

151

Technical Advisory Groups

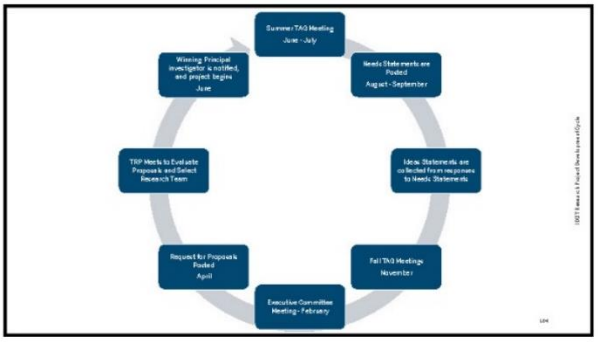
Bridges and Foundations
Environmental Impacts
Mobility and Freight Modes
Mobility Safety
Operations and Maintenance
Pavements and Materials
Planning, Policy, and Asset Management
Sustainable Construction

152

Executive Committee Members

Director of Office of Planning and Programming
Director of Office of Highways Project Implementation
Director of Office of Office of Intermodal Project Implementation
Bureau Chief of Research – Non-voting
Bridges and Foundations TAG Chair
Environmental Impacts TAG Chair
Mobility and Freight Modes TAG Chair
Mobility Safety TAG Chair
Operations and Maintenance TAG Chair
Pavements and Materials TAG Chair
Planning, Policy, and Asset Management TAG Chair
Sustainable Construction TAG Chair
Illinois Center for Transportation Representatives – Non-voting

153



154

A few notes

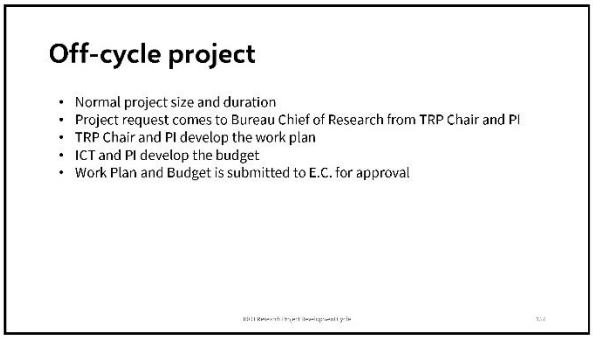
- FHWA and Industry sit on the TAGs, so they get an opportunity to bring ideas to the table
- We could get several Idea statements in response to the needs statement – needs statement author will review to see if we want to combine and submit for RFP.
- Idea statements can be submitted without any solicitation.
- All of the Idea statements are reviewed at the Fall TAG meetings and ranked for Executive Comm. approval

155

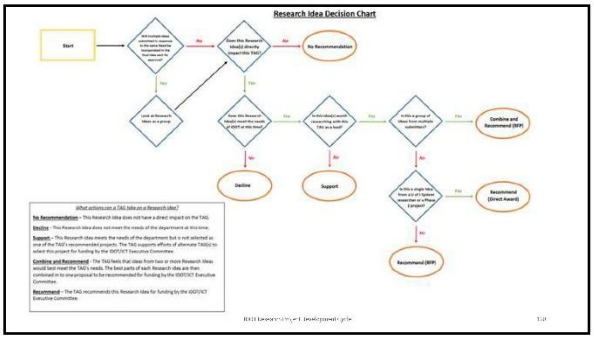
Special Projects

- Short 6-month project
- 3-month report editing
- Maximum budget of $75,000
- Tech Brief (4-8 pages)
- White Paper (20 pages)
- Full Report (75 page maximum, excluding appendices)

156



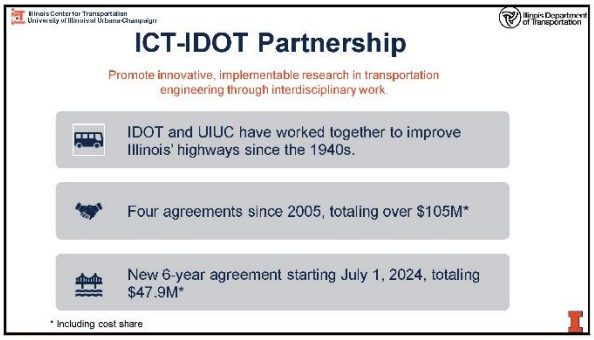
157



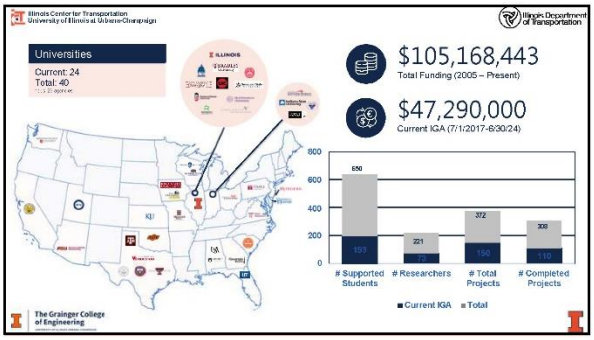
158

159

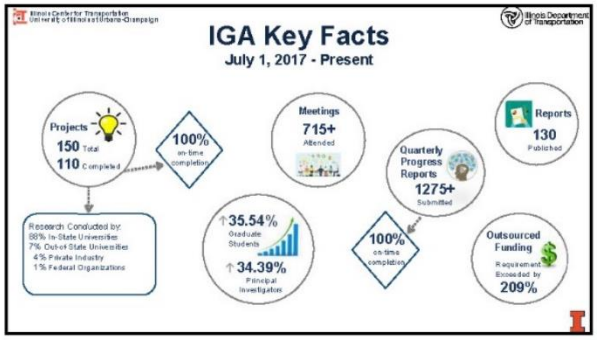
160



161

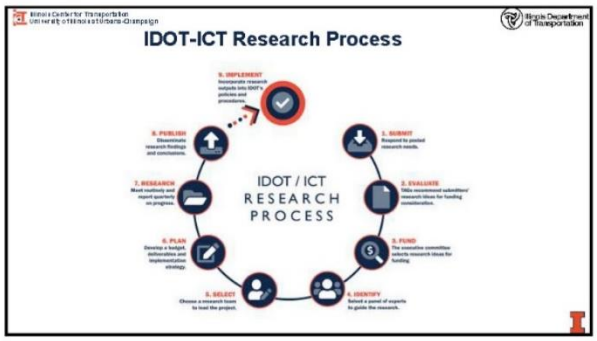


162



163

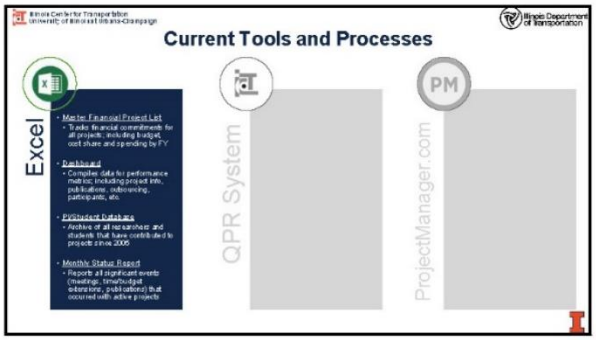
164



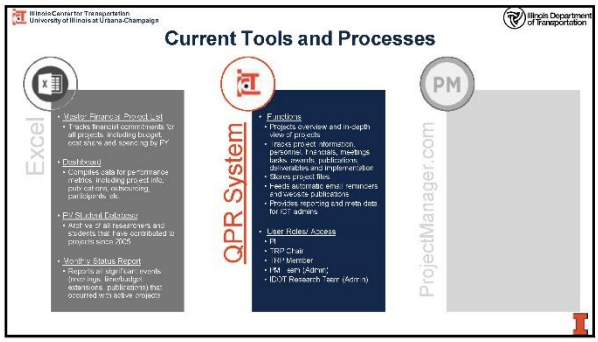
165

166

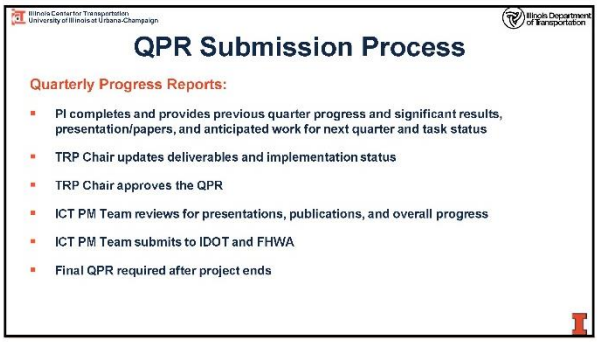
167



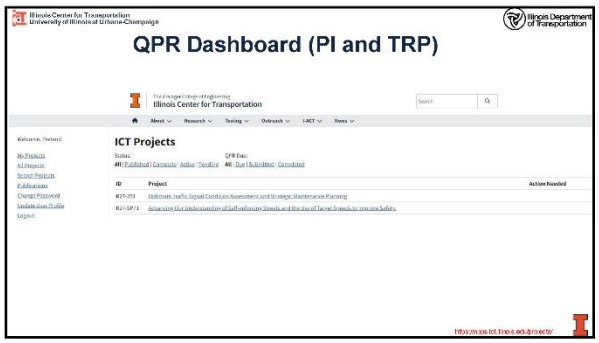
168



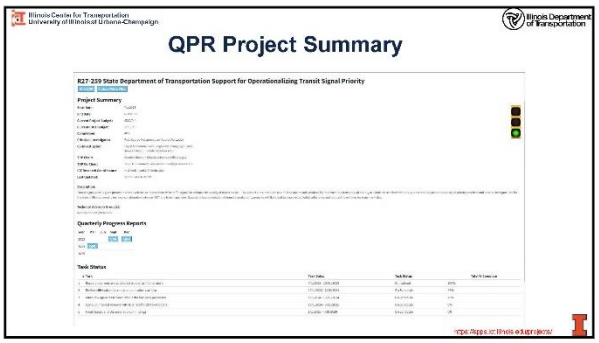
169



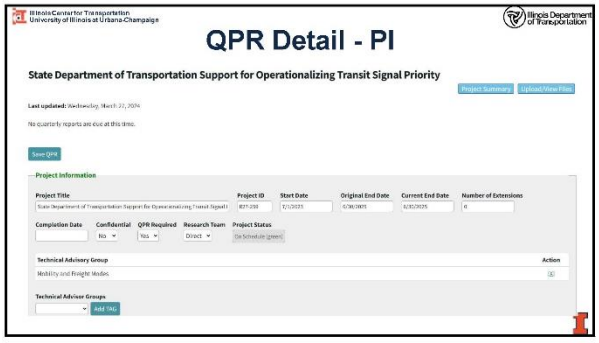
170



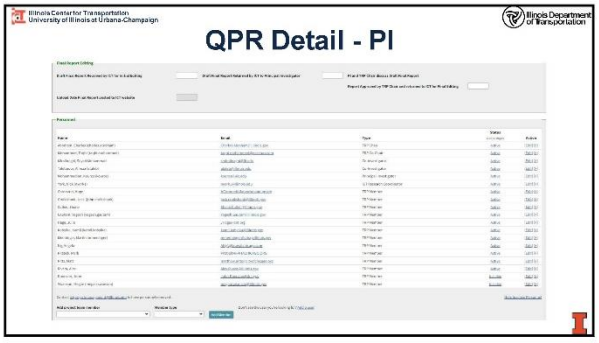
171



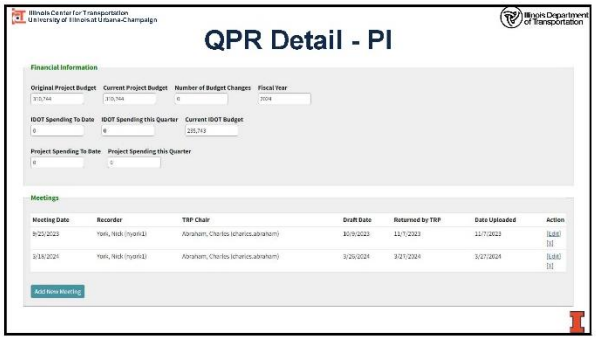
172



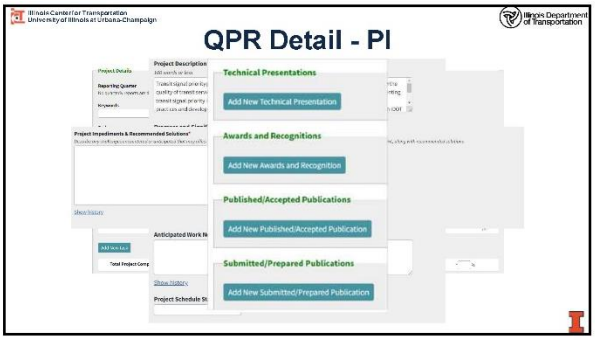
173



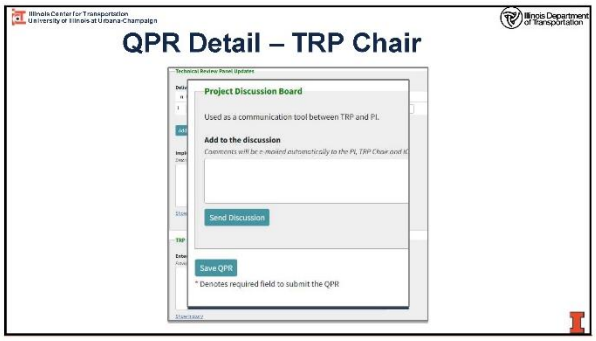
174



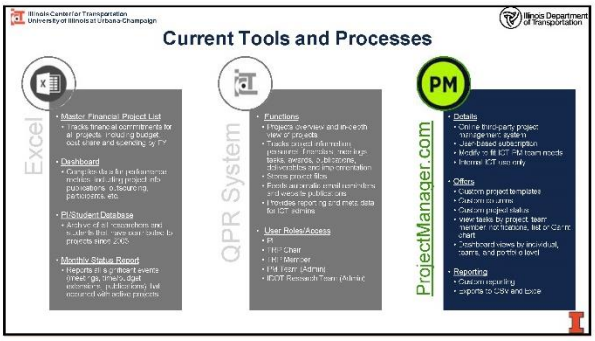
175



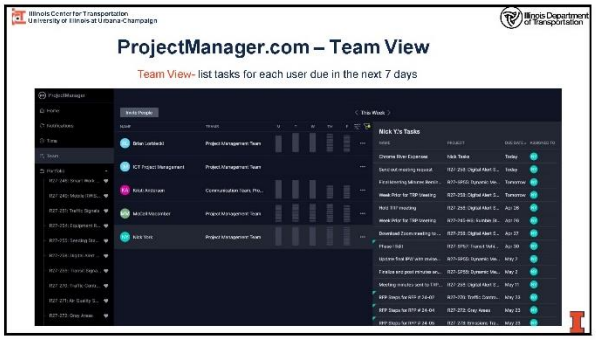
176



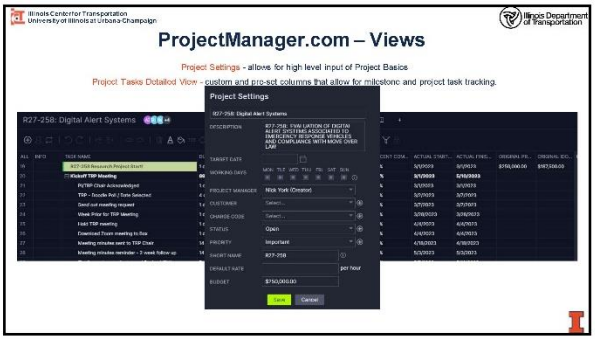
177



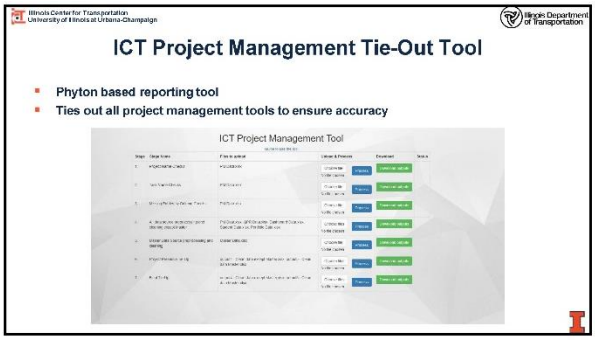
178



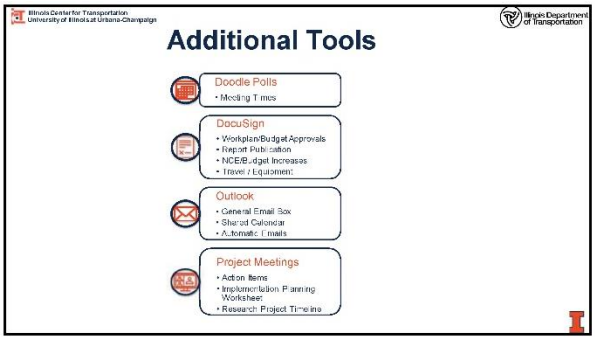
179



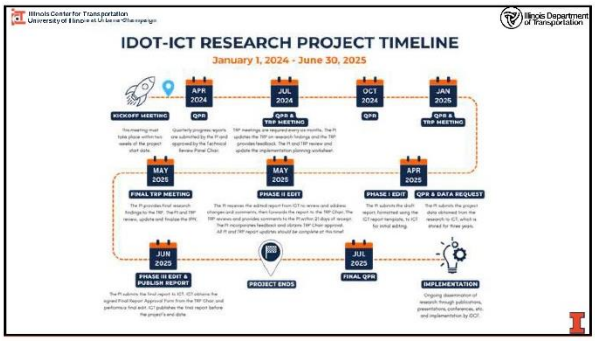
180



181



182



183

184

185