Idaho TD, New Mexico DOT, and Washington State DOT 2026 Research Peer Exchange

FINAL REPORT



Lake Coeur d'Alene Scenic Byway, Idaho
(Source: Idaho TD)



Rio Grande Gorge Bridge outside Taos, New Mexico
(Source: New Mexico DOT)



Evergreen Point Floating Bridge, State Highway 520, Seattle
(Source: Washington State DOT)

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16. Abstract

Idaho Transportation Department, New Mexico Department of Transportation, and Washington State Department of Transportation, in collaboration with the Western Transportation Research Consortium (WTRC), hosted a peer exchange May 19-21, 2026, in Boise, Idaho. The publication of this report fulfills the agencies' obligations to conduct a periodic peer exchange as part of the federal State Planning & Research program. The event focused on four themes: (1) regional research, (2) emerging technologies and future research trends, (3) preparing for Federal Highway Administration (FHWA) management process reviews and SPR-B programs ("desk reviews") and (4) anatomy of a successful implementation through completed research. Participants of the three-day event included staff from the WTRC members (the state DOTs of Alaska, California, Colorado, Idaho, Montana, Nebraska, New Mexico, Nevada, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Washington State) and FHWA. Based on presentations and group discussions, participants shared what they saw as the strengths, challenges, and opportunities for the host agencies in the areas discussed, and takeaways for their home agencies.

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TABLE OF CONTENTS

Peer Exchange At-A-Glance 1

Peer Exchange Themes 1

Top Findings and Takeaways 1

Regional Research 1

Emerging Technologies and Future Research Trends 2

Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews") 2

Anatomy of a Successful Implementation Through Completed Research 3

Meeting Introduction and Overview 4

Peer Exchange Participants 4

Format 5

Topic Discussions 6

Peer Exchange Theme 1—Regional Research 7

Overview 7

Presentation 7

Discussions and Findings 7

Alaska DOT&PF – Innovative Responses to Typhoon Halong 7

Research Updates 8

Consortium Best Practices 8

Peer Exchange Theme 2— Emerging Technologies and Future Research Trends 10

Overview 10

Presentations 10

Discussion and Findings 10

Successes and Best Practices 10

Challenges and Opportunities 12

Peer Exchange Theme 3—Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews") 13

Overview 13
Presentations 13
Discussion and Findings 13
Successes and Best Practices 13
Challenges and Opportunities 14
Peer Exchange Theme 4—Anatomy of a Successful Implementation Through Completed Research 16
Overview 16
Presentations 16
Discussion and Findings 16
Successes and Best Practices 16
Challenges and Opportunities 18
APPENDIX A. WTRC 2026 Meeting and Peer Exchange Agenda
APPENDIX B. Alaska DOT&PF – One Map, One Mission: A GIS Based Common Operating Picture
APPENDIX C. New Mexico DOT – UAS and Augmented Reality for Bridge Inspection
APPENDIX D. Idaho TD – RARE: Building Reusable Research Capacity with AI
APPENDIX E. Washington State DOT – Forecasting Truck Parking with AI
APPENDIX F. New Mexico DOT – Developing Key Performance Indicators & Implementation Planning for Research Planning
APPENDIX G. Idaho TD – Anatomy of a Successful Implementation

LIST OF FIGURES

Figure 1. Meeting Participants 6

PEER EXCHANGE AT-A-GLANCE

Host Agencies: Idaho Transportation Department (ITD), New Mexico Department of Transportation (NMDOT), and Washington State Department of Transportation (WSDOT).

Participating Agencies: Alaska Department of Transportation & Public Facilities (DOT&PF), California Department of Transportation (Caltrans), Colorado Department of Transportation, Montana Department of Transportation, Nebraska Department of Transportation, Nevada Department of Transportation, North Dakota Department of Transportation, Oklahoma Department of Transportation, South Dakota Department of Transportation, Texas Department of Transportation, Utah Department of Transportation, and the Federal Highway Administration (FHWA).

PEER EXCHANGE THEMES

Regional Research: For the first theme, participants reviewed completed and in-progress WTRC 2025 research projects, selected and initiated WTRC 2026 research, and discussed possible new activities and improved processes for the consortium. In addition, attendees learned how Alaska DOT&PF used ingenuity and innovation to aid citizens in the aftermath of Typhoon Halong.

Emerging Technologies and Future Research Trends: The host states shared experiences and insights on emerging technologies and their research programs. This included state DOT research into new technologies, as well as how agencies use new technologies to conduct research.

Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews"): The host states shared their experience going through, or preparing for, an FHWA Desk Review, highlighting tools and strategies to help with preparation and next steps following the review. Attendees provided their own examples of tools and processes they have, or are planning for, should they undertake an FHWA Desk Review.

Anatomy of a Successful Implementation Through Completed Research: For the last theme, host states highlighted recent successful research implementations and associated processes. They discussed program successes and best practices, strategies they have used to overcome obstacles, and current program challenges.

TOP FINDINGS AND TAKEAWAYS

Regional Research

- **WTRC's one-year synthesis and quick-turnaround project approach** is functioning as intended and **provides funding routes to timely research efforts** that benefit the members.
- **Include implementation plans for WTRC projects** that states could institute at their agencies.
- **The peer exchange is a great venue to network and share ideas among agencies.**
- **Continue to have only the host states give short presentations on peer exchange topics,** which allows more time for discussion among the members.
- **Survey members before the peer exchange to gather program information and processes** related to the peer exchange themes.
- **Use live polling to select community of practice topics**, unrelated to peer exchange topics, that can be discussed during the peer exchange.

- **Make members' tech transfer success stories — the implementation of ideas learned at WTRC peer exchanges — a standing agenda item** for all WTRC meetings.
- **Discuss communication and coordination among all RAC region consortiums** to better share ideas and information.
- Alaska's research program, using SPR-B funding, will build a tool that can be used in future emergencies to help with response, coordination, assessment and updates. **The agency's ingenuity provides a roadmap for other DOTs** when planning for an emergency.

Emerging Technologies and Future Research Trends

- **Plan for a workshop and tech transfer materials at the beginning of a project to get buy-in and accelerate implementation.**
- **Integrate state DOT efforts with other agencies and groups**, such as pooled funds, to address a national issue.
- **Partner with universities to innovate**, as Washington State DOT did with the University of Washington Smart Transportation Applications & Research (STAR) Lab.
- **AI-assisted research can potentially be done in a much shorter timeframe and at a significant cost savings.**
- **AI may support work for some types of research** (analysis, literature reviews, coding, reports) **but not others** (physical or lab work).
- **Experiment with using AI for parts of a research project** to save time and money.
- **Hold regular show-and-tell sessions so staff learning AI can share their successes and challenges.**
- **Review of AI products is crucial** to ensure information in a report or product is correct and presented appropriately.

Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews")

- Washington State's **Research Program Core & Key Responsibilities spreadsheet is a comprehensive tool for tracking and coordinating Research activities**, showing activity purpose, audience, owner, due date, and status.
    - The spreadsheet shows the important areas of the Research Program to Research staff and agency executives and organizes program information so Research staff members can intelligently and quickly discuss their program.
    - The Key Activities section provides information staff can use to complete the Annual Work Program.
    - The spreadsheet shows activities the Research Program conducts in addition to FHWA guidance.
- **Turn FHWA's checklist into a spreadsheet to organize information with links** to relevant documents.
- **A Gantt chart/schedule to visually display research activities is a helpful tool** for Research staff and agency staff who may not be well informed of Research Program processes and timelines.

Anatomy of a Successful Implementation Through Completed Research

- **Coordinate the State Transportation Innovation Council (STIC) with the Research Program and projects**.
- **Build implementation plans into research contracts** (professional service agreements) to ensure each project has an implementation plan.
- **Include user guides, workshops, and training in the projects** as a step towards buy-in and implementation.
- **A successful implementation may be simple,** such as a program manual update or a process review.
- **Define and document roles and responsibilities and focus on preserving institutional knowledge** to help ensure implementation and sustainability from start to finish.
- **Utilize the Research project manager, via onsite visits, to share and implement** a project tool after the research is complete.
- **Use AI to create project presentation graphics** to engage the audience.
- **Focus on applied and innovative research**.
- **Fund innovative research at a lower level than applied research** to mitigate risk.
- **Tie innovative research to strategic goals** when selecting projects that have meaning to the agency.
- **Use the likelihood of implementation as a rating criterion for requested research projects** to ensure that most selected projects will be implemented.
- **Identify upstream and downstream stakeholders, risks, and opportunities of innovative research** to get a better idea of a project's impact.
- **Spreadsheets** that provide a multifaceted view of projects **allow project managers to quickly assess risk and project status**.

MEETING INTRODUCTION AND OVERVIEW

ITD, NMDOT, and WSDOT, in collaboration with WTRC, hosted a peer exchange from May 19-21, 2026 in Boise, Idaho. The publication of this report fulfills the agencies' obligations to conduct a periodic peer exchange as part of the federal State Planning & Research (SPR) program. The peer exchange was funded by the WTRC pooled fund.

The peer exchange focused on four themes:

- Regional Research
- Emerging Technologies and Future Research Trends
- Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews")
- Anatomy of a Successful Implementation Through Completed Research

For each theme, participants shared their own agency's experiences and noted the host agencies' strengths and opportunities for enhancement.

PEER EXCHANGE PARTICIPANTS

The peer exchange included representatives from across and beyond the western region of the United States in order to represent a variety of interests and perspectives. Participants included ITD, NMDOT, WSDOT, 11 additional state DOTs representing the membership of WTRC, and FHWA.

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

Host State DOTs

Idaho Transportation Department
- Mike Copeland, Construction and Materials Quality Assurance Program Manager
- Caleb Forrey, Freight Program Manager
- Amanda Laib, Research Program Manager
- Amy Schroeder, Highways Division Administrator
- Casey Walker, Principal Research Analyst, Research Program

New Mexico Department of Transportation
- Angelo Armijo, Staff Manager, Research and Climate Bureau
- Randolph Trujillo, Research and Climate Bureau Chief

Washington State Department of Transportation
- Anne Freeman, Research & Library Services Program Administrator
- Shervin Jahangirnejad, Research Coordinator, Research & Library Services
- Mustafa Mohamedali, Research Coordinator, Research & Library Services
- David Strich, Research Coordinator, Research & Library Services
- Kathy Szolomayer, Technology Transfer/Implementation Coordinator, Research & Library Services

Participating WTRC State DOT Research Programs

Alaska Department of Transportation & Public Facilities

Cristina DeMattio, Program Manager, Research & Technical Training

California Department of Transportation

Heather Loebs, Acting Chief, Office of Safety Innovation and Cooperative Research

Prakash Sah, Chief, Division of Research, Innovation and System Information

Colorado Department of Transportation

Steve Cohn, DTD Assistant Director for Research, Office of Applied Research

Montana Department of Transportation

Alexandra Nelson, Research Project Manager

Nebraska Department of Transportation

Mark Fischer, Assistant Materials & Research Engineer, Research Program Manager

Lieska Halsey, Research Engineer, Research Project Manager

Nevada Department of Transportation

Mitch Ison, Research Coordinator

Lucy Koury, Assistant Chief, Research, Product Evaluation & Library

North Dakota Department of Transportation

T.J. Murphy, Research Engineer

Oklahoma Department of Transportation

Gary Hook, Engineering Manager

South Dakota Department of Transportation

Thad Bauer, Inventory Management & Research Program Manager

Texas Department of Transportation

Kevin Pete, Division Director, Research and Technology Implementation

Utah Department of Transportation

Cameron Kergaye, Director of Research and Innovation

David Stevens, Research Program Manager

Federal Highway Administration

Katie Potts, Montana Division Office

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

FORMAT

Participants (Day 2 participants are shown in Figure 1) attended the in-person peer exchange in Boise, Idaho. The meeting agenda for the three-day event is included as Appendix A to this report.



Figure 1. Meeting Participants

From left to right, back row: Katie Potts, Mike Copeland, Lucy Koury, Casey Walker, Cameron Kergaye, Mustafa Mohamedali, Amanda Laib, Cristina DeMattio, Alex Nelson, T.J. Murphy, and Shervin Jahangirnejad. Front row: Angelo Armijo, Steve Cohn, Kevin Pete, David Strich, Mark Fischer, Prakash Sah, Caleb Forrey, Heather Loebs, Lieska Halsey, Thad Bauer, Gary Hook, and Mitch Ison.

TOPIC DISCUSSIONS

Participants discussed research-related themes of specific interest to the three host agencies. Each session included prepared presentations from the hosts, as well as additional presentations from participating states.

Theme 1: Regional Research

Theme 2: Emerging Technologies and Future Research Trends

Theme 3: Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews")

Theme 4: Anatomy of a Successful Implementation Through Completed Research

PEER EXCHANGE THEME 1—REGIONAL RESEARCH

OVERVIEW

Theme 1 of the peer exchange, Regional Research, was largely dedicated to WTRC activities in selecting, conducting, reporting on, and coordinating its regional research program. This year's activities included:

- Review of completed and in-progress Year 2025 research projects
- Selection and initiation of Program Year 2026 research
- Business and planning for WTRC, including discussion of possible new activities and improved processes

Key discussion items, outcomes, and decisions are documented in the WTRC Research and Business Meeting notes published on the WTRC website.

The theme of regional research was also an opportunity for a presentation focusing on regional innovation from a member agency. Attendees heard about how multiple state and local agencies worked together in Alaska to aid citizens in the wake of Typhoon Halong.

PRESENTATION

Cristina DeMattio, Alaska DOT&PF, presented the state's innovative response, using several technologies, to damage from the October 2025 Typhoon Halong. This presentation is reproduced as an appendix to this report.

> Appendix B. Alaska DOT&PF – One Map, One Mission: A GIS Based Common Operating Picture, Cristina DeMattio, Alaska DOT&PF

DISCUSSIONS AND FINDINGS

Alaska DOT&PF – Innovative Responses to Typhoon Halong

The group agreed that Alaska's ingenuity provided a helpful roadmap for other DOTs when planning for an emergency. Additional discussion highlights follow.

- To deal with the impact of Typhoon Halong on 50 difficult-to-reach Alaskan communities, state, federal, and tribal agencies worked together to aid citizens.
- GIS mapping and AI were used to assign addresses to houses in 20 communities for emergency response and damage assessment. A dashboard was built to track and catalog damaged houses. This rolled into a community dashboard with updates for citizens.
- Multiple agencies needed to view and navigate drone footage. Alaska DOT&PF developed a Python workflow that stitched video and GIS files together and pulled the videos into apps every 15 minutes, which saved significant time and effort.
- Drone aerial footage was coordinated with GoPro ground footage to help responders know where they were and what they were looking at.
- The Research Program, using SPR-B funding, will build a tool that can be used in future emergencies to help with response, coordination, assessment, and updates.
    - In this scenario, innovation of new tools and apps is leading to a research project.

Research Updates

Based on the review of Year 2025 research projects during theme 1 of the peer exchange, attendees shared takeaways on WTRC's research program as constructed — what's working well, and what might be improved.

- The research updates were informative.
- The Topical Discussion on Highly Modified Asphalt was timely and well received by staff engineers and industry.
- The findings from the Wildlife Fencing Effectiveness in Reducing Crashes are interesting and applicable to most member states.
    - The crash modification factors (CMFs) developed in this project are encouraging.
- The potential pooled fund to come out of Estimating Bridge Scour During Hydrological Disaster and Extreme Weather Events will be of interest to bridge staff.
- The Documenting the Research Study Process project results will be useful. A similar effort for innovation programs is needed.
- The one-year synthesis and quick-turnaround project approach is functioning as intended and provides funding routes to timely research efforts that benefit the members.
- Include implementation plans for WTRC projects that states could institute at their agencies.

Consortium Best Practices

Participants identified current effective practices and possible new opportunities for WTRC as a whole.

- The peer exchange format was beneficial to attendees. Continue with the general order of completed-year project updates, coming-year project selections, peer exchange topics, and the business meeting.
- Project submitters should spend more effort estimating the project costs to make it easier to select projects.
- The peer exchange is a great venue to network and share ideas among agencies.
- Continue to have only the host states give short presentations on peer exchange topics, which allows more time for discussion among the members.
    - Host states should continue to have different staff members give their topic presentations when possible to provide a range of voices during the peer exchange.
- Survey members before the peer exchange to gather program information and processes related to the peer exchange themes.
- Use live polling to select community of practice topics, unrelated to peer exchange topics, that can be discussed during the peer exchange.
    - These topics could also be addressed at AASHTO RAC Region 4 meetings.
- Make members' tech transfer success stories — the implementation of ideas learned at WTRC peer exchanges — a standing agenda item for all WTRC meetings.

- Discuss communication and coordination among all RAC region consortiums to better share ideas and information.
    - Bring consortium leadership together at the 2027 RAC Summer Meeting to share updates, information and insights.
- Develop a WTRC email distribution list and send a weekly news item to the group to communicate WTRC activities and project deliverables.
- The WTRC website is well organized and a great resource for members and others.

PEER EXCHANGE THEME 2— EMERGING TECHNOLOGIES AND FUTURE RESEARCH TRENDS

OVERVIEW

The host states shared experiences and insights on emerging technologies and their research programs. This included state DOT research into new technologies, as well as how agencies use new technologies to conduct research.

PRESENTATIONS

The three host states gave presentations highlighting specific emerging technologies at their agencies; Q-and-A among attendees followed each presentation. These are reproduced as appendices to this report.

Appendix C. New Mexico DOT – UAS and Augmented Reality for Bridge Inspection, Angelo Armijo, New Mexico DOT

Appendix D. Idaho TD – RARE: Building Reusable Research Capacity with AI, Mike Copeland, Idaho TD

Appendix E. Washington State DOT – Forecasting Truck Parking with AI, David Strich, Washington State DOT

DISCUSSION AND FINDINGS

Attendees shared useful and meaningful emerging technologies used by their agency. Attendees also discussed their agency's most significant challenges related to emerging technologies and how they address those challenges. These comments were collected during group discussions, via a Mentimeter poll taken at the end of the session and in report-out forms that participants completed and submitted after the session.

Below are the host states' successes and best practices and challenges and opportunities as identified by attendees.

Successes and Best Practices

- New Mexico DOT
    - Augmented reality (AR) collects objective bridge data in the field, which saves time for inspectors.
        - AR saves bridge data that can be shared across time and space with field inspectors.
        - Using computer vision (CV) guided by an inspector ensures reliability in bridge assessments.
    - Unmanned aerial systems (UAS) collect structural information in a streamlined manner that saves time and money.
        - UAS bridge inspections are quicker, cheaper, safer, and provide improved access for inspectors.

    - Plan for an implementation workshop and tech transfer materials at the beginning of a project to get buy-in and accelerate implementation.
    - Include training and certification as deliverables to a research project.
    - Coordinating the AR and UAS projects together allowed New Mexico to build a bridge database so inspectors can create field reports on the spot.
- Washington State DOT
    - Use multiple detection methods (sensors, cameras, Lidar) in conjunction with machine learning to predict available truck parking at rest stops.
    - Partner with universities to innovate, as Washington State DOT did with the University of Washington Smart Transportation Applications & Research (STAR) Lab.
    - Develop an app and dashboard to disseminate available parking information to truck drivers to help them plan their routes and timing.
    - Integrate state DOT efforts with other agencies and groups, such as pooled funds, to address a national issue.
    - The multi-phase approach to truck parking demonstrates a long-term solution.
    - Consider partnering opportunities with private and public entities that have large parking lots to provide truck parking. This has been put into practice in a peer WTRC state.
    - Work with entities with large parking lots to allow trucks to park in the lots during emergency situations, such as bad weather. This has been put into practice in a peer WTRC state.
- Idaho TD
    - Use Rapid Applied Research Environment (RARE) in conjunction with expert AI code research (EACER) for an iterative process that builds, refines, and tests an AI-generated product.
    - AI-assisted research can potentially be conducted in a much shorter timeframe and at a significant cost savings.
        - Consider using SPR funds to accelerate getting the agency what it needs through the use of AI.
    - AI may support work for some types of research (analysis, literature reviews, coding, reports) but not others (physical or lab work).
    - Train multiple staff to use AI so the group is familiar and comfortable with it.
        - In-house AI training can improve staff knowledge by building staff skillsets, helping with workforce development and knowledge retention.
    - Informal training by trying out AI in multiple scenarios is fast and inexpensive.
        - Structured training may be obsolete by the time it is presented.
    - Hold regular show-and-tell sessions so staff learning AI can share their successes and challenges and keep up with the fast pace of AI advancements.

    - Experiment with using AI for parts of a research project to save time and money.
        - Use AI for portions of a research project such as a literature review, survey, or synthesis.
        - Use AI to develop project tech transfer products including briefs, infographics, posters, presentations, or webinars. AI can be used to create engaging and entertaining products.
    - Involve IT staff at the beginning of a project utilizing AI to address permissions, data storage, and other issues.

Challenges and Opportunities

- New Mexico DOT
    - Future phases of a project may not get funded so build tangible outcomes into the project at the beginning.
        - Request funds for multiple phases at one time or build in contingency funding for additional project phases.
    - Share project findings with other states via a webinar.
- Washington State DOT
    - For a new truck parking app and dashboard to succeed, good word of mouth among truck drivers is critical to their acceptance and usage.
    - Consider leading a pooled fund that connects other agencies with the UW-Seattle STAR Lab to address truck parking nationwide.
    - A future effort could be to integrate the truck parking app into the 511 and ITS message board systems across corridors to promote its use after rollout.
- Idaho TD
    - Review of AI products is crucial to ensure information in a report or product is correct and presented appropriately.
        - AI review can be done through a human check and/or an iteration process.
        - Liability can become an issue if research contains incorrect AI-generated information or conclusions.
    - Be aware of the cultural shift that is needed for AI acceptance.
        - Consider how researchers will react to the agency using AI for portions of their research projects. Have the researcher do a peer review of an AI-generated product such as a literature search.
        - Get AI into the hands of more staff and teach them how to properly work with AI and become comfortable with it.
        - Be realistic about AI and balance optimism with cautious usage.
    - Consider developing a report or manual to highlight lessons learned and insights of using AI in a DOT setting.

PEER EXCHANGE THEME 3—PREPARING FOR FHWA MANAGEMENT PROCESS REVIEWS OF SPR-B PROGRAMS ("DESK REVIEWS")

OVERVIEW

The host states shared their experience going through, or preparing for, an FHWA Desk Review, highlighting tools and strategies to help with preparation, and next steps following the reviews.

PRESENTATIONS

Washington State DOT gave a presentation on the agency's experience with preparing for an FHWA "Desk Review." Anne Freeman reviewed a matrix on Washington State DOT's Research Program core and key responsibilities, and she also discussed elements of the December 2022 federal publication, FHWA Division Review of State Department of Transportation: Research Management Process.

DISCUSSION AND FINDINGS

Attendees provided examples of tools and processes they have, or are planning for, should they undertake an FHWA Desk Review. These comments were collected during group discussions, via a Mentimeter poll taken at the end of the session and in report-out forms that participants completed and submitted after the session.

Below are the host states' successes and best practices and challenges and opportunities as identified by attendees.

Successes and Best Practices

- Washington State DOT
    - The Research Program Core & Key Responsibilities spreadsheet is a comprehensive method for tracking and coordinating Research activities, showing activity purpose, audience, owner, due date, and status.
        - The spreadsheet shows the important areas of the Research Program to Research staff and agency executives.
        - The spreadsheet organizes program information so Research staff can intelligently and quickly discuss their program.
        - The Key Activities section provides information staff can use to complete the Annual Work Program.
        - The spreadsheet shows activities the Research Program does in addition to FHWA guidance.
- Idaho TD
    - Turn FHWA's checklist into a spreadsheet to organize the agency's information with links to relevant documents.

    - A Gantt chart/schedule to visually display research activities is a helpful tool for Research staff and agency staff who may not be well informed of Research Program processes and timelines.
    - Idaho's last FHWA Desk Review revealed components to be added to their Research Manual, such as training and development.
        - Idaho initiated a research project to evaluate the benefits of the Research Program as a response to its last FHWA Desk Review. Project outcomes will include a standardized method for evaluating qualitative and quantitative benefits and establish performance measures and targets for the program.
- New Mexico DOT
    - The elements for an FHWA Desk Review are in place and only need to be pulled together.
    - Possibly share the internal project tracking worksheet with FHWA staff.
    - Have FHWA staff participate in project technical panels.

Challenges and Opportunities

- Washington State DOT
    - A tracking system could be built out of the Research Program Core & Key Responsibilities spreadsheet.
    - The Research Program Core & Key Responsibilities spreadsheet is a good support for succession planning and can be used as a knowledge management framework. It provides a way to have everything written down for staff to keep the Research Program going.
    - Use AI to plain talk the Research Program Core & Key Responsibilities spreadsheet.
- Idaho TD
    - Idaho has an opportunity to update its Research Manual.
- New Mexico DOT
    - New Mexico has an opportunity to update its Research Manual.
    - Take the opportunity to get to know the new FHWA Division Office contact to determine expectations for the Research Program.
- General comments
    - Keep your Research Manual updated, either every two years or when there is a major process change, to help prepare for an FHWA Desk Review.
    - Consider developing a research program workflow tracking spreadsheet for internal and external marketing and accountability.
    - Plan ahead for an FHWA Desk Review so there is less work and stress when your Division Office requests one.
    - Consider using AI to enhance checklists and timelines.

- A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis would be a good addition to an FHWA Desk Review.
- An FHWA Desk Review is not meant to be a “gotcha” audit but a status check of the Research Program and to identify areas that may be out of compliance.
- FHWA is moving to a risk-based approach to oversight and stewardship, which will bring more flexibility at the state level. Activities that could lead to a failure of administering the federal aid program are considered high risk.
- Confirm with your FHWA Division Office what is expected related to a Desk Review and documentation, because each office has distinct expectations.
- Keep your FHWA Division Office informed of your program’s successes and how you are aware of and fixing risk areas.

PEER EXCHANGE THEME 4—ANATOMY OF A SUCCESSFUL IMPLEMENTATION THROUGH COMPLETED RESEARCH

OVERVIEW

In the final session, the host states highlighted recent successful research implementation and shared tools developed to track research projects through implementation. They discussed program successes and best practices, strategies they have used to overcome obstacles, and current program challenges.

PRESENTATIONS

To kick off discussion on implementation success, New Mexico, Idaho and Washington State gave presentations on implementation efforts at their agencies. Two presentations are reproduced as appendices to this report.

> Appendix F. New Mexico DOT – Developing Key Performance Indicators & Implementation Planning for Research Planning, Randolph Trujillo, New Mexico DOT
>
> Appendix G. Idaho TD – Anatomy of a Successful Implementation, Amanda Laib, Idaho TD

For his presentation, Mustafa Mohamedali, Washington State DOT, demonstrated SharePoint and Excel tools that support successful implementation at WSDOT by incorporating stakeholder management and strategies to identify and mitigate risk. Among the tools presented were those that WSDOT uses to quantify, sort, and track project performance and help identify projects at risk, as well as those to aid with fiscal management of large and multiple pooled funds.

DISCUSSION AND FINDINGS

Attendees shared examples of successful research implementation at their agencies, as well as challenges they face with implementation. These comments were collected during group discussions, via a Mentimeter poll taken at the end of the session and in report-out forms that participants completed and submitted after the session.

Below are the host states' successes and best practices and challenges and opportunities as identified by attendees.

Successes and Best Practices

- New Mexico DOT
  - Coordinating STIC into the Research Program and projects is a strength.
  - Build implementation plans into research contracts (or "professional service agreements" in New Mexico) to ensure each project has an implementation plan.
  - The Research Program is staffed for success and has many topical research projects to serve its stakeholders. The inclusion of workshops and training in the projects is a great step towards getting buy-in.
  - New Mexico has a useful framework for project implementation and a process review system.

    - New Mexico is asking the key questions to learn from its peers and to move its implementation program forward.
    - Using safety as a metric of success for a project demonstrates that not all benefits are related to money.
    - New Mexico's experiences show the need for a long time span for observing and verifying implementation.
- Idaho TD
    - Selecting research to address a federal need is a strength for immediate successful implementation.
    - Include user guides and in-person training in a research project as an excellent way to ensure implementation.
    - Bringing key stakeholders and experts together to tackle a need through research is a great workflow for doing valuable work.
    - Define and document roles and responsibilities and focus on preserving institutional knowledge to help ensure implementation and sustainability from start to finish.
    - Take the time to document implementation; even a limited time investment can have a significant payoff.
    - Utilize the Research project manager, via onsite visits, to share and implement a project tool after the research is complete.
    - A successful implementation may be simple, such as a program manual update or a process review.
    - Identify a useful framework for project implementation and a process review system.
    - Use AI to create the project presentation graphics to engage the audience.
    - Use anatomy as a framework to discuss directing a research process from start to finish.
- Washington State DOT
    - Focus on applied and innovative research.
    - Fund innovative research at a lower level than applied research as a way to mitigate risk.
    - Tie innovative research to strategic goals when selecting projects that have meaning to the agency.
    - A thorough solicitation process and guidance documents, coupled with strong SME responsibility and involvement, strengthens the research project process and encourages implementation.
    - Use the likelihood of implementation as a rating criterion for requested research projects to ensure that most selected projects will be implemented.
        - Because a project has a high probability of being implemented from the beginning, Washington State doesn't focus heavily on tracking implementation after the project ends.

- In addition to a traditional problem statement, ask project submitters to make their case with a short video submission to give decision makers time to digest the information before the project selection meeting.
- Identify upstream and downstream stakeholders, risks and opportunities of innovative research to get a better idea of a project's impact.
    - Invite upstream and downstream stakeholders to project meetings to help guide the research.
    - Identify risks at the beginning of a project to put contingency plans in place for issues that may occur during the project.
- Spreadsheets that provide a multifaceted view of projects allow project managers to quickly assess risk and project status.
    - Employ a Power BI-driven dashboard to monitor "percent spent vs. percent duration" to identify projects at risk of stalling before they reach the final report phase.
- A color-coded model is an excellent way to track funding issues.
- Use Teams functions to track the draft final report through the approval process.
- Use webinars such as Washington State's "Webinar Wednesdays" as a way to share implementation success stories.

Challenges and Opportunities

- New Mexico DOT
    - Be intentional and selective about what projects will be implemented.
    - Establish a process for identifying or assigning implementation champions who can ensure implementation happens (if applicable), monitor implementation, and verify implementation funds are being spent wisely.
        - Several states utilize their Research project managers and/or implementation engineers to guide implementation efforts, so someone is seeing implementation through to its end even if the implementation champion has left their position or the agency.
    - Calculating ROI is difficult and will depend on the type of project. Not all projects will have a cost−benefit, and many will have qualitative benefits, such as lives saved or adoption of guidelines.
    - Talking with implementation champions about benefits and numbers may produce more information than an email or survey.
    - Tie project results and implementation activities to the agency's strategic plan as one method for demonstrating project ROI.
    - There are opportunities to develop new implementation processes and tracking.
        - Consider adding implementation schema to the research manual to assure follow up.

        - Consider an implementation plan that can be applied to a variety of project types.
    - For research that isn't ready for implementation, implementation planning and possibly a phased project approach will be needed.
    - Adapt best practices from other states to effectively use limited resources, time, and staff.
        - Things to borrow from other states include implementation tracking spreadsheets, outreach activities with internal partners, ways to communicate implementation activities with leadership, and demonstrating ROI.
    - Work with SMEs that have adapted to estimate labor/time savings from research vs. previous approaches.
- Idaho TD
    - Build implementation into a project from the beginning by requiring the project investigator to provide an implementation plan or roadmap.
    - Develop an implementation system that can be applied to a variety of projects. Look at implementation systems of other DOTs for inspiration.
    - Be aware that some research isn't ready for implementation and would need phased implementation over time.
- Washington State DOT
    - Consider a more formal and systematic approach to project implementation.
    - It can be difficult to maintain agility and alignment with agency goals through change and challenges outside of research.

APPENDIX A. WTRC 2026 MEETING AND PEER EXCHANGE AGENDA

Meeting and Peer Exchange

May 19-21, 2026 | The Riverside Hotel – North Star Room, 2900 East Chinden Boulevard, Boise, ID

All times are **Mountain** — Breaks will be taken as needed
Microsoft Teams Meeting Information shared via email

Tuesday, May 19, 2026

8:30 a.m. to 11:30 p.m.	**Call to Order**, Cameron Kergaye, Utah DOT **Host State Welcome** • Amy Schroeder, Highway Division Director, Idaho TD • Amanda Laib, Research Program Manager, Idaho TD **Meeting Format, Goals and Report-Out**, Brian Hirt, CTC & Associates **Introductions**, All **PEER EXCHANGE THEME 1: Regional Research** **WTRC Activities** • Transportation Pooled Fund (TPF) Management Update ○ Administration, contract, budget • Research Cycle: Development and delivery timeline • Review of 2025 Research Projects ○ 25-1: Wildlife Fencing Effectiveness in Reducing Crashes ○ 25-2: Buy America Build America Compliance Across State DOTs: Barriers, Best Practices, and the Case for Uniformity ○ 25-3: Documenting the Research Study Process ○ 25-4: Estimating Bridge Scour During Hydrological Disaster and Extreme Weather Events ○ 25-05: AI Safeguards and Considerations for Research Program and Project Management ○ 25-TD-1: Topical Discussion: Highly Modified Asphalt Mixtures ○ 25-TD-2: Topical Discussion: Using UAS to Augment Existing Noxious Weed Treatment Workflows
12:00 to 1:00	**Lunch**
1:00 to 1:30	**Regional Innovation Focus** • West Coast Alaska: Storm Response 2025 — Cristina DeMattio, Alaska DOT&PF ○ Role of Research in developing and deploying innovative tools ○ Lessons learned and guidance for other western states
1:30 to 5:00	**WTRC Activities** • 2026 Research ○ Discussion of initial voting and selection of 2026 research ○ Next steps for selected projects ○ Next steps and alternatives for other projects ○ UDOT contracting
5:00	**Adjourn Day 1,** Cameron Kergaye
Evening	**Group Dinner.** *Time and location to be provided at the meeting.*

Western Transportation Research Consortium

Meeting and Peer Exchange

May 19-21, 2026 | The Riverside Hotel – North Star Room, 2900 East Chinden Boulevard, Boise, ID

All times are **Mountain** — Breaks will be taken as needed
Microsoft Teams Meeting Information shared via email

Wednesday, May 20, 2026

8:30 a.m. to 11:00	**PEER EXCHANGE THEME 2. Emerging Technologies and Future Research Trends** • Cohost states — Presentations highlighting emerging technologies ○ Washington State DOT – Project for forecasting truck parking with AI ○ New Mexico DOT – Using drones and augmented reality for bridge inspections ○ Idaho TD – How AI can help achieve research objectives and save time and money (Mike Copeland, 10:00 a.m.) • Discussion — ○ Q-and-A on trends, successes, pain points, barriers ○ Roundtable highlights (no formal presentations) from other states on other examples of emerging technologies, research trends, and how their research offices manage these • Menti-based report-out ○ Where host states are excelling; opportunities for next steps ○ Great ideas from peers to bring home
11:00 a.m. to 2 p.m. *Including Lunch-and-Learn*	**PEER EXCHANGE THEME 3. Preparing for FHWA Management Process Reviews of SPR-B Programs ("Desk Reviews")** • Cohost states — ○ Menti on pre-meeting questions: 1. When did your agency last have an FHWA Desk Review, and were you or any of your current staff involved? 2. What is your agency's readiness to complete an FHWA Desk Review? Consider each of the eight required elements 16 of the requirements of FHWA Desk Review. *(See pp. 14-16 of the linked/provided file.)* 3. Does your agency have a similar tool as WSDOT's for use FHWA Desk Reviews or similar purposes? *(See p. 1 of the provided file.)* ○ Presentation by Washington State DOT: WSDOT's Research Program Core & Key Responsibilities tool, Anne Freeman (remote) and Mustafa Mohamedali • Discussion — ○ Q-and-A for WSDOT and cohosts ○ Develop questions for breakout groups 1. What tools do you need to succeed for an FHWA Desk Review? 2. What are your biggest gaps right now based on what is requested? What processes would bridge these gaps? 3. (Additional items to developed during the meeting.) • Lunch and breakout group discussions • Breakout group report-out
2 p.m. to 4:30 p.m.	**PEER EXCHANGE THEME 4. Anatomy of a Successful Implementation Through Completed Research**

	• Cohost states — Presentations highlighting implementation processes and program features: ○ New Mexico DOT – Developing key performance indicators, and implementation planning for research planning. ○ Idaho TD – Implementable research, and how SMEs submit research with implementation in mind. ○ Washington State DOT – Assessing potential implementation for a large research portfolio and risk mitigation. • Interactive Q-and-A with all WTRC attendees ○ What's working, what's challenging, how each state got where they are ○ Roundtable highlights (no formal presentations) from other states on other examples of implementation processes and challenges ○ Review of WTRC Project 25-3 Documenting the Research Study Process survey responses to the section on Implementation • Menti-based report-out ○ Where host states are excelling; opportunities for next steps ○ Great ideas from peers to bring home **Adjourn Day 2,** Cameron Kergaye
Evening	*Small group dinners or dinner on your own*

Meeting and Peer Exchange

May 19-21, 2026 | The Riverside Hotel – North Star Room, 2900 East Chinden Boulevard, Boise, ID

All times are **Mountain** — Breaks will be taken as needed
Microsoft Teams Meeting Information shared via email

Thursday, May 21, 2026

8 a.m. to 12 p.m.	**PEER EXCHANGE THEME 1. REGIONAL RESEARCH** (continued from Day 1) **WTRC Activities** • Planning ○ Identify Year 4 WTRC Meeting: location and month ○ Identify Year 4 Peer Exchange: cohosts; format ○ Next TAC call • Outreach Activities • Marketing and Communications Activities • WTRC Charter and Operating Procedures ○ Discuss and vote on changes, if needed • Additional Topics and Open Forum • Wrap-up Day 3 Activities ○ Action Item Review
12 p.m.	**Adjourn Meeting,** Cameron Kergaye

APPENDIX B. ALASKA DOT&PF – ONE MAP, ONE MISSION: A GIS BASED COMMON OPERATING PICTURE

Alaska Department of Transportation & Public Facilities

One Map, One Mission:
A GIS Based Common Operating Picture

Christine Langley – Data Modernization & Innovation Director

Faith Espinosa – Special Projects Coordinator

March 19th 2026

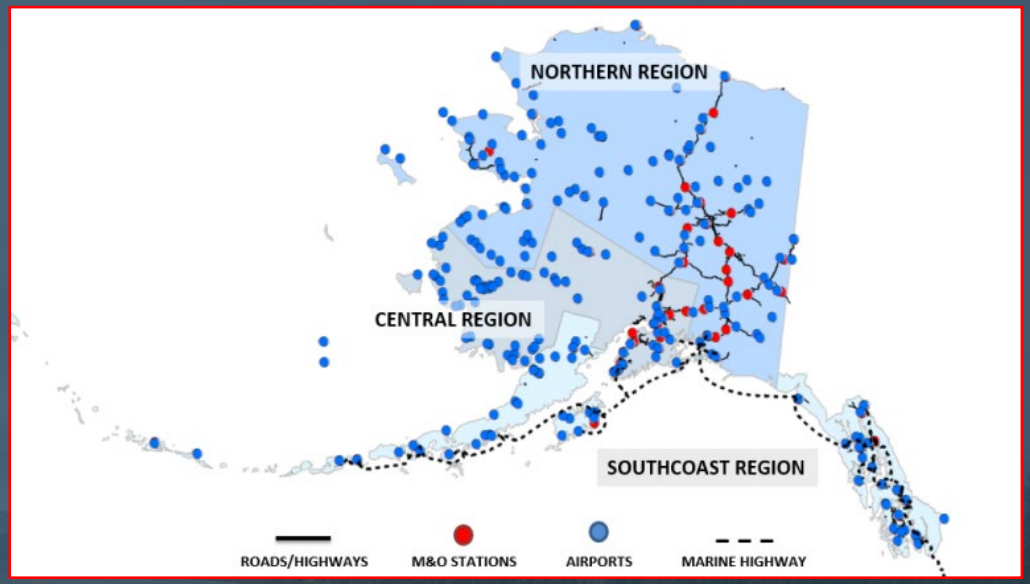


KEEP ALASKA MOVING

Alaska DOT&PF By…..

Land…

- 11894 Lane Miles
- 1139 Signalized Intersections
- 7500 Pieces of Equipment
- 827 Buildings
- 80 Maintenance Shops
- 51 Equipment Shops
- 9 Weigh Stations
- 3 Tunnels



Air…

- 235 Rural Airports
- 2 International Airports
- 104 Seaplane bases
- over 6 M Passengers

and Sea…

- 9 AMHS Vessels
- 16 Harbors
- 118K passengers
- 53K vehicles

Western Alaska

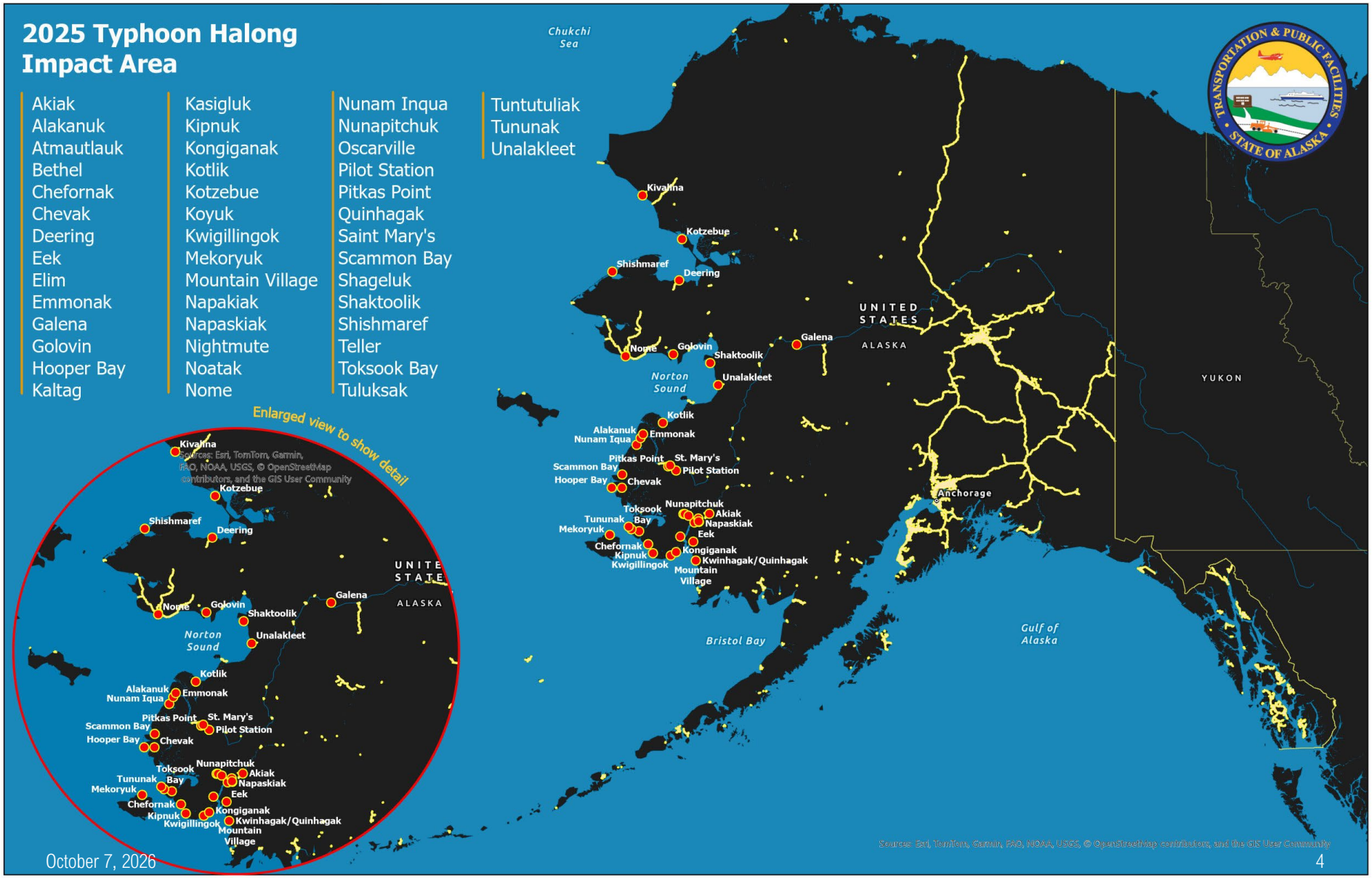








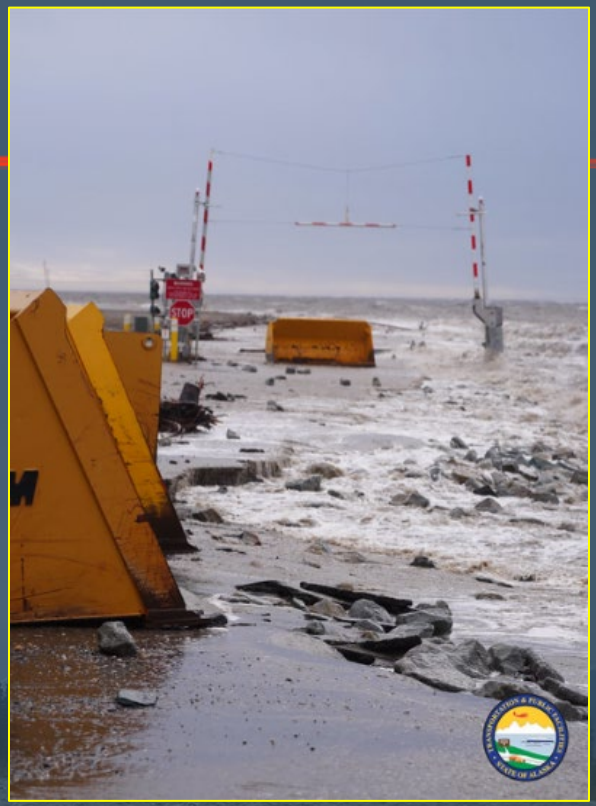
No Road to Nunapitchuk



Winter Is Coming

- Barges Had Been Pulled From The Water
- Subsistance Harvesting Nearly Complete
- Eminent Freeze Up Of Docks
- Damaged Runways



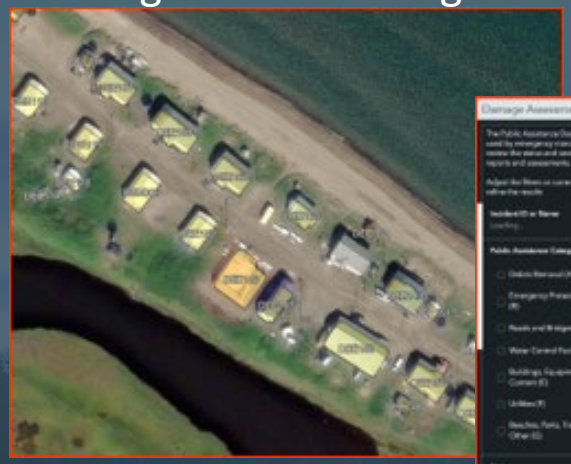


- Limited Number of Flights
- Limited Housing
- Limited Supplies in the Community
- Limited Communication

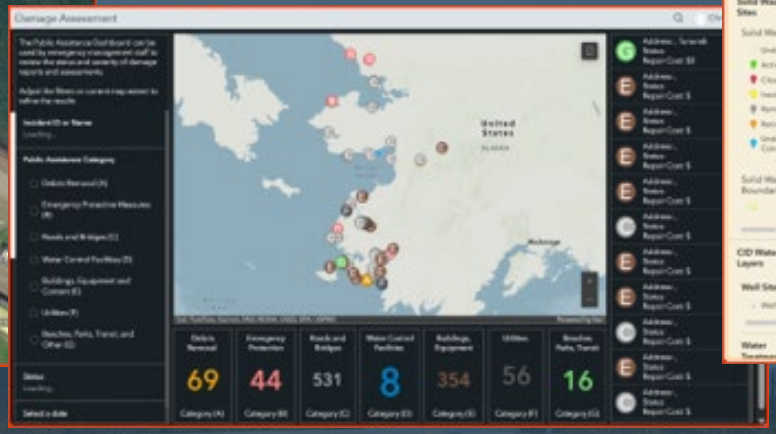
- Dropping Temperatures
- Decreasing Battery Life
- Decreasing Visibility

Common Operating Picture

AI Assigned Addressing



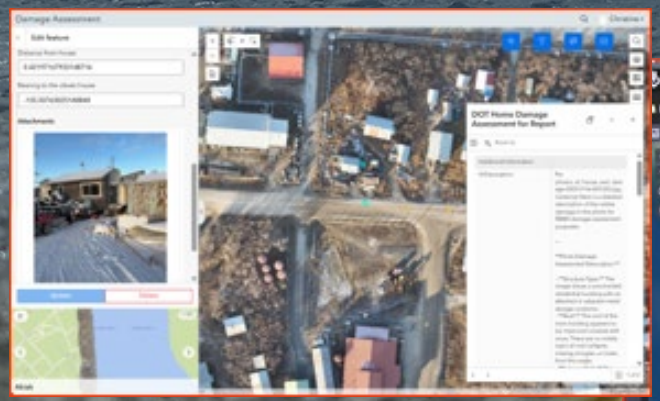
Real Time Damage Dashboard



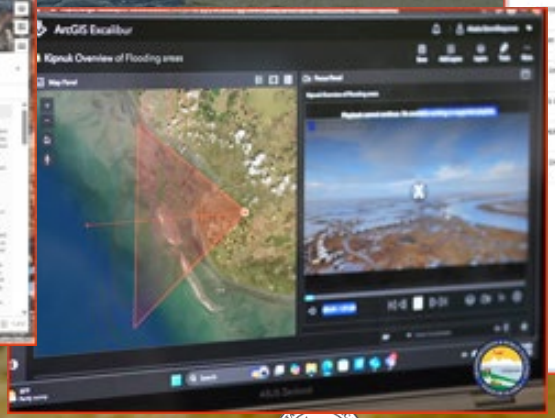
Community Infrastructure Maps



Workspace to Estimate Repairs



Oriented Imagery



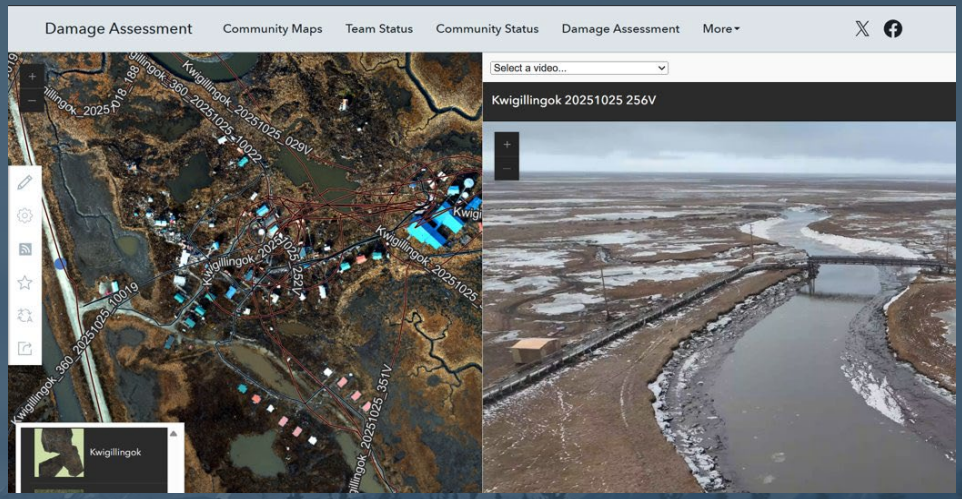
Community Infrastructure Status



Digital Command & Control DOT&PF ICS

Drone & AI Integration

- Orthomosaics
- Before/After imagery comparison
- Synchronized aerial and ground-based imagery
- AI-assisted home numbering and home damage rating validation



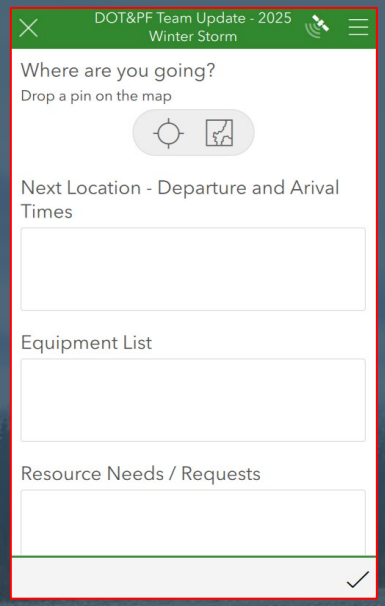
Common Operating Picture

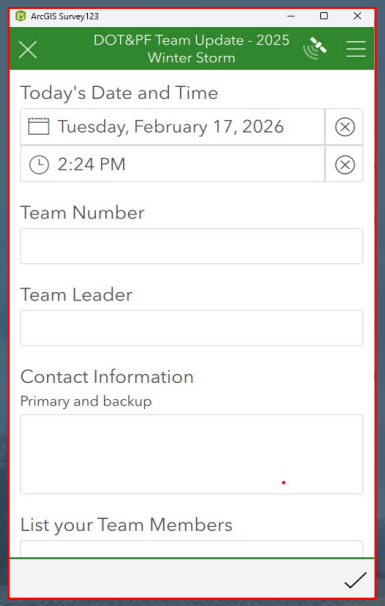
- Applications deployed in real time
- Real time understanding of conditions
- Reduction in duplicated efforts

Real Time Development as Needs Arose

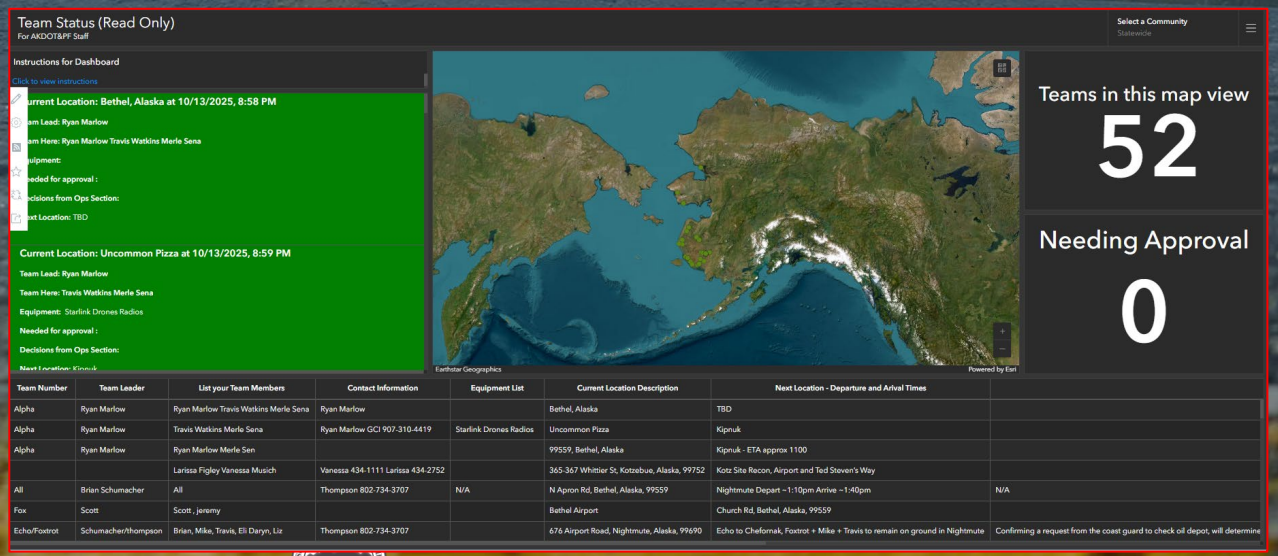
• FEMA Damage Rating Tools	-Survey123, Experience Builder
• Team Check in Tools	-Survey123, Dashboard
• Community Maps	-Dashboard
• Community Status Updates	-Dashboard
• Orthomosaics	-Imagery Layer/ Workflow
• Before & After Comparison Tool	-Instant App
• Full Motion Video Page	-Experience Builder
• Designers Tool	-Experience Builder
• Export Record Tool	-Experience Builder
• Housing Numbers	-Deep Learning Model
• Repair in Progress	-Experience Builder

Where are you, and What's your Need?

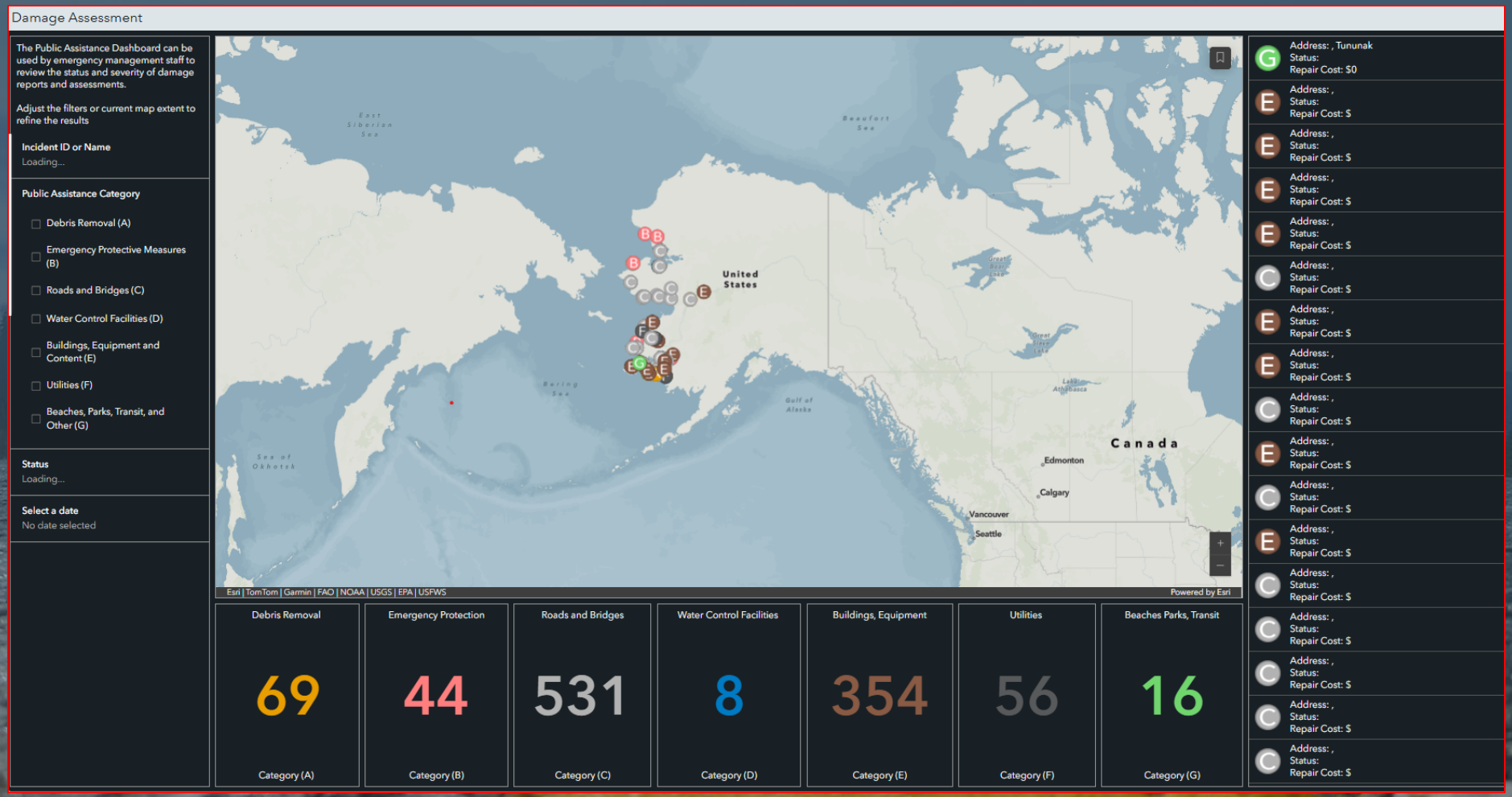




Easy Team Check ins, Provided Real time Status, Allowed ICS Staff to Address needs, Increased Safety

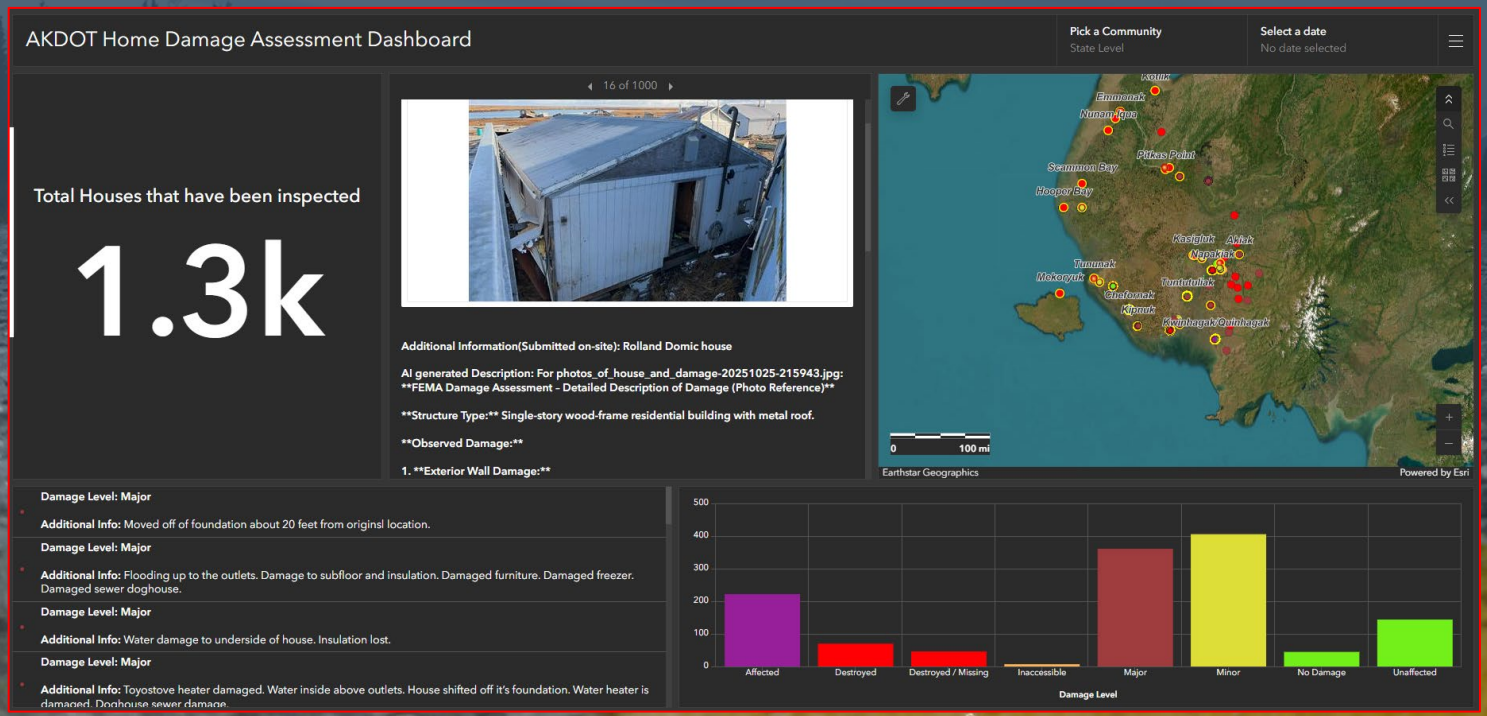


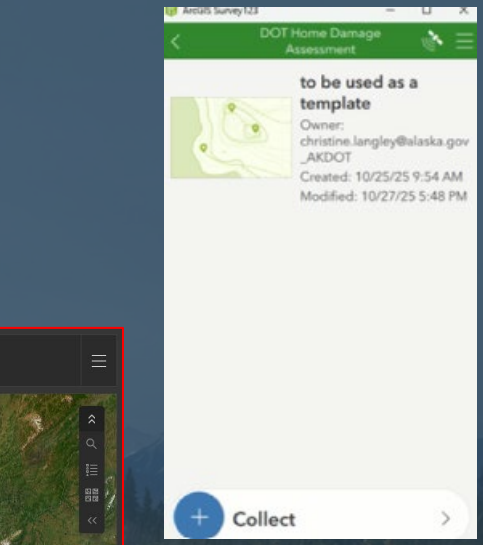
Infrastructure Assessment



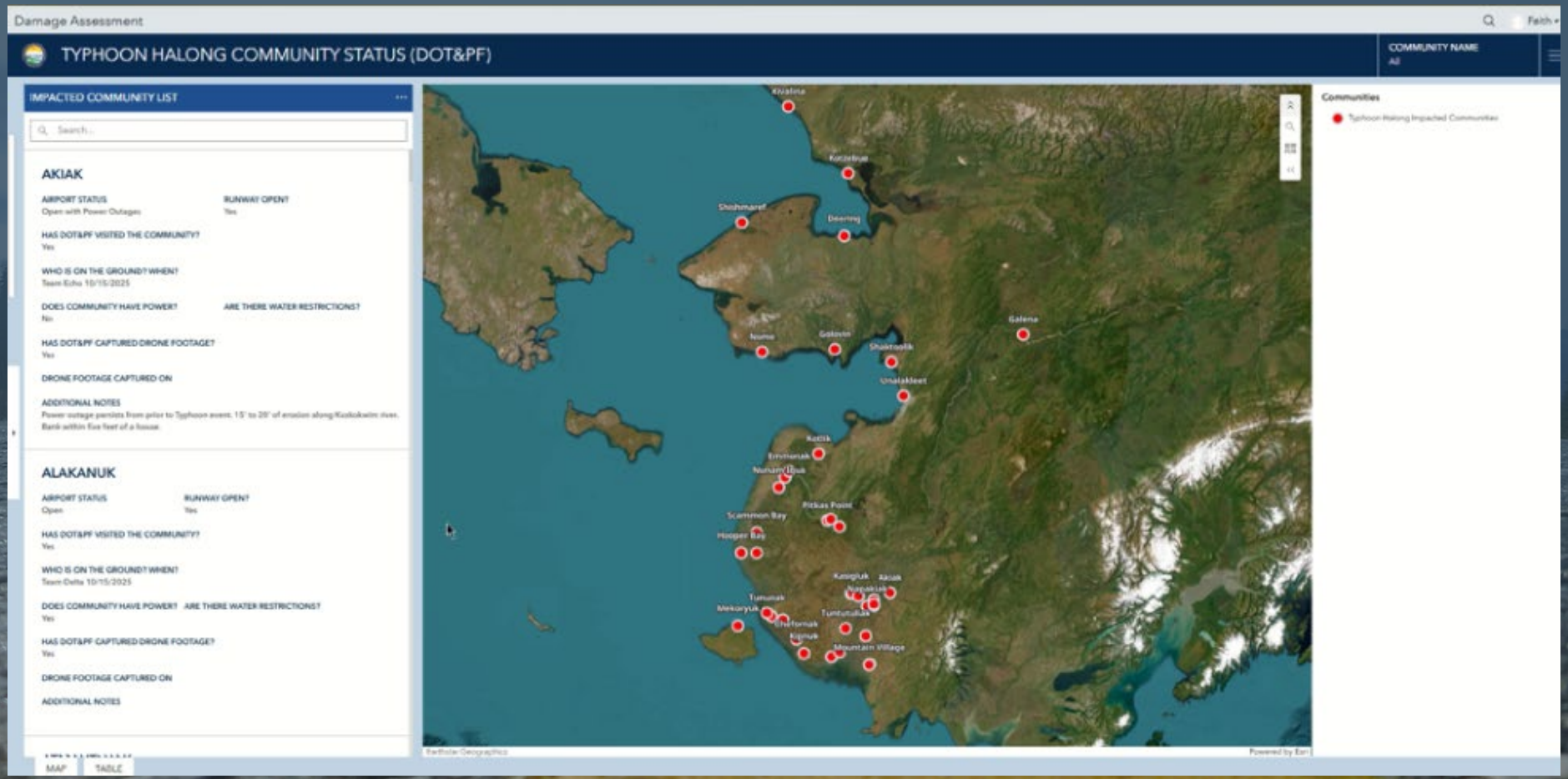
Home Assessments

Aggregated Home Assessments from AK DOT&PF and others

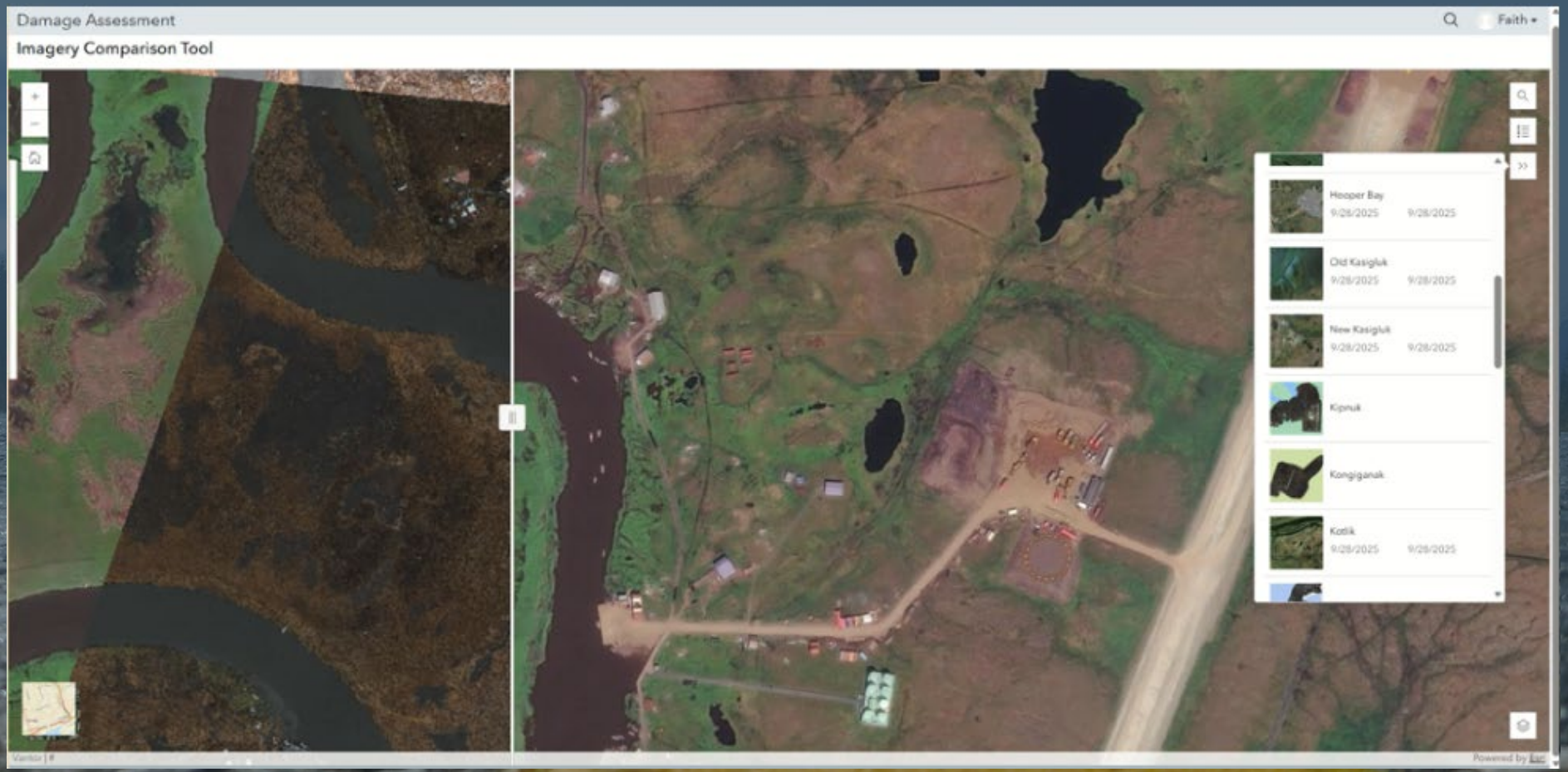




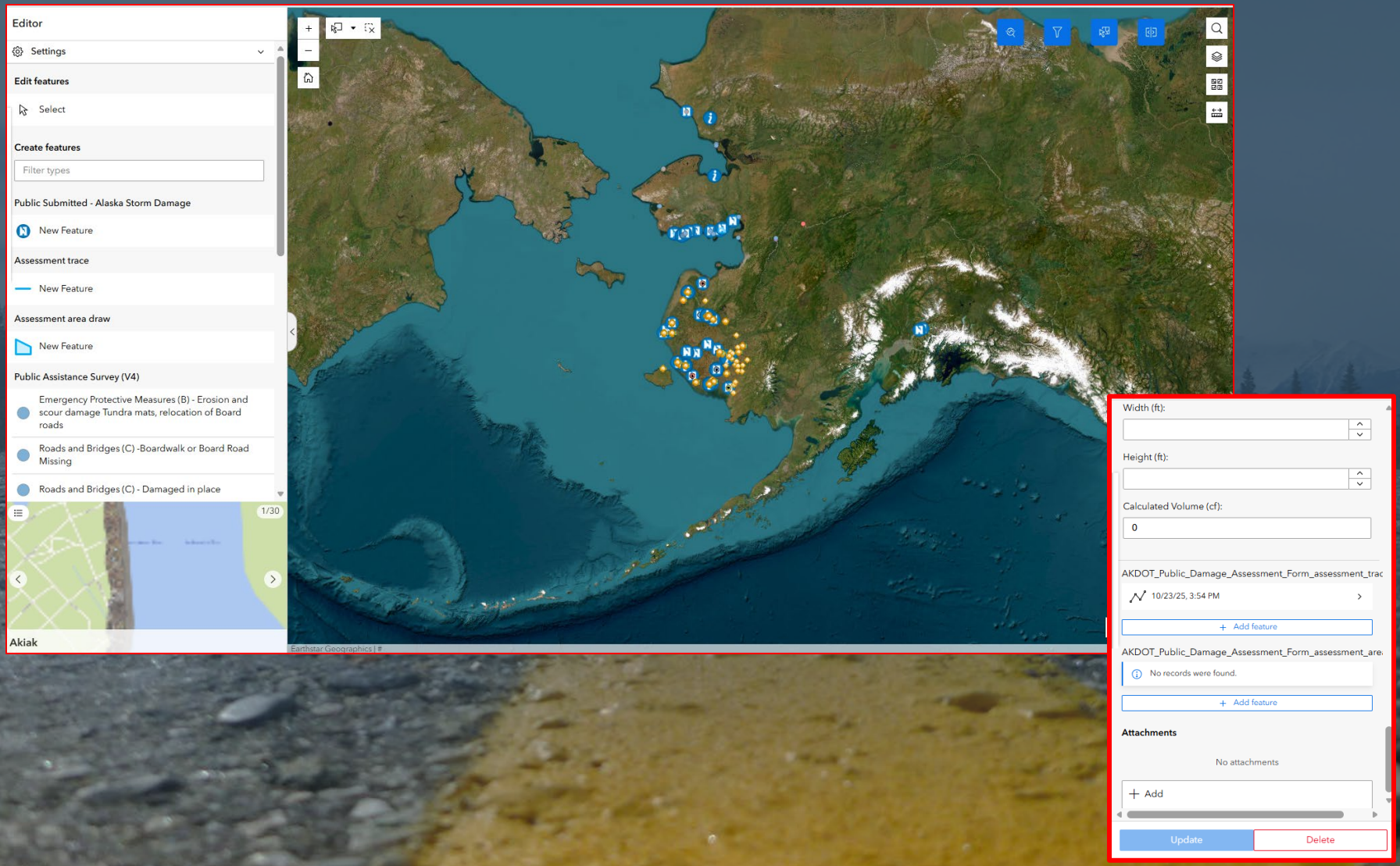
Community Status Updates



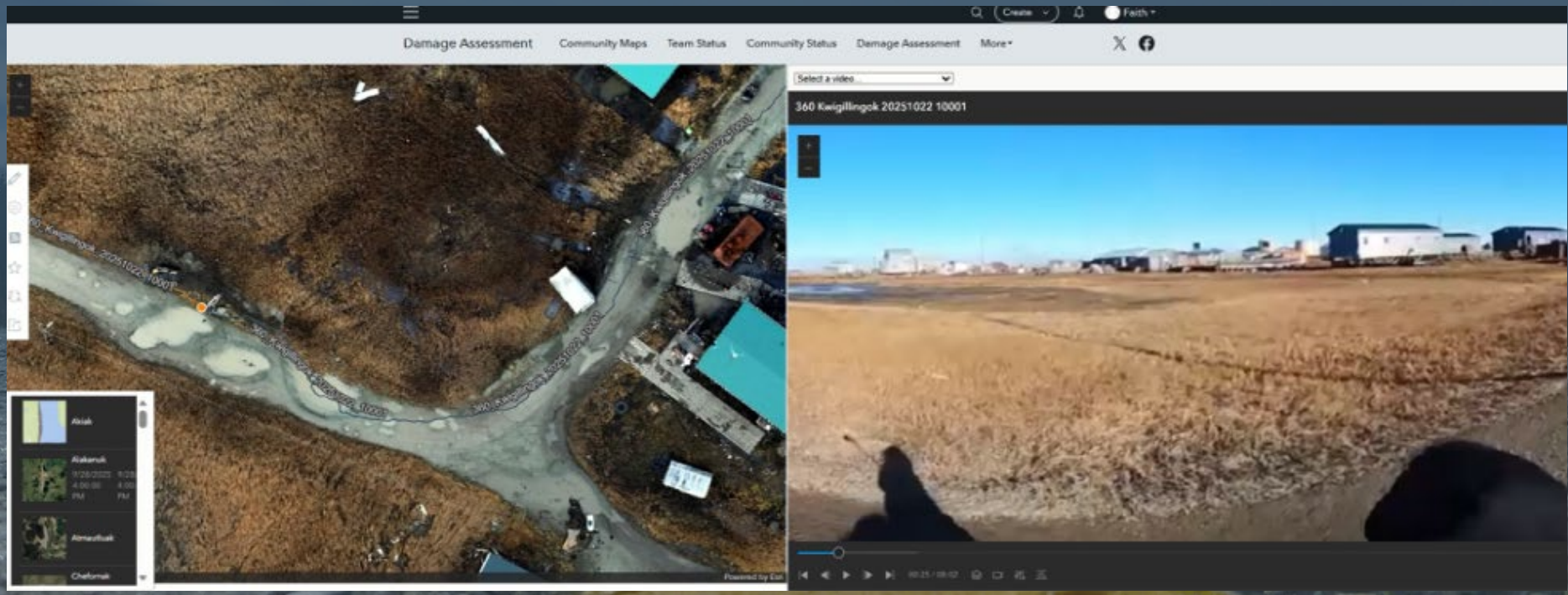
Imagery Comparison Tool



From Assessment to Work Plan

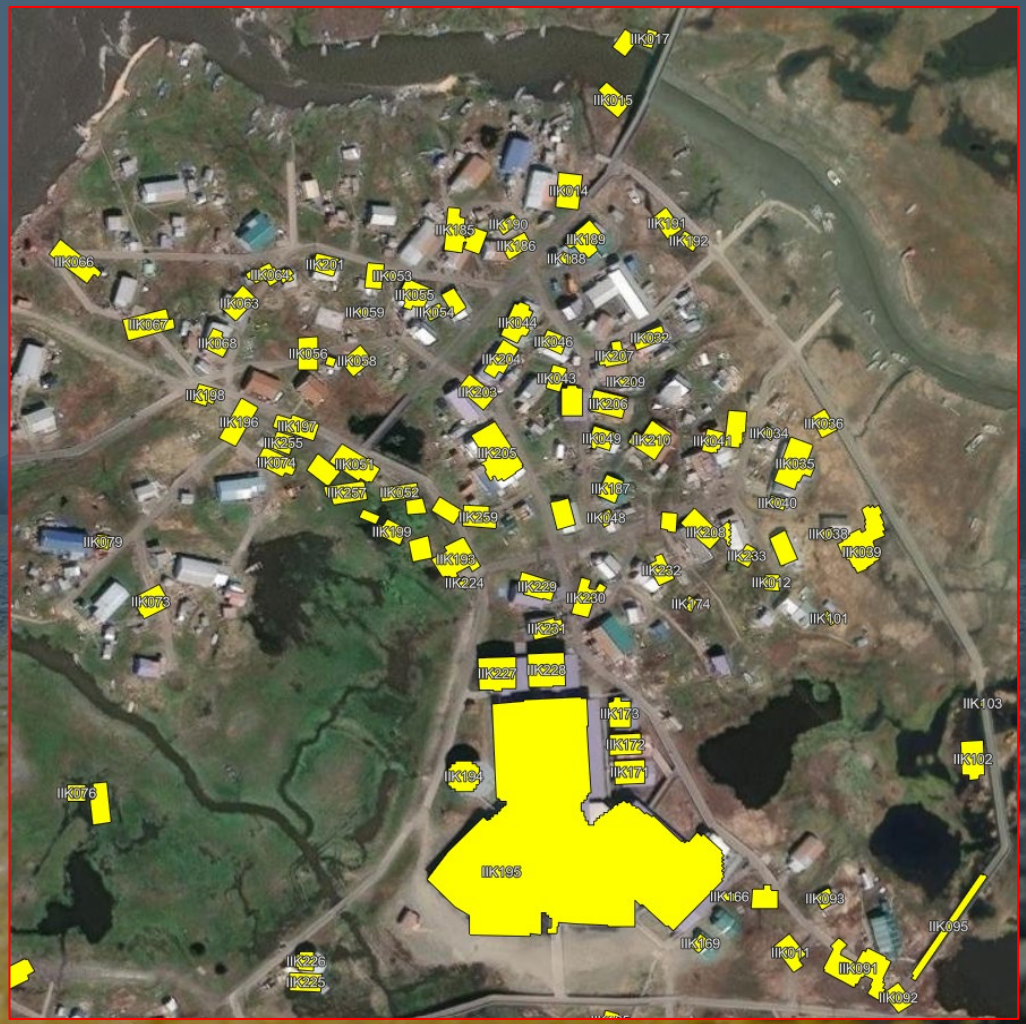


Imagery From Above Vs Footage on the Ground

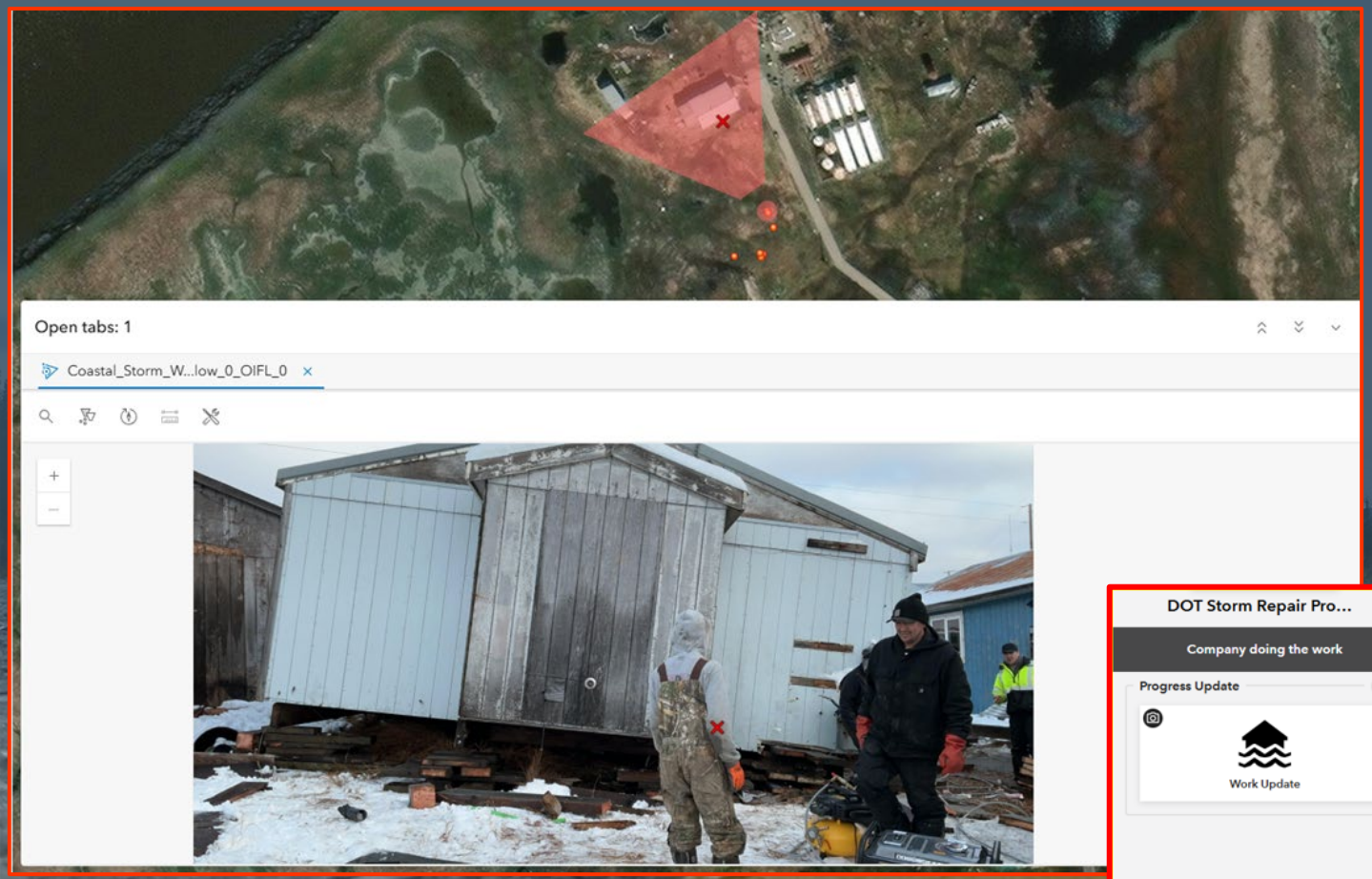


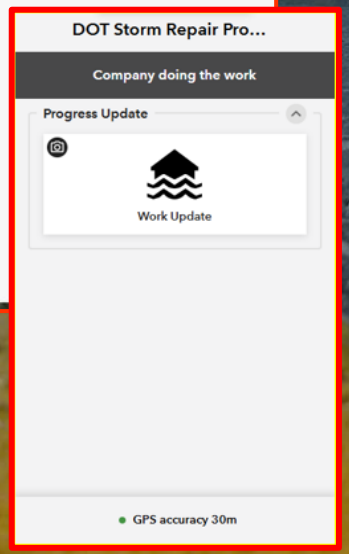
Home Reference Numbers

- In Western Alaska many of these communities do not have traditional street addresses
- Generated housing numbers for 20 communities
- Enabled clearer conversations and better reporting



Ongoing Repairs



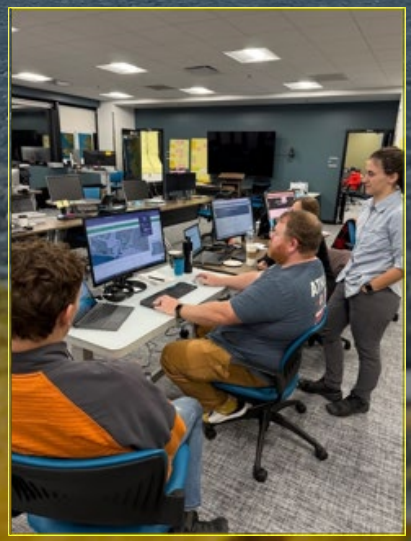


One app to document it all

How To Keep Sensitive Data Safe…

- Data Access:
  - Federal and State Agencies
  - Tribal Partners
  - Local Communities
- Data Editors
  - Select individuals based on need and position assignment
- Structured GIS Groups
  - Followers – view only
  - Core Team – editor

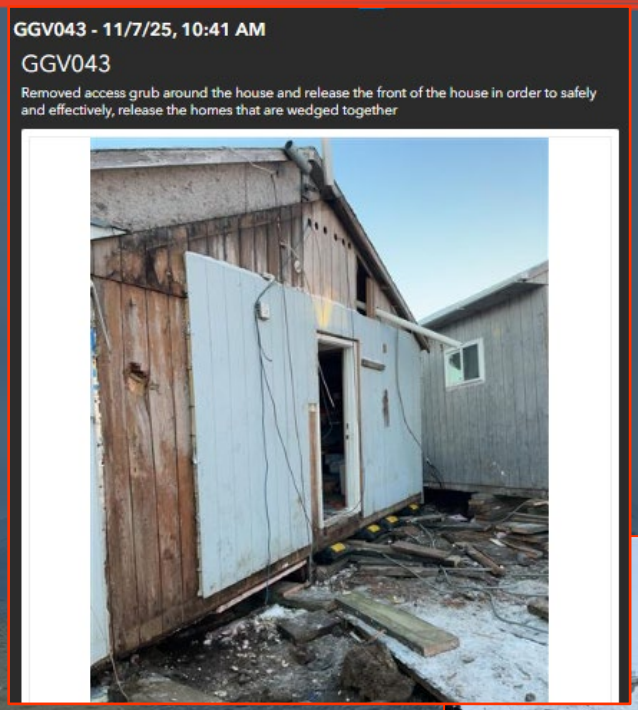




Rapid Damage Declaration Benefits Alaskans

- October 11th , 2025
  - Typhoon Halong hits the west coast
- October 22nd, 2025
  - Federal Disaster Declaration
- October 24th , 2025
  - Materials on the way

- Results
  - Faster obligation of funds for emergency and permanent repair work
  - Detailed Damage Assessments that drove emergency repair plans
  - FEMA Accepting electronic records due to evacuation conditions without Homeowner Present





Thank you to our Partners!

































Thank You.



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Christine Langley – Data Modernization & Innovation Director
Christine.Langley@alaska.gov
dot.alaska.gov

Cover photo: *The Alaska Range, Richardson Highway.*
By Dennis Bishop, Alaska DOT&PF

KEEP ALASKA MOVING

APPENDIX C. NEW MEXICO DOT – UAS AND AUGMENTED REALITY FOR BRIDGE INSPECTION

UAS and Augmented Reality for Bridge Inspection

Research & Climate Bureau
7500B Pan American Freeway NE
Albuquerque, NM 87109



New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

Research Need

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

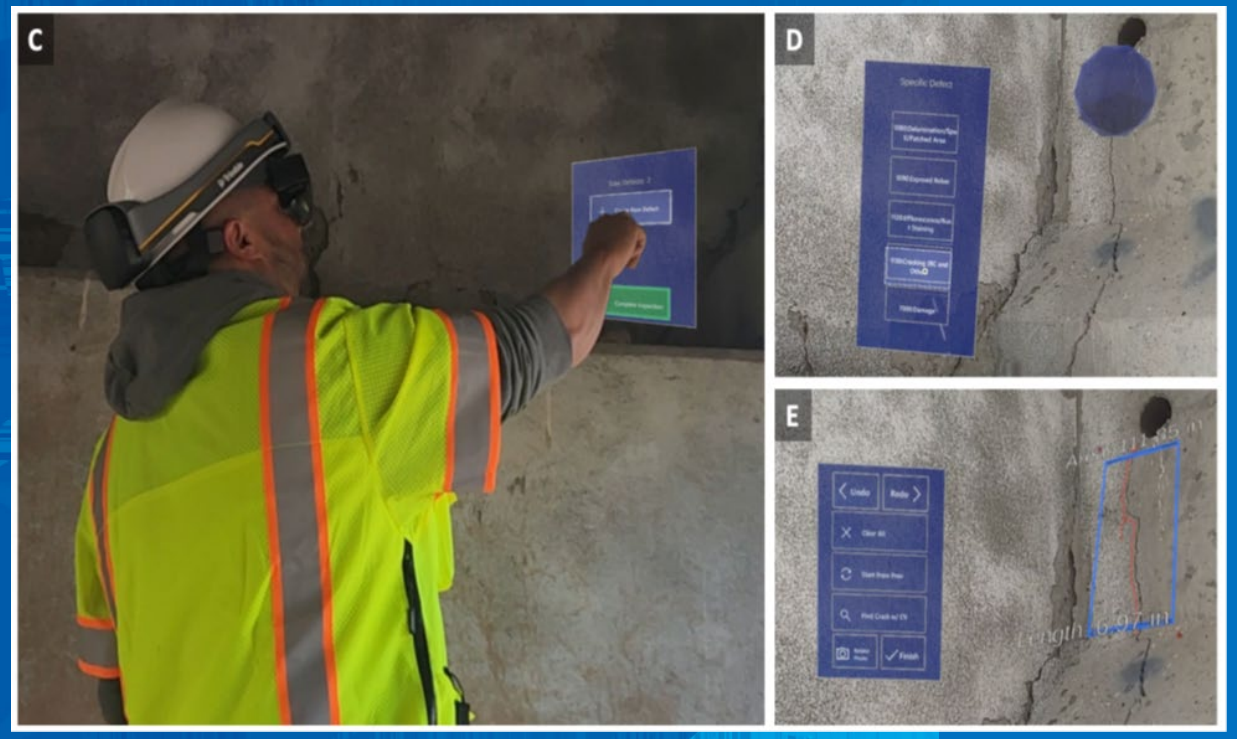
- Bridge inspections are critical for maintaining infrastructure safety and reliability.
- The NMDOT has identified several challenges faced during the bi-annual inspection of the approximately 3820 span bridges. With so many bridges and relatively few bridge inspectors, the time spent at each structure and the amount of information that can be collected is limited.
- Augmented Reality (AR) can help collect objective data in the field faster, saving time for the inspectors. Often, different bridge inspectors go out year to year and the data collected by different individuals can vary greatly. Accessing that previously collected information can also be difficult while out in the field.
- AR could assist by saving bridge data that can be easily shared across time and space between inspectors wherever they are.

Augmented Reality

New Mexico DEPARTMENT OF TRANSPORTATION
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Augmented Reality is a technology superimposing interactional virtual objects onto a real environment. AR is already used in several industries.

This research explores the application of Augmented Reality (AR) and Computer Vision (CV) in bridge inspections through the development of an AR-based head-mounted display system.





Augmented Reality

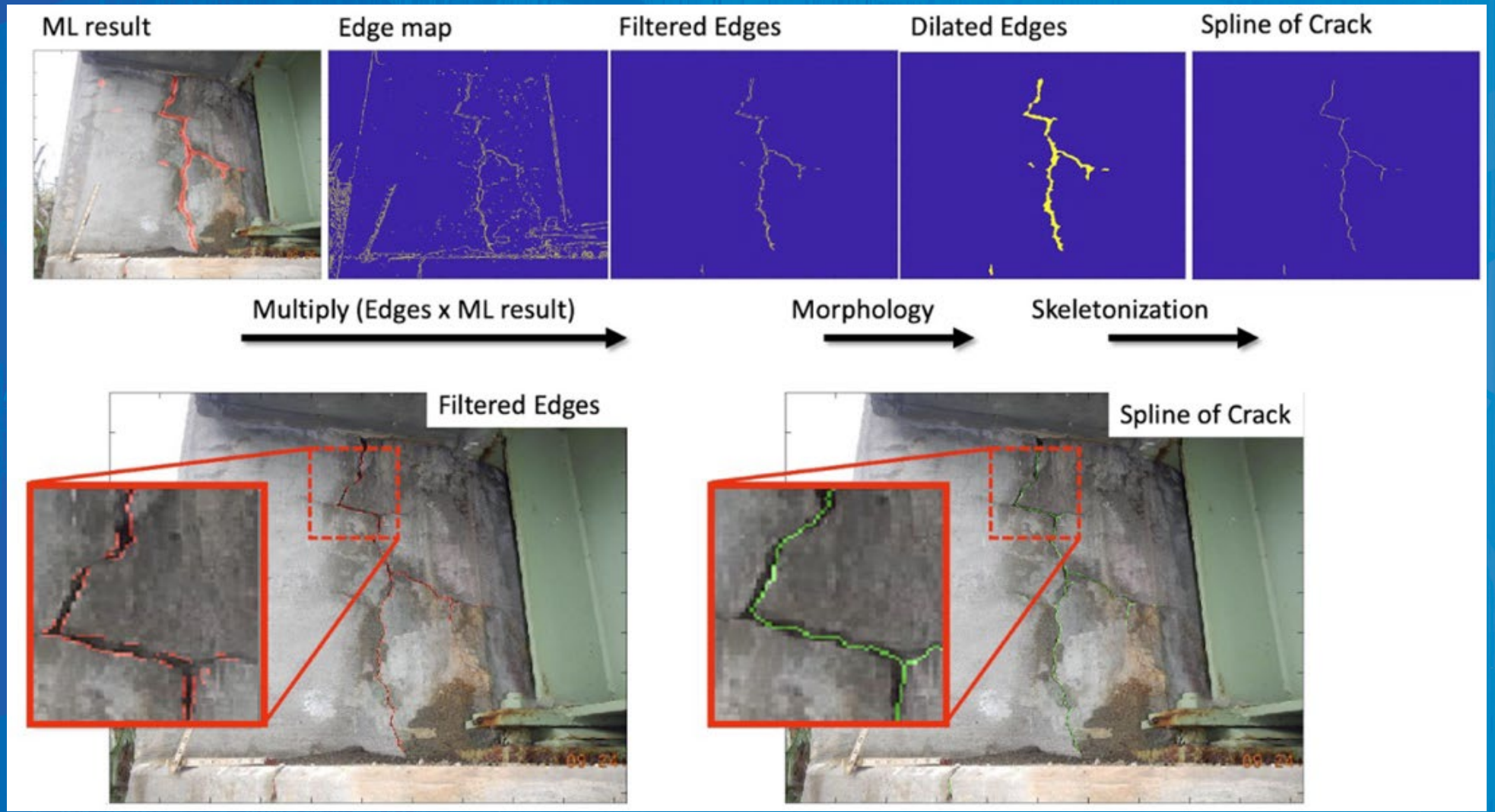
- An AR interface was designed to document crack defects, as well as access to previous measurements related to a given crack.
- VT designed and tested a field architecture which supports computer vision based crack documentation within the AR space.
- The team developed an accurate projection method for visualizing crack detection results overlaid on physical cracks in 3D.



VIRGINIA TECH

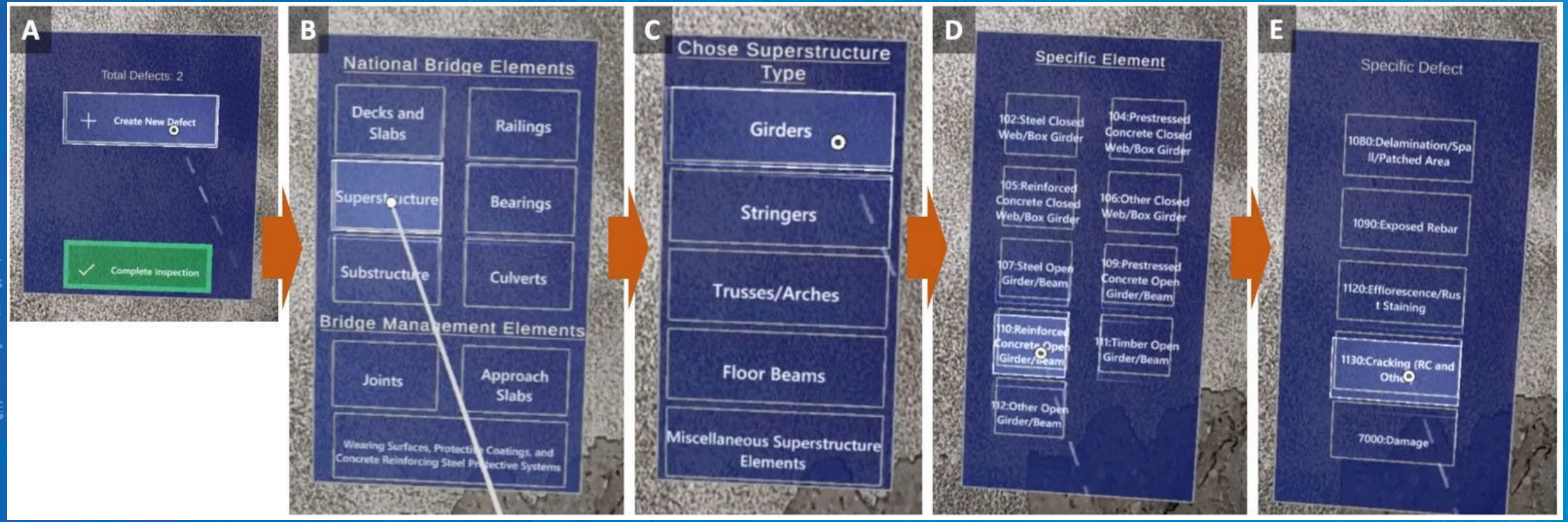
Augmented Reality

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE



Augmented Reality

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE



Augmented Reality

- Through field testing with bridge inspectors, we evaluated the usability and practicality of various AR-based inspection techniques.
- Key findings from real-world testing indicate that AR improves spatial awareness by anchoring annotations and data directly to defects of interest on the bridge structure.
- The integration of CV for crack quantification has value for facilitating measurements at a distance.
- The team determined that the best way to ensure reliability in assessments was a hybrid approach where CV is guided by the inspector, with flexibility to bypass it altogether if preferred.
- Routine tasks are accelerated in the inspection process and reduce mental fatigue and inconsistencies.

(UAS) Unmanned Aerial Systems for Bridge Inspection

Emerging technologies hold great potential for evaluating infrastructure conditions. Notably, the adoption of Unmanned Aircraft Systems (UAS) and object-based image analysis techniques has captured significant attention. UASs facilitate the streamlined collection of structural information in a manner that is both time and cost-effective.





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THE UNIVERSITY of NEW MEXICO

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UAS for Bridge Inspection



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UAS for Bridge Inspection

For this project, an advanced UAS platform was developed. UAS-based bridge inspection strategies, data interpretation frameworks, and implementation software for individual NBI classified bridge components were developed. Advanced UAS platforms and high-resolution sensors were utilized for automated data capturing.

- TASK 1: Personnel Training and Certification: a guideline is developed for either existing and first-time pilots.
- TASK 2: Hardware Selection: Before integrating UAVs into the airspace, a few aspects, including equipment features, pilot protocols, object qualities, surroundings, and safety rules, must be considered. It is crucial to have a thorough awareness of these aspects to allow safe and effective operations.
- TASK 3: Pre-flight Preparation for Data Collection: A well-planned flight path is of paramount importance when using UAVs for inspection operations. To unlock the full potential of the UAV, the mission must be carefully designed to encompass all inspection targets.
- TASK 4: Software Development for Flight Path Optimization: UAV path planning involves addressing the optimal path planning for UAVs. The main goal of path optimization is to minimize energy consumption while ensuring the successful completion of the UAV's mission.

UAS for Bridge Inspection

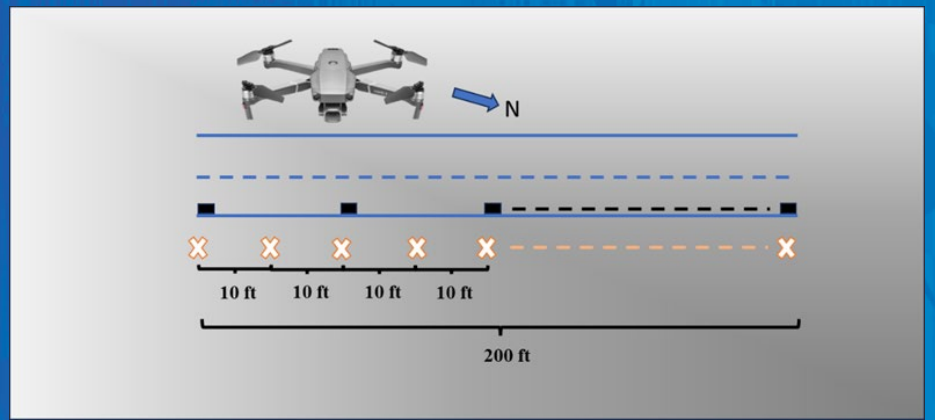
New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

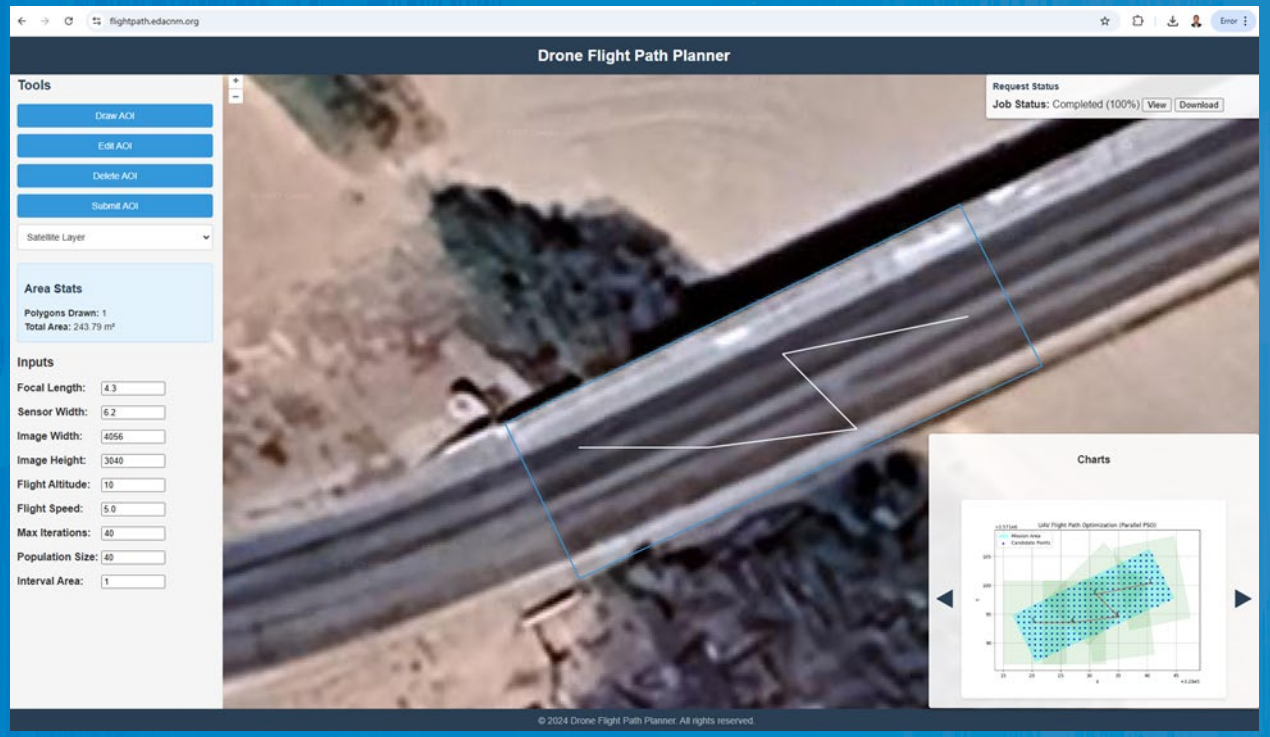


UAS for Bridge Inspection

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

A well-planned flight path is of paramount importance when using UAVs for inspection operations. To unlock the full potential of the UAV, the mission must be carefully designed to encompass all inspection targets. However, path planning for UAV-based bridge inspection presents challenges in finding the optimal or near-optimal path. The flight path comprises a set of camera positions from which images will be captured. These camera positions are determined by their horizontal and vertical distance from the object, as well as the angle of the camera.

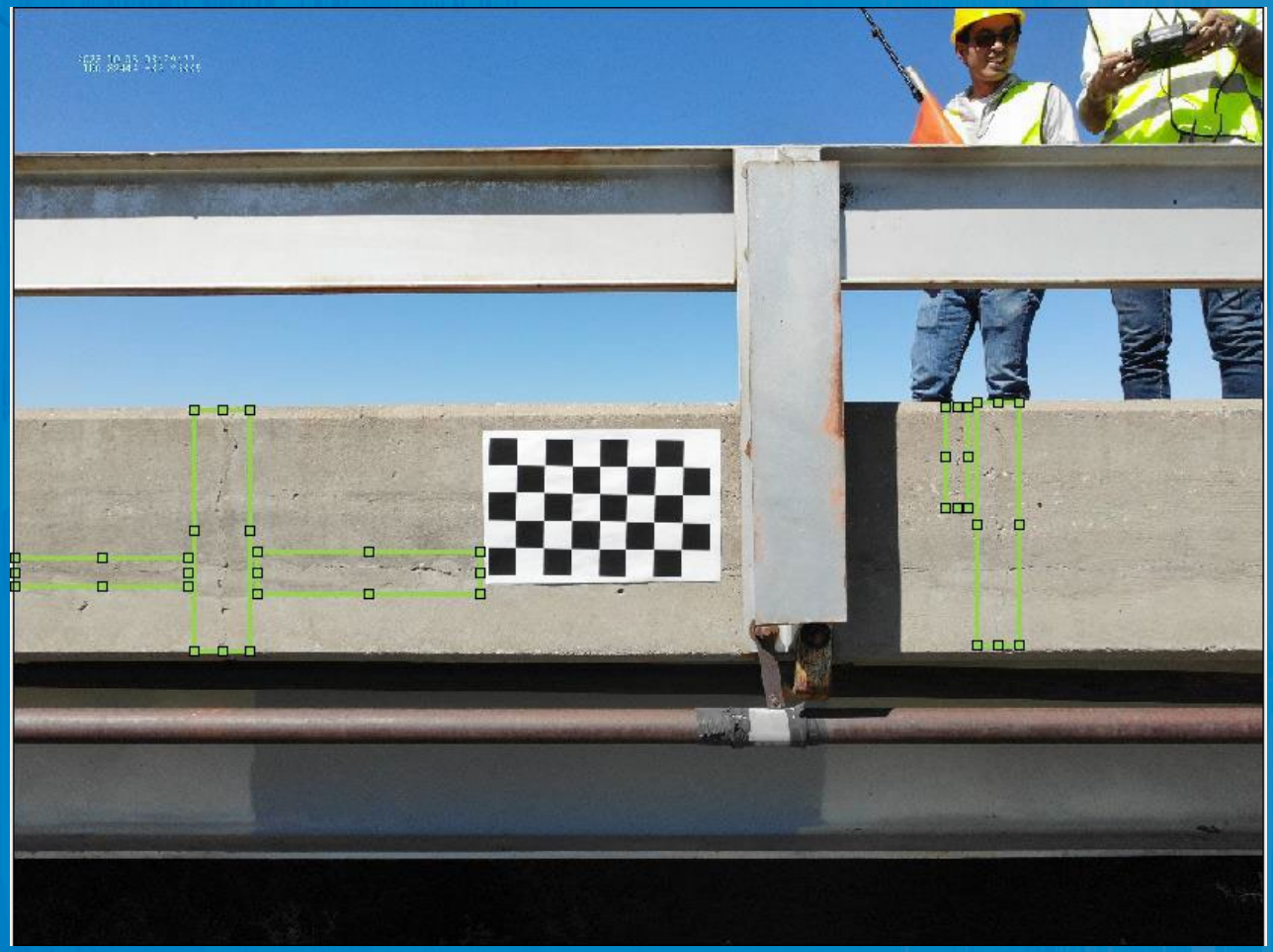




UAS for Bridge Inspection

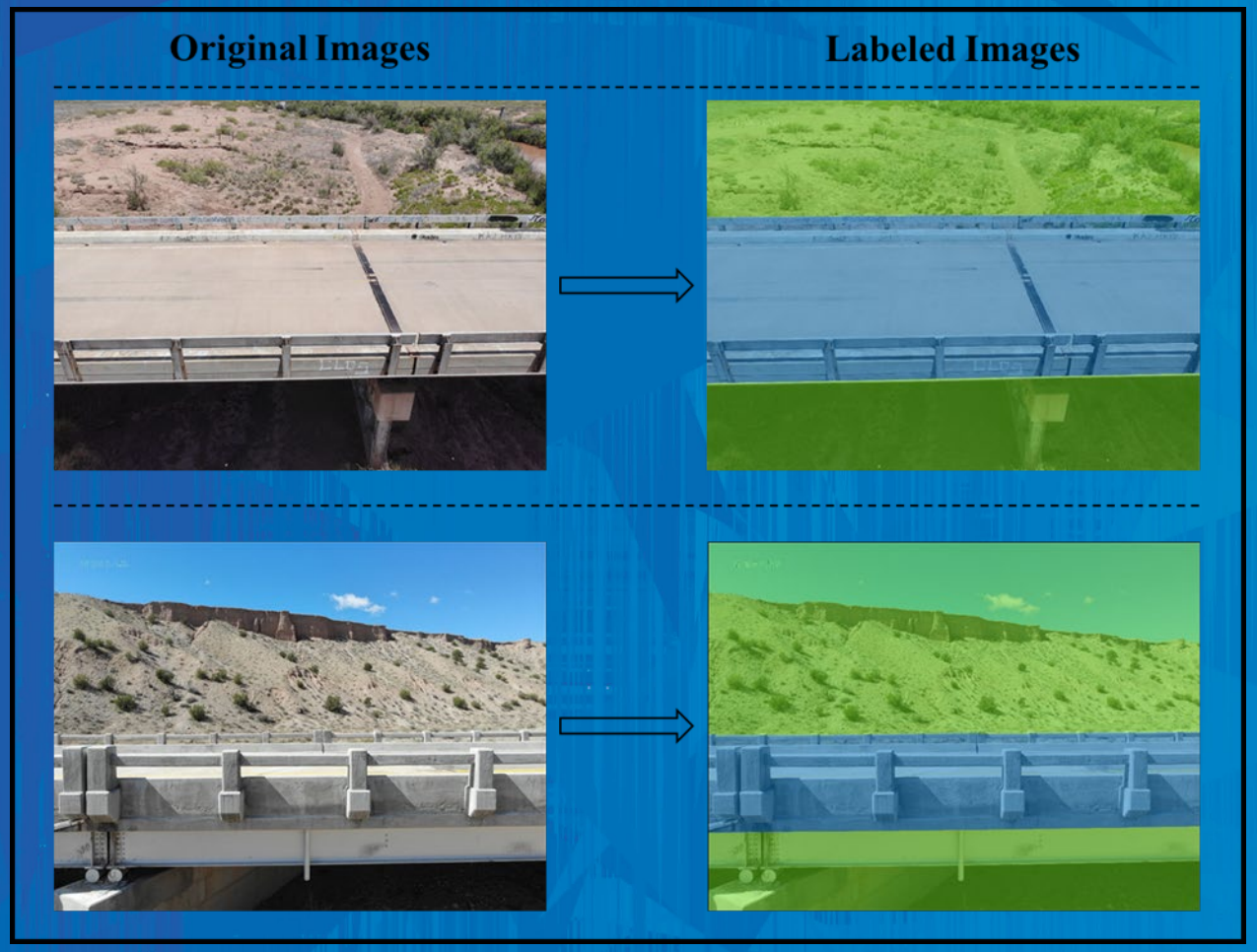
New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

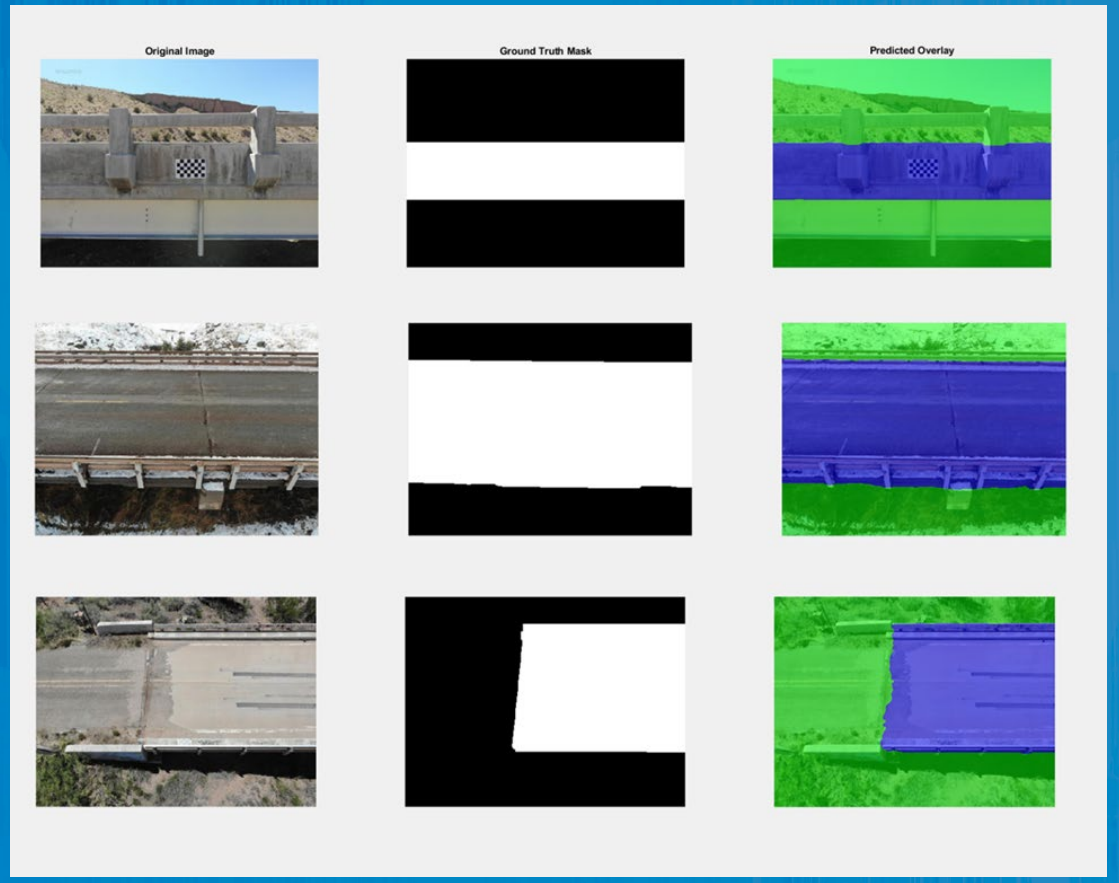




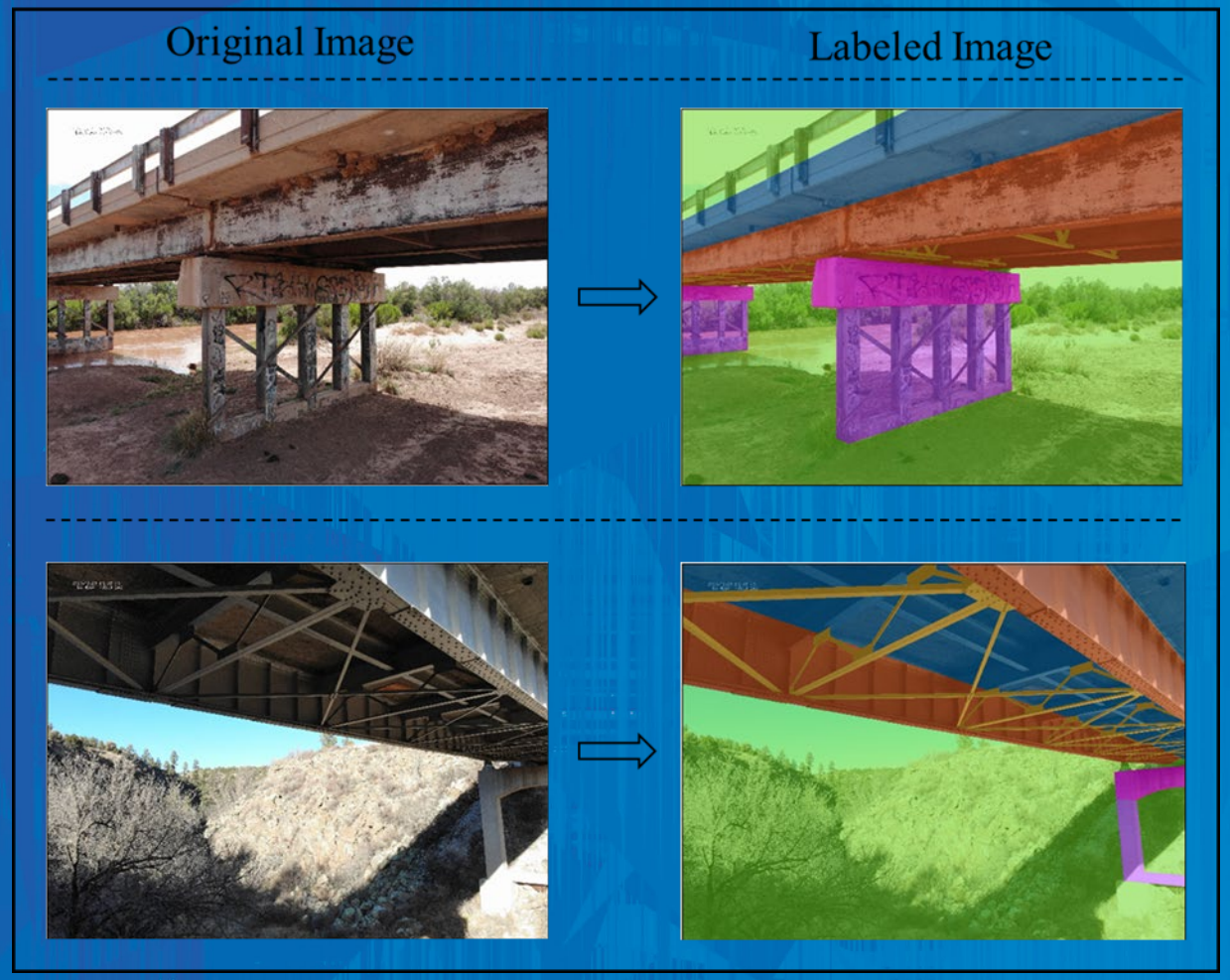
UAS for Bridge Inspection

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE





UAS for Bridge Inspection



The enhanced model was trained and optimized to recognize not only bridge decks but also cross girders, main girders, pier caps, and piers, thereby a more holistic understanding of bridge condition and structural performance.

The developed web application offers an intuitive and user-friendly interface for uploading and analyzing images containing potential spalling, effectively streamlining the inspection workflow for both automated and human-guided assessment.

Research & Climate Bureau

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE





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APPENDIX D. IDAHO TD – RARE: BUILDING REUSABLE RESEARCH CAPACITY WITH AI

WTRC 2026 PEER EXCHANGE

RARE: Building Reusable Research Capacity with AI

Too many research needs. Not enough SPR funds. Sound familiar?

Mike Copeland — Quality Program Manager, Idaho Transportation Department

THE TRADITIONAL PATH

Utah Project 2026-UT-1

The Proposal: $25,000 to determine if AI can repurpose research reports into podcasts, videos, and infographics.

The Traditional Path: Write the RFP. Wait months for proposals. Wait months for kickoff. Wait 1–2 years for actionable deliverables.

That process is expensive — not just in dollars, but in time.



WHAT CAME BACK

Last Night, On My Laptop

Podcast: Two-person conversational audio. 10 min. **$0.18**

Research report: 60 pages, 84 citations, two AI platforms in parallel. **$5.41**

Infographic + survey: Included. Total: **$5.59 · 30 min**

But I haven't reviewed any of it. HITL takes ~50x longer. Still days, not months. PI time, not a contract.

AI-GENERATED PODCAST
Utah 2026-UT-1
Click to play

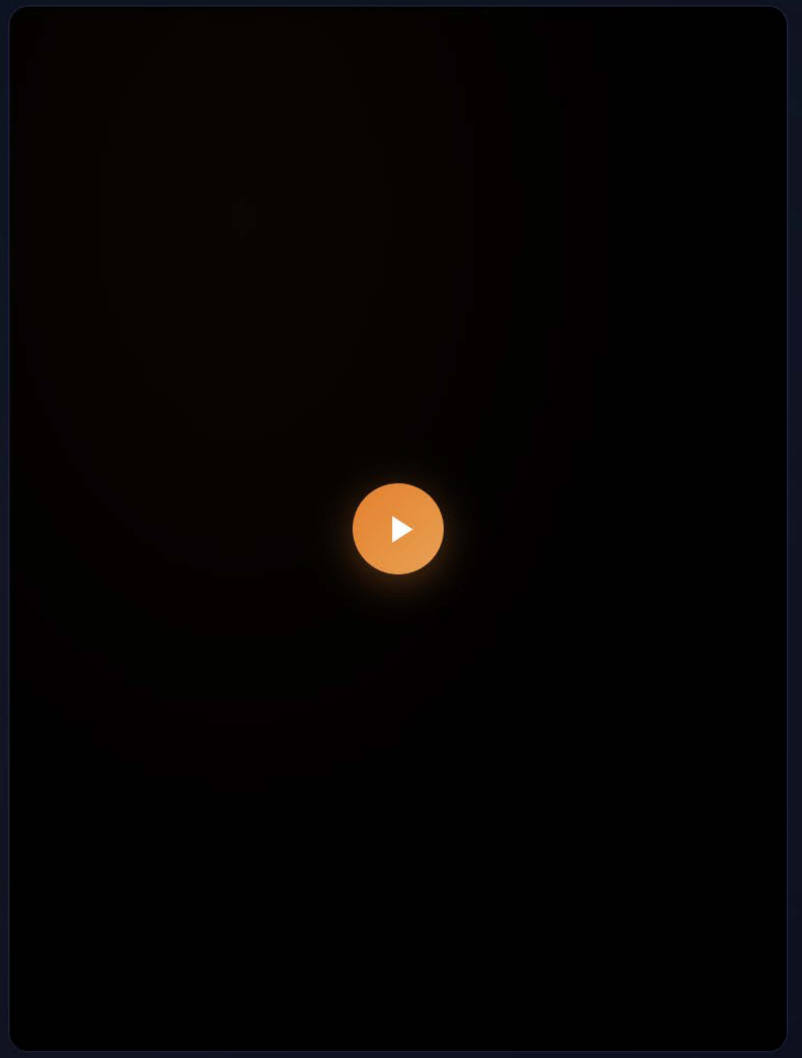


BUT WAIT

Same PDF. Same Night.

AI-generated video presentation walking through Utah's entire proposal with a synthetic presenter.

From the same source PDF that produced the podcast, the report, the infographic, and the survey.



TRACK RECORD

What This Methodology Has Already Produced

Handwritten form extraction: 98.2% accuracy, 1,967 fields. Deployed to ITD field staff. Preprint released so any DOT can replicate.

Agentic TCP plan generator: Two GPS pins → MUTCD-compliant plan set.

Construction document search: 20 years of ProjectWise records, queryable by AI.

One person. Same framework. No RFPs. No contracts. Domain expertise + compute.

And that's just a few examples from 2026 alone.





THE FRAMEWORK

Rapid Applied Research Environment

An SPR-funded framework that gives domain experts compute and PI time
to route analytical research work through AI.

$55K	$40K	$95K
COMPUTE	PI TIME	TOTAL

Built on Expert-AI Co-Research (EACR) — published in the Transportation Research Record

THE BIGGER PICTURE

Not All Research Work Is the Same

Physical work: Lab testing, field instrumentation, specimen fabrication. AI can't do this. Keep it traditional.

Analytical work: Literature review, synthesis, data analysis, coding, report writing. This is where AI compresses timelines.

ITD's FFY2027 queue: 14 proposals, $2.23M. After triage — 4 fully analytical, 5 hybrid, 4 traditional.

Estimated savings: $274K–$484K in SPR funds redeployed to backlog projects.

14 STANDALONE PROPOSALS

~~$2.23M~~

↓

$1.75M

AFTER RARE TRIAGE

4 Full | 5 Hybrid | 4 Traditional

$274K — $484K

FREED FOR BACKLOG PROJECTS

PATHS FORWARD

Three Options

1

Stay where we are.
Traditional contracting works. It's understood. It's safe.

2

Require full disclosure of GenAI.
Your researchers are likely already using it. The application is novel. You deserve to know — and to ask what that means for the price.

3

Do it yourselves.
Build internal capacity. Cover more ground for less.

APPENDIX E. WASHINGTON STATE DOT – FORECASTING TRUCK PARKING WITH AI

Smart and Cooperative Truck Parking Information Management System

WSDOT FMCSA-Truck Parking Information and Management System (TPIMS)
Smart and Cooperative Truck Parking Monitoring and Calibration System Empowered by Machine Learning

Nutvara Jantarathaneewat (GOO) [1], Kehua (Zeon) Chen[1], Ph.D.,
Yinhai Wang[1], Ph.D., P.E, Matt Neeley[2], P.E.

[1] University of Washington, [2] Washington State Department of Transportation

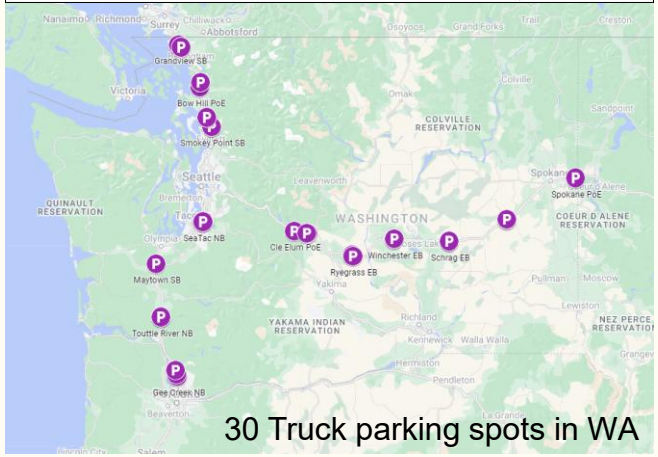
WSDOT

STARLab

Introduction

- **Parking Shortage:** 60% of drivers spend over an hour finding overnight parking*, risking safety and compliance.
- **Truck Parking Information Management System (TPIMS):** integrates real-time sensing and predictive analytics
- **Statewide Expansion**: Deployed at 16 I-5 sites, covering 273 stalls with sensors and predictive support

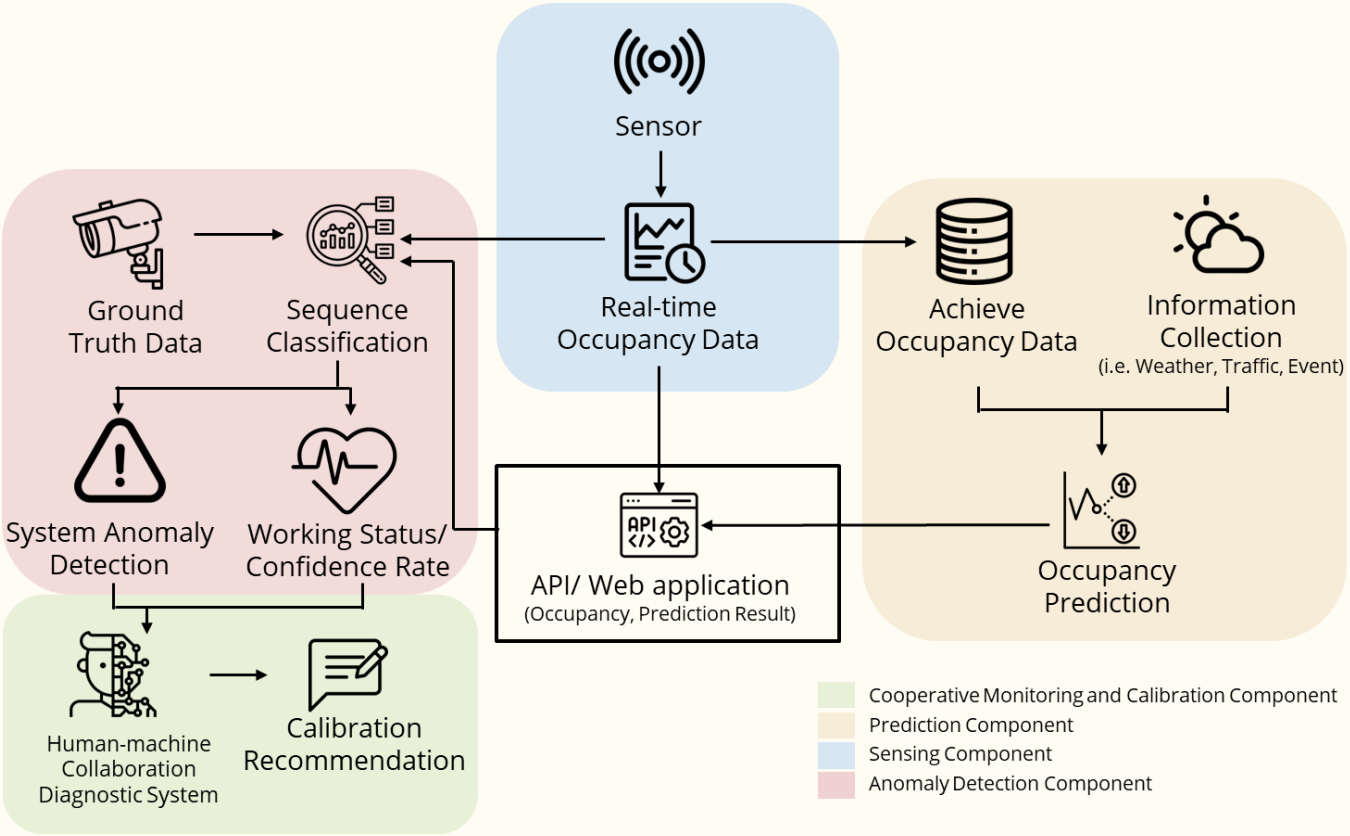




30 Truck parking spots in WA

Washington State Truck Parking Study, WSDOT, December 2016.

TPIMS Overall



Data Collection

Truck Parking Detection Sensor and System

Space-by-space Sensing System



Radar-based Entrance/exit Counting Sensor

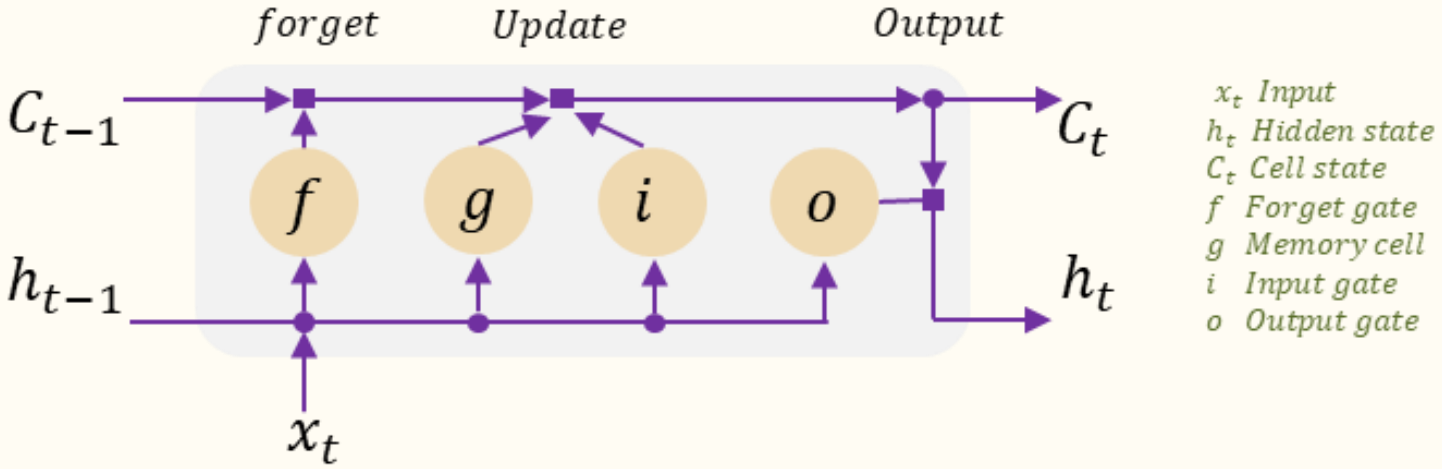


Camera Detection



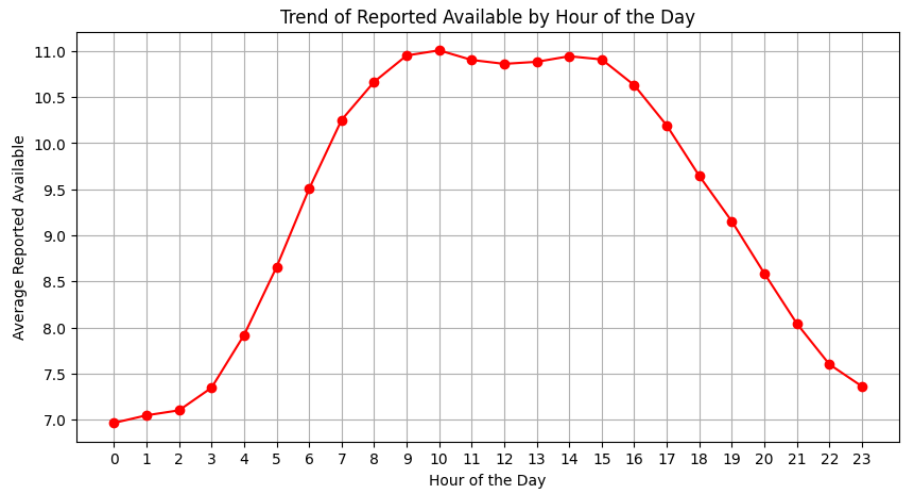
Occupancy Prediction

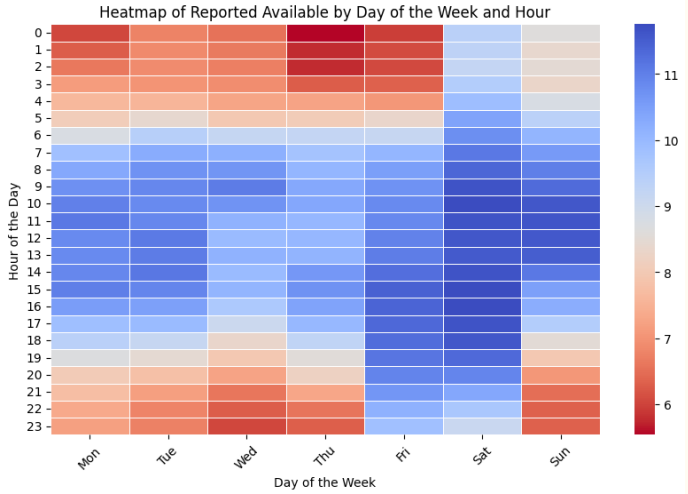
- Uses a Long Short-Term Memory (LSTM) network, a type of recurrent neural network (RNN)
- Forecasts availability at multiple time steps
  - 10 min, 30 min, 1, 2, 3, 4, 6, and 8 hours ahead



Occupancy Prediction

- Data collected at Ft. Lewis
- Every 5 minutes, over 5 months (Aug 20, 2024 – Feb 13, 2025)
- Totaling 50k records.

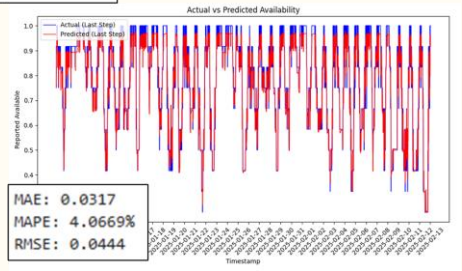




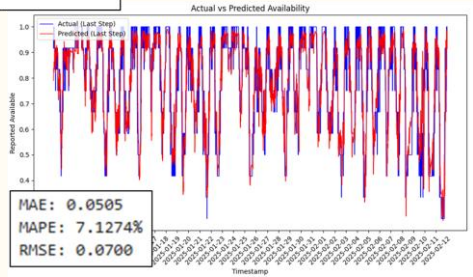
Occupancy Prediction

- Prediction results at various time steps (10 min to 8 hours)
- Achieve over 80% prediction accuracy

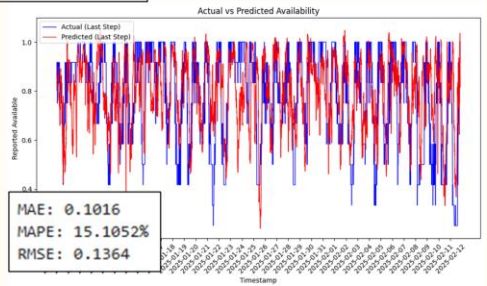
10 min



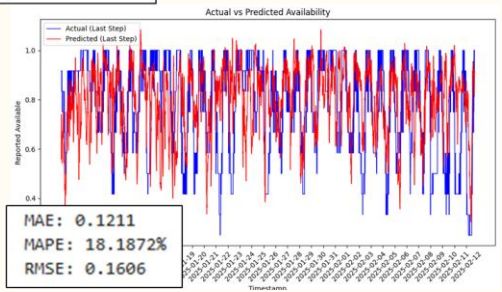
1 hr



4 hr



8 hr



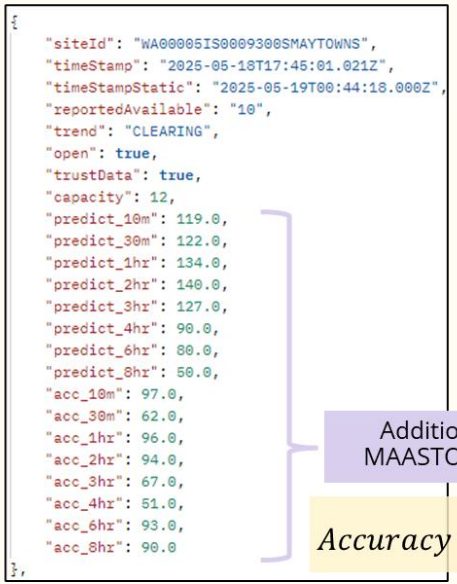
API/Web Application

- Complied with the Mid America Association of State Transportation Officials (MAASTO)

WSDOT
UW
STARLab



Static Public Feed





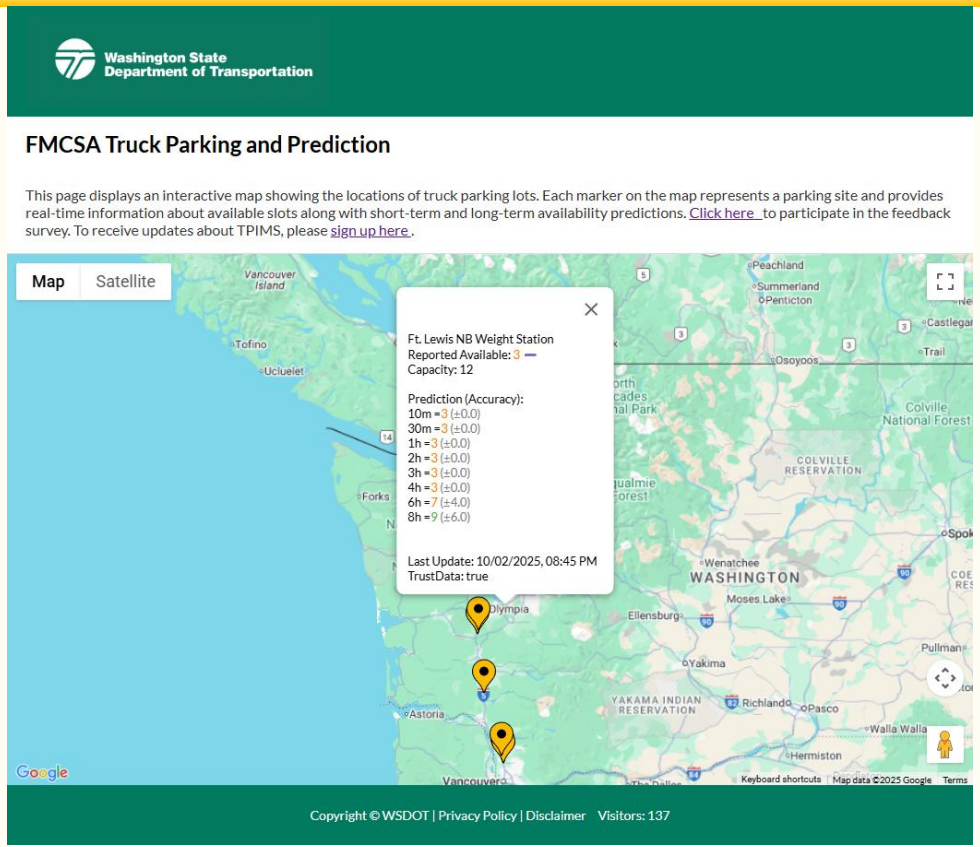
Dynamic Archive Feed

Additional from MAASTO Standard

$$Accuracy = 1 - \frac{|TruthValue - Predicted|}{TruthValue}$$

Dynamic Public Feed (modified)

API/Web Application



Anomaly Detection and Calibration

- When can in/out radar sensors miscount vehicles?



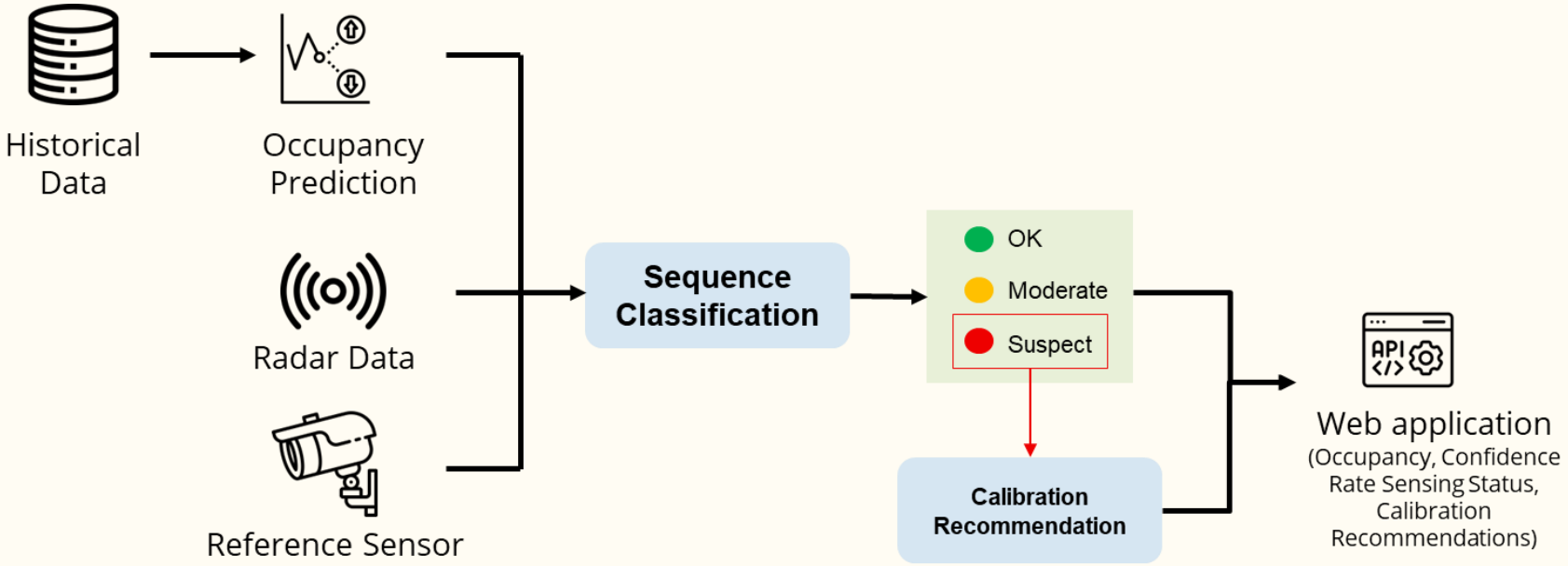
Missed detection



Tailgating

Anomaly Detection and Calibration

- Sequence classification for sensor status



Anomaly Detection and Calibration Pipeline

Anomaly Detection

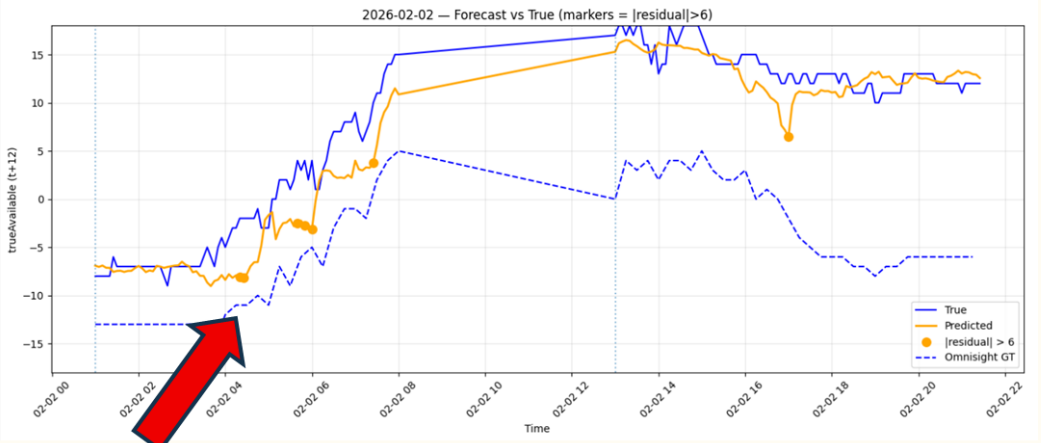
➢Result

Sensor status is determined by comparing radar measurements, reference sensor data, and model prediction.

OK
- |Radar − Reference| ≤ 2
- Prediction supports a sensor

Moderate
- 2 < |Radar − Reference| < 8

Suspect
- |Radar − Reference| ≥ 8
- Possible sensor malfunction or accumulated counting error

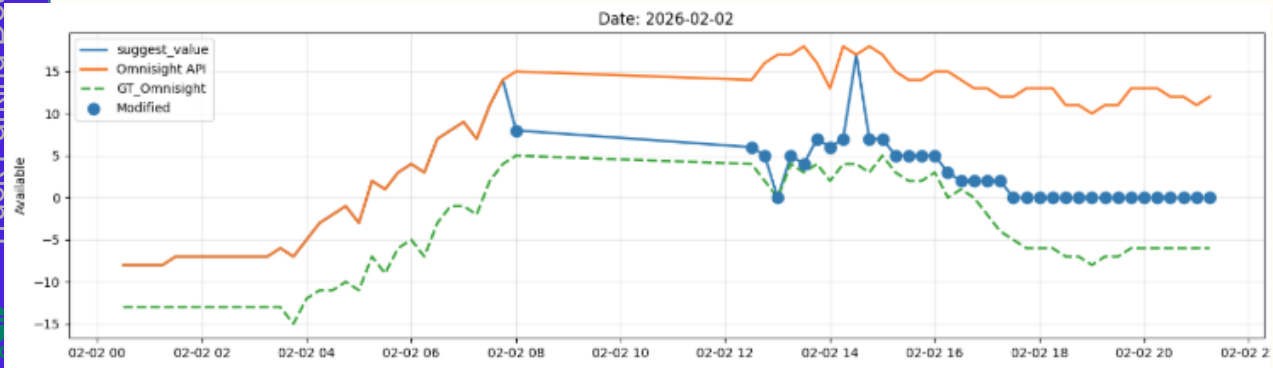


Prediction-assisted anomaly detection

Data: 2 months (SeaTac site)
Prediction model: LSTM (30-min ahead) — MAE = 1.88
Status classifier: InceptionTime — Accuracy = 74.5%

Calibration Recommendation

- Automatically correct cases with clear evidence
  - Status is “SUSPECT” AND
  - Radar signal exceeds reference sensor
  - Suggestion: Use reference sensor

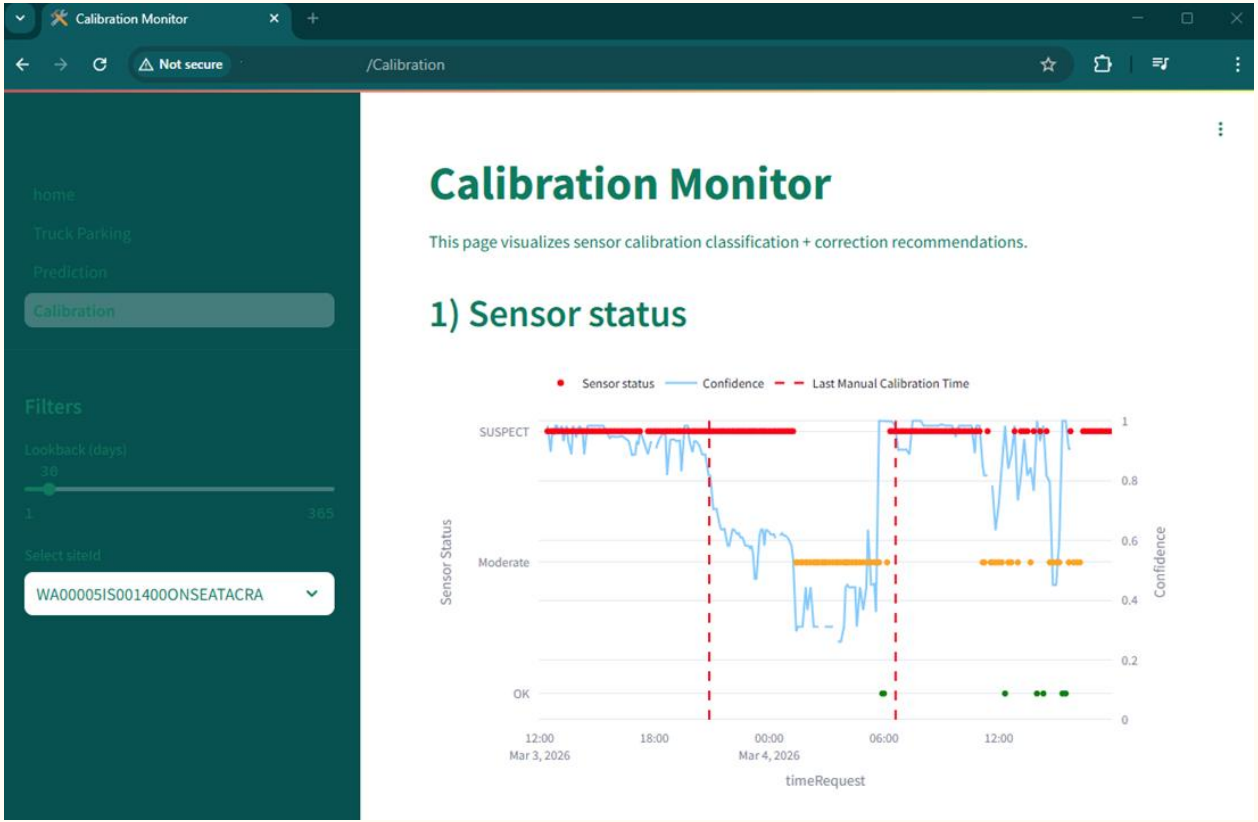


Example of automatic calibration using reference sensor data

```
=== ORIGINAL ===
MAE : 5.51

=== AFTER SUGGESTION ===
MAE : 3.97
```

Web Application



Thanks !

APPENDIX F. NEW MEXICO DOT – DEVELOPING KEY PERFORMANCE INDICATORS & IMPLEMENTATION PLANNING FOR RESEARCH PLANNING

Developing Key Performance Indicators & Implementation Planning for Research Planning

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE



WTRC Peer Exchange
May 20, 2026

Randy Trujillo, Chief Research and Climate Bureau

Research & Climate Bureau

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE



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Highlights of Implemented Research Initiatives

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

Statewide Transportation Innovation Council (STIC) Incentive Program Project

Research Need: SmartPile Technology Evaluation (4-Years / $40K)

OBJECTIVE:

- Improve pile driving monitoring on NMDOT bridge projects
- Real-time digital hammer stroke data collection
- Improve measurement accuracy vs. traditional Saximeter methods
- Improve safety and field efficiency
- Reduce manual data entry and reporting

SmartPile Technology Evaluation (4-Years / $40K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION:

- Implemented SmartPile technology across multiple bridge projects
- Identified operational benefits and areas for improvement
- Recommended development of a digital system for remote pile set measurement to improve safety and inspection efficiency



Statewide Transportation Innovation Council (STIC) Incentive Program Project
Research Need: E-Ticketing Portal Development (4-Years / 32K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

OBJECTIVE:

- Develop an NMDOT E-Ticketing portal for field material deliveries
- Replace paper ticketing with a digital delivery tracking process
- Improve safety, efficiency, and sustainability
- Reduce resource demands and streamline field operations
- Enhance data accessibility and project documentation

E-Ticketing Portal Development (4-Years / $32K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION:

- Successfully implemented a digital E-Ticketing system for field material deliveries
- Reduced reliance on paper tickets and manual documentation
- Improved safety, efficiency, and real-time data accessibility
- Streamlined communication and delivery tracking in field operations
- Supported more sustainable and resource-efficient project management
- Increased higher customer satisfaction

Research Need: Robotic-Enabled Automated Underwater Bridge Inspection (18-Months / $62K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

OBJECTIVE:

- Investigate robotic technology for underwater bridge inspections
- Develop a preliminary underwater robotic inspection platform
- Create methods for collecting and analyzing inspection data
- Perform field tests to identify limitations and opportunities for improvement
- Demonstrate potential for future implementation and improve inspection efficiency

Robotic-Enabled Automated Underwater Bridge Inspection (18-Months / $62K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION:

- Developed and field-tested an underwater robotic platform for bridge inspections
- Implemented data collection and analysis methods for underwater inspection activities
- Evaluated robotic technology for improving bridge inspection capabilities and efficiency

Research Need: Dust Mitigation Monitoring Project Phase I & II (9-Years / $317K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

OBJECTIVE:

- Evaluate the effectiveness of dust mitigation treatments at the Lordsburg Playa along I-10
- Monitor whether land management practices reduce blowing dust conditions
- Assess impacts of mitigation efforts on dust-related traffic crashes and highway safety
- Compare the performance of treatments implemented in the Southern and Northern Playa areas
- Provide recommendations for future NMDOT dust mitigation and HSIP safety projects

Research Need: Dust Mitigation Monitoring Project Phase I & II (9-Years / $317K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION:

- Installed fencing and excluded livestock to reduce dust-generating surface disturbance
- Applied revegetation methods to stabilize soil and reduce blowing dust
- Installed visibility monitoring equipment along I-10 to track dust conditions





Research Need: Dust Mitigation Monitoring Project Phase I and II (9-Years / $317K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION (continued):

- Added roadway warning signs to improve driver awareness during dust events
- Used cameras, satellite data, and weather models to monitor dust activity
- Identified key dust source areas and seasonal dust patterns
- Supported development of improved dust storm forecasting and early warning systems
- Advanced long-term efforts to improve safety and reduce dust-related crashes on I-10

Research Need: UAS-Based Pilot Automated Bridge Inspection (18-Months / $105K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

OBJECTIVE:

- Develop safe and effective guidelines for building and operating drone systems
- Define best practices for designing, testing, and managing unmanned aircraft systems (UAS) platforms
- Ensure compliance with FAA Part 107 regulations for legal drone operation
- Support safe integration of drones into real-world operational environments

Research Need: UAS-Based Pilot Automated Bridge Inspection (18-Months / $105K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION:

- Implemented guidelines for safe development and operation of drone systems
- Established procedures for drone design, testing, and operational us
- Applied FAA Part 107 certification requirements for compliant UAS operation
- Ensured adherence to regulatory standards for legal and safe drone deployment
- Supported structured integration of drone systems into field operations

Research Need: Implementation of Automated Bridge Inspection Practice Via Unmanned Aerial Vehicles in New Mexico (2.5-Years / $390K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

OBJECTIVE:

- Develop a drone-based (UAS) framework for bridge deck inspection
- Establish methods for collecting and processing inspection data
- Create a web-based tool to support NMDOT inspection workflows
- Validate system performance through field testing
- Provide hands-on training through a technology transfer workshop for NMDOT staff
- Demonstrate real-world application of UAS for bridge inspection tasks

Research Need: Implementation of Automated Bridge Inspection Practice Via Unmanned Aerial Vehicles in New Mexico (2.5-Years / $390K)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION:

- Tested the system in the field under real inspection conditions
- Demonstrated performance during an actual bridge inspection
- Delivered a technology transfer workshop to NMDOT staff
- Shared system workflows and practical implementation methods

Research Need: Phases I Through IV
Study & Evaluation of Materials Response in Hot Mix Asphalt Based on Field Instrumentation (15-Years / $1.1M)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

OBJECTIVE

- Monitor pavement performance using field sensors and testing data
- Evaluate pavement deterioration and material property changes
- Calibrate PMED models using site-specific data
- Develop local calibration factors and compare to default values
- Continue long-term pavement monitoring on I-40
- Collect traffic, weather, and pavement response data
- Improve and validate PMED models for New Mexico conditions
- Account for environmental and traffic-related pavement damage

Research Need: Phases I Through IV
Study & Evaluation of Materials Response in Hot Mix Asphalt Based on Field Instrumentation (15-Years / $1.1M)

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

IMPLEMENTATION – Phases I Through III (Phase IV completed 2029)

- Developed pavement analysis guidelines and calibration methods for NMDOT
- Collected long-term pavement, traffic, climate, and material response data
- Implemented WIMDAS and integrated field data into AASHTOWare ME analysis
- Improved pavement distress prediction using site-specific conditions
- Conducted long-term monitoring using embedded sensors, FWD, and WIM data
- Evaluated pavement performance under real traffic and environmental conditions
- Supported PMED implementation and pavement model calibration in New Mexico
- Recommended additional weather stations and instrumented pavement sections
- Provided training and technology transfer for pavement engineering staff

Questions for My Peers:

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

1. How do other states incorporate implementation planning into project agreements?
2. How do you define the key elements needed to demonstrate return on investment (ROI) for research projects?
3. Do you continue meeting with project advocates and sponsors after project completion to monitor implementation and effectiveness?
4. How many states have a dedicated implementation engineer on staff?
5. Is there a formal checklist or tracking tool used to document implementation progress?
6. How do you communicate project implementation results to executive leadership?

Thank You!

APPENDIX G. IDAHO TD – ANATOMY OF A SUCCESSFUL IMPLEMENTATION

Anatomy of Successful Implementation

Statewide AADT Estimation System for Off-System Public Roads in Idaho

Western Transportation Research Consortium
Peer Exchange - Theme 4
Boise, ID May 20, 2026

Amanda Laib, ITD Research Program Manager



WTRC
Western Transportation Research Consortium

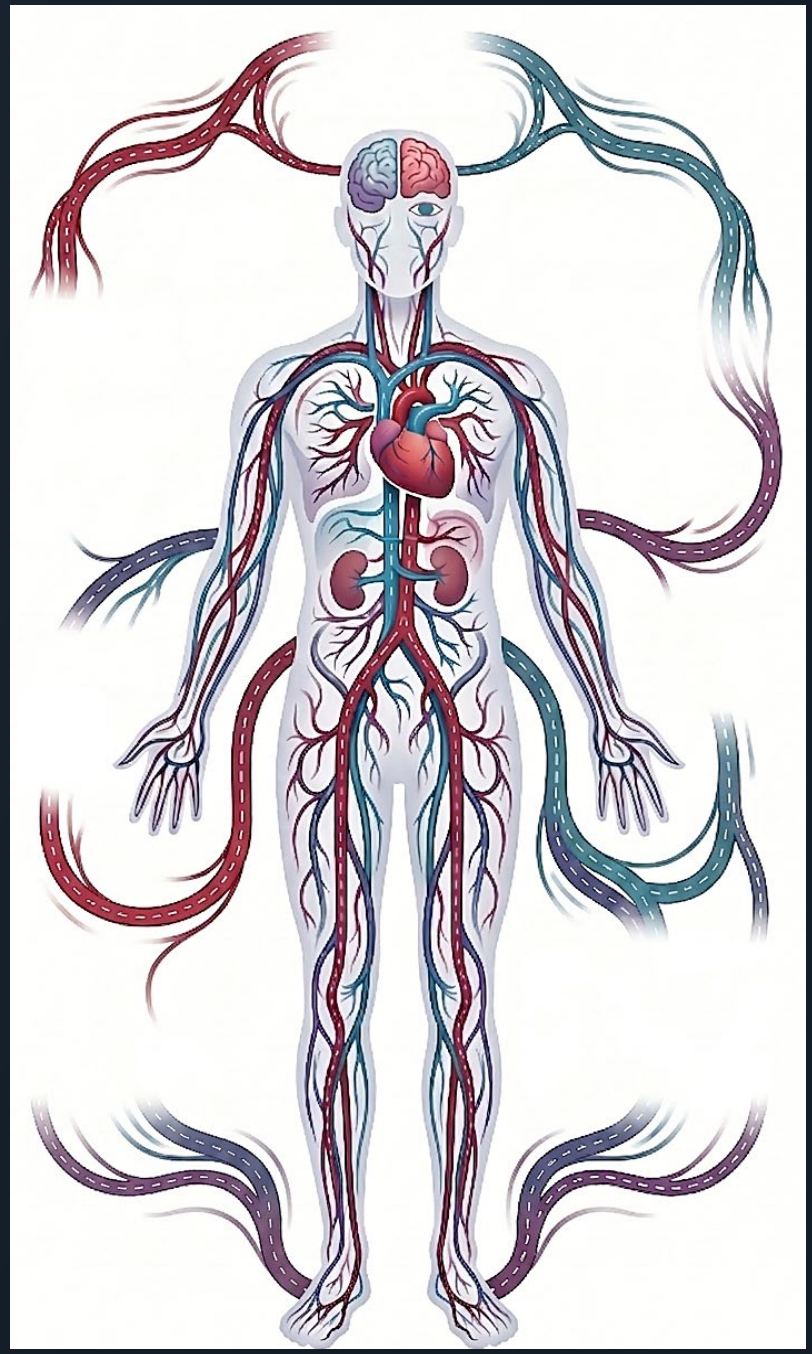
NotebookLM

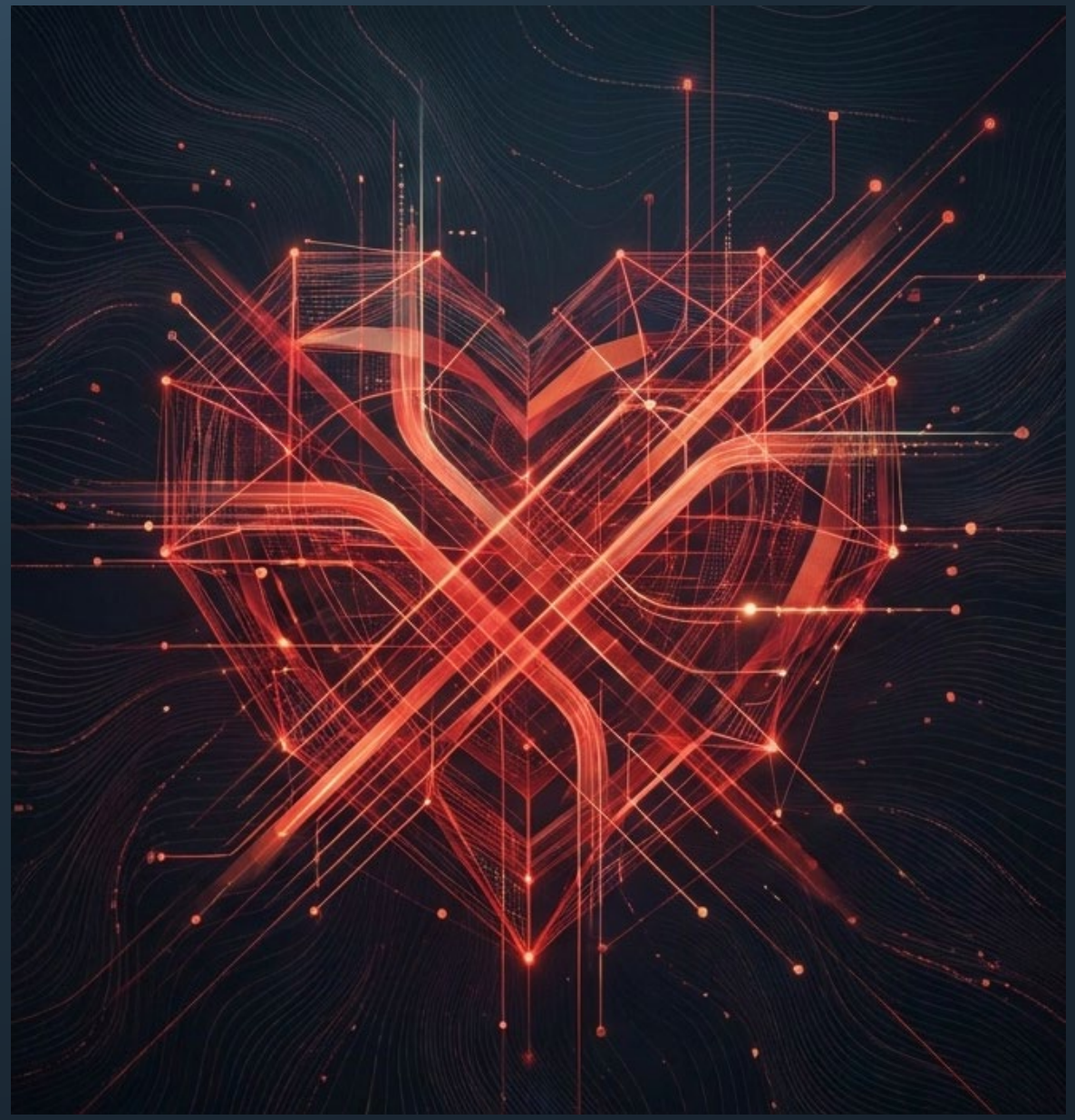
The Body of Work

The Federal Mandate: Per the FAST Act of 2015, ITD faced a requirement to establish AADT estimates on all public paved roads—approximately 40,000 centerline miles—by September 30, 2026, as established in Model Inventory of Roadway Elements

The Problem: Existing traffic count program covered 12,000 centerline miles of the federal aid system. Expanding the physical traffic count program to include all off-system roads was fiscally impossible







The Heart

Implementation-First Mindset

Project Champion's Motivation:

- Complying with federal mandate
- Solving the fiscal challenge
- Defining and documenting roles & responsibilities
- Preserving intuitional knowledge

Objective: Practical methodology for estimating local AADT that included maintenance and succession planning to ensure sustainability

The Brain

Choosing the Intelligence



- ✓ Literature and Peer Review: Drawing on practices in other states
- ✓ Exploring Options: evaluated multiple traffic volume estimation techniques, including regression models, travel demand models (TDM), and machine learning

- ✓ Selecting the Method: The TAC chose Geospatial Interpolation—specifically Empirical Bayesian Kriging (EBK)
- ✓ Reasoning: flexibility, accuracy in rural contexts, and its ability to be executed using ITD's existing in-house resources (ArcGIS and Python)

	Rural Accuracy	Data Appetite	ITD Tool Integration
Sampling & Standard Regression	Low ⊗	High ⚠	Moderate —
Travel Demand Models (TDM)	Moderate —	Very High ⚠	Low ⊗
Geospatial Interpolation (EBK)	High ✓	Moderate / Scalable ✓	High (Native to ArcGIS Pro) ✓

The Hands

Building the Tools

- ✓ Establishing workflow: Data Preparation → Estimation → Scaling & Balancing
- ✓ Beta testing and debugging: In dev environment with ITD staff and data
- ✓ The Final Touch: Validating accuracy with a script that reserves 20% of known count locations to test against modeled results and reporting error metrics
- ✓ Report includes a User Guide, Catalog of Data & Variables, and all Python scripts in the Toolbox
- ✓ Contractor also delivered an in-person training that was recorded for future staff

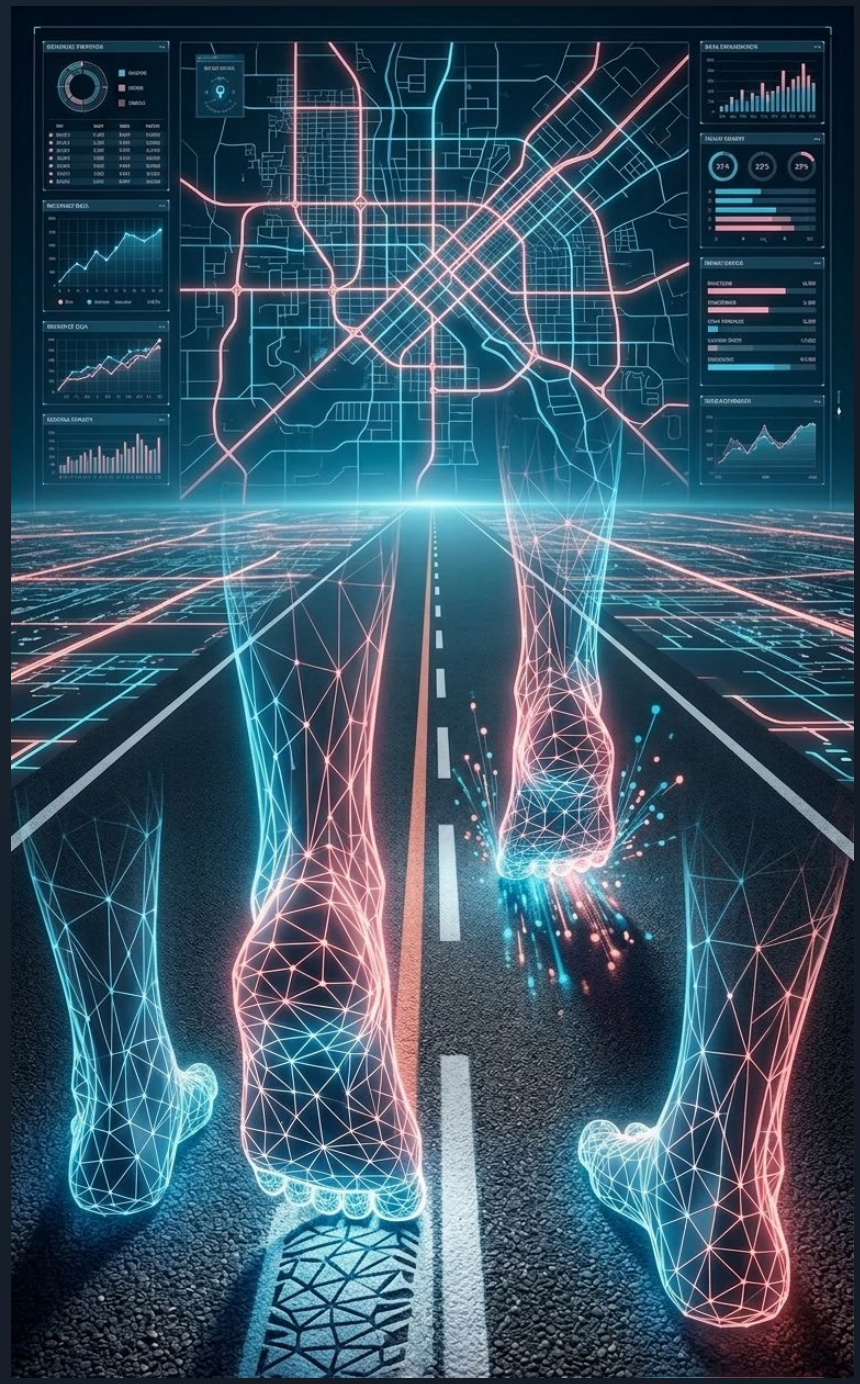




The Feet

Hitting the Pavement

- ✓ Traveling the State: The current active phase, Local Count Incorporation - MPOs, local highway districts, and counties.
- ✓ Incorporating Ground Truth: Incorporating actual traffic counts conducted by local partners calibrates and improves the model
- ✓ Maintaining Credibility: Using local agency data ensures the system is reflective of real-world local conditions, maintaining trust with the agencies that manage these roads
- ✓ Closing the Maintenance Gap: Documenting the workflow for future staff to consistently funnel local data into ITD's existing systems



The Living Being

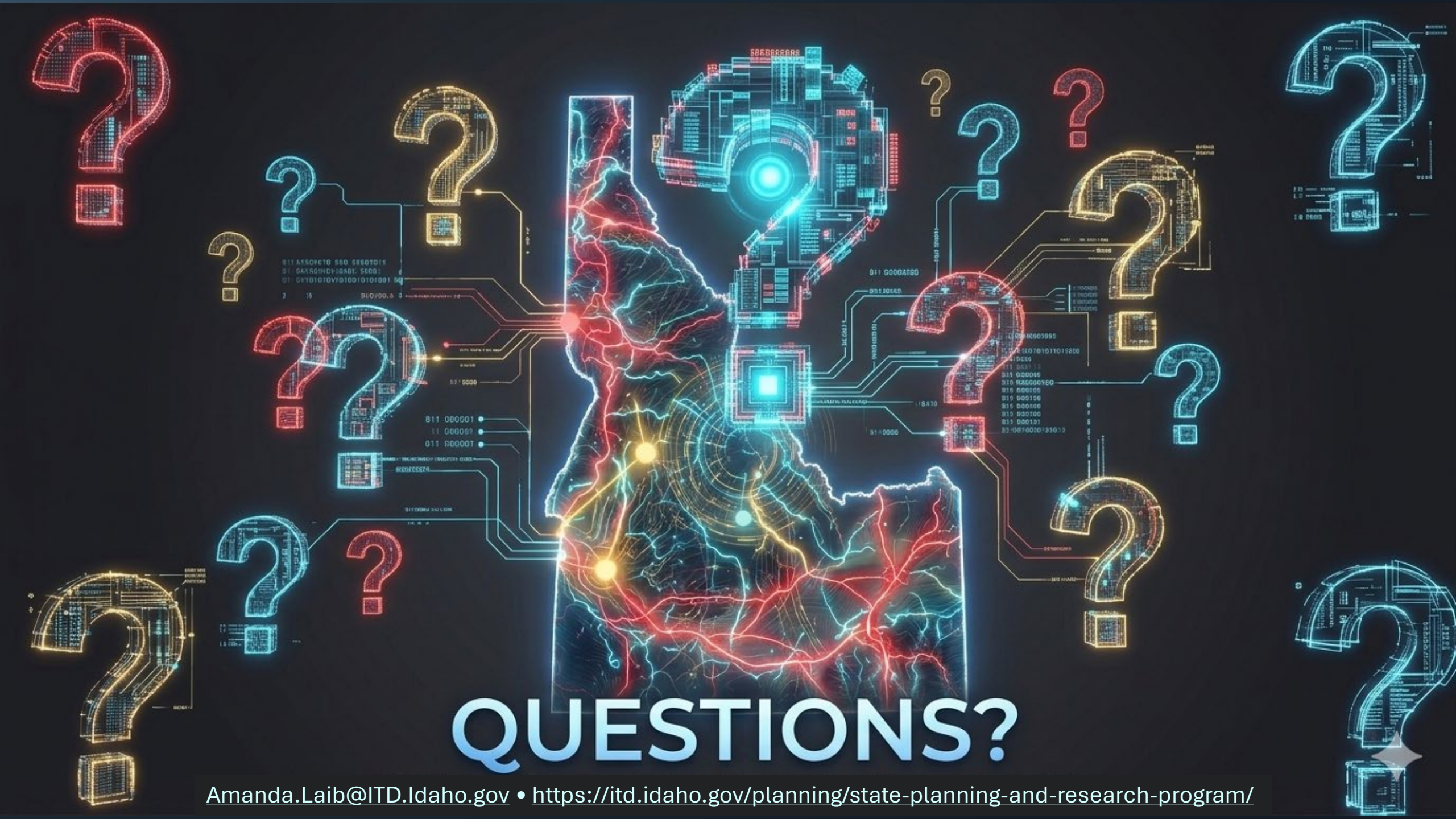
Keys to Success:

- Driven by a well-defined need
- Implementable by design from the beginning
- Included elements to address maintenance and sustainability
- Thoughtfully conducted in phased approach
- Incorporated all players for each phase early on



Bonus Benefits:

- Enables enhanced network-level screenings for safety analytics
- Leaves behind a comprehensive and well-documented system so future staff won't have to start from scratch
- Improves collaboration with local partners
- Empowers locals with defensible data they can use in grant applications



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