Michigan Department of Transportation
Research Advisory Committee Region 3 Peer Exchange

October 13-15, 2020

Final Report
January 2021

Host Organization
Research Administration, Bureau of Field Services, Michigan Department of Transportation

Participating Guest Organizations
Iowa Department of Transportation
Illinois Department of Transportation
Indiana Department of Transportation
Kansas Department of Transportation
Minnesota Department of Transportation
Missouri Department of Transportation
Nebraska Department of Transportation
Ohio Department of Transportation
Transportation Research Board
Wisconsin Department of Transportation

Michigan Department of Transportation
RESEARCH
Administration

Report prepared by
CTC & Associates LLC

Contents

Introduction and Overview

The Michigan Department of Transportation (MDOT) hosted a virtual peer exchange meeting on October 13-15, 2020, to discuss topics related to transportation research goals, strategies and processes with other state DOTs. The meeting and the subsequent publication of this report fulfill the agency's obligation to conduct a periodic peer exchange as part of the federal State Planning & Research (SP&R) program (per Title 23, Part 420 of the Code of Federal Regulations).

The meeting also served a second purpose of allowing midwestern state members of the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC)—AASHTO RAC Region 3—to meet annually to explore opportunities for collaboration among research programs.

Representatives from all nine Region 3 state DOT members convened with the Michigan DOT Research Bureau staff to share experiences, lessons learned, and opportunities for collaboration among the group. Combining a regional collaboration meeting with one member's SP&R peer exchange continues to be a successful strategy to meet multiple objectives in a single setting.

The peer exchange theme was "Innovation is the Key to Everything the Future Can Be." The event centered around three main topics:

- Communicating and Tracking Innovations.
- Strategically Entering the Technology Movement.
- Implementation Assistance.

Peer Exchange Participants

The peer exchange brought together representatives from MDOT, nine other state DOTs, Mcity, the American Center for Mobility (ACM) and the Transportation Research Board (TRB). The following individuals participated in the three-day event.

Michigan Department of Transportation

Bureau of Field Services
- Gregg Brunner, Director

Research Administration
- Carol Aldrich, Engineer of Research
- Lisa Branch, Administrative Assistant
- Mary Hoffmeyer, Research Program Specialist
- André Clover, Research Program Manager
- Jennifer Herron, Librarian
- Rebecca Petri, Research Project Analyst
- Faith Rodriguez, Research Program Specialist
- Michael Townley, Supervisor, Research Project Administration Manager

Guest State DOT Research Programs

Illinois Department of Transportation
- Megan Swanson, Technical Research Coordinator

Indiana Department of Transportation
- Tommy Nantung, Research Manager

Iowa Department of Transportation
- Peggi Knight, Director, Research & Analytics Bureau
- Khyle Clute, SPR Research Engineer
- Vanessa Goetz, State Research Program Manager – Iowa Highway Research Board
- Brian Worrel, Research Program Manager, Research & Analytics Bureau

Kansas Department of Transportation
- Dave Meggers, Bureau Chief, Research Bureau
- Sally Mayer, Advanced and Innovative Technology Engineer
- Dan Wadley, Assistant Bureau Chief, Research Bureau

Minnesota Department of Transportation
- Katie Walker, Director of Research & Innovation
- Katie Fleming-Vogl, Research Implementation Manager
- Sheila Hatchell, Library Manager
- Hafiz Munir, Research Strategy Manager

Missouri Department of Transportation
- Jen Harper, Research Administrative Engineer
- Ryan Martin, Research Engineer

Nebraska Department of Transportation
- Mark Fischer, Assistant Materials and Research Engineer

Ohio Department of Transportation

Zona Kahkonen Keppler, Technology Transfer Administrator

Wisconsin Department of Transportation

Diane Gurtner, Research & Library Services Supervisor

Andy Eiter, Research Communications Coordinator

Ethan Severson, National Programs Coordinator

Transportation Research Board

Sid Mohan, Implementation Program Manager

Additional Guests

Mcity

Vaughn Haack, Test Facilities Manager

Victoria Waters, Assistant Director

American Center for Mobility

Mark Chaput, Chief Operating Officer

Kevin Kelly, Technical Sales and Event Manager

Format

Due to travel restrictions related to the novel coronavirus (COVID-19) pandemic, MDOT held the peer exchange as a virtual event over three consecutive days. Staff from MDOT facilitated discussions for three topic sections each day, which included presentations from six participating state DOTs, Mcity, ACM and the TRB.

As noted in the meeting agenda (Appendix B) and MDOT's slide presentation guiding the entire event (Appendix C), each of the three days centered on one of the three main topics:

Day 1. Communicating and Tracking Innovations

Areas of particular interest included how to effectively deploy research results, how to curate knowledge and information through future-facing transportation libraries, and identification of best practices for transferring of technologies.

Day 2. Strategically Entering the Technology Movement

Specific areas explored in this topic included considerations for being part of the leading edge of research and perspectives from Michigan's automated vehicles and mobilities technologies testing facilities.

Day 3. Implementation Assistance

This topic more broadly addressed the common needs of Michigan and the other Region 3 states, addressing a new National Cooperative Highway Research Program (NCHRP) project on Region 3 technology transfer and best practices for state engagement in national pooled funds.

Over the course of each day, prepared presentations given by MDOT and guest participants were followed by group discussion and question-and-answer sessions. From time to time, MDOT also made use of real-time polling using the Mentimeter online platform for targeted questions. In addition, participants broke into smaller discussion groups periodically to address selected topics in greater depth.

Day 3 concluded with a group discussion of each participant's key takeaways from the event, including opportunities and new ideas to explore at their individual agencies and collaboratively in the region.

Peer Exchange Topic 1—Communicating and Tracking Innovations

Participant Presentations

Representatives from several DOTs addressed the following subjects in 10-minute presentations:

- **Effective Deployment of Research Results – Iowa DOT and Indiana DOT**
  Methods for deploying research results, tracking and documenting research results and showcasing innovative platforms (such as websites).
- **Curating Cutting-Edge Knowledge & Innovations Through the Library of the Future – MDOT and Minnesota DOT**
  Knowledge/data management, scholarly publications, Section 508 compliance and knowledge networks.
- **Best Practices for the Transferring of Technologies (TOT) – Wisconsin DOT and Missouri DOT**
  Internal processes for TOT, collecting and selecting ideas to implement, sharing TOT within your DOT and beyond, and what successful TOT looks like for your DOT.

Complete presentation materials are reproduced in the appendices to this report.

Highlighted Observations, Questions and Resources

After each presentation, attendees, presenters and facilitators engaged in discussions with opportunities for questions and answers. Highlighted discussion items related to Topic 1 follow. These include noteworthy features of the presenters' programs and processes, questions about the presentations and follow-up resources for more information. These are grouped by subject and then by common themes. (Note: Formal staff roles and committees at different agencies, such as "Research Manager" and "Executive Committee," are capitalized for clarity.)

Effective Deployment of Research Results

- All participants addressed two questions in a chatbox. Responses follow.
  - *How does your DOT fund implementation?*
    - Mark Fischer (Nebraska) – No specific funding. Comes from operational side.
    - Diane Gurtner (Wisconsin) – We don't have specific research implementation funding.
    - Jen Harper (Missouri) – No funding for research implementation, we look for grants.
    - Zona Kahkonen Keppler (Ohio) – No specific funding.
    - Dave Meggers (Kansas) – Generally tied to project.

        - Tommy Nantung (Indiana) – We have a set aside funding for implementation.
        - Megan Swanson (Illinois) – We can do an implementation pilot project using SPR2, but we do not have a broader funding plan.
        - Katie Walker (Minnesota) – Use some of our state funds and can be funded at any time during the year.... Our research steering committee decides.
        - Brian Worrel (Iowa) – No specific program in place.
    - *How does your DOT determine what to fund for further deployment?*
        - Diane Gurtner (Wisconsin) – WisDOT research program doesn't have funding for this. After the research is completed, implementation is handled on the engineering side of the department.
        - Jen Harper (Missouri) – It is typically up to each Division if they wish to fund an implementation project. Occasionally at a higher level, implementation will be pushed forward.
        - Zona Kahkonen Keppler (Ohio) – Technical Liaison input.
        - Dave Meggers (Kansas) – Determined by Bureau or District. Generally evaluated in benefit-cost.
        - Tommy Nantung (Indiana) – A business owner has to submit a very short business case.
        - Katie Walker (Minnesota) – Request goes to steering committee.
        - Brian Worrel (Iowa) – Based on requests from project TACs, PIs and stakeholders.

- MDOT completes 10 research projects annually and communicates research results beyond the research project team via a two-page Research Spotlight and a distribution strategy. The Research Spotlights are distributed internally through an MDOT newsletter and Yammer (internal state employee communication forum), as well as sent directly to relevant MDOT staff. Externally, Research Spotlights are disseminated through Facebook, Twitter, LinkedIn, YouTube and a Gov Delivery email to specific groups. MDOT will continue to look for other ways to communicate its research results.
    - An example Research Spotlight and distribution strategy presented to the group highlighted MDOTs recent AASHTO Sweet Sixteen award on carbon fiber research.

- MDOT Research Administration (RA) has developed a tiered approach to identify, prioritize and manage successful research. Executives provide the strategic direction for research, and managers and subject-area experts are engaged in the process. RA plans to use the same approach for managing implementation of research findings.

- MDOT will roll out an internal tracking/monitoring process for implementation in 2021. Research Managers will work with Project Managers to draft implementation plans and identify objectives, tasks, outline cost, scope and a schedule for initiating the plan. Plans will be reviewed and approved by the Research Advisory Committee and the Executive Committee before moving forward. Approved implementation projects will get assistance from RA to identify funding sources.
    - The goal is to capture how the implementation of research findings may produce tangible changes to procedures, equipment, design or materials at MDOT, as well as the benefits of implementing research findings (cost savings, reduced labor, increased safety). Implementation results will be communicated in the same manner as research projects.

- Chapter four of the MDOT Research and Implementation Manual addresses implementation.

- Mentimeter real-time participant poll*: Does your DOT have a specialized position for monitoring deployment?*
  - Yes: 4
  - No: 13

- Poll: *In a word, what is needed within a DOT to effectively implement/deploy research findings?*

Figure 1. Word cloud of DOTs' needs to effectively implement/deploy research findings.

- Iowa DOT's Research website has a News and Subscriptions section where Iowa communicates research results through social media, newsletters and a news section. The purpose of these channels is to communicate with the public, stakeholders and news outlets.
  - The news section features short news items, which are distributed to all system users (about 3,000) via an email every two weeks.
  - Iowa DOT recently developed a Research Solutions brief to highlight and disseminate research results. These two-page briefs are flashier with more graphics and present the point of view of the DOT, for a less academic summary of the projects.

- Iowa DOT has a new website platform that allows the agency to track a research project from idea to completion and final report. This site is the central hub for all research ideas and projects. Each project has its own unique web address. Iowa DOT uses this platform to engage stakeholders and the public.
  - Using a link, registered users submit a basic research idea. The Iowa DOT Research staff help the idea grow into a project. So far, 115 ideas have been submitted since the site launched in July 2020. All users can see all submitted ideas, which can be filtered to specific topics.
  - When an idea is in the open feedback stage, users can upvote or downvote it and can also add comments about it. Users can comment back and forth with each other, which can start a conversation about an idea. Users receive an email and a notification through the system that advises when someone is communicating with them.

    - For completed projects, all of the original submission information is available. Details of the project are also available including project dates, funding, researcher information, Technical Advisory Committee (TAC) members, project results, key findings, and a link to the final report. When a TAC member logs into the system, they can see all of the projects they are on.

- Indiana DOT's Research Program has three primary responsibilities:
    - Conduct, oversee, implement and partner in effective research.
    - Conduct and oversee specialized testing programs.
    - Assist in technology development.
- Indiana DOT Research Managers and Focus Group Leaders (there are seven focus groups) formulate the research program and needs for the department with an emphasis on implementation planning early on in the development of research project proposals. Business owners, staff, faculty and industry members propose the research ideas and the business owners are responsible for project deliverables and implementation, which includes developing and executing the implementation plan.
- Indiana DOT emphasizes demonstrating implementation, return on investment and the impact of a project. The agency must show the implementation benefits to the executive staff, district staff and engineers to get them on board with the projects. The Research staff put on showcases to the districts and Central Office to demonstrate the impact of research projects.
- The goal of the Indiana DOT Research Office is to implement all research projects. Even those projects which don't show a high benefit-cost ratio impact may have other types of impact on the department, such as qualitative results.
- Indiana DOT staff feel that communication and dissemination of research results, and showing the impacts to the department, are key. They use several methods of communication including technical reports, posters, pocket portfolios, social media, newsletters, and video abstracts. Each February, the Research staff puts on a poster session featuring recently completed or soon-to-be-completed projects to show potential implementers the impacts and benefits to the department
- Indiana DOT monitors all 868 of their implementation projects through SmartSheet, a spreadsheet available to executive staff, so that all can see the impacts of implementation. New research projects are added to the spreadsheet as they are finishing up. Two Research Managers and the Program Director are responsible for updating the spreadsheet.

Curating Cutting-Edge Knowledge & Innovations Through the Library of the Future

- Mentimeter real-time participant poll: *Does your organization have a library?*
  - Yes: 10
  - No: 3
- Poll: *If your organization has a library, do you use the library?*
  - Yes: 13
- Poll: *What is one word/phrase you would use to describe a library?*

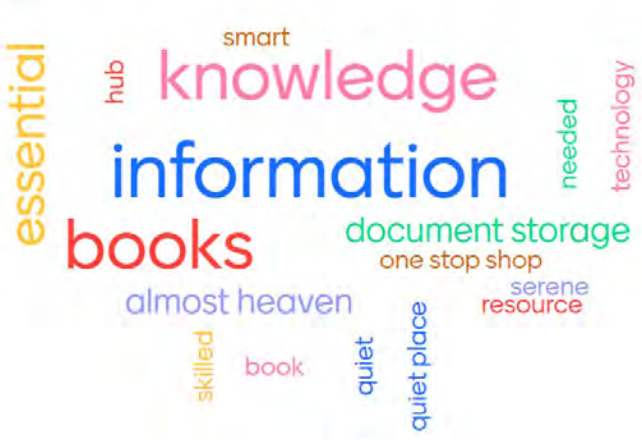


Figure 2. Word cloud of descriptors for libraries.

- Libraries are changing. Rather than just being a place a customer visits, libraries go where they are needed, such as with the use of embedded librarians. Libraries link resources and communities and form a knowledge network to enable a higher level of service to all communities.
- Libraries focus on sharing information, and not just books and periodicals. Libraries democratize access, which allows everyone to access information resources that they might not be able to obtain on their own.
- MDOT's Library Services provides expert-level information searching, management, preservation, organization, publishing, and lending and borrowing.
- Minnesota DOT provides value-added library services, which include Current Awareness, Community Profiles, AASHTO digital publications, ASTM DOT Compass Portal, Professional Engineer (P.E.) exam materials, fostering relationships and services for Research staff.
  - Current Awareness services include periodical routing to keep staff up-to-date in their fields and alert services to provide staff with only the information they want.
  - Community Profiles are a popular new service that include businesses, residences, demographics or any combination of this data. Outreach to the public includes upcoming transportation projects that will disrupt neighborhoods and travel patterns.

  - The Library has an Intranet page, which shows the 42 AASHTO digital publications that are available to Minnesota DOT staff with the use of a plug-in.
  - The Library secured funding to implement the ASTM DOT Compass Portal.
  - The Library provides the materials for the P.E. exam, which staff need to pass in order to work as Minnesota DOT engineers. The materials are print-only and the Library has 10 sets for the P.E. Civil Transportation exam, as well as materials for the additional P.E. exams. These materials are the Library's most-used print resource.
  - The Minnesota Transportation Libraries Program is a partnership between Minnesota cities and counties (via the Minnesota Local Road Research Board), the University of Minnesota (Center for Transportation Studies) and the Minnesota DOT Library.
  - The Minnesota DOT Library provides services to the Office of Research and Innovation staff such as assisting with literature searches, updating TRB's Research in Progress database, cataloging final reports, promoting final reports via the New Library Materials monthly newsletters and preserving final reports in the University of Minnesota digital repository.
- Wisconsin DOT has a virtual library, which was precipitated by a move to a new building. Library staff are currently working to digitize the Wisconsin-related materials kept after the move. AASHTO publications are on the Wisconsin DOT Intranet site. The staff have to plan for the materials they will keep or digitize.
- Ohio DOT has not had a physical library for the last seven years or so. When the library went away, most of the materials were discarded. One librarian was kept on staff and is part of the Research office. She markets her skills rather than emphasizing her job description of librarian, and she is busier than ever. She partners with the State Library of Ohio.
- The U.S. Department of Transportation library no longer exists, and the library sent all state-related materials back to the individual states. Attendees are unsure what happened to materials that were not state-specific.
- Explaining the value of a state DOT library to non-library users is a challenge. Minnesota DOT is working on a marketing plan to spread the word about its library. Wisconsin DOT has presented to some departments about available library services. The agency also created a short video posted on the Internet about library services to let staff know they are still available.

Best Practices for the Transferring of Technologies

- Mentimeter real-time participant poll: *Which is the best platform for transferring technologies at your DOT?*

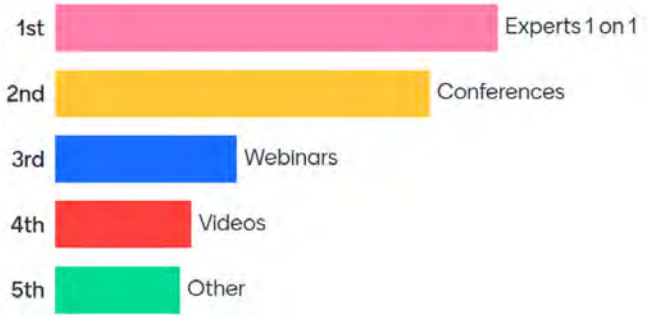


Figure 3. Ranking of platforms for transfer of technologies.

- Poll: *Do you consider different methods for TOT for different generations of employees?*
  - Yes: 3
  - No: 10
- Wisconsin DOT develops research ideas and projects through oversight and advisory committees facilitated by the Research and Library (R&L) Services Unit.
- Wisconsin DOT R&L supports implementation of innovation and the development of research ideas through information requests (literature searches and synthesis reports) and peer exchanges. Each year, 20 to 35 literatures searches and five to 10 synthesis reports are completed. Five to 10 research projects close each year.
- Wisconsin DOT uses a communication plan to facilitate technology transfer through a framework for communicating research findings and value to transportation policymakers and stakeholders.
  - The two-page communication plan lays out its purpose and its five components: objectives, strategies to support objectives, target audiences, messages and assessments.
  - The three major themes of their specific, targeted messaging are: research is valuable, Wisconsin DOT does good research, and the research program is essential to Wisconsin DOT's research efforts.
  - The communication plan targets specific audiences, which include staff, other transportation agencies, transportation industry stakeholders, transportation system users and taxpayers.
  - Current Wisconsin DOT R&L communication strategies include posting updates and opportunities to the agency bulletin, publishing a research annual report, sending periodic email blast updates and participating in AASHTO's High Value Research contest.

- Potential Wisconsin DOT R&L communication strategies include preparing a PowerPoint deck for the Secretary's Office speaking events, promoting R&L services at new-hire orientations and surveying staff and past customers.
- Wisconsin DOT uses a tactical planner to outline the implementation and assessment plan for prioritized R&L communication strategies. The planner incorporates the five key components of the communication plan and outlines a timeline to keep the project on track. For example, a tactical planner aided in executing and measuring the success of the WisDOT Research & Library Services video.
- Wisconsin DOT R&L utilizes metrics for assessing the effectiveness of its communication plans. These metrics include analytics and trends, awards and recognition, and surveys and feedback.
- Wisconsin DOT's goals for successful TOT include designing projects with applicable results, effectively and efficiently communicating results, applying research findings to promote data-driven decisions and determining metrices for gauging success.

- Wisconsin DOT is working to develop an implementation plan to get research results implemented quickly and to track progress.
- Internal Processes for Transfer of Technology
  - Iowa DOT uses many of the print and digital examples other states mentioned. Its next step may be an event, similar to those held in Missouri and Ohio, focused on implementation and innovations coming out of research. Iowa would be looking to include boots-on-the-ground staff, as well as staff from local agencies and industry.
  - Indiana DOT has a separate Innovation Office, so innovations that are not coming from the Research Division are handled by the INDOT Innovation Office. The Research Division and the Office of Innovations have formal communications for technology transfer of Every Day Counts, the State Transportation Innovation Council, etc.
  - MDOT recently began creating videos to showcase research project results and implementation efforts. The video featuring a remote-control boat for monitoring bridge scour is an example. The typical number of consultant hours to develop, produce and deliver a video is approximately 71.5 hours, plus time for the development and format for the initial video.
- Missouri DOT holds an Innovations Challenge, which initially focused on tool and equipment best practices but has been expanded to include project and productivity best practices. Winners are selected at the district or central office level before moving to the statewide challenge where cash prizes are awarded to individuals and funds are added to winning districts' budgets. Sixty local innovations are chosen to attend the Innovations Challenge Showcase, held in Springfield each year.

- The Innovations Challenge provides an opportunity for employees to periodically share innovations in three categories and receive prizes and recognition for their ideas. The bragging rights for winning an innovation prize seem to be a bigger motivation than the money, especially for the younger professionals.
- There are seven to 10 winners per category at the local levels and up to four statewide winners per category. There are also overall Director's Awards and a Dickson People's Choice Award.
- The Innovations Challenge, usually held in April, was cancelled for 2020 due to the COVID-19 pandemic. Local challenges started in fall 2020. The statewide competition remains to be finalized.

Peer Exchange Topic 2—Strategically Entering the Technology Movement

Participant Presentations

Representatives from MDOT, Mcity and the American Center for Mobility addressed the following topics during facilitated discussions and presentations:

- **When to Start or Ride the Research Wave – MDOT**
  Finding the balance between pushing technology or waiting for technology to develop, examples of states leading a new research topic and why a state chooses to be a leader.
- **Michigan's Automated Vehicle and Mobility Technologies Testing Facilities – Mcity and ACM**
  Overview of test facilities of each organization. Attendees were given a virtual tour of each facility.

Complete presentation materials are reproduced in the appendices to this report.

Highlighted Observations, Questions and Resources

After each presentation, attendees, presenters and facilitators engaged in discussions with opportunities for questions and answers. Highlighted discussion items related to Topic 2 follow. These include noteworthy features of the presenters' programs and processes, questions about the presentations and follow-up resources for more information. These are grouped by subject and then by common themes.

When to Start or Ride the Research Wave

- Mentimeter real-time participant poll: *What research subject areas does your state DOT lead or succeed in?*

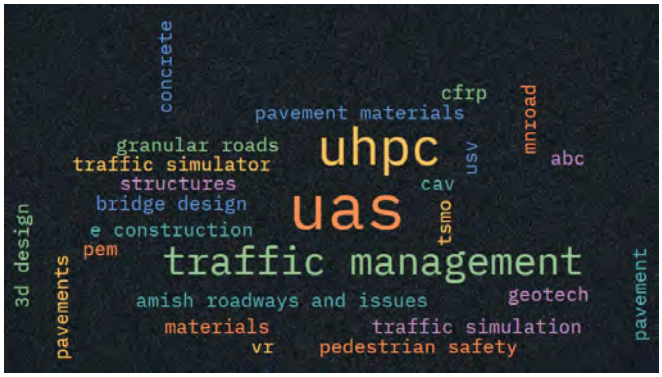


Figure 4. Word cloud on leading subject areas by state.

- How do people adopt new things? A discussion of the book *Diffusion of Innovations* by Everett Rogers.
    - The tipping point in the adoption process is the chasm. The point between the "early adopters" and the "early majority." When energy is focused here, adoption of innovations moves faster.
    - How many states would need to adopt a new innovation to get across the chasm point? 16% of the states = eight states. Once the ninth state adopts, there is acceptance (into the early majority" section). If all states in Region 3 adopted an innovation, then we would be past the tipping point. As a group, Region 3 has a lot of influence. The group can start a wave of innovation and adoption.
- *Breakout Group Discussion* – Leading a new research wave as an innovator or early adopter, finding the balance between being an early adopter or part of the majority and why your state choses to be a leader.
    - <u>Group A – Ohio, Illinois, Minnesota and Nebraska</u>
        - The Every Day Counts program helps move some of the innovations along to get to a wider audience.
        - Electric vehicles are impacting the combustion vehicle marketplace right now.
        - Examples of using innovations in Minnesota include using unmanned aerial vehicles for bridge inspections, using the inspection explorer vehicle that other states have adopted and adopting accelerated bridge construction that most states have a program in place for now.
        - Other examples of innovation include using carbon fiber in bridges and recycled asphalt using rejuvenators and antioxidants.
        - Some states choose to be innovation leaders through grassroots efforts, while others are led by their department administration.
    - <u>Group B – Indiana, Iowa and Kansas</u>
        - Kansas DOT was an early adopter of the air void analyzer. A problem prompted the agency to look at new technology and adopt it. Kansas DOT is already looking for the next solution.
        - Iowa DOT uses Ultra-High Performance Concrete (UHPC). This started at the county engineer level where there are a few early adopters who will try new things. This proved the concept for the DOT technical staff, who then used UHPC on bigger projects. This has led to many firsts in the nation related to UHPC. It is now part of the Every Day Counts initiative.
    - <u>Group C – Missouri, Michigan and Wisconsin</u>
        - For the different states, choosing to be an innovation leader depends on necessity.
        - For one state, innovation was necessary due to funding. They had to make do with what they had.

        - Another state takes risks and accepts failure within reason. Practical design initiative within the DOT is an example of innovating and not only following standards.
        - How a DOT chooses to be a leader depends on the strengths of the DOT. The department leadership helps drive the innovation.

Michigan's Automated Vehicle and Mobility Technologies Testing Facilities – Mcity and ACM

- Mcity – Presentation by Victoria Waters and Vaughn Haack.
    - Mcity is a research center and 30-acre test facility within the University of Michigan. It opened in 2015 to test automated vehicles.
    - It works on a consortium model comprised of 59 transportation industry members. All members have access to research results and data, and receive preferred rates for using the facility and attending annual events.
    - There are different levels of membership. The leadership members set the research direction and decide which projects will receive funding.
    - Innovations that have come out of Mcity:
        - The test facility is its own separate financial operation. It is a turnkey facility, so when a company rents it out, they have complete control of it. Mcity employees are not on site because the companies are trying to keep their work confidential. Mcity won't divulge who rents out the test facility.
        - Mcity itself is doing a lot with augmented reality. They have developed OCTANE, a software interface that allows for full automated control of the test facility infrastructure from a phone, laptop or vehicle computing platform.
        - Mcity uses the "ABC" test, which is a methodology in which to validate an AV system to make it safe enough to be on the road. A = Augmented reality, B = Behavior competencies within a closed test facility, and C = Vehicle being able to master corner scenarios. Mcity's contribution is this testing methodology.
        - Mcity engages in pre-competitive research. Competitive research is left to the companies.
- American Center for Mobility – Presentation by Kevin Kelly and Mark Chaput.
    - ACM is a collaborative effort comprised of transportation industry partners focused on accelerating the mobility industry through research, testing, standards development and educational programming. It is a Smart City Test Center on 500 acres of variable road systems and customizable test environments. ACM also has an event center that will accommodate meetings and conferences.
    - ACM is focused on later-stage research and is getting into product development and validation of systems that are being developed on vehicles.
    - The initial intent of ACM was to support connected automated vehicles research and testing, but it is looking to branch out to other areas in mobility solutions, such as product launches and customer training.

- The legislative environment in Michigan related to automated vehicles is progressive when it comes to testing. The Secretary of State approves a special application in order for a company to test AVs on the roads. Safety drivers are required to be in the car. Mcity feels that on-road testing is the last step in testing, which begins with simulation, hybrid simulation and closed course testing prior to going out on the roads.
- Region 3 participants expressed a high interest in looking into the possibility for a future pooled fund study with MDOT where the Mcity and/or ACM facilities could be utilized to address research needs of a shared interest among the pooled fund members.

Peer Exchange Topic 3—Implementation Assistance

Participant Presentations

Representatives from Iowa DOT, TRB, Wisconsin DOT and MDOT addressed the following topics during facilitated discussions and presentations:

- **Review of NCHRP 20-44(28) RAC Region 3 Technology Transfer Project – TRB and Wisconsin DOT**
  Region 3's selection process for projects to be targeted for technology transfer, using the project's materials for maximum effect, engaging state's subject matter experts (SMEs) in projects' deliverables, and additional steps after NCHRP 20-44(28) is complete.
- **State Engagement in Pooled Fund Projects – MDOT**
  Communicating about pooled fund project opportunities within your DOT, communicating pooled fund project results within your DOT, renewing or extending pooled fund projects, and capturing the pooled fund project's benefits within your agency.

Complete presentation materials are reproduced in the appendices to this report.

Highlighted Observations, Questions and Resources

After each presentation, attendees, presenters and facilitators engaged in discussions with opportunities for questions and answers. Highlighted discussion items related to Topic 3 follow. These include noteworthy features of the presenters' programs and processes, questions about the presentations and follow-up resources for more information. These are grouped by subject and then by common themes.

Review of NCHRP 20-44(28) RAC Region 3 Technology Transfer Project - Development of a Technology Transfer Plan for State Departments of Transportation Research Programs

- Brian Worrel applied for funding for this project through the NCHRP Implementation Support Program (20-44). The idea for this project came out of the 2019 Region 3 peer exchange where members discussed piloting a project to determine research projects that are of regional interest and how to spread them far and wide within the region.

- A researcher has been selected and contracting is in the final stages. The project tasks include:
    - Create dissemination strategies for selected research projects that are of regional importance.
    - Develop one or two short videos on selected research projects. The videos will highlight the benefit of the projects to the states who completed them and to other transportation agencies.
    - Hold one or two webinars, which would provide more information than the videos, on the selected research projects. The project research teams and the originating DOTs will provide details on projects.
    - Host targeted technology transfer visits, a focused meeting between the project research team and a DOT interested in implementing the project at their state. This will be a deep-dive into the project and its potential implementation.
    - Develop a technology transfer plan for others to use the above process to promote research projects and their transfer to additional states. Region 3 is looking at making this a program of technology transfer for research projects that are of interest to the region as a whole. This could possibly turn into a pooled fund where states would contribute funds to put research projects through the program each year.
- How Region 3 will select projects to target for technology transfer:
        - The members decided that using the AASHTO High Value Research projects submitted by the Region 3 members is a good starting point for the selection process. The project panel will work with the investigators to come up with voting criteria for the Region 3 members to consider prior to selecting the research projects for the technology transfer process.
        - Things to consider:
            - Each state should consult with its SMEs to determine the potential value of the projects to their state.
            - Members should keep in mind that some projects will lend themselves better to some technology transfer methods (videos, webinar) than others.
            - Selected projects may not necessarily be high-value research Sweet Sixteen winners.
            - It may be difficult to find projects that would be implementable at each state. Members should select research projects that would benefit as many states as possible.
            - Region 3 will set up a system for the future selection of projects for this technology transfer process.
    - This project is for startup costs only for this technology transfer process. Region 3 would have to start a pooled fund program (for Region 3 only or open to additional states) to continue funding the effort.

- This project will be a standing topic at Region 3 meetings going forward.

State Engagement in Pooled Fund Projects

- Mentimeter real-time participant poll: *On average, how many new pooled fund projects does your state add to its annual research program each year?*
  - None - 0 respondents.
  - 1 to 2 - 3 respondents.
  - 3 to 4 - 3 respondents.
  - 5 or greater - 5 respondents.
- Poll: *What is your state's range of annual pledge contribution amounts per pooled fund project?*
  - Less than $5,000 - 0 respondents.
  - $5,001 to $25,000 - 2 respondents.
  - $25,000 to $150,000 - 9 respondents.
  - $150,001 or greater - 0 respondents.
- In 2005 MDOT was the lead agency for one pooled fund study and a partner state on just a few others. Around that time, MDOT's leadership challenged the Research office to seek more opportunities to increase leveraging of the SPR Part B federal funds with other state DOTs. Increased participation in pooled funds was a way to do this. The approach provided more opportunities for MDOT SMEs to engage with their counterparts while relieving the strain on limited travel funds. MDOT now leads several pooled fund studies and is a partner in more than 20 studies.
- Participants detailed funds spent on pooled fund projects and the number of pooled studies they lead or participate in:
  - MDOT – 46% of funds spent on federally funded projects which include TRB, NCHRP and AASHTO contributions. MDOT leads two pooled fund projects and partners in 32 additional pooled fund studies.
  - Iowa DOT – Pooled funds make up approximately 50% of its SP&R program. Iowa leads 25 pooled fund projects and partners in 40 additional pooled fund studies.
  - Indiana DOT – Pooled fund budget is $425,000 per year. Indiana leads four pooled fund projects and partners in 10 additional pooled fund studies.
  - Minnesota DOT – Minnesota leads two pooled fund projects and partners in 30 additional pooled fund studies. For every dollar spent on a pooled fund, the agency gets $10 back in benefit.
  - Kansas DOT – Spends $1 million per year on pooled fund studies.

- Participants discussed personnel resources dedicated to pooled funds:
    - MDOT — The Research Program Manager is the sole person dedicated to pooled funds, but the entire research team helps with tracking finances and program administration. The Research Program Specialist helps with communication to the SMEs about pooled fund opportunities.
    - Indiana DOT – Only the Research Director.
    - Wisconsin DOT – Only the National Programs Coordinator.
    - Iowa DOT – Only the SPR Research Engineer with help from a financial person.
- Participants discussed how they spread the word of upcoming or existing pooled fund projects within their DOTs:
    - MDOT – Research Administration sends an email each month to SMEs about current solicitations to determine their interest. Then it goes through a committee structure to get approval from bureau heads and executives. Research Administration looks at possible budgetary and staff constraints to make sure there is enough money and MDOT staff to participate in the pooled funds.
    - Minnesota DOT – Research sends pooled fund solicitations to the appropriate SMEs. If an SME determines that the pooled fund is a good fit, they reach out to Research and collaborate on available resources. The SME prepares a two- to three-page brief, along with a letter, that goes to the Director of the Office of Research and Innovation. The project is discussed at a Research Committee meeting, where a decision is made. Generally, if it is a priority for the office and the resources are available, then the study is funded.
    - Indiana DOT – If a staff person wants to be involved in a pooled fund study, they need to get a signature from two directors. The directors reach out to the Research office to join the study and provide the funding.
    - Iowa DOT – When an SME requests that Iowa lead a pooled fund study, Iowa leverages its connection with their AASHTO and TRB committees to get the early word out. The committee members are aware of the study so when the solicitation is posted, several states are already familiar with it. Iowa DOT doesn't do additional activities around solicitations; word gets around the department about studies because Iowa is involved in 65 of them. Pooled fund opportunities can also be entered into Iowa's normal research solicitation process, via its website.
    - Kansas DOT – Research sends solicitations to the appropriate bureau. If the bureau wants to be involved, Research joins the study. Sometimes staff will approach Research to be involved in a study.
- Participants discussed dissemination of research results of pooled fund projects:
    - MDOT – A few years back, working with a consultant, MDOT created a newsletter about innovations through pooled fund partnerships with other states. This format is good for leadership to use and for presentations to the legislature.

- Indiana DOT – Indiana's pooled fund TAC member (business owner) is responsible for spreading the word about study results. The Research office writes a report every year for the executive staff. The information on pooled funds studies comes from the TAC members who complete a form.
- MDOT – Pooled fund TAC members (SMEs) fill out a form every year to express the benefits of the studies and how the results are incorporated into daily operations. It is difficult for the TAC members to fill out the form because of time constraints, which makes it hard to disseminate the pooled fund benefits to the department. MDOT wants to quantify pooled benefits and formally communicate them, which it will explore this year.
- Minnesota DOT – All completed research projects, including pooled fund projects, get a two-page technical summary. Minnesota uses targeted communications through blogs, social media, newsletters, targeted videos and webinars to disseminate results to the appropriate audiences. It works with the TAC members (SMEs) to use implementation dollars to develop technology transfer products, pilots, or demonstrations. For pooled fund studies led by Minnesota, the process is similar but broader. Individual offices may have their own way to communicate study results using their own innovation dollars. Research and Innovation has an innovation newsletter and will highlight pooled fund studies there.

Summary—Participant Takeaways

Participants discussed top takeaways from the event. These include information and opportunities learned during presentations, follow-up discussions and breakout sessions. Takeaways are grouped by participating agency.

MDOT

- MDOT was interested in communications strategies that Region 3 members employ – how Region 3 members spread the word to the proper audiences, and in a context and form that will be well received and appreciated.
- Podcasting research results may be easier to digest than reading a report. Younger staff may appreciate this more.
- Wisconsin DOT's communication plans target specific audiences: staff, other transportation agencies, transportation industry stakeholders, transportation system user and taxpayers.
- MDOT could follow the system used by Wisconsin DOT by promoting three messages: research is valuable, the library is valuable and MDOT is innovative. These messages could be woven into the communications MDOT puts out on research projects, such as MDOT's Monday Memos newsletter.
- Iowa DOT's new web platform gives the ability for users to comment on research ideas. Also, the website gets research program news and updates in front of a lot of people.
- MDOT was impressed with the information shared about NCHRP Project 20-44(28) on Implementation of a Region 3 Technology Transfer Program.

- There is interest in exploring an opportunity for MDOT and Region 3 member states to draft a problem statement for a Connected Automated Vehicle (CAV) pooled fund study, utilizing ACM and/or Mcity test facilities in the future.

Indiana DOT

- Region 3 is unique among the AASHTO RAC regions. The members communicate very well with each other.
- Region 3 members have a similar structure as to how they administer their research programs and projects, but each has a little different flavor.
- It is important to show the benefits and the return on investment of research and implementation projects.
- Explore Missouri DOT's Innovation Challenge. Indiana DOT's Innovation Office provides funds for innovations on a case-by-case basis, but a strong case must be made. Missouri DOT has a good approach.
- Indiana DOT is looking at what Mcity may offer related to CAVs.
- Indiana DOT learned a great deal from Kansas DOT's research program administration, whose research program shares many similarities with Indiana's.
- Indiana DOT also learned about pooled fund program administration from other state DOTs in Region 3.

Iowa DOT

- Iowa wants to see how it can address the "riding the research wave" concept. How can that lead to interaction with current SMEs, as well as the next generation of SMEs?
    - Identify early adopters and get them involved and engaged with research.
    - Newly involved individuals could form connections and networks with each other, within the state, regionally and nationally.
- How can Iowa recruit new staff into research activities? There are opportunities for Iowa to showcase what research can do for the bureaus and also to new hires. It is important to get to new hires early on when they join the department and have good energy, enthusiasm and ideas, and to encourage new hires to submit research ideas and be involved with research projects.
    - MDOT has added young people to all of their research panels to build the group of people who are aware of research within the department.
- Have research projects lead to more than a final report.
- Make an implementation plan a deliverable for all research projects, as MDOT is doing.
- Engage in further conversation with the Region 3 members on a potential CAV pooled fund.
- Look into all digital/remote library services, since Iowa DOT no longer has a library.

- Regarding NCHRP Project 20-44(28): Implementation of a Region 3 Technology Transfer Program:
    - Have a formalized framework for project implementation, not just within the region, but also so Iowa can use it as a template to track their own projects once they are done with the research phase.
    - Think through the process for the RAC Region 3 Technology Transfer program.
    - Finding a project that will be relevant to all Region 3 member states for this project may be a barrier.

Kansas DOT

- Kansas DOT would like to have a website similar to Iowa's, where users can add research ideas at any time. Kansas currently collects research ideas at the beginning of the year, but ideas may be forgotten. Having the ability to collect ideas at any time of the year would be helpful.
- Kansas DOT doesn't track its involvement in pooled fund projects as well as it could. The subject-related bureaus manage Kansas' involvement in pooled funds, so the Research Bureau doesn't know what is happening with them. The Research Bureau pays for the pooled fund membership and ensures the final report is distributed. The Research Bureau would like to begin tracking implementation of pooled fund projects and eventually do benefit-cost analyses on pooled funds.
- Kansas would like to investigate using good ideas among the Transfer of Technology initiatives: newsletters, blogs, videos, and others. The various Region 3 transfer of technology initiatives should be shared with the rest of the country.
- The online format for this peer exchange is a good way to get feedback from people quickly. A suggestion is to continue with virtual meetings between in-person peer exchanges.

Minnesota DOT

- Implement research results faster. Cut down on the lag time between the completion of a research project and an implementation project. There can be a year or more gap, and staff lose motivation.
- Communication planning – Minnesota DOT is starting to put a communication plan into every research project. How to put research project information into a digestible format and how to get it out to people in a way they want to get the message. Testing out new communications techniques (podcast, video, etc.). Sharing with each other about how these new techniques work for folks and how successful they are.
- Minnesota was interested in Missouri DOT's information on innovation implementation and sharing.
- Minnesota DOT would like to replicate Missouri's Innovation Challenge and Research Implementation Showcase. They would like to have a day dedicated to research to showcase their work to staff.
- Minnesota called out MDOT's EMILY project on bridge scour inspection.

- Minnesota DOT does not have a testing facility like Mcity where a full spectrum of CAV scenarios can be tested. They will share Mcity's information with Minnesota DOT's CAV-X office. Perhaps Minnesota can circle back with Michigan DOT to collaborate or the Region 3 members could start a pooled fund.
- The discussion of NCHRP Project 20-44(28) Implementation of a Region 3 Technology Transfer Program showed there is value for Region 3 and beyond.
- MDOT did a good job of keeping participants engaged during this virtual peer exchange. The breakout sessions were valuable in allowing participants to informally chat and learn how others view the different peer exchange topics.

Missouri DOT

- Iowa DOT's web platform may be too pricey for Missouri DOT, but the cradle-to-grave capture of a research project, as well as the ability for folks to comment on research ideas, is beneficial.
- In light of Wisconsin DOT's communication plan, Missouri DOT does not do as good a job as it could communicating about research to the department; it would like to improve in this area.
- MDOT's draft plan for how it guides a project through implementation was helpful to Missouri, which struggles with this and would like to learn more.

Ohio DOT

- This was the Ohio DOT participant's first research program peer exchange. She noted: "I enjoyed hearing about Region 3 research programs, and learned so much. I work mostly independently, and it was interesting to contrast other programs to ODOT's. I also learned about pooled fund participation, structure and administration."
- The area on Iowa DOT Research Office's website where users can add research ideas at any time is interesting. Having the ability to collect ideas throughout the year might bring in a wider variety of ideas, provide insight into common problems, and help to establish partnerships.
- The level of planning that other states put toward the communication of research projects is impressive.

Wisconsin DOT

- It is important to formalize implementation plans.
- Engineers at Wisconsin DOT sit on the research advisory and oversight committees, but there is no formal connection with their areas. It would be helpful for the Research program to identify the business owner for a research project from the beginning, as Indiana DOT does.
- Streamline notifying the department of new pooled fund solicitations to a monthly or quarterly basis to make it easier to track.

Appendices

Appendix A. List of Acronyms

Appendix B. Peer Exchange Meeting Agenda

Appendix C. Peer Exchange Meeting Slides

Appendix D. Indiana DOT Presentation

Appendix E. Michigan DOT Presentation on Libraries

Appendix F. Minnesota DOT Presentation

Appendix G. Wisconsin DOT Presentation

Appendix H. Missouri DOT Presentation

Appendix I. American Center for Mobility Presentation

Appendix A. List of Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ACM	American Center for Mobility
CAV	Connected Automated Vehicles
COVID-19	Coronavirus Disease 2019
DOT	Department of Transportation
MDOT	Michigan Department of Transportation
P.E.	Professional Engineer
R&L	Research and Library (Wisconsin)
RA	Research Administration (Michigan)
RAC	Research Advisory Committee (AASHTO)
SP&R	State Planning & Research
TOT	Transferring of Technologies
TRB	Transportation Research Board
UHPC	Ultra-High Performance Concrete

Appendix B.

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAC REGION 3 PEER EXCHANGE
October 13-15, 2020 (8:30-12:00pm EST each day)

Innovation is the Key to Everything the Future Can Be

AGENDA

DAY 1 - TUESDAY, OCTOBER 13 **Communicating & Tracking Innovations**

8:30-9:00am	**Optional** - Welcome & Networking Opportunity – Bring a picture and explain why it is your favorite. • *Not on the attendee sheet? Please add your name, agency, email via MSTeams Chat Box*
9:00–9:10am	**Introduction & Overview of Agenda** – *Carol Aldrich*
9:10–10:00am	**Effective Deployment of Research Results** – *Mary Hoffmeyer* *Targeted Presentation by Brian Worrel (Iowa), Tommy Nantung (Indiana), (10 min each) – followed by discussion* • *What are the methods your DOT utilizes for deploying results?* • *How does your DOT track and document research results?* • *Showcase your innovative platform (i.e. websites)*
10:00-10:10am	**Break**
10:10–11:00am	**Curating Cutting Edge Knowledge & Innovations Through the Library of the Future** – *Jennifer Herron* *Targeted Presentation by Jennifer Herron (Michigan), Sheila Hatchell (Minnesota) (10 min each) – followed by discussion* • *What is a library of the future?* o *Knowledge/Data Management* o *Scholarly publications – searching, copyright* o *508 compliance* o *Knowledge Network*
11:00-11:50am	**Best Practices for the Transferring of Technologies (TOT)** – *Carol Aldrich* *Targeted Presentation by Andy Eiter (Wisconsin), Jen Harper (Missouri) (10 min each) – followed by discussion* • *What is your internal process for TOT? How do you collect ideas and select which to bring to implementation?* • *What are plans for executing/sharing TOT within your DOT and beyond?* • *What does successful TOT look like for your DOT?*
11:50–12:00pm	**End of Day Wrap Up** – *Carol Aldrich* *Write down your take-a-ways for today and save for Wednesday or Thursday.* • *Explain Group Assignments for Peer Exchange Break-Out Activities*
12:00pm-1:00pm	**Optional Networking Lunch –** *Mary Hoffmeyer* **Pasty Recipe** *Michigan Upper Peninsula Meat Pie or whatever you have which is close* *https://www.tasteofhome.com/recipes/upper-peninsula-pasties/*

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAC REGION 3 PEER EXCHANGE
October 13-15, 2020 (8:30-12:00pm EST each day)

Innovation is the Key to Everything the Future Can Be

AGENDA

DAY 2 – WEDNESDAY, OCTOBER 14 **Strategically Entering the Technology Movement**

8:30–9:00am	**Optional** - Welcome & Networking Opportunity – Take us outside to show us something unique about your state or tell us a fact/show an item that represents your state.
9:00–9:40am	**When to Start or Ride the Research Wave** – *Michael Townley* *Open forum for discussion with all state DOTs* • *How do you find the balance between which projects to lead and push technology forward versus which projects to wait for developing technology?* • *When has your state lead a new research topic? Tell us your story?* • *Why does your state choose to be a leader? How did you lead?*
9:40–10:25am	**Michigan's Automated Vehicle & Mobility Technologies Testing Facilities** – *Andre Clover* *Targeted Presentation by Victoria Waters, Mcity Assistant Director and Vaughn Haack, Mcity Test Facilities Manager (University of Michigan) (30 min) – followed by discussion*
10:25-10:35am	**Break**
10:35–11:20am	**Michigan's Automated Vehicle & Mobility Technologies Testing Facilities** – *Andre Clover* *Targeted Presentation by Kevin Kelly & Mark Chaput at American Center for Mobility (ACM) – Smart City Test Center (30 min) – followed by discussion*
11:20–12:00pm	**End of Day Wrap Up** – *Michael Townley* *Discuss what was heard, take-a-ways for your DOT & verify discussion for Day 3* • *Break-Out Activity with Assigned Partners – Separate TEAMS LINK*
12:00pm-1:00pm	**Optional Networking Lunch –** *Michael Townley* **Live Music Lunch -** *Performance by Jonathan Townley* *jonathantownleymusic.com*

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAC REGION 3 PEER EXCHANGE
October 13-15, 2020 (8:30-12:00pm EST each day)

Innovation is the Key to Everything the Future Can Be

AGENDA

DAY 3 – THURSDAY, OCTOBER 15 **Implementation Assistance**

8:30–9:00am	**Optional** - Welcome & Networking Opportunity – Share your favorite joke.
9:00–10:00am	**Review of NCHRP 20-44 RAC Region 3 Technology Transfer Project** – *Brian Worrel* *<u>Targeted Presentation by Sid Mohan (NCHRP), Ethan Severson (Wisconsin) (5 min each) – followed by discussion</u>* • *How will we as a Region select projects that will be targeted for technology transfer?* • *Will we use the HVR process?* • *When do we need to have a list of projects for technology transfer?* • *How will we use the materials developed by this project for maximum impact?* • *How will be engage our subject matter experts in the deliverables from this project?* • *Sustainability Options for Future Innovations & Keeping Implementation Moving Forward?* • *What do we want to do collectively after NCHRP 20-44 project is completed?* • *Will this require future funds? Should we apply again?*
10:00–10:10am	**Break**
10:10–10:40am	**State Engagement in Pooled Fund Projects** - *Andre Clover* *<u>Open forum for discussion with all state DOTs</u>* • *How many pooled fund projects does your state lead or participate in?* • *How do you spread the word of upcoming or existing pooled fund projects within your DOT?* • *How do spread the word about results of pooled fund projects?* • *Renewing and extending projects and commitment of partner state contributions.* • *How do you capture the benefits of those projects?*
10:40–12:00am	**End of Day Wrap Up** – *Michael Townley* *<u>Discuss what was heard and discuss take-a-ways for your DOT</u>* • *Break-Out Activity with Assigned Partners – Separate TEAMS LINK*
12:00pm-1:00pm	**Optional Networking Lunch –** *Mary Hoffmeyer*

Appendix C.

RAC REGION 3 Peer Exchange

October 13-15, 2020

DAY 1

Innovation is the Key to Everything the Future Can Be…

WELCOME

Icebreaker Activity

Share a Picture
with the Group
& Explain Why it's
One of Your Favorites!

(Or Else Gigi Here will Give You the Stink Eye!!!)

Welcome to the RAC Region 3 Peer Exchange

Carol Aldrich (Michigan)

Welcome to the RAC Region 3 Peer Exchange!

- Introduction
- Background
- Ground Rules & Instructions
  - Navigating a Teams meeting.
  - Sessions will be recorded.
  - Presenters will be notified when nearing the end of their time with a bell.
    - At 2-minutes remaining -Two Chimes.
    - At 1-minute remaining – 1 Chime.
- Agenda
- Time for Discussion & Input

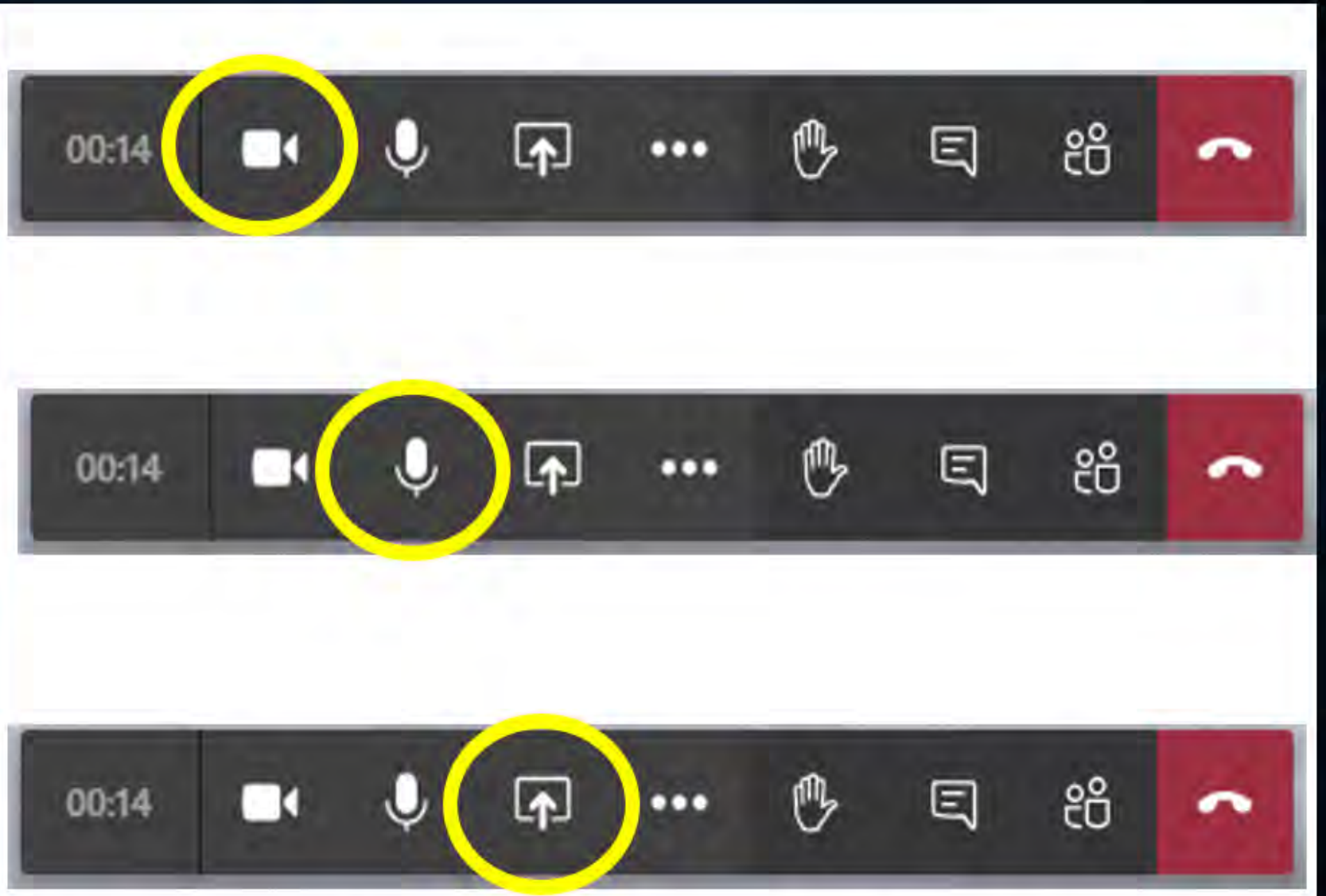
BACKGROUND

- It all began in Iowa....
- AASHTO RAC Region 3 collaboration meeting with a state peer exchange and ways this could become an annual event
- Who’s next for 2021?

Turn on Camera

Unmute

Share your Screen



** Share sound by checking box when share screen

Quick Thoughts in Chat Pod

1. Type your answers or thoughts into the meeting chat.

Raise Your Hand to Speak

2. Use the “Raise Hand” feature to let us now if you want to share your thoughts verbally.

AGENDA

Day 1 - 10/13/20

- **Effective Deployment of Research Results**
- **Curating Cutting Edge Knowledge & Innovations Through the Library of the Future**
- **Best Practices for the Transferring of Technologies (TOT)**

Day 2 - 10/14/20

- **When to Start or Ride the Research Wave**
- **Michigan's Automated Vehicle & Mobility Technologies Testing Facilities**

Day 3 - 10/15/20

- **Review of NCHRP 20-44 RAC Region 3 Technology Transfer Project & Sustainability Options for Future Innovations & Keeping Implementation Moving Forward**
- **State Engagement in Pooled Fund Projects**

Effective Deployment of Research Results

Mary Hoffmeyer

Targeted Presentations by:

Brian Worrel (Iowa)

Tommy Nantung (Indiana)

RAC Region 3 Peer Exchange

Communicating Research

Carbon Fiber Research

Since 2001, MDOT has successfully used carbon fiber reinforced polymer (CFRP) in place of steel as a prestressing and reinforcement material in the design and construction of several bridges across the state. CFRP components have tensile strength similar to steel, and their resistance to corrosion means they are anticipated to require less maintenance over time. Now, after four years of extensive research, MDOT's bridge designers have the technical information and specifications they need to predict how CFRP components will perform under a variety of conditions - and the design tools for future bridge projects. Recent research resulted in design criteria, design guidelines, MathCAD sheets and recommendations to help make MDOT's design and construction of highway bridges with CFRP components more efficient. Select "Modeling - Bridge" and then "CFRP Bridges" to download design examples from the Support Services website.

YouTube

Carbon Fiber use in MDOT projects

facebook

Michigan Department of Transportation
September 9 at 7:11 AM

MDOT research into carbon fiber bridge components gains national recognition

https://content.govdelivery.com/accounts/.../bulletins/29f433c

62 29 Comments 17 Shares

Michigan Department of Transportation RESEARCH Administration

RESEARCH SPOTLIGHT

Extensive testing of carbon polymer for highway bridge reinforcement provides guidance for improved designs

Since 2001, MDOT has successfully used carbon fiber reinforced polymer (CFRP) in place of steel as a prestressing and reinforcement material in the design and construction of several bridges across the state. CFRP components have tensile strength similar to steel, and their resistance to corrosion means they are anticipated to require less maintenance over time. Now, after four years of extensive research, MDOT's bridge designers have the technical information and specifications they need to predict how CFRP components will perform under a variety of conditions – and the design tools for future bridge projects.

Project Information

REPORT NAME: Evaluating Long-Term Capacity and Ductility of Carbon Fiber Reinforced Polymer Prestressing and Post-Tensioning Strands Subject to Long-Term Losses, Creep and Environmental Factors, and Development of CFRP Prestressing Specifications for the Design of Highway Bridges

START DATE: October 2013

REPORT DATE: September 2019

RESEARCH REPORT NUMBER: SPR-1690

TOTAL COST: $880,592

COST SHARING: 20% MDOT, 80% FHWA through the SPR, Part II, Program

MDOT Project Manager

Matthew J. Chynoweth, P.E.
Chief Bridge Engineer
Director, Bureau of Bridges and Structures
ChynowethM@Michigan.gov
517-243-4302

PROBLEM

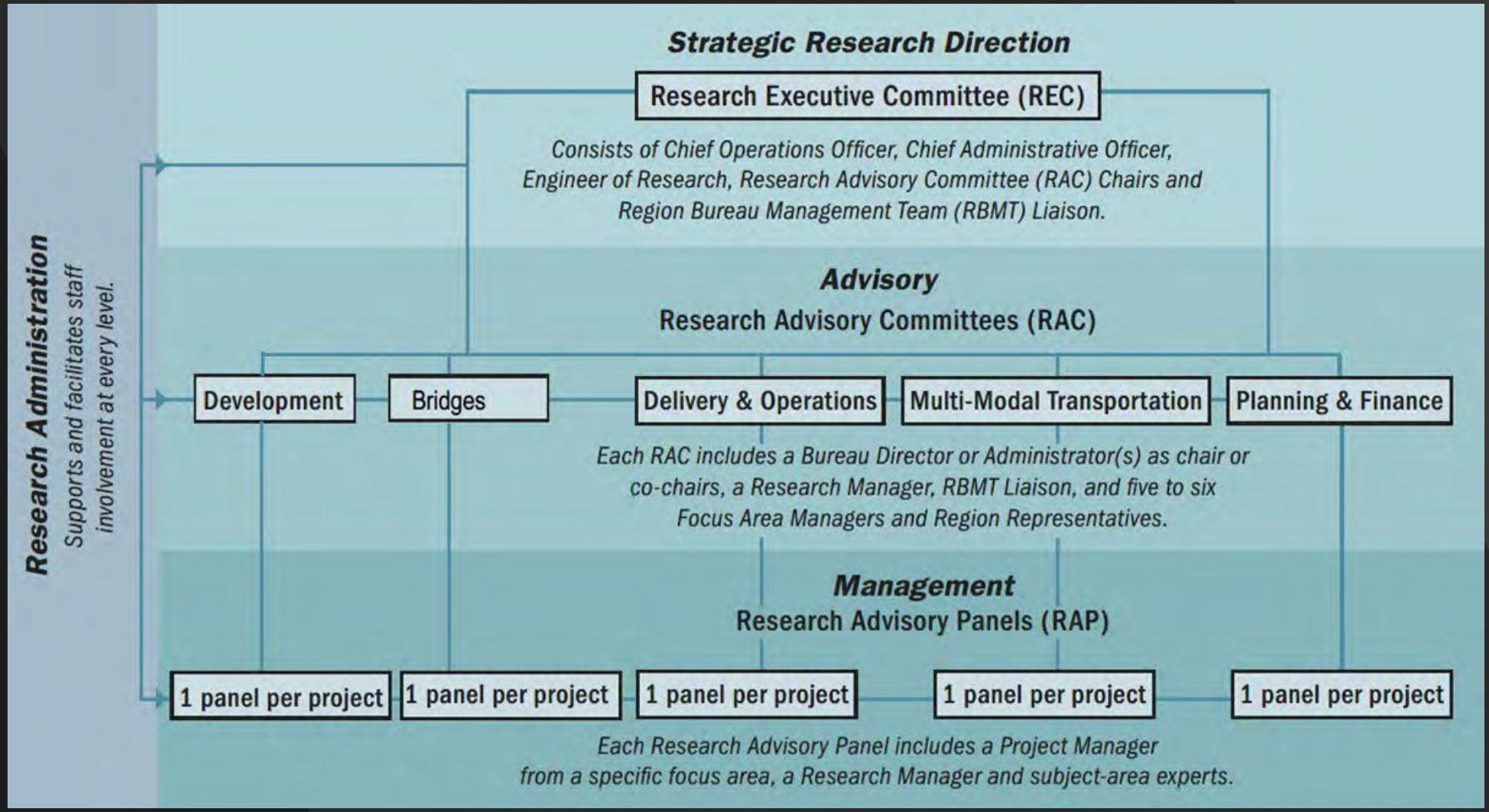
Steel has historically been the go-to material for reinforcing and pretensioning concrete used in highway bridge designs. While steel adds much-needed strength, it is prone to corrosion as extreme temperatures, water and deicing chemicals assault the bridge's structure, causing the steel reinforcement to deteriorate over time. Preventing corrosion and repairing damaged areas requires additional maintenance time and resources.

Years ago, MDOT engineers helped pioneer an innovative alternative: using CFRP in place of steel reinforcement in critical applications, such as mild reinforcing for bridge decks and concrete superstructure prestressing. CFRP prestressing strands are strong, corrosion-resistant and highly durable, making the material particularly well suited for bridges. In 2001, MDOT partnered with Lawrence Technological University

Concrete beams prestressed with CFRP strands were subjected to fire/loading tests to evaluate their fire endurance.

RAC Region 3 Peer Exchange

Tracking Implementation



RAC Region 3 Peer Exchange

What Do You Do With The Research?

- *What are the methods your DOT utilizes?*
- *How does your DOT track and document results?*
- *What is your innovative platform?*
- *MDOT Video Spotlight –*
  - *Gateway Treatment*
  - https://www.youtube.com/watch?v=hVdEG5C-Qu4

Taking a 10 Minute Break

https://stateofmichigan.sharepoint.com/sites/MDOT-Teams-Research-Admin/Shared%20Documents/General/STIC-Videos/Group-1.mp4

Curating Cutting Edge Knowledge & Innovations Through the Library of the Future

Jennifer Herron (Michigan DOT)

Targeted Presentation by:
Sheila Hatchell (Minnesota)

RAC Region 3 Peer Exchange

What is the Library of the Future?

- *Knowledge/Data Management*
- *Scholarly publications – searching, copyright*
- *508 compliance*
- *Knowledge Network*

Best Practices for the Transferring of Technologies

Carol Aldrich (Michigan)

Targeted Presentations by:

Andy Eiter (Wisconsin)

Jen Harper (Missouri)

RAC Region 3 Peer Exchange

What Does TOT Look Like for You?

- *What is your internal process for TOT?*
- *How do you collect ideas and select which to bring to implementation?*
- *What are plans for sharing TOT within your DOT and beyond?*
- *What does successful TOT look like for your DOT?*
- MDOT Spotlight Video
  - EMILY

End of Day Wrap-Up

Carol Aldrich (Michigan)

RAC Region 3 Peer Exchange

NETWORKING LUNCH

Can You Identify this Delicious Treat?

RAC Region 3 Peer Exchange

The ‘Beloved’ Michigan Pasty

When Cornish miners migrated to Michigan's Upper Peninsula in the 1800's, they brought with them their beloved national dish: the pasty. The Finnish miners that followed adopted these meat pies as their own (easily transportable for long subterranean days!), and the pasty since then has became a large part of the regional culture of Michigan and the UP. There’s even an annual pasty festival in early July.

RAC REGION 3 Peer Exchange

October 13-15, 2020

DAY 2

Innovation is the Key to Everything the Future Can Be…

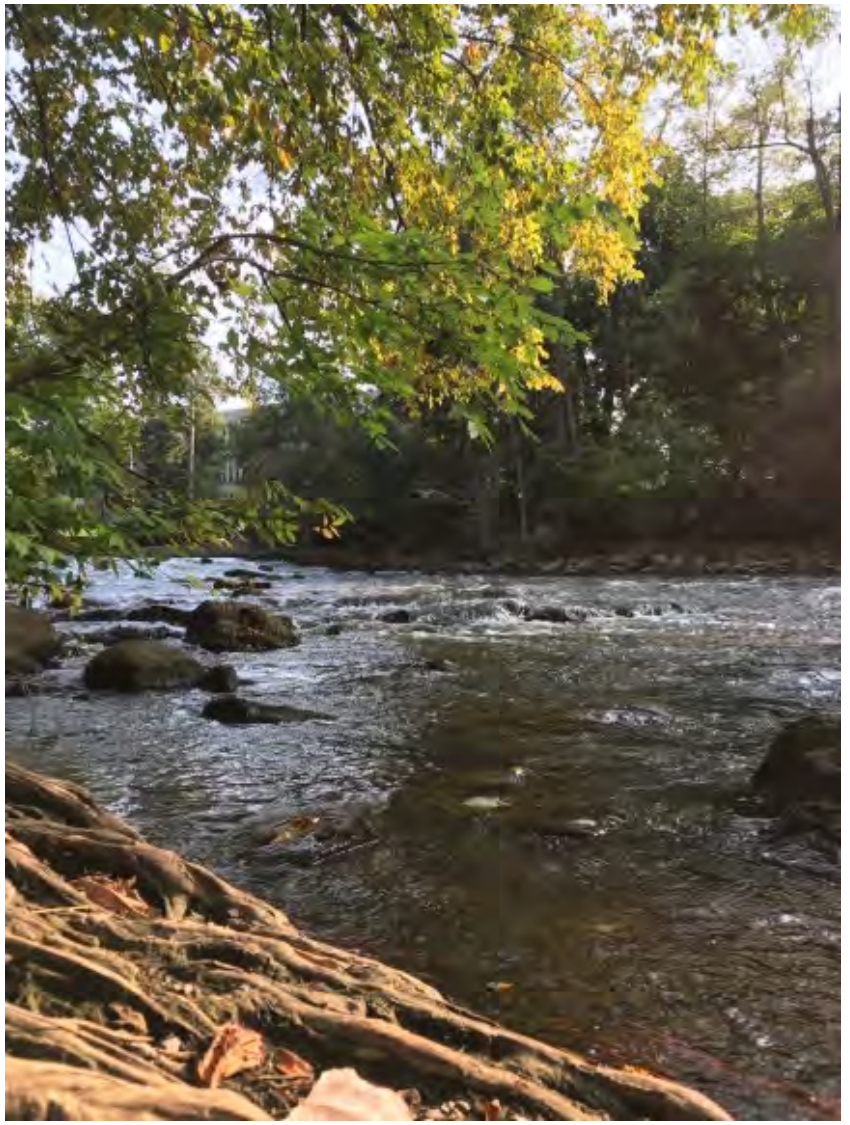
WELCOME

Icebreaker Activity

Take Us Outside to Show Us Something Unique About Your State!

Or

Show Us An Item That Represents Your State!



When to Start or Ride the Research Wave

Michael Townley (Michigan)

RAC Region 3 Peer Exchange

Pompeii's Pedestrian Crossings

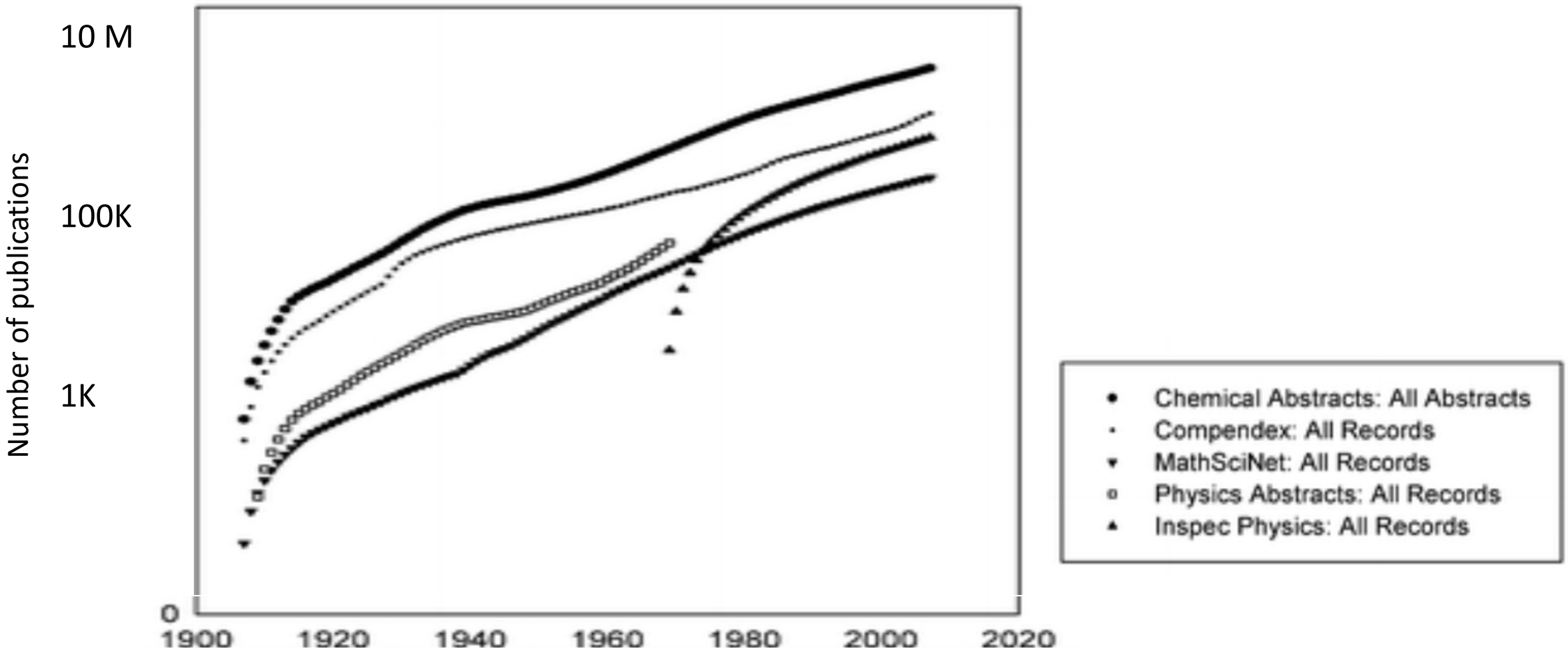
Title Photo Credit: Wikimedia Commons, the free media repository - https://commons.wikimedia.org/wiki/File:Pompeii_BW_2013-05-13_10-11-47_DxO.jpg#/media/File:Pompeii_BW_2013-05-13_10-11-47_DxO.jpg

Pedestrian Crossing | Gateway Treatment

RAC Region 3 Peer Exchange


MAP of THE UNITED STATES
WASHINGTON
OREGON
MONTANA
IDAHO
WYOMING
NORTH DAKOTA
SOUTH DAKOTA
MINNESOTA
NEBRASKA
IOWA
NEVADA
UTAH
COLORADO
KANSAS
MISSOURI
CALIFORNIA
ARIZONA
NEW MEXICO
OKLAHOMA
ARKANSAS
TEXAS
LOUISIANA
WISCONSIN
ILLINOIS
MICHIGAN
INDIANA
OHIO
KENTUCKY
TENNESSEE
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
SOUTH CAROLINA
NORTH CAROLINA
VIRGINIA
WEST VIRGINIA
PENNSYLVANIA
NEW YORK
MAINE
ALASKA
HAWAII

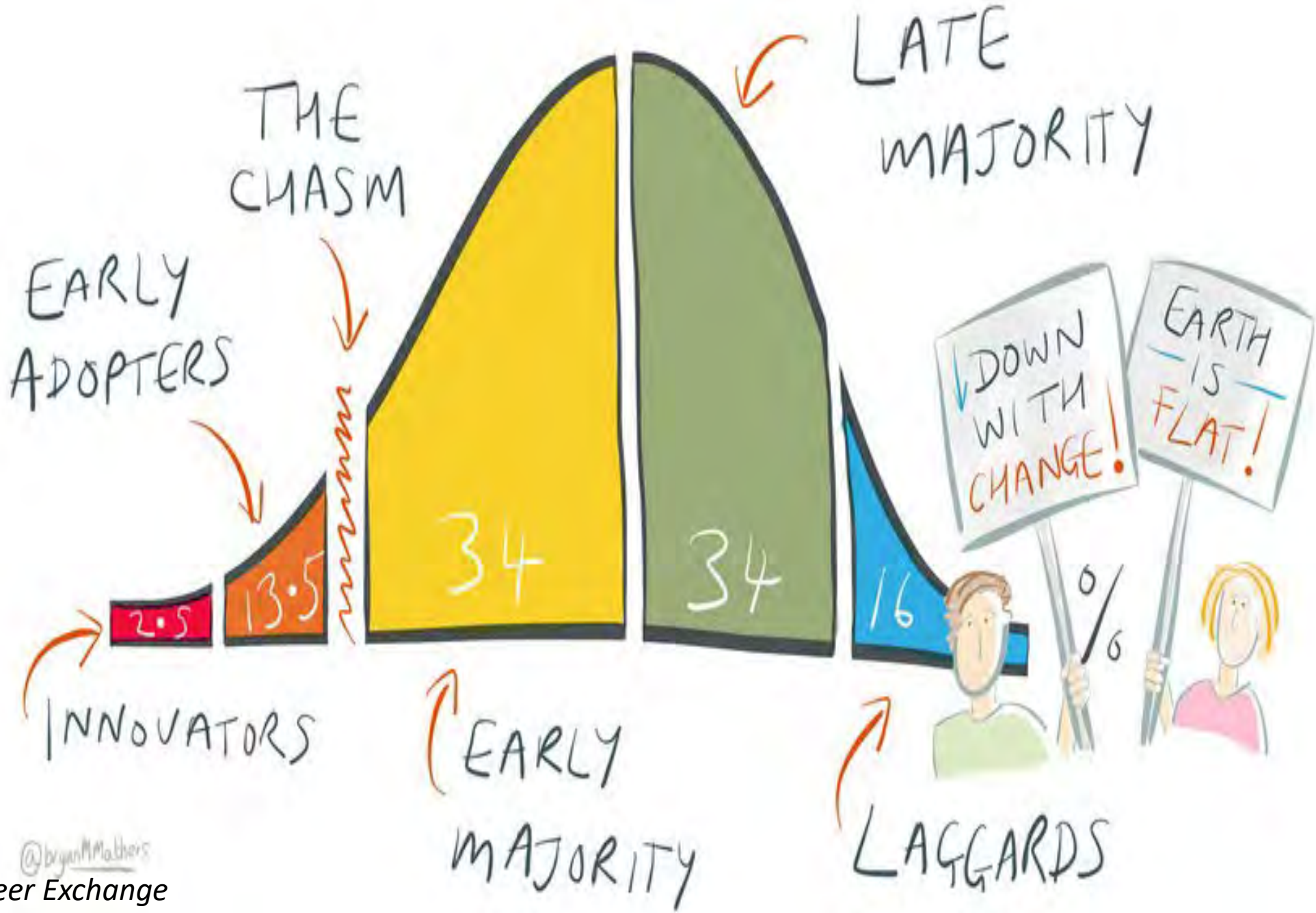
Publications Quantity is Overwhelming



Scientometrics. 2010 Sep; 84(3): 575–603.

How Do People Adopt New Things?

RAC Region 3 Peer Exchange


THE CHASM
LATE MAJORITY
EARLY ADOPTERS
2.5
13.5
34
34
16
DOWN WITH CHANGE!
EARTH IS FLAT!
%
INNOVATORS
EARLY MAJORITY
LAGGARDS
@bryanMMathers


MAP of THE UNITED STATES
MONTANA
OREGON
NEVADA
UTAH
ARIZONA
NEW MEXICO
ALASKA
LOUISIANA
MAINE
VIRGINIA
NORTH CAROLINA

The Research Wave

RAC Region 3 Peer Exchange

Research Wave Discussion

Meeting A: Facilitator - Townley

Ohio, Illinois, Minnesota

Meeting B: Facilitator - Aldrich

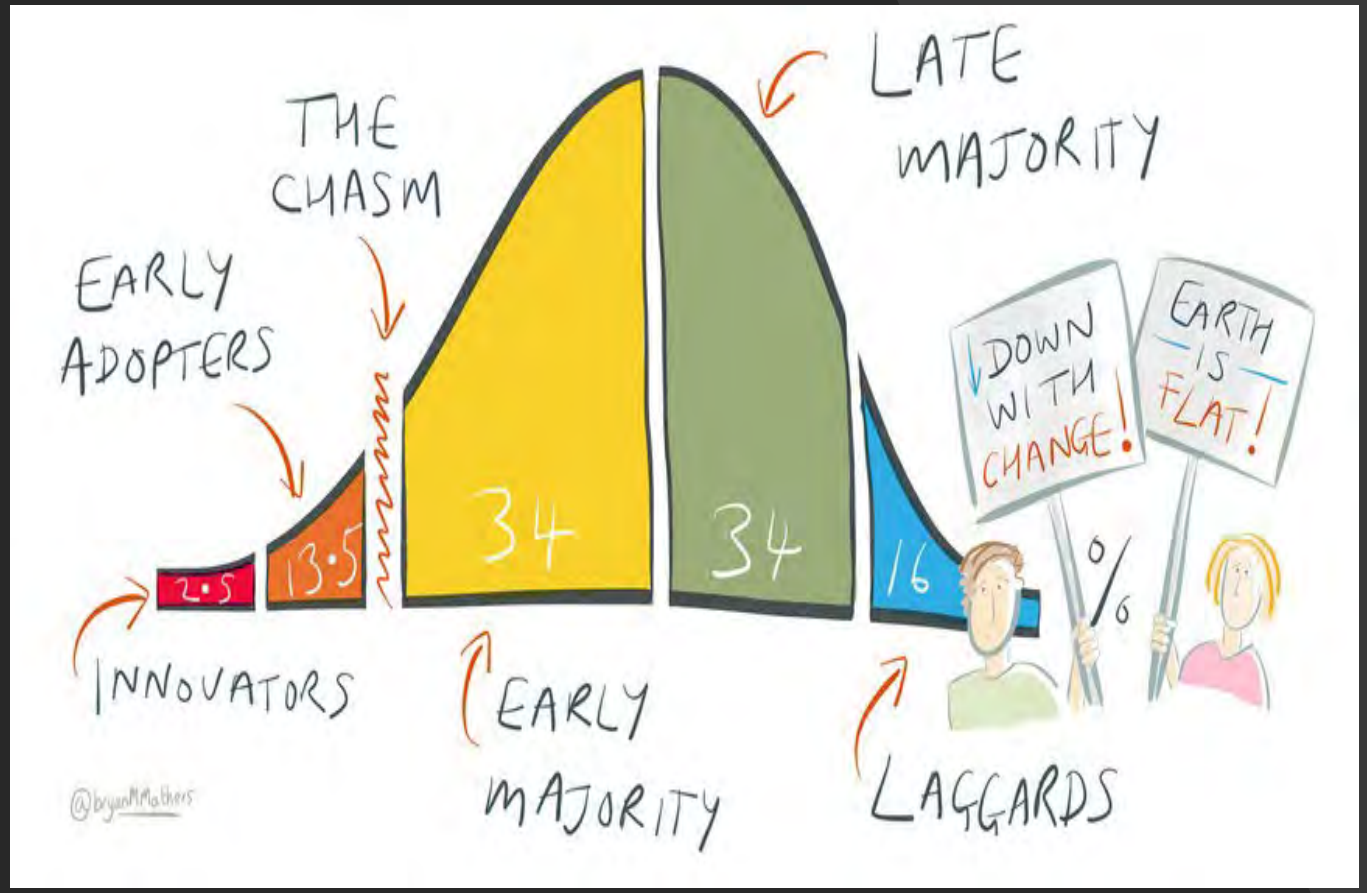
Indiana, Iowa, Kansas

Meeting C: Facilitator - Hoffmeyer

Missouri, Michigan, Wisconsin

When Have You Noticed the "The Law of Diffusion of Innovation" at Work in:

The General Marketplace
or
With the Transportation Innovations?



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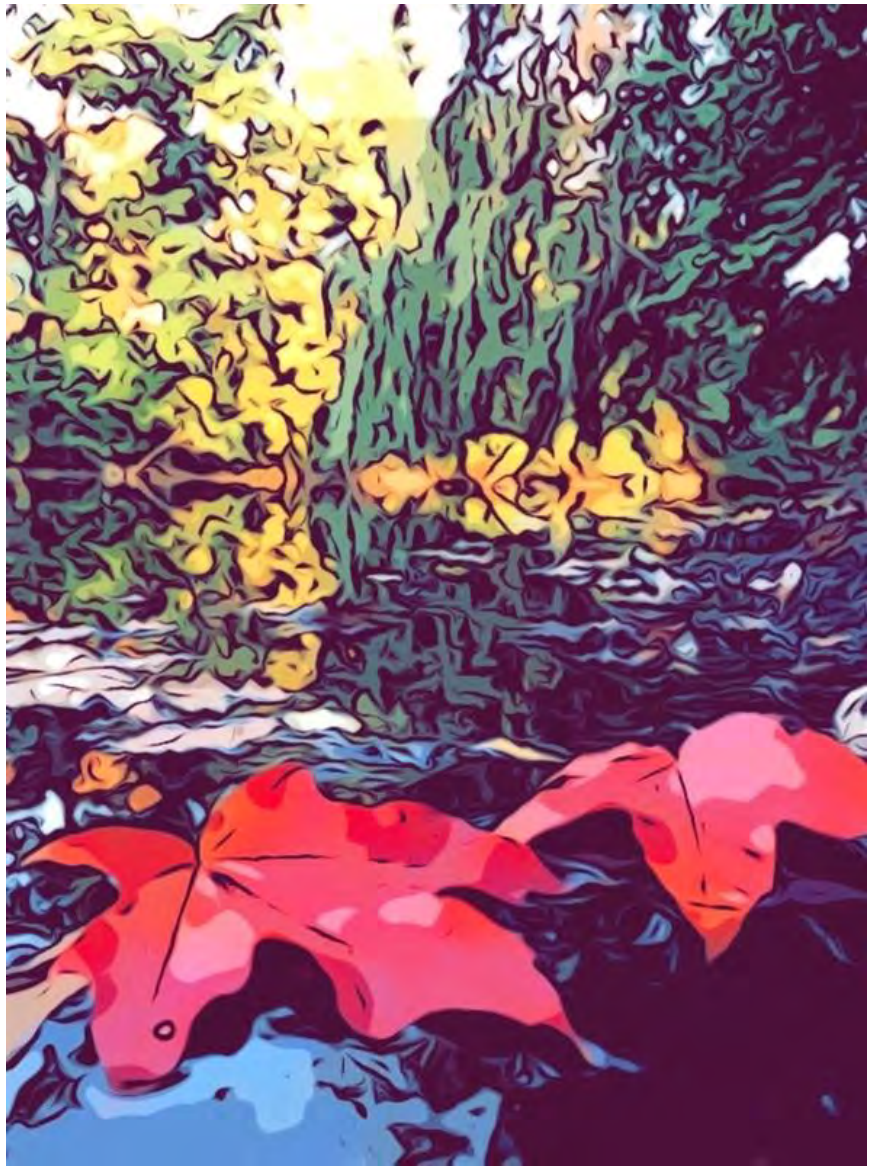
When Has Your State Lead a New Research Wave as an Innovator or Early Adopter?

Tell Us Your Story



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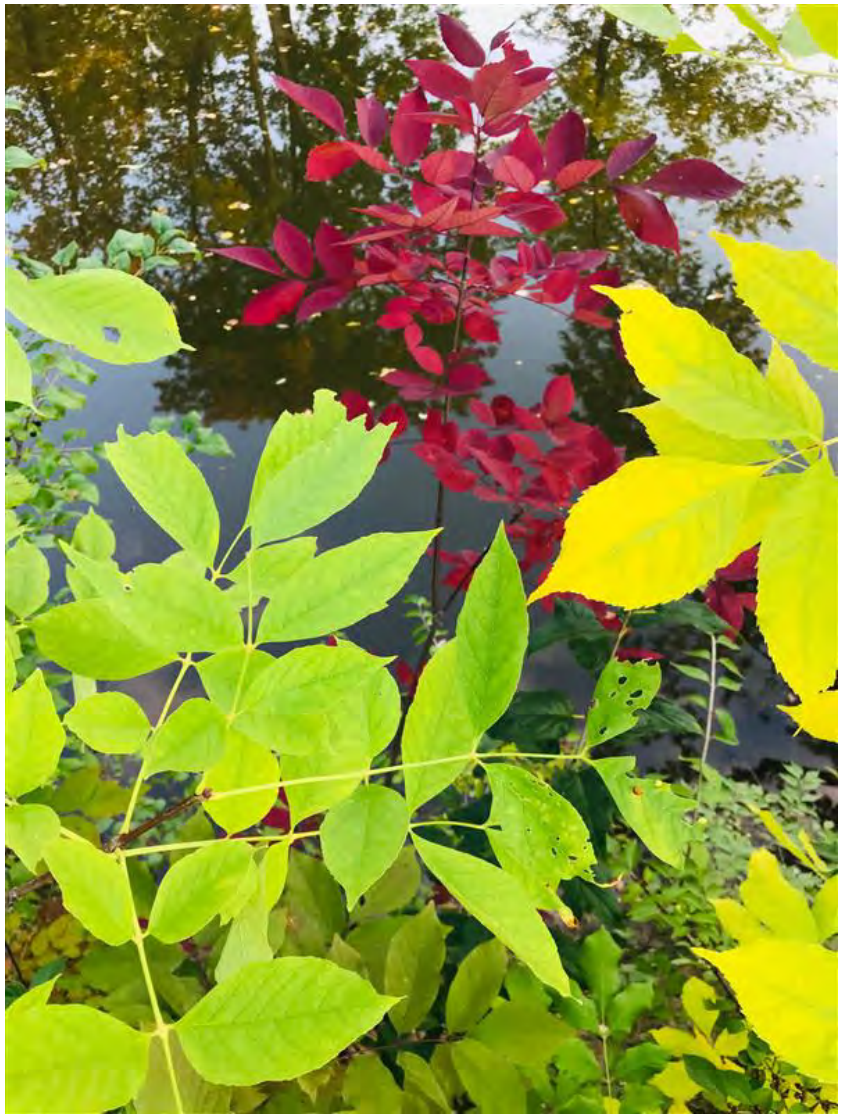
How Do You Find a Balance Between Being?

An Early Adopter
or
Part of the Majority



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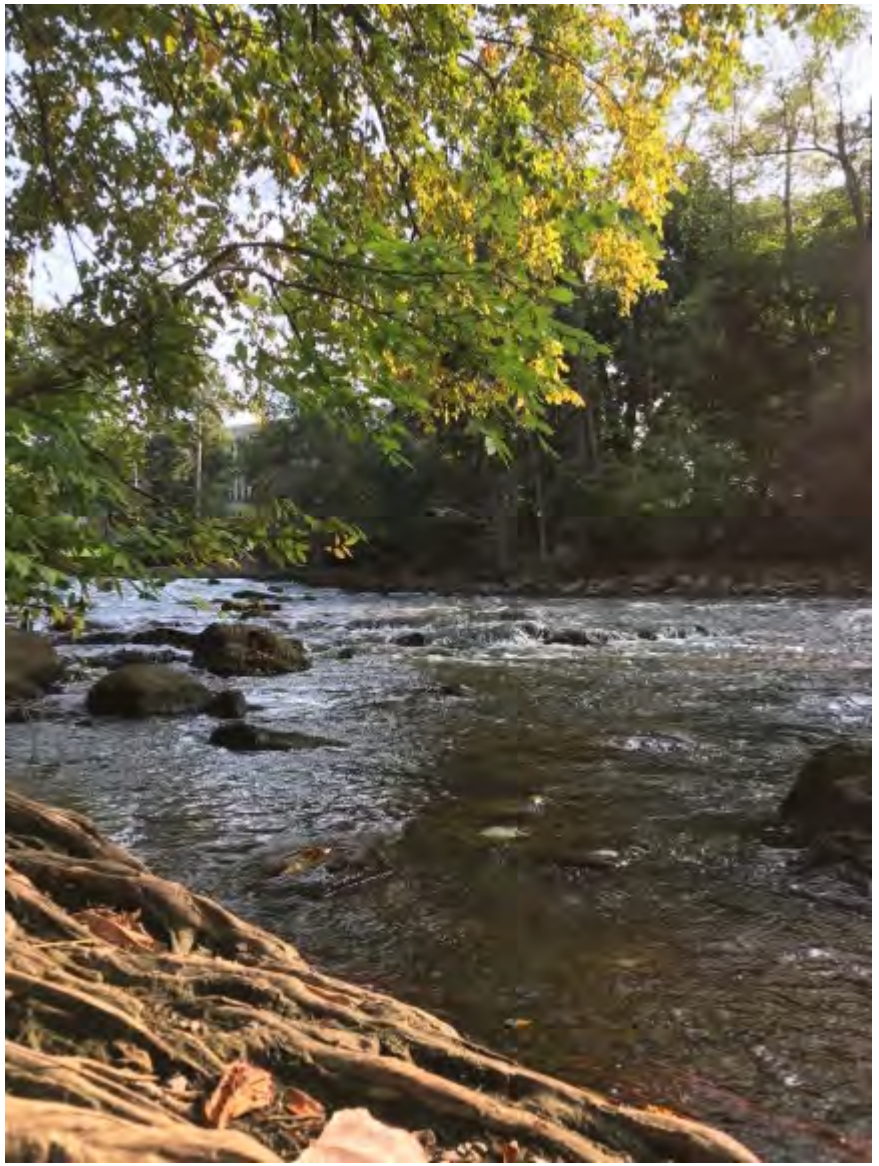
Why Does Your State Choose to Be a Leader?

How Do You Lead?



When to Start or Ride the Research Wave

Groups A, B & C
Will Return Here at 9:30
For Group Reporting

RAC Region 3 Peer Exchange

When to Start or Ride the Research Wave

Group Reporting

RAC Region 3 Peer Exchange

Michigan's Automated Vehicle & Mobility Technologies Testing Facilities

Andre Clover (Michigan)

Targeted Presentations by:
Victoria Waters & Vaughn Haack (Mcity)
Kevin Kelly & Mark Chaput (ACM)

RAC Region 3 Peer Exchange

Taking a 10 Minute Break

https://stateofmichigan.sharepoint.com/sites/MDOT-Teams-Research-Admin/Shared%20Documents/General/STIC-Videos/Group-2.mp4

Michigan's Automated Vehicle & Mobility Technologies Testing Facilities

Andre Clover (Michigan)

Targeted Presentations by:
Victoria Waters & Vaughn Haack (Mcity)
Kevin Kelly & Mark Chaput (ACM)

RAC Region 3 Peer Exchange

End of Day Wrap-Up

Michael Townley (Michigan)

RAC Region 3 Peer Exchange

5 Minutes to Jot Down Take-Aways

- *Ideas you want to implement.*
- *People you want to follow up with and learn more from.*
- *Documents you want to obtain from other states.*
- *Other ideas.*

Meet in Groups of 2-3

- *Take turns sharing your takeaways:*
  - *Why are you drawn to the idea?*
  - *What do plan to do with the idea?*
  - *What barriers might impede implementing it?*
  - *How will you over come the barriers?*
- *Return to main Teams meeting by noon for live music.*

Starting at Noon

LIVE MUSIC LUNCH

Jonathan Townley

Storytelling songs and gentle acoustic guitar with a casual performance style

jonathantownleymusic.com

RAC Region 3 Peer Exchange

RAC REGION 3 Peer Exchange

October 13-15, 2020

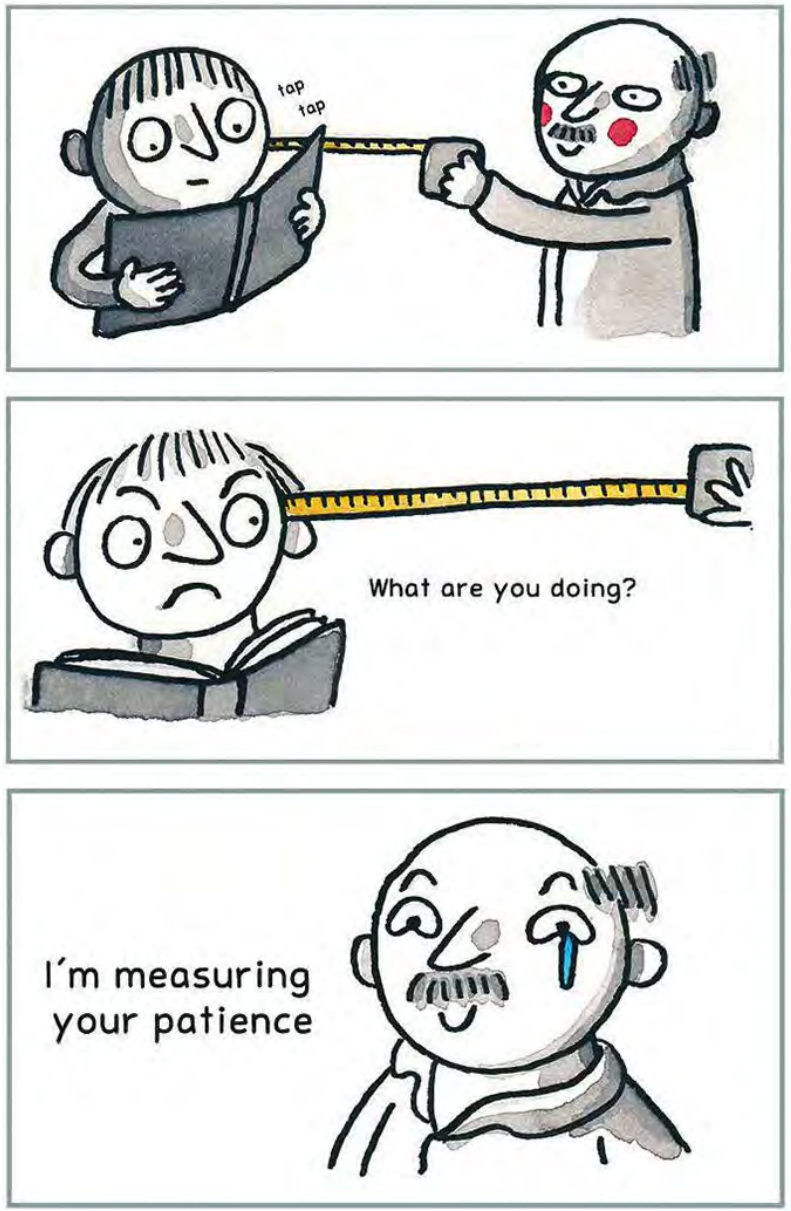
DAY 3

Innovation is the Key to Everything the Future Can Be…

WELCOME

Icebreaker Activity

Share Your Favorite Light-Hearted Joke!



Review of NCHRP 20-44 RAC Region 3 Technology Transfer Project

Brian Worrel (Iowa)

Targeted Presentations by:
Sid Mohan (NCHRP)
Ethan Severson (Wisconsin)

RAC Region 3 Peer Exchange

How Will We Utilize Technology Transfer as a Region?

- *How will we as a Region select projects that will be targeted for technology transfer?*
- *Will we use the HVR process?*
- *When do we need to have a list of projects for technology transfer?*
- *How will we use the materials developed by this project for maximum impact?*
- *How will be engage our subject matter experts in the deliverables from this project?*

Sustainability Options for Future Innovations & Keeping Implementation Moving Forward

- *Next Steps?*
- *What do we want to do collectively after NCHRP 20-44 project is completed?*
- *Will this require future funds?*
- *Should we apply again?*

Taking a 10 Minute Break

https://stateofmichigan.sharepoint.com/sites/MDOT-Teams-Research-Admin/Shared%20Documents/General/STIC-Videos/Group-3.mp4

State Engagement in Pooled Fund Projects

Andre Clover (Michigan)

RAC Region 3 Peer Exchange

How Does TPF Projects Work for You?

- *How many pooled fund projects does your state lead or participate in?*
- *How do you spread the word of upcoming or existing pooled fund projects within your DOT?*
- *How do spread the word about results of pooled fund projects?*
- *How do you capture the benefits of those projects?*

End of Day Wrap-Up

Michael Townley (Michigan)

RAC Region 3 Peer Exchange

5 Minutes to Jot Down Take-Aways

- *Ideas you want to implement.*
- *People you want to follow up with and learn more from.*
- *Documents you want to obtain from other states.*
- *Other ideas.*

Meet in Groups of 2-3

- *Take turns sharing your takeaways:*
  - *Why are you drawn to the idea?*
  - *What do plan to do with the idea?*
  - *What barriers might impede implementing it?*
  - *How will you over come the barriers?*
- *Return to main Teams meeting to share your ideas.*


Thank You For Attending
We'll Leave the Light on For You!
RAC Region 3 Peer Exchange

Effective Deployment of Research Results

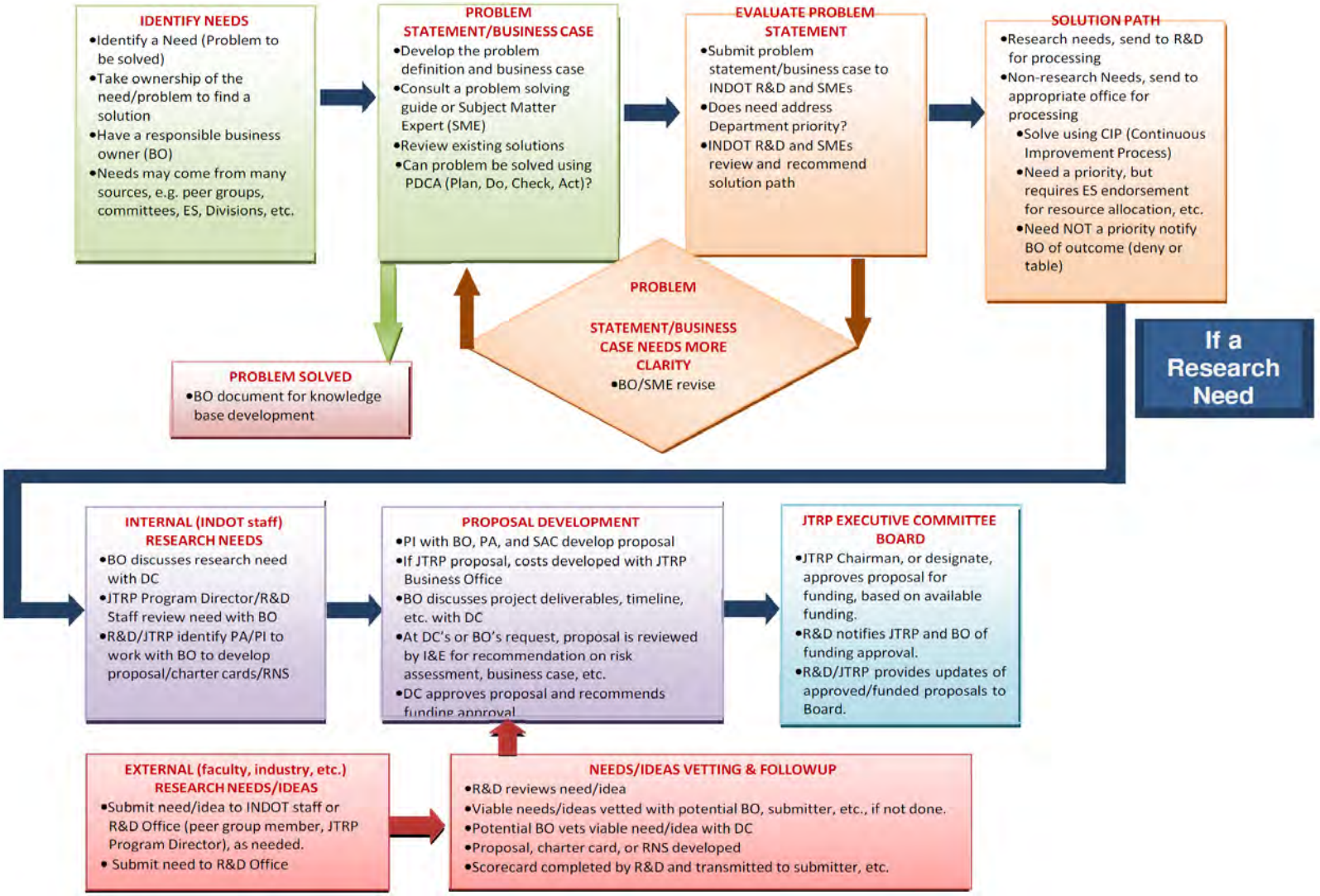
Tommy Nantung
INDOT Research and Development Division

AASHTO RAC Region 3 Peer Exchange
October 13, 2020
Michigan

INDOT/JTRP Research Program

- Three primary responsibilities:
  - Conduct, oversee, implement and partner in effective research that benefits our customers (currently 92 active research projects and 868 cumulative number of implementation projects, monitored through SmartSheet).
  - Conduct and oversee specialized testing programs for INDOT (e.g. Friction, Pavement Structure, and Pavement Condition programs)
  - Assist in technology development, identification and transfer (emerging technology with a 10-year future perspective), STIC, EDC, etc.

INDOT Innovation Process



Responsibility of Research Manager

- Formulate research needs for the Department.
- Set-up budgets for research and implementation programs
- Manage proposals including deliverables in the items to be implemented
- Plan for implementation of research projects early on in proposal development.
- Administer on-going research projects.

Responsibility of Project Administrator

- Formulate research needs for the Department.
- Set-up budgets for research and implementation programs
- Manage proposals including deliverables in the items to be implemented
- Plan for implementation of research projects early on in proposal development.
- Administer on-going research projects.

Responsibility of Business Owner

- Has ownership of the research and ensures (before initiation, during the conduct and at delivery) that the research addresses INDOT needs.
- Participate actively with the PI and PA during the research proposal development process.
- Communicates to his or her supervisor and the DC the need for the research, their support of the research, and how the results will be implemented in INDOT operations.
- Team with the PI and PA in presenting the proposal to the JTRP Executive Committee for approval. Conveys support of the research and intended use of the research deliverables to the Executive Committee.

Responsibility of Business Owner

- Attends and participates in SAC meetings. SAC meetings are not be held without the participation of the BO.
- Reviews and approves, minutes of SAC meetings, interim reports (if any), final reports, technical summary and project deliverables.
- Reviews and approves, minutes of SAC meetings, interim reports (if any), final reports, technical summary and project deliverables.
- Reviews and gives initial approval to proposed project scope changes, project expansions/extensions, reallocation of proposal budgets, approval to purchase equipment/computers (not specified in the original proposal).

Responsibility of Business Owner

- Works with the PI and PA to keep projects on time and on budget, identify intermediate deliverables and concurrent implementation opportunities, and resolve any project issues/conflicts.
- Raises concerns to the R&D Director or JTRP Chairperson if the research is not addressing the department's needs.
- Develops and executes (including obtaining signatures and transmitting) the Implementation Plan.

Implementation of Deliverables

New Way to Show Benefits

- Demonstrating implementation & return on investment is good, but demonstrating IMPACT is even more important
- IMPACT can be measured in multiple different ways
  - Having a diverse portfolio of IMPACT messages is important
  - It is important to have a variety of traditional and nontraditional media to communicate IMPACT

Your investment is having IMPACT

Engagement is Critical

FHWA Briefing

District One Law Enforcement

Webinar Workshop with Utah

IMI and E&B Paving

Other Benefits

- Improved specifications and testing procedures
- Better methods resulting in improved material performance
- Cost-effective policy and procedures
- Safer highways and work zones
- New technologies and processes that improve productivity
- Environmentally-friendly solutions to Indiana's waste problems

Measuring IMPACT

- One size does not fit all
- Metrics include:
  - Mapping into Executive Staff priorities
  - Saving Dollars
  - Prioritizing Capital Program
  - Safety
  - Outcome Assessment
  - Extending Infrastructure Life
  - Leveraging University Resources
  - Environmental impact
  - National Recognition of Impact

Communicating and Dissemination

- Technical Reports
  - Electronic repository (e-Pubs)
  - Print on Demand
  - e-Books
- Posters
- Pocket Portfolios
- Electronic Media: Website, Twitter and Flickr,
- Newsletters
- Video Abstracts
- Conferences, Presentations and Workshops

Communicating and Dissemination

Recognition: Governor's Award

Recognition: Internal Newsletter

Inside INDOT

New Tool, Proposed to Help INDOT Inspectors, Wins Research Awards

An award-winning new construction inspection method is being reviewed by INDOT for potential implementation in the future. Developed with guidance by the agency's Research & Development (R&D) Division, the construction digital inspection program proposes to shift the onus of inspecting contracted work from solely the judgment of INDOT employees to a digital, risk-based system.

INDOT Goals

New Tool, Proposed to Help Inspectors, Wins Research Awards

A digital inspection program — currently being reviewed by INDOT — proposes to shift inspecting contracted work from solely the judgment of INDOT employees to a digital, risk-based system. Read more.

documents. Construction Management Manager Andrew Pangallo was heavily involved in the process, as was Management Information Systems (MIS) Specialist Derek Fuller.

Converting and linking information from text documents to a checklist was completed using a computer function known as natural language processing.

Andrew Pangallo

Derek Fuller

Indiana
A State that Works

Conclusions

- Message is very important
- Show case past efforts
- Implement new communication initiatives to support **engagement**
- Implement series of case studies illustrating blended communications tools
- Maintain dialog

Appendix E.

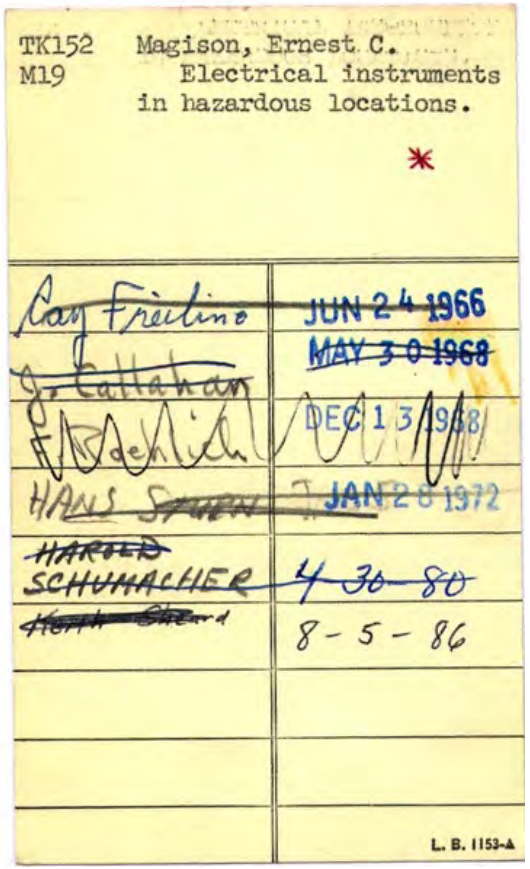
What is a Library?

Jennifer Herron

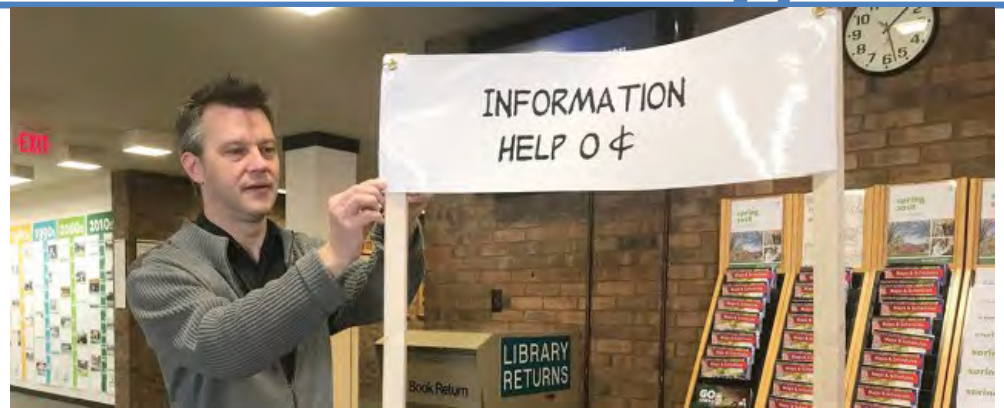
MDOT Librarian


Google
can bring you back
100,000 answers.
A librarian
can bring you back
the right one.
– NEIL GAIMAN

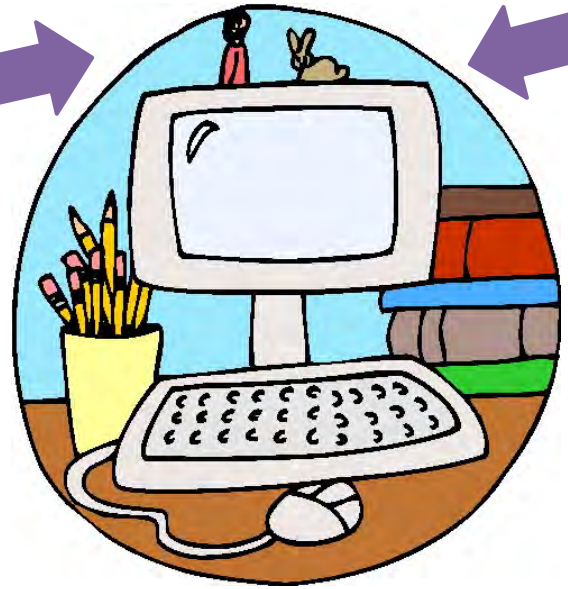
What is a Library/Librarian? Public Perception

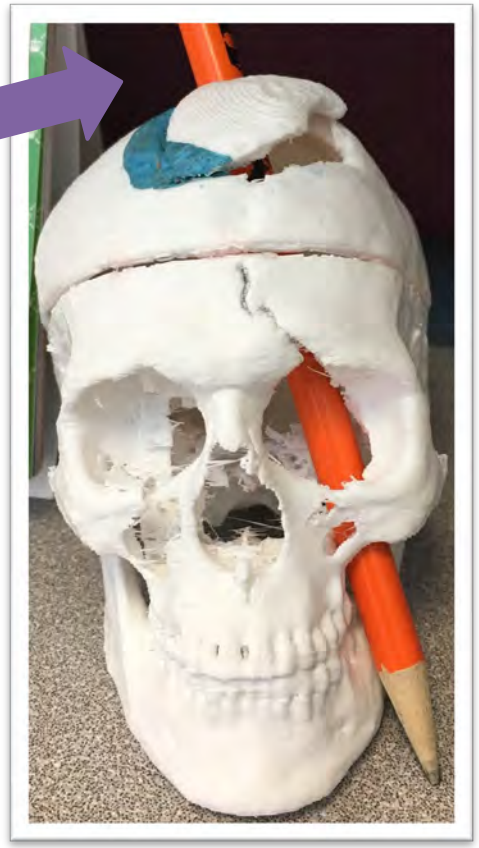


What is a Library/Librarian? Reality



Libraries and Evolution of Information





Democratizing Access

MDOT Library Services

Expert Searching

- Literature Reviews

Preservation of Information

- Archive/Corporate memory

Lending and Borrowing

- Interlibrary Loans
- PE Materials
- AASHTO Gatekeeper

Information Management

- Data storage and planning

Publishing

- Accessibility / 508 compliance
- Plagiarism
- Copyright

Organization of Information

- Website Structure

Lisa Janicke Hinchliffe
@lisalibrarian

This is the message. Academic libs have been building up a parallel digital services, content, and infrastructure for two decades. We are not moving online from in-person. We are online. We're just suspending in-person for now.

We've got this. Indiv+cooperatively. #CovidLibrary

Appendix F.

Libraries of the Future
AASHTO RAC Region 3 Peer Exchange
October 13, 2020

Sheila Hatchell | Library Director

DEPARTMENT OF TRANSPORTATION
MnDOT LIBRARY

mndot.gov/library

Value-Added Library Services

- Current Awareness
- Community Profiles
- AASHTO Digital Publications
- ASTM DOT Compass Portal
- P.E. Exam Materials
- Fostering Relationships
- Services for Research Staff

Current Awareness

- Periodical Routing
  - *A Covid Pivot*
- Alerts Service
  - Connected and Automated Vehicles
  - Sustainability, Public Health, and Transportation
  - Local news for MN Cities and Counties
  - Big Data and Transportation

CAV Alert
Connected and Automated Vehicles

- Governor's Advisory Council on Connected and Automated Vehicles was established in April 2019

Sustainability, Public Health, and Transportation Alert

Recent news curated by MnDOT Library

SUSTAINABILITY

Colorado releases its plan to slash greenhouse gases, leaving some environmental groups wanting more

Colorado Sun (October 1, 2020)

Ninety percent of U.S. cars must be electric by 2050 to meet climate goals

Scientific American (September 29, 2020)

Polaris and Zero Motorcycles reach deal to bring electric off-roaders to market

TechCrunch (September 29, 2020)

PUBLIC HEALTH

How COVID-19 repurposed city streets

Marketplace (September 30, 2020)

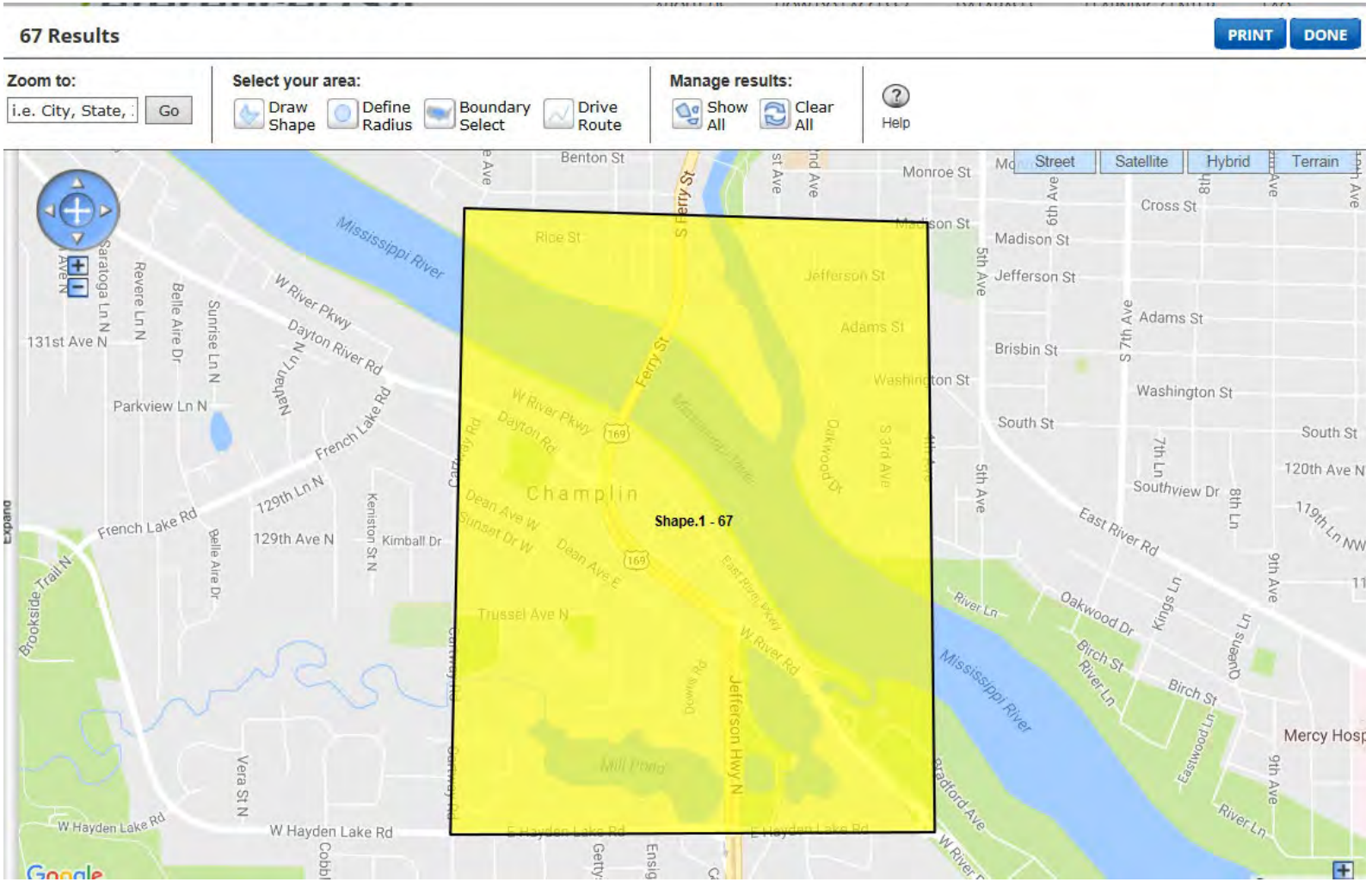
Safer with sharrows? Do bike lanes make cyclists safer?

World Highways (September 30, 2020)

Traffic fatalities, speeding on the rise in Minnesota

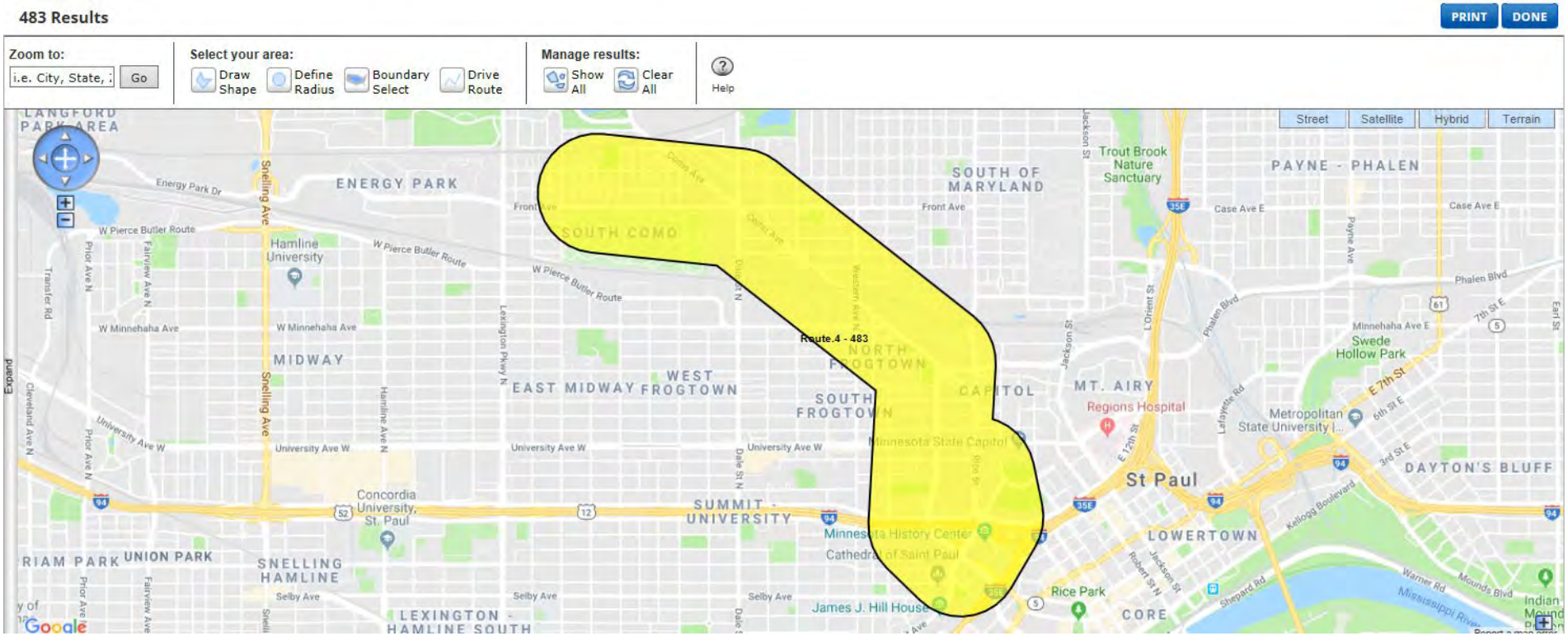
KIMT 3 (September 29, 2020)

Demographic and Business Profiles



Source: ReferenceUSA

Drive route example



Source: ReferenceUSA

AASHTO Digital Publications

AASHTO digital publications

AASHTO is slowly transitioning to digital-only publications. **The access method depends on the publication.** Digital-only publications are grouped by method below and listed alphabetically under each method. These items are only for MnDOT employees.

Method 1: PDF from AASHTO. Open the PDF following the instructions located here. This is set by AASHTO and cannot be changed.

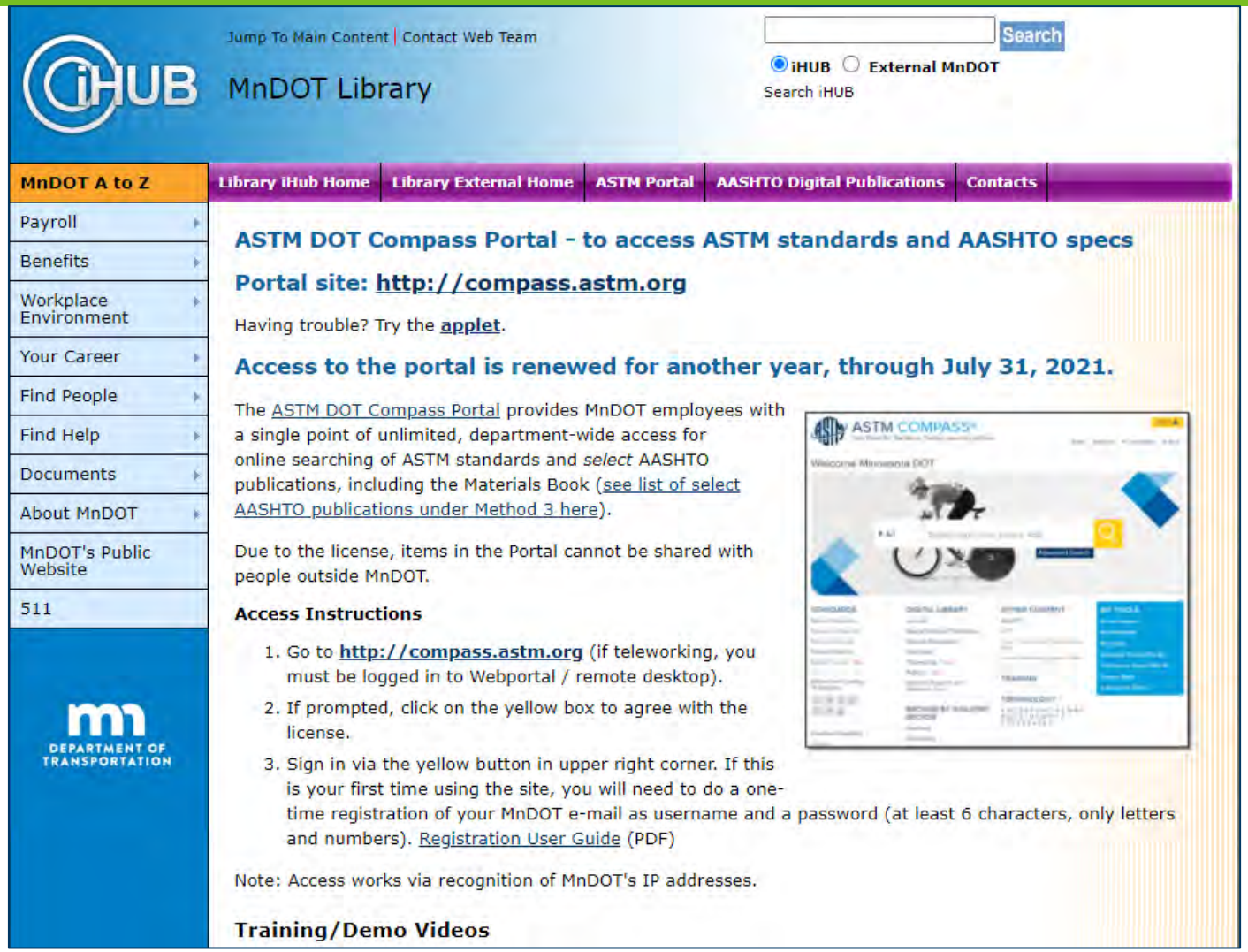
Update (1-13-2020): If the file won't open when you simply click on the title, the solution is to right-click the title and select **"Save target as"** to your desktop. You still need the FileOpen plug-in and will be prompted by a small box to enter the account name and password below. Then the PDF should open.

You will need the following information to login.
Account Name: [redacted]
Password: [redacted]

NOTE: you will need to ask Mn.IT to install the **FileOpen plug-in** on your PC if you don't have it yet.

- Construction Handbook for Bridge Temporary Works, 2nd Edition (PDF)
- Culvert and Storm Drain System Inspection Guide, 1st Edition (PDF)
- Guide for Design and Construction of Near-Surface Mounted Titanium Alloy Bars for Strengthening Concrete Structures, 1st Edition (PDF)
- Guide Design Specifications for Bridge Temporary Works, 2nd Edition (PDF) See below.

ASTM DOT Compass Portal



P.E. Exam Materials

Minnesota Transportation Libraries Program

- Ongoing partnership among Minnesota Cities and Counties (the MN Local Road Research Board - LRRB), the University of Minnesota - Center for Transportation Studies (CTS) and the MnDOT Library
- Established in 1995 – one fully staffed, fully funded Library to serve the needs of Minnesota's Transportation Community
- $70K annually from the LRRB for library services; Shared librarian with CTS

MnDOT Research Services

- Literature searches for proposed research
- Enter and update research projects into TRB's Research in Progress (RiP) database
- Catalog final reports and fill requests
- Submit missing final reports to TRID database
- Promote final reports via New Library Materials (NLM) monthly newsletter. NLM is also distributed to transportation libraries around the world, and to TRB/TRID
- Preserve final reports with a U of M connection in the U of M digital repository

Thank you!

Sheila Hatchell

Sheila.hatchell@state.mn.us

Appendix G.

WisDOT Technology Transfer

Research and Library Services Unit

Andy Eiter

Presentation to AASHTO RAC Region 3

October 13, 2020

Division of Budget and Strategic Initiatives
Bureau of Performance Improvement, Research, & Strategic Initiatives
Performance, Policy and Research Section

Research Idea Development

Research ideas and projects are developed by oversight/advisory committees facilitated by the Research and Library Services Unit.

- Wisconsin Highway Research Program
  - Four technical oversight committees comprising WisDOT staff, academia, industry professionals and FHWA
    - Focus areas: flexible pavements, rigid pavements, structures, geotechnics
- Policy research program
  - Advisory committee comprising WisDOT staff from each division
    - Focused on planning, operations, safety, finance, etc.

Technology Transfer
Advancing Research into Practice

- Information requests
  - Literature searches (reports, papers, articles)
    - Required for each proposed research project topic
  - Synthesis reports (current practices, surveys)
- Peer exchanges
  - Discussions with experts and counterparts from other DOTs
- Project reports
  - Final reports and research briefs
- Communications
  - Website, social media, email blasts, bulletin articles, video

WisDOT Research Communication Plan

- Purpose: Facilitate technology transfer through a framework for communicating the findings and value of research to transportation policymakers and stakeholders
- Objectives
  - Evaluate and increase awareness of Research & Library activities/services
  - Increase the dissemination and impact of research findings
  - Measure effects of communication on research implementation

Research and Library Communications Plan

Overview

The Wisconsin Department of Transportation (WisDOT) Research and Library Services Unit (R&L) supports the department's mission to "provide leadership in the development and operation of a safe and efficient transportation system" through activities that promote data-driven decision making. Timely and effective dissemination of relevant research findings and materials is crucial to this mission; without it, valuable research may go unnoticed or be underutilized, resulting in a higher-cost, lower-performance transportation system. The Research and Library Communications Plan (RLCP) provides a framework for communicating the findings and value of research to transportation-policy makers and stakeholders.

1. Objectives

The objectives of this communications plan are to:

1. Evaluate awareness and perception of WisDOT R&L activities and services
2. Increase awareness of R&L activities and services
3. Increase and expedite dissemination of research findings to policy makers and stakeholders
4. Measure the effects of communication on research implementation

2. Strategies to support objectives

Each objective is supported by strategies, some already in practice and others yet to be incorporated, that aim to deliver specific messages to target audiences regarding R&L services and activities. A linear tactical plan will be developed for each of these strategies that describes how it will help achieve one or more of the four objectives and how the performance of each strategy will be assessed. These strategies, their priority level and the implementation status of each are listed in a table at the end of this document.

3. Target Audiences

WisDOT R&L serves a multitude of constituents, both internal and external to the agency. The communications plan has components that serve and inform each of the following audiences:

1. WisDOT staff
2. Other transportation agencies (e.g., state, federal, international)
3. Transportation industry stakeholders (e.g., contractors, researchers/institutions, trade associations)
4. Transportation system users
5. Taxpayers

4. Messages

Simply increasing the dissemination of research is not enough to achieve the objectives of this communication plan. Research requires buy-in from each of the listed target audiences. To ensure research is not overlooked or disregarded, each strategy should convey one or more of the following messages:

1. Research
   a. Is core to process improvement
   b. Aids in preservation of critical infrastructure
   c. Has measurable returns on investments
   d. Derives value from dissemination
   e. Benefits the citizens and stakeholders of Wisconsin and beyond
2. WisDOT
   a. Has an award-winning research program
   b. Understands the need for and benefits of research
   c. Supports and implements innovative ideas
   d. Has measurable returns on its investments in research
3. R&L serves to
   a. Identify areas of research need
   b. Provide opportunity for innovative ideas to be developed
   c. Expedite the research process by providing support throughout the research cycle
   d. Increase knowledge, time-savings and efficiencies for WisDOT staff
   e. Deliver research results to stakeholders who can implement improvements
   f. Communicate the value of research activities

5. Assessment

A strategic plan should be results driven and responsive to changing circumstances. The outcomes of each strategy and of the plan as a whole will be continuously monitored so that adjustments can be made to ensure efforts are effective and prioritized correctly. The ultimate goal of R&L is to support the implementation of promising research findings, but it is difficult to measure the exact level to which communication efforts can be credited for final results. Attributing any change in implementation to a specific strategy may be impractical, but safer assumptions can be made through the cumulative performance of all strategies in advancing the specific objectives of the communications plan

Methods for measuring the performance of each may include one or more of the following:

1. Tracking the following and evaluating for trends overall and coinciding with specific communication events:
   a. WisDOT website page and document views
   b. Proposals submitted for WisDOT projects
   c. Requests for information (lit searches/synthesis reports/library services)
   d. Social media interactions (e.g., follows, views, likes, shares, comments)
   e. Subscriptions to email updates
2. Reviewing awards and recognition received by WisDOT research projects such as:
   a. AASHTO High Value Research
   b. Inclusion in other organizations' newsletters and communications (e.g., TR News)
3. Media (e.g., television, newspaper) features/articles
   Compile and analyze feedback from target audiences
   a. Formal surveys
   b. Interpersonal communication at meetings/conferences
   c. Social media comments

WisDOT Research Communication Plan

Messages

- Research is valuable
  - Has measurable returns on investments
  - Core to process improvement and infrastructure quality
- WisDOT is innovative
  - Has an award-winning research program
  - Has measurable returns on its investments in research
- Research & Library activities are valuable
  - Facilitates research and innovation
  - Informs staff in decision/policy making

WisDOT Research Communication Plan
Audiences

- WisDOT staff
  - Staff, management, administrators, Secretary's Office
- Other transportation agencies
  - State DOTs, FHWA
- Transportation industry stakeholders
  - Contractors, researchers, industry, etc.
- Transportation system users
- Taxpayers

WisDOT Research Communication Plan

Current Strategies

Triggered / Responsive	Scheduled	Unscheduled
Create/publish final reports and research briefs	Post R&L updates/opportunities to bulletin	Track website, SharePoint, social media analytics
Fulfill information requests	Create and publish annual report	Host and facilitate attendance at peer exchanges and conferences
Post updates to research web pages	Send periodic email blast updates	Create promotional video(s) for R&L
Promote research on social media	Participate in High Value Research contest	

WisDOT Research Communication Plan

Potential Strategies

Triggered / Responsive	Scheduled	Unscheduled
Collaborate with PI's organization's to promote research	Prepare PowerPoint deck for Secretary's Office speaking events	Design/distribute handout outlining R&L services
Invite more staff to close-out presentations	Promote R&L services at new-hire orientation	Survey AASHTO RAC on communication plans
Leverage other organizations' newsletters/social media	Survey WisDOT staff / past "customers"	Contact local news outlets with hot-topic research

WisDOT Research Communication Plan

Tactical Planners

Tactical planners outline the implementation and assessment plan for prioritized strategies

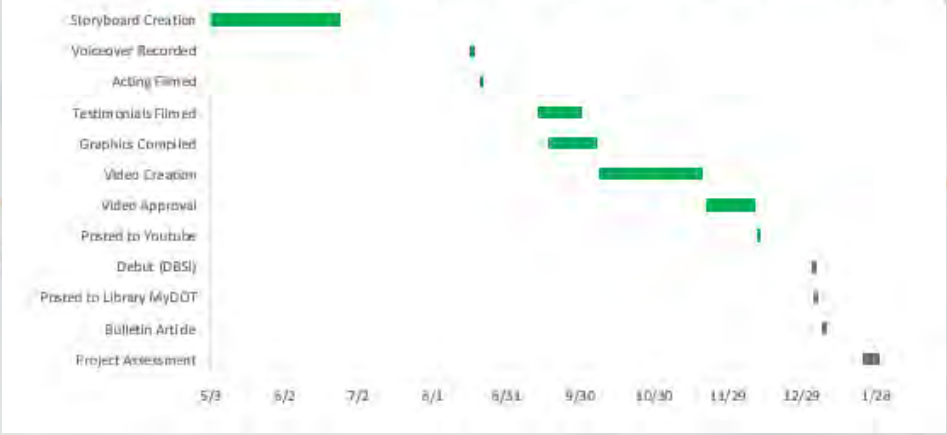
Planners incorporate the five key components of the communication plan

They establish a timeline for implementation and assessment

E.g., library services video plan

WisDOT Research & Library Services - Communications Plan
Library Services Video

Strategy	Create and distribute a video outlining and encouraging the use of library services available to WisDOT staff
Objective	Increase awareness of services provided by Research and Library
Target Audience	WisDOT staff (all divisions)
Key Message	Research and Library serves to: 1. Increase knowledge, time-savings and efficiencies for WisDOT staff 2. Provide opportunity for innovative ideas to be developed 3. Deliver research results to stakeholders who can implement improvements
Assessment	1. Web metrics (e.g., video and Library MyDOT page views) 2. Requests for services (e.g., literature searches, synthesis reports, materials)
Timeline	May 3rd, 2019 - January 30th, 2020 Completed (green): Storyboard created; voiceover created; acting filmed; testimonials filmed; graphics compiled; video created; video approved; posted to YT In progress (yellow): Next steps (grey): Post to MyDOT; Debut to DBSI; Bulletin article; assess metrics



https://youtu.be/UX0qAu5vcsM

WisDOT Research Communication Plan

Assessment

- Analytics and trends
  - E.g., Google Analytics, social media analytics, SharePoint document views, research project proposal submissions
- Awards and recognition
  - E.g., High Value Research, mentions in TR News
- Surveys and feedback
  - Formal and informal

Successful Technology Transfer

- Technology transfer goals
  - Design and facilitate research projects with applicable results
  - Communicate research results in timely and effective manner
  - Apply research findings to promote data-driven decisions
  - Determining metrics for gauging and success
- Opportunities / Challenges
  - Developing an implementation plan
    - Utilizing findings of NCHRP 20-44 *Implementation Support Program*
  - Limited resources

Innovations Challenge

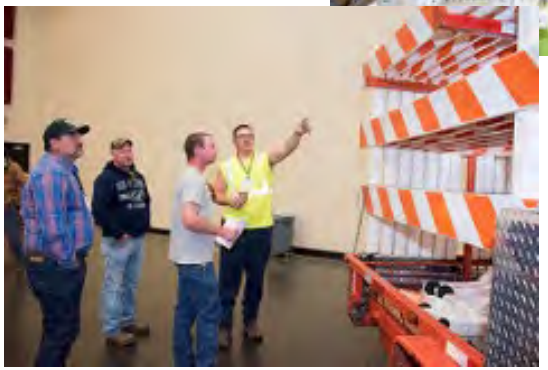
Our mission is to provide a world-class transportation system that is safe, innovative, reliable and dedicated to a prosperous Missouri.

Innovation Categories

- Tools and Equipment:
  Fabricated items getting work done better, faster and safer
- Projects:
  Efforts resulting in exceptional results for the transportation users or internal operations
- Productivity:
  Office and field processes, materials and products

Challenge Basics

- Local competitions
- Statewide evaluation
- Innovations Challenge Showcase
- Incentives for individuals, teams, districts and divisions



Statewide Evaluations

- All first round winners will be evaluated by district and Central Office evaluators to narrow the field to the top 60 for the Showcase
- District and Central Office judges will evaluate all exhibitors

Innovations Challenge Showcase

- Allows employees to see innovations from other areas in one location
- Identifies as many as four Showcase winners per category
- Director's Awards chosen by the director at the Showcase
- Dickson People's Choice Award chosen by everyone attending the Showcase

Incentives for individuals, teams, districts and divisions

- First-round winners earn $75 per person up to a maximum of $450 per team
- Showcase category winners earn up to $425 per person up to a maximum of $1,550 per team
- Showcase winners will earn from $1,000 to $10,000 for the district or division budget
- Trophies to display in their work areas

MoDOT's Virtual Innovations Showcase

Innovations Challenge

Questions?

Appendix I.


American Center for Mobility
CONNECTED. AUTOMATED. VALIDATED.

OVERVIEW

The American Center for Mobility is the catalyst for the advancement of mobility solutions focused on three main areas that will drive the global mobility industry forward to include testing, standards and education.

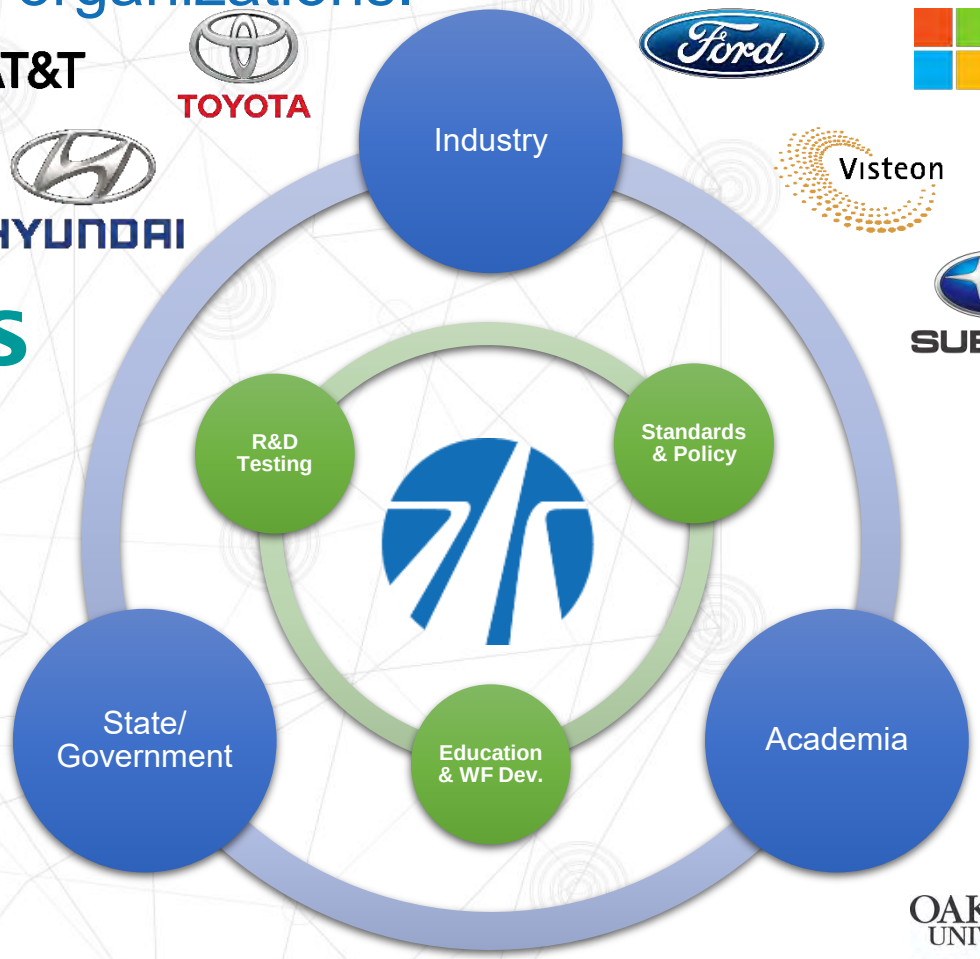
Accelerate the research, development, test and validation process of mobility products and technologies in a safe and re-configurable environment

Support industry standardization and policy requirements of mobility products and technologies

Empower workforce development, through education and immersion with mobility products and technologies

OVERVIEW

ACM is a not-for-profit public and private effort comprised of government, industry and academic organizations.



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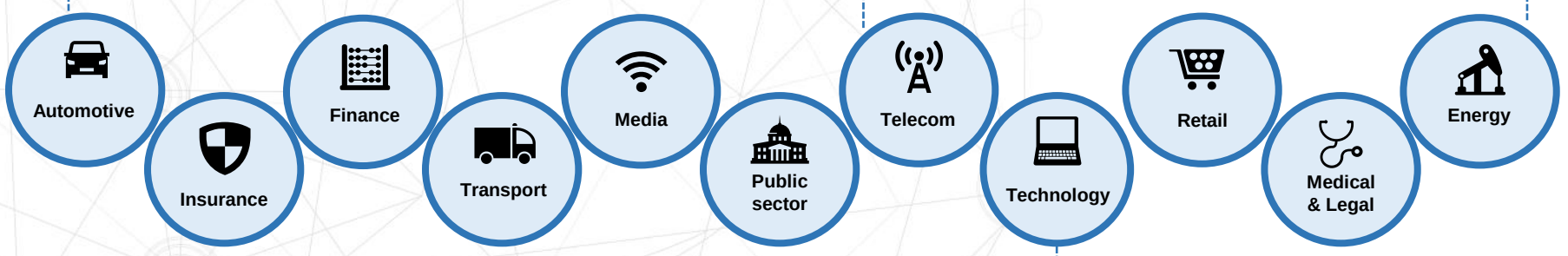
OVERVIEW

ACM's targeted membership and customer base extends across a variety of industries within the mobility ecosystem.

Customers in the **Automotive** industry include OEMs, Tier 1 and Tier 2 Suppliers, Dealers, and Aftermarket Sales Organizations. Automotive customers *interests range from supplementary testing to workforce development*.

Telecom companies will likely be *interested in testing connectivity services (e.g. 5G, V2X), connection to industry, and research.*

Energy companies as well as charging infrastructure providers may be interested in *testing new charging infrastructure and Smart Grid technology*.



Fleet operators, **logistics** companies, and commercial vehicle operators may be interested in *testing new technologies, **intermodal** transport, or delivery methodology*.

Representatives of **cities** and municipalities will likely need to *test connected infrastructure as well as privately operated emergency fleets.*

Technology companies range from startups looking for *a place to incubate and test their products* to larger mobility management organizations and technology providers *interested in research, testing, and public education*.

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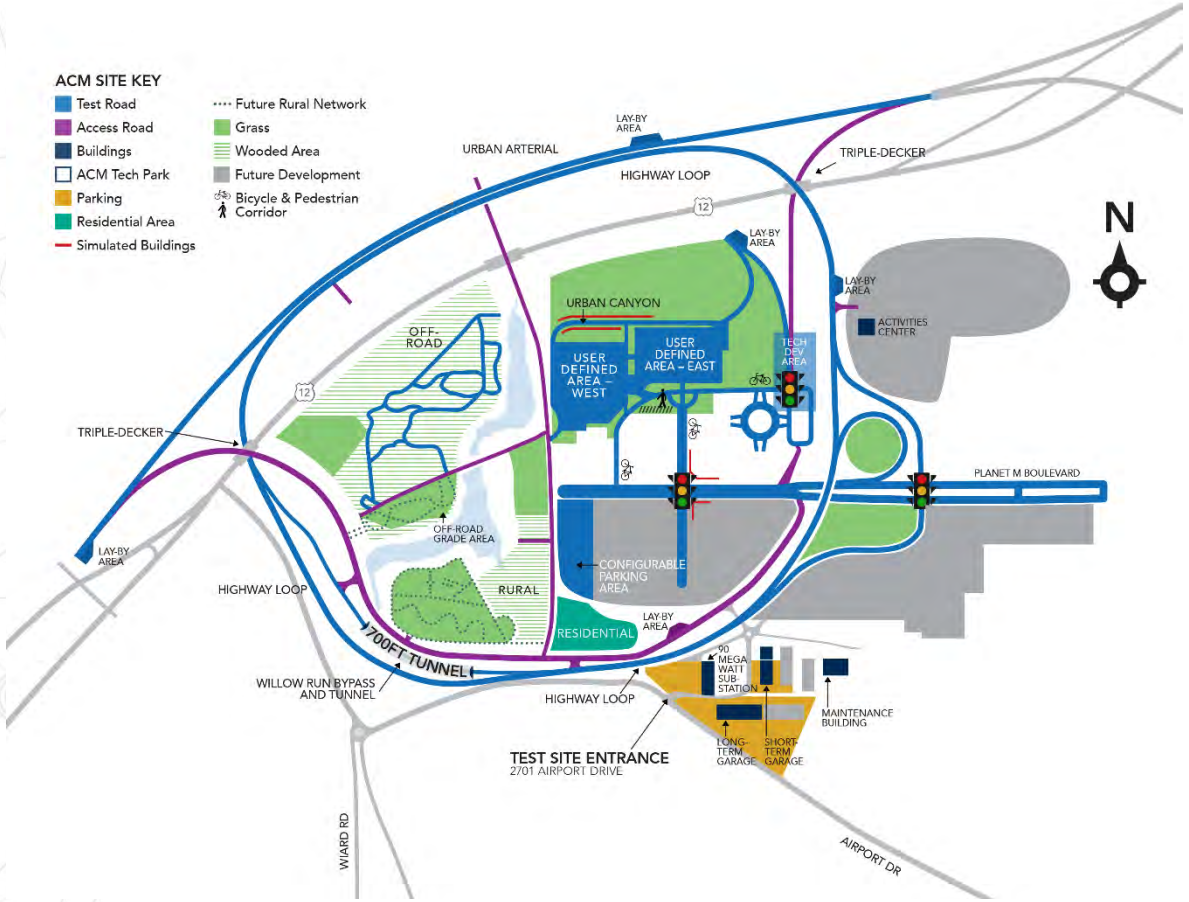
RESEARCH, DEVELOPMENT, TEST & VALIDATION

The ACM is a one-of-a-kind global **Smart City Test Center** providing a platform for the integration of emerging mobility technologies in intentionally challenging environments.

- Over 500 acres of variable road systems and customizable test environments
- Comprehensive Intelligent Transportation System network
  - World's first CAV specific 5G Network (AT&T Global Test Bed)
  - Closed data network to support testing and product development activities
  - Cloud services for high volume data transfer
- Concierge engineering services
- Private vehicle laboratories



RESEARCH, DEVELOPMENT, TEST & VALIDATION

The ACM Smart City Test Center is unique from other test centers, fully equipped with the technologies that enable test and validation of V2X interoperability.

At ACM companies can test:

- Vehicle sensor function and environm
- Interaction of the vehicle with real wo communciations infrastructure
- With large amounts of vehicles
- With other types of road users
- With multiple (competing) companies

RESEARCH, DEVELOPMENT, TEST & VALIDATION

The ACM is regarded as a leader in research and development of emerging mobility technologies, recipient of multiple technical research grants from the US government.

U.S. DOE: Office of Energy Efficiency and Renewable Energy (EERE)

Project: Fuel Efficient Platooning In Mixed Traffic Highway Environments

Sub-Recipients:

University of Michigan-Dearborn

Auburn University

Michigan Department of Transportation

U.S. Army Combat Capabilities Development Command, Ground Vehicle Systems Center

U.S. DOE, National Renewable Energy Laboratory

U.S. DOE: Office of Energy Efficiency & Renewable Energy (EERE)

Program: Energy Efficient Mobility Systems (EEMS) Vehicle Technologies Office (VTO)

Project: Validating Connected, Automated, and Electric Vehicle (CAEV) Models & Simulation

Sub-Recipients:

Michigan Technological Research Institute

Michigan Technological University

U.S. DOT: Federal Highway Administration

Project: Automated Driving System (ADS) Demonstration Grant

Collaborative Recipients:

MEDC

MDOT

American Center for Mobility

Mcity & UMTRI

University of Michigan

Wayne State University

Ford Smart Mobility LLC

Deloitte LLP

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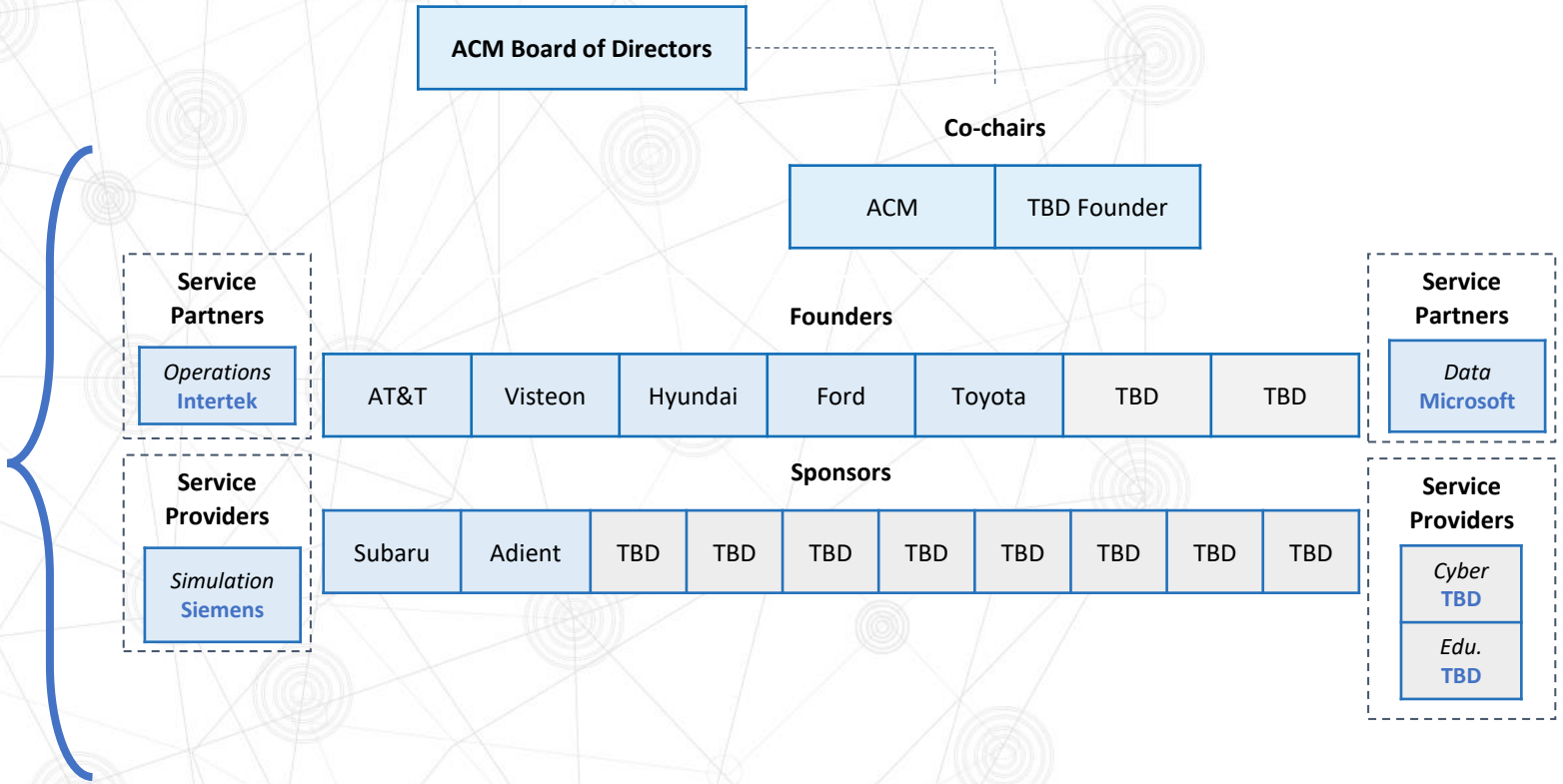
INDUSTRY ADVISORY BOARD

A seat on the ACM Industry Advisory Board offers access to and integration with the Detroit mobility ecosystem including suppliers, partners, and policy leaders.

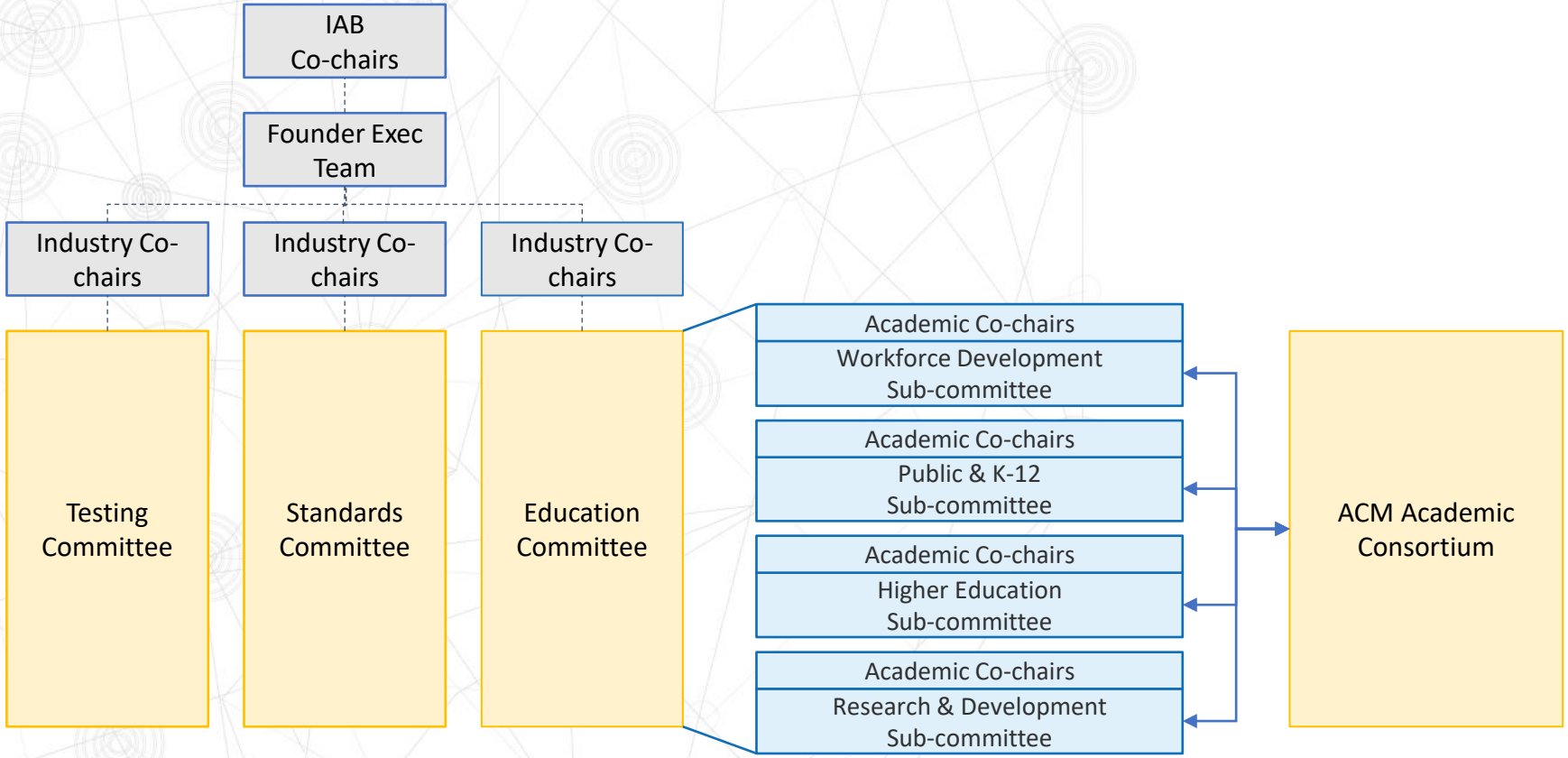
American Center for Mobility

INDUSTRY ADVISORY BOARD



INDUSTRY ADVISORY BOARD

The ACM Industry Advisory Board is structured to create cross-industry collaboration on core areas within the mobility industry, the development of committees further supports the development of programs that can create the impact needed to move the industry forward.



INDUSTRY ADVISORY BOARD

Benefits of a seat on the ACM Industry Advisory Board give your organization the advantage to be positioned at the cutting edge of the mobility industry.

- REPRESENTATION at world-class CAV purpose built, third party testing facility offering agnostic testing with wraparound services including data management, labs, and physical track testing
- PREFERRED ACCESS and accommodations regarding testing configuration, operations, and services
- PROVIDE INPUT AND INFLUENCE the development of future STANDARDS for CAV related technologies
- INFLUENCE AND SHAPE WORKFORCE development programs to next train the workforce in response to changing technologies; opportunity to influence public education / adoption
- NETWORK WITH LEADERS in industry and academia and be a part of FoM/CAV education discussion (branding, marketing)
- TECHPARK: CO-WORKING SPACE close to ACM test track and tied to the CAV / mobility community; opportunity to work alongside and make connections with leaders and innovators in the CAV/mobility space
- TECHCASE: ACCESS to potential partners /acquisition targets/technology providers and priority access to TechCase or startups
- ADDITIONAL BENEFITS
  - Advance booking for exclusive use of test environments
  - Influence facility design priorities
  - Interact with federal government policy makers and technical users
  - First or Second choice on dedicated, secure garage space
  - Naming rights to significant facility features
  - Recognition in entryway and on ACM marketing materials
  - Participate in professional, promotional, educational, and workforce development programs and events
  - Conduct marketing and branding events for customers and media

INDUSTRY ADVISORY BOARD

A seat on the ACM Industry Advisory Board offers a low barrier to entry to the mobility innovation market.

- Immediate access to ACM's established smart city test center embedded with intelligent transportation system technologies.
- Integration with the mobility ecosystem including OEM's, suppliers, and policy leaders in Detroit, Washington DC, California, throughout the nation and connected to the world.
- Immersion with a diverse and growing industry group including:
  - Automotive
  - Telecommunications
  - Energy
  - Technology
  - Simulation
  - Academia

INDUSTRY ADVISORY BOARD

The ACM Industry Advisory Board has a clear vision and mission to drive collaborative results.

Vision

Convene key leaders across the mobility ecosystem in order to shape the future state of ACM and to best service its stakeholders in changing the mobility landscape.

Mission

The ACM IAB's mission is to bring investment partners together to gain their strategic and operational guidance on testing, standards, and education related to future mobility. Engaging diverse representatives from industries will lend ACM a unique lens into the rapidly evolving mobility space, provide guidance as the landscape changes, support ACM's intention to be a world class convener of the mobility ecosystem and facilitate connection and collaboration of partner organizations to advance technologies and capabilities in the space.

INDUSTRY ADVISORY BOARD

The ACM Testing Committee provides a platform for industry to inform developments needed for testing emerging mobility technologies as they evolve.

Purpose

- To convene on strategies and topics related to the test needs of the industry, feedback on current services and input on future developments.

Goals

- Seek insights on needed environments for testing.
- Create integrated solutions at ACM.
- Identify related programming to support the expansion of ACM Smart City testing capabilities.

INDUSTRY ADVISORY BOARD

The ACM Standards Committee acts as a neutral convener of industry, standards and government organizations to collectively discuss and shape mobility technology standards.

Purpose

- Participate in the accelerated development of standards and suggested regulation terminology concerning the mobility industry

Goals

- Identify existing standards organizations focusing on mobility solutions
- Partner with select organizations and suggest direction and guidelines
- Coordinate ACM utilization for standards verification and validation
- Maintain a global perspective

INDUSTRY ADVISORY BOARD

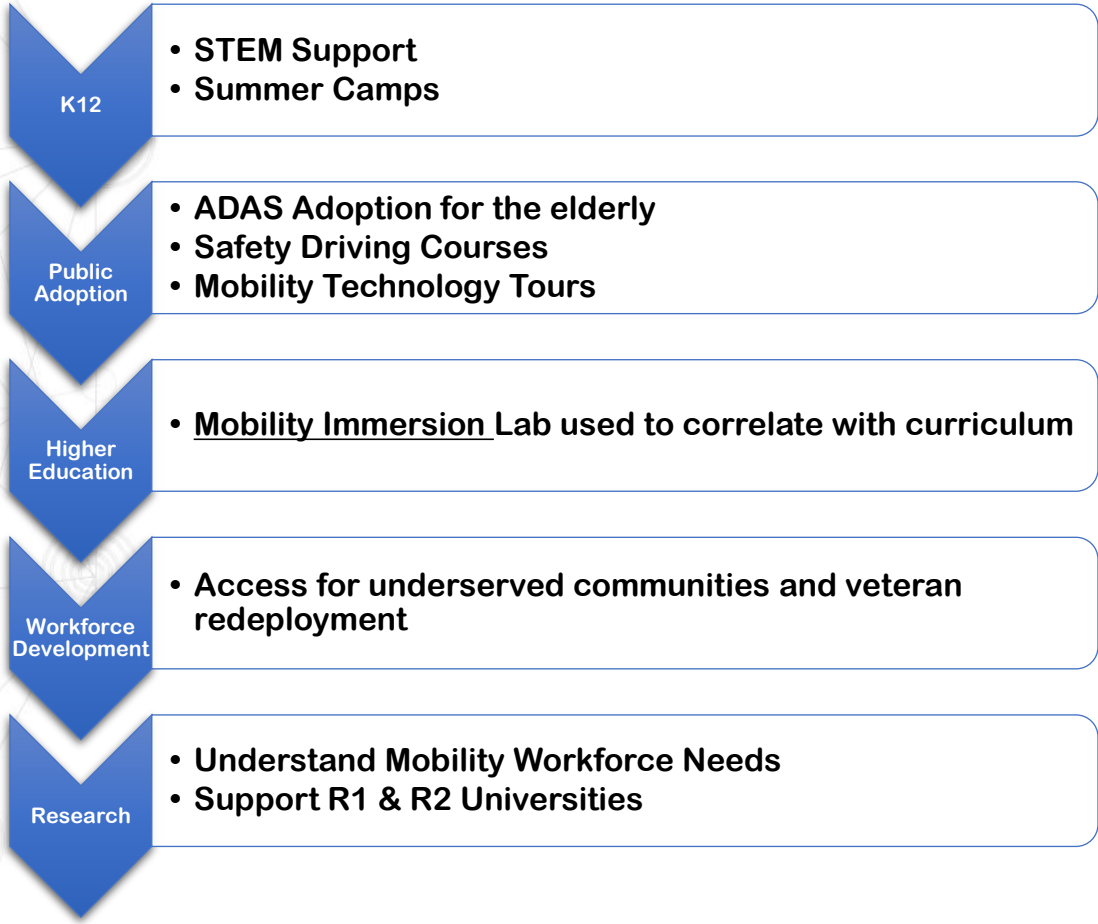
The ACM Education Committee works to empower a new technical mobility workforce with educational activities that span the life-long learning process.

Purpose/Mission

To identify, develop and offer education, training and research in future mobility systems by convening academic and industry leaders to build the talent pipeline and advance technology development.

Goals

- Create ongoing integrated learning tools and platforms with industry partners that shrink mobility industry skills gaps
- Lead teach-the-teacher events in STEM mobility activities
- Be known as a state and national resource to host student mobility competitions at ACM



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EDUCATION

The ACM Academic Consortium is comprised of Michigan colleges and universities led by the ACM IAB Education Committee to create workforce solutions.

- Academic Consortium: 15 Michigan Colleges and Universities
  - Individual meetings with
    - Deans of Research
    - Dean of Engineering
    - Dean of Computer Science
    - Career Services
  - Reconvene Consortium: Q4 2019

American Center for Mobility Foundation

The ACM Foundation helps to provide funding support for the development of programs and activities that create the desired industry impact. IAB members are the advocates that help to build a strong legacy for the industry.

Purpose

- To create an opportunity for industry and community organizations to contribute to the development of programs that will accelerate the mobility industry through testing, standards, and workforce development.

Goals

- Develop educational programming
- Offer programming to underserved communities
- Host STEM activities at ACM facility
- Support additional ACM campus growth
- Stimulate start-up incubation and acceleration
- Create targeted programs for specific industry mobility advancements
- Advance public adoption and understanding of mobility technologies for safety

TECHNOLOGY PARK

The ACM technology park will further act as a community and educational accelerator for ongoing collaboration of mobility technology companies, including start-ups and ventures.

- 300,000 - 500,000 sqft of multi-tenant space
- 26 total acres
- Potential building uses:
  - Individual/Shared Offices
  - Innovation Labs
  - Start-up Incubators
  - Conferencing & Events
  - Education & Workforce Dev. Labs

EVENTS AND CONFERENCES

The ACM is a unique venue to host automotive and mobility events and conferences, where context is everything. Display and drive vehicles while easily accommodating small groups, hold your next board meeting here, or use the entire facility for a private event.

Venue Accommodates

- Educational and Hands-on Workshops
- Vehicle Technology Trainings
- Vehicle & Dealer Demonstrations
- Corporate Initiatives
- Vehicle Reveals
- Public Industry Conferences

Technology

- Audio Visual LCD Screens
- Conferencing speaker phone system
- WiFi and fiber connectivity

Capacity

- Vehicle Laboratories accommodate 25-200 people
- Heated/Cooled outdoor tents expand capacity to 1000+ people
- 3000 sq. ft. of shared class A reconfigurable Conference Rooms
  - (3) Accommodate 15 people - combined to 40
  - (1) Accommodate 20 people
  - (1) Accommodate 6 people

Support Services

- Catering service coordination
- AV equipment and technical support staff
- Common area lounge and kitchen

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Thank You