NEW ENGLAND TRANSPORTATION CONSORTIUM
2024 RESEARCH PEER EXCHANGE

FINAL REPORT
NETCR127

Submitted to:
Transportation Research
Maine Department of Transportation

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Connecticut Department of Transportation, Maine Department of Transportation and New Hampshire Department of Transportation, in collaboration with the New England Transportation Consortium (NETC), hosted a peer exchange on June 25, 26 and 27, 2024, to discuss topics related to transportation research with other state departments of transportation (DOTs). The meeting and the subsequent publication of this report fulfill all three agencies' obligations to conduct a periodic peer exchange as part of the federal State Planning & Research program. The peer exchange was funded through the NETC pooled fund, whose members are the three host agencies as well as Massachusetts DOT, Rhode Island DOT and Vermont Agency of Transportation. The event focused on three primary topics: engaging subject matter experts; optimizing research budget and staff; and facilitating technology transfer. Participants of the three-day event included staff from all three host states, two additional NETC member states (Massachusetts and Vermont), four other state transportation agencies (Mississippi, Nevada, New Jersey and Utah DOTs), and the Federal Highway Administration. Based on presentations and group discussions, participants shared what they saw as strengths, challenges and opportunities for the host agencies in the areas discussed. They also shared their own takeaways for their home agencies.

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PEER EXCHANGE AT-A-GLANCE

Host Agencies: Connecticut Department of Transportation (CTDOT), Maine Department of Transportation (MaineDOT) and New Hampshire Department of Transportation (NHDOT).

Participating Agencies: Massachusetts Department of Transportation (MassDOT), Mississippi Department of Transportation (MDOT), Nevada Department of Transportation, New Jersey Department of Transportation, Utah Department of Transportation, Vermont Agency of Transportation (Vermont AOT), and the Federal Highway Administration (FHWA).

PEER EXCHANGE TOPICS

The event focused on three primary topics:

- Engaging subject matter experts
- Optimizing research budget and staff
- Facilitating technology transfer

TOP FINDINGS AND TAKEAWAYS

Engaging Subject Matter Experts (SMEs)

- It is important to acknowledge the contributions of agency SMEs when research is complete. A short webinar can **recognize SMEs and celebrate the benefits** of working with research. The recording can then be used in a variety of ways to provide long-term value.
- Engage with task forces or find ways to solve problems within the department of transportation (DOT), so people **see research as a source of help and funding**.
- Consider **developing newer employees as SMEs** and helping grow them as employees and as project champions.
- Encourage those who attend the Transportation Research Board (TRB) annual meeting at the agency's expense to become research project champions. The attendees called it "**the TRB-to-Champion pipeline**."
- CTDOT developed an **e-flyer about how to work with research**, which defines and communicates roles for DOT staff involved in research.

Optimizing Research Budget and Staff

- Almost all participants emphasized **the value of pooled fund participation** to get a lot of value for less staff effort.

- **Be creative with staffing;** this may include hiring part-timers, interns and initiating or expanding university partnerships. Reach out to underutilized areas of the DOT and be more flexible with requirements to fill positions, including rehiring DOT retirees or cross-training.
- It was a key takeaway from nearly all the participants that **research programs could benefit greatly from administrative or contract assistance** to ease the administrative burden on research engineers who are in short supply.
- Several states use **memorandums of understanding (MOUs) and master agreements** to streamline the contracting process.
- Incorporate into the project contract the cost of making a final report **Section 508 compliant and publication-ready**. MassDOT includes a line item for getting the final report to publication quality in its research contract for projects.
- CTDOT and MDOT use **standard operating procedures (SOPs)** as an important knowledge management tool. MDOT also notes the value of research manuals and training modules.

Facilitating Technology Transfer

- **Research symposiums**, whether larger (MassDOT) or smaller (Vermont AOT), are an excellent way to raise the profile of a research program, communicate results, and share appreciation for SMEs and other key team members.
- There was significant agreement on the **value of focusing on implementation and technology transfer at the start of the research process** rather than at the end of it. Building resources and support for implementation and technology transfer into project contracts can streamline staff time and effort.
- It was a key takeaway across nearly all states that a good way to promote research results is **"just-in-time" communication,** which means providing technology transfer materials at key milestones or upon completion of the project rather than via monthly newsletter.
- Many participants use their **Local Technical Assistance Program (LTAP) to boost technology transfer**. Support can include writing technical briefs and advertising research events.
- Vermont AOT employees are invited to **lunch-and-learn debrief sessions** after attending a research conference including the TRB Annual Meeting and MassDOT's Innovation Exchange.

MEETING INTRODUCTION AND OVERVIEW

Connecticut Department of Transportation (CTDOT), Maine Department of Transportation (MaineDOT) and New Hampshire Department of Transportation (NHDOT), in collaboration with the New England Transportation Consortium (NETC), hosted a peer exchange on June 25, 26 and 27, 2024, to discuss topics related to transportation research with other state departments of transportation (DOTs) and the Federal Highway Administration (FHWA). The meeting and the subsequent publication of this report fulfill these three agencies' obligation to conduct a periodic peer exchange as part of the federal State Planning & Research (SP&R) program (per Title 23, Part 420 of the Code of Federal Regulations). The peer exchange was funded by the NETC pooled fund, which consists of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

The peer exchange focused on three topics:

- Engaging subject matter experts
- Optimizing research budget and staff
- Promoting effective technology transfer

PEER EXCHANGE PARTICIPANTS

The peer exchange included representatives from multiple state DOTs, as well as the federal government in order to represent a variety of agencies and perspectives. Participants included CTDOT, MaineDOT, NHDOT, six guest state DOTs, and two FHWA Division Offices.

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

Host State DOTs

Connecticut Department of Transportation
- Melanie Zimyeski, Transportation Supervising Planner, Research
- Tyson Byrne, Transportation Planning Director
- David Elder, Transportation Assistant Planning Director

Maine Department of Transportation
- Jeffrey Pulver, Director of Research & Innovation
- Ulrich Amoussou-Guenou, Transportation Engineer

New Hampshire Department of Transportation
- Deirdre Nash, Research Engineer

Participating NETC State DOT Research Programs

Massachusetts Department of Transportation
- Nicholas Zavolas, Transportation Planner
- Austin Sanders, Transportation Planner
- Anil Gurcan, Transportation Planner

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

Guest State DOT Research Programs

Mississippi Department of Transportation
Cindy Smith, State Research Engineer

New Jersey Department of Transportation
Pragna Shah, Research Analyst

Nevada Department of Transportation
Lucy Koury, Research Analyst

Utah Department of Transportation
Cameron Kergaye, Director of Research

Federal Highway Administration

Paige Melius, Maine Division Office
Karim Naji, New Hampshire Division Office

Staff from consulting firm CTC & Associates coordinated, facilitated and documented the peer exchange.

FORMAT

Participants (Figure 1) attended the in-person peer exchange at NHDOT headquarters at 7 Hazen Drive in Concord, New Hampshire. The meeting agenda for the three-day event is included as Appendix A to this report.

Figure 1: Meeting Participants

From left to right: Ulrich Amoussou-Guenou, Anil Gurcan, Nicholas Zavolas, Cameron Kergaye, Tyson Byrne, Deirdre Nash, Lucy Koury, David Elder, Emily Parkany, Ashlie Mercado, Cindy Smith, Jeffrey Pulver, Pragna Shah, Melanie Zimyeski, Paige Melius.

INTRODUCTORY PRESENTATIONS

To establish a mutual understanding among participants and prepare for topic discussions, the four guest state DOTs, two NETC participating DOTs, and three host state DOTs gave prepared presentations to share basics of the size and structure of their research programs. They also shared their successes and challenges in generating research ideas, optimizing their budgets and resources, and engaging in meaningful technology transfer.

The nine State Research Overview presentations are reproduced in the appendices to this report.

Appendix B. Maine DOT, Jeffrey Pulver, Maine DOT
Appendix C. Utah DOT, Cameron Kergaye, Utah DOT
Appendix D. Vermont AOT, Emily Parkany, Vermont AOT
Appendix E. Connecticut DOT, Melanie Zimyeski, Connecticut DOT
Appendix F. Nevada DOT, Lucy Koury, Nevada DOT
Appendix G. New Jersey DOT, Pragna Shah, New Jersey DOT
Appendix H. Massachusetts DOT, Nicholas Zavolas, Massachusetts DOT
Appendix I. Mississippi DOT, Cindy Smith, Mississippi DOT
Appendix J. New Hampshire DOT, Deirdre Nash, New Hampshire DOT

TOPIC DISCUSSIONS

Participants spent half a day addressing each of the three main topic areas. Each of these topics was expanded by many amplifying questions of top concern to the host states. Prior to the meeting, participants considered these questions to help drive discussions. These questions are noted in each of the following chapters, which are organized by topic:

Topic 1. Engaging Subject Matter Experts
Topic 2. Optimizing Research Budget and Staff
Topic 3. Facilitating Technology Transfer

During the course of the event, several other important topics were raised and discussed by participants. These are addressed in the chapter titled **Additional Critical Topics**.

OPPORTUNITIES FOR HOST STATES

Throughout the peer exchange and at the end of the event, all participants had opportunities to reflect upon, record and share **Opportunities for Host States**, note areas where each host state is already excelling and leading, and identify areas for growth and improvement. Participants also recorded and shared their key takeaways.

PEER EXCHANGE TOPIC 1—ENGAGING SUBJECT MATTER EXPERTS

QUESTIONS FOR PRESENTATION TOPIC 1

The host states expanded the discussion of **Topic 1—Engaging Subject Matter Experts**, with the following amplifying questions in advance of the meeting:

- How does your program define a Subject Matter Expert?
    - What pool of staff do you draw from at your agency?
    - Are non-DOT SMEs utilized, and how are they utilized?
    - How do you know who is knowledgeable?
- SME Role
    - How much influence do SMEs have on research: selecting research, guiding principal investigators (PIs), implementing results?
    - Is it possible to have too many SMEs on one project?
    - How do you work with SMEs with differing or opposite opinions?
- SME Solicitation
    - How do you recruit and engage SMEs?
    - How do you sell participation on a research project to potential SMEs?
    - How do you show new SMEs the value of being a project champion?
- SME Engagement
    - Share onboarding guidance provided to SMEs and/or their supervisors.
    - How do you keep SMEs engaged throughout the life of a project?
    - What percentage of their work time do SMEs spend on research projects?
    - What do you do to reduce SME burnout? Is it possible to reduce the workload for an SME too much, negatively impacting engagement?
    - How do you manage to finish or implement a project if an SME leaves?
    - How are SMEs recognized at your agency?
- SME Agency Issues
    - How do you address a shortage of SMEs throughout the agency?
    - Describe your methods for letting SMEs know what Research can offer at a state and national level (pooled funds, NCHRP, etc.)
    - How do you teach new upper management about research?
    - How do you deal with projects that require data gathering, which can be a hurdle to a successful project?
- SME Project Solicitation
    - Please describe the research project idea solicitation process.
        - Share best practices and tools for canvassing research project ideas from agency staff and outside stakeholders.

        - How do you keep a balance between SME engagement and ensuring research topic diversity?
        - How often do you solicit project ideas? Specific time of year, continuous.
    - How much detail do you require when soliciting project ideas?
    - Please describe the process for soliciting and contracting with researchers.

PRESENTATIONS

To kick off discussion on engaging SMEs, three of the participating states gave presentations on their efforts at engagement. These are reproduced as appendices to this report.

> APPENDIX K. Nevada DOT – Engaging Subject Matter Experts, Lucy Koury, Nevada DOT
> APPENDIX L. Maine DOT – Engaging Subject Matter Experts, Jeffrey Pulver, Maine DOT
> APPENDIX M. Utah DOT – Engaging Subject Matter Experts, Cameron Kergaye, Utah DOT

DISCUSSIONS AND FINDINGS

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

Comments are grouped by common challenges that emerged and the best practices that resonated with the participants. Opportunities for host states appear in later chapters, as do additional best practices and ideas that attendees noted for potential use within their home agencies.

Common Challenges and Promising Best Practices

- Challenge: Finding **ways to recognize agency SMEs** and show appreciation for what they do.
    - New Jersey DOT recognizes champions at its **annual showcase**.
    - Show appreciation by sharing **positive feedback with supervisors**.
    - Recognize SME efforts in **newsletters or other publications**.
- Challenge: Promoting **the value of research to solve problems for DOT staff**. SMEs may not be aware of what research can do for them.
    - Utah DOT allots an **informal research budget** for different areas of the DOT, which is a great way to get buy-in and participation.
    - MaineDOT gets involved with internal DOT **task forces**, which helps solve key problems for the agency and provides an opportunity for Research to help solve problems and deliver quick wins.
    - Michigan DOT developed a **project manager promotional video that recognizes SMEs** and highlights what SMEs are getting out of being Champions.
- Challenge: **Recruiting SMEs** can be difficult, because they are often high-value, experienced staff with little time to spare.

    - Encourage agency staff who use Research funds to attend the TRB Annual Meeting to become research project champions. The attendees referred to this as the "**TRB-to-Champion pipeline**." Sending more people to TRB (especially project champions) can encourage a mutually beneficial relationship between the research office and technical experts.
    - Nevada DOT promotes SME participation by encouraging curiosity, letting them know that **they can concentrate on the technical aspect of a project while the research program does the administrative work**, and that research funds are available.
    - Look at a wider pool of SMEs to **utilize less-senior staff**. This helps newer employees grow and gain experience while managing a research project.
    - Consider **using a non-DOT project champion** in some cases, such as a retired DOT employee, as Utah DOT has done.
- Challenge: Helping SMEs **understand the research idea solicitation process**.
    - Montana DOT provides a **15-minute webinar** on how to write a research needs statement for DOT employees.
    - CTDOT developed an **e-flyer about how to work with research**, defining and communicating roles for DOT staff involved in research. Vermont AOT also utilizes a similar document.
- Challenge: **Supporting SMEs during the project** to help ensure good outcomes for all.
    - Hold more **regular Technical Advisory Panel meetings**; for example, MassDOT schedules check-in meetings in advance, at the start of the project.
    - Utah DOT has **a midpoint rating process** for the project manager, project champion and principal investigator while the project is still in progress.

TOP IDEAS: (those that were highlighted by several participants.)

- A short webinar can **recognize SMEs and celebrate the benefits** of working with research. The recording can then be used in a variety of ways to provide long-term value.
- Consider **developing newer employees as SMEs** and helping them grow as employees and as project champions.
- Activate the **TRB-to-Champion pipeline**.

PEER EXCHANGE TOPIC 2—OPTIMIZING RESEARCH BUDGET AND STAFF

QUESTIONS FOR PRESENTATION TOPICS

The host states expanded the discussion of **Topic 2—Optimizing Research Budget and Staff**, with the following amplifying questions:

- Do you have trouble spending your SPR funds? If so, why?
- How do you effectively leverage both state and national funding?
    - Explain your utilization of the Transportation Pooled Fund program.
    - Explain your utilization of the AASHTO Technical Service Programs. Why do you, or don't you, fund TSPs?
- Is your agency forced to go outside your usual contracting partners?
- Is there a reason that you do not use additional universities or partners?
- Please share innovative ideas to do more with less.
- How do you juggle research with other heavily technical operational areas?
- Describe the top optimization process for contracting that your DOT uses.
- Does your agency make it a practice to limit the scope of your research projects to help keep overall costs down?
- If your agency utilizes a program/electronic research proposal submittal and review process, please describe.
    - How did you get it implemented?
- Are you understaffed? Please provide details.
- How do you get the most out of your staff, especially when you are understaffed?
- How do you recruit people to open positions?
- How do you retain new hires?
- Succession planning – How do you transfer knowledge from outgoing staff to new staff?
- What compromises do you make when hiring?
- How do you decide what roles/tasks are performed by each staff member?
- What research services do you expect from PIs that might typically be performed by a DOT?
- Are there ways to utilize employees or services from other parts of the DOT, for free?
- What research activities do you prioritize from highest to lowest in terms of time commitment?
- When you get a new task, who completes it?
- How does Research convince leadership that additional staff are needed? How do you foster a strong relationship and garner buy-in from your directing staff/leadership?

PRESENTATIONS

To kick off discussion on optimizing Research budget and staff, three of the participating states gave presentations on their approaches. These are reproduced as appendices to this report.

APPENDIX N. Mississippi DOT – Optimizing Research Budget and Staff, Cindy Smith, Mississippi DOT

APPENDIX O. New Hampshire DOT - Optimizing Research Budget and Staff, Deirdre Nash, New Hampshire DOT

APPENDIX P. Connecticut DOT - Optimizing Research Budget and Staff, Melanie Zimyeski, Connecticut DOT

DISCUSSION AND FINDINGS

The attendees then discussed the common challenge of optimizing staff and budgets and identified a number of best practices that have helped them succeed. Report-out forms, which participants completed and submitted at the end of the day, also contributed to the summaries below.

Common Challenges and Promising Best Practices

- Challenge: How to **leverage available resources** to minimize staff time?
  - All the participants agreed on the value proposition of **pooled fund participation**. MDOT and CTDOT are especially invested in pooled fund participation.
  - Vermont AOT had an **engineer outside of the research office help administer a project** relevant to her job duties and expertise.
  - Incorporate into the project contract the cost of making a final report **Section 508 compliant and publication-ready**. MassDOT includes a line item for getting the final report to publication quality in its research contract for projects.
  - **Be creative with staffing**; this may include part-timers, interns and university partners. Reach out to underutilized areas of DOT and be more flexible with requirements to fill positions, including rehiring retirees for cross-training.
- Challenge: How to **streamline contracting**?
  - Several states use **memorandums of understanding (MOUs) and master agreements** to streamline the contracting process.
  - Vermont and Connecticut **classify projects as grant agreements**. This seems like a small issue but makes a difference in payment timelines and flexibility.
  - Connecticut adds a **contingency fund in their work program** budget. This is not to fund future projects but to cover overages on the projects they fund.
  - CTDOT has implemented **automation** using a financial tracking spreadsheet to enhance its project management abilities.
  - **Streamline the NCHRP ballot process**. MaineDOT has tools that help facilitate the process and automate the tallying of results.

- Challenge: How to address **succession planning and knowledge transfer**?
    - CTDOT and MDOT use **standard operating procedures (SOPs).**
    - CTDOT engages in **cross-training and job shadowing** where possible.

TOP IDEAS:

- Almost all participants emphasized **the value of pooled fund participation** in order to get a lot of value for less staff effort.
- **Be creative with staffing**, including part-timers, interns, recent retirees, and universities.
- It was a key takeaway across nearly all the participants that **research programs could benefit greatly from administrative and contract assistance**.

PEER EXCHANGE TOPIC 3—FACILITATING TECHNOLOGY TRANSFER

QUESTIONS FOR PRESENTATION TOPICS

The host states expanded the discussion of **Topic 3—Facilitating Technology Transfer**, with the following amplifying questions in advance of the meeting:

- Please share examples of your tech transfer products including deliverables for individual projects, summary briefs, newsletters, etc.
    - Favorite and least favorite tech transfer activities?
- How often do you communicate about research internally? Externally?
- What products or outreach methods are successful in effectively reaching people, in terms of time or funding? Tips, tricks, products you use.
- Do you have tech transfer software, applications, or tools you can share to get better, more appealing results (ex. an application for fact sheet templates or a video editing program).
- How do you utilize webinars effectively?
- How have you changed your tech transfer approach to keep up with modern methods/short attention spans? Do you utilize short videos, social media, short briefs, etc.
    - Describe a futuristic technology transfer activity that would be helpful.
- Once you advertise project results how do you know people are using them?
    - Do you track implementation? Have they tried it? Did it work for them?
- Do researchers do tech transfer as part of the research contracts?
    - How are your contracts structured to support tech transfer?
- Do you work with other offices on tech transfer such as Communications, Public Affairs or Creative Services? Please describe.
    - How do you effectively do tech transfer if you can't get Public Affairs' attention?
- Do you work with outside firms to assist with tech transfer? Please explain.
- If Tech Transfer leads to unwanted attention/discussions, how do you deal with it?
    - How are the states featuring High Value Research projects?
    - How do you share your “wins”?
- Are you sharing the regional and national winners or the nominated projects?
- Is it appropriate to resurrect and share older projects?

PRESENTATIONS

To kick off discussion on optimizing technology transfer, three of the participating states gave presentations on their efforts. These are reproduced as appendices to this report.

APPENDIX Q. Vermont AOT – Facilitating Technology Transfer, Emily Parkany, Vermont AOT
APPENDIX R. New Jersey DOT – Facilitating Technology Transfer, Pragna Shah, New Jersey DOT
APPENDIX S. Massachusetts DOT - Facilitating Technology Transfer, Nicholas Zavolas, Massachusetts DOT

DISCUSSION AND FINDINGS

The attendees discussed technology transfer and identified tools and practices that have been successful at communicating research outcomes. Report-out forms, which participants completed and submitted at the end of the day, also contributed to the summaries below.

- Challenge: Identifying **successful channels for Technology Transfer**
  - Vermont AOT hosts an annual **Research and Innovation Symposium**.
  - The New Jersey DOT's **Research Showcase** celebrates research outcomes, presents awards (Best Poster, Research Champion Excellence, Outstanding University Student in Transportation Research) and communicates the value of current research activities.
  - MassDOT's **Transportation Innovation Conference** is a great opportunity for Technology Transfer. It is a large event with many sponsors, but it started small and grew from there.
- Vermont AOT employees are invited to **lunch-and-learn debrief sessions** after attending a research conference including the TRB Annual Meeting and MassDOT's Innovation Exchange.
- Challenge: Ensuring that **Technology Transfer reaches its audience**.
  - Vermont has a **communications plan** and is moving away from quarterly newsletters to **just-in-time communications** to update everyone in the department upon project completion.
  - Vermont captures videos of in-person presentations and cuts them down to **3- to 5-minute videos**. This creates a real opportunity for **digital on-demand learning,** which is key to knowledge transfer and onboarding of new technical champions.
  - Vermont asks its **PIs create brief public videos** for its symposium, which are later available online.
  - New Jersey DOT has many and various forms of research communications and technology transfer. The agency utilizes a **consultant who specializes in research communications** to help. That consultant also puts research **results into the national databases** (TRID, RIP, ROSA P).
  - Some participants use their **Local Technical Assistance Programs (LTAPs) to boost technology transfer**, such as writing technical briefs and advertising research events.
- Challenge: **Building technology transfer into research projects**

- Emphasize implementation and technology transfer from the beginning of research idea development and **give priority to projects that have good potential to be implemented**. For example, in Utah, the project solicitation emphasizes scoring "how would it be implemented" heavily.
- Utah DOT **tracks implementation** and prioritizes funding research for areas that have had good success with implementation.
- **Include an implementation plan in project deliverables**, as well as a fact sheet, a technical brief, or other key means of communication.
- MassDOT recommends **building technology transfer and Section 508 compliance into contracts**. This also helps with limited staff time and ensures projects can go quickly into the national databases.

TOP IDEAS:

- It was a key takeaway across nearly all states that **"just-in-time" communication** is the right way to promote research results.
- **Research symposiums**, whether larger (MassDOT) or smaller (Vermont AOT), are an excellent way to raise the profile of a research program, communicate results, and share appreciation for subject matter experts and other key team members.
- There was significant agreement on the **value of focusing on implementation and technology transfer at the start of the research process** rather than at the end of it. Building resources and support for implementation and technology transfer into contracts can streamline a lot of staff time and effort.

ADDITIONAL CRITICAL TOPICS

DISCUSSIONS

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

Advice for New Research Directors

- CTDOT recommends developing master-Memorandums of Understanding to ease contracting processes.
- Vermont suggests working from a qualified partners list.
- New Hampshire encourages figuring out the relationships between AASHTO, TRB, FHWA, and NCHRP. It's challenging, but the AASHTO Research Advisory Committee introductory presentation, **"**RAC 101," **is a resource**.
- MDOT notes that templates and manuals are helpful, but also:
    - Be creative and flexible.
    - Leverage pooled funds to your advantage.
    - Get involved in your AASHTO RAC region and, time permitting, join a task force or two.

Building a Better Relationship with the Executive Level

- Maine recommends identifying issues or topics that are important to senior leadership and proposing ways that the research office can help find solutions.
- Several states encouraged inviting executives to higher-profile events such as a ribbon-cutting, a TRB state visit or a peer exchange. If there can be press involved, then it will be more enticing.

The Value or Challenges of a Regional Transportation Research Consortium

- NETC was a thriving research consortium for over 30 years.
- NETC states were struggling to find consensus on which major projects to fund, which is why the consortium is not going forward. It was also challenging to find a state that wanted to take on the administrative work involved as the Lead State.
- Maine noted the yearly $100,000 pooled fund contribution was a big part of its budget and impacted how much research it could do at the state level.
- Vermont suggests it's likely that NETC will reconfigure itself again at some point but perhaps with a lower funding requirement.

ADDITIONAL RESOURCES

Throughout the peer exchange, attendees also shared a variety of printed materials, which are available in the Appendices or upon request. Several also shared online resources as linked below.

Online Resources

- Vermont's 3- to 5-minute project videos from its symposium.
- Vermont's Lunch and Learn (Nov 16, 2023) about its External Research Program (identifying a project idea and Championing it through selection and conduct of the project).

Research Program Tools – Appendix T

- CTDOT Solicitation Form
- Utah DOT Mid-Point Check-in Form
- Utah DOT Roles and Responsibilities

Research Communications Products – Appendix U

- CTDOT E-flyer – One-page document that summarizes who is in the research unit, what the research program does and the benefits of working with the research program.
- CTDOT Research Highlights Bulletin – A multi-page research bulletin that provides the highlights of completed research for the quarter.
- Vermont AOT External Research Process – A one-page document that provides an overview of the different roles for people working with AOT Research.
- Vermont AOT Engaging with Research – A one-page overview of the research process from idea solicitation through funding.

Research Educational Resource

- AASHTO Research Advisory Committee "RAC 101" introductory presentation; available upon request from Cindy Smith, Mississippi DOT, cjsmith@mdot.ms.gov.

OPPORTUNITIES FOR HOST STATES

A measure of a successful peer exchange is how the host states learn from others and identify the tools and practices that may solve their problems and help grow their programs. Throughout the peer exchange and in submitted report-out forms, attendees praised the many impressive achievements of each host research program and highlighted strategies to address the challenges that each agency had presented.

NEW HAMPSHIRE

New Hampshire's Strengths

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

- New Hampshire has a **large research advisory committee** which gathers many voices and opinions throughout its DOT to help prioritize what is important to the agency. This allows many offices at their department to be engaged in research.
- NHDOT Research is **lean and efficient**, with one person doing everything and doing it very well.
- NHDOT is an **active participant in regional and national activities**.
- The agency has an innovative approach to **sending more staff to TRB using SPR funds**, which benefits technology transfer. Funding multiple attendees to TRB should help increase involvement and engagement of staff and stimulate new SMEs.

Opportunities for NHDOT

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

- NHDOT sends many people to the TRB Annual Meeting (12 in 2024). Attendees could be tasked to document their takeaways while at the TRB meeting and present their findings when back in the office. This could lead to research ideas that attendees or others are interested in championing. **NHDOT could leverage TRB travel and participation to recruit SMEs.**
- The **importance of hiring two research staff immediately** is emphasized.
    - NHDOT may want to consider some **flexibility in hiring.** The positions might not have to be filled by licensed professional engineers. They could be newer engineers or others with another technical degree.
    - NHDOT could make the **positions more attractive by including the possibility of cross-training** and working part-time in other bureaus or offices like design, construction, material testing, etc.
    - **Universities can also be a good resource** for staffing. Talk to PIs that you have a relationship with about students they might recommend
- New Hampshire has had a decline in the number of project ideas submitted and funded in recent years, likely due to SME retirement and short staffing. One idea is putting on a **short**

webinar covering how to submit a research idea and the benefits of working with the Research program.

- When there is a shortage of project ideas, **check with other states about collaboration.** Some states have more ideas than they can fund. This especially works well if a university or a university transportation center wants to do a project and is looking for a state partner.
- Encourage **NHDOT administration to attend a research peer exchange** so they understand and engage in the issues of their Research program.

MAINE

Maine's Strengths

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

- Task forces are an excellent way to be involved in problem solving within the DOT. MaineDOT **displays a service mindset to assist SMEs and the DOT with addressing problems.**
- MaineDOT has an **NCHRP problem statement voting system spreadsheet** for its ranking process that is practical and successful. Other states would like to borrow it or learn from it.
- MaineDOT Research has **excellent engagement with upper management.** Maine meets every two months with its Engineering Council to share projects, talk about implementation and engage others outside research, which builds broader interest and support.
- MaineDOT **works very efficiently** with only three permanent employees and a summer intern.
- MaineDOT has **a successful in-house research program** that delivers results inexpensively and provides job satisfaction to staff.

Opportunities for MaineDOT

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

- Maine **needs help with administrative/contract duties** to free them up for more project and technical work.
- MaineDOT plans to improve their final deliverable requirements to **ensure they get publication-quality documents** suitable for national database posting.
- Maine would like to put more emphasis on **tracking and measuring research results and benefits.**
- MaineDOT learned that **it may not need to put projects into the Statewide Transportation Improvement Program**, which would greatly streamline its processes. MaineDOT will be looking into the best way to make this change moving forward.

CONNECTICUT

Connecticut's Strengths

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

- CTDOT's research staff has advanced project and program management skills with advanced financial tracking systems that **support proactive planning.** They are well-organized and have a good project management process with financial tracking.
- MOUs with the University of Connecticut (UConn) are an innovative way to **shorten the contracting process**. CTDOT also maintains good relationships with other university partners, which allows competition to select the most knowledgeable consultant for each project.
- CTDOT has developed **standard operating procedures (SOPs)** that support succession planning and allow a smooth transition.
- CTDOT is **thinking ahead to mitigate staff burnout.** It is flexible in assigning tasks and adjusting roles based on deadlines.
- **Participation in multiple pooled fund studies** (46) is a great way to be involved in many projects at a lower cost and staff effort.
- Its **research projects ranking system** (based on NETC/NCHRP) seems to work efficiently.
- CTDOT has a **collaborative staff and supports cross-training** to increase awareness of what different staff members do.
- They utilize an **e-flyer** for reaching out within the DOT.
- CTDOT has top-down support with the **Connecticut management team attending the peer exchange** and supporting research.

Opportunities for CTDOT

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

- Try to find ways to work with **the UConn staff to do some technology transfer** activities, the way Rutgers University does for the New Jersey DOT. S&PR Part B funds support the UConn Training and Technical Assistance Center, so this should be an opportunity for assistance.
- **Write Section 508 compliance into contracts,** as suggested by MassDOT.
- **Look into more expedited agreements or streamlined contract processes.** Like most states, contracting duties take a lot of time and effort, so additional master agreements with other university partners would be beneficial.
- **Consider reviewing projects more frequently.** A two-year project review cycle can be a barrier to quickly addressing staff needs and research ideas.
- **The CTDOT research office would benefit from more staff**. It could achieve a wider variety of goals, aid in succession planning, and open up time for technical work if it had more assistance.
- **Include an implementation plan in the scope of work** as part of a project final report.
- **Track and measure research implementation and benefits** to help document the long-term value of research.

- **Add SMEs to the acknowledgements section in a project final report** so they receive additional recognition for their efforts.

KEY TAKEAWAYS FOR ALL PARTICIPANTS

All participants shared a number of issues, tools and solutions:

- Streamline the contracting process either by establishing master agreements with universities or by using a qualified partners list.
- Track research implementation and work to understand the "why" if research is not implemented.
- Develop an e-flyer like CTDOT to help communicate how to work with a Research Office and the benefits of doing so.
- Communicate research events "just in time," when projects reach relevant milestones or are completed. This seems more impactful than a regular barrage of research newsletters.
- Tap TRB attendees as SMEs and think of travel to TRB as a "reward" for a good project champion.
- Have a lunch-and-learn session to review research outcomes.
- Award professional development hours to encourage participation in technology transfer presentations.

APPENDIX A. NETC 2024 PEER EXCHANGE AGENDA

NETC 2024 Research Peer Exchange

Agenda

June 25-27, 2024

NHDOT Headquarters – 7 Hazen Drive, Concord, NH – Rm. 114, Granite State Conference Room

All times are Eastern – Breaks will be taken as needed

Day 1: Tuesday, June 25, 2024

Morning Session

8:50 a.m. Arrive at NHDOT

9:00 a.m. **Welcome, Meeting Goals and Agenda Review**

Dee Nash, New Hampshire DOT
Kirsten Seeber, CTC & Associates

9:10 a.m. **Introductions**

- Name, Agency, Role
- What you hope to learn at this peer exchange?
- Get-to-know-you questions

9:45 a.m. **State Research Program Presentations** (75 minutes — 10 minutes each plus Q-and-A)

- Maine DOT
- Utah DOT
- Vermont AOT
- Connecticut DOT
- Nevada DOT

11:00 a.m. Break

11:15 a.m. **State Research Program Presentations** (60 minutes — 10 minutes each plus Q-and-A)

- New Jersey DOT
- Massachusetts DOT
- Mississippi DOT
- New Hampshire DOT

12:15 p.m. Lunch

NETC 2024 Research Peer Exchange

Agenda

June 25-27, 2024

NHDOT Headquarters – 7 Hazen Drive, Concord, NH – Rm. 114, Granite State Conference Room

All times are Eastern – Breaks will be taken as needed

Day 1: Tuesday, June 25, 2024 (continued)

Afternoon Session

1:00 p.m. **Topic 1. Engaging Subject Matter Experts** (Shortage of SMEs throughout the agency, recruitment, engagement, reducing SME burnout. Research project idea solicitation, including best practices and tools to canvass ideas from agency staff and outside stakeholders.)

Presentations (15-20 minutes per presentation)

- Nevada DOT
- Maine DOT
- Utah DOT

Group Discussion

- Targeted list of questions

4:15 p.m. **Complete Day 1 Report Out Worksheet**

4:30 p.m. Adjourn afternoon session

5:45 p.m. Meet in the hotel lobby for a group dinner – Cheers Grill & Bar

NETC 2024 Research Peer Exchange

Agenda

June 25-27, 2024

NHDOT Headquarters – 7 Hazen Drive, Concord, NH – Rm. 114, Granite State Conference Room

All times are Eastern – Breaks will be taken as needed

Day 2: Wednesday, June 26, 2024

Morning Session

8:50 a.m. Arrive at NHDOT

9:00 a.m. **Review of Peer Exchange to Date; Goals**

9:05 a.m. **Topic 2. Optimizing the Research Budget and Staff** (Working effectively with a small budget and few staff.)

Presentations (15-20 minutes per presentation)

- Mississippi DOT
- New Hampshire DOT
- Connecticut DOT

Group Discussion

- Targeted list of questions

12:00 p.m. Lunch

NETC 2024 Research Peer Exchange

Agenda

June 25-27, 2024

NHDOT Headquarters – 7 Hazen Drive, Concord, NH – Rm. 114, Granite State Conference Room

All times are Eastern – Breaks will be taken as needed

Day 2: Wednesday, June 26, 2024 (continued)

Afternoon Session

1:00 p.m. **Topic 3. Technology Transfer** (Effective tools and processes to share research results within and beyond the agency.)

Presentations (15-20 minutes per presentation)

- Vermont AOT
- New Jersey DOT
- Massachusetts DOT

Group Discussion

- Targeted list of questions

4:00 p.m. **Complete Day 2 Report Out Worksheet**

4:15 p.m. Adjourn afternoon session

Dinner on your own.

NETC 2024 Research Peer Exchange

Agenda

June 25-27, 2024

NHDOT Headquarters – 7 Hazen Drive, Concord, NH – Rm. 114, Granite State Conference Room

All times are Eastern – Breaks will be taken as needed

Day 3: Thursday, June 27, 2024

Morning Session

8:50 a.m. Arrive at NHDOT

9:00 a.m. **Complete Day 3 Report Out Worksheet**

9:20 a.m. **CT, ME and NH**

- Strengths and challenges
- Opportunities

Peer Agencies

- "Aha moments" and great ideas to take home

11:30 a.m. NETC agencies moving forward once pooled fund ends

Noon Adjourn meeting

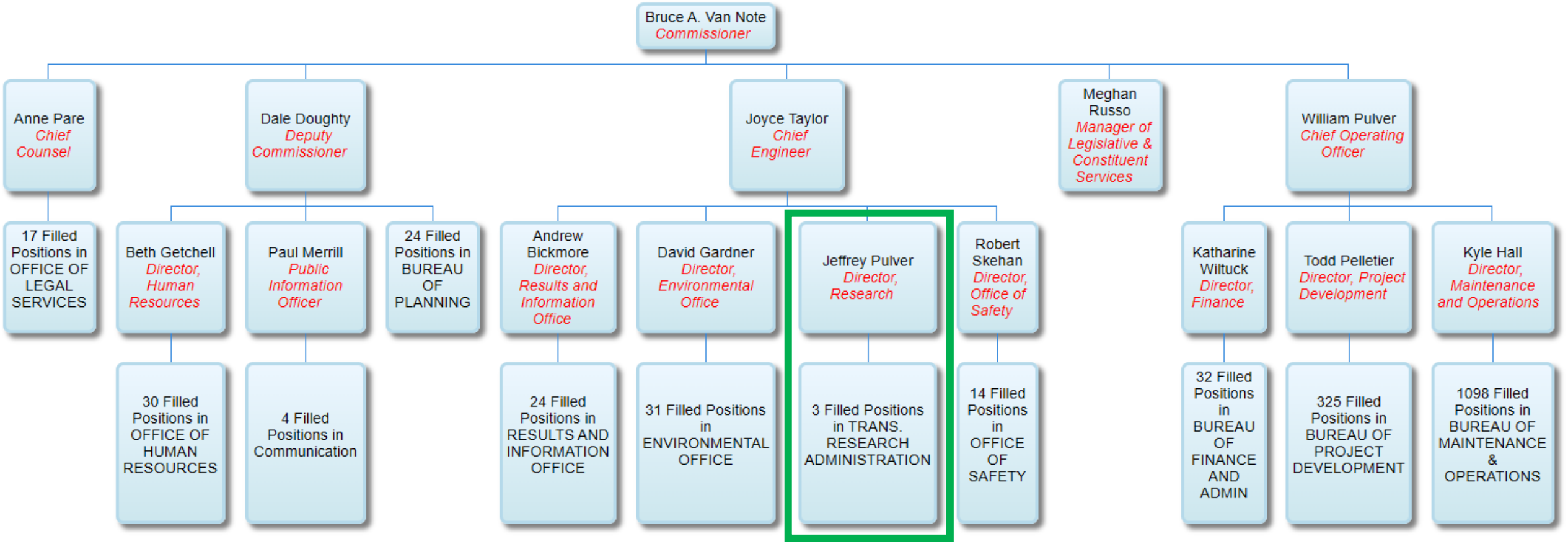
APPENDIX B. MAINE DOT RESEARCH PROGRAM OVERVIEW

MaineDOT Research Program Overview

June 25, 2024

Jeff Pulver

Where does the Research program fit into your agency?



Where does the Research program fit into your agency (part 2)?

- Office of Research and Innovation reports directly to the Chief Engineer
  - Not part of Planning or Materials
- Director is a Senior Management position
  - +/- 53 people in senior management at MaineDOT
  - Director plays a large role in our Engineering Council (+/- 27 senior engineers who meet every other month)
- Elevated position in the organization
  - Direct line to Chief Engineer weekly helps communicate with leadership
  - Chief Engineer is familiar with most of the major engineering issues at the Department
- Task forces and internal committees to address significant problems or change practice.
- Leaned on for sharing information internally and externally as well as learning
- Leadership see involvement in research projects as an interesting development opportunity for staff

Task Force Examples

- **Value Engineering**
- **Speed and Context**
- **Complete Streets Task Force**
- **Strategic Information Roadmap**
- **Keep Our Bridges Safe**
- **Drone User Group**
- **Mobility Report**
- **Interstate Rutting**
- **Autonomous Vehicle Rules**
- **Low-Carbon Materials**
- **Etc.**

Information Sharing

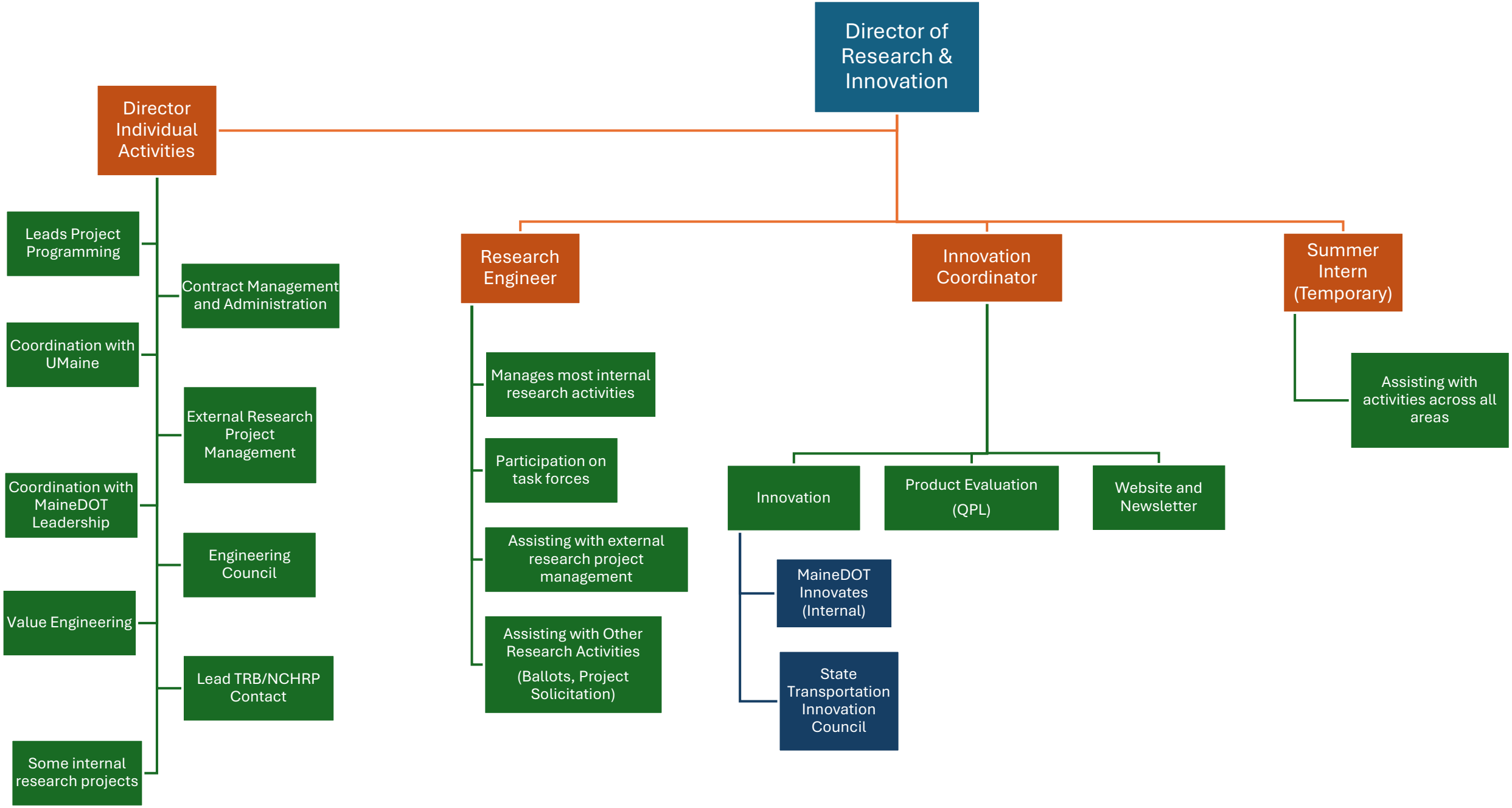
ENGINEERING COUNCIL – COORDINATING TOPICS/PRESENTATIONS

CONNECTING PEOPLE WITH AASHTO PUBLICATIONS AND TECHNICAL PROGRAMS OR TRAINING

TRANSPORTATION CONFERENCE COMMITTEE

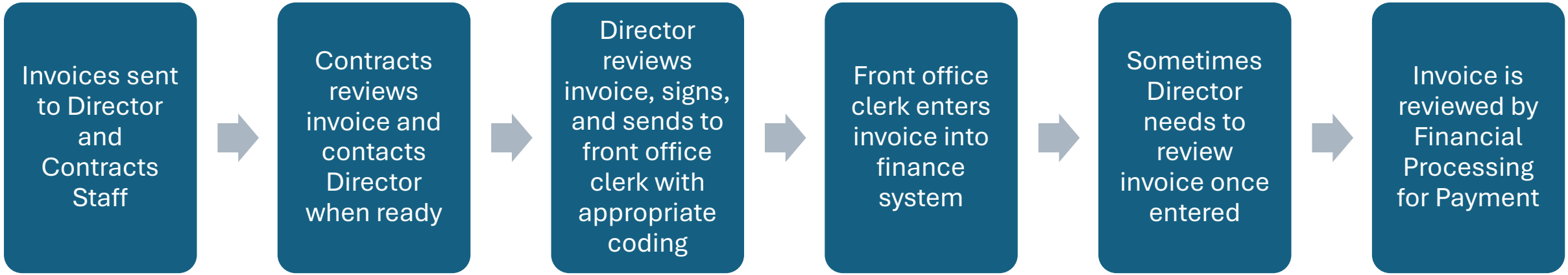
LIAISON TO UNIVERSITY OF MAINE

CONNECTION OR TRB AND NCHRP PUBLICATIONS AND OPPORTUNITIES


Director of Research & Innovation
Director Individual Activities
Leads Project Programming
Contract Management and Administration
Coordination with UMaine
External Research Project Management
Coordination with MaineDOT Leadership
Engineering Council
Value Engineering
Lead TRB/NCHRP Contact
Some internal research projects
Research Engineer
Manages most internal research activities
Participation on task forces
Assisting with external research project management
Assisting with Other Research Activities
(Ballots, Project Solicitation)
Innovation Coordinator
Innovation
Product Evaluation (QPL)
Website and Newsletter
MaineDOT Innovates (Internal)
State Transportation Innovation Council
Summer Intern (Temporary)
Assisting with activities across all areas

Contract Management

- No Clerical Staff in Research & Innovation
  - Simple contract activities go through MaineDOT Contracts
    - Contract Procurement Office in the Bureau of Finance
  - Cooperative Agreements and complicated contracts go through the Legal Office first, then to Contracts
  - Invoices

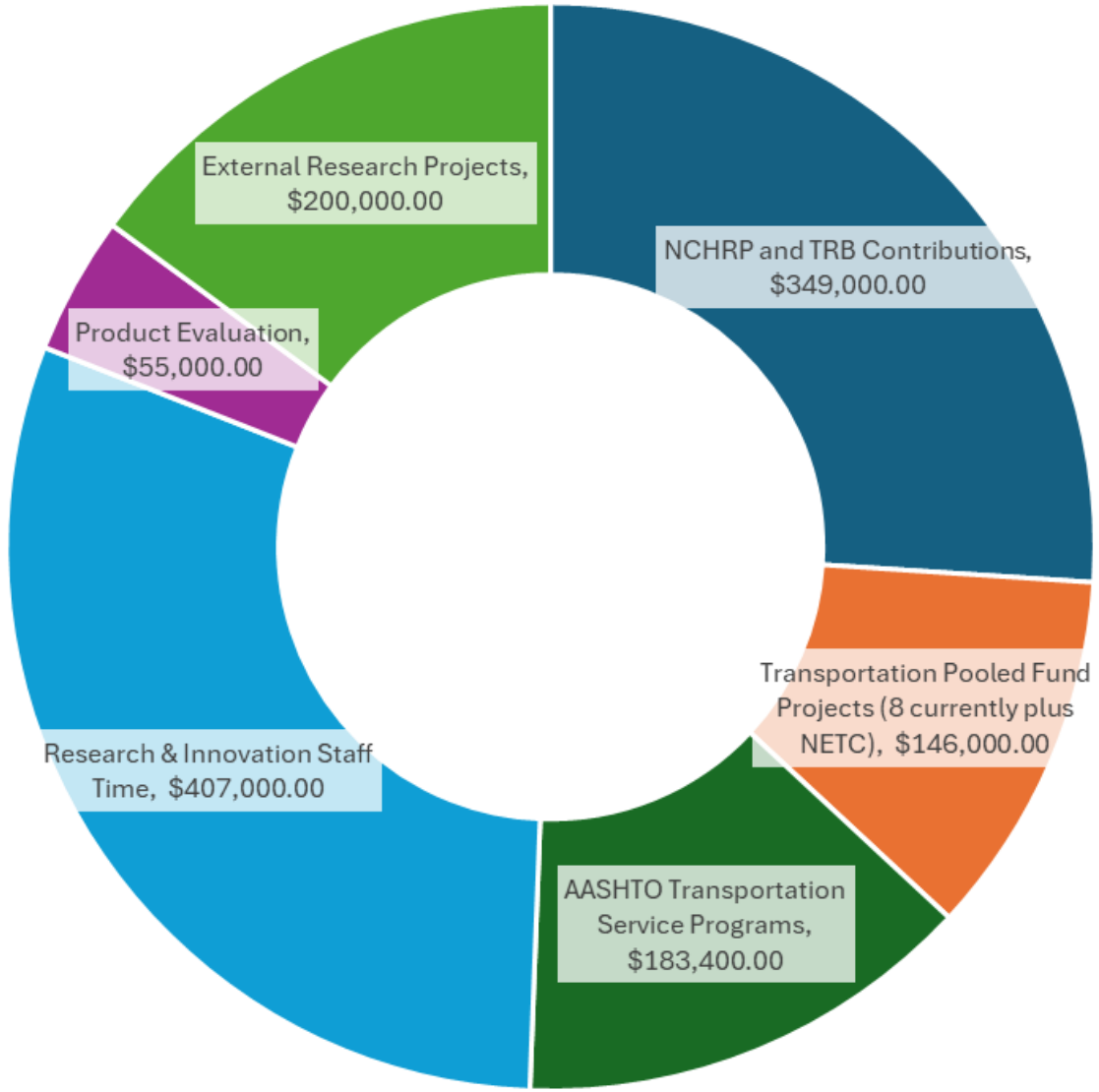


  - This has been complicated lately with staff turnover and delays in the review process

Research Advisory Committee

- Research project candidates are presented in front of a panel of MaineDOT senior management for scoring or ranking
- RAC Includes
  - Director of Safety and Mobility
  - Director of the Environmental Office
  - Highway Program Manager
  - Highway Maintenance Engineer
- After RAC review, final review and approval of projects goes through the Chief Engineer

MaineDOT Research Budget



MaineDOT Research Budget (Percentages)

MaineDOT Research & Innovation Budget (Percentages)

One thing our research program does well

Ability to execute small, quick-hitting external research projects

- Problem Solving WIN
  - Active WIN set aside
  - Projects $25k or less
  - Scope related to:
    - Synthesis Projects
    - Surveys
    - Continuation or updates of previous research
    - Project kick-off tasks
    - Tech transfer activities
- Multi-PIN Assignment Letter Contract with UMaine
  - One-page assignments within a larger contract
  - Soon to be 12 assignments under this contract since February 2023

APPENDIX C. UTAH DOT RESEARCH PROGRAM OVERVIEW

NETC Research Peer Exchange

State Presentation

June 25, 2024

Presentation by: Cameron Kergaye, Utah

State of Utah

84,900 Square Miles

3.4M Population

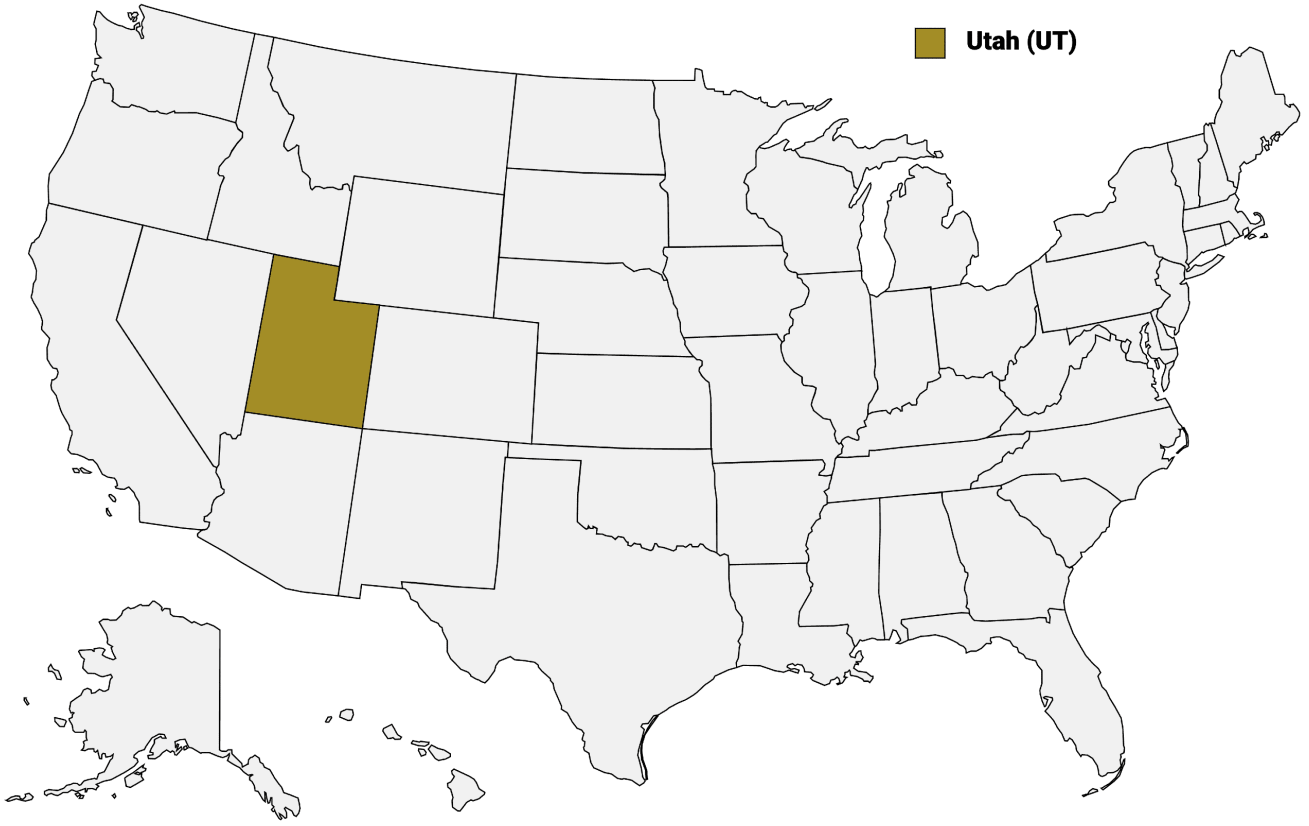
- 1.2M Salt Lake Metro

1700 UDOT employees

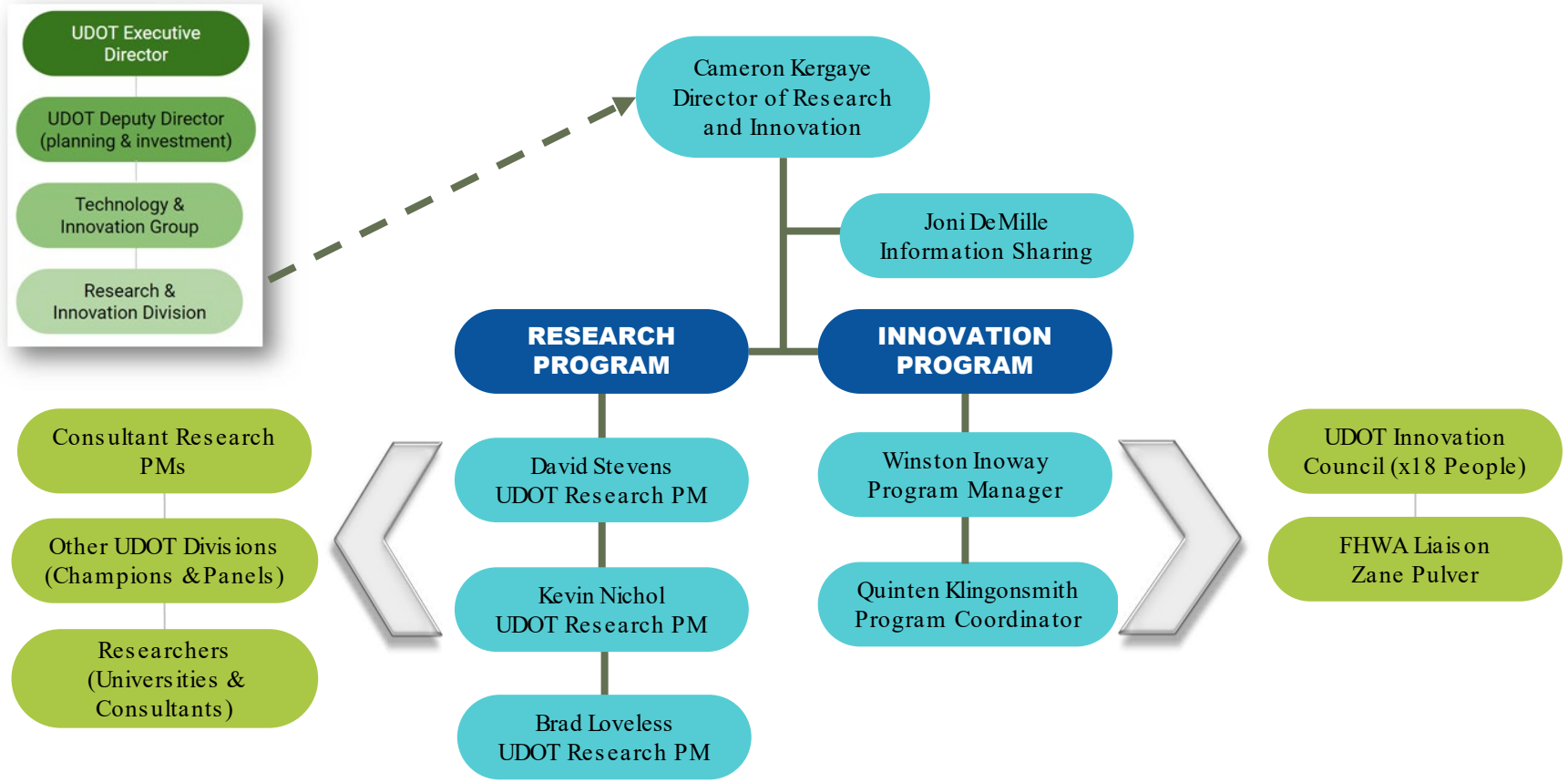
49,000 Lane-miles

3000 Bridges

520 Snowplow trucks



Research Program



Research Program (continued)

- One thing we do well:

  Identify and prioritize research needs

- Our number one challenge:

  Support the implementation of research results

Research Program Budget

- Traditional research projects: $1.2M/year
- Cost per project: $20K to $100K
- Pooled funds: Lead on 6; contribute $180K/year to others
- AASHTO Technical Service Programs: $6K/year
- NCHRP: $500K/year
- TRB: $120K/year
- Personnel: $1.2M/year (state and SPR2 funds)
- Consultant PMs and support: $180K/year
- Travel: $12K/year

Research Contracting

- Utah public university contracts
  - Research project managers
  - Comptrollers office
- Contracts with private firms (qualified pool)
  - Research project managers
  - Consultant Services Division
  - Comptrollers office

APPENDIX D. VERMONT AOT RESEARCH PROGRAM OVERVIEW

NETC Research Peer Exchange

State Presentation

June 25, 2024

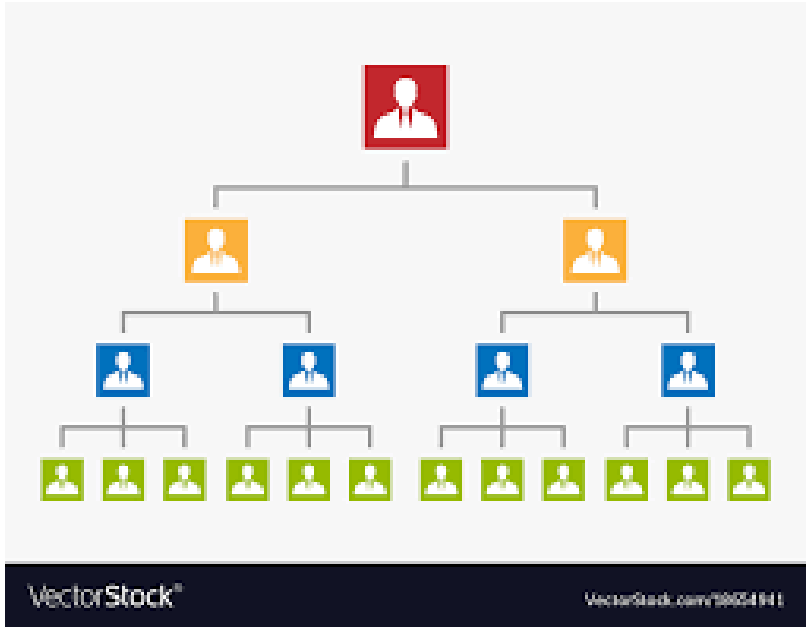
Presentation by: Emily Parkany, VT AOT

Program responsibilities

- When Research was part of the Materials Lab, there was more staff and more field and internal research.
- Now, two staff and greater emphasis on research management
  - External research projects led by VTrans
  - Maximizing utilization of external payments
    - Pooled funds including NETC
    - National Cooperative Highway Research Program/TRB

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

- The two of us (Research Manager and Research Engineer) are part of the Policy, Planning and Research Bureau (15 staff) which is part of the Policy, Planning and Intermodal Development Division
- My boss is the Bureau Director who reports to the Division Director who reports to the Secretary
- It's hierarchical but people are friendly and supportive of research



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

SPR-B in FFY24: $1.236M

Total Research Budget: $1.392M
- (90% or more of staff time in Work Program)

External Research Program:
- 3-4 projects a year; 9 active projects; FFY24 $370,000

AASHTO TSPs: $114,000

Pooled Funds: $113,000*

* including new phase of the Concrete Consortium Pooled Fund (joined mid-year)

Recent Successes

- Project Champions from across the Agency
- Variety of projects: materials, structures, snow and ice, environmental, safety, etc.—directly and indirectly research funded, other
- Annual Research and Innovation Symposium
  - 2024 will be the 7th!!
  - People's Choice Award worked well in 2022 (first attempt)
  - Can use federal funds for food!
- Benefits and Implementation Survey and Discussion

Biggest Challenges

Contracting for Symposium support

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

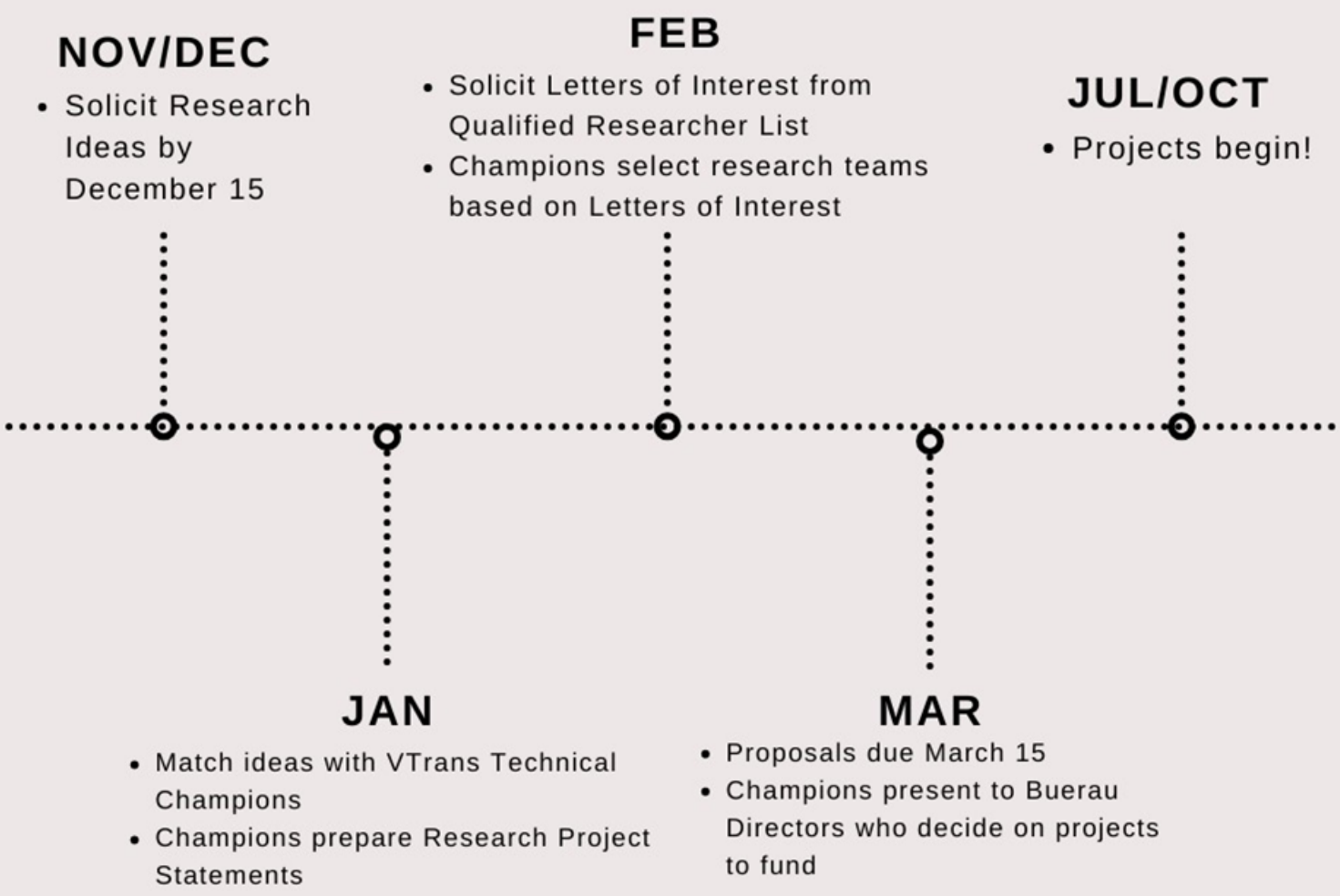
Transitioning from Quarterly Newsletter to Just in Time Announcements

- How can we maximize contractor support
- Much of the content comes from Research staff

Contracting

- We work with our Contract Administration and it's rarely smooth
- All projects need an Agency of Digital Services (IT) review
- Now all External Research Projects are grant agreements—even projects with for-profit consultants
- We're supposed to be using a "grant template" but there's some confusion from Legal about whether they can say "OK" to a template without a specific Statement of Work/research proposal
- Will be soliciting a new Qualified Researchers List (universities and consultants) this fall—potentially good for four years with an "on ramp"
- Just got a Symposium videographer through another Agency's communications retainer that our AOT Communications Manager set up for us

AOT Research Process



ACTIVE EXTERNAL RESEARCH PROJECTS

- 22-3 Phosphorus Removal with DWTRs
- 22-4 Smart Growth, VMT and GHG
- 23-1 Small Culvert Monitoring
- 23-2 Pavement Deterioration Modeling
- 23-3 Recycled Asphalt Shingles in FDR
- 23-4 Work Zone Travel Time Delay
- 24-1 Developing a Framework for Defining Quality and Constructability
- 24-2 Landslide Hazard Identification and Monitoring
- 24-3 GHG Reductions due to VT Clean Transportation Incentive Programs

APPENDIX E. CONNECTICUT DOT RESEARCH PROGRAM OVERVIEW

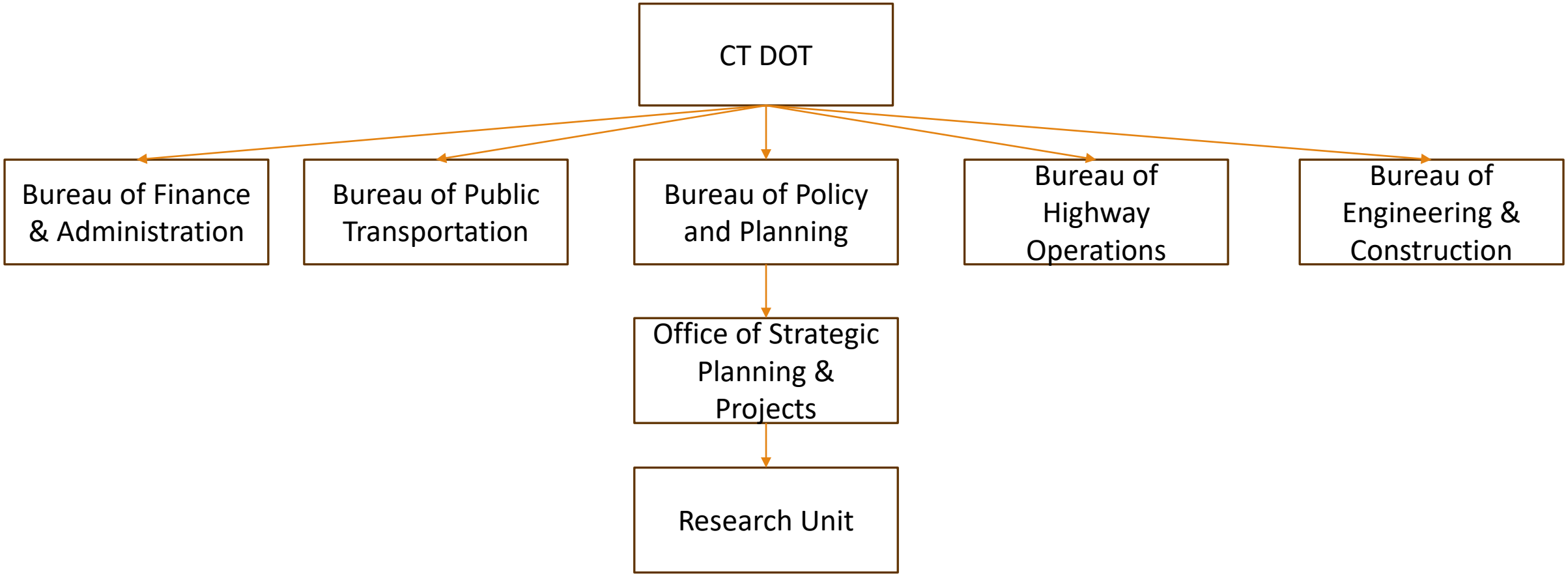
NETC Research Peer Exchange

State Presentation

June 25, 2024

Presentation by: Melanie Zimyeski, PE, Connecticut

Research Program: Org. Structure



Research Program: Staff Size

- Transportation Supervising Planner: Melanie Zimyeski, PE
- Transportation Engineer 3: Dionysia Oliveira
- Connecticut Careers Trainee - CCT: Devon Kleeblatt

Research Program: Staff Roles

- Higher administrative functions for Research
- Unit staff
- Financial units: Capital Services, Financial Mgmt & Support
- Staff Attorney
- Agreements office
- University staff – Administrative, Principal Investigators (PI's), Technical Staff, Financial, Legal
- Administrative Staff

Research Program: Unit Staff Roles

- Administration
- Implementation
- Project Management
- QA/QC for reports and other project deliverables
- Technology transfer
- Serve on Committees
- Required Governmental Reporting (State/Fed),
- Collaboration/liaison with Fed/State/Local agencies as required
- Use of innovative technology

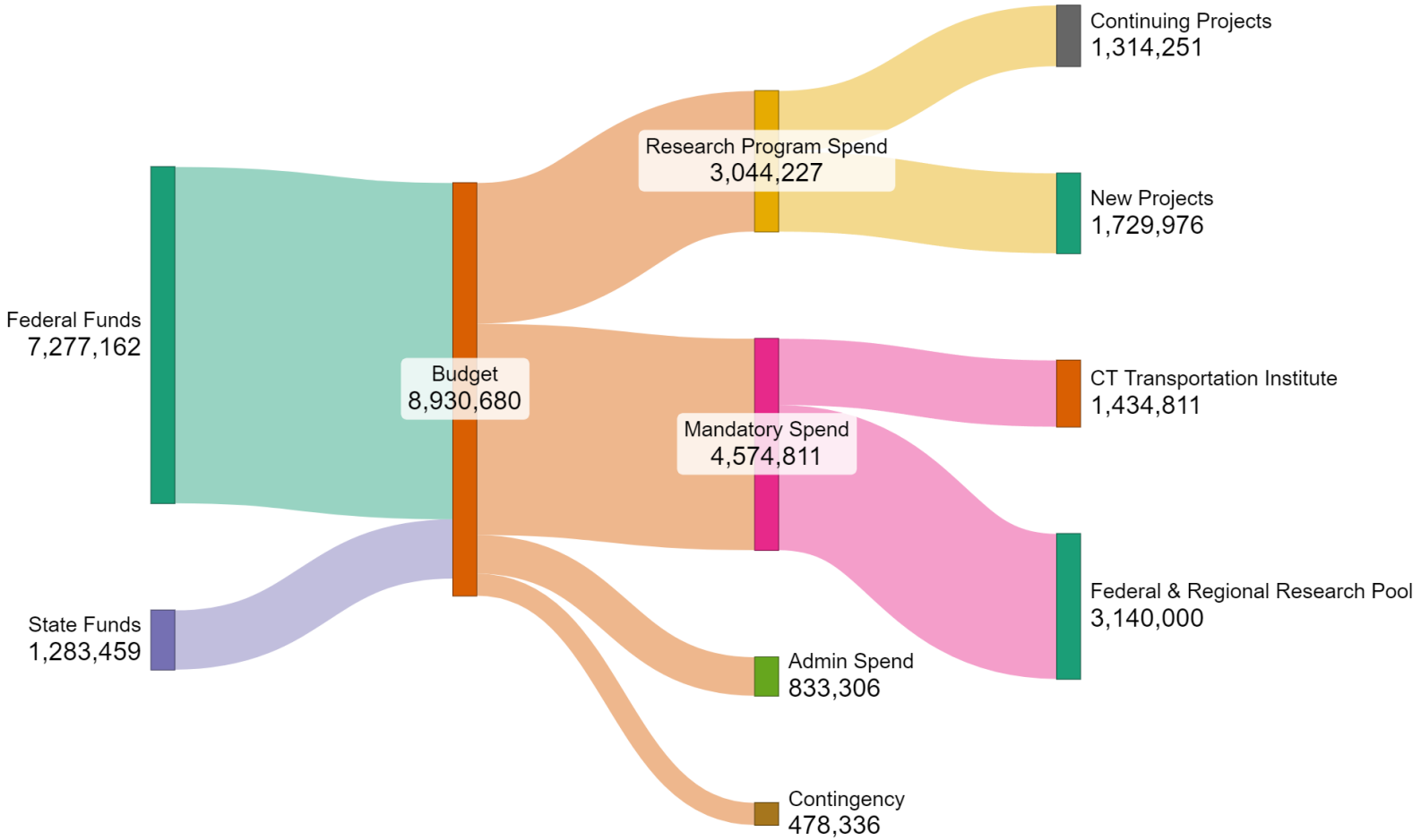
Research Program: Greatest Strength

- Maintaining a well-balanced multimodal program with limited staff who can organize and track multiple/numerous project details accurately

Research Program: Greatest Challenge

- Reliance on Subject Matter Experts' ability to provide quality and timely responses to pertinent technical questions

Research Program Budget/Contracting



Research Program Budget/Contracting I

Budget – FY23 & FY24 total: $8.5 million

- Traditional research projects: $3,044,227
- Cost per project (range):
  - Largest: $1,178,312 (SPR-1271: T2 Center)
  - Smallest: $41,727 (SPR-2329: Pollinator Study)
- Pooled funds: $3,140,000 (AASHTO TSP, TPF, NETC, TRB, NCHRP)
- AASHTO Technical Service Programs: $45,000
- Travel: included in SPR-0222 Admin budget: $489,946
- Internal staff misc/minor research projects: $40,000 (not spent)

Research Program Budget/Contracting II

- SPR Part II
- State match
- JHRAC (State)
- STIC
- SELDM (Federal Non-SPR)
- SPR-2330 (MAVRIC): ~$450 K
  - SPR Part I: ~$210K
  - SPR Part 2: ~$241K (77% to Consultant)

Research Program Budget/Contracting III

Research office with assistance from:

- Staff Attorney (legal review)
- Fiscal Admin Supervisor- Agreements (Bureau of F&A)
- Financial Management and Support (Purchase Orders, Invoices)
- Capital Projects – Programming
- Corresponding titles from the Universities – Sponsored Project Services (SPS, OSP)

APPENDIX F. NEVADA DOT RESEARCH PROGRAM OVERVIEW

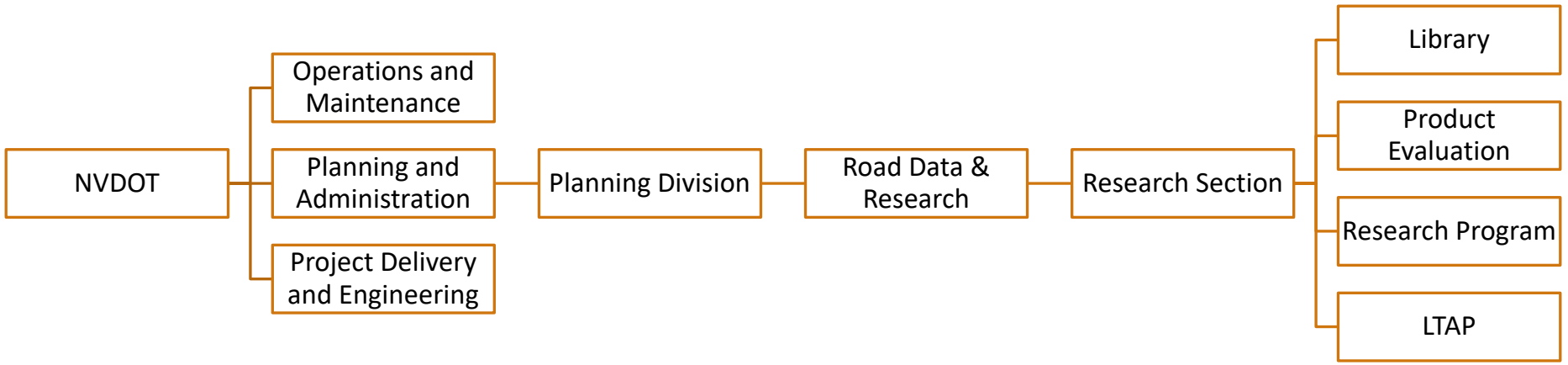
NETC Research Peer Exchange

JUNE 25, 2024

LUCY KOURY - NEVADA

Research Program Hierarchy

- The NDOT Research Section is within the Planning Division as part of Road Data and Research
- The Research Section encompasses: Library, Product Evaluation, Research Program, and LTAP
- Of the 5 people within the Research Section, only 2.5 are part of the Research Program



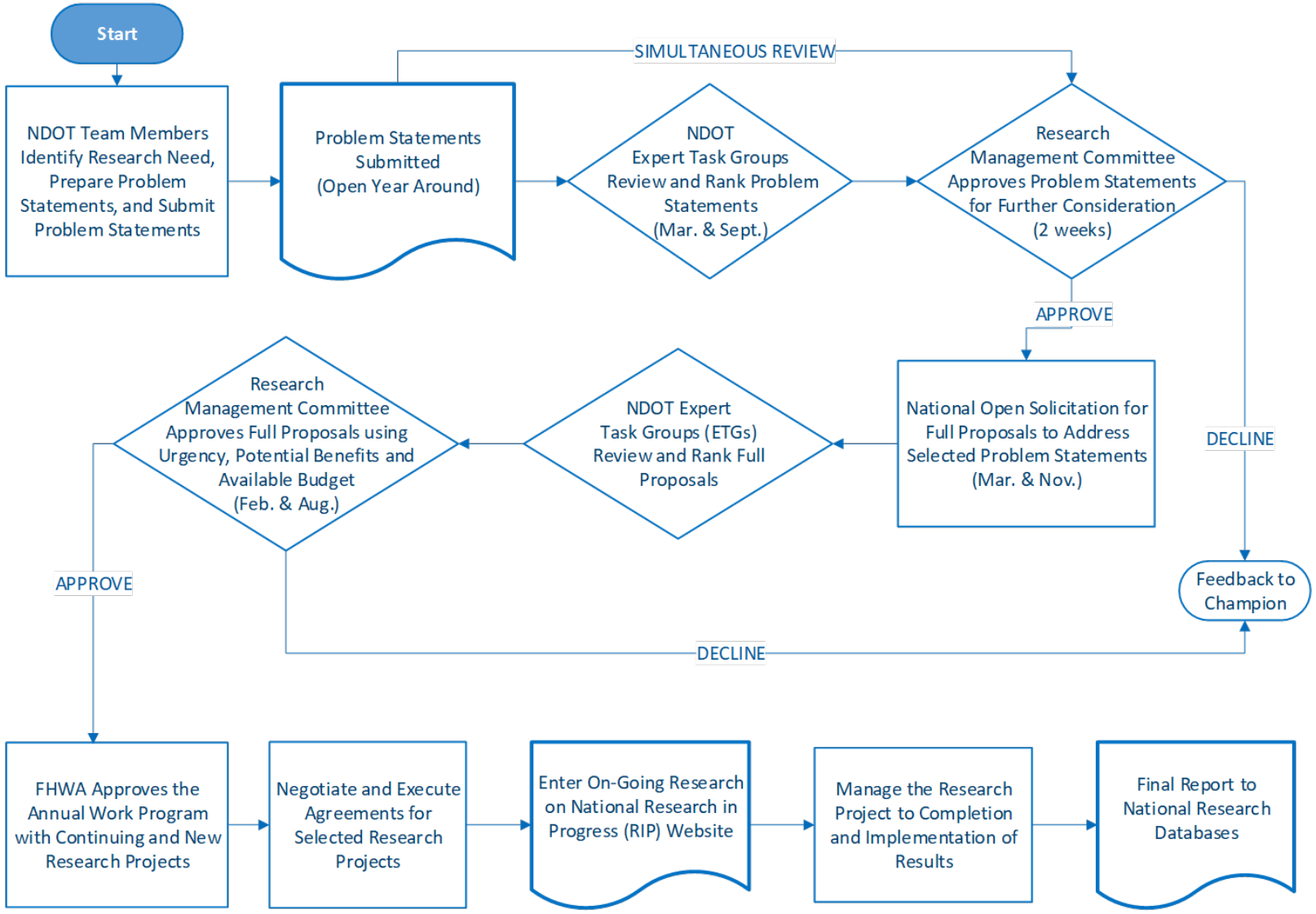
Research Program Staff

- Research Program has 2.5 fulltime employees
  - **Research Coordinator** (FTE) – administers all aspects of the research program, manages research projects, is the main point of contact and cheerleader for the Research Program
  - **Research Analyst** (FTE) – supports Research Coordinator in managing the program, develops reports, handles administrative processes, 508 compliance, website
  - **Research Chief** (.5) – manages research program and personnel, oversees research activities, budgets, research representative for Nevada

- We do not perform research in-house. All research is completed by outside entities, frequently by universities but also by consultants.

Research Program Strength

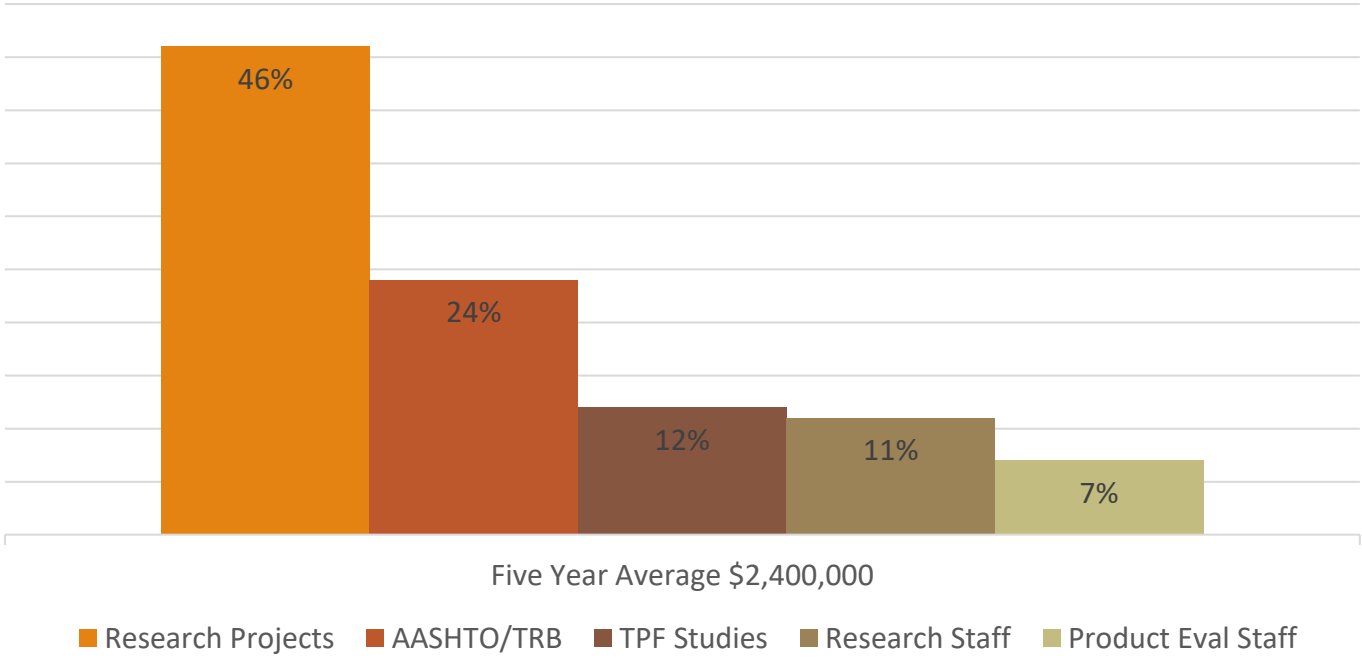
- Our process allows us to trim the fat and cut to the heart of pertinent research topics. We take in a limited but high-quality number of Problem Statements/research ideas that are evaluated by knowledgeable, key NDOT team members.



Research Program Weakness

- Finding consistent, high-quality champions to be technical leads on research projects. There is a wide gap in skills and abilities between our strong champions and our weak ones.

Research Program Budget



- SPR Part 2 provides the main funding for the Research Program (80% federal/20% state match)
- University Transportation Centers (UTC) are 100% state funded (do not happen often)

Research Program Contracting

- Contracts are initiated after the solicitation and selection of a proposal. Research staff aid in negotiations and put together the contracts with all required backup documentation.
- NDOT Agreement Services works with Deputy Attorneys General to finalize the contract.
- NDOT Research staff manage the administrative aspects of the contract.
- NDOT Champion manages the technical aspects of the contract.

NETC Research Peer Exchange Topic 1

JUNE 25, 2024

TOPIC 1: ENGAGING SUBJECT MATTER EXPERTS

Subject Matter Experts – Definitions (continued)

How does your program define a SME?

- Pretty much anyone who has a working technical knowledge of their profession or position
- When leading the research, the SME is referred to the champion

What pool of staff do you draw from at your agency?

- Any and all
- Most frequently materials and civil engineers
- Our approach is anyone who has identified a problem or has a question that needs to be researched is welcome to submit their idea
- Newer NDOT personnel are partnered with more experienced personnel

Subject Matter Experts – Definitions

Are non-DOT SMEs utilized, and how are they utilized?

- Yes, typically as part of the Technical Advisory Panel that helps guide the project
- Most frequently from other governmental agencies (e.g., MPO, RTC, counties, etc.)
- Also participate as co-champions of research projects

How do you know who is knowledgeable?

- No formal metric
- By having a conversation with them and reviewing their filled-out Problem Statement. Generally, this gives us insight into their thought process and communication skills. While it is difficult for me to know if a structural engineer knows their business, the Problem Statement is reviewed by a different person from their business section, which gives further insight into the merit of their knowledge.

Subject Matter Experts – Roles

How much influence do SMEs have on research: selecting research, guiding PIs, implementing results?

- Lots!
- Develop research ideas
- Review Problem Statements and then research proposals, evaluating both in separate steps
- Champions and Technical Advisory Panel SMEs are responsible for guiding PIs and helping keep the research on the correct technical track
- Champions/SMEs are completely responsible for implementing results

Is it possible to have too many SMEs on one project?

- So long as there is a strong champion who can and will make final determinations, there can be as many SMEs as are needed

APPENDIX G. NEW JERSEY DOT RESEARCH PROGRAM OVERVIEW

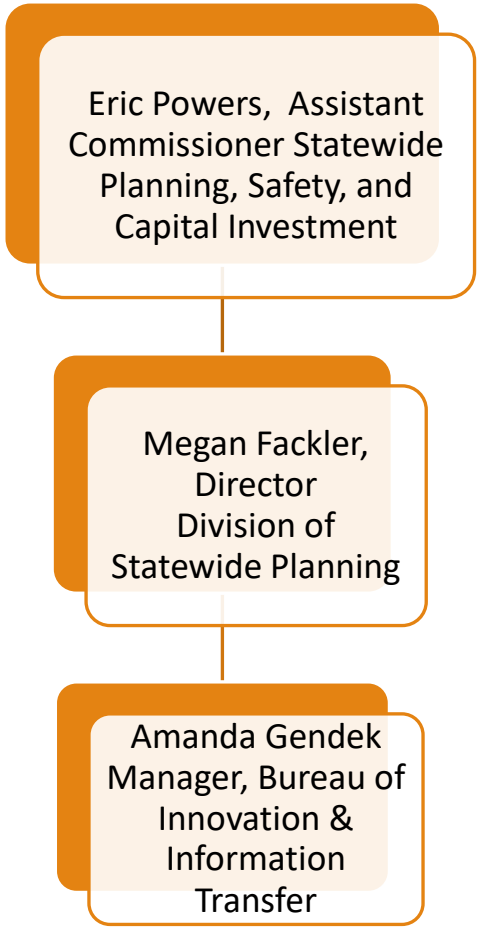
NETC Research Peer Exchange

State Presentation

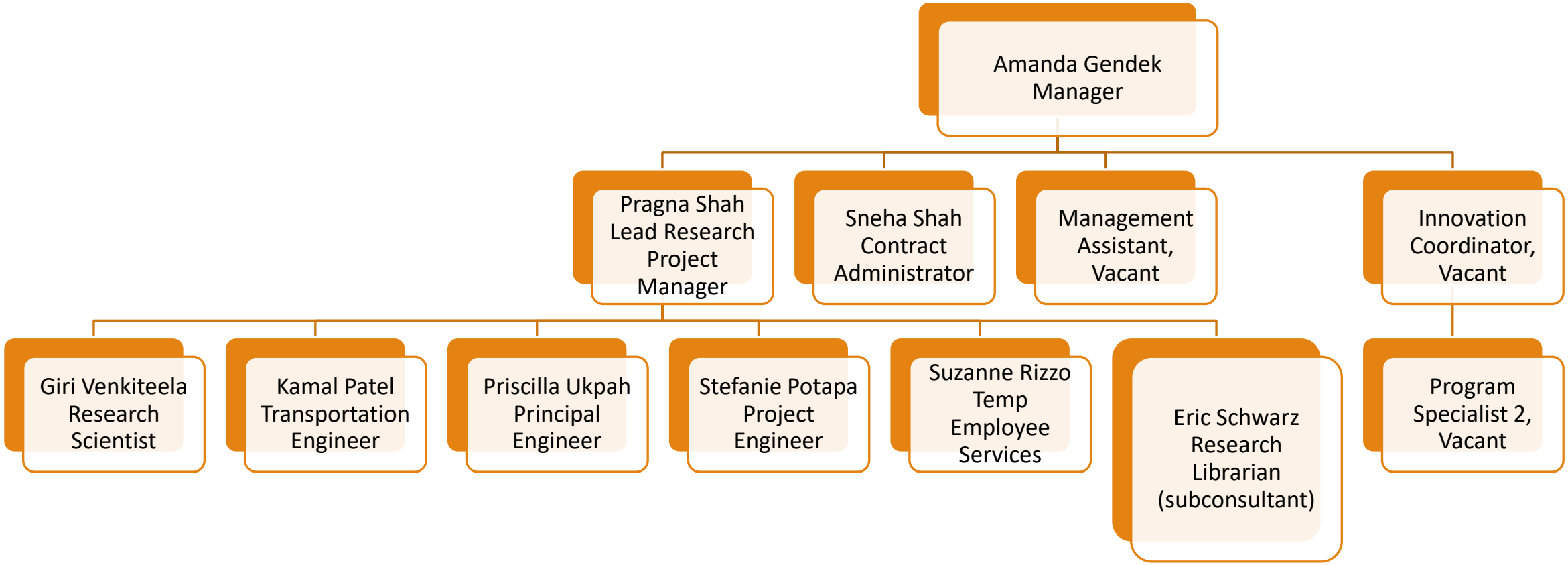
June 25, 2024

Presentation by: Pragna Shah, New Jersey DOT

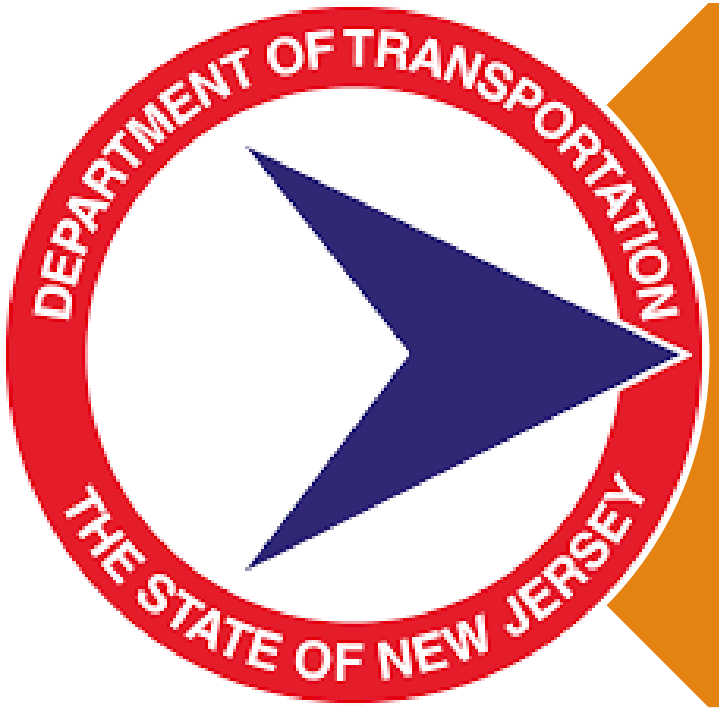
Bureau of Research, Innovation & Information Transfer (1 of 2)



Bureau of Research, Innovation & Information Transfer (2 of 2)



Research Staff and Agency Roles



- Deliver customer-focused quality research for NJDOT, NJ Transit and other customers/champions
- Annually assess the research needs of the Department.
- Maintain collaborative relationships with transportation agencies and university/consultants.
- Facilitate and track research implementation, report annually, disseminate results.
- Administer NJ's State Transportation Innovation Council
- Provide training (non-NJDOT and NJDOT) through the Local Technical Assistance Program
- Assist applicants for applying to grant opportunities that help implement research and innovation

Who do we contract with?

- Institutions of Higher Education
- Treasury Contract – on call consultants for quick turnaround research

Successes & Challenges

- What one thing does your Research Program do particularly well?
  - Technology Transfer

- What would you call your Research Program's number one challenge?

  Solicitation of Ideas

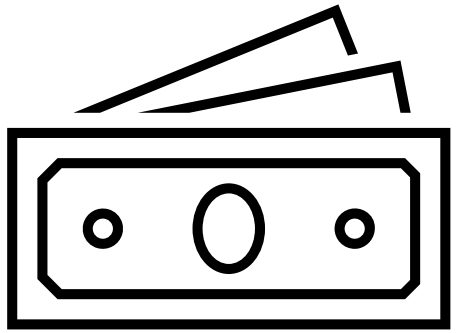
2023-2024 Work Program	Average Annual Budget	Funding Source		
Research Program Management				
Salaries (90% of time)	$ 1,800,000	SPR		
Research Studies	$ 3,000,000	SPR		
Pooled Fund Studies	$ 380,000	SPR		
Resource Centers & Support Center Research		SPR		
TRB Core Program	$ 215,000	SPR		
NCHRP Contributions	$ 1,400,000	SPR		
AASAHTO Technical Service Products	$ 100,000	SPR		
Annual Research Showcase (hybrid event)				
University Contract	$ 140,000	SPR		
Tech Transfer Program				
Salaries (10% of time)	$ 175,000	SPR		
University Contract	$ 915,000	SPR		
Equipment	$ 17,000	SPR		
Conference Travel & Accomodations	$ 28,000	SPR		
Local Technical Assistance Program				
University Contract	$ 725,000	SPR		
National LTAP Funding	$ 210,000	SPR		
Conference Travel & Accomodations	$ 5,000	SPR		
Innovation Program				
New Technologies & Product Evaluation		SPR		
NJ State Transportation Innovation Council		SPR		
		SPR		
On-Call Consultant Services	$ 2,000,000	TTF		
Special Grant Projects				
Low-Carbon Transportation Materials		FHWA	Pending	$ 28,000,000.00
STIC Incentive Grant	$ 125,000	FHWA	Pending	$ 125,000.00
TOTAL ANNUAL BUDGET	$ 11,235,000			$ 28,125,000.00

Research Program Budget/Contracting

- Budget
  - Break down the percentage of the budget for categories you spend your money on including traditional research projects, cost per project, pooled funds, AASHTO Technical Service Programs, travel, internal staff projects (staff hours).

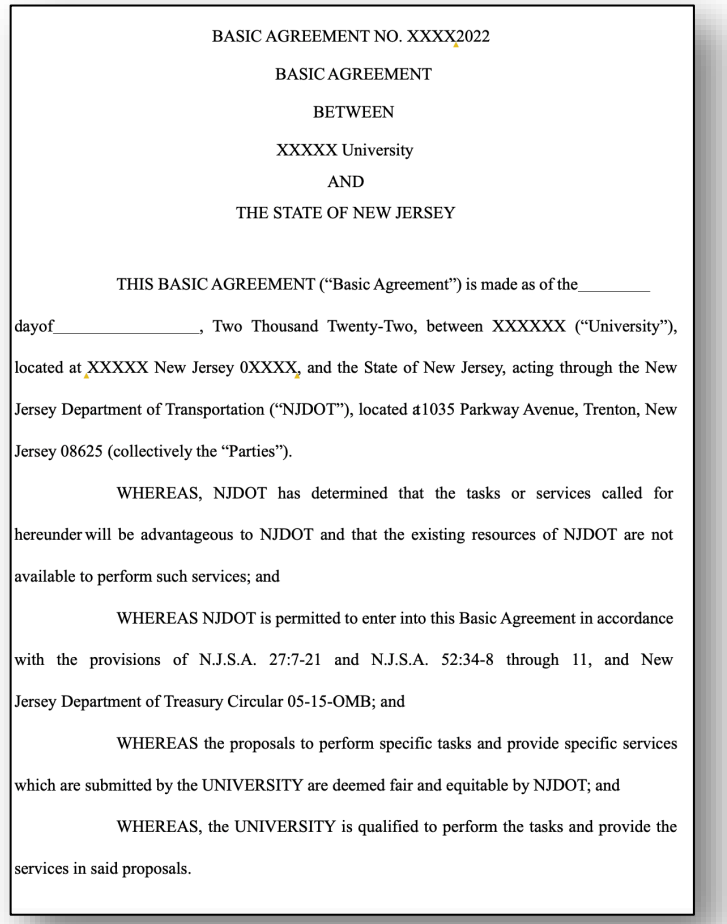
Funds used for research other than SPR2 funds

State Funds	National Local Technical Assistance Program Funds	STIC Incentive Funds
• $2M in State Transportation Trust Fund • Treasury Contract for quick turnaround research	$210,000	$125,000



Contracting

- Research Projects Contracts: Sneha Shah (Contract Administrator)
- Treasury Contract: Priscilla Ukpah & Sneha Shah



BASIC AGREEMENT NO. XXXX2022

BASIC AGREEMENT

BETWEEN

XXXXX University

AND

THE STATE OF NEW JERSEY

THIS BASIC AGREEMENT ("Basic Agreement") is made as of the_____ dayof_____, Two Thousand Twenty-Two, between XXXXXX ("University"), located at XXXXX New Jersey 0XXXX, and the State of New Jersey, acting through the New Jersey Department of Transportation ("NJDOT"), located at1035 Parkway Avenue, Trenton, New Jersey 08625 (collectively the "Parties").

WHEREAS, NJDOT has determined that the tasks or services called for hereunder will be advantageous to NJDOT and that the existing resources of NJDOT are not available to perform such services; and

WHEREAS NJDOT is permitted to enter into this Basic Agreement in accordance with the provisions of N.J.S.A. 27:7-21 and N.J.S.A. 52:34-8 through 11, and New Jersey Department of Treasury Circular 05-15-OMB; and

WHEREAS the proposals to perform specific tasks and provide specific services which are submitted by the UNIVERSITY are deemed fair and equitable by NJDOT; and

WHEREAS, the UNIVERSITY is qualified to perform the tasks and provide the services in said proposals.

APPENDIX H. MASSACHUSETTS DOT RESEARCH PROGRAM OVERVIEW

NETC Research Peer Exchange

JUNE 25, 2024

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

MassDOT - Other Topics

IMPLEMENTATION – USING TRANSPORTATION RESEARCH RESULTS

How do NETC State DOTs implement-use research results, and how to enhance State DOT's implementation of transportation research results?

- Inform state of practice
- Implement revisions to existing programs, policies & procedures
- Create new programs, policies & procedures
- Other

What are some of the key determinants for NETC State DOTs successful use implementation of transportation research results?

MEASURING AND COMMUNICATING VALUE OF TRANSPORTATION RESEARCH

How do NETC State DOTs measure and communicate the value of transportation research

- Improved process or methods to reduce costs, improve safety, other;
- Improved or increased information for management decision-making and policy formulation;
- Other

MassDOT - Other Topics cont.

EVALUATING STATE DOT RESEARCH PROGRAM PERFORMANCE

HOW DO NETC STATE DOTS ASSESS AND EVALUATE STATE DOT RESEARCH PROGRAM PERFORMANCE

· WHAT PERFORMANCE MEASURES ARE USED OR BEING CONSIDERED FOR FUTURE RESEARCH PROGRAM EVALUATIONS?

- ADMINISTRATIVE (TIME, BUDGET, QUALITY, ETC.)
- IMPLEMENTATION OF RESULTS (DID IT GET IMPLEMENTED, ETC.) OR BOTH.

· FORMAT USED TO CONVEY RESEARCH RESULTS AND HOW OFTEN TO CONVEY

· OTHER

APPENDIX I. MISSISSIPPI DOT RESEARCH PROGRAM OVERVIEW

MDOT
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

NETC Research Peer Exchange

State Presentation

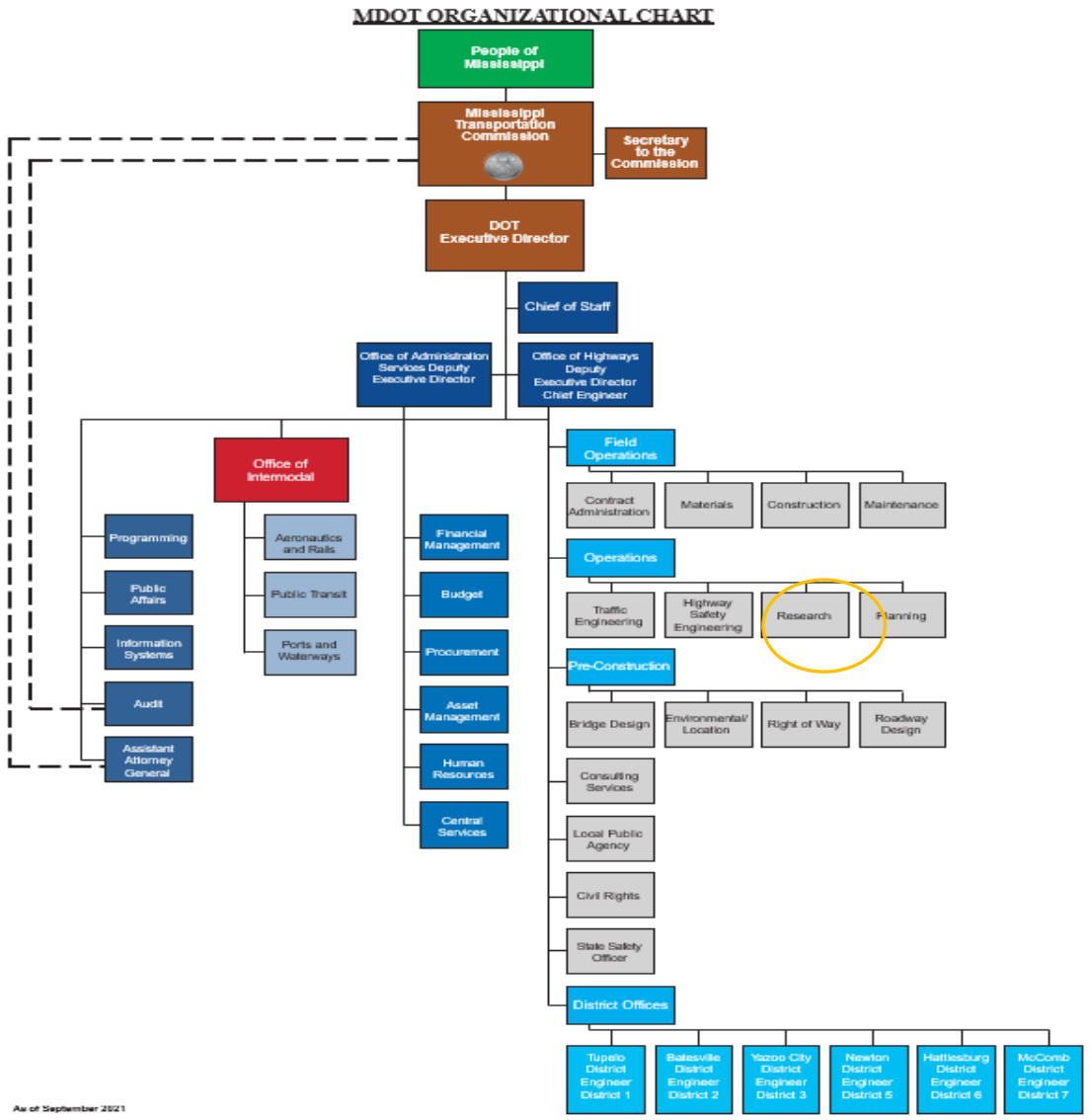
June 25, 2024

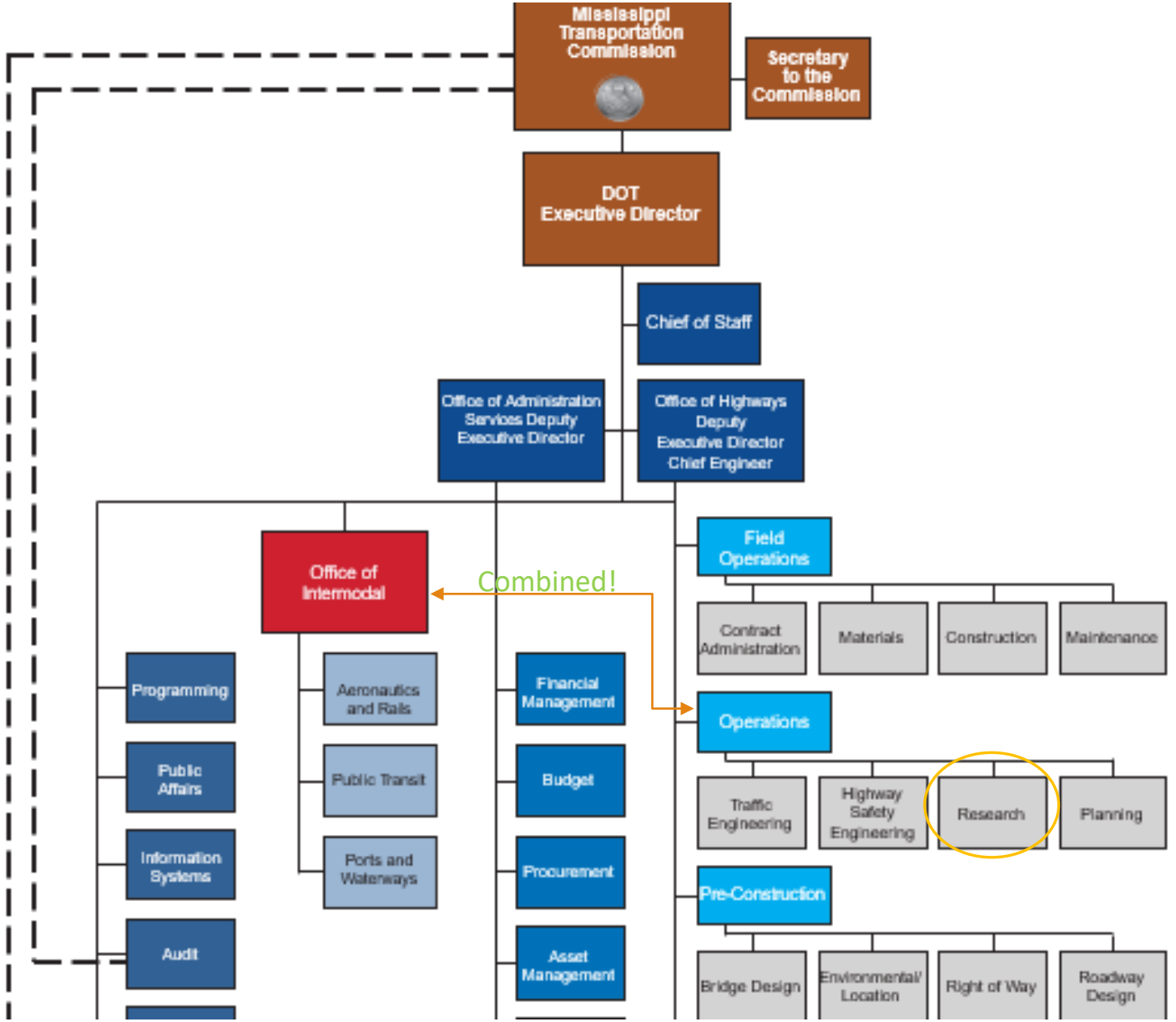
Presentation by: Cynthia J. (Cindy) Smith, PE
Mississippi DOT

Mississippi DOT's Research Program

- Research is under the Assistant Chief Engineer—Operation/ Intermodal Director
- 8 permanent, 2 part-time contract staff
- Strengths: Nimble, enjoy wonderful agency-wide and upper management support, great champions, bench strength, excellent team
- Challenges: Juggling other operational duties, champion saturation, young engineers need new EIT behind them (research is nontraditional engineering area)

MDOT Organizational Chart




Mississippi Transportation Commission
Secretary to the Commission
DOT Executive Director
Chief of Staff
Office of Administration Services Deputy Executive Director
Office of Highways Deputy Executive Director Chief Engineer
Office of Intermodal
Combined!
Field Operations
Contract Administration
Materials
Construction
Maintenance
Programming
Public Affairs
Information Systems
Audit
Aeronautics and Rails
Public Transit
Ports and Waterways
Financial Management
Budget
Procurement
Asset Management
Operations
Traffic Engineering
Highway Safety Engineering
Research
Planning
Pre-Construction
Bridge Design
Environmental/ Location
Right of Way
Roadway Design

Research Program Budget

- Budget
  - About $3.2M/year (breakdown to follow)
  - Other than SPR2
    - 20% state match on state studies
    - Contract retired engineer and IT analyst—state funds
    - All salaries paid with state funds only unless charging to an in-house project

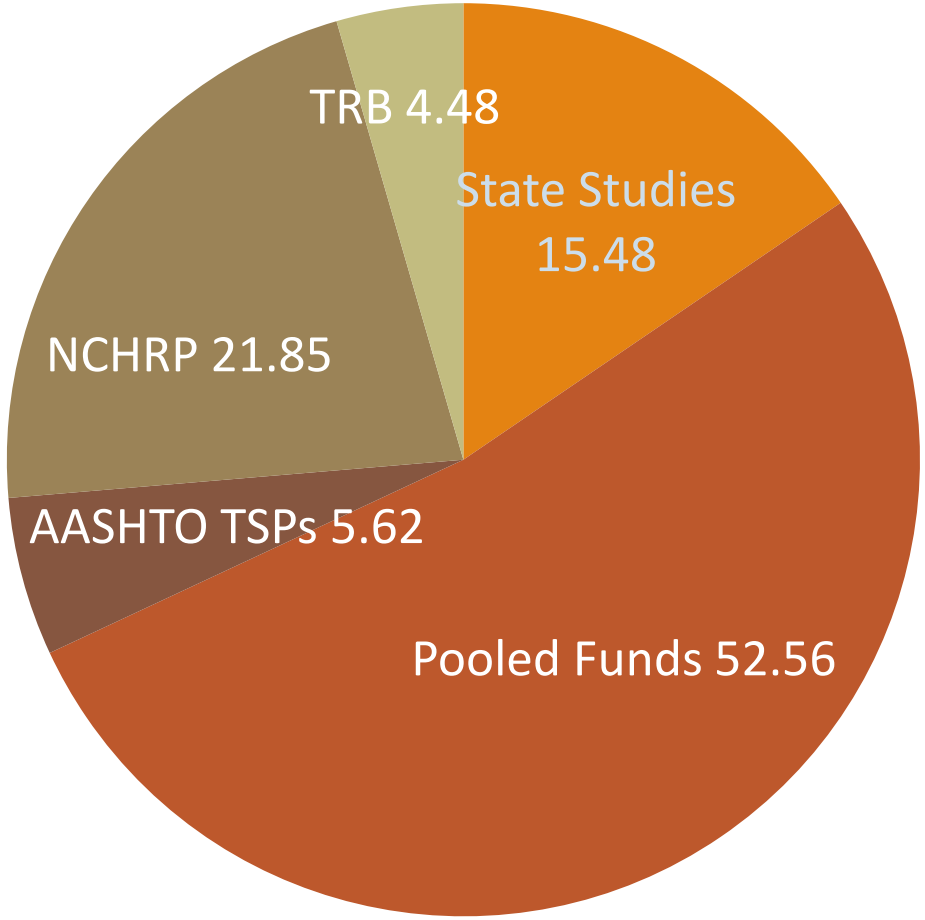
Budget—About $3.2M in SPR2 Funds

FY 2024 REVENUE			
Item	SPR Part II	State Funds	
Anticipated Carryover from FY 2023	$280,461.11	$0.00	
Anticipated FY 2024	$3,168,570.00	$97,552.17	
Total	**$3,449,031.11**	**$97,552.17**	
TOTAL AVAILABLE FUNDS FOR FY 2024			**$3,546,583.28**

FY 2024 WORK PROGRAM EXPENSES			
Item	SPR Part II	State Funds	
State Studies	$390,208.68	$97,552.17	
Continuing Pooled Fund Studies 100% Federal	$604,000.00	$0.00	
Rejoined Pooled Fund Studies 100 % Federal	$0.00	$0.00	
New Pooled Fund Studies 100 % Federal	$1,051,666.67	$0.00	
FY 2025 AASHTO TSP's 100% Federal	$177,000.00	$0.00	
NCHRP Mississippi Participation 100% Federal	$688,329.00	$0.00	
TRB Correlation Service 100% Federal	$141,191.00	$0.00	
Total FY 2024 Expenses	**$3,052,395.35**	**$97,552.17**	
Contingency Funds	$396,635.76	$0.00	
TOTAL FY 2024 WORK PROGRAM EXPENSES AND FY 2023 CARRYOVER	**$3,449,031.11**	**$97,552.17**	**$3,546,583.28**
Encumbered Funds	**$2,664,666.34**	**$0.00**	

Budget % Breakdown for FFY24

Percentage Budget Breakdown--Mississippi DOT (Bit of an atypical few years, heavier on the pooled funds)



Contracting

- MDOT's Consultant Services Unit (CSU) handles contracts
- We work with them and SMEs to write tasks/SOW
- We have some Master Agreements (MAs)
  - In-state universities
  - Consultant MAs in subject areas
  - Examples: Planning & Environmental, Materials & Research, Roadway Design
- Some small purchases allowed
- RFP if above mechanisms aren't an option
- FHWA and Commission approval

Strengths and Challenges

- Strong team and support
- Biggest challenges
  - Other operational duties (more later)
  - Need more follow-up on implementation

Thank you!

Cynthia J. (Cindy) Smith, PE
State Research Engineer
Mississippi Department of Transportation
601-359-7647 Office
601-946-7734 Cell
cjsmith@mdot.ms.gov
MDOT Research Website

APPENDIX J. NEW HAMPSHIRE DOT RESEARCH PROGRAM OVERVIEW

NETC Research Peer Exchange

JUNE 25, 2024

STATE PRESENTATION – NEW HAMPSHIRE DOT

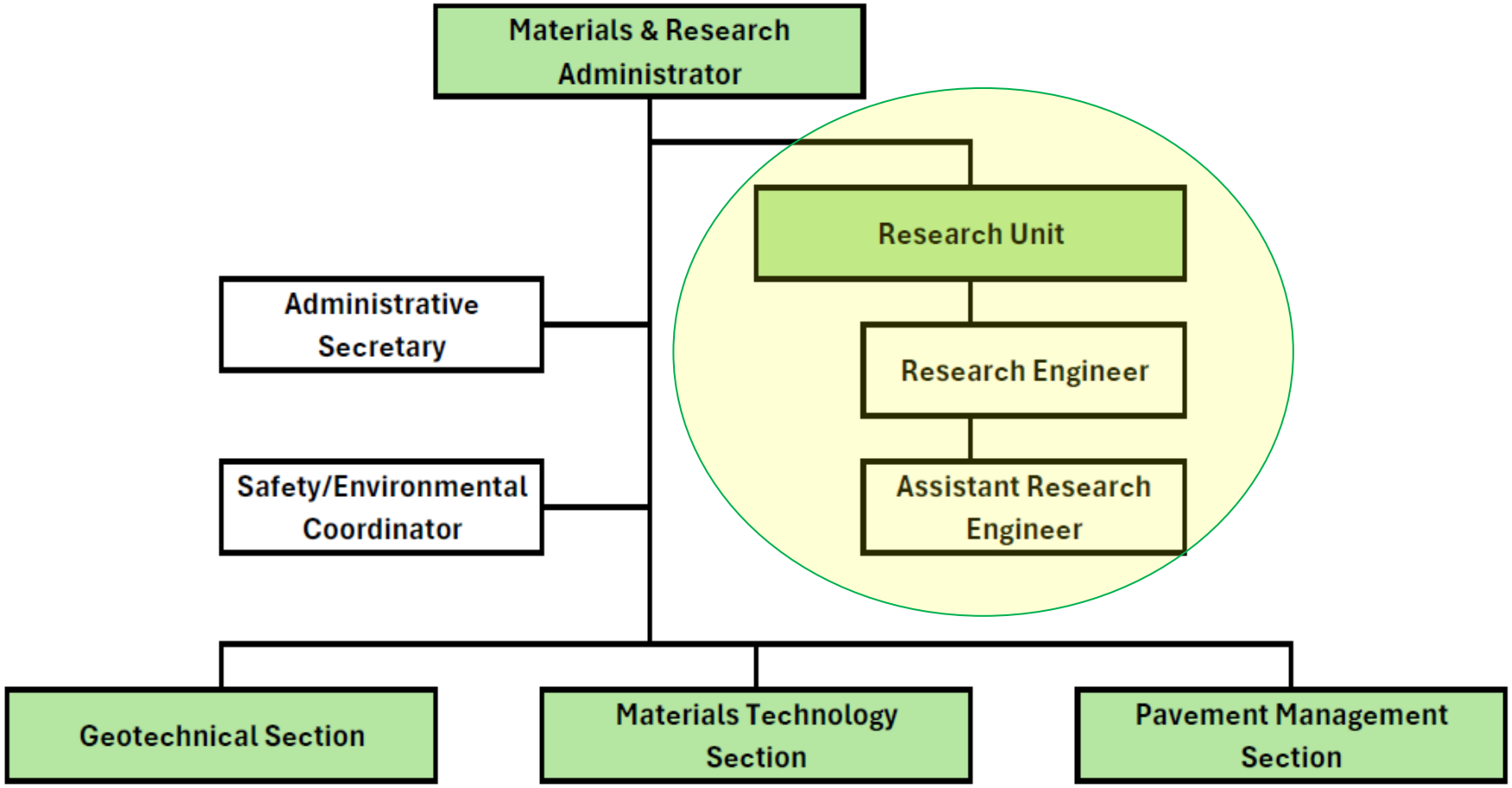
DEE NASH - DEIRDRE.T.NASH@DOT.NH.GOV

- Commissioner
  - Assistant Commissioner
    - Director Project Development
      - Assistant Director
      - Bridge Design (33)
      - Highway Design (90)
      - Environment (22)
      - Right of Way (60)
      - Construction (102)
      - Materials & Research (51)
      - Planning & Comm Assistance (26)
    - Director Operations
      - Assistant Director
      - Bridge Maintenance (102)
      - Highway Maintenance (18)
        - D1 (132)
        - D2 (107)
        - D3 (115)
        - D4 (86)
        - D5 (143)
        - D6 (95)
      - Mechanical Services (80)
      - Traffic (63)
      - TSMO (19)
      - Turnpikes (201)
  - AMPS Office (7)
  - Deputy Commissioner
    - Director Aero/Rail/Transit
      - Aeronautics (7)
      - Rail & Transit (9)
    - Director Finance
      - Finance & Contracts (38)
    - Director Policy & Admin
      - Human Resources (17)
      - Federal Compliance (6)
      - Internal Audit (3)
      - Commissioner Staff (3)
      - Communications (2)
      - Hearings & Legislation (1)

1642 FT Classified Positions
8 Unclassified (Green Boxes)
3rd Largest State Agency

New Hampshire DOT
Department of Transportation

NHDOT Research Unit - Materials & Research



Research Roles & Responsibilities – SPR2

- Manage the SPR Part 2 (Research) Program
  - Solicit research projects and develop the annual SPR2 Work Program
  - Prepare contracts – from funding approval through to project completion
  - Financial – set up, invoicing, monitoring, project closeout
  - Schedule and coordinate Technical Advisory Meetings (TAGs)
  - Review/Distribute – Quarterly Reports, Deliverables (Reports, Briefs, Posters)
  - Reporting – Quarterly/Annual Reports to FHWA
- Prepare quarterly internal and annual external newsletters

Research Roles & Responsibilities - Other

- RAC Region 1 Member
- TRB State Coordinator
- NCHRP – Annual problem statement review
- Transportation Pooled Fund Contact
- NH State Transportation Innovation Council (STIC) Coordinator
- NH Every Day Counts Coordinator
- AASHTO – Technical Service Programs, Backup Gate Keeper, Committee List

What does NHDOT Research Do Well?

- **Provide support to Project Champions**
  - Often not familiar with research funding and processes
  - Funding Options – connect needs with opportunities
  - Contract Development
    - Scope of Work
    - Contract Preparation and Approval
    - Notice to Proceed
  - Financial Aspect – guide the budgeting and invoicing processes

What is NHDOT Research's Challenge?

- **Staffing Shortages and Turnover**
  - NHDOT – approx. 25 percent vacancy
  - Research Staff – 1-1/2 year with no Assistant Research Engineer
  - Subject Matter Experts (SMEs) needed to lead projects
    - Retirement
    - Private Sector
    - Other DOT Divisions or other State Agencies
  - Loss of Institutional Knowledge
  - SMEs less apt to initiate/lead a research project

NHDOT Research Budget - $1M/Year

$320K is sent back to Washington DC to support:

- Transportation Research Board (TRB)
- National Cooperative Highway Research Program (NCHRP)

The balance is used to fund:

- Transportation Pooled Funds (TPFs) $110K
- AASHTO Technical Service Programs (TSPs) $94K
- Training and Technology Transfer Activities, about $75K budgeted
- NHDOT Research Projects, about $400K (project range $50K to $250K)

STIC Funding – up to $125,000 per year

Thank You!

"Research is creating new knowledge."

Neil Armstrong

American Astronaut and Historian
Commander of Apollo 11
The first man to walk on the moon

NHDOT Research Contact Information:

Dee Nash, Research Engineer

deirdre.t.nash@dot.nh.gov

603-271-1659

APPENDIX K. NEVADA DOT - ENGAGING SUBJECT MATTER EXPERTS

NETC Research Peer Exchange Topic 1 – Nevada DOT

June 25, 2024

Presentation by: Lucy Koury, Nevada

Subject Matter Experts – Definitions

How does your program define a SME?

- Pretty much anyone who has a working technical knowledge of their profession or position
- When leading the research, the SME is referred to the champion

What pool of staff do you draw from at your agency?

- Any and all
- Most frequently materials and civil engineers
- Our approach is anyone who has identified a problem or has a question that needs to be researched is welcome to submit their idea
- Newer NDOT personnel are partnered with more experienced personnel

Subject Matter Experts – Definitions (continued)

Are non-DOT SMEs utilized, and how are they utilized?

- Yes, typically as part of the Technical Advisory Panel that helps guide the project
- Most frequently from other governmental agencies (e.g., MPO, RTC, counties, etc.)
- Also participate as co-champions of research projects

How do you know who is knowledgeable?

- No formal metric
- By having a conversation with them and reviewing their filled-out Problem Statement. Generally, this gives us insight into their thought process and communication skills. While it is difficult for me to know if a structural engineer knows their business, the Problem Statement is reviewed by a different person from their business section, which gives further insight into the merit of their knowledge.

Subject Matter Experts – Roles

How much influence do SMEs have on research: selecting research, guiding PIs, implementing results?

- Lots!
- Develop research ideas
- Review Problem Statements and then research proposals, evaluating both in separate steps
- Champions and Technical Advisory Panel SMEs are responsible for guiding PIs and helping keep the research on the correct technical track
- Champions/SMEs are completely responsible for implementing results

Is it possible to have too many SMEs on one project?

- So long as there is a strong champion who can and will make final determinations, there can be as many SMEs as are needed

Subject Matter Experts – Roles (continued)

How do you work with SMEs with differing or opposite opinions?

- Acknowledge the difference in opinions
- Try to find the core of the disagreement
- Search for a common item or point within the opposing opinion
- Build on the common point and try to come to a consensus
- When no common ground can be found, document the opposing opinions and explain how and why the pursued route/decision was chosen, and include with the working file
- Often times, this approach helps the dissenting voice know they are being heard and that their difference of opinion is worth voicing even if it doesn't change the course of action

Subject Matter Experts – Solicitation

How do you recruit and engage SMEs?

- Word of mouth
- Twice a year announcements/calls for Problem Statements
- Reach out to discuss research opportunities when a known topic of interest comes up
- Going to meetings, local events, checking in with SMEs across NDOT, building relationships

How do you sell participation on a research project to potential SMEs?

- Encourage their curiosity
- Stress that they get to focus on the technical aspects, while we handle the administrative stuff
- Free money!

Subject Matter Experts – Engagement

How do you keep SMEs engaged throughout the life of a project?

- Quarterly project status meetings, at a minimum
- Checking in with SMEs individually on how the project is going from their perspective

What percentage of their work time do SMEs spend on research projects?

- Varies depending on project needs
- Overall, an average of 5% to 10% a month
- As part of their proposal, researchers identify the amount of effort they anticipate will be needed from NDOT personnel

Subject Matter Experts – Engagement (continued)

How do you manage to finish or implement a project if an SME leaves?

- Co-champions are encouraged on all projects, along with a Technical Advisory Panel
- Check-ins allow opportunities to be informed of SMEs planning to depart
- Division Head buy-in allows for support in identifying or assigning a new champion

How are SMEs recognized at your agency?

- Section leads are assumed to be SMEs
- Personal knowledge of capable personnel
- Rely on SMEs to help identify other SMEs

Subject Matter Experts – Agency Issues

How do you address a shortage of SMEs throughout the agency?

- Keep making connections with coworkers
- Keep offering research as a solution

How do you teach new upper management about research?

- Help!

How do you deal with projects that require data gathering, which can be a hurdle to a successful project?

- I'm not totally sure what this questions means. If the asker wants to expound, let's chat and see if I can provide some insight.

Research Project Solicitation

Share best practices and tools for canvassing research project ideas from agency staff and outside stakeholders.

- Word of mouth
- Being an active part of the agency in small ways

How often do you solicit project ideas? Specific time of year, continuous.

- Accept research ideas all year, that fit into either the Spring or Fall Cycle
- Solicit ideas twice a year at Director/Division Head meeting

How much detail do you require when soliciting project ideas?

- Not lots
- One-page form with 8 questions, that's not to exceed three pages completed
- Problem description, objective of research, current practice/related research, implementation potential, and urgency/payoff potential

Research Project Solicitation (continued)

Please describe the process for soliciting and contracting with researchers.

- Issue an email blast to internally curated and NCHRP emailing lists (through Joe Snell)
- Email announcement provides link to Problem Statement, champion names and email addresses, submittal instructions, and due date
- Champions are not part of the Expert Task Groups who review research proposals
- Research proposals are submitted to the Research Coordinator via email
- Research Coordinator performs an initial review, then provides research proposals and ballots to the appropriate Expert Task Group for evaluation
- Top ranked proposal for each project is recommended to the Research Management Committee for approval, based on the ETG's evaluation
- Negotiations begin with selected researcher, scope of research is finalized
- Draft contract is reviewed by researcher, then goes through NDOT's Agreement Services for legal review and final execution

APPENDIX L. MAINE DOT – ENGAGING SUBJECT MATTER EXPERTS

NETC Research Peer Exchange Topic 1

June 25, 2024

Topic 1: **Engaging Subject Matter experts**

MaineDOT

How does your program define a SME?

Someone in our organization who can competently speak on a topic based on their job knowledge and experience.

- What pool of staff do you draw from at your agency?
  - "Technical expert scale" of Transportation Engineer III
  - Engineering or technical managers/directors
  - Entry level professional engineers, assistant engineers, senior technicians, planners, etc.
    - This depends on the person
    - Someone slightly less knowledgeable but outspoken, engaged, and available can be better.
  - Someone who can help with implementation long-term is beneficial even if they are not the primary technical expert.

- Someone in our organization who can competently speak on a topic based on their job knowledge and experience.
- What pool of staff do you draw from at your agency?
  - Our office draws SME's from many types of positions:
    - "Technical expert scale" of Transportation Engineer III
    - Engineering or technical managers/directors
    - Entry level professional engineers, assistant engineers, senior technicians, planners, etc.
      - This depends on the person
      - Someone slightly less knowledgeable but outspoken, engaged, and available can be better.
    - Someone who can help with implementation long-term is beneficial even if they are not the primary technical expert.

How does your program define a SME? (Continued)

Are non-DOT SMEs utilized, and how are they utilized?

- We need at least one MaineDOT subject matter expert on each project we manage.
- Outlier Example – One project has a supplemental SME from DEP because this is a former MaineDOT employee that requested the project and originally had the idea.
- MaineIT is used at times for data or GIS

How do you know who is knowledgeable?

- Working with them in the office (task forces and other research projects)
- Discussions with their program managers and references from others at MaineDOT
- Contact from SME's directly with research ideas or interest in getting involved
- Nominations for NCHRP project panels
- NCHRP ballot responses
- Engineering Council presentation and Innovation Council
- Sharing research reports

How do you know who is knowledgeable? (Continued)

MaineDOT sees Research and Innovation as an office that serves its employees

- Helping people solve problems and connecting them with information or opportunities.

To fulfill that role, we need to know who people are, what they are doing, and what problems or changes they are facing

SME Role - How much influence do SMEs have on research?

Selecting Research

- SMEs can submit project ideas
- A select group serves as our Research Advisory Committee
- If a project idea comes from an outside source, such as a university partner, at least one MaineDOT SME needs to be consulted.
- We will not bring a project forward to our RAC for scoring unless there is an SME on board to support the project.
  - Enthusiasm goes a long way.
- SMEs get to score and provide feedback on NCHRP ballots.

SME Role - How much influence do SMEs have on research?

Guiding PIs

- SME role within a project varies case-to-case.
- Some have a significant influence, and others are there to learn and provide general guidance during meetings
- SMEs tend to have…
  - more control when they are the requestor.
  - less control when the project is majority funded by a UTC.

SME Role - How much influence do SMEs have on research?

Implementing Results

- This varies based on the project and the position the SME holds.
  - Some less senior employees have more time to dedicate.
  - Management involved in the project will have more decision-making power to support implementation.
  - This is a consideration when picking SMEs
  - GIS Example

Note: Not every project is ready for implementation upon completion. (Do not push when inappropriate)

Is it possible to have too many SMEs on one project?

- You can have too many SMEs if you are asking for too much time from a specific office
  - **Burnout**
  - This may negatively impact their willingness to participate next time.
- Sometimes you need numerous SMEs from multiple departments
  - Pavement design example
  - Make sure clear roles are assigned
  - One primary SME is necessary for tie-breaking decisions

SME Solicitation

Process Varies

- Are they the project requestor?
  - We need you involved to make sure your idea is executed to the full extent.
  - Allows employees to stay engaged in the process early and provide input
- Are they a lower-level employee currently overachieving in their role?
  - This title of Technical Champion is a complement to their abilities.
  - It may provide them with more decision-making power than their current role.
  - It could make their job more interesting and give them additional confidence.
- To their supervisor
  - This can be a development opportunity for staff
  - This can help keep them engaged in their work

SME Solicitation

For NCHRP Projects

- Gives them a chance to travel for work
  - Not something most employers can offer
- Allows people without supervisory experience to practices skills such as project oversight, applicant scoring, providing feedback, drafting RFPs etc.
- MaineDOT has bought into this to develop and retain employees
  - Sold as one key step to prepare for the future where numerous important employees are retiring in 3-5 years

SME Solicitation

For Employees New to Research

- Share research reports with them
- Give them a chance to score NCHRP Ballots
- Invite them to listen in on an ongoing project meeting related to their field
- Encourage them to attend TRB – encourage their supervisors to support.

Subject Matter Experts - Engagement

Feel out the energy an SME has for a project

- Offer for Research to be primary contact point, set up meetings, etc. unless you can tell they are willing and desire to do so.
- If necessary, limit project interactions to only within meetings.
  - Less “homework”
  - Lay down ground rules as needed

How do you keep SMEs engaged throughout the life of a project?

- Be sure to ask for their input during meetings, ask specific questions which show that you are engaged yourself.
- Periodically revisit the goal of the project and anticipated benefit / progress toward that goal

Subject Matter Experts - Engagement

What percentage of their work time do SMEs spend on research projects?

An individual project does not need to take up more than 1% of an SME's time – unless they want it to

Avoid distancing them too much from the project and losing their interest or guidance.

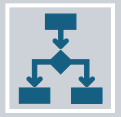
Make sure they are engaged with enough detail often enough to remember what is happening with the project when a meeting or update happens

Subject Matter Experts - Engagement

- How do you manage to finish or implement a project if an SME leaves?
  - **Engage more than one person from various offices in research!**
    - If this is not the lead expert, they can have a direct line to them for important questions.
    - Do not necessarily need to be on the same project
    - You have an SME in training without layover time.
  - If someone is completely new, ask to set up a meeting with the PI. Have a welcome conversation and give them a project update.
    - Remember to hit on the purpose of the project and why the potential outcome would be significant to them in their new position.
    - Make sure they feel appreciated for their time.

Recognizing SMEs

Be sure to let them and their supervisors know how significant their contribution is to your office and your DOT in general.



Share the final report with them.

Give them a chance to present the project results in some setting that is significant to them

Engineering Council

MaineDOT Innovates will have a recognition component for SMEs sharing innovative practices and ideas.

This can be an avenue to facilitate implementation and recognition at the same time

How do you teach new upper management about research?

“We help staff find solutions to their problems.” - Ulrich

Reducing Burnout and Increasing Feedback for NCHRP Ballots

- New process experimented in 2024
- Electronic SharePoint Excel “Form”
- Only show them the problem statements you need them to review
  - Can be 2 to 20 problem statements
  - Add more categories than NCHRP to refine SME contact and reduce questions per SME
  - Includes a tracking and aggregation file to combine responses
- Process was a success with a high response rate and comments provided for many projects.
- Multiple SMEs noted they appreciated the reduced effort on their end
- I absorbed the additional effort and time to reduce their workload and to increase engagement

NCHRP Full Project Ballots FY25

Rate the problem statements shown below to help select the best national research projects

The AASHTO's Special Committee on Research and Innovation (R&I) will meet in person on April 11-12, 2024 to formulate the FY2025 program for the NCHRP.

You can access the Compendium PDF using the following link: https://onlinepubs.trb.org/onlinepubs/nchrp/FY2025/Compendium.pdf

While reviewing the problem statements, consider the following:
1) Does the proposed study represent a current problem that needs researching?
2) Is the proposed study appropriate for NCHRP or should it be performed elsewhere?
3) Is the problem of interest to a majority of states?
4) Are similar efforts already underway elsewhere? If so, will this unnecessarily duplicate the efforts of others?
5) What is the probability of this research being successful?
6) If the research is successful, what is the anticipated return with respect to its cost?

Please rate each problem statement from **1** (low priority) to **5** (high priority). Select **0** if the problem statement is not applicable to your organization/not appropriate for NCHRP. You can provide comments in the field below each rating.

PLEASE PROVIDE A COMMENT IF YOU RATE A 1, 5, OR 0

Problem Statement Scoring

A/23-05 Impact and Opportunity of Artificial Intelligence (AI) and Automation on the Transportation Workforce: Exploring Skill Gaps, Competen

Funds: $500,000.00

Link to Full Project Details
https://onlinepubs.trb.org/onlinepubs/nchrp/FY2025/ProblemStatements/A23-05.pdf

Please rate the problem statement using the drop down box to the right *(1 to 5 or 0 if not applicable/appropriate)*: 4

Provide an optional comment in the box below if desired.

B/08-10 Use and Application of Generative AI Models (e.g., ChatGPT, Bard) in the Context of Transportation Planning

Funds: $400,000

Link to Full Project Details
https://onlinepubs.trb.org/onlinepubs/nchrp/FY2025/ProblemStatements/B08-10.pdf

G/17-17 Development of Comprehensive Training for the Second Edition of the Highway Safety Manual

Funds: $400,000.00

Link to Full Project Details

https://onlinepubs.trb.org/onlinepubs/nchrp/FY2025/ProblemStatements/G17-17.pdf

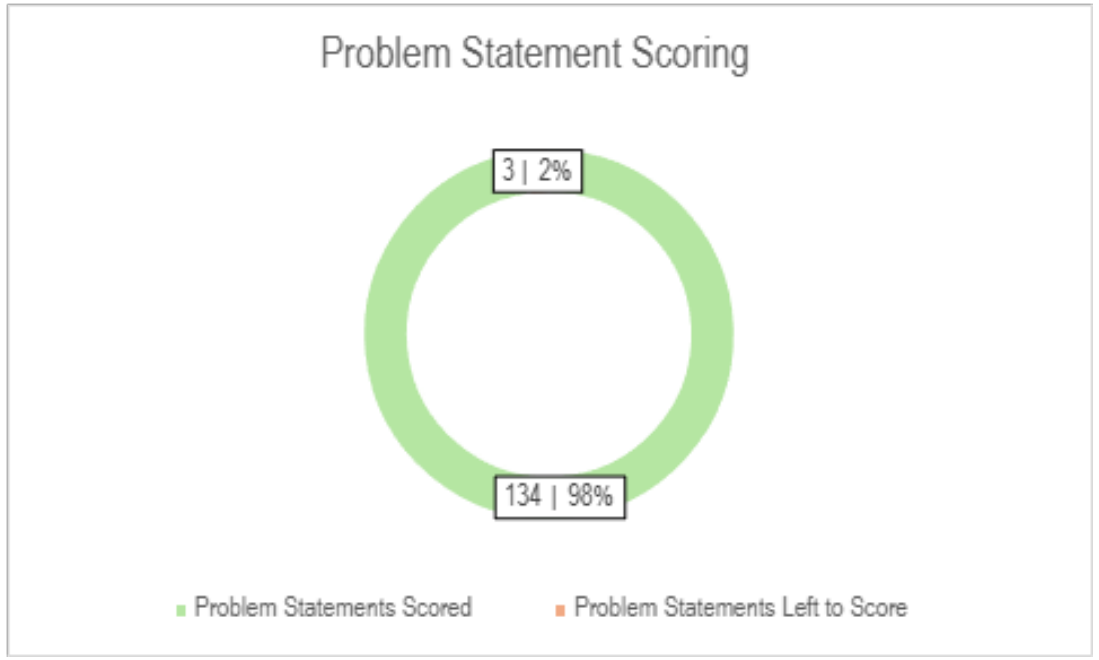
Please rate the problem statement using the drop down box to the right *(1 to 5 or 0 if not applicable/appropriate)*: 5

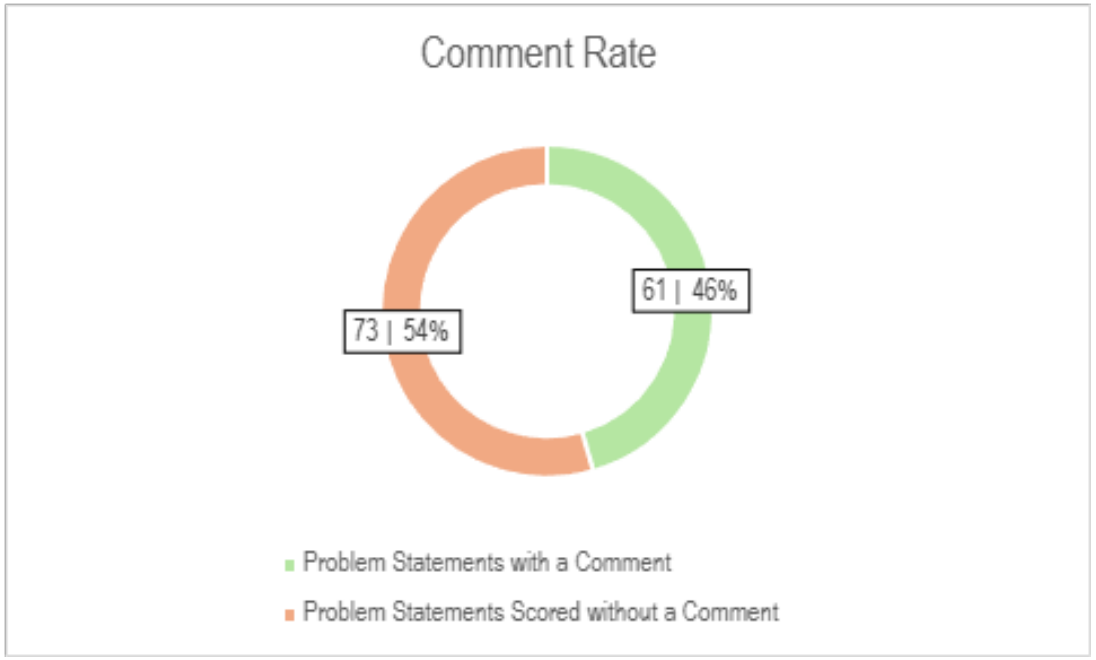
Thank you for your comment.

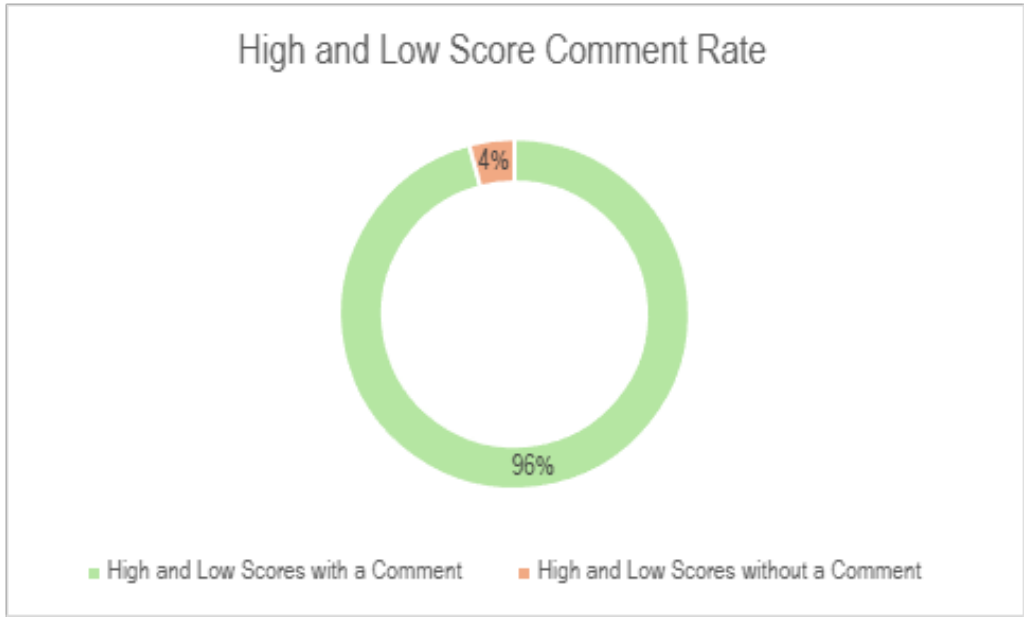
Having training courses to support the HSM2 is critical for implementation of the new HSM2.

Thank you for completing this form! MaineDOT Research and Innovation appreciates your input.

NO FURTHER ACTION IS REQUIRED.


Problem Statement Scoring
3 | 2%
134 | 98%
Problem Statements Scored
Problem Statements Left to Score


Comment Rate
61 | 46%
73 | 54%
Problem Statements with a Comment
Problem Statements Scored without a Comment


High and Low Score Comment Rate
4%
96%
High and Low Scores with a Comment
High and Low Scores without a Comment

Group Response Tracking

File Group	Total Topics	Topics Scored	Percent of Topics Scored	MaineDOT Scorers
Safety	9	9	100%	Dennis Emidy
Project Delivery	4	4	100%	Scott Rollins. Jonathan French
Traffic	9	9	100%	Steve Landry, Colby Forter-Brown, Dan Garber
Occupational Safety	3	3	100%	Eula DeRoche
Planning	5	5	100%	Matt Drost, Ian Gorecki
Recruitment and Workforce	1	1	100%	Jeremiah Hutchinson
Mental Health	3	3	100%	Beth Getchell, Kegan Blood
Research	1	1	100%	Jeff Pulver
Highway Maintenance	3	3	100%	Curtis Clifton, Brian Burne
Property and Utilities	3	3	100%	Ron Cote
Environmental	8	8	100%	Charlie Hebson, Cindy Dionne
Active Transportation	2	2	100%	Dakota Hewlett
Pavement Materials	5	5	100%	Rick Bradbury
Technology	1	1	100%	Cindy Owings
Bridge Maintenance	3	3	100%	Ron Taylor, Ben Foster
Pavement Construction	4	4	100%	Karen Gross, Brian Luce
Bridge Design	3	3	100%	Wayne Frankhauser, Rich Myers
Geotech	6	6	100%	Laura Krusinski
Bridge Management	1	1	100%	Chester Kolota
Fabrication	3	3	100%	Taylor Clark, Jason Stetson
Contracting	7	7	100%	Jeff Folsom
Highway Construction	3	3	100%	Shawn Smith
Mobility Analysis	2	2	100%	Kara Aguilar, Parker O'Brien

Thank you!

APPENDIX M. UTAH DOT – ENGAGING SUBJECT MATTER EXPERTS

NETC Research Peer Exchange

Topic 1: Engaging Subject Matter Experts

June 25, 2024

Presentation by: Cameron Kergaye, Utah

Subject Matter Experts

- How does your program define an SME?
  - What pool of staff do you draw from at your agency?
  - Are non-DOT SMEs utilized, and how are they utilized?
  - How do you know who is knowledgeable?
- SME Role
  - How much influence do SMEs have on research: selecting research, guiding PIs, implementing results?
  - Is it possible to have too many SMEs on one project?
  - How do you work with SMEs with differing or opposite opinions?

Subject Matter Experts (continued)

- SME Solicitation
  - How do you recruit and engage SMEs?
  - How do you sell participation on a research project to potential SMEs?
  - How do you show new SMEs the value of being a project champion?

Subject Matter Experts - Engagement

- Share onboarding guidance provided to SMEs and/or their supervisors.
- How do you keep SMEs engaged throughout the life of a project?
- What percentage of their work time do SMEs spend on research projects?
- What do you do to reduce SME burnout? Is it possible to reduce the workload for an SME too much, negatively impacting engagement?
- How do you manage to finish or implement a project if an SME leaves?
- How are SMEs recognized at your agency?

Subject Matter Experts – Agency Issues

- How do you address a shortage of SMEs throughout the agency?
- Describe your methods for letting SMEs know what Research can offer at a state and national level (pooled funds, NCHRP etc.)
- How do you teach new upper management about research?
- How do you deal with projects that require data gathering, which can be a hurdle to a successful project?

Research Project Solicitation

- Please describe the research project idea solicitation process.
  - Share best practices and tools for canvassing research project ideas from agency staff and outside stakeholders
  - How do you keep a balance between SME engagement and ensuring research topic diversity?
  - How often do you solicit project ideas? Specific time of year, continuous.
- How much detail do you require when soliciting project ideas?
- Please describe the process for soliciting and contracting with researchers.

Subject Matter Experts – Defining an SME

- Defining an SME
  - UDOT research project Champions and other experts
  - Central division managers and their staff
  - Region office staff
  - Other agencies in the state (UTA, MPOs, wildlife resources, and FHWA)
  - Design consultants, contractors, product suppliers, and industry representatives
  - Non-DOT SMEs are utilized for technical input and reviews
  - Identified by past involvement or recommendation from division managers

Subject Matter Experts – SME Role

- SME Role
  - Research project technical advisory committees
  - UDOT and UTA SMEs select research, guide PIs, and review reports
  - Champions and other SMEs help implement results
  - Good number of SMEs on a project is 4 to 7
  - Welcome various opinions and try to reach consensus

Subject Matter Experts – SME Solicitation

- SME Solicitation
  - Invite UDOT leaders and staff to identify research needs
  - Division leaders confirm Champions for funded projects
  - Invite SMEs to project scoping meeting
  - Welcome email
  - Share “Roles and Responsibilities for UDOT Research Project Teams”
  - Express appreciation for their participation

GUIDANCE ON ROLES AND RESPONSIBILITIES FOR UDOT RESEARCH PROJECT TEAMS

This document provides (1) guidance for UDOT research project teams regarding roles and responsibilities of each team member, as well as (2) tips for effective project meetings.

Four roles exist for members of the technical advisory committee (TAC) for a UDOT research project:

- Research Project Manager (PM)
- Project Champion (PC)
- Principal Investigator (PI)
- Other TAC members

Below are the main responsibilities for these roles. Some of the responsibilities may be transferred to other team members depending on each person's strengths and their capacity for the research project.

Research Project Manager (PM): The PM is a UDOT employee (or a consultant) who is assigned PM responsibilities for various research projects by the Research & Innovation Division Director based on experience. The PM is the central point of contact for all project activities including contract setup and management and the review of deliverables. The PM manages the project's scope, schedule, and budget using the CMS and RPMs systems and regular project team communication. Some additional PM responsibilities include:

- Follow the Research Project Management Checklist as the project progresses
- Keep project documents up to date in the Research shared drive
- Schedule TAC meetings and coordinate the meeting agenda
- Coordinate with the PI on preparation and sharing of the TAC meeting minutes
- Coordinate the draft and final project Implementation Plan with the PC and TAC
- Be extremely responsive
- Effectively handle issues and concerns
- Be fully engaged in project meetings

Project Champion (PC): The PC is a UDOT division leader or their designee who is empowered by UDOT leaders to make decisions related to project tasks and implementation of the research results. The PC dedicates the time and resources needed to help complete the project and maximize its benefit to UDOT and the public. The PC is technically knowledgeable on the topic. Some additional PC responsibilities include:

- Help confirm or select the PI for the project in coordination with the PM
- Attend and lead periodic TAC meetings including discussions with the project team
- Assess the technical status of the project by reviewing reports and giving feedback
- Work with the PM and TAC to develop an Implementation Plan for using research results
- Coordinate UDOT's implementation of the project deliverables
- Be extremely responsive
- Be fully engaged in project meetings
- Keep meetings moving effectively

Principal Investigator (PI): The PI is the designated researcher on the project, typically a consultant or university professor hired by UDOT to perform and direct the research. The PI helps refine the project work plan in coordination with the PM and PC and conducts the project

based on the executed contract scope, schedule, and budget. The PI has a complete knowledge of the issue to be studied and the needed research skills. Some additional PI responsibilities include:

- Communicate frequently with the PM and PC
- Attend periodic TAC meetings, and present on the latest research results
- Coordinate with the PM on preparation and sharing of the TAC meeting minutes
- Follow UDOT guidelines for preparation of research final reports
- Incorporate TAC feedback on draft deliverables in the final versions
- Present final research results to a broader UDOT or industry audience in coordination with the PM and PC
- Be extremely responsive
- Clearly communicate to everyone
- Complete commitments on time

Other TAC members: Additional TAC members are identified by the PC or a division leader based on the individual's expertise or role as a likely end-user of research results. These TAC members could be employees of UDOT, UTA, FHWA, or other agencies, consultants (volunteer or on-contract), or other experts. They liaise with their stakeholder groups on project progress and share stakeholder concerns with the TAC. Some additional TAC member responsibilities include:

- Work with the PI, PM, and PC to develop or refine the project work plan
- Provide data, testing, specific knowledge, or other information related to the project
- Attend periodic TAC meetings to discuss progress and results with the project team
- Assess the technical status of the project by reviewing reports and giving feedback
- Assist the PC and PM in drafting the Implementation Plan for using research results
- Provide support on the implementation of the project deliverables
- Be engaged and helpful

Guidelines for TAC Meetings: Research project TAC meetings are held to keep team members informed and for them to give feedback to the PI. Schedule these regularly or when key milestones are reached or deliverables are ready for evaluation. Typically hold a cluster of meetings early in the project to finalize the scope of work and identify an initial implementation strategy for the expected results. For the project wrap-up, typically hold another group of meetings to review and comment on final deliverables, and to finalize the implementation strategy. Meetings typically include an update presentation by the PI, group discussion, reviewing next steps, and implementation planning. When scheduling, the PM coordinates with the PC and PI on the meeting agenda. The PI or PM should prepare and distribute meeting minutes to the TAC. TAC meetings are typically held for one to two hours depending on the items to address.

Subject Matter Experts – Engagement - continued

- Input and feedback on scope
- Periodic project update meetings
- Share results often
- Feedback on interim and final deliverables
- Input on an implementation plan for research results
- Manage workload (a few hours per month)
- Manage the schedule and communicate delays
- Fill in SME vacancies with input from division leaders

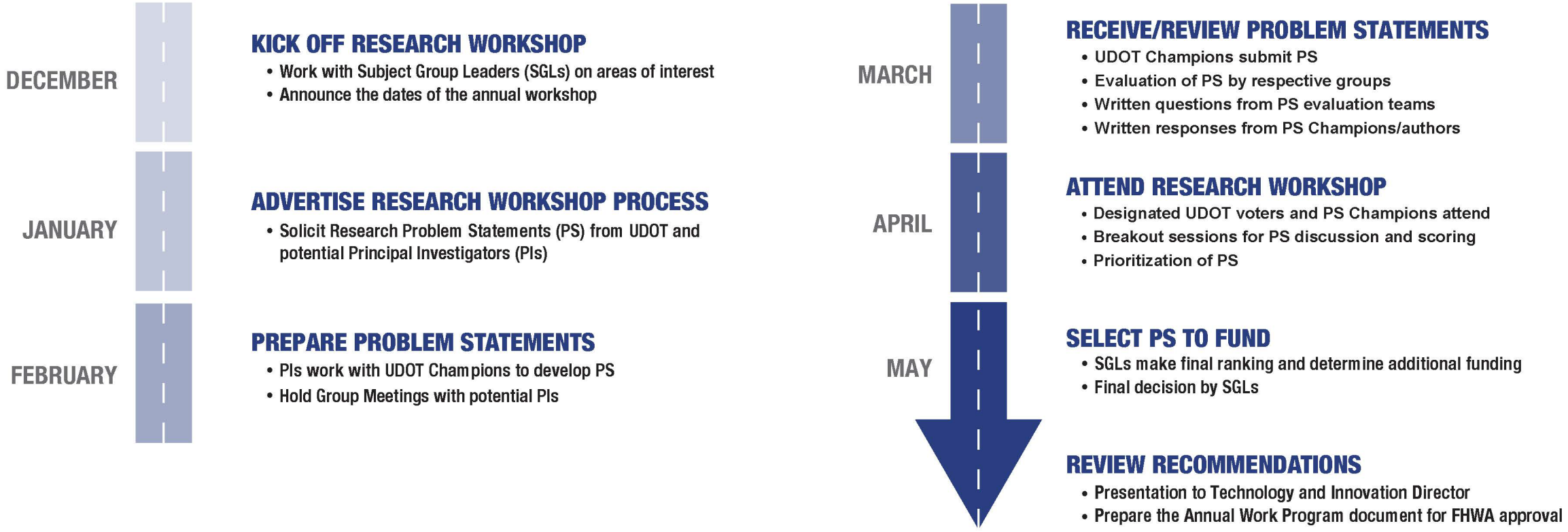
Subject Matter Experts – Agency Issues - continued

- Some SMEs are too busy for research time commitment
- Discuss new or junior staff options with division leaders
- Reduce number of SMEs for project, if needed
- Share research final presentation opportunities
- Invite SMEs to help with NCHRP problem statement voting
- Inform SMEs about pooled fund opportunities
- Share research successes in upper management meetings
- For projects that require data gathering, discuss best options with SMEs and PIs

Research Project Solicitation - continued

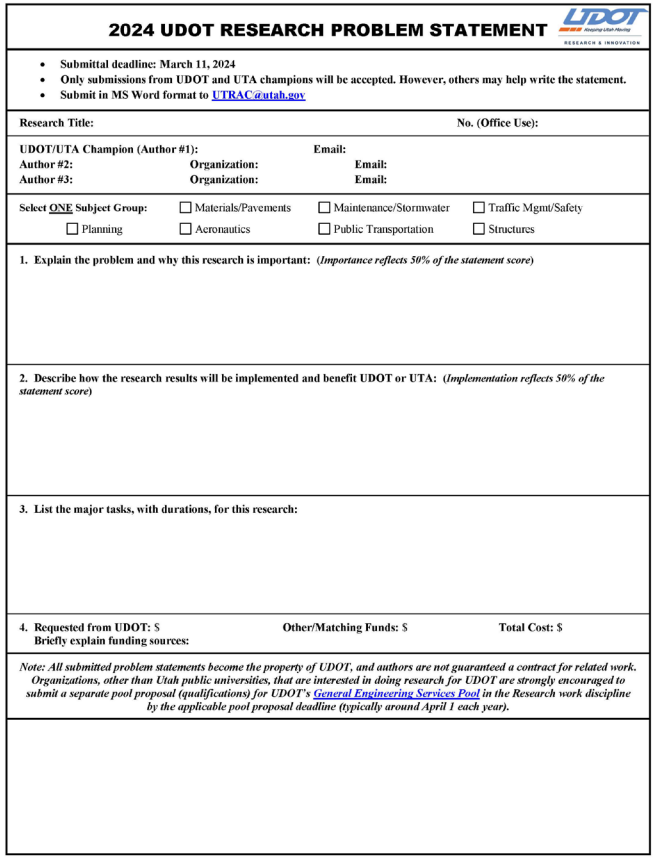
- Annual research prioritization process and workshop
- Aug-Nov: Confirm research process participation with division leaders
- Dec: Request research needs lists from division leaders
- Jan: Solicit research problem statements from UDOT/UTA SMEs and research consultants
- Feb: Discuss research needs in pre-workshop meetings (division leaders, staff, and research consultants)
- Mar: UDOT/UTA Champions submit problem statements, and evaluation teams review these
- Apr: Research Workshop for evaluation teams (division leaders, Champions, and other UDOT/UTA voters)
- May: Announce new projects selected for funding
- Jun: Engage with Champions and other SMEs on project scopes and consultant selection
- Jul: Start executing contracts

Research Project Solicitation - timeline



Research Project Solicitation (cont'd)

- Research solicited and funded in 7 subject area groups
- Research problem statement information
  - UDOT/UTA Champion and other authors
  - Explain problem and importance
  - Describe potential implementation and benefits
  - List tasks and durations
  - Requested funding amount
- Contract with Utah public university co-authors
- Consider contracting with private firm co-authors if in qualified pool (must review 3 firms' qualifications)



2024 UDOT RESEARCH PROBLEM STATEMENT

- **Submittal deadline: March 11, 2024**
- **Only submissions from UDOT and UTA champions will be accepted. However, others may help write the statement.**
- **Submit in MS Word format to UTRAC@utah.gov**

Research Title: **No. (Office Use):**

UDOT/UTA Champion (Author #1): **Email:**
Author #2: **Organization:** **Email:**
Author #3: **Organization:** **Email:**

Select ONE Subject Group: ☐ Materials/Pavements ☐ Maintenance/Stormwater ☐ Traffic Mgmt/Safety ☐ Planning ☐ Aeronautics ☐ Public Transportation ☐ Structures

1. Explain the problem and why this research is important: ***(Importance reflects 50% of the statement score)***

2. Describe how the research results will be implemented and benefit UDOT or UTA: ***(Implementation reflects 50% of the statement score)***

3. List the major tasks, with durations, for this research:

4. Requested from UDOT: $ **Other/Matching Funds:** $ **Total Cost:** $
Briefly explain funding sources:

Note: All submitted problem statements become the property of UDOT, and authors are not guaranteed a contract for related work. Organizations, other than Utah public universities, that are interested in doing research for UDOT are strongly encouraged to submit a separate pool proposal (qualifications) for UDOT's General Engineering Services Pool in the Research work discipline by the applicable pool proposal deadline (typically around April 1 each year).

APPENDIX N. MISSISSIPPI DOT – OPTIMIZING RESEARCH BUDGET AND STAFF

NETC Research Peer Exchange

Topic 2: Optimizing Research Budget & Staff

June 26, 2024

Presentation by: Cindy Smith--Mississippi DOT

Optimizing Research Budget and Staff-Budget Issues

- Q: Do you generally do not have trouble spending SPR2 funds? No
  - Support of upper management and FHWA-MS
  - Most frustration is the time taken to get contracts going (4-5 months typically)
- How do you effectively leverage both state and national funding?
  - We **heavily** utilize the TPF program (more later)
    - CAPRI—Consortium for Pavement Research Implementation, NCAT-adjacent flexible projects
    - Technologies and innovations
  - We do fund AASHTO Technical Service Programs for champions and training purposes.
    - Product Evaluation and Lab certifications
    - Design and others
    - Technical Training Solutions
    - Even Winter Weather Management (yes, in Mississippi!)

Optimizing Research Budget and Staff-Budget Issues (continued)

- Q: Is your agency forced to go outside your usual contracting partners?
  - Sometimes with small purchases
  - Rarely to RFP
- We cannot contract with other than state of MS public entities easily
  - Different sets of laws in other states, so no out-of-state universities
  - Hard to contract with Army Corps of Engineers in Vicksburg (major brain power 40 miles away)
  - Private sector can be easier

Optimizing Research Budget and Staff- Doing More with Less

- Pooled funds
  - Very helpful for smaller/less populous states, huge ROI
  - We can sometimes combine efforts or weave in work with state studies
  - Help us do what would likely be impossible otherwise—examples:
    - Tested many currently used pavement mixes at NCAT first
    - Currently investigating continuous friction/deflection technology
- NCHRP
  - Upper management support for time/travel for panel work
  - AASHTO committee members/panel members—Mississippi well represented
  - Communities of practice
    - Internal (District Engineers, Financial Management System Users, etc.)
    - AASHTO/TRB committees and task forces

Optimizing Research Budget and Staff-Doing More with Less (continued)

- Automation in General—much improvement in my almost 28 years at MDOT
  - Research Management System (RMS)
    - Generates work program document and presentation
    - PIs can upload progress reports
    - Developed by Information Systems (IS) and past research databases in-house
    - Depends on us putting information in
  - Workflows/approvals in all areas
  - Very progressive and helpful Information System Division

Optimizing Research Budget and Staff - Budget Issues—Other Duties

- MDOT Research Division also has:
  - Pavement management
  - Nondestructive testing--skid, FWD, profiler
  - Smoothness specification certification
  - Library
- Describe the top optimization process for contracting that your DOT uses.
  - Master agreements
    - In-state universities
    - Private sector

Optimizing Research Budget and Staff - Budget Issues—Other Duties - Part 1

- We are generally not required to limit the scope of your research projects to help keep overall costs down (unless MA max is hit)
- MDOT does not use a program/electronic research proposal submittal and review process (not needed)
  - We only initiate 4-5 state studies per year.
  - Usually we have these in the hopper from upper management/SMEs

Optimizing Research Budget and Staff – Staffing Issues

- Are you understaffed? Yes and no, covered but could use some backup
- How do you get the most out of your staff, especially when you are understaffed?
  - Everyone pitches in
  - Most are cross-trained
- Recruitment for open positions
  - Best hires have been students who worked with university professor PIs
  - Other positions sometimes are transfers from other areas of MDOT
  - Our division is known as a great place to work
  - Emphasize work-life balance

Optimizing Research Budget and Staff – Staffing Issues – Part 2

- How do you retain new hires?
  - Variety of tasks appeals to younger generation
  - Training and development are well-supported
  - We know that thought leaders work at all levels, not just management
- Succession planning – How do you transfer knowledge from outgoing staff to new staff?
  - Documentation
  - Collaborative work
  - Taking newer/younger staff to any meetings or events we can

Optimizing Research Budget and Staff – Staffing Issues – Part 3

- What compromises do you make when hiring?
  - Not many people have needed skill sets coming in, so learning curve can be long
  - Allow for growing into jobs (myself included)
- How do you decide what roles/tasks are performed by each staff member?
  - Try to match likes and interests (not always possible)
  - Many are prescribed by job description
  - Work collaboratively on many tasks—builds morale and transfers knowledge
- What research services do you expect from PIs that might typically be performed by a DOT? Unsure…

Optimizing Research Budget and Staff – Staffing Issues – Part 4

- Are there ways to utilize employees or services from other parts of the DOT, for free?
  - Materials/Districts have helped with some studies/testing
  - District/Project offices have helped with some studies/testing
  - Materials Division certifies university labs

Optimizing Research Budget and Staff – Staffing Issues – Part 5

- What research activities do you prioritize highest to lowest in terms of time commitment?
  - Upper management/SME needs and wants
  - Agency goals and efforts, including pavement/asset management
- When you get a new task, who completes it? Depends
- How does Research convince leadership that additional staff are needed?
  - We have not had to do this because we have open PINs.
  - We can sometimes trade PINs with other Divisions or Districts if need be.
- How do you foster a strong relationship and garner buy-in from your directing staff/leadership?
  - Regular meetings with our boss and other management as needed
  - Connect at other meetings (Winter Construction, Maintenance, MS Engineering Society, etc.)

Thank you!

Cynthia J. (Cindy) Smith, PE
State Research Engineer
Mississippi Department of Transportation
601-359-7647 Office
601-946-7734 Cell
cjsmith@mdot.ms.gov
MDOT Research Website

APPENDIX O. NEW HAMPSHIRE DOT - OPTIMIZING RESEARCH BUDGET AND STAFF

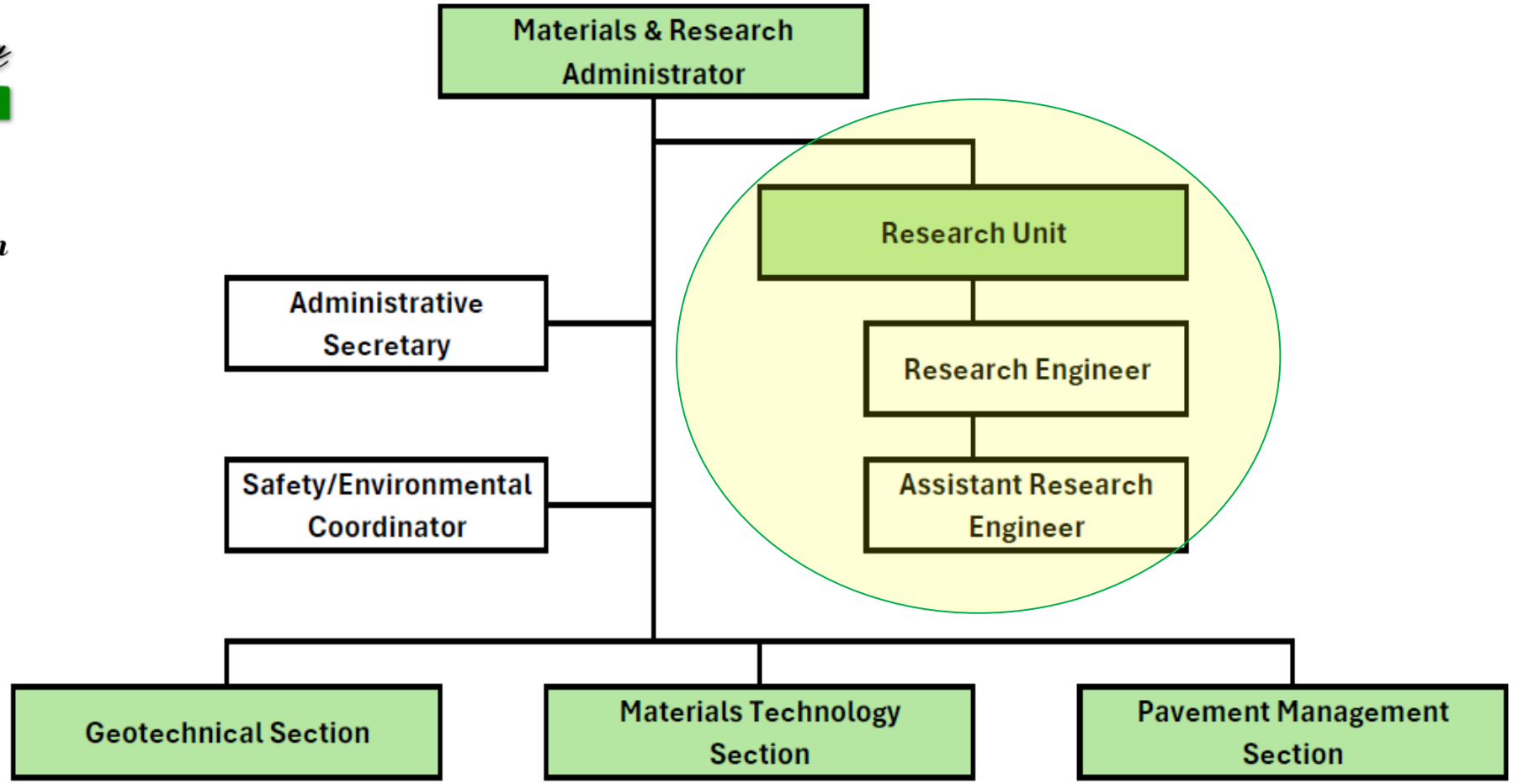
NETC Research Peer Exchange Topic 2

JUNE 26, 2024

TOPIC 2: OPTIMIZING RESEARCH BUDGET & STAFF

DEE NASH - DEIRDRE.T.NASH@DOT.NH.GOV

NHDOT Research Unit - Materials & Research



How Does NHDOT Spend SPR2 Funds?

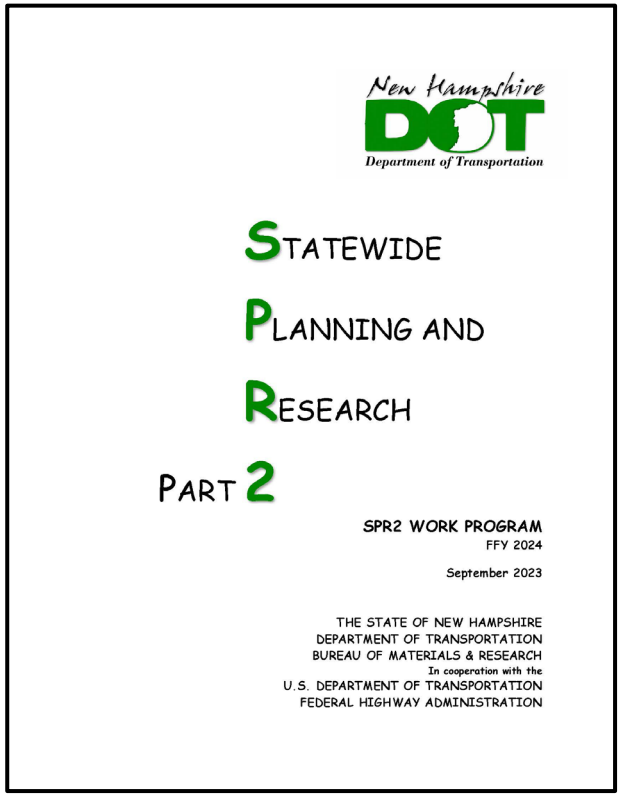
NHDOT Research Budget - $1M/Year

$320K is sent back to Washington DC to support:

- Transportation Research Board (TRB)
- National Cooperative Highway Research Program (NCHRP)

The balance is used to fund:

- Transportation Pooled Funds (TPFs) $110K
- AASHTO Technical Service Programs (TSPs) $94K
- Training and Technology Transfer Activities, $75K budgeted
- NHDOT Research Projects, about $400K (range $50K to $250K)



Transportation Pooled Fund Participation

FFY 2025 - $110K on TPFs

- 5(447 Traffic Control Device (TCD) Consortium - *$15K since 2007*
- 5(479) Clear Roads Winter Highway Operations Pooled Fund - *$25K, since 2007*
- 5(515) Evaluation of Low Cost Safety Improvements - *$10K, since 2014*
- 5(389) Connected Vehicle Pooled Fund Study - *$25K since 2019*
- 5(464) Hydrologic and Hydraulic Software Enhancements - *$10K since 2022*
- 5(520) - Improving Traffic Detection through New i-LST Technology Demonstration Pilot - *$15K, since 2023*
- Solicitation #1606 - Ahead of the Curve - Migration from NCHRP to AASHTO Technical Training Solutions (TTS) - *$10K committed for FY 2024*

AASHTO Technical Service Programs

FFY 2025 - $94K on AASHTO TSPs

- AASHTO Product Evaluation and Audit Solutions (Formerly NTPEP) - *$25K since 2006*
- AASHTO Winter Weather Management (Formerly SICOP) - *$4K since 2010*
- AASHTO Preservation Management (Formerly TSP2) - *$20K, since 2010*
- AASHTO Equipment Management (Formerly EMTSP) - *$5K, since 2012*
- AASHTO Structures Guidelines (LRFDSM) - *$15K, since 2012*
- AASHTO Materials Guidelines (Formerly DAMS) - *$10K since 2023*
- AASHTO Operations Technical Services Program (Ops TSP) - *$15K, since 2024*

Training and Technology Transfer

Annual Budget – about $75K/yr

- TRB Travel – 12 attendees in 2024
- AASHTO RAC Summer Meeting
- Conference attendance for the purpose of research-related Technology
- Tech Certifications – Asphalt and Concrete

Additional Funding – STIC & AID

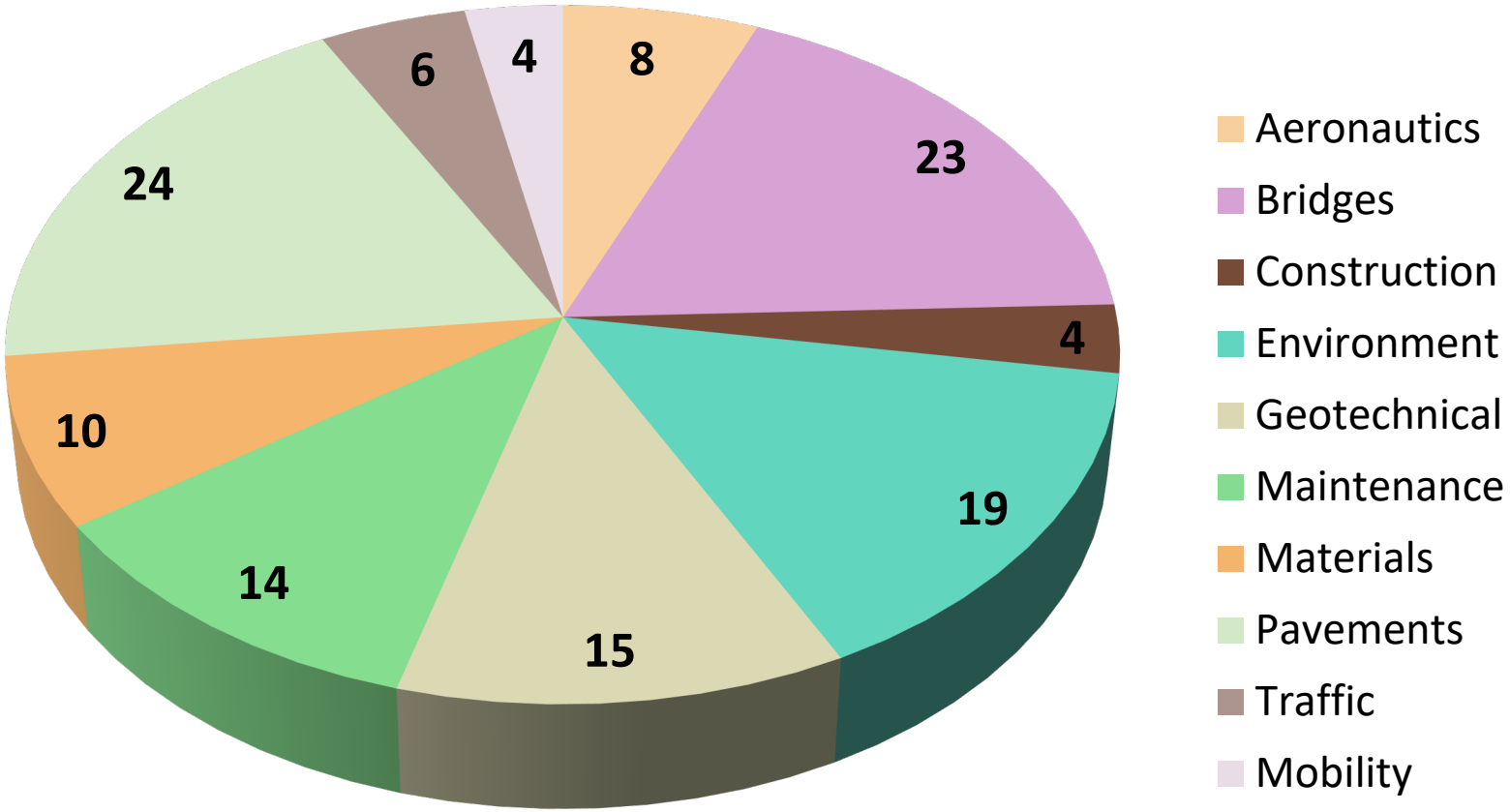
STIC

- 2023 - Implement a balance mix design ($40,000) *active*
- 2023 - Workforce Outreach Strategy for Public Works ($8,000) *active*
- 2023 - Implement standardized e-Ticketing solution ($41,200) *active*
- 2024 - Evaluating Video based Technologies for Vehicle Detection ($48,000) *active*
- 2024 - New England - Weigh in Motion Peer Exchange ($48,000) *proposed*

AID Demo

- Application in the works

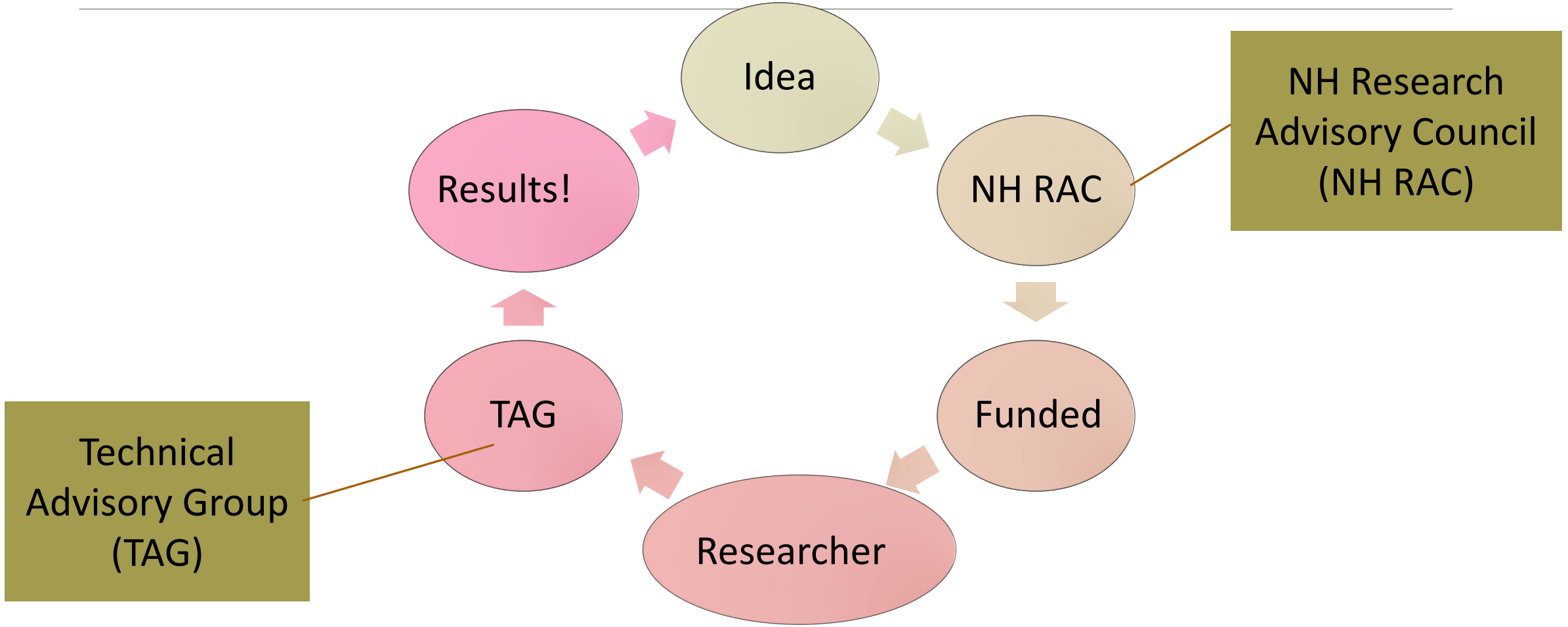
SPR2 Research Focus Areas



New Hampshire Research Advisory Council

- Problem statement submitted via electronic form (NHDOT website)
- NH RAC members are primarily NHDOT administrators
- Potential projects are prioritized to determined which projects are funded.

The Research Cycle



SPR2 Research Partners

- Universities
  - University of NH
  - Plymouth State University
  - University of VT
- Other Public Entities
  - USGS
- Consultants
  - Consultant selection process
  - On-call contract
- In-house Project – NHDOT Staff

Plymouth State
UNIVERSITY
Center for the Environment

Contracting Process

- Contracts are prepared/managed by the NHDOT research manager (occasionally by the NHDOT project champion)
- Process is optimized through NHDOT's electronic approval process – *Management Tracking System (MTS)*
- All contracts require approval by NH's Attorney General's Office(AGO) and Governor & Executive Council (G&C)
- Sole source contract for projects where specific expertise of a university can be justified
- Pass though option with on call contracts that are already in place with the DOT (when applicable)

History of SPR2 Projects - Proposed vs. Funded

- 2016: 19 proposals, 10 funded
- 2018: 12 proposals, 8 funded
- 2020: 9 proposals, 7 funded
- 2022: 4 proposals, all 4 funded
- 2024: 1 proposal to date

A downward trend over time.

Why?

How NHDOT Solicits Problem Statements

- Personal Encounters/Meetings
- Presentations at NHDOT groups
- Biennial solicitation
  - Newsletters
  - Posters
  - emails

Requires staff time

Staffing, Retention, and Cross-Training

- We are understaffed – Asst. Research Engineer position vacant 1-1/2 years
- Retention of Staff – Research & Subject Matter Experts
  - Promotions due to retirement/job changes results in promotions that leave vacancies for movement within the DOT
  - Increased salaries/job flexibility is desirable and not always available
  - Changing the job requirements

Staffing, Retention, and Cross-Training (cont'd)

- Succession planning
  - Cross training when possible, provide guides or manuals
  - Part time positions to recent retirees to help with knowledge transfer
- Additional Staff
  - Leadership is fully aware that additional staff is needed
  - Consider non-technical support staff

Innovative Ideas of Doing More with Less

- Research Staff
  - Work overtime
  - Prioritizing tasks
    - Top is contracting and financial aspects
    - Lowest is anything that is not required!
  - Utilizing additional employees – winter assignment, interns
- Subject Matter Experts
  - How to make things easier for the SMEs to encourage participation?
- Principal Investigators
  - Can PIs take on more tasks that might typically be performed by a DOT?

Summary – NHDOT Research Needs

- Research Staff
  - How to fill research positions given the current job market?
- Solicitation of Research Projects
  - How to solicit research ideas with limited research staff?
  - How to promote SME participation when the current candidates are overcommitted?
- Funding Items with Minimal Staff
  - Are there ways to spend funds that NHDOT is not currently using that do not require extensive staff involvement?

Thank you…

…and I look forward to our discussions on *Topic 2*

Optimizing Research Budget & Staff

APPENDIX P. CONNECTICUT DOT - OPTIMIZING RESEARCH BUDGET AND STAFF

NETC Research Peer Exchange

Topic 2: Optimizing Research Budget & Staff

June 26, 2024

Presentation by: Melanie Zimyeski, PE, CTDOT

Optimizing Research Budget and Staff-Spending

Do you have trouble spending your SPR funds? If so, why?

- 51% of budget to fixed costs (TRB, NCHRP, TPF, etc)
- 34% of budget to Research Projects
- Remaining 14% to Administration and Contingency
- Challenge: ability to manage multiple projects with a smaller staff
- In-house research is not likely

Optimizing Research Budget and Staff-Proposals

- Operating SPR budget did not increase
  - Fixed costs increased (TPF, NCHRP, TRB Correlation Services, AASHTO invoices)
  - TPF, University and CTDOT project costs have increased
- Maximizing budget
  - Decreasing our ability to fund new projects mid-cycle

Has there been a recent decrease in research proposals?

- 15 (10 cont. + 5 new) proposals included in SFY 23-24 Work Plan
- 16 (6 cont. + 10 new) proposals included in SFY 25-26 Work Plan

Optimizing Research Budget and Staff-Budget Issues

How do you effectively leverage both state and national funding?

- The goal is to **maximize** available funding and **minimizing** carryover/unspent funds at the conclusion of the Work Program, while still meeting all deadlines.
- Be cognizant of limitations with the amount of administration involved with a limited staff (e.g. More Projects = more administration).

Optimizing Research Budget and Staff- State and National funding

Utilization of the TPF program:

- SPR-B waiver must be in place
- Pooled Funds CTDOT participates in: 46
- Pooled Funds CTDOT leads: 0
- Total Amount spent on Pooled Funds: $3,140,000

Optimizing Research Budget and Staff- State and National funding – Part 2

Explain your utilization of the AASHTO Technical Service Programs. Why do you, or don't you, fund TSPs?

- AASHTO TSP Invoices, @$45,000/yr is paid with 100% Federal Funds, through the following AASHTO TSP Invoices:
  - $25,000 per year for the AASHTO Product Evaluation and Audit Solutions (formerly Transportation Product Evaluation Program (NTPEP));
  - $10,000 per year for the AASHTO Environmental Management (formerly Environmental Technical Assistance Program (ETAP)); and,
  - $10,000 per year for the AASHTO Resilience and Sustainability Management (formerly Resilient and Sustainable Transportation System Program (RSTS)) .

Optimizing Research Budget and Staff-Contracting

Is your agency forced to go outside your usual contracting partners?

- University of Connecticut (UConn)
- Central Connecticut State University (CCSU)
- University of Hartford (UHart)

Optimizing Research Budget and Staff- Universities

Is there a reason that you do not use additional universities or partners?

- Agreements process takes time/administration
  - Need an approved Proposal
  - Develop Scope of Work
  - Multiple rounds of review from Attorneys (both parties), Agreements, and Attorney General
  - Signature process
  - Annual Amendments are needed to carry into new FY

Optimizing Research Budget and Staff- Innovative Ideas

Innovative ideas to do more with less:

- Master MOUs
- Financial Tracking Spreadsheet
- Standard Operating Procedures
- Sharepoint – concurrent reviews

Optimizing Research Budget and Staff – Technical Areas

How do you juggle research with other heavily technical operational areas?

Optimizing Research Budget and Staff – Optimization Process

Describe the top optimization process for contracting that your DOT uses.

- For UConn only: Master Memorandum of Understanding (MOU) with Project Authorization Letters (PALs)

Optimizing Research Budget and Staff – Scope

Does your agency make it a practice to limit the scope of your research projects to help keep overall costs down?

- No cap on the dollar amount
- Largest Project: SPR-1271 (T2 Center) Dollar Value: $1,178,312
- Smallest Project: SPR-2329 (Pollinator Study) Dollar Value: $41,727

Optimizing Research Budget and Staff – Solicitation Process

- Biennial Solicitation – coincides with new Work Plan
- Fillable Research Needs Solicitation (RNS) form
- Reach out to SME's for feedback/determine support
- Internal Ranking Process (based on NETC/NCHRP)
- During Selection phase, determine budget constraints

Optimizing Research Budget and Staff – Solicitation Process (Cont'd)

How did you get it implemented?

- Adopted NCHRP/NETC process – good track record
- Incorporate lessons learned
  - Provide budget by Fiscal Year (vs. total amount) for planning the Work Program
  - Allow ample time for RNS submittal and review

Optimizing Research Budget and Staff – Staffing Issues

Are you understaffed? Please provide details.

- Transportation Supervising Planner (1): Melanie Zimyeski, PE
- Transportation Engineer 3 (1): Dionysia Oliveira
- Connecticut Careers Trainee - CCT (1): Devon Kleeblatt

- With the number of projects programmed for FY 25/26, and resultant project management tasks, additional staff would be welcome
- This would aid in our succession planning process

Optimizing Research Budget and Staff – Staffing Issues (continued)

How do you get the most out of your staff, especially when you are understaffed?

- Cross training/shadowing on all tasks
- Roles may shift based on deadlines
- Planning ahead/Outlook calendar/cyclical deadlines
- Avoiding burnout
- Avoiding assigning repetitious tasks to a single employee

Optimizing Research Budget and Staff – Recruiting

How do you recruit people to open positions?

- Hiring process for State Employment is fixed through CT DAS (job apps)
- Constrained/Government restrictions (process approved by HR)
- Advertise on LinkedIn, share through University contacts

Optimizing Research Budget and Staff – Retaining New Hires

How do you retain new hires?

- Diversity of tasks
- Internal cross-training
- Cross training through other offices where possible (incl. Rotation Program- still in development)- constrained by union rules (job specs, grievances)
- Offer opportunities to get involved in Committees, taking ownership
- Learning opportunities and networking with other research managers/staff through Research-related conferences

Optimizing Research Budget and Staff – Succession Planning

Succession planning – How do you transfer knowledge from outgoing staff to new staff?

- There is no transition period
- Develop Standard Operating Procedures
- Shadowing/Assisting remaining staff/responsible party
- Utilize existing documentation

Optimizing Research Budget and Staff – Hiring

What compromises do you make when hiring?

- Flexibility in Job titles
- Broader Degree requirements
- Experience requirements

Optimizing Research Budget and Staff – Roles/Tasks

How do you decide what roles/tasks are performed by each staff member?

- Workload
- Familiarity
- Learning Opportunities
- Consider the deadline / other risks involved
- Job title

Optimizing Research Budget and Staff – Research Services

What research services do you expect from PIs that might typically be performed by a DOT?

- Keeping track of budget records
- Submitting Quarterly Reports
- Testing/Use of Equipment
- Literature Review
- Media coverage
- Drafting the Final Report

Optimizing Research Budget and Staff – Utilizing Internal Employees

Are there ways to utilize employees or services from other parts of the DOT, for free?

- Traffic Monitoring (Miovision)/Counts
- Drones
- GIS data
- Publicity/Media
- Financial support services (purchase orders, financial programming)
- Subject Matter Expert (SME) support

Optimizing Research Budget and Staff – Time Commitment (Highest to Lowest)

- Review/proofread Proposals and reports
- Quarterly Reports, Review Invoicing
- Annual Report, End of Program Report
- NCHRP reviews
- Survey of State Government Research and Development Financial Report
- Contract documents
- Work Plan
- Committee membership

Optimizing Research Budget and Staff – Assigning work

Considerations:

- Complexity in nature
- Availability

Optimizing Research Budget and Staff

How does the Research convince leadership that additional staff are needed? How do you foster a strong relationship and garner buy-in from your directing staff/leadership?

- Must demonstrate to management that all staff are working at full capacity
- Must demonstrate to them the importance of Research's role and how it benefits multiple Bureaus – ex: E-flyer
- Keep them informed on deliverables, implementation, and the importance of Research
- Highlight Research successes: HVR Awards, Bulletin

APPENDIX Q. VERMONT AOT – FACILITATING TECHNOLOGY TRANSFER

NETC Research Peer Exchange

Topic 3: Technology Transfer

June 26, 2024

Presentation by: Emily Parkany, Vermont

AOT Research and Innovation Symposiums

- 26-30 Projects in Four Groupings:
  - Asset Management and Maintenance
  - Materials
  - Environmental, Resilience, Planning and Public Transportation
  - Structures and Construction
- Virtual 2020, 2021, Hybrid 2022, 2023 Symposium Substitute Report
- Each project includes
  - Web page—permanently available!
  - Fact Sheet
  - Poster
  - 3-5 Minute Recording (support team failed in 2022)
  - Half of the projects in 2022 included table demos

Tech Transfer as Part of Research Contract

- Yearly Symposium participation is expected during the project and the September after the project completion
- Updated versions of Posters, Fact Sheets, videos, and other materials may be requested at the conclusion of the project to share the results of the project on the project's AOT Research web page
- Researchers may be asked to participate in a webinar or similar, to share results of the project
- Mixed responses about sharing work not funded by AOT

Enhanced Communications Contract

- Working with consultant for Communications support
- Communications Plan
- Branding, including
  - Fact Sheet and poster templates
  - Mailings (Constant Contact) templates

- Enhanced Fact Sheet
- Advertising support for Symposium

VERMONT
AGENCY OF TRANSPORTATION
RESEARCH PROGRAM

Speed Countermeasure Toolbox
Project Factsheet

2024

Learn more about this project, where University of Vermont researchers evaluated proven speeding countermeasures for Vermont roadways and created a toolbox to help local agencies make informed decisions when determining their applicability in jurisdictions. Also, read about how the information in this toolbox helped a Vermont town implement a median island and road diet.

SAFETY TOOLS

Background

Speeding on local and state-maintained town highways is a major contributor to traffic fatalities in Vermont. In fact, in 2018, over half of all fatal crashes on local and collector roadways were speeding-related.

Vermont's towns and villages face a difficult challenge with speeding, especially in transition zones between higher-speed rural highways and their lower-speed streets. Often, these municipalities task local engineers or department of public works superintendents with addressing speeds and improving safety, though they may have limited experience or expertise in the selection and implementation of speeding countermeasures.

What could be done to bridge this knowledge-gap and reduce speeding in these areas?

This project sought a means to provide resources and guidance to these small and rural communities to help them select and implement speeding countermeasures that will be both effective and appropriate for their needs.

Benefits

Districts, towns, and villages across Vermont can use this toolbox to simplify the question of how to effectively reduce speeding and reduce the severity and number of future speeding fatalities in their jurisdictions. The toolbox provides an informational "head-start" and can help municipalities save time during planning. Decision makers and planners can also directly benefit from the experiences and lessons learned of other municipalities and weigh the pros and cons of possible countermeasures before determining which course of action to take. Once a jurisdiction plans a path forward, they will be able to seek out additional information and support from the Agency of Transportation.

Key Benefits

- *Multiple countermeasure options presented in comparable formats*
- *Includes Vermont-based applications and guidance*
- *Provides speed-data needs to support implementation*

Goals & Methodology

This project sought to:

1. Evaluate speeding countermeasures for their applicability on Vermont roadways.
2. Create profile sheets for proven speeding countermeasures including describing their use and effectiveness in Vermont communities.
3. Create a clear and concise "Traffic Safety Toolbox" to support local decision-makers in villages and towns across Vermont.

The University of Vermont research team conducted an extensive literature review, including resources from the Federal Highway Administration, existing Vermont State and municipal documents, peer states, and Canadian guidance.

Additionally, the team selected four sites across the State to demonstrate the type of real-world speed-data collection that a jurisdiction needs to support implementing speeding countermeasures and provide a site-specific evaluation. The team provided fact sheets on each of these field tests in the final toolbox.

Figure 2: The median island and bulbouts provide refuge for pedestrians crossing a very wide street. It also narrows the traffic lanes, shortens the crossing distance, and improves conspicuity. (Credit: Rutland Regional Planning Commission)

Finally, to further demonstrate this project's relevance to Vermont towns, the research team conducted a series of four case studies which provide speeding countermeasure implementation examples as well as lessons learned from each.

Results

Based upon the review, the team identified 15 speeding countermeasures listed in a chart summarizing similarities and differences and created fact sheets for each that cover the context where the countermeasure may be appropriate, design considerations, how often each is used across Vermont, and pros and cons.

These speeding countermeasure and field test fact sheets, along with the case studies, are presented together in the project's toolbox. A separate final report describes the research process and presents the literature review.

"Being able to point to guidance specific to Vermont helped the community understand that it could work here— Other guides I've previously used could have been perceived as only for 'big cities.'"

Ethan Pepin
Rutland Regional Planning Commission

Implementation

After this research was completed in June 2023, it served as a useful resource to the Rutland Regional Planning Commission. For this project, the Downtown Rutland Partnership had requested suggestions on speeding countermeasures to address safety, speed, and a lack of driver yielding at a midblock crossing.

The location for this project was on a very wide (~50 feet), two-lane road, which was previously home to a streetcar line. The midblock crossing is adjacent to a children's museum and is a main connection between a parking structure and several large office buildings. This means the crossing is used by many parents with children in addition to those who work in these office buildings.

Ethan Pepin, a transportation planner for the Rutland Regional Planning Commission, used this toolbox as a resource when researching potential solutions.

"While the elected officials were on board with idea of a median island, there were some concerns from other departments within the town," said Pepin. "I developed a short report for both elected leaders and city staff laying out the countermeasure and referenced specific guidance and standards, including the relevant sections of this toolbox."

Pepin notes that the toolbox was a useful resource that took into account the Vermont context.

"Being able to point to guidance specific to Vermont helped the community understand that it could work here," he said. "Other guides I've previously used could have been perceived as only for 'big cities.'"

More Information:

Project webpage
Speeding Countermeasure Toolbox link
Project Final Report

Find these documents and materials for additional AOT projects by searching "*VTrans Research.*"

Research Team:

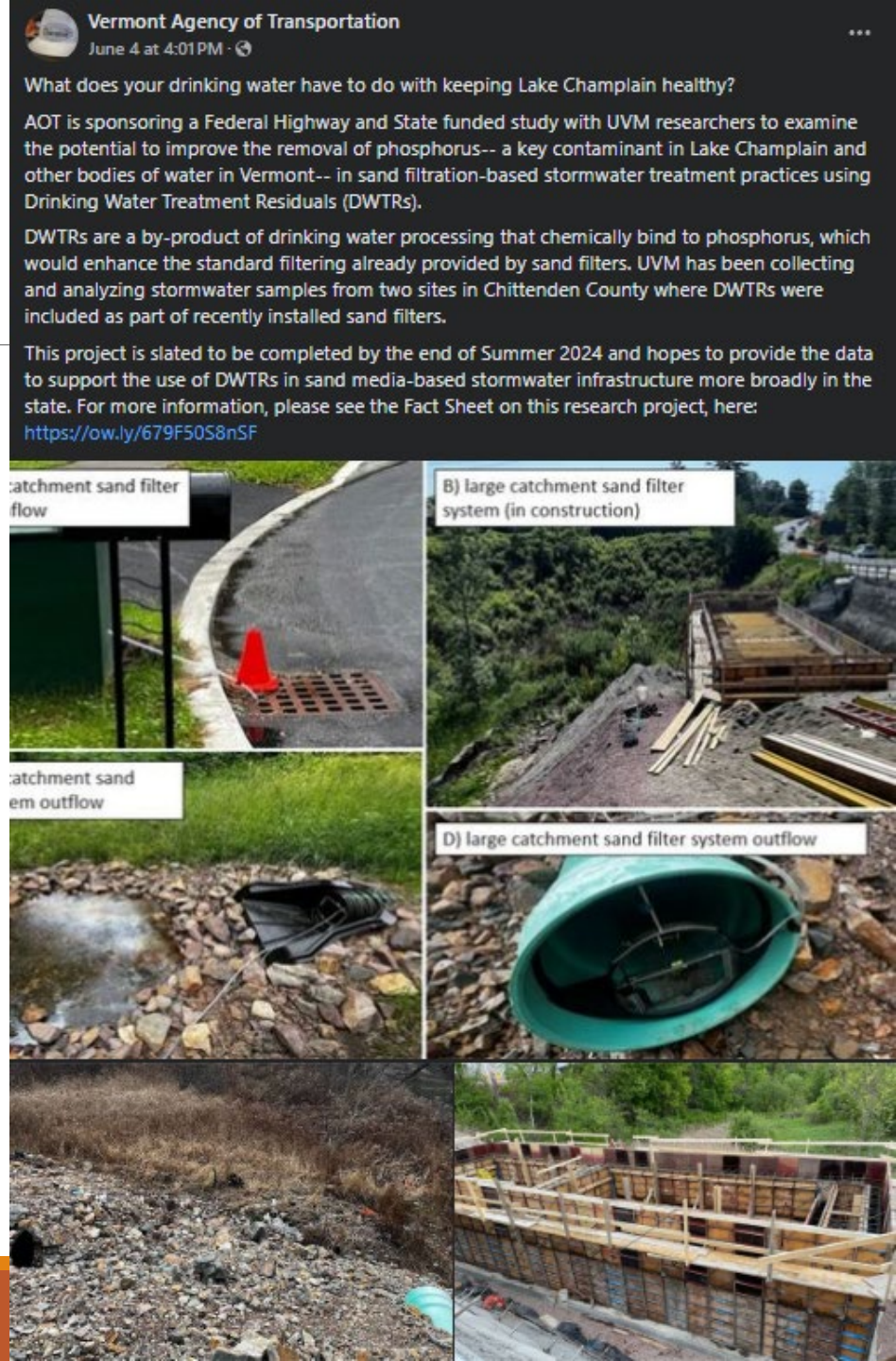
University of Vermont Transportation Research Center
James L. Sullivan
Dr. Dana Rowangould

VERMONT
AGENCY OF TRANSPORTATION
RESEARCH PROGRAM

Figure 1: Example factsheets included in this project. (Credit: AOT)

Social Media Attempts

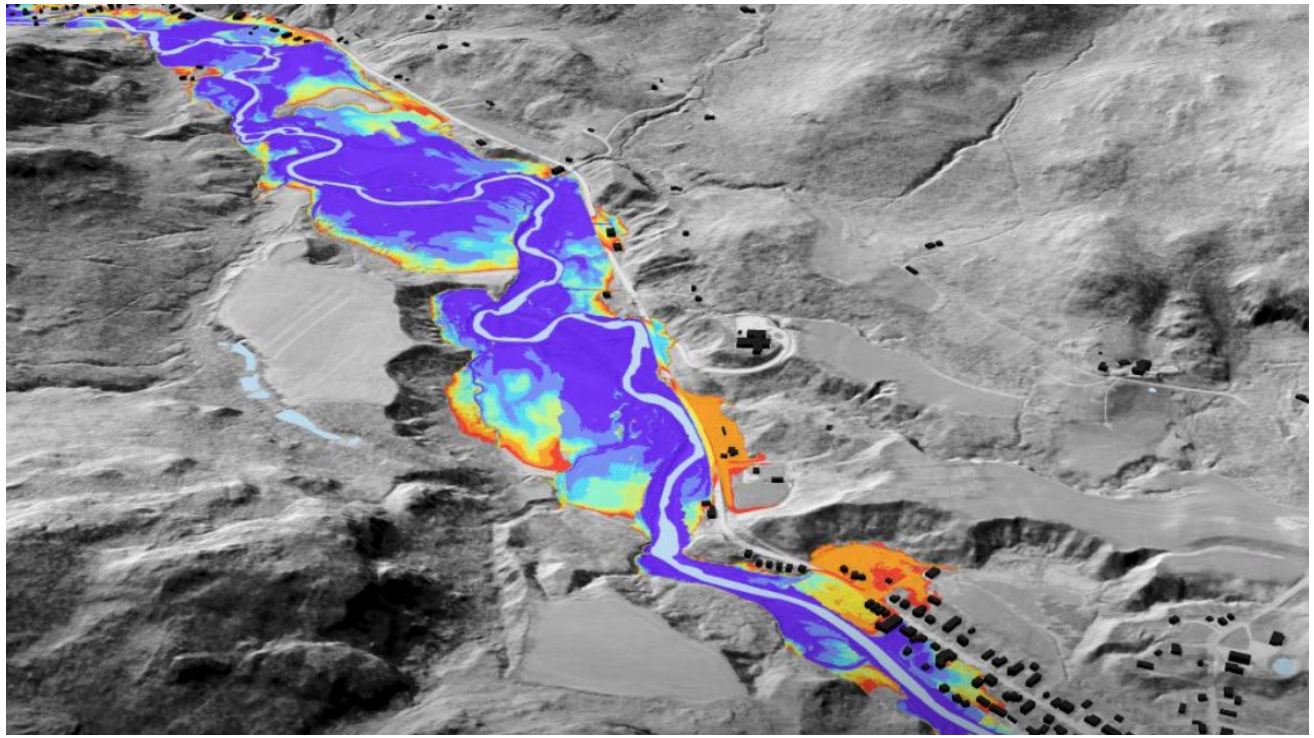
- All discussion is good—even uncomfortable comments
- Working with Project Champions for text and approval and new Social Engagement Communications staff
- BMD Round Robin
  - Approx. 90 comments in 24 hours
  - Materials Manager peeved and convinced he could write the post without generating discourse
- Toolbox was squashed
- Rapid Setting Concrete
- Phosphorus Reduction



Just in Time Mailings

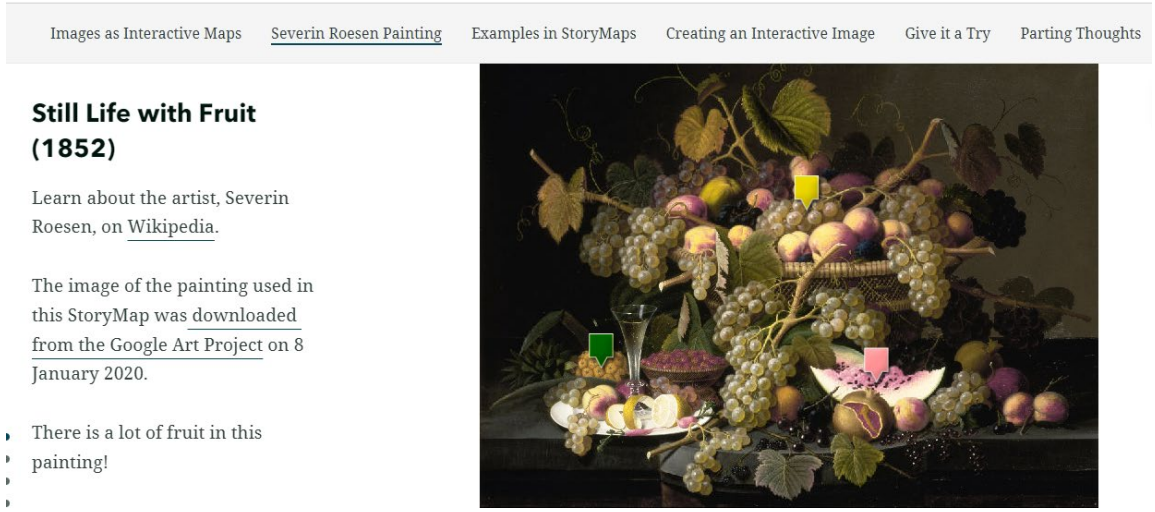
- Project completed alerts
- Final Report available
- Selected External Research Projects announcement
- Symposium Save the Date/Updates
- Aiming for two per month

Older Project Discussion



- Vermont Public video
- Included former UVM PI and project similar to AOT funded project
- UVM PI was enthusiastic about talking to us about former and current projects and next steps
- Discussion meeting with 20 people: AOT, UVM, ANR, 7-8 consulting staff from 2 firms

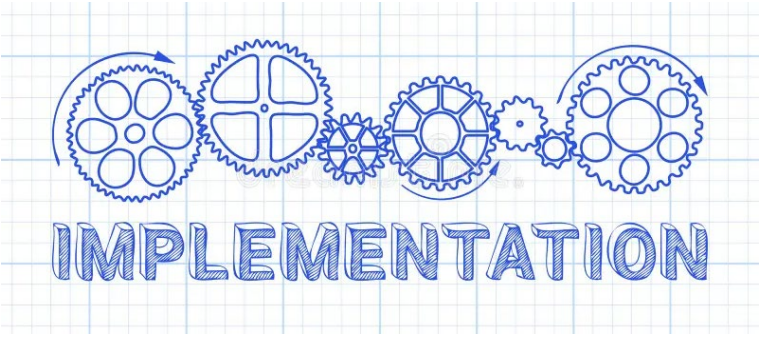
20-44 Interactive Video Product RAC 1 Project



- RAC 1 has been talking for years about a NCHRP 20-44 regional submission (similar to Region 3's 20-44 project)
- With the prevalence of StoryMap examples, wondering whether they are "worth it" for sharing research projects
- Advantages: interactive, images/graphics/video, great for projects that have options/multiple cases
- Disadvantages: proprietary, learning curve, unknown value
- Do StoryMaps count as futuristic/new research management paradigm?
- For what types of projects are StoryMaps effective?

Qs we have for other states

- By sharing our projects, are we increasing implementation?
- How do you utilize webinars effectively?
- How are states featuring High Value Research projects?
  - How do you share your “wins”?
  - Are you sharing the regional and national winners or the nominated projects?



HIGH VALUE RESEARCH

APPENDIX R. NEW JERSEY DOT - FACILITATING TECHNOLOGY TRANSFER

NETC Research Peer Exchange

Topic 3: Technology Transfer

June 26, 2024

Presentation by: Pragna Shah, New Jersey DOT

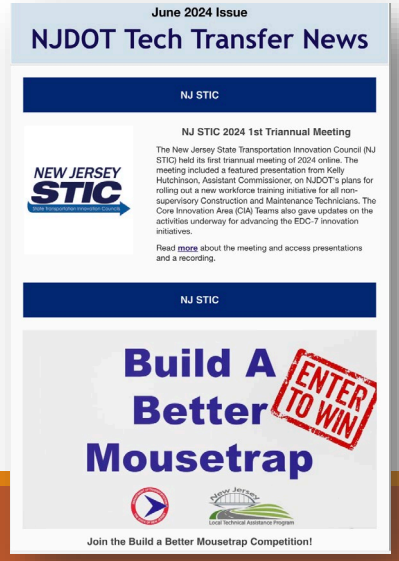
Technology Transfer – Products & Processes

Newsletter & Email	Social Media	Website Articles & TRB News	IdeaScale
Conference Presentations	Briefs	Papers & Videos	Webinars & White Papers
Final Reports & In-progress Research Projects	Research Library	STIC Support	Peer Exchange

Newsletter & Email

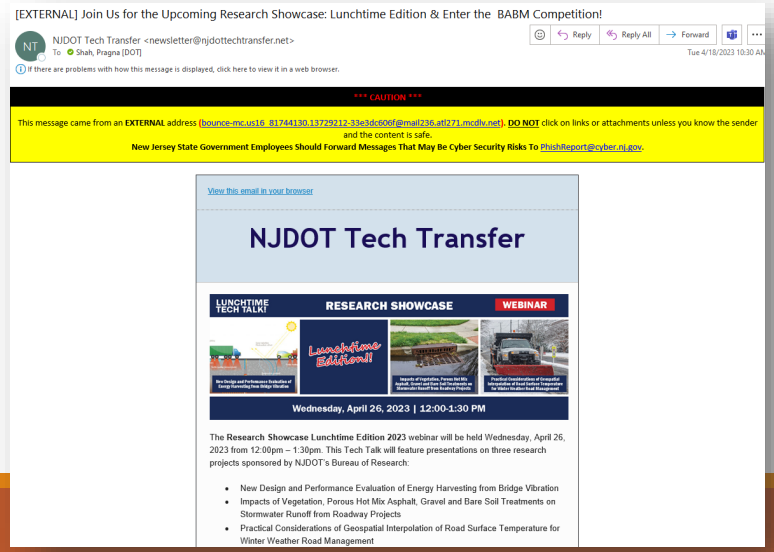
Newsletter

- NJDOT Tech Transfer News
- Transporter/PMGA Scoop – Research Articles
- *COMING SOON:* Bureau Newsletter



Email

- Tech Talk Announcements/Flyers
- IdeaScale Emails
- Idea Solicitation Period



Social Media & Other

Social Media

- T2 Facebook Page
- NJDOT Intranet (Bureau Spotlight “BRIIT BITS”)
- NJDOT Social Media Sites

Other

- Bureau Slide at LTAP Classes

T2 Website Articles & TRB News

T2 Website Article

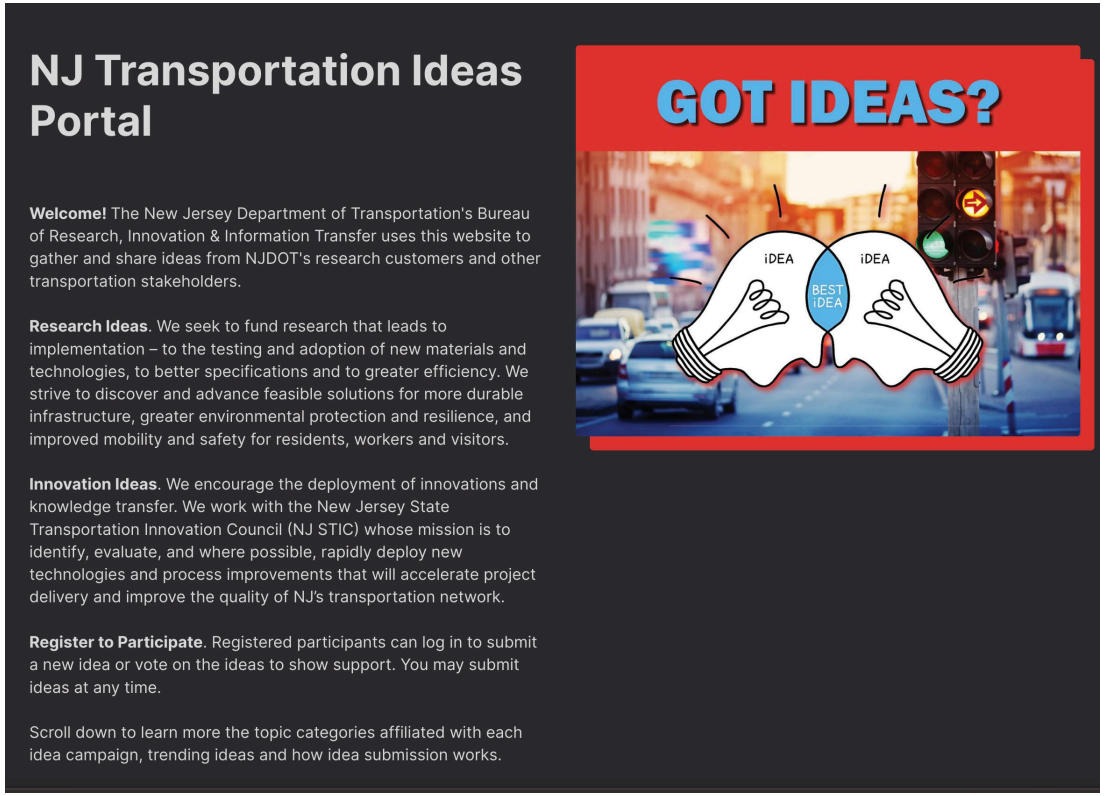
- Latest Research
- Dr. Giri Venkiteela at Monroe
- Research Library

TRB News Article

- TRB Transportation Research Feeds
- Upcoming (topic?)
- Innovation Spotlight

IdeaScale

Research & Innovative Ideas are solicited through the NJ Transportation Research Ideas portal.



Conference Presentations

Dr. Giri Venkiteela at Conferences

Principal Investigator at TRB

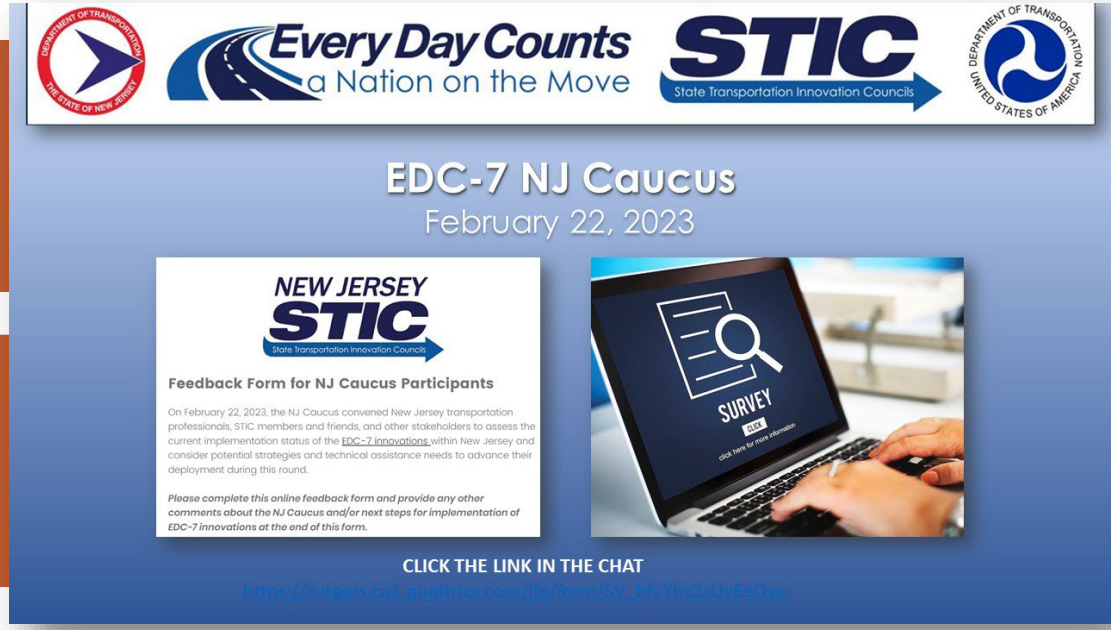
Research Spotlight at STIC Meetings

Research Showcase Presentations/info tables

Briefs

Tech Briefs

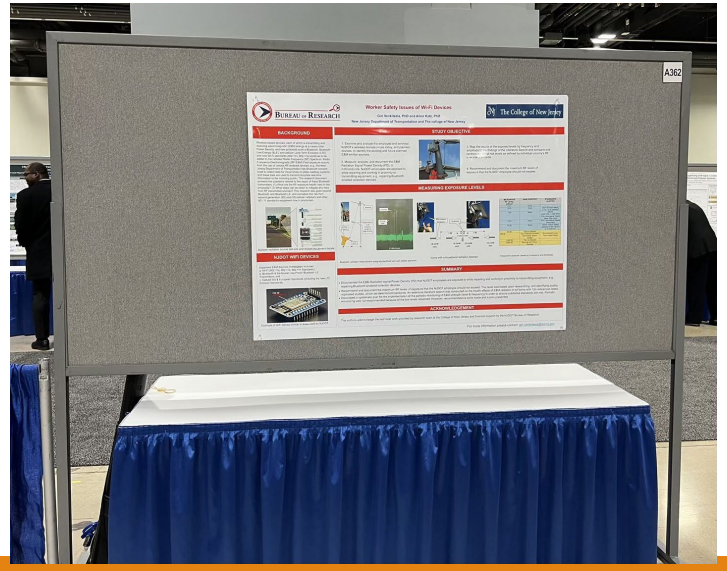
STIC/EDC flyers with QR code



Papers & Videos

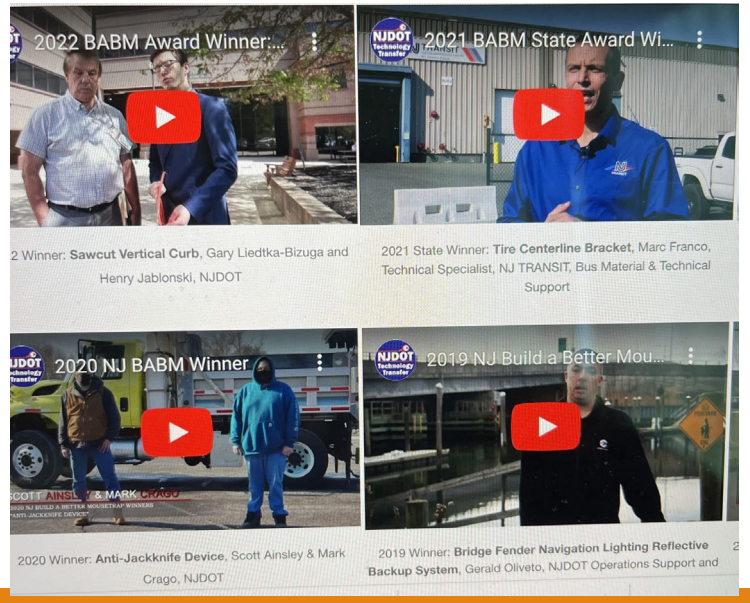
Paper/Poster for TRB

- Poster for TRB
- AASHTO RAC High Value Research



Videos

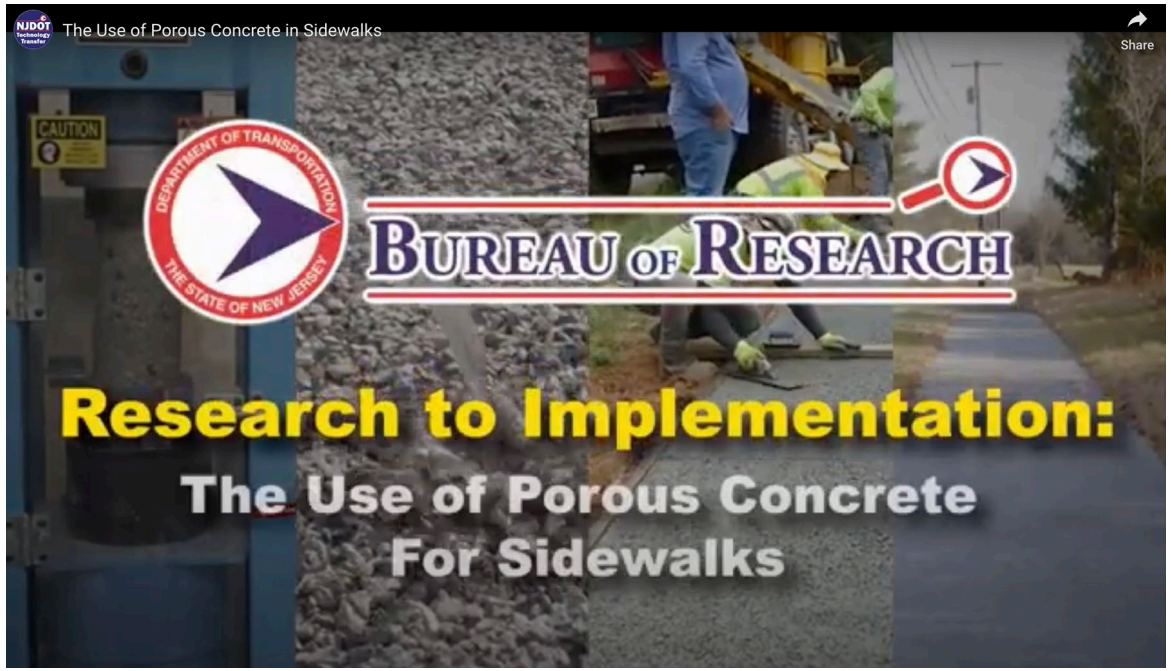
- Build A Better Mousetrap Competition Announcement Video
- Build A Better Mousetrap Competition Winner Videos
  - Sawcut Vertical Curb
  - Anti-Jackknife Device
  - Inlet Repair trailer
  - Reflective Fender
- Pavement Preservation
- Drone Technology
- Safety Countermeasures



Videos

Research to Implementation

- The Use of Porous Concrete for Sidewalks
- Reclaimed Asphalt Pavement
- Design & Evaluation of Scour for Bridges Using HEC-18



Final Reports & In-progress Research Projects

- Maintain Research projects database lists research in-progress and final reports & tech briefs for completed research.
- Inputting all research results into National databases

FHWA-NJ-2022-003	Completed	2022	Understanding the Needs of Current and Potential Bus Transit Riders	Rutgers University, Voorhees Transportation Center	Deka, Devajyoti
FHWA-NJ-2022-002	Completed	2022	Real-Time Traffic Signal System Performance Measurement Phase II	Rutgers, The State University - Center for Advanced Infrastructure & Transportation	Jin, Peter J.
FHWA-NJ-2022-001	Completed	2022	Implementation of Porous Concrete for Sidewalks in New Jersey	Rutgers University, Center for Advanced Infrastructure and Transportation (CAIT)	Najm, Husam
FHWA-NJ-	Completed	2021	Marketing Research for the Quantitative Benefits of	Rutgers University, Voorhees	Carnegie, Jon

Research Library

- Oversee onsite NJDOT Research Library Operations
- Raising awareness of the Research Library
- Maintaining the Library & in the 21st Century Library

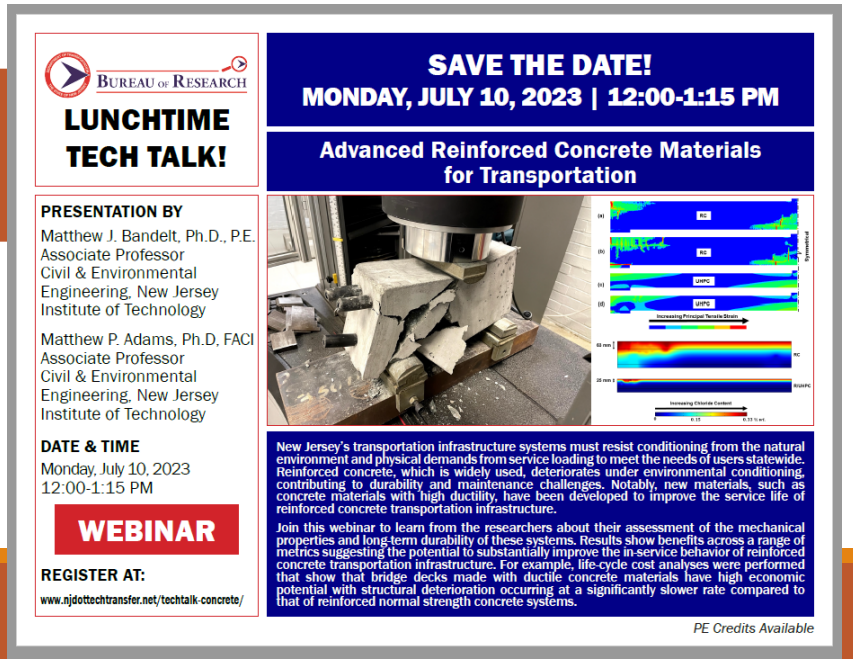
Webinar & White Paper

Webinar

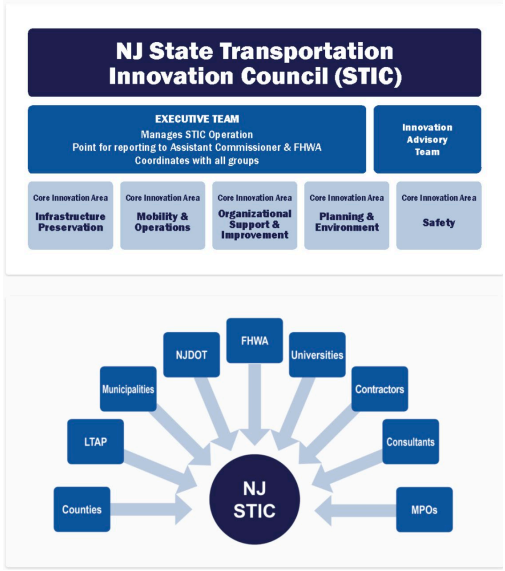
- Tech Talks
- Links on T2 Website to other trainings: NJLTAP, FHWA Events, TRB Events, “Online Training Library”

White Paper

- Annual Implementation Report
- Annual Innovation Report



State Transportation Innovation Council Support



Provide technical support and communication strategies to support the NJ STIC

Peer Exchange

- How NJ Counties are Reducing Rural Roadway Departures
- Drone
- Local Safety
- E-Construction & Partnering

Tech Transfer Activities - Comparative Analysis

Favorite tech transfer activities - Videos

Least favorite tech transfer activities – Knowledge Management Toolbox

Communication

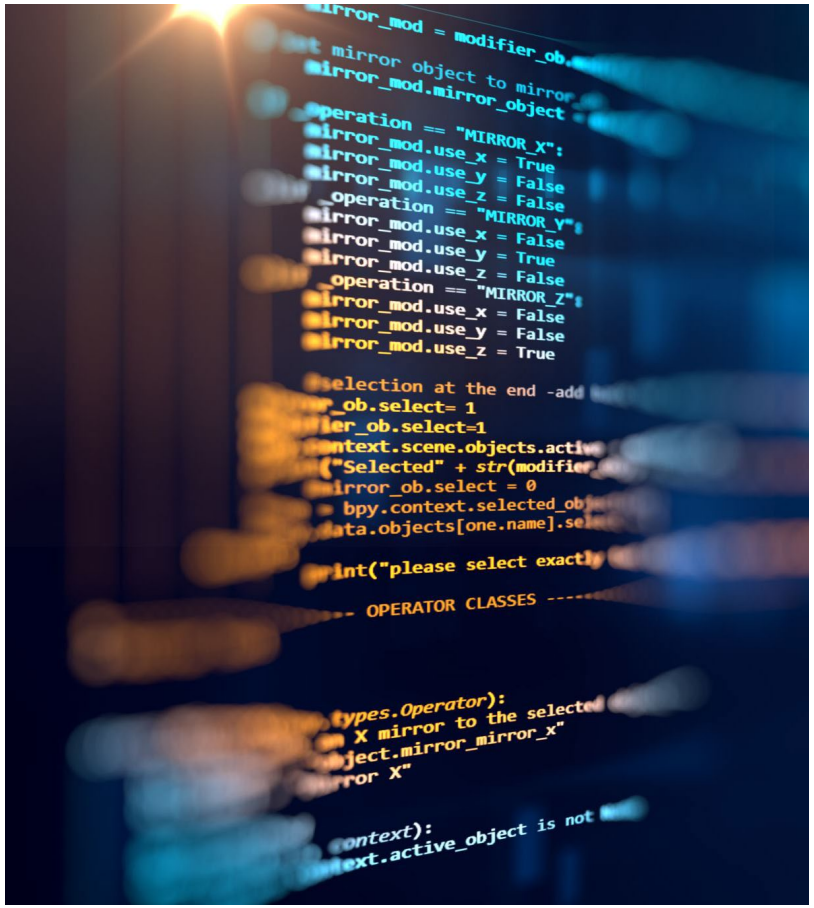
How often do you communicate about research internally? Externally?

Several ways periodically throughout the year

Outreach Methods

- What products or outreach methods are successful in effectively reaching people, in terms of time or funding? Tips, tricks, products you use.
  - Videos
  - Articles
  - Social media
  - Tech Talks

Tech Transfer Tools



- Do you have tech transfer software, applications, or tools you can share to get better, more appealing results (ex. an application for fact sheet templates or a video editing program).
- How do you utilize webinars effectively?

Keeping Up with the Times

- How have we changed our tech transfer approach to keep up with modern methods/short attention spans? Video ”teasers” have been produced
- Describe a futuristic technology transfer activity that would be helpful.
  Produce “shorts” or “reels”
- Once you advertise project results how do you know people are using them?
  - Do you track implementation? Have they tried it? Did it work for them?
    - Tech Transfer Program Website
    - MailChimp platform
    - T2 Video Library
    - Qualtrics - surveys

Technology Transfer – Working with Others

- Do researchers do tech transfer as part of the research contracts?
  - How are your contracts structured to support tech transfer? Requirement in the proposal
- Do you work with other offices on tech transfer such as Communications, Public Affairs or Creative Services? Please describe.
  - How do you effectively do tech transfer if you can't get Public Affairs' attention?

Inquiring Minds may want to know…

- Do you work with outside firms to assist with tech transfer?
- If Tech Transfer leads to unwanted attention/discussions, how do you deal with it?

Technology Transfer Recognition

- How are the states featuring High Value Research projects?
  - How do you share your “wins”?
  - Are you sharing the regional and national winners or the nominated projects?
- Is it appropriate to resurrect and share older projects?
  - VT example – A VT PI was recently featured in a Vermont Public video talking about work related to the VTrans work. Emily wants to follow up with the researcher and project Champion(s) about the impact of the older project (related to the project featured in the video and after our July floods).

Questions?

APPENDIX S. MASSACHUSETTS DOT - FACILITATING TECHNOLOGY TRANSFER

NETC Research Peer Exchange

TOPIC 3: TECHNOLOGY TRANSFER

MassDOT - Technology Transfer

MassDOT Research is actively involved in internal and external Technology Transfer activities and products including:

- Announcements and Publication of Research Final Papers
- Dissemination of quarterly ***MassDOT Research Newsletter***
- Hosting Conferences – **MOVING TOGETHER, INNOVATION**
- Publication of the **MassDOT Research Annual Report** to communicate MassDOT's research activities
- **Local Technical Assistance Program** (LTAP) and **Municipal Technical Assistance Program** (MTAP)
- MassDOT's research contracts are structured to require tech transfer as part of their implementation plans
- MassDOT utilizes short videos, social media, short briefs as shared tech transfer approaches
- Tracking & reporting of Implementation of Research Results - (under development)

2023 Moving Together Conference

- Attend workshops and panels that highlight current pedestrian, bicycli transportation topics
- Network with colleagues representing diverse interests from the publi private sectors
- All new site visits and mobile workshops led by engineers and bicyclist advocates.

October 4, 2023

New Location!

Sheraton Boston Hotel
39 Dalton Street
Boston, MA • 7:45 am - 4:30 pm
*with Limited Virtual Attendance Option**

2024

massDOT Transportation Innovation CONFERENCE

April 30 - May 1 • DCU Center, Worcester, MA

FINAL REPORT

massDOT
Massachusetts Department of Transportation
Office of Transportation Planning

U.S. Department of Transportation
Federal Highway Administration

Prepared by
UMassAmherst
College of Engineering
UMass Transportation Center

Technology Transfer: Newsletter

massDOT
Massachusetts Department of Transportation

Transportation Research Quarterly

Providing highlights of MassDOT's transportation research activities and other helpful information **2022 Q4**

Continuous Improvement

Excellent firms don't believe in excellence – only in constant improvement and constant change.

– Tom Peters, Influential American writer on business management practices

Snow and Ice Program Aims to Further Improve Road Treatment Practices through Research

Massachusetts's average annual snowfall of 47.0 inches makes it snowier than most states in the United States. Snow and ice reduce pavement friction and vehicle maneuverability, causing slower speeds, reduced roadway capacity, and increased crash risk. It is estimated that nationwide, 24 percent of weather-related vehicle crashes occur on snowy, slushy or icy pavement and 15 percent happen during snowfall or sleet (source: FHWA Road Weather Management Program website).

INSIDE THIS ISSUE

MassDOT Highway Division works hard to keep the 16,000 lane-miles under its jurisdiction safe during storms. The Snow and Ice Program staff watch pavement temperature and precipitation types to choose the best way to treat the roads. Before a storm, a liquid salt brine solution is often applied to the road to prevent snow and ice from binding to the pavement and lowers the temperature at which water freezes. During and after a storm, the ice and snow are removed from the surface of the road and then additional deicing materials are applied to the road to keep the water on the road surface from freezing.

Following the adoption of various anti-icing practices and other efficiency measures, MassDOT has reduced its average annual statewide road salt usage by about 25% on a ton per lane mile basis in the past decade (adjusting for differences in winter weather severity). Presently, through MassDOT's SPRII Research support, Snow and Ice are working with UMass researchers and a USGS water scientist to investigate new ways to improve our anti-icing practices. The goal is to improve the precision of anti-icing and de-icing material applications and to reduce material costs and environmental impacts without compromising performance targets for roadway safety and levels of service.

Visit the MassDOT Research Section website www.mass.gov/research-and-technology-transfer

Technology Transfer: Annual Report

massDOT
Massachusetts Department of Transportation

020

APPENDIX T. RESEARCH PROGRAM TOOLS

Connecticut Department of Transportation
Bureau of Policy and Planning
Strategic Planning and Projects Division
Research Unit

Research Project Solicitation Form

Do You have an Idea that is Eligible for Research Selection/Funding?

For Research Unit Use Only
Solicitation #:
Date Received:

The CTDOT Research Unit welcomes your ideas for potential research projects. Perhaps you have heard of a new and innovative technology or available process and would like to take a deeper dive into whether this idea applies to the Department's needs. A single idea can transform the world and rewrite all the rules. What's your idea?

Please answer these initial questions to help us learn more about your research idea and help us determine if your idea would be eligible for research funding.

Please complete and return this electronic submission form to the CTDOT Research Unit (Melanie.Zimyeski@ct.gov) by **December 31, 2023,** to be considered for the next fiscal year. All blue fields are required. Completing additional fields to aid the evaluation of solicitation ideas is strongly encouraged.

Name:	Telephone:
Title:	Email:
CTDOT Division/Unit:	

Problem Statement Title and Subject

Proposed Project Title:

Project Subject(s): *(Per 23 U.S.C. 505 research projects funded through SPR Part-B must be related to highway, public transportation, or intermodal transportation systems.)*

- ☐ Active Transportation
- ☐ Policy and Planning
- ☐ Safety and Human Factors
- ☐ Future Transportation Technology and Systems
- ☐ Health and Equity
- ☐ Design and Engineering
- ☐ Construction, Materials, and Maintenance
- ☐ Operations and Traffic Management
- ☐ Energy, Environment, and Resiliency
- ☐ Other:

Problem Statement

Problem Statement and Research Objectives: *(Provide a brief description of your research need and specific research objectives.)*

Anticipated Products: *(Provide a brief description of the anticipated products, including, but not limited to, tools, prototypes, standards, specifications, software, materials, policies, processes, and data.)*

Benefits to CTDOT *(Provide a brief explanation of how the anticipated products will advance the strategic goals and mission of CTDOT. Address the urgency, timeliness, and importance of the research. Where applicable, explain if a product is required for any Federal or State compliance or initiative.)*

Implementation

Implementation Strategy: *(Describe how the anticipated results of this project would be implemented including, but not limited to, specifications, methods, systems, processes, or policies that may be changed based on the results. Identify the CTDOT office responsible for implementation.)*

Literature Search

□ Preliminary literature search completed *(If you checked this box, please list the titles of or provide links to the identified sources. The Transport Research International Documentation (TRID) database is an excellent place to begin a literature review.)*

1.
2.
3.

Budget and Schedule

Estimated Cost:

Estimated Duration:

Procurement of Equipment?:

Additional Information: *(Provide any other information that may help with the evaluation of this solicitation idea.)*

Please contact the Research Unit (Melanie.Zimyeski@ct.gov)with any questions or for help completing this form.

Research Project Team Evaluation

PI's form

Thank you for taking the time to provide valuable feedback about the project PM and Champion. If you answer "No" to any question, please elaborate in the Comments fields.

1. PROJECT TITLE: _____

2. Name of the **PM** being evaluated: _____
3. The PM is extremely responsive. Yes or No
4. The PM is fully engaged in project meetings. Yes or No
5. The PM effectively handles issues and concerns. Yes or No
6. I definitely want to work with this PM again. Yes or No
7. Comments about the PM:

   _____

   _____

8. Name of the **Champion** being evaluated: _____
9. The Champion is extremely responsive. Yes or No
10. The Champion is fully engaged in project meetings. Yes or No
11. The Champion keeps meetings moving effectively. Yes or No
12. I definitely want to work with this Champion again. Yes or No
13. Comments about the Champion:

    _____

    _____

14. All other TAC members are engaged and helpful. Yes or No

Research Project Team Evaluation

Champion's form

Thank you for taking the time to provide valuable feedback about the PI and PM. If you answer "No" to any question, please elaborate in the Comments fields.

1. PROJECT TITLE: _____
2. Name of the **PI** being evaluated: _____
3. The PI is extremely responsive. Yes or No
4. The PI clearly communicates to everyone. Yes or No
5. The PI completes commitments on time. Yes or No
6. I definitely want to work with this PI again. Yes or No
7. Comments about the PI:

   _____

   _____

8. Name of the **PM** being evaluated: _____
9. The PM is extremely responsive. Yes or No
10. The PM is fully engaged in project meetings. Yes or No
11. The PM effectively handles issues and concerns. Yes or No
12. I definitely want to work with this PM again. Yes or No
13. Comments about the PM:

    _____

    _____

14. All other TAC members are engaged and helpful. Yes or No

Research Project Team Evaluation

PM's form

Thank you for taking the time to provide valuable feedback about the project PI and Champion. If you answer "No" to any question, please elaborate in the Comments fields.

1. PROJECT TITLE: _____

2. Name of the **PI** being evaluated: _____
3. The PI is extremely responsive. Yes or No
4. The PI clearly communicates to everyone. Yes or No
5. The PI completes commitments on time. Yes or No
6. I definitely want to work with this PI again. Yes or No
7. Comments about the PI:

   _____

   _____

8. Name of the **Champion** being evaluated: _____
9. The Champion is extremely responsive. Yes or No
10. The Champion is fully engaged in project meetings. Yes or No
11. The Champion keeps meetings moving effectively. Yes or No
12. I definitely want to work with this Champion again. Yes or No
13. Comments about the Champion:

    _____

    _____

14. All other TAC members are engaged and helpful. Yes or No

Nov. 2020

Updated 2/4/2021

GUIDANCE ON ROLES AND RESPONSIBILITIES FOR UDOT RESEARCH PROJECT TEAMS

This document provides (1) guidance for UDOT research project teams regarding roles and responsibilities of each team member, as well as (2) tips for effective project meetings.

Four roles exist for members of the technical advisory committee (TAC) for a UDOT research project:

- Research Project Manager (PM)
- Project Champion (PC)
- Principal Investigator (PI)
- Other TAC members

Below are the main responsibilities for these roles. Some of the responsibilities may be transferred to other team members depending on each person's strengths and their capacity for the research project.

Research Project Manager (PM): The PM is a UDOT employee (or a consultant) who is assigned PM responsibilities for various research projects by the Research & Innovation Division Director based on experience. The PM is the central point of contact for all project activities including contract setup and management and the review of deliverables. The PM manages the project's scope, schedule, and budget using the CMS and RPMs systems and regular project team communication. Some additional PM responsibilities include:

- Follow the Research Project Management Checklist as the project progresses
- Keep project documents up to date in the Research shared drive
- Schedule TAC meetings and coordinate the meeting agenda
- Coordinate with the PI on preparation and sharing of the TAC meeting minutes
- Coordinate the draft and final project Implementation Plan with the PC and TAC
- Be extremely responsive
- Effectively handle issues and concerns
- Be fully engaged in project meetings

Project Champion (PC): The PC is a UDOT division leader or their designee who is empowered by UDOT leaders to make decisions related to project tasks and implementation of the research results. The PC dedicates the time and resources needed to help complete the project and maximize its benefit to UDOT and the public. The PC is technically knowledgeable on the topic. Some additional PC responsibilities include:

- Help confirm or select the PI for the project in coordination with the PM
- Attend and lead periodic TAC meetings including discussions with the project team
- Assess the technical status of the project by reviewing reports and giving feedback
- Work with the PM and TAC to develop an Implementation Plan for using research results
- Coordinate UDOT's implementation of the project deliverables
- Be extremely responsive
- Be fully engaged in project meetings
- Keep meetings moving effectively

Principal Investigator (PI): The PI is the designated researcher on the project, typically a consultant or university professor hired by UDOT to perform and direct the research. The PI helps refine the project work plan in coordination with the PM and PC and conducts the project based on the executed contract scope, schedule, and budget. The PI has a complete knowledge of the issue to be studied and the needed research skills. Some additional PI responsibilities include:

- Communicate frequently with the PM and PC
- Attend periodic TAC meetings, and present on the latest research results
- Coordinate with the PM on preparation and sharing of the TAC meeting minutes
- Follow UDOT guidelines for preparation of research final reports
- Incorporate TAC feedback on draft deliverables in the final versions
- Present final research results to a broader UDOT or industry audience in coordination with the PM and PC
- Be extremely responsive
- Clearly communicate to everyone
- Complete commitments on time

Other TAC members: Additional TAC members are identified by the PC or a division leader based on the individual's expertise or role as a likely end-user of research results. These TAC members could be employees of UDOT, UTA, FHWA, or other agencies, consultants (volunteer or on-contract), or other experts. They liaise with their stakeholder groups on project progress and share stakeholder concerns with the TAC. Some additional TAC member responsibilities include:

- Work with the PI, PM, and PC to develop or refine the project work plan
- Provide data, testing, specific knowledge, or other information related to the project
- Attend periodic TAC meetings to discuss progress and results with the project team
- Assess the technical status of the project by reviewing reports and giving feedback
- Assist the PC and PM in drafting the Implementation Plan for using research results
- Provide support on the implementation of the project deliverables
- Be engaged and helpful

Guidelines for TAC Meetings: Research project TAC meetings are held to keep team members informed and for them to give feedback to the PI. Schedule these regularly or when key milestones are reached or deliverables are ready for evaluation. Typically hold a cluster of meetings early in the project to finalize the scope of work and identify an initial implementation strategy for the expected results. For the project wrap-up, typically hold another group of meetings to review and comment on final deliverables, and to finalize the implementation strategy. Meetings typically include an update presentation by the PI, group discussion, reviewing next steps, and implementation planning. When scheduling, the PM coordinates with the PC and PI on the meeting agenda. The PI or PM should prepare and distribute meeting minutes to the TAC. TAC meetings are typically held for one to two hours depending on the items to address.

APPENDIX U. RESEARCH COMMUNICATION PRODUCTS

RESEARCH PROGRAM

Office of Strategic Planning & Projects
Questions? Call, email, or visit the Research Unit's homepage

- Melanie Zimyeski (Supervisor)
- Dionysia "Dinny" Oliveira
- Andrew Mroczkowski, P.E.

Image source: Connecticut Department of Transportation

CTDOT Research Unit Overview:

The CTDOT Research Program staff works directly with university, other research professionals and other states to find workable solutions to problems that affect the transportation system and infrastructure.

Research consists of many things, including but not limited to:

- Facing a major challenge in our work and for which research is needed to find or test solutions.
- Evaluating technology used by other state DOTs here at the CTDOT
- Participating in Pooled-Fund Studies
- Projects that can be taken from research to implementation
- Improving the skills and increasing the knowledge of the transportation workforce in Connecticut.

How can the Research Program help YOU?

Image source: Connecticut Department of Transportation

1. Every 1-2 years, we issue a solicitation to Bureaus for research ideas to be considered as new research projects. The ideas are prioritized to fit available funding. Selected projects are developed into Proposals (with assistance of a University Professor) and submitted to FHWA for funding approval. The next solicitation is anticipated in fall 2023.

2. At any time, Bureaus/Offices can submit questions or issues that they want to learn how the other states handle it. The Research staff have partnerships with other states' Research Programs and will reach out to other states to obtain responses. Similarly, we may ask you to respond to other states when they need our help on their questions or issues.

CTDOT Research Highlights Winter 2024

Highway Sign Support Systems: Condition Assessment Deterioration Models and Asset Management

CTDOT and CCSU collaborated on a research project to optimize sign support system management. They built a deterioration model and asset management plan that factors in age, structure type, material, traffic volume, and population. Through surveys and field tests, they discovered that while age is the biggest culprit for sign support failures, factors like traffic volume and material type also play a role.

To address this, they developed a risk assessment model that considers these various factors to predict failure probability and prioritize repairs. This project's findings will not only enhance the safety and reliability of CTDOT's sign support systems but also allow for more efficient maintenance and resource allocation.

Image source: Connecticut Department of Transportation

Principal Investigators: Talat Salama, P.E. talats@ccsu.edu
Andy Chae, P.E chae@ccsu.edu.
CTDOT SME: Jacob A. Booth jacob.booth@ct.gov

Artificial Intelligence (AI) & Markov Process Based Data Mining on Predicting Bridge Operating Conditions

The University of Hartford is using Artificial intelligence (AI) to help the CTDOT predict the bridge deterioration process and enhance its bridge and infrastructure management system. With AI's remarkable ability to acquire knowledge from large data sets, the research develops a machine learning algorithm for training and analyzing 30 years of large and complex bridge inspection data for more than 4,000 bridges in Connecticut.

The developed algorithm uncovers hidden relationships, identifies patterns within this extensive bridge inspection data, and models the intricate connections between various bridge features & bridge performance. A variety of features are considered, including bridge geometry, design, construction, service, cost, weather, & traffic dynamics

Image source: Connecticut Department of Transportation

Principal Investigator: Clara Fang; fang@hartford.edu
CTDOT SME: Jacob A. Booth jacob.booth@ct.gov

Adaption of 3D Scanning Technology for High Precision Bridge Inspection

Current bridge evaluation methods are labor-intensive and subjective, impacting safety assessment and repair prioritization. Our research explored hand-held 3D scanning technology for accurate inspection data, involving trials on Connecticut bridges and creating CTDOT training videos.

The technology assists in quality assurance checks, section loss measurements, and evaluating use cases like corrosion rate determination, crack mapping, and bridge hit documentation.This improved methodology enables better decision-making for load postings, rehabilitation prioritization, and funding allocation.

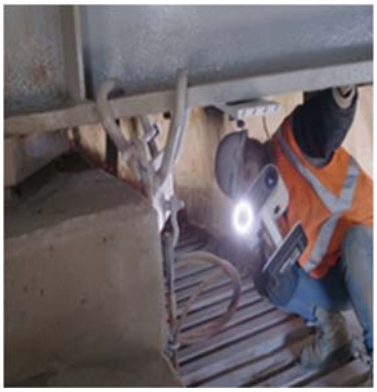


Image source: Connecticut Department of Transportation

Principal Investigators: Alexandra Hain, PhD, PE; Alexandra.hain@uconn.edu
CTDOT SME: Mary E. Baker. Mary.Baker@ct.gov

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Bureau of Policy & Planning
Office of Strategic Planning and Projects
Research Unit

2800 Berlin Turnpike
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Melanie S. Zimyeski
Transportation Supervising Planner
860-594-2144
Melanie.Zimyeski@ct.gov

CTDOT Research Highlights Winter 2024

CT Training & Technical Assistance Center (T2 Center)

Image source: Connecticut Transportation Institute, University of Connecticut

For forty years, the T2 Center at UCONN has served the CT Transportation Community with professional learning programs, technical assistance, and comprehensive technical resources. These programs include Public Works Academy, Road Master, Road Scholar, Local Traffic Authority, and Transportation Leadership Program. The center also offers a series of custom training programs to meet the individual needs of CT's cities/towns.

Monthly CT Crossroads and Leadership Lessons newsletters keep the transportation community connected to timely information and tips for their leadership success. The overall focus areas of the center are Safety, Infrastructure Management, Workforce Development and Organization Excellence.

P.I: Donna M. Shea donna.shea@uconn.edu

CTDOT SME: Melanie S. Zimyeski Melanie.Zimyeski@ct.gov

Connecticut Advanced Pavement Laboratory (CAP Lab)

. Image source: Connecticut Department of Transportation

The CAP Lab is the premier transportation construction materials research laboratory in New England. The lab has been conducting applied research in cooperation with CTDOT since 1995. The CAP Lab has been involved with implementation of advanced pavement technologies including SUPERPAVE, Warm-Mix Additives, Thermal Imaging, and Notched Wedge Longitudinal joints.

On-going research through SPR-2305 includes analysis of long-term field conditions with laboratory performance testing as part of an effort to bring CTDOT to the forefront of Balanced Mix Design. Additional efforts include validation of new performance test methods, implementation of high-performance or specialty pavement mixes

Principal Investigator: Jim Mahoney; James.Mahoney@uconn.edu.

CTDOT SME: Melanie S. Zimyeski Melanie.Zimyeski@ct.gov

Repair of Steel Beam/Girder Ends with Ultra High-Strength Concrete – Phase II Part 1: UHPC Push-out Experiments.

Image source: Connecticut Department of Transportation,

An innovative repair technique for severely corroded steel beam ends was assessed for its structural integrity, constructability, and longevity.This method offers design flexibility to enhance the structural performance and load-bearing capacity of aging steel bridges. The repair's effectiveness relies on the load transfer from ultra-high performance concrete (UHPC) cast onto the damaged element.

Push-off tests evaluated the load-bearing capabilities of shear studs embedded in UHPC, leading to design refinements and installation best practices.The successful use of this repair method in a couple of real-world construction projects highlights its practicality and effectiveness. This real-world application underscores the method's potential for broader adoption in similar projects.

PI: Arash Zaghi, PhD, PE, SE & Kay Wille, PhD; arash.esmaili_zaghi@uconn.edu

CTDOT SME: Bao K. Chuong, Bao.Chuong@ct.gov

CONNECTICUT DEPARTMENT OF TRANSPORTATION

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CTDOT Research Highlights Winter 2024

Impacts of CTrail Hartford Line on Real Estate and Urban Economic Development: Phase 1

The Hartford Line, a commuter rail line connecting New Haven, Hartford, CT, and Springfield, MA, is anticipated to impact real estate development. This report focuses on gathering real estate and other urban data for statistical analysis in Phase 2.

The data will be compared to periods before the 2012 funding approval and before the 2018 service initiation. A recommended follow-up study would examine post-2018 data to assess the long-term impact of the Hartford Line on real estate.

Image source: Connecticut Department of Transportation

PI: Jeffrey P. Cohen Jeffrey.Cohen@uconn.edu
CTDOT SME: Elise C. Greenberg, Elise.Greenberg@ct.gov

Impacts of CTfastrak on Real Estate and Urban Economic Development: Phase 2

Impacts of CTfastrak on Real Estate and Urban Economic Development: Phase 2 CTfastrak, a bus rapid transit line in four Central Connecticut municipalities that opened in March 2015, is expected to affect real estate. A Phase 1 study set the baseline as of the start of service.

This Phase 2 study, for the first 5 years of service, includes a comprehensive set of over 500 before/after maps superimposed on aerial photography (e.g., sales prices; assessed values; property tax revenues; vacancies; vacant parcels; rental units; environmental remediation; number of "assisted units"; travel costs; and planned/ proposed development).

A visualization tool compares maps from both phases. A statistical analysis found after controlling for covariates, proximity to CTfastrak significantly correlated with sales price. A recommended Phase 3 study would cover post-March 2020.

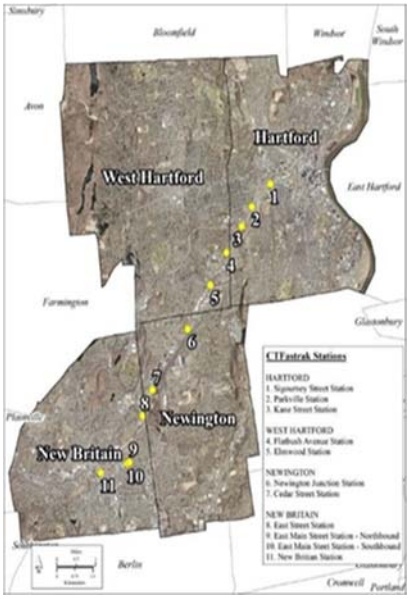

Image source: Connecticut Department of Transportation

PI: Jeffrey P. Cohen
Jeffrey.Cohen@uconn.edu
CTDOT SME: Elise C. Greenberg, Elise.Greenberg@ct.gov

Effectiveness Monitoring of CTDOT Conservation Areas: Pollinator Habitat Survey

CTDOT is protecting pollinator habitat within the right-of-way in designated conservation areas. Pollinator habitat conservation is critical for sustaining pollinators such as native bees and insects facing severe population declines like the monarch butterfly. This project will evaluate how well vegetation management practices in conservation areas are working to provide pollinator habitat resources and food plant resources for the monarch butterfly.

Field surveys will assess nectar plant resources available from spring through late summer & the insect pollinators using these resources. Surveys will quantify the presence of milkweeds and their use by monarch butterflies and caterpillars.

Image source: Connecticut Department of Transportation

PI: Ana Legrand **ana.legrand@uconn.edu**

CTDOT SME: Marilyn R. Gould, Marilyn.Gould@ct.gov

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CTDOT Research Highlights Winter 2024

Safety Evaluation of Alternatives for Installing Pedestrian Signals Under Side Street Green

Image source: Connecticut Department of Transportation

This project evaluated the conversion of intersections operating underside street green pedestrian operation, where pedestrians cross the main road during the side street green phase with no additional indications, to concurrent pedestrian operation, where pedestrians cross the main road during the side street phase with "Walk" and "Don't Walk" indications.

Concurrent operation and exclusive pedestrian phasing were found to reduce the probability of pedestrian-vehicle conflicts by almost 50% compared to side street green operations. Concurrent operation with auxiliary informational signage showed almost 50% higher pedestrian compliance compared with concurrent operation without auxiliary signage or exclusive phasing.

PI: John N. Ivan & Kai Wang john.ivan@uconn.edu
CTDOT SME: Kenneth A. Lussier, Kenneth.Lussier@ct.gov

Proof of Concept Study for the Applicability of 3D Imaging for the Inspection of Dry-Stone Masonry Retaining Walls

This project aims to develop a reliable inspection and monitoring method for stone masonry retaining walls using 3D imaging technologies. The project will generate high-resolution 3D models of masonry walls to document in-situ conditions, providing a baseline for future comparisons and revealing vulnerable areas. Objectives include outlining specifications for the data collection process, advancing an image-based monitoring framework, and quantifying minimum achievable errors in measurements.

Screen Shot of 3D Model

Zoomed in View of Model Showing Point Cloud

PI: Alexandra Hain, PhD, PE; & Arash E. Zaghi, PhD, PE, SE; Alexandra.hain@uconn.edu
CTDOT SME: Sara Ghatee, Sara.Ghatee@ct.gov

Automated Vehicle and Pavement Marking Evaluation in Connecticut

The Connecticut Transportation Institute (CTI) is conducting a study to investigate the effect of pavement marking characteristics on machine vision detection. The study will also examine the performance of advanced driver assistance (ADAS) technologies under different lighting conditions.

The outcomes of this study will help the CTDOT and other infrastructure organizations (IOOs) make informed decisions about the design and maintenance of pavement markings to ensure that they are compatible with ADAS technologies. This will help to improve the safety and efficiency of automated vehicles.

Image source: Connecticut Department of Transportation

PI: Mohammad Razaur Rahman Shaon, Ph.D., mrr.shaon@uconn.edu

CTDOT SME: Peter J. Calcaterra, Peter.Calcaterra@ct.gov

U.S. Department of Transportation
Federal Highway Administration

UCONN
UNIVERSITY OF CONNECTICUT

UNIVERSITY OF HARTFORD

CENTRAL CONNECTICUT STATE UNIVERSITY 1849

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CTDOT Research Highlights Winter 2024

Repair of Steel Beam/Girder Ends with Ultra High-Strength Concrete (Phase III: Implementation &Training)

Image source: Connecticut Department of Transportation

Corrosion damage is a major issue on steel girder bridges, costing billions of dollars annually. A multi-phase research project at the University of Connecticut has investigated a repair method using ultra high-performance concrete (UHPC) encasement as an alternative solution to reduce labor and costs.

Phase III aims to transition the technology from the lab to practice by simplifying designs, conducting field monitoring of select repairs, and transferring knowledge to CTDOT.

The project was featured in the March/April 2022 Issue of the USDOT Innovator Magazine, and the FHWA EDC-6 Initiative.

PI: Alexandra Hain, PhD, PE; & Arash E. Zaghi, PhD, PE, SE Alexandra.hain@uconn.edu

CTDOT SME: Bao K. Chuong, Bao.Chuong@ct.gov

Implementation and Evaluation of AirAccess Pilot Run in Connecticut

Image source: aira.io

The Connecticut Transportation Institute (CTI) worked with the CTDOT and

Bureau of Education and Services for the Blind (BESB) to provide free access to Aira's virtual visual assistance services for Blind and Low Vision (BLV) individuals across Connecticut. BLV individuals could use the service for navigation, wayfinding, riding public transportation, and completing essential daily tasks. CTI conducted pre- and post-user surveys to understand travel patterns and barriers faced by BLV individuals and evaluated Aira service usage to identify changes in reported mobility. The goal was to make recommendations on how the state may support these services in the future.

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CONNECTICUT DEPARTMENT OF TRANSPORTATION

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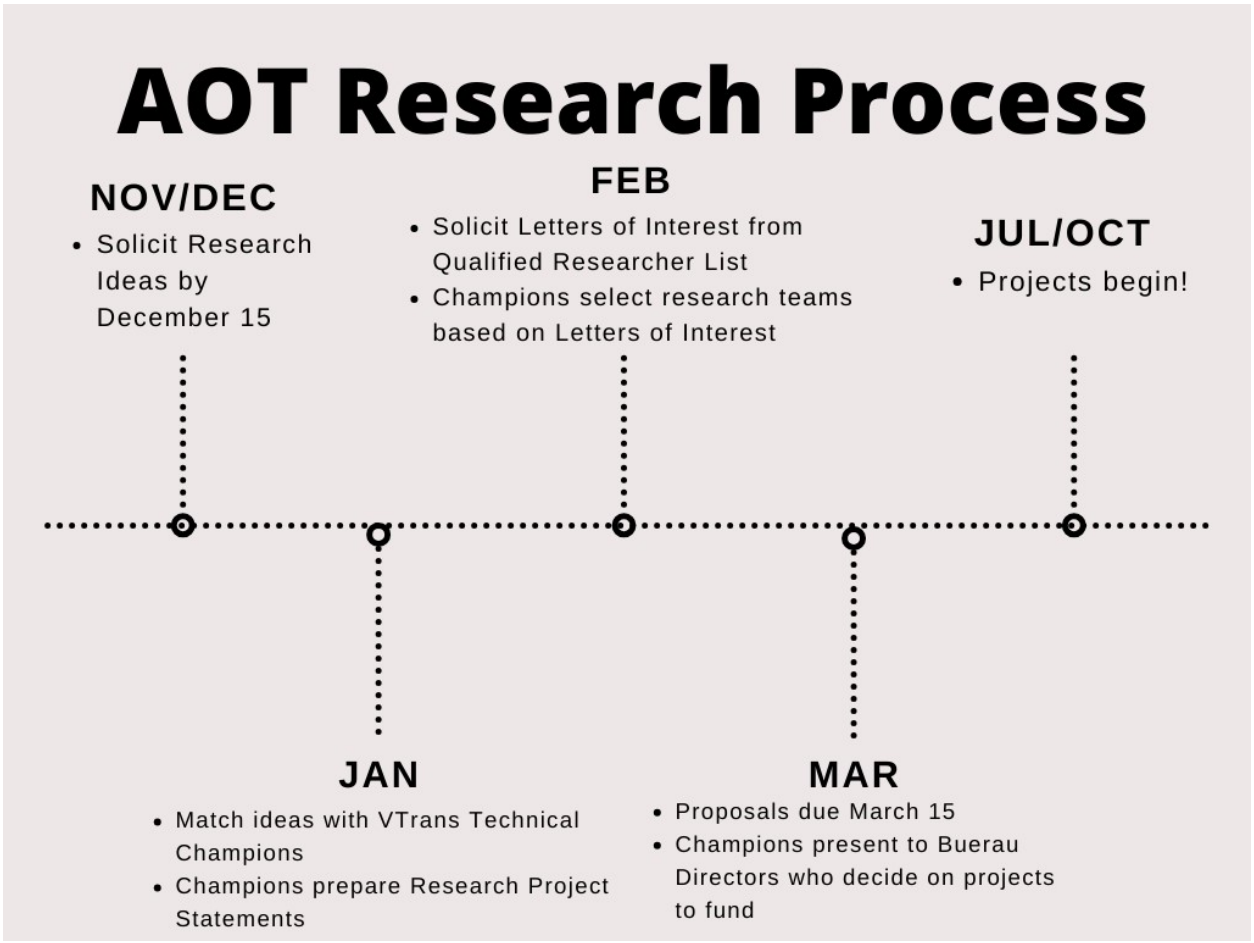

FFY 2023 External Research Process Cycle

40 Research Project Ideas Submitted

11 Ideas Matched to AOT Champions

9 Letters of Interest Received From 8 Organizations on Qualified Researcher List

9 Projects Presented to Decisionmakers

4 Projects Selected

Do You Have a Research Idea?

Will you Champion Your Idea that Fits an AOT Need?

Submit Your Idea!

- Google "VTrans Research Idea Submission"
- Go to… https://vtrans.vermont.gov/planning/research/resources

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November 2023

Engaging with AOT Research

Project Champion

AOT Research uses Project Champions from across the Agency. Research Ideas are matched with an enthusiastic technical Champion. The Champion then develops a Research Problem Statement that is distributed to the Qualified Researcher List, selects the research team based on 2-page Letters of Interest, works with this research team to get a 10-page project proposal they want to advocate for, and then presents project description and benefits in four minutes in front of Bureau Directors and Deputy Division Directors all before the project is selected for funding. After the project is selected, the Champion identifies Technical Advisory Committee members, reviews project deliverables, and implements the project.

Technical Advisory Committee (TAC) Guidance

All VTrans led projects have Technical Advisory Committees. The Technical Advisory Committee (TAC) is made up of

- Technical Champion
- Research Staff
- AOT Staff from different Bureaus and Divisions
- Technical Staff from other Agencies
- Regional Planning Commission staff

The more participation of the TAC members, the more project guidance, and the more implementation potential for the project.

National Cooperative Highway Research Program (NCHRP)

All states vote on 120-150 potential projects a year in Feb/March

AOT has a SharePoint site to provide 0 to 5 votes and technical comments on all potential projects

If you rate a project a 4 or 5 (beneficial to VT) we hope that you will consider sitting on the project panel

NCHRP NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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