SCAN TEAM REPORT

NCHRP Project 20-68, Scan 23-04

Developing and Maintaining a Culture of Innovation within DOTs

Supported by the

National Cooperative Highway Research Program

The information contained in this report was prepared as part of NCHRP Project 20-68 U.S. Domestic Scan, National Cooperative Highway Research Program.

SPECIAL NOTE: This report IS NOT an official publication of the National Cooperative Highway Research Program, Transportation Research Board, or the National Academies of Sciences, Engineering, and Medicine.

Acknowledgments

The work described in this document was conducted as part of NCHRP Project 20-68, the U.S. Domestic Scan program. This program was requested by the American Association of State Highway and Transportation Officials (AASHTO), with funding provided through the National Cooperative Highway Research Program (NCHRP). The NCHRP is supported by annual voluntary contributions from the state Departments of Transportation. Additional support for selected scans is provided by the U.S. Federal Highway Administration and other agencies.

The purpose of each scan, and of Project 20-68, is to accelerate beneficial innovation by facilitating information sharing and technology exchange among the states and other transportation agencies and identifying actionable items of common interest. Experience has shown that personal contact with new ideas and their applications is a particularly valuable means for such sharing and exchange. A scan entails peer-to-peer discussions between practitioners who have implemented new practices and others who are able to disseminate knowledge of these new practices and their possible benefits to a broad audience of other users. Each scan addresses a single technical topic selected by AASHTO and the NCHRP 20-68 Project Panel. Further information on the NCHRP 20-68 U.S. Domestic Scan program is available at

https://www.trb.org/NCHRP/USDomesticScanProgram.aspx

This report was prepared by the scan team for *Domestic Scan 23-04 Developing and Maintaining a Culture of Innovation within DOTs,* whose members are listed below. Scan planning and logistics are managed by Arora and Associates, P.C.; Harry Capers is the Principal Investigator. NCHRP Project 20-68 is guided by a technical project panel and managed by Sid Mohan, NCHRP Associate Program Manager.

The scan team members include the following individuals:

Dara Wheeler,
California DOT, Team Chair

Todd May,
Indiana DOT

Tyson Rupnow,
Louisiana DOTD

Katie Walker,
Minnesota DOT

Cameron Kergaye,
Utah DOT

Jeffrey A. Zaharewicz,
FHWA

Amanda Gilman-Bogie,
Vermont DOT

Shante Hastings,
Delaware DOT

Alyson Tamer,
North Carolina DOT

Anne K. Freeman,
Washington State DOT

Linda Su,
Iowa DOT

Glenn Page,
AASHTO liaison

Dale Peabody,
Subject Matter Expert


CASE


INNOVATION
Improvement
Education
Deliverable
Values
Accountability
INDOT
Creativity
Strategic
Great Service
Cost
Effective
Trust
Mobility
Diversity
Safety
21st Century
Efficient Communication
Expertise
Performance
Responsibility
Vision Partnership
Excellence
Mission

Disclaimer

The information in this document was taken directly from the submission of the authors. The opinions and conclusions expressed or implied are those of the scan team and are not necessarily those of the Transportation Research Board or its sponsoring agencies. This report has not been reviewed by, and is not a report of, the Transportation Research Board or the National Academies of Sciences, Engineering, and Medicine.

Scan 23-04
Developing and Maintaining a Culture of Innovation within DOTs

REQUESTED BY THE

American Association of State Highway and Transportation Officials

PREPARED BY SCAN 23-04 TEAM

Dara Wheeler,
California DOT, Team Chair

Todd May,
Indiana DOT

Tyson Rupnow,
Louisiana DOTD

Katie Walker,
Minnesota DOT

Cameron Kergaye,
Utah DOT

Jeffrey A. Zaharewicz,
FHWA

Amanda Gilman-Bogie,
Vermont DOT

Shante Hastings,
Delaware DOT

Alyson Tamer,
North Carolina DOT

Anne K. Freeman,
Washington State DOT

Linda Su,
Iowa DOT

Glenn Page,
AASHTO liaison

Dale Peabody,
Subject Matter Expert

SCAN MANAGEMENT

Arora and Associates, P.C.

Lawrenceville, NJ
August 2024

The information contained in this report was prepared as part of NCHRP Project 20 68 U.S. Domestic Scan, National Cooperative Highway Research Program.

SPECIAL NOTE: This report IS NOT an official publication of the National Cooperative Highway Research Program, Transportation Research Board, or the National Academies of Sciences, Engineering, and Medicine.

Table of Contents

Abbreviations and Acronyms

AASHTO	American Association of State Highway Transportation Officials
AIM	AASHTO Innovation Management
Caltrans	California Department of Transportation
CAI	Center for Accelerating Innovation
CoP	Community of Practice
EDC	Every Day Counts
FTE	Full Time Equivalent
FHWA	Federal Highway Administration
ITD	Idaho Transportation Department
InDOT	Indiana Department of Transportation
LTAP	Local Technical Assistance Program
MnDOT	Minnesota Department of Transportation
MoDOT	Missouri Department of Transportation
NCHRP	National Cooperative Highway Research Program
PennDOT	Pennsylvania Department of Transportation
SP&R	State Planning & Research
STIC	State Transportation Innovation Council
SME	Subject Matter Expert
TxDOT	Texas Department of Transportation
UDOT	Utah Department of Transportation

Executive Summary

Overview

All the state DOTs are innovative in many ways. Developing and adopting new practices, products, and technologies is a daily occurrence. In recent years, many agencies have developed more formal innovation programs, recognizing that an innovation culture can not only result in tangible benefits but also lead to improved employee morale, retention, and development.

The National Cooperative Highway Research Program, through its Domestic Scan Program, approved this effort to examine and document some of the practices used by state agencies that have successfully designed and implemented programs and/or initiatives that support a culture of innovation. Results from a desk scan, amplifying questions, and a virtual scan workshop produced recommendations for transportation agencies to consider when getting started or wanting to improve an innovation program.

Key Findings and Observations

Leadership Support

Leadership needs to consistently provide the message that innovation is a core value and that trying things is an expectation. As innovation champions, leaders should implement practices to build and maintain the culture and support policies and programs that foster collaboration, risk-taking, and employee empowerment.

Successful programs:

- Have executive level leadership and leadership at all levels proactively supporting innovation.
- Build innovation into agency values, mission, goals, and expectations.
- Have leadership that can break down barriers to innovation implementation.
- Have leaders that encourage risk-taking and communicate to employees that failure is acceptable.
- Have leaders that support innovation and allow organic evolution of ideas.
- Have leaders that provide positive feedback to innovators regardless of outcome.

Employee Empowerment

An innovation culture requires employee empowerment that equips every employee with knowledge to stimulate ideas and help sustain a mindset that innovation is an expectation for DOT employees at all levels. Employees need to know that their feedback and opinions matter, they need opportunities for growth, and they need to feel trusted, valued, and supported.

Successful programs:

- Allow and support risk-taking and agency employees understand this.
- Encourage employees to share ideas and innovations through employee-driven initiatives.
- Support employee teams to solve problems via process improvement tools and programs.
- Capture maintenance and field crew innovations since these are foundational to DOT's DNA.
- Grow knowledge and enable skills so employees can evaluate innovations from themselves and others.
- Provide online platforms so employees can easily submit ideas.
- Build mutual respect and trust between leadership and employees.
- Include innovation stewards and/or ambassadors.
- Provide training to bridge the gap so employees know how to share and access innovations.
- Have leaders and employees that embrace innovation expectations and accountability.

Communication

Communication should be creative and practical and draw attention to the importance of innovation, and to frequently remind employees that new ideas are valued in a transportation agency.

Successful programs:

- Effectively communicate the importance of innovation to internal and external stakeholders, including staff, partners, policymakers, and the public.
- Create an innovation brand that is easily recognizable by internal staff and external partners.
- Have agency communication offices that get involved early on with initiatives and programs and then stay involved.
- Use multiple methods (social media, newsletters, websites, emails, in-person) to effectively communicate to diverse audiences (central office, district office, maintenance crew garages).
- Keep communications and messaging fresh, compelling, and interesting.
- Build relationships and trust by in-person visits from innovation champions and staff.

Recognition

Recognition motivates employees and communicates the importance of innovation to the agency. Frequent and timely recognition is a powerful way to motivate employees to become innovative. Recognition strengthens leadership-employee relationships and provides employees with a clear purpose aligned to agency goals, while reinforcing the desired innovation culture.

Successful programs:

- Support a campaign to recognize new innovations and inspire future innovators.
- Have annual showcases and award competitions to recognize the best innovations and innovators.
- Celebrate successes and share stories of innovation to inspire others and reinforce its importance within the organization.
- Implement the best innovations.

Measurement

Agencies seeking to sustain a culture of innovation routinely stress the importance of finding simple ways to measure the pace and the impact of innovation. Routine tracking and communication of the pace of innovation help keep employees engaged and motivated. The scan team recommends tracking who is submitting ideas so broad, diverse participation can be engaged.

Successful programs:

- Track the number of innovations being submitted and implemented.
- Quantify the benefits of innovation in terms of cost savings, time savings, improved safety, etc.
- Allow employees to determine realistic and reasonable benefits of their innovations using various methods.
- Roll up benefits into annual reports, scorecards, and dashboards.

Collaboration

Collaboration is a great way to encourage innovation and creativity. Collaboration among staff should be encouraged and supported. Also, collaboration with external partners can improve ideas and lead to broader implementation.

Successful programs:

- Promote collaboration and exchange of ideas among employees through workshops, seminars, and networking events.
- Effectively use innovation stewards/ambassadors to broaden the reach of efforts. This enables a higher level of collaboration, especially with district offices and maintenance crew garages.
- Involve staff throughout the entire agency in programs and initiatives.
- Often engage employees through design-thinking, or other human-centered techniques to improve processes and move ideas and technologies into implementation.
- Recognize the opportunities that a robust national innovation ecosystem can provide.

Recommendations

Considering the findings and conclusions mentioned above, the scan team has the following recommendations:

Active **executive level leadership is essential** for a successful innovation program and, more importantly, to improve the agency's innovation culture. Building innovation into agency values, goals, and vision along with an innovation champion/sponsor at the executive level is a great place to start. Having enthusiastic innovation champions at all levels of leadership will ensure employees understand the agency's appetite for risk, and that failure is acceptable.

Conduct an agency self-assessment or cultural assessment using survey tools to better understand the innovation culture as it stands. Focus initial efforts on addressing those gaps between employee values and behaviors and the agency vision and goals. Self-assessment can be re-visited periodically to determine innovation culture changes.

Empower employees by establishing innovation committee(s) consisting of a mix of managers, supervisors, and front line workers. These committees are charged with promoting innovation, vetting ideas and innovations, and prioritizing innovations for award recognition and implementation.

Establish a process to collect innovation ideas. Ensure there is an easy way to submit ideas, such as a website or portal. Then acknowledge and recognize all submittals. Use an innovation competition to encourage idea submissions to give a defined endpoint to a collection cycle. Employees will be more apt to remember and to participate when there is a known endpoint and recognition event.

Communications and marketing efforts should be done frequently and using methods tailored to the audience. The agency communications office should be involved from the start and efforts should be kept fresh and interesting. Effective communications and marketing are key so employees and external partners are kept in the loop.

Create a brand, logo, and clever name for the innovation effort that employees will remember and recognize. If possible, involve the innovation committee and employees in selection of the brand and logo.

Communicate examples of homegrown innovations as soon as possible to build credibility with the program. This will very likely encourage others to submit ideas and innovations.

Establish employee recognitions and awards. Consider using financial awards. However, if direct cash awards to employees is not allowed, consider awarding extra funds to maintenance shops or units for purchase of new equipment or supplies.

Leaders at all levels should look for opportunities to praise and recognize innovators. It could be a simple thank you in front of a field crew or a message in front of legislators. Seeing and hearing is believing. Employees will see their innovations are noticed and appreciated.

Measure innovation progress by tracking the number of innovations submitted and implemented and sharing this information with the agency. Develop a simple-to-use process to determine benefits of innovations, especially if it is implemented. Ensure this information is communicated via a website and other methods.

It is important for agency collaboration to be both internal and external. Establish teams to implement new and emerging technologies, solve problems, bring ideas to fruition, and improve processes. Provide networking and learning opportunities that enable employees to discuss innovations together. Work closely with federal partners, other state DOTs, and local partners through State Transportation Innovation Council (STIC) and other means to identify and broaden the impact of innovations.

There are opportunities to **leverage the national transportation innovation programs and initiatives** to improve individual state agency programs and efforts. These opportunities could include a national database to share innovations, policy-level discussions about the benefits of innovation programs, and elevating innovation within AASHTO.

Additional Information

The appendices in this report provide the following additional information:

Appendix A – Scan Team Biographical Sketches

Appendix B – Scan Team Contact Information

Appendix C – Invited Agency Contact Information

Appendix D – Amplifying Questions

Appendix E – Virtual Scan Agenda

Introduction and Background

Continuing innovation in the practices of U.S. transportation agencies has brought substantial benefits to the nation. Many new and emerging technologies offering improved performance/effectiveness are continually being developed and deployed within DOTs, whether through rigorous research, gleaned from information exchange among practitioners, or they may have evolved within the agency over time. The value of innovation is well recognized within the highway community. In support of promoting innovation within DOTs, the AASHTO Board of Directors authorized the AASHTO Innovation Management, formerly the AASHTO Innovation Initiative, to identify and champion the implementation or deployment of proven technologies, products, or processes that are likely to yield significant economic or qualitative benefits to the users. NCHRP supports innovation initiatives through such programs as the NCHRP Project 20-44 "NCHRP Implementation Support Program" and NCHRP 20-68 "U.S. Domestic Scan Program." The Federal Highway Administration (FHWA) encourages innovation through their Every Day Counts (EDC) program and support to the STIC. All these programs depend on the existence of a culture of innovation within the transportation community to produce products to consider. To help DOTs focus on innovation, there is a need to better understand how to create an environment to support innovation, how to systemically institutionalize innovation within organizations, how to use technology in the evolving work environment, and how to sustain innovation over time.

The objective of this NCHRP domestic scan is to examine organizations that have successfully designed and implemented programs and/or initiatives that support a culture of innovation.

Specific areas to examine and document include:

- The characteristics of a strong organizational culture of innovation.
- How innovation culture differs by discipline within an organization.
- Examples within the state DOTs of successful initiatives to change organizational culture to one that encourages and supports innovation.
- Examples of specific programs within state DOTs aimed at supporting innovation.
- How improvements in a culture of innovation can be sustained.

This scan was conducted as a virtual peer exchange. Agencies examined and interviewed by the team include California DOT, Idaho TD, Indiana DOT, Minnesota DOT, Missouri DOT, Pennsylvania DOT, Texas DOT, Utah DOT, and FHWA. The scan team was interested in investigating successful programs offered by agencies that may be transferred to other state DOT practices. Case studies demonstrating successful practices and programs were captured for dissemination to others as part of the teams' deliverables. The results of this scan can be used by AASHTO, FHWA, and state DOTs, as well as others in the transportation community who are interested in accelerating innovation within their organizations and building a culture that embraces it.

Overview of Scan Approach

Initial Desk Scan

All state DOTs are innovative in many ways. Developing and adopting new practices, products, and technologies is a daily occurrence. However, the goal of this domestic scan is to document and learn from those agencies that may best exhibit the combined innovation culture qualities of leadership, employee empowerment, communication, recognition, measurement, and collaboration.

The scope of the desk scan was to identify relevant sources of information and to help the scan team determine host agencies to participate in the virtual scan meetings.

The desk scan focused on two NCHRP reports: *NCHRP Report 885: Guide to Creating and Sustaining a Culture of Innovation for Departments of Transportation and NCHRP Synthesis 633: Innovation Programs and Practices of State Departments of Transportation*. Interviews were conducted with the scan team Chair, scan team members, and others identified throughout the desk scan process. Agency websites were reviewed for possible scan host agencies to gain more perspective of their innovation programs.

The amplifying questions that were developed by the scan team to further clarify topics the team wished to study (**Appendix D**) were used as guidance to attempt to prioritize the host agency recommendations.

Organizational culture is the set of values, beliefs, attitudes, systems, and rules that outline and influence employee behavior within an organization. The culture reflects how employees, customers, vendors, and stakeholders experience the organization and its brand. However, don't confuse culture with organizational goals or a mission statement, although both can help define it. Culture is created through consistent and authentic behaviors, not press releases or policy documents.

Recent studies in the transportation field address organizational culture through the innovation lens. "*NCHRP Research Report 885: Guide to Creating and Sustaining a Culture of Innovation for Departments of Transportation* presents guidance for government transportation agencies on encouraging and sustaining a culture of innovation within the organization, its partners, and other stakeholders. A culture of innovation supports agency managers and staff efforts to encourage and accept innovation to enhance the agency's success. This guide is designed to assist agencies in assessing their culture with respect to innovation, identifying ways to make the organization more adaptable and open to beneficial change, and sustaining the organization's adaptability to respond effectively to evolving technology, workforce, and public priorities."

NCHRP Synthesis 633: Innovation Programs and Practices of State Departments of Transportation, boils innovation organizational culture down to three primary themes: **Effective Leadership Support, Employee Empowerment**, and **Collaborative Organizational Structure**. In the section on agency culture to support innovation in NCHRP Synthesis 633 report, Minnesota DOT, Wisconsin DOT, and Idaho Transportation Department (ITD) are specifically cited for exhibiting some of these primary themes. The case examples in this scan report include Wisconsin, Delaware, New Jersey, Caltrans, and Texas.

Many state DOTs exhibit components of the primary themes found in section 4 of Report 885: Innovation Building Blocks, as well as have innovation occurring daily. However, it is difficult to determine through websites and even brief interviews which states may be the leaders in excellence for culture of innovation without embedding oneself into the agency to observe firsthand how the organization exhibits those themes and building blocks. Table 1 below includes some of the information that assisted the scan team with decisions regarding state DOTs to feature in this scan effort. Some of the considerations included:

1. Structure the virtual scan event(s) such that the host agencies have ample time to present but also include plenty of time for the scan team members to provide perspectives from their agency. This is much like many of the recent State Planning & Research (SP&R) Part B Research Peer Exchanges. Gaining perspectives will provide a wealth of information, in addition to the host agency presentation.
2. Given #1, and enabling a healthy dialogue from all scan participants, the scan team suggests that preference is given to host agencies that are not represented on the scan team. This will enable a broader discussion and scan recommendations that perhaps more state agencies can apply.
3. Select small, medium, and large host agencies, if possible. This was mentioned numerous times by scan team members. This will provide a good, sound basis for state agencies of similar size that want to adopt some of these practices.
4. Select host agencies with wide geographic representation, if possible.
5. Select agencies with longevity for innovation programs – the theory being that a long-lasting program has survived leadership changes, has generated lessons learned, and over time has built this culture of innovation. Studies reported by the Harvard Business School suggest three to five years to change organizational culture. Oftentimes, this period can be longer than the CEO tenure.

Scan Team Member	State Agency (AASHTO Region, Size)	Report 885 Case Studies	Synthesis Case Example	Comments
YES	Utah (R4, Small, 1700 employees)	No	No	INTERVIEWED ● A well-established innovation program with excellent leadership support. ● FTE for innovation program in 2017. Now staff of two have visited 92 UDOT locations to promote and gather ideas. ● Since 2006, have published an annual Innovations and Efficiency Report. ● The 2023 report shows cumulative since 2017: 555 innovations adopted, over $30M in savings and 85,000 hours saved.
YES	Caltrans (R4, Large, 22,000 employees)	YES	YES	INTERVIEWED ● Caltrans Expo held every two years. ● Published first annual innovation report in 2021. ● The 2022 annual report highlighted 50 projects. ● The Innovation Branch will have seven staff members eventually.
YES	Minnesota (R3, Medium, 3000 employees)	YES	No	INTERVIEWED ● The NCHRP Synthesis 633 report mentions recently published *Innovation Strategy* that supports/promotes culture. ● Formalized innovation program in 2019/2020. ● Have done employee survey, set strategies in place.
YES	Delaware (R1, Small, 1600 employees)	NO	YES	● Have no formal innovation program but exhibit innovation culture. ● First Innovation Fair held in 2017, none held since 2018. Led by Chief Engineer.
YES	Indiana (R3, Medium, 3500 employees)	NO	NO	INTERVIEWED ● Have excellent innovation recognition and awards programs. ● Recognition is critical. ● Innovation councils are in each district, no directors on councils. ● This is employee-driven.

Table 1: Agencies Interviewed for Desk Scan Report

Scan Team Member	State Agency (AASHTO Region, Size)	Report 885 Case Studies	Synthesis Case Example	Comments
YES	Louisiana (R2, Medium, 4300 employees)	NO	NO	• Innovation initiative roughly seven years old. • Good Maintenance & Operations program, copied MODOT Challenge. • Have new equipment prizes to M&O camps and districts.
YES	Vermont (R1, Small, 1200 employees)	NO	NO	• Relatively new program: Continuous Improvement Program
YES	North Carolina (R2, Large, 9000 employees)	NO	NO	• NC DOT STIC. Also have CLEAR portal for employees to share and collaborate. This is a combined innovation and knowledge management program effort. • US DOT Volpe Center report completed for NC DOT, March 2021
YES	Washington (R4, Medium, 7100 employees)	NO	NO	• Innovation is an agency value at WSDOT, and it flourishes throughout the department • Maintenance and Operations issues an annual Innovation Challenge, incentivizing front line staff with cash awards for developing and deploying creative ideas for improved tools, equipment, technology, and techniques • Innovations from throughout the agency are regularly featured in exhibits at conferences, including the WSDOT's 2022 Innovations & Partnerships in Transportation conference
YES	Iowa (R3, Medium, 2700 employees)	NO	NO	• Iowa Highway Research Board has taken on the role of their STIC. • Per 2021 Volpe Center Report for NC DOT: Iowa DOT's 2020 web portal has helped with culture but agency still ongoing change.

Table 1: Agencies Interviewed for Desk Scan Report

Scan Team Member	State Agency (AASHTO Region, Size)	Report 885 Case Studies	Synthesis Case Example	Comments
NO	Idaho (R4, Small, 1600 employees)	YES	NO	INTERVIEWED ● ITD was very involved with Report 885 and continues to be leaders in this area. ● Their program began in **2014** and has been through leadership changes, both at the CEO level and at other executive team levels.
NO	Wisconsin (R3, Medium, 3500 employees)	NO	YES	● Launched in **2014.** ● Engineering-focused program on website. ● Per draft synthesis report, the agency has made progress with innovation culture. ● They do have a bottoms-up grass roots initiative too.
NO	Missouri (R3, Medium, 6000 employees)	NO	NO	INTERVIEWED ● Innovation Challenge since **2007,** Chief Engineer support. ● The Challenge has generated over 2000 innovations with 800 of those making MoDOT's best practices. ● At least two other state DOTs have mentioned modeling their programs after MoDOT.
NO	Pennsylvania (R1, Large, 12,000 employees)	NO	NO	INTERVIEWED ● Celebrating ten years of STIC. ● Website information shows 100 innovations have gone through their STIC. ● Have rich history of innovation over decades. ● Have Bureau of Innovations administering efforts. ● Annual award ceremony to recognize staff.

Table 1: Agencies Interviewed for Desk Scan Report

Assessment

For the purposes of this desk scan, the following agency size groupings were used:

Small agency – up to 2500 employees

Medium agency – between 2500 and 7500 employees

Large agency – over 7500 employees

Host agencies should feature most, if not all, the innovative culture qualities and have mature enough programs to provide lessons learned. Innovation should permeate throughout their agency from top-down initiatives to grass roots front line innovations.

All the agencies mentioned provided valuable insights on this topic and were worth including in the virtual scan.

Due to the virtual format, it was decided that all agencies interviewed during the desk scan were to be invited to participate. This gives the scan a good cross section of different sized agencies and good geographical distribution. All agencies exhibit those qualities that lead to a culture of innovation. The scan agenda had eight state DOTs and the FHWA over a four day period. Each agency presented their innovation programs with ample time allotted for scan team questions and dialogue.

Overview of Programs

This section provides a summary of state DOT programs that were part of the virtual scan.

Caltrans

Caltrans is the largest state DOT with 22,000 employees. Their 2020–2024 Strategic Plan has innovation as one of its five core values, empowering employees to seek creative solutions and take informed risks. An Innovation Leadership Council (ILC) consisting of executive-level staff provides strategic direction for the initiatives and ensures alignment with agency goals. An Innovation Technical Advisory Committee with senior management leadership supports the ILC.

Innovation Liaisons are established in each district, division, and headquarters program to serve as a point of contact for the Innovation Branch. Innovation Liaisons play a crucial role in helping the agency capture, share, and implement innovations.

The Innovation Branch manages the day-to-day workload and is within the Division of Research, Innovation and System Information. They manage the Innovation Initiatives with the staff of six FTEs and plan to have seven FTEs.

Innovation Station is an online portal and the star of their program. This portal is used for two types of innovations: the Idea Factory and the Innovation Exchange. The Idea Factory provides opportunities for staff to submit an unimplemented innovative idea and engage in conversations about innovative ideas. The Innovation Exchange is used by Caltrans employees to capture, share, and search implemented innovations across the agency.

The Caltrans Innovation Expo is a biennial, agency-wide event highlighting the agency's creative employees and innovative projects. The first event was held in 2020. Both the inaugural event and the one held in 2022 were virtual. The Innovation Branch is planning an in-person event for 2024.

Caltrans' Innovation Branch publishes a monthly newsletter and an annual report to highlight innovations. The most recent 2022 annual report included over 50 deployed innovations.

The Innovation Branch also supports innovation-focused training by the Caltrans' Learning and Development office and offers an online innovation course of two half-day sessions for front line and other staff to develop their abilities to explore strategies, think analytically, and recognize their own capacity to innovate.

Idaho

The Idaho Transportation Department (ITD) has around 1600 employees and began their innovation program in 2014. ITD has a strategic innovation team led by the Chief Innovation Experience Officer, who is charged with directing agency-wide strategies. Innovation is a big part of their agency's strategic plan vision.

ITD uses "innovation stewards" to help spread innovation throughout the department. Innovation stewards are often front line staff who have the trust and respect of their peers and share a passion for being "early adopters." In addition to their regular duties, innovation stewards help other staff develop, submit, and implement innovation ideas. They make up the agency innovation team. **You can learn more about the steward program in the case study section of this report.**

There is no centralized innovation office; rather, employees are empowered to suggest innovations and work with other staff members to determine benefits such as cost and time savings. An ITD Innovate! SharePoint™[1] site is used to collect and share innovations.

ITD has an annual "Best of the Best Awards" with winners in different categories that are aligned with agency strategic plan goals. YouTube™[2] videos are made for the winners to be shared and promoted. They also publish innovation success stories in the agency-wide digital newsletter.

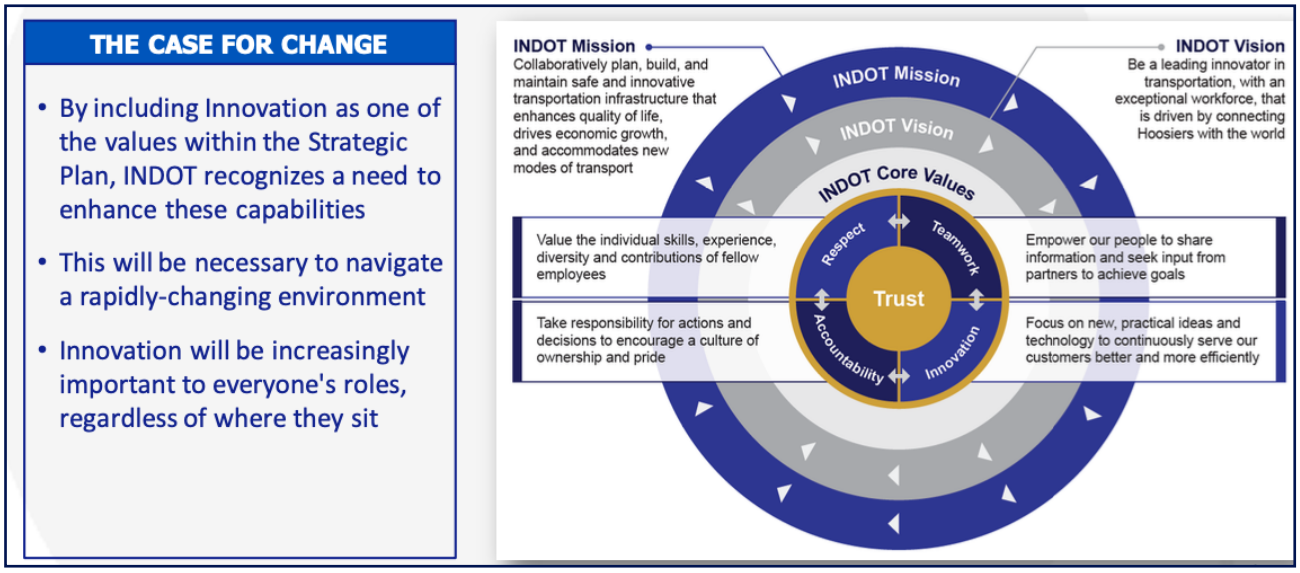
ITD Innovate! keeps a score card, tracking the number of employee ideas, implemented innovations, and benefits. These results are rolled up into their Innovation Dashboard.

1 SharePoint is a trademark of Microsoft Corporation.

2 YouTube is a trademark of Google LLC.

Indiana

Indiana DOT has 4000 employees and began their innovation program about five years ago. It all started with an employee survey with results showing that employees felt their ideas weren't heard, and that there was a lack of mutual trust and overall poor communications between staff and management. Innovation was added to their strategic plan values in recognition that there's a need to change the culture, and innovation will become increasingly important to all staff. **You can learn more in the case study section of this report.**



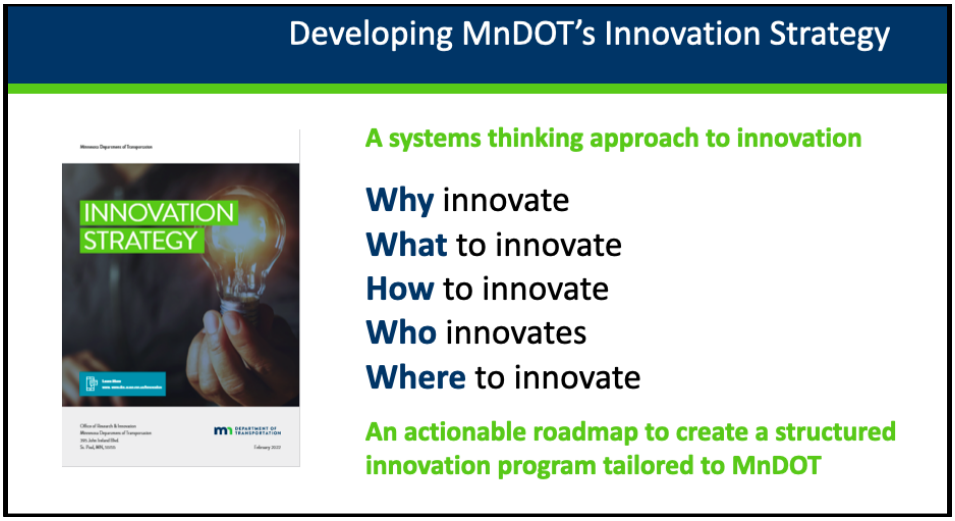
They have innovation councils at the central office and each district, and manage the program with a Director of Innovation and two FTEs. Some of the core functions of the innovation team are to build trust with staff and to be present and seen.

The program is primarily an employee-driven initiative to collect, share, and promote innovations being generated throughout the agency. There's emphasis on employee rewards and recognition. All innovations submitted are recognized and acknowledged regardless of its implementation status. An annual innovation competition includes cash rewards for winners and for their respective facility or unit. For example, an individual can receive a $500 bonus plus the maintenance garage can receive another $500 worth of tools or equipment.

Minnesota

Minnesota DOT is a medium-sized agency with 3000 employees. They started an innovation program in the 2019–2020 timeframe with an employee self-assessment survey. The survey results identified barriers such as risk aversion, fear of failure, no time for innovation, and reluctance to brag.

This set the stage for the Innovation Strategy Report by defining areas that need to be improved.



The Executive office has committed to an innovation program. Agency offices have included innovation actions in their individual business plans. One of the challenges is having middle management buy in and promote the program and culture.

The Office of Research and Innovation is responsible for managing the agency innovation program. This office has three communications staff so there's been significant effort through newsletters and webinars. However, getting this information to front line crews can be a challenge. They are working on establishing ambassadors at districts and throughout the agency.

Missouri

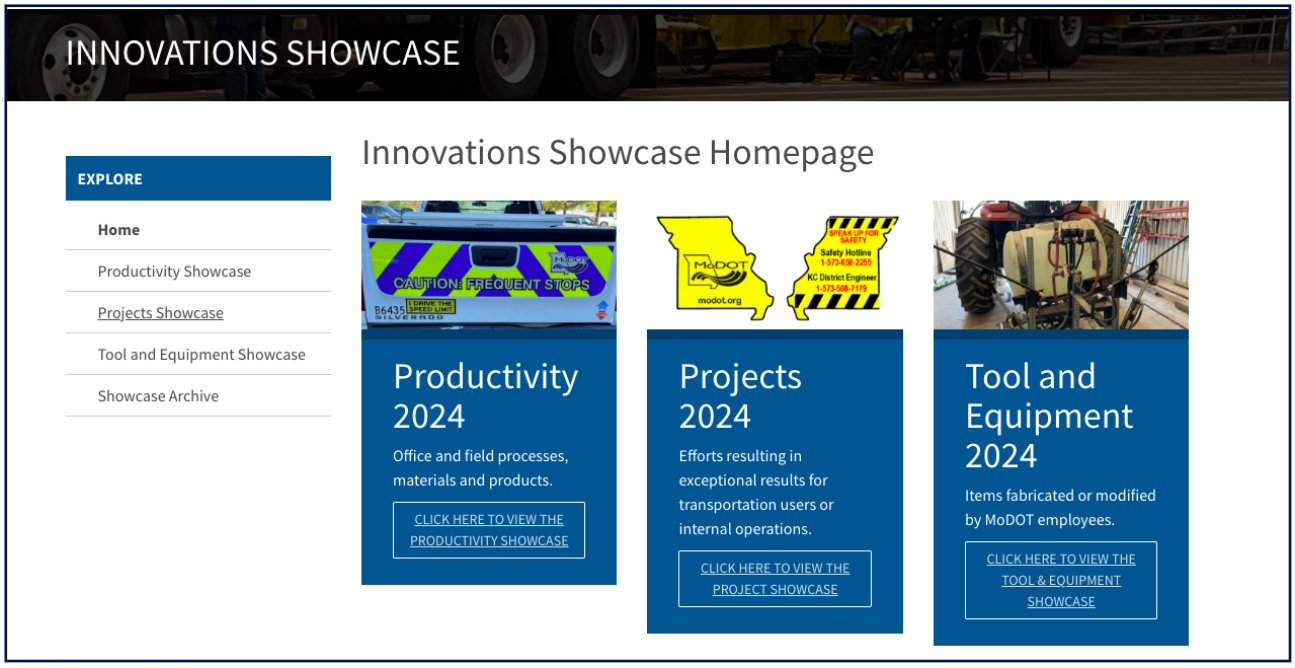
Missouri DOT is a medium-sized agency with just over 5000 employees. It has perhaps the longest tenured grassroots innovation program, boasting over 2000 innovations since 2007, with 800 of those becoming MoDOT's best practices.

Missouri DOT is governed by a transportation commission and innovation is a core value of this commission. The commission governance supports innovation from the top, a belief in innovation, a willingness to take risks, and a willingness to support employees taking risks.

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

According to Ed Hassinger, Deputy Director/Chief Engineer, "Innovation exists in every corner of your organization.... it really depends on what you're willing to do to encourage it and cultivate it to make sure it blossoms within your organization."

It all starts with the Innovation Challenge Program and Showcase that had an initial focus on tools and equipment innovations developed at the crew level. The Challenge has expanded to include other categories that envelope the entire department. The Challenge is managed by a statewide coordinator in the Performance Management group. Roughly a full-time equivalent position is dedicated to managing the Challenge. They have district and central office innovation coordinators that help promote the competition, collect submissions, serve as the Technical Review Team, and choose 18 first-round winners. The three central office coordinators spend between 10% to 25% of their time on innovation activities. The first-round winners receive $75 per person or a maximum of $450 per team. A second-round evaluation reduces the total field to 60 submissions and the final showcase awards are given in three categories and three Directors Awards. These winners receive $425 per person or up to $1550 per team. These winners also are awarded $10,000 for division or district budgets. **You can learn more about the Challenge in the Case Study section of this report.**



MoDOT's upper management has been very involved from the beginning. The current chief engineer is very passionate and active in promoting the program. The department budgets $1 million a year for bringing innovations into the mainstream. They feel the Challenge competition drives the innovation production by staff. Early on there was growth of submittals, those numbers have since stabilized.\

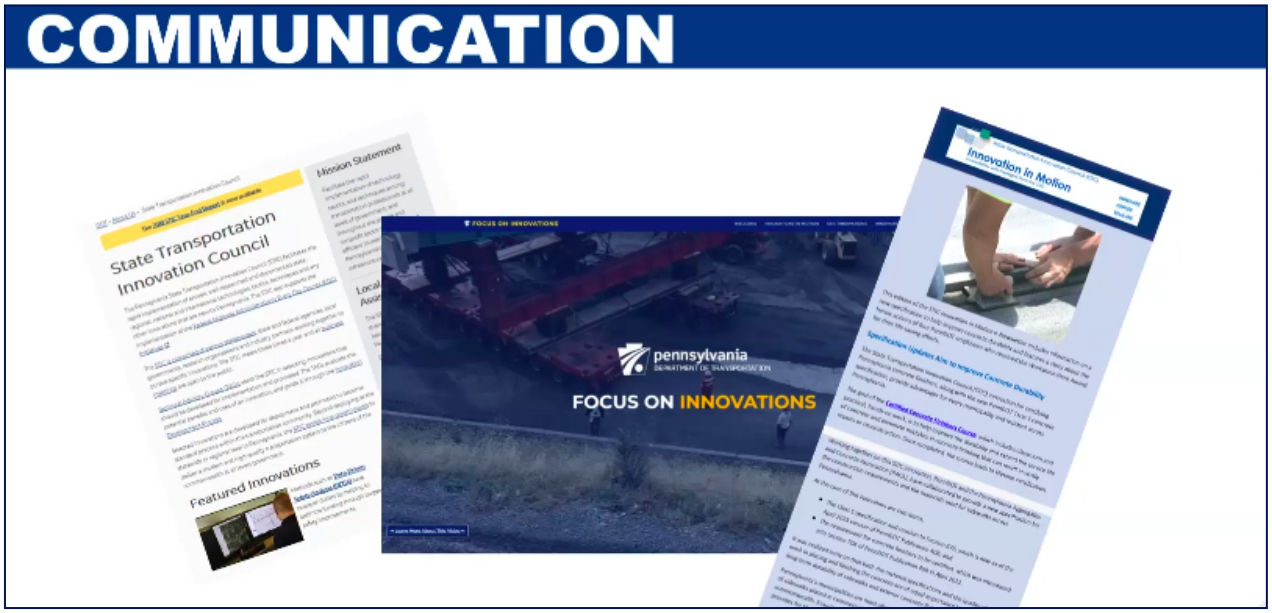
Each district has a showcase, leading up to the agency-wide showcase.

Pennsylvania

PennDOT is a large-sized agency with over 11,000 employees. They have a rich history of organizational performance and innovations going back to the 1990s. Currently, the Bureau of Innovations (BOI) manages a collaborative innovation program, in addition to organizational performance improvements and a data management and analytics group. The collaborative program includes an internal innovation awards program and a more recent innovations challenge program for high schoolers.

PennDOT's BOI administers the State Transportation Innovation Council (STIC), which has seen more than 80 innovations introduced and evaluated for implementation over its 12-year history. The STIC facilitates the rapid implementation of proven, well-researched and documented state, regional, national, and international transportation innovations that are new to Pennsylvania. The STIC also supports and promotes the implementation of Federal Highway Administration (FHWA) Every Day Counts (EDC) innovations.

They recently started an *Innovation in Motion* webinar series that typically draws between 200 and 400 attendees. They feel communications are critical and use these webinars along with newsletters and social media to promote efforts. Also, they do change programs and communications to keep things fresh and relevant. An annual *Focus on Innovations* report is published. **You can learn more about the *Innovation in Motion* webinar series in the case study section of this report.**



PennDOT's employee engagement program has been collecting, evaluating, and implementing employee ideas for over 30 years.

BOI builds and maintains user-friendly, Excel™-based tools to aid project teams' evaluations of alternatives and outcomes. A Cost Savings calculator generates cost savings by a project recommendation using known project data. A Make vs. Buy calculator provides a tool for maintenance to evaluate their decisions between agency manufacturing and off-the-shelf purchase.

Most districts have innovation councils or committees in addition to the central office STIC.

Texas

Innovative TRANSPORTATION in Texas

TxDOT is a large-sized agency with 12,000 employees. The department-wide innovation focus appears in the agency's 2023–2027 Strategic Plan, which includes the following action item: **Identify efficiencies and develop innovative and cost-saving ideas to improve the system and operations.**

The Texas Technology Task Force provides TxDOT with a strategic look at emerging technologies, while the Texas Innovation Alliances (TxDOT STIC) focuses on implementation of innovations.

	TEXAS TECHNOLOGY TASK FORCE *The **Texas Technology Task Force (T3F)** provides TxDOT with a strategic look at emerging technologies.*	*The **Texas Innovation Alliance (TIA)** is TxDOT's State Transportation Innovation Council (STIC).*
Approach	Strategic	Implementation
Planning Horizon	Future/Emerging	Current
Audience	TxDOT, technology industry	TxDOT, FHWA, state and local governments
Membership	TxDOT, technology domain experts, industry, and research institutes	TxDOT, FHWA, other state agencies, cities, counties, transit agencies, MPOs/COGs, ports, industry, and research institutes
Primary Strengths	▪ Texas transportation focused ▪ Technology discovery ▪ Captures technology recommendations ▪ Forum for researchers to present work	▪ State, regional, and local agency collaboration ▪ Knowledge sharing and best practices ▪ Grant readiness ▪ Research presentations

To supplement and expand on longer-standing innovation efforts, in 2023 TxDOT launched a formal innovation program: Innovative Transportation in Texas. TxDOT's innovation program seeks to identify, evaluate, and develop innovative solutions to meet the state's growing transportation needs. In addition, this program serves to support and reward innovation in transportation projects, technology, and processes.

Three staff members in leadership roles provide critical support for TxDOT's innovation program:

- **Director of Strategy and Innovation** directs business process improvements, strategic research, and innovation initiatives across TxDOT.
- **Director of Strategic Initiatives and Innovation** oversees business process improvements, strategic initiatives, and emerging technologies related to innovative transportation solutions.
- **Innovation Section Director** oversees a staff of six that is focused on identifying, advancing, implementing, and scaling transportation technologies and innovations across the agency.

Early innovation focuses on emerging technologies like Autonomous Vehicles, Electric Vehicles, and solar energy. A grassroots effort to engage all TxDOT employees is now underway.

The Innovations Section started an annual awards and recognition program in 2023. To further nurture a culture of innovation at TxDOT, designated Innovation Champions represent TxDOT's 25 districts and 34 divisions at monthly Champions meetings. In their roles as advocates and liaisons, Champions are uniquely positioned to both lead and deliver innovative transportation at TxDOT. TxDOT also has started a quarterly Innovation Community of Practice (CoP) meeting to share innovations and emerging technology success stories. The CoP meetings have been very well attended.

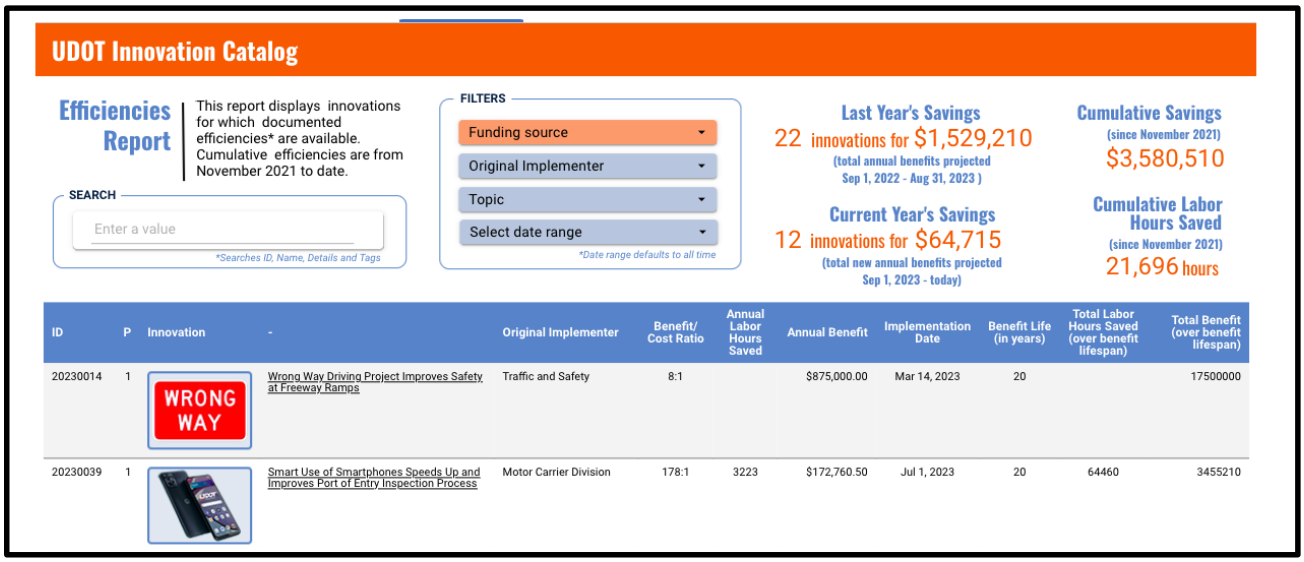
Utah

Utah DOT is a small-sized agency with about 1700 employees and has a well-established innovation program with excellent leadership support. The executive leadership shares a consistent message with employees that it's acceptable to try things and take risks, and acceptable to fail. They have two FTEs that manage the innovation program. Over recent years the innovation staff have visited 92 UDOT locations to promote and gather ideas. UDOT has implemented an innovation steward program and has an agency innovation council.

Since 2006, UDOT has published a legislature-mandated, annual Innovations and Efficiency report. This annual report drives the annual innovation idea collection cycle, and is a good communication tool for the senior agency leaders. The 2023 report shows cumulative since 2017: 555 innovations adopted, over $30M in savings, and 85,000 hours saved.

They have an annual awards program with an Innovator of the Year award and multiple categories of winners.

Their Innovation Catalog is a searchable database that includes innovations and a dashboard with savings due to implementation of innovations.



FHWA

The Federal Highway Administrations' 2022–2026 Strategic Plan, under the "Transformation" goal, calls for investments in purpose-driven research and innovation. This goal calls for collaboration with its diverse set of stakeholders to share noteworthy practices and accelerate the adoption of innovations and technologies. In addition, the "Organizational" goal includes an inclusive and innovative culture.

Within FHWA, the Technology and Innovation Deployment Program (TIDP) gives the framework for accelerating the adoption of innovation at FHWA and with the state DOTs. The FHWA Center for Accelerating Innovation has five FTEs dedicated to facilitating these programs and rely heavily on subject matter experts and others from across the country to help fulfill the program objectives. FHWA division offices also have staff that serve as Every Day Counts (EDC) coordinators to work closely with the state DOTs to implement these programs and report progress and success stories to the Center for Accelerating Innovation.

The core programs within the TIDP are the Every Day Counts Initiative, the Statewide Transportation Innovation Councils, the Accelerated Innovation Deployment program, and the Accelerating Market Readiness program.

These programs provide resources–both financial incentives and grants, as well as knowledge sharing–to partner organizations that accelerate implementation of innovations in the transportation landscape.

Organizational Meeting and Amplifying Questions

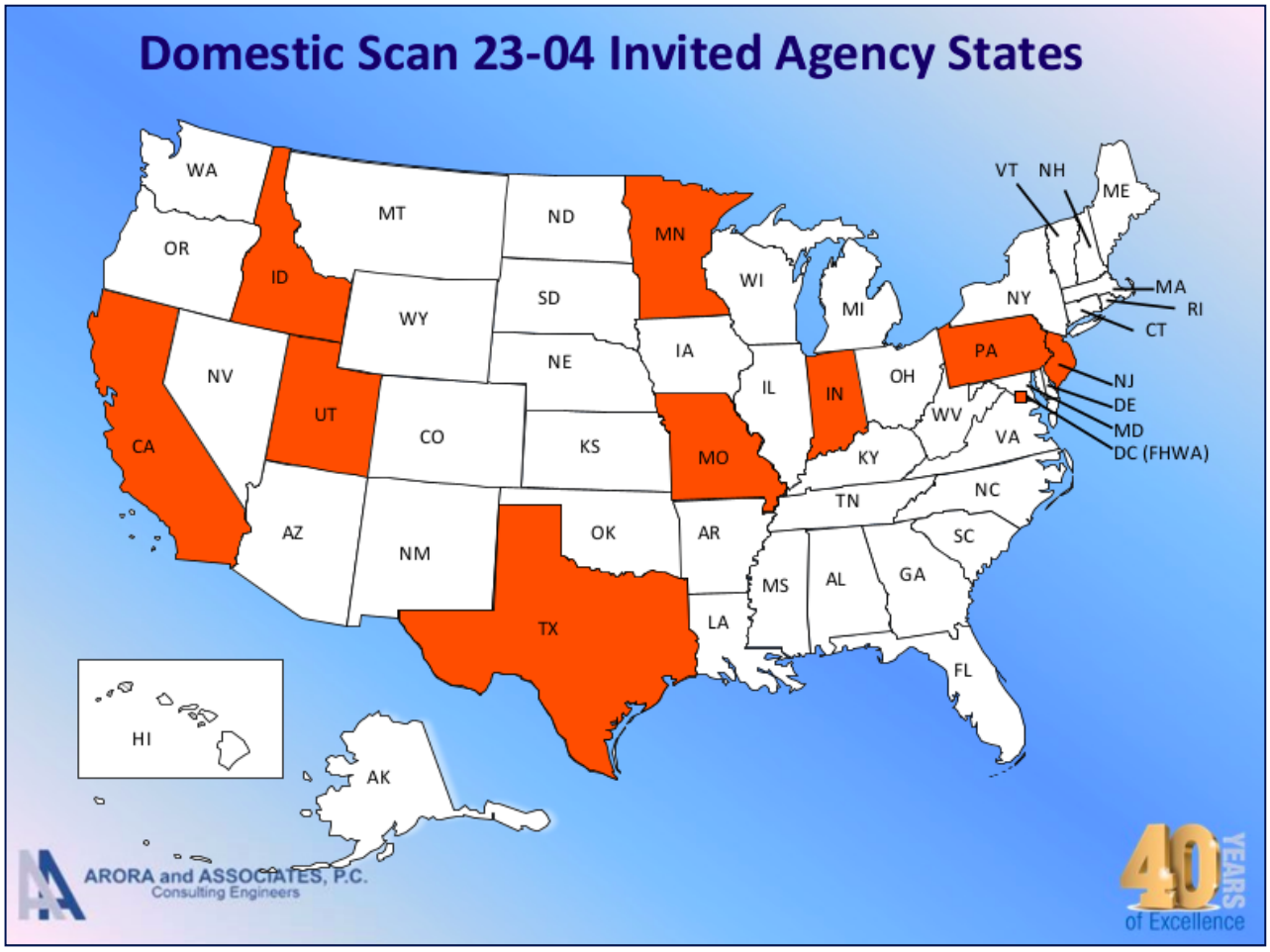
On November 3, 2023, the scan team convened in a virtual meeting to discuss the results presented in the initial desk scan. During this meeting, team members were briefed on the goals and expectations of the domestic scan, reviewed and finalized the amplifying questions (see Appendix D), and were briefed

on the subject matter experts' (SMEs') initial recommendations. Team members supplemented the discussion with their expertise and knowledge of innovation activities of various state transportation agencies. The original concept was to focus on a small subset of large, medium, and small state agencies to strive for geographical balance and to focus on state agencies that have not yet been highlighted on innovation in past NCHRP reports. However, because of the virtual scan format, it was realized that many of the agencies could be included in the scan, providing a more robust exchange of programs. The agencies considered would all be able to provide valuable insights and lessons learned in their innovation journey and are at different levels of organizational cultural changes. The scan team still strived for different-sized agencies and geographical equity. State agencies with long-lasting innovation programs were a top priority with the understanding that they have been through multiple executive leadership changes, which would be a good surrogate measure of innovation culture maturity. Even some of the state agencies with relatively new programs showed great potential because they had completed self-assessment surveys amongst their staff. This is perhaps the most direct way to measure organizational culture.

The team members identified and agreed upon the following state agencies as having the highest priority for continued engagement in the scan:

- Caltrans
- Idaho Transportation Department
- Indiana DOT
- Minnesota DOT
- Missouri DOT
- Pennsylvania DOT
- Texas DOT
- Utah DOT
- FHWA

Ultimately, the states illustrated below were invited to present at a virtual peer exchange workshop held April 15–29, 2024.



Key Findings and Observations

The virtual scan peer exchange was held in April 2024. In preparation for the workshop, each invited state agency was prompted with a list of amplifying questions designed by the scan team (see **Appendix D**). Eight state agencies were each given a two-hour slot to present their innovation program experiences to the scan team members and their peers. The Federal Highway Administration (FHWA) also made a presentation during the workshop. There was ample time during and after each presentation for questions and dialogue with the scan team. Each day ended with a conclusion time for team members to provide takeaways and highlights. The final day was dedicated to team discussion, final thoughts, and next steps.

The team agreed to categorize findings and observations by the innovation building blocks: **Leadership, Employee Empowerment, Communication, Recognition, Measurement, and Collaboration**. Research, specifically NCHRP Report 885, has shown these first five principles are essential for building and sustaining a culture of innovation. **Collaboration** is included as another essential principle to encompass the work and coordination that can exist both internally within an agency and externally with other stakeholders to help drive innovation. The agency examples provided under each section below may cross into more than one principle or building block.

3.1 Leadership Support

According to NCHRP Report 885, "A persistent culture of innovation depends on strong leadership that establishes innovation as a core value throughout an organization." Leadership support is important through every step of the innovation cycle, from soliciting ideas from staff to implementing the best innovations statewide. Leadership needs to consistently provide the message that innovation is a core value, and that trying things is not just acceptable but an expectation. As innovation champions, leaders should implement practices to build and maintain the culture and support policies and programs that foster collaboration and risk-taking and empower employees.

MoDOT is governed by a highway and transportation commission with members appointed by the governor. Commission governance provides the high-level support and direction needed to sustain a long-lasting innovation program. It is not uncommon for commissioners to attend annual showcases and, in some instances, even be able to use an innovation that has been developed at MoDOT. This top-level commitment transfers through the agency mission, values, and culture.

Utah DOT has learned that its leadership needs to deliver the innovation message, early and often. A great example is the Executive Director will promote innovation at new employee orientation and send the message that it's important to try new things and it's acceptable to fail. This is leadership clearly delivering the innovation message on day one. Also, the leadership needs to continue to repeat the innovation message, and not solely rely on the innovation program staff for this. Furthermore, Utah has found that it is critical for innovation program staff to continue to push leadership to communicate the message. Throughout Utah DOT there's a clear message that "*Innovation is in our DNA.*"

Idaho Transportation Department's innovation roots go back to their 2011 Strategic Plan, with a goal to develop a culture that fosters innovation and engages employees in the innovation process. An Innovation Business Practices (IBP) team was ultimately established, made up of a diverse group with the Chief Administrative Officer as the executive sponsor. The IBP roadmap laid out these objectives: vision, targets and goals, framework, engage ALL employees, and measure and celebrate success. ITD's innovation focus has been to develop a culture of innovation from the start.

"While we do track dollar savings, the bigger win is the cultural change that we are beginning to experience," said Scott Stokes, ITD Director.

Leadership needs to not only show innovation commitment in words, but also in their actions. A great example of this is at the Indiana DOT. After collecting numerous agency ideas being used on snowplow trucks across the state, such as back up cameras and other monitors, management fully endorsed implementation of five innovations on all new plow truck purchases. They have found that leadership needs to listen to staff about the innovation benefits and to lead by their actions – in this case, full implementation of beneficial innovations that lead to safer and more efficient snowplow operations.

Texas DOT's initial focus has been on technology innovation implementation, including wrong-way driving countermeasures, roadway flooding warning, rural lane departure countermeasures, and construction work zone traveler information, amongst other technologies. The TxDOT Executive Director has asked each of the 25 districts to have at least one innovation project per year. All districts now have one or more focused projects. This shows a high level of commitment from the executive leadership and the district leadership. **You can learn more in the case study section of this report.**

Marc Williams, TxDOT Executive Director, states, "Innovation is about inspiration and creativity, and you all are the key. Help us continue to meet our challenges by turning ideas into solutions.''

Minnesota DOT recently updated its Strategic Plan with innovation in the forefront as one of the agency's core values. As a result, leadership approved the use of an innovation culture assessment survey to gather important information prior to launching any innovation strategies and programs. Overall, they learned the innovation culture is at a competent maturity level. However, more importantly, they can focus their efforts on closing the gaps and improving this innovation culture. **You can learn more in the case study section of this report.**

Leadership Support Findings and Conclusions

Successful programs:

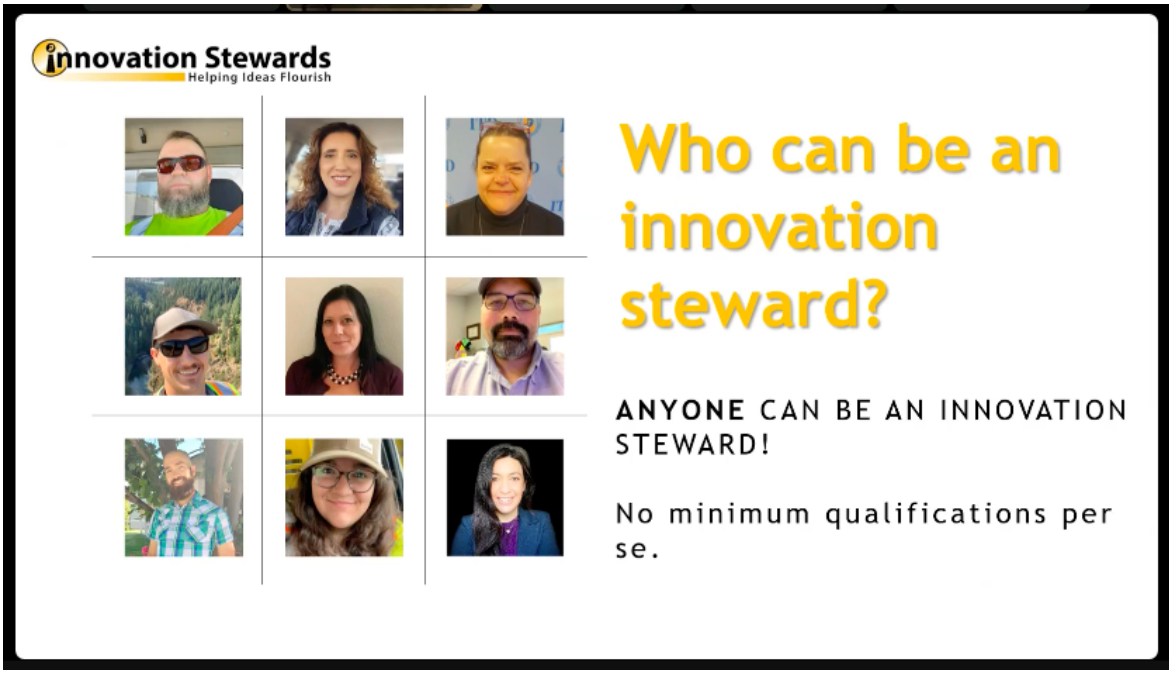
- Have executive-level leadership and leadership at all levels proactively supporting innovation.
- Build innovation into agency values, mission, goals, and expectations.
- Have leadership that can break down barriers to implementation of innovations.
- Have leaders that encourage risk-taking and communicate to employees that failure is acceptable.
- Support innovation and allow organic growth of ideas.
- Provide positive feedback to innovators regardless of outcome.

3.2 Employee Empowerment

An innovation culture requires employee empowerment that equips every employee with knowledge to stimulate ideas and helps sustain a mindset that innovation is an expectation for DOT employees at all levels. Employees need to know that their feedback and opinions matter, they need opportunities for growth, and they need to feel trusted, valued, and supported.

Once it becomes clear that innovation is an agency value, there is an expectation of management at all levels, and employees have some leeway to innovate, good things can happen. A case-in-point occurred at MoDOT: after a tough winter and heavy public criticism, one of the district engineers– in a very informal conversation– asked his maintenance liaison how they can keep multilane highways best plowed, especially with limited snowplow trucks and drivers. There was a clear need and a clean slate on how to solve the problem. A few months later, the liaison had come up with a potential solution using technology from the farming industry. MoDOT built a mockup, and the tow plow technology was born. Now the tow plow is commercially available equipment used by MoDOT, as well as many agencies across the country and elsewhere.

Idaho has Innovation Stewards that are an integral part of their success. The stewards are a group of 18 members from across the state representing different divisions and districts. They advocate for innovation within their respective units and for the agency. They are the voice to encourage and stimulate innovation and a foundation to employee empowerment. You can learn more in the case study section of this report.



Most of the agencies underscored the importance of collecting "grassroots" innovations from their districts right down to the crew-level maintenance facilities. Relatively small innovations from across the agency will grow the culture. This involves all agency employees and shows all improvements, big or small, are important.

Most of the agencies have some type of online website or portal for any employee to submit their ideas and innovations. Idaho uses a SharePoint platform while Utah uses Google™[3] suite tools for their Innovation Station and Catalog. Caltrans' Innovation Station uses a commercial off-the-shelf program for idea generation and much more. The common ground for these programs is employees can easily submit ideas, view other ideas that have been submitted, and are empowered by their agency to submit.

The Caltrans online Innovation Station includes an Innovation Exchange and an Idea Factory. The Innovation Exchange allows employees to submit implemented innovations and provides an interactive space to view and comment on the submissions. The Idea Factory allows employees to submit innovative ideas that are not yet implemented. These ideas are shared and vetted by subject matter experts who determine if it's a viable idea for implementation.

Caltrans offers two training courses to their agency related to innovation. One course is for any employee and covers the importance of innovation to the agency and resources available. The other course is training for managers and supervisors, which focuses on encouraging staff to be innovative and taking informed risks.

TxDOT offers an Innovation Academy for TxDOT staff. There are six core online learning courses with other optional courses. They feel that staff development accelerates deployment of innovative initiatives. Coursework includes Planning for Innovation, Cultivating Creativity with teams, and Managing Innovation.

3 Google is a trademark of Google LLC.

In most agencies, employee-empowered teams are often charged with solving problems and improving processes. PennDOT's Bureau of Innovations offers facilitation services to employee teams to help work through issues and challenges. For example, streamlining a process for review of county maintenance annual work plans, and improved processes for reclaiming funds following guiderail and attenuators damage in work zones. MnDOT's High Tension Cable Barrier Working Group included crew members that repair cable after it has been damaged. This is a very dangerous activity because the cable may likely still be in high tension, especially when a vehicle has crashed into it. Using a risk assessment model for onsite process improvements, they were able to show a 70% safety improvement for crew members responding to these events.

PennDOT's Bureau of Innovations builds and maintains user-friendly Excel-based worksheets for project teams to evaluate alternatives and decisions between use of department forces and contractors and vendors. A Cost Savings calculator and a Make vs. Buy calculator are very helpful tools.

PROJECT TOOLS

- BOI builds and maintains user-friendly, Excel-based tools to aid in project teams' evaluations of alternatives and outcomes
  - Cost Savings Calculator: estimates cost savings generated by a project recommendation or outcome using known project data
  - Make vs Buy Calculator: provides an easy-to-use tool for county maintenance organizations to evaluate their decisions between department forces and contractors when planning activities
  - Agility Valuation Tool: helps maintenance organizations evaluate the value of Agility exchanges when standard activity costing data is not available

Employee Empowerment Findings and Conclusions

Successful programs:

- Allow and support risk-taking and agency employees understand this.
- Encourage employees to share ideas and innovations through employee-driven initiatives.
- Support employee teams to solve problems via process improvements tools and programs.
- Capture maintenance and field crew innovations, since these are foundational to DOT's DNA.
- Enable knowledge and skills so employees can evaluate innovations, including their own.
- Have platforms so employees can easily submit ideas.
- Build mutual respect and trust between leadership and employees.
- Include innovation stewards and/or ambassadors.
- Provide training to bridge the gap so employees know how to share and access innovations.
- Have leaders and employees that embrace innovation expectations and accountability.

3.3 Communication

Communication should be creative and practical and draw attention to the importance of innovation, and to frequently remind employees that new ideas are valued in a transportation agency. Communication can be the more formal presentations, publications, and websites, but also good old-fashioned meeting people one-on-one where they are. This latter form will build trusting relationships which will be a key to creating and sustaining the innovation culture.

According to NCHRP Report 885, giving innovation a brand in your agency establishes simple visual and word cues (logo, name, tag line) that become shorthand for a host of innovation activities and help embed awareness in employees. Branding creates a distinct identity and has been associated with building loyalty and influencing people's feelings in a positive way. Numerous brands were presented during the scan with just a few examples shown here.

innovate ITD!

Innovative TRANSPORTATION in Texas

BRANDING

Best of the Best

innovate ITD

innovate ITD!

innovation Stewards
Helping Ideas Flourish

DRIVING IMPROVEMENT
INNOVATION STEWARD

innovate ITD!

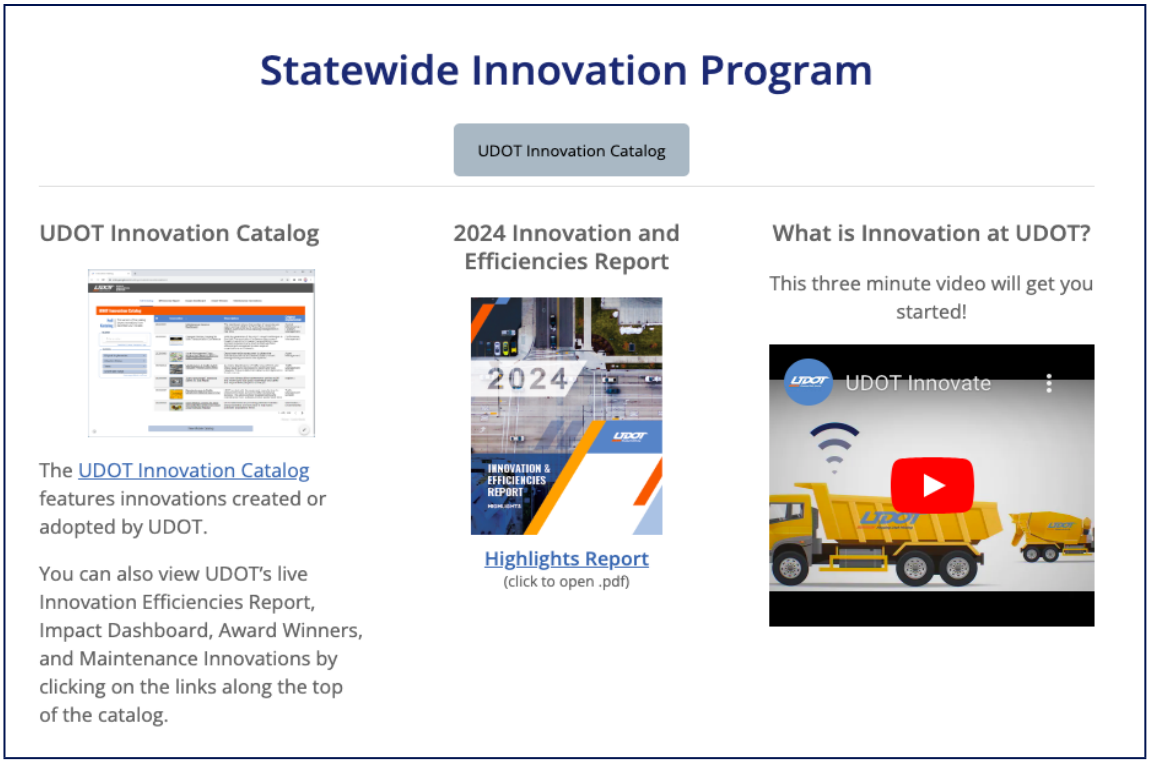
Agencies interviewed utilize websites, periodic newsletters and briefs, and other electronic marketing and promotional materials for their communications to internal staff and external stakeholders. Most of this information is available on agency websites. Also, videos are often published and shared.

Missouri DOT asks Innovation Challenge submitters to prepare a brief video describing the innovation. These videos are provided in a link in the submittal documents on their website. They also produce an Innovations Showcase recap video to promote the annual event.

Employee Solutions Making a Difference

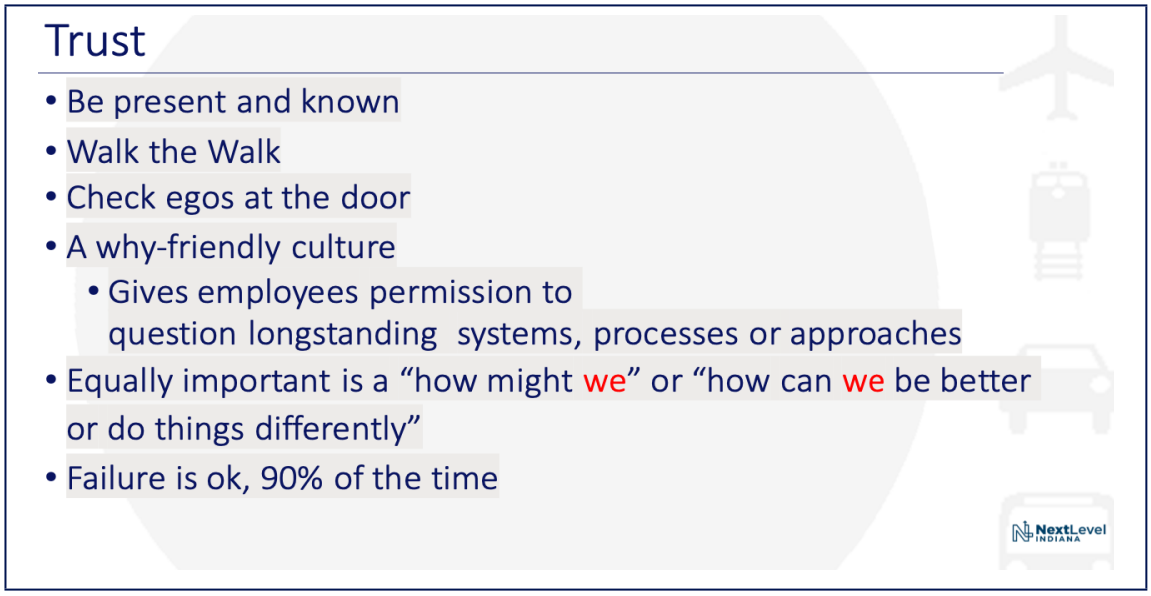
Utah DOT has produced a three-minute animated video on what innovation is at UDOT. It describes what innovation means to the agency, with innovation examples from UDOT employees and others. They also have produced innovation specific videos to help inspire others to innovate.

UDOT's annual Innovation and Efficiencies Report began in 2006 as a legislative-mandated report to document significant efficiencies implemented at UDOT. Although the report continues to meet the needs of Utah policymakers it now includes annual statistics of innovations implemented and benefits in costs and time savings. The report is a good communications document for senior leaders.



PennDOT creates an interactive, web-based Focus on Innovations publication that highlights many of the innovations being implemented. This interactive report includes a welcome message from the Secretary, showcases innovation projects, and celebrates PennDOT's dedicated team and its collaboration with transportation industry partners and stakeholders. They have also established a successful Innovation in Motion webinar series that you can learn more about in the **case study** section, and recently started offering professional development hours to promote and encourage attendance in the webinars.

InDOT innovation staff and leaders have been able to build trusting relationships with many of the districts by visiting the facilities, listening to the employees and being present. Their Director of Innovations tells a story about traveling in an agency vehicle in a district and hearing over the radio a "pink cadillac" was in the area. This is a reference used when central office personnel show up in this district, underscoring the need to build trust and mutual respect.



Communication Findings and Conclusions

Successful programs:

- Effectively communicate the importance of innovation to internal and external stakeholders, including staff, partners, policymakers, and the public.
- Create an innovation brand.
- Have agency communication offices involved early on and continually with initiatives and programs.
- Use multiple methods (social media, newsletters, websites, emails, in-person) to effectively communicate to diverse audiences (central office, district office, maintenance crew garages).
- Keep communications and messaging fresh, compelling, and interesting.
- Build relationships and trust by in-person visits from innovation champions and staff.

3.4 Recognition

Recognition motivates employees and communicates the importance of innovation to the agency. Employees who see efforts to implement good ideas are rewarded are more likely to try themselves. Frequent and timely recognition is a powerful way to motivate employees to try to be more innovative. Recognition strengthens leadership-employee relationships and provides employees with a clear purpose aligned to agency goals, while reinforcing the desired innovation culture.

The MoDOT Innovation Challenge and Showcase began in 2007 with humble beginnings and now has generated over 2000 employee innovations with over 800 selected for MoDOT best practices. They have three categories: Productivity, Projects, and Tool and Equipment.

InDOT introduced a targeted bonus program to reward staff for identifying and deploying innovations. Over five years, they have generated almost 700 ideas with a total of 55 state winners. Winners receive $500 and their respective department receives a $500 allowance. Innovators are recognized with signage and with hard hat stickers that are very popular with the field staff. They have learned that innovation culture takes root faster when leaders recognize employees–regardless if the ideas are implemented–and this reinforces a commitment to the program and innovation behaviors.

Idaho TD has the annual Best of the Best Award that is a key component of the Innovate ITD recognition program. There are five categories: Resource Stewardship, Safety, Ideal Workplace, Customer Service and Mobility, and Economic Opportunity.

Utah DOT has an annual awards program featuring Innovation of the Year, Spark Award, Enhance Award, and the Flow Award. **You can learn more in the case study section of this report.**

Recognition should also include the less formal means–for example, hard hat stickers and other simple gifts for submitters are popular with employees. Agency leaders and managers should not underestimate a thank you and a handshake too.

The annual PennDOT Innovation Awards Ceremony recognizes some of the best and most innovative ideas cultivated and implemented by PennDOT employees across the department. The ceremony seeks to recognize employees who looked at the work they were doing, the processes, systems and tools they were using, and found innovative ways to improve the quality, safety, and value of the products and services PennDOT provides. Award winners are selected by PennDOT executive leadership and honored at the Innovation Awards Ceremony in Harrisburg each year.

Recognition Findings and Conclusions

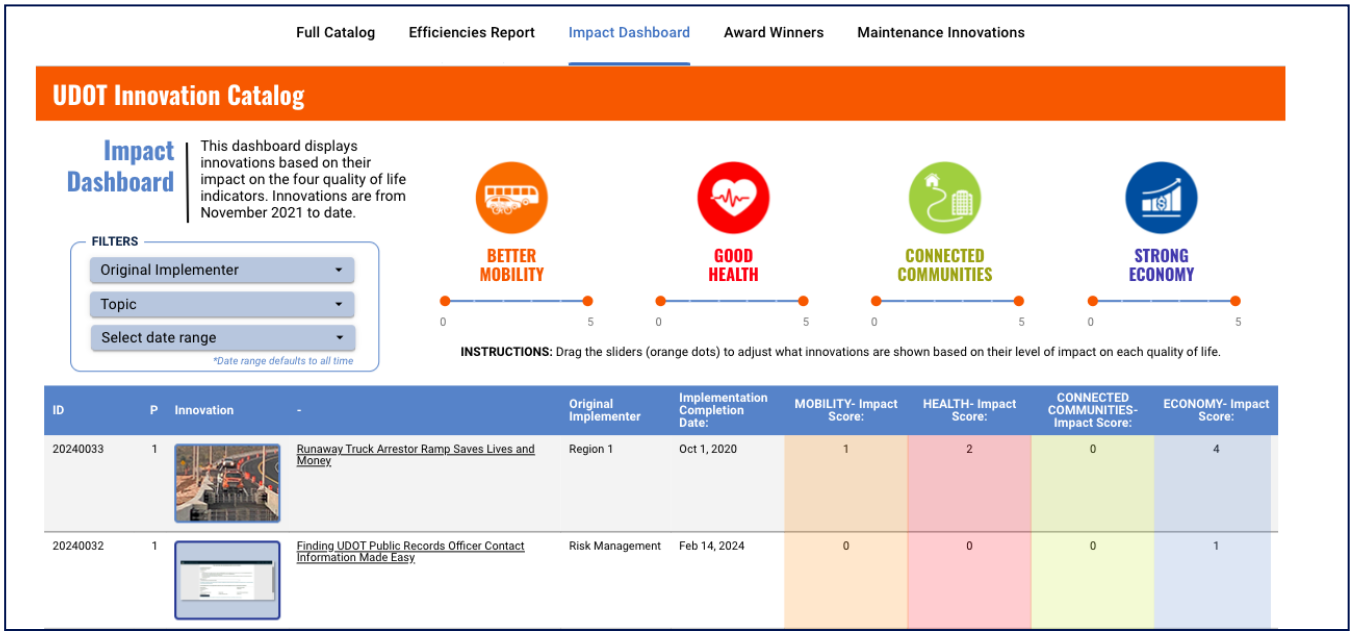
Successful programs:

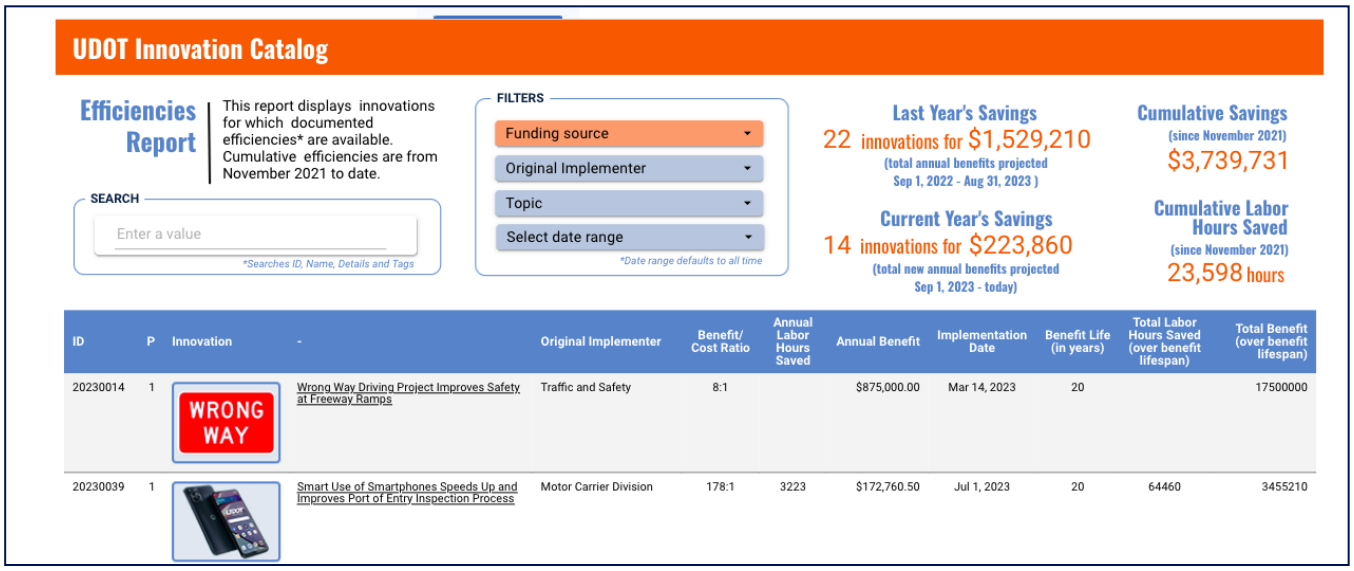
- Have annual showcases and award competitions to recognize the best innovations and innovators.
- Celebrate successes and share stories of innovation to inspire others and reinforce its importance within the organization.
- Implement the best innovations.

3.5 Measurement

According to NCHRP Report 885, organizations seeking to sustain a culture of innovation routinely stress the importance of finding simple ways to measure the pace and the impact of innovation. Routine tracking and communication of the pace of innovation help keep employees engaged and motivated. NCHRP Report 885 suggested to track who is submitting ideas so that broad, diverse participation can be engaged. When determining the benefits of individual innovations, the agencies should try to keep things relatively simple and do not get caught up in over complicated calculations.

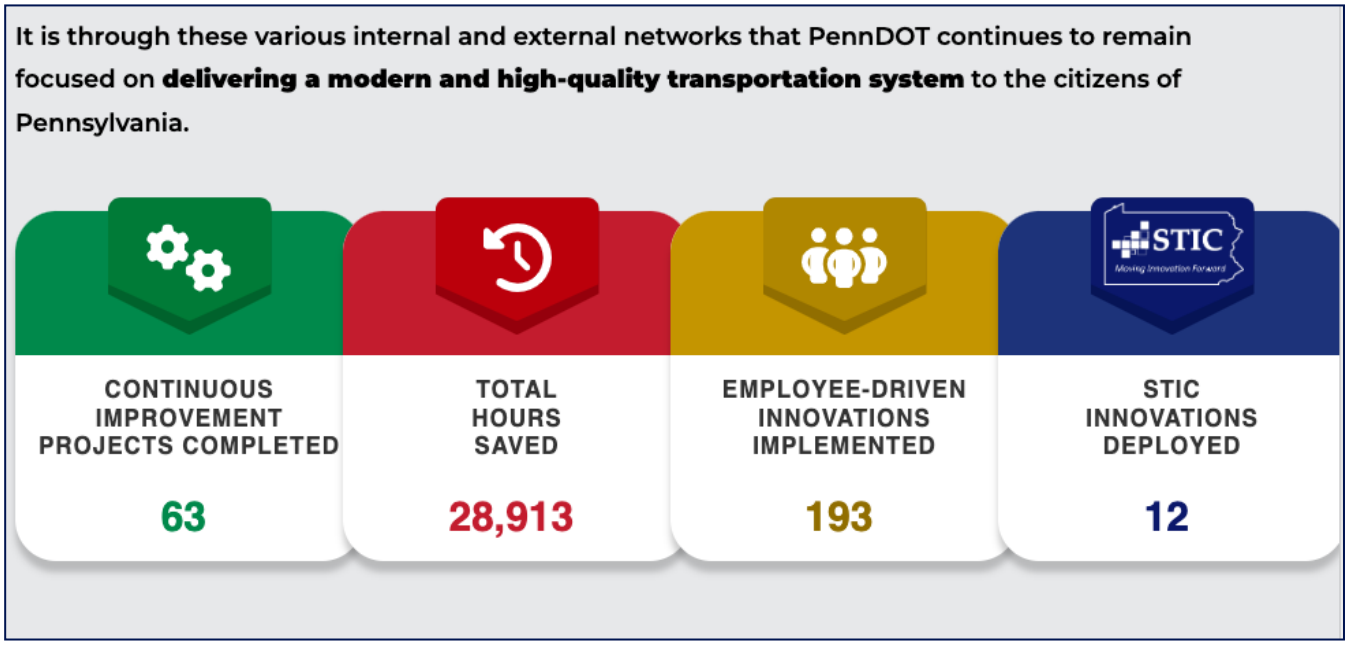
Utah DOT's Innovation Station includes the Innovation Catalog, a repository for all the innovations with descriptions and benefits. Their Impacts Dashboard displays innovations based on their four quality of life indicators: Better Mobility, Good Health, Connected Communities, and Strong Economy. The Efficiencies Report section of the Innovation Catalog displays innovations for which documented efficiencies are available.





Idaho TD has developed a scorecard to track innovations efforts. They have learned that setting annual innovation targets and goals can be counterproductive. Innovation goals are included in employee performance plans. They rely on the submitters to determine the innovation benefits with guidance from the innovation stewards and others.

According to their 2022 Focus on Innovations publication, PennDOT completed 63 continuous improvement projects resulting in benefits of nearly 29,000 saved hours. Additionally, there were over 190 employee-driven innovations implemented.



Measurement Findings and Conclusions

Successful programs:

- Track the number of innovations being submitted and implemented.
- Quantify the benefits of innovation in terms of cost savings, time savings, improved safety, etc.
- Allow employees to determine realistic and reasonable benefits of their innovations using various methods.
- Roll up benefits into annual reports, scorecards, and dashboards.

3.6 Collaboration

Collaboration is a great way to encourage innovation and creativity. Collaboration among staff should be encouraged and supported. Also, collaboration with external partners can improve ideas and lead to broader implementation.

The MoDOT Innovation Showcase event enables collaboration as innovations are displayed and the staff can learn from each other, which can oftentimes lead to more innovation ideas or an improvement to an existing one.

Each state agency has a Statewide Transportation Innovation Council that is the FHWA-recommended collaboration initiative. Having a chartered and engaged agency STIC is a precursor to access annual FHWA STIC incentive funding. Most agencies mentioned having innovation committees in addition to their STIC for grassroot and other initiatives. These innovation committees generally consist of a mix of central and district office staff and represent units from across the agency. This committee structure enables a higher level of agency collaboration. TxDOT has a unique Texas Technology Task Force for emerging technologies while the Texas Innovation Alliance functions as their STIC.

As mentioned earlier, the Caltrans Innovation Exchange allows employees to submit implemented innovations and provides an interactive space to view and comment on the submissions. These crowdsourcing ideation platforms allow online collaboration.

Caltrans has developed an online portal for vendors to submit their products, ideas, and technologies. This may be like many state DOT's product evaluation program portals where unsolicited products are submitted to agencies for potential use on projects. Caltrans recently established a Vendor Days, using their portal as a means for vendors to submit solutions for five distinct areas of need as identified by the agency. They received 96 submissions to these five focus areas and will soon have a "pitch day" for selected vendors to discuss their solutions with agency staff and leaders. This is a good example of collaboration with external partners.

Working with local high schools, PennDOT established an Innovations Challenge for students in 2017. The agency selects a topic of interest, for example, reconnecting communities, and students submit proposals based on the topic. This annual statewide competition provides $4,000 to the winning team. This provides some interesting insights and solutions while engaging students and encouraging them to consider careers in the transportation industry.

PennDOT leverages their STIC to provide numerous outreach and collaborative events such as regional and district innovation days, safety symposiums, and virtual innovation days.

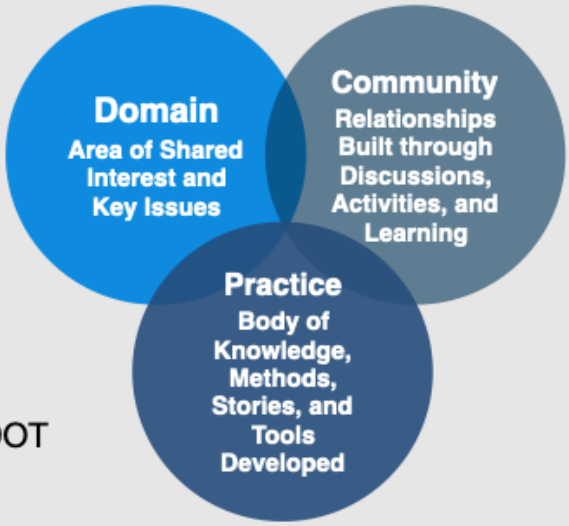
PENNDOT INNOVATIONS CHALLENGE

- Established in 2017
- Annual statewide competition geared to high school students
- Sponsors provide a total award of $4,000 to the winning team
- This year's topic focuses on reconnecting communities

TxDOT recently started an Innovation Community of Practice (ICoP) within the agency. Quarterly virtual meetings open to any interested staff are held to share innovations and successes. The ICoP meetings are very well attended.

TxDOT Innovation Community of Practice

- **Who:** Open to TxDOT staff interested in innovation
- **What:** Serves as a platform for
  - ✓ Sharing innovations
  - ✓ Lessons learned
  - ✓ Guest speakers
  - ✓ Emerging technology successes
- **Where:** Virtual MS Teams Meetings
- § **Why:** Build culture of innovation within TxDOT
- **When:** Held Quarterly



MnDOT recognizes the importance of collaboration by including it as one of their strategies to foster a culture of innovation. This strategy includes building relationships with public and private communities, creating a trained group of innovation ambassadors to help break down "silos," and convening an Innovation Leadership Council to support and promote innovation.

The MnDOT High Tension Cable Barrier Working Group mentioned earlier in this report consisted of district maintenance staff along with safety, training, and operations staff, and used a human-centered risk assessment model to provide recommendations to reduce safety risks when repairing damaged cable barriers.

InDOT has partnered with the Indiana Local Technical Assistance Program (LTAP) on an innovation competition. This led up to a one-day event that showcased many of the innovations and awarded the People's Choice Award to the best innovation as voted on by InDOT and LTAP members.

The FHWA Center for Accelerating Innovation (CAI) has numerous collaborative programs and resources to support the identification and prioritization of innovation implementation. The Every Day Counts program administers strategic innovation deployment throughout the country with a collection of proven, yet underutilized, innovations selected every two years. The CAI fosters collaboration between stakeholders within the transportation community through the State Transportation Innovation Council (STIC) network. The STIC is a national network that brings together public and private transportation stakeholders to evaluate innovations and spearhead their deployment in each state. CAI administers the Accelerated Innovation Deployment program as an incentive for eligible entities to accelerate the implementation and adoption of proven innovation in highway transportation.

The AASHTO Innovation Management (AIM) is an AASHTO technical service program that identifies and champions the implementation of a select few "ready-to-use" innovations, products, or processes that are likely to yield benefits to the users. AIM scans the horizon for outstanding advancements in transportation technology and invests time and money to accelerate their adoption by agencies nationwide. Each year, the AIM Executive Committee, composed of state DOT members, selects several highly valuable, but largely unrecognized, procedures, processes, software, devices, or other innovations that have been adopted by at least one agency, are market ready, and are available for use by other interested agencies.

The AASHTO Innovation Community of Practice (ICOP) meets quarterly to collaborate and share good practices and success stories. ICOP is composed of state DOT innovation program leaders as well as FHWA. Some of the ICOP members serve on the AIM Executive Committee, the AASHTO Special Committee on Research & Innovation, and the AASHTO Research Advisory Committee.

These FHWA and AASHTO programs, along with the individual state agency innovation programs, are a large part of the national innovation ecosystem.

Collaboration Findings and Conclusions

Successful programs:

- Promote collaboration and exchange of ideas among employees through workshops, seminars, and networking events.
- Effectively use innovation stewards/ambassadors to broaden the reach of efforts. This enables a higher level of collaboration, especially with district offices and maintenance crew garages
- Involve staff throughout the entire agency in programs and initiatives.
- Often engage employees through design-thinking, or other human-centered techniques to improve processes and move ideas and technologies into implementation.
- Recognize the opportunities that a robust national innovation ecosystem can provide.

3.7 Case Studies

CASE STUDY 1: Caltrans Innovation Business Plan

NAME OF AGENCY: Caltrans

DESCRIPTION AND SUMMARY:

Caltrans recognizes that innovation is a key factor in achieving its goals. In our 2020–2024 department strategic plan, innovation serves as a core value, alongside engagement, equity, integrity, and pride. With this, we empower employees to seek creative solutions and take informed risks.

Since its inception in 2020, the Innovation Program has worked towards institutionalizing innovation across the department through technical assistance, project management support, and professional development opportunities. One of these efforts was the Innovation Business Plan. This plan serves as a guidance document for the innovation team to track progress on tasks and identify future work areas. Other stakeholders within the department find it useful to identify the department's vision on innovation, especially staff who work on innovation teams within the 12 districts.

The plan details the tasks, deliverables, goals, and direction of the program through the end of fiscal year 2025–2026. It is meant to be comprehensive, including target dates and objectives for each task. As a living document, the plan will be updated as the program progresses, adjusting details as necessary to work towards achieving broader Caltrans goals.

KEY RESULTS:

Because of the plan's focus on identifying specific tasks, the Innovation Program has accomplished numerous activities with enterprise-wide benefits.

- **Created a platform to engage employees in innovation**
  Caltrans has sustained and grown its Innovation Station platform, a crowdsourcing tool that provides a place that involves employees at all levels of the organization in community brainstorming activities. The program uses Innovation Station as its main landing point for all things innovative in Caltrans.

- **Increased collaboration with partners**
  The program has embarked on numerous activities since the launch of the plan that engage internal and external stakeholders and partners to identify specific ways in which the department can develop more innovative solutions to its challenges. This includes the new Caltrans Vendor Day, a virtual event where subject matter experts within the department engage directly with prospective vendors and industry partners to identify specific ideas and solutions to established risks and problems. The Innovation Program successfully held its first Vendor Day in March 2024, and has since identified several potential solutions that staff across the department would like to pursue. Internally, Caltrans has established the Director's Innovation Award, which awards a monetary prize to the most innovative projects, teams, and districts across the department. Our first year saw participation from more than 10,000 staff and awarded three projects, one district, and one program area as the most innovative for 2023.

- **Established performance management framework for innovation program management and development**
  The plan affords us the opportunity to establish timelines and criteria for the implementation of each task, defining how successful we are at accomplishing our goals. Much like other strategic planning frameworks, our team can identify our progress to date and make changes based on current needs.

CHALLENGES:

While the plan and its use have not been challenging, it does highlight larger, program-level challenges that are complex to implement. Our core challenge remains employee engagement within the department. Despite wild success with initiatives like Vendor Day and the Director's Innovation Award, our program and its resources still struggle to attract staff, with many people throughout Caltrans unaware of the existence of our program.

RESOURCES:

As an internal document mainly focused on keeping the team on track, the plan was created by the Innovation Branch Chief, with input from four staff members. We did not require additional funding to complete the plan. All combined, it took roughly one week from start to finish to complete the plan, including review and discussion with managers and leaders.

LESSONS LEARNED:

The key to success for the Innovation Business Plan has been to reinforce its role as a guide, rather than a declaration. The plan is not meant to "punish" the team for not accomplishing its tasks, but rather is meant to establish a direction and an expected time frame to manage workloads and expectations. Understanding that this is a living document meant to be updated is critical, allowing the team to adjust program tasks to address current needs, priorities, and trends.

FUTURE PLANS:

We will continue to update the plan as our work changes over time. Caltrans is scheduled to release a new strategic plan for 2025–2029, and, as such, our work plan will likely evolve to meet new goals, values, and strategic imperatives. We expect that innovation will remain a core value in the next Caltrans Strategic Plan. Our plan is meant to go through the end of fiscal year 2026, at which time we will create a new version in whatever format or medium best serves the program at the time.

CASE STUDY 2: Innovate ITD! Innovation Stewards

NAME OF AGENCY: Idaho Transportation Department

DESCRIPTION AND SUMMARY:

Summary:

In 2014, the Idaho Transportation Department (ITD) introduced the Innovate ITD! program, aiming to establish a culture of empowerment where employees at all levels could contribute to enhancing services and efficiency. This program sought to tap into the collective insights and creativity of ITD's workforce, encouraging a proactive approach to innovation and continuous improvement within the organization. By doing so, ITD aimed to promote, celebrate, and foster a sense of ownership and engagement among its employees, making innovation a core aspect of its organizational identity. It quickly became apparent that to achieve the type of culture shift envisioned, more resources were needed to support the effort, and in 2015, ITD's Innovation Stewards was initiated. This program encapsulates ITD's commitment to creating an environment where innovation is encouraged and celebrated, inspiring and motivating our employees to share their innovative ideas across the agency.

Commitment: Serving as a steward is generally a two-year commitment. Stewards typically spend 5% of their work time supporting innovation efforts.

Key Responsibilities: Stewards encourage and assist with idea submissions, stay current on innovations, identify resources, recognize employee efforts, collaborate at monthly meetings, communicate innovations throughout the agency, and lead by inspiring others.

Traits of Stewards: They are high performers, forward-thinkers, open-minded, approachable, organized, and passionate about innovation.

The program has successfully created a network of 18 innovation stewards across the state. Two stewards (one office personnel and one operations personnel) represent ITD's six districts. The other six stewards represent DMV, highways, and headquarters staff.

KEY RESULTS:

The key results stemming from the implementation of the Innovation Stewards program within the Idaho Transportation Department (ITD) are:

- **Enhanced Innovation Culture:** The program successfully promotes a culture where innovation is encouraged and celebrated, leading to a more dynamic organization.
- **Empowered Employees:** Employees across ITD are empowered to share their ideas and take initiative, resulting in a sense of ownership and engagement in the agency's success.
- **Widespread Participation:** The program breaks down barriers between work units, sections, and divisions, ensuring that innovation is not limited to certain areas but is an ITD statewide endeavor.
- **Efficiency Gains:** There are measurable improvements in efficiency and service delivery as a direct result of innovations implemented with the help of stewards and their teams.
- **Leadership Development:** Many innovation stewards have developed leadership skills, resulting in career advancement, demonstrating the program's role in professional growth.
- **Improved Problem-Solving:** Stewards foster a problem-solving mindset among employees, leading to more effective and creative solutions to challenges.
- **Recognition and Morale:** Steward recognition of employee contributions boosts morale and motivates staff to continue seeking innovative solutions.
- **Teamwork:** Stewards working with employees during innovation foster an increased sense of teamwork. This also helps the entire organization work together to improve processes and implement innovations statewide.

These results demonstrate the significant impact of the Innovation Stewards program on ITD, driving positive changes and fostering a thriving environment for innovation.

CHALLENGES:

- **Time Management:** Balancing additional stewardship responsibilities with full-time roles is a primary challenge for stewards, as they must find time to support innovation initiatives alongside their regular duties.
- **Resource Allocation:** Providing adequate resources, management support, and proper tools, including time, allowing stewards to encourage and implement innovations effectively.
- **Engagement:** Maintaining high engagement and participation from all employees.
- **Recognition and Reward:** Ensuring employees feel recognized and valued for their contributions is crucial for sustaining motivation and participation in the program.
- **Scaling Innovations:** Successfully spreading and implementing practical innovations across different divisions and districts can be complex due to varying local needs.
- **Continuous Improvement:** Maintaining the program's momentum and continuously improving the processes and outcomes of the stewardship efforts.

RESOURCES:

Resources allocated to innovation stewards within the Innovate ITD! program are designed to support the steward's role in fostering innovation across the department. These resources include:

- **Time Allocation:** Stewards dedicate 5% of their work time to innovation-related activities.
- **Support Tools:** Access to tools such as the Steward's Handbook, training, design thinking, and the Innovate ITD! SharePoint site for submitting and tracking innovations.
- **Communication Channels:** Opportunities to communicate and collaborate with teams across ITD to share innovation knowledge via SharePoint, email, Teams™[4] , and face-to-face communication.
- **Recognition Mechanisms:** Systems to recognize, celebrate, and share innovative efforts, such as the Best of the Best celebration event and RISE certificates (ITD's digital employee recognition program).
- **Leadership Opportunities:** Planning and executing innovation-related events, monthly meetings, and activities.

LESSONS LEARNED:

The Innovation Program has made fantastic improvements within the last two years through leadership support and dedication from the Innovation Stewards Team. Below are a few examples.

In May of 2022, the Innovate ITD! program restructured the Stewards Team to include the election of the Innovation Chairperson (Chair) and Innovation Vice Chairperson (Vice-Chair). These elected appointments serve for a term of one year. Once the current Vice-Chair's annual term ends, they transition to the role of Chair. The innovation stewards then elect a new Vice-Chair through a nomination and voting process at the beginning of each fiscal year. The Chair and Vice Chair play a vital role in the success of the innovation stewards and their goals.

The Chair role:

- Plans and facilitates virtual and in-person monthly steward meetings.
- Participates in the Innovative Business Practices (IBP) Team meetings and serves as a liaison between IBP and the innovation stewards.
- Leads the activities of the innovations stewards and implements strategies and tactics that assist the Innovate ITD! program in meeting its goals and objectives.

4 Teams is a trademark of Microsoft Corporation.

The Vice-Chair role:

- Aids the Chair in their duties.
- Takes notes during the monthly stewards meetings.
- Helps determine the locations of upcoming monthly stewards meetings and works with the host district, as needed.

These appointed roles and responsibilities provide innovation stewards with experience that enhances their career development. Creating the stewards has been an excellent mechanism for developing new leaders in the organization. We have found that the stewards are a resource that can be drawn upon when needed to support other vital initiatives, like spearheading the planning of executive leadership team (ELT) meetings with workgroups across the organization.

In fiscal year 2023, there were several enhancements to the program that included:

- Streamlining the number of innovation categories from seven to five and assigning each category a clear and concise definition.
- Streamlining the process for employees to enter ideas and innovations.
- Removing bottlenecks and clarifying the Best of the Best nomination process.
- Increasing the number of innovation stewards from 12 to 18, having representation from staff in the office and operations.
- Adding Innovation Leads in the Division of Motor Vehicles to advocate innovation within their respective teams.

FUTURE EXPANSION CONSIDERATION:

The proposed expansion of the Innovation Stewards program to include Innovation Leads is a strategic move aimed at enhancing the innovation ecosystem within the Idaho Transportation Department (ITD). Here's a detailed description and summary of the proposed role:

Description: Innovation Leads will be a new tier within the existing Innovation Stewards structure, selected from various business units to work closely with the innovation stewards. Their primary role will be to foster a deeper connection with a smaller group of employees, enabling more personalized support and guidance in innovation efforts.

Summary:

- **Selection:** Innovation leads will be chosen for their proximity to day-to-day operations and to the teams they support.
- **Responsibilities:** They will identify and nurture potential innovations, ensuring these ideas are captured and entered the ITD's innovation funnel.
- **Benefits:** The introduction of innovation leads is expected to:

- Improve the quality and quantity of innovative interactions.
- Build more robust, meaningful connections within their respective areas.
- Increase visibility for new or overlooked innovations.
- Make the idea submission process more accessible and less intimidating.

- Promotion of Values: Innovation leads will actively promote continuous improvement and collaborate with innovation stewards to educate teams on the innovation process.

This expansion reflects ITD's commitment to continuous improvement and the importance of grassroots innovation. By empowering individuals closely connected to the work, ITD aims to capture a broader range of ideas and accelerate the adoption of valuable innovations.

Steward quotes:

Vicky Calderón – Current Steward:

"I have had opportunities to gain skills, knowledge, and experience I otherwise wouldn't have been afforded in my traditional role within the agency. Being a steward has allowed me to seek mentorship, develop my soft skills, grow my professional network, and improve my communication and presentation skills. I've been able to naturally pursue leadership development in a non-conventional way through this program. It's been organic, evolving, and fulfilling.

My favorite part about being an innovation steward is having the opportunity to empower, highlight, and support our innovative culture throughout the agency. It's amazing to work for an agency that encourages innovative ideas at all levels."

Santiago Palomera – Current Steward:

"My role in a team environment is multifaceted and revolves around fostering a culture of creativity, collaboration, and growth."

Connie Rozean – Former Steward:

"The problems I tend to solve best are ones that require a collaborative resolve. I am passionate about solving problems through connecting with others and sharing knowledge."

Brent Brumfield – Former Steward:

"… the solution to the problem may be right in front of you, but you don't know enough to ask the right questions to the right people."

Kimberly Hobson – Current Steward:

"Sometimes different departments within a district become very isolated, but I love that the innovation steward plays a role within the district that can bring disparate parts of one organization together. This also works within ITD statewide. For instance, one of our maintenance crews created a mobile eyewash station which has now been implemented statewide – but without the innovation program, this would not have been likely."

CASE STUDY 3: Developing a Culture of Innovation at InDOT

NAME OF AGENCY OR ORGANIZATION: Indiana Department of Transportation

DESCRIPTION AND SUMMARY:

As a result of an all employee survey and feedback, employees didn't feel heard or trusted. In 2019, the executive team revamped our mission, vision and values. We added innovation as a core value and subsequently a dedicated department. The Innovation department adheres to the mission statement:

We gather information and input from ALL levels of INDOT, focusing on solutions while fostering an environment of idea-sharing, testing, and implementation. We will recognize and celebrate the contributions that move INDOT to the next level.

KEY RESULTS:

A website was developed for all employees to enter their innovative ideas, focusing on increased safety, productivity, higher efficiency, or process changes. Ideas are vetted by councils and scored to determine which move forward to statewide implementation. To date, we have received over 600 ideas with over 40 of the innovation ideas being implemented and have wide-ranging applications across multiple departments.

CHALLENGES:

The largest hurdle is universal implementation. We have six districts and often adoption can be a challenge. Fundamentally, an idea to be implemented is asking for change in daily operations. Change is very difficult for some and seen as a challenge–sometimes an insult–and moving from what's comfortable to "new" is challenging. We are also challenged in data collection for some operations utilizing new processes or equipment.

RESOURCES:

We are a small but mighty group. In addition to an innovation director, there are two innovation coordinators who work with the districts and central office personnel to implement ideas, create work plans, training, and drive additional ideas to the website. Currently, we are undergoing a revamp of both our internal and external web pages to make data collection and navigation easier. We rely a great deal on district innovation councils. These councils are members within each district who volunteer to be a part of the innovation process. We have had over 500 individuals serve on district innovation councils.

LESSONS LEARNED:

Creating, maintaining, and growing a culture of innovation is challenging and isn't something that happens overnight. Patience and persistence are the key. Having champions carry the message of innovation from all levels is crucial. We are extraordinarily lucky to have the support of our commissioner and executive staff. Each one gives full support to the innovation culture and value.

FUTURE PLANS:

We are planning to have an innovation showcase for our yearly winners. Additionally, we have been awarded a STIC grant to host an innovation peer-sharing meeting hopefully at the end of this year. Lastly, growth of the program internally through revamped web pages and a more robust data collection effort is intended.

CASE STUDY 4: MnDOT Innovation Culture Assessment

NAME OF AGENCY: MnDOT (Minnesota Department of Transportation)

DESCRIPTION AND SUMMARY:

While developing an agency-wide innovation strategy, the project team wanted a way to assess the current state of innovation at MnDOT. To meet this goal, in the fall of 2020, MnDOT distributed an innovation culture assessment to all employees. This assessment was based on research conducted at Harvard Business School and MIT and was field-tested over two years for statistical validity and executive acceptance. The assessment measured an organization's culture of innovation around six building blocks: Values, Behaviors, Climate, Resources, Processes, and Success. Additionally, the six building blocks may be broken down into 18 factors and 54 elements. (Each building block has three factors, and each factor consists of three elements.)

This survey was implemented so that MnDOT could assess the health of its innovation culture and learn about strengths, opportunities, and challenges. The data from the survey informed the development of MnDOT's Innovation Strategy.

KEY RESULTS:

Wins and successes: Gathering 985 responses was a success that helped MnDOT better understand and develop baselines in areas deemed essential for the growth of innovation cultures. The responses were calculated by division with each division in the agency receiving an overall Innovation Quotient. Listed below are MnDOT's overall agency scores in the six building block areas, as well as definitions of each:

Agency Score, Values: 2.8 Values drive priorities and decisions, which are reflected in how a company spends its time and money. Truly innovative enterprises spend generously on being entrepreneurial, promoting creativity, and encouraging continuous learning. The values of a company are less what the leaders say or what they write in the annual reports than what they do and invest in. Values manifest themselves in how people behave and spend, more than in how they speak.

Agency Score, Resources: 2.8 Resources comprise three main factors: people, systems, and projects. Of these, people – especially "innovation champions" – are the most critical, because they have a powerful impact on the organization's values and climate.

Agency Score, Behaviors: 2.7 Behaviors describe how people act in the cause of innovation. For leaders, those acts include a willingness to kill off existing products with new and better ones, to energize employees with a vivid description of the future, and to cut through red tape. For employees, actions in support of innovation include doggedness in overcoming technical roadblocks, scrounging resources when budgets are thin, and listening to customers.

Agency Score, Processes: 2.6 Processes are the route that innovations follow as they are developed. These may include the familiar "innovation funnel" used to capture and sift through ideas or stage-gate systems for reviewing and prioritizing projects and prototyping.

Agency Score, Climate: 2.7 Climate is the tenor of workplace life. An innovative climate cultivates engagement and enthusiasm, challenges people to take risks within a safe environment, fosters learning, and encourages independent thinking.

Agency Score, Success: 2.7 The success of an innovation can be captured at three levels: external, enterprise, and personal. Particularly, external recognition shows how well a company is regarded as being innovative by its customers and competitors, and whether an innovation has paid off financially. More generally, success reinforces the enterprise's values, behaviors, and processes, which in turn drive many subsequent actions and decisions: who will be rewarded, which people will be hired, and which projects will get the green light.

Results from the survey also indicated which operational areas of MnDOT scored higher for the Innovation Quotient (Government Affairs, Audit, Research and Innovation, Controller/Financial Management). The survey also indicated which districts had higher Innovation Quotients (district 7, central office, metro office).

All this information helped MnDOT assess its innovation landscape at the time, in 2020.

CHALLENGES:

Administering an online survey only reached so many people, mostly those working in office. To meet the challenge of how to hear and learn from those working in the field, the project team developed a tailored, separate paper survey that went out to Maintenance and Operations teams:

- 1,609 surveys were distributed to MnDOT truck stations
- 181 responses were collected
- 11.2% response rate

This survey asked for responses about:

- Team attitude about innovation
- Team perception of supervisor and manager innovation values
- Team perception of the department's innovation values
- Perception of the department's innovation environment
- Open-ended responses
- Suggestions on ways to innovate and general suggestions

A few key learnings from this phase of the survey included:

- **Problem-solving:** Over 80% of respondents reported that their supervisor understood their challenges when problem-solving; 40% of respondents reported they had the support of their area manager when problem-solving
- **More long-term solutions:** More than 50% of respondents reported the perception that MnDOT needs to focus on finding innovative solutions that last instead of short-term fixes
- **Suggesting ways to innovate:** Focus on relationship building and listening to front line staff and attend to equipment needs (training, safety)

RESOURCES:

Staff time: The Innovation Culture Assessment was coordinated by an internal project team led by the Office of Research and Innovation and a contracted consultant (external resource). Staff time was also incurred when responding to the survey.

Other related administrative costs: printing, coordination, distribution, and travel.

LESSONS LEARNED:

- Adapt your methods of engagement to reach as many people as possible: MnDOT utilized an online survey and paper survey tailored to field staff. We asked different questions because experiences and responsibilities are different when it comes to innovating (in the field and in the administrative areas)
- Take time and make opportunities to share the results so the agency can learn.

FUTURE PLANS:

MnDOT continues to build its innovation culture by implementing the goals and actions included in our Innovation Strategy. We closely ascribe to the goal of connecting, learning, and sharing in the details of our work. At present and in the future, we seek to:

- Build awareness of, and participation in, our agency-wide Innovation Portal so that we can collect ideas, share ideas, and provide innovation resources
- Continue offering opportunities to learn and connect about innovation-related topics through a webinar series and our regular array of communications tools – Innovation newsletter, Microsoft Teams channel, message boards – that highlight innovation agency-wide
- Cultivate relationships across the agency and with peer DOTs
- Compile MnDOT's innovation portfolio to catalog and share successes and efficiencies
- Host an Innovation Summit

CASE STUDY 5: MoDOT's Innovations Challenge Program and Showcase

NAME OF AGENCY: Missouri Department of Transportation

DESCRIPTION AND SUMMARY:

MoDOT's Innovations Challenge program was born out of an employee idea system called Solutions at Work, which began in 2005. The maintenance-focused idea system was clunky and didn't move the department toward the goals of creating new ways of doing business, executing those ideas, and implementing them statewide. After a few years of struggling to evaluate innovative ideas, a team of technical experts formed MoDOT's Tool and Equipment Challenge, which brought life to innovative ideas by making the competition about implemented innovations, not ideas. The first competition was a huge success in 2007, followed by an awesome innovations showcase in 2008.

In 2012, MoDOT expanded the program to include innovations throughout the entire department, not just tools, equipment, and maintenance-type innovations. It was rebranded as Innovations Challenge. Categories of Productivity and Projects were added to the program with the existing Tools and Equipment category. Again, another successful effort brought more innovation to life in the department.

Each of MoDOT's seven districts and central office can choose up to 18 local, piloted innovations to compete for state recognition. MoDOT central office and district coordinators use surveys and technical review committees to narrow the number from a possible 144 innovations to 60 qualifying for showcase. The review process includes considering whether innovations meet applicable state and federal standards, safety requirements, and MoDOT policies.

60 state finalists compete in one of three categories: Tools and Equipment, Productivity, and Projects. Four winners are chosen in each category and three Director's awards in the categories of Safety, Service, and Stability are presented. In addition, the Dickson People's Choice Award is given to the innovation receiving the most votes by the spectators.

Since the programs' inception, over 2,300 innovations have been considered for showcase and nearly 900 innovations have competed in 18 showcases.

While MoDOT has produced big-ticket innovations that have saved millions of dollars, for the most part we're generating hundreds of innovations, like replacing a plastic fitting on a string trimmer with a bolt and a steel washer. Most of the innovations that we implement are more practical, day-to-day innovations.

Competitions aren't successful without rewards and rewarding winners continues to be a driving force in participation. First-round winning employees in each category receive a $75 award and qualify for the second-round evaluations. Innovators winning a top-four spot at showcase receive $425 per person (a maximum payout of $1,550 per team). Innovations taking home a Director's Award also receive monetary awards and traveling trophies. Perhaps the biggest incentive is earning bragging rights for being awarded the Dickson People's Choice Award and presented with a trophy.

KEY RESULTS:

The key result of our program is to implement hundreds of innovations that increase employee and traveler safety, improve efficiencies throughout the department, and save Missourian's tax dollars.

MoDOT's Innovations Challenge has successfully made us a leading state in supporting grassroots innovations. We share our program with other states and each year extend invitations to other departments of transportation to attend our showcase. The statewide coordinator continually presents our program to other departments and national committees.

CHALLENGES:

Statewide implementation of innovations has been one challenge we've faced, but we have continued to enhance the challenge itself making implementation easier and sometimes free!

Our most robust implementation tactic is MoDOT's Innovations Store. In 2019, executive leadership opted to provide funding every year to implement approved, best-practice innovations so they can be put into action statewide. After technical reviews for safety and compliance, some maintenance-related innovations are made available statewide to implement at no cost to the districts. The store is managed through the Central Office Maintenance Division. Innovations, or parts and materials to handcraft them, can be ordered via an application accessible to district maintenance employees. To make this a smooth process, we've revised the entry requirements to include a video demonstration with each entry and have required parts lists and shop drawings for all handcrafted innovations.

MoDOT promotes implementation in a weekly news publication that is disseminated statewide via email and is displayed on large screens in maintenance sheds. A photo of the innovation is shown along with a bulleted description, benefits of the innovation, and the name of the innovator. The QR code on the slide takes users directly to a one page handout that provides more details about the innovation.

We also have a website dedicated to innovations that have been approved to implement statewide that all MoDOT employees can access. The site is categorized by year, category, and is alphabetical and features keyword searchability.

RESOURCES:

There has never been a need to outsource technology to administer our program. We access existing SharePoint software, website design, and in-house applications that are currently in place. District budgets cover the cost of creating, developing, and handcrafting innovations. Monetary awards are paid from existing district and division budgets within MoDOT, and the MoDOT store funding is a department-wide budget set aside each year. The cost to carry out a successful showcase is roughly $25,000. This includes the showcase venue and award luncheon.

The statewide coordinator devotes approximately 85% of her time administering and overseeing MoDOT's Innovations Challenge, including year-round coordination of the competition, planning and carrying out the annual Innovations Showcase, and spearheading the innovation approved best-practices process. An additional staff person spends roughly 25% of her time assisting with showcase preparations. District and central office coordinators devote about 15% of their time coordinating the competition, reviewing innovations for safety and compliance, and assisting at the showcase.

LESSONS LEARNED:

Bulleted below are pieces of advice to departments looking to implement an innovation program:

- Receiving full support from a department's executive leadership is essential. MoDOT's program would not exist without support from its leaders and their forward-thinking, innovative approaches to transportation.
- Host an annual in-person showcase. The excitement in the room is contagious, and when employees see the newest tool or process that can make their jobs better, they want to implement it. Seeing the simplest innovations at showcases can also spark new ways to improve different areas of the department which leads to submissions for the next Innovations Challenge.
- Capture an eight- to ten-minute video recap of the showcase, then promote it throughout the department for all employees to view. Sharing photos of winners taken at the award luncheon is important to promote.
- Distributing funds to districts to implement innovations has been a gamechanger in implementation throughout the state.

FUTURE PLANS:

Keeping the Innovations Challenge a success is crucial to the department. The proceeding statewide coordinator, who spearheaded building the challenge from the beginning, shared a wealth of knowledge before retirement in 2018 and allowed the current coordinator to tackle most of the duties that year. Currently, tasks and steps are well-documented with detailed timelines and tasks. Within the districts, coordinators occasionally change and conduct a similar process of training the upcoming coordinator. In addition, utilizing staff from other areas of the department to conduct reviews increases program knowledge and awareness of the importance of the program. Nothing is in the works to robustly make changes, but we make small improvements to processes and tasks each year to streamline and enhance our program.

CASE STUDY 6: PennDOT *Innovation in Motion Webinar* Series

NAME OF AGENCY: Pennsylvania Department of Transportation

DESCRIPTION AND SUMMARY:

In celebration of the State Transportation Innovation Council's (STIC) 10th Anniversary in 2022, PennDOT's Bureau of Innovations (BOI) launched the Innovation in Motion webinar series, featuring

hour-long innovation webinars to educate PennDOT staff, industry partners, and local government representatives on innovative approaches being implemented in Pennsylvania. The webinar series serves to increase awareness of these tools, technologies, and products that are available to help enhance services and address the challenges the transportation industry is facing.

Hosted quarterly, each webinar includes a 30- to 40-minute presentation and is followed by a question and answer period. Topics are derived from various sources, including STIC innovations, Federal Highway Administration (FHWA) Every Day Counts innovations, as well as innovations from PennDOT's Engineering Districts. Past webinars focused on the topics of:

- Unmanned Aerial Systems;
- Continuous Process Improvement Initiatives;
- Transformational Transportation Technologies, including PennDOT's automated and connected vehicle initiatives and the build-out of Pennsylvania's electric vehicle infrastructure; Transforming Traffic Operations for Better Planning and Improved Safety, including the Lane Reservation System and Freeway Evaluation - Pennsylvania (FREEVAL-PA), two tools to assist with efficient and effective work zone planning to minimize traffic congestion and delays;
- Driver and Vehicle Services: Leveraging Technology to Enhance the Customer Experience; PennDOT's Digital Transformation, including PennDOT's e-Construction and e-Ticketing efforts;
- Transformational Transportation Applications, including the development of the Highway Performance Monitoring System (HPMS) mobile application to support Metropolitan Planning Organizations as well as PennDOT employees and several applications to support transit agency oversight;
- and the Modernization of PennDOT's Automated Permit Routing and Analysis System (APRAS).
- Following each webinar, the recording is uploaded to PennDOT's YouTube channel and linked on PennDOT's website, as well as sent to webinar participants, to ensure that interested individuals can watch the webinar later.

KEY RESULTS:

The webinars have been well-received. On average, between 250 and 300 participants attend each webinar. Post-webinar feedback survey results show that 97% of survey respondents found the webinars informative and were satisfied or more than satisfied with their webinar experience. The survey results also indicate that 98% of survey respondents learned about something new and innovative that PennDOT is pursuing. The webinars have been successful at sharing innovations with a statewide audience at no cost. Presenters have asked to be featured on an annual basis to provide updates on their topic, since the webinars are a great opportunity to share information with a large audience.

CHALLENGES:

The biggest challenges encountered include technical difficulties and stable network connectivity to ensure a smooth delivery of the webinar.

RESOURCES:

Webinars are hosted on the WebEx™[5] platform and include two members of BOI as well as the presenters. Presentations are pre-recorded through PowerPoint™[6] and compiled into an MP4 video file by PennDOT's Communications office. Webinars feature PennDOT presenters and are hosted virtually; thus, there are no direct costs involved. In addition, invitations are designed and sent through the Commonwealth of Pennsylvania's email marketing software to pre-established email distribution lists maintained by PennDOT.

LESSONS LEARNED:

Pre-recording the presentations has proven to be helpful in minimizing technical difficulties and ensuring a smooth webinar experience for everyone. It ensures that presenters adhere to the timeframe and allows enough time for the question and answer period. In addition, combining all files into one master MP4 video simplifies hosting the webinar because only one file is being shared during the webinar.

Beginning in 2024, PennDOT now offers one Professional Development Hour (PDH) credit to attendees for participating in the webinar, which can be applied to the Professional Engineer license requirement in Pennsylvania. This offering was implemented following attendee feedback and requests to offer PDH credits.

FUTURE PLANS:

PennDOT plans on continuing the annual webinar series in future years on a quarterly basis, in addition to other virtual or in-person innovation events.

CASE STUDY 7: Texas - Support for District Innovative Transportation Projects

NAME OF AGENCY OR ORGANIZATION: Texas Department of Transportation

DESCRIPTION AND SUMMARY:

Challenges in the transportation industry and the rapid pace of technological change bring opportunities to innovate as we build the future of Texas transportation. A top priority at TxDOT with support of executive leadership, is embracing innovation in everything we do. TxDOT's Innovative Transportation in Texas program kicked off in 2022 to identify, evaluate, and develop innovative solutions to meet the growing transportation needs across the state. The goal of this effort culminated into identifying one innovation project for each TxDOT district to target for implementation based on input from that district's leadership and with support from the Strategic Initiatives and Innovation Division on an annual basis–all while leveraging interagency cooperation with public universities such as the Texas Transportation Institute at Texas A&M University.

5 WebEx is a trademark Cisco Technology Inc.

6 PowerPoint is a trademark of Microsoft Corporation.

KEY RESULTS:

To jumpstart the program and to communicate existing innovative transportation projects already developed within the districts, the program produced 18 district innovation summaries in an easy-to-use format that can be easily shared in its first year; developed more than 25 district innovation projects in the second year; and has begun the project discovery phase with 15 of 25 districts to kick-off this third annual cycle. The implementation of this program has been successful in that we have brought the districts into the conversation and the effort has become well known. District leadership has begun encouraging a culture of innovation with staff with renewed focus on inspiring innovative transportation to improve our system, and district leaders are actively involved in finding and developing life-saving technologies to share with other districts for statewide impacts. These accomplishments were achieved through collaboration between STR, TxDOT subject matter experts (SMEs), leadership within the districts, and TTI SMEs to solve technological constraints in multiple business areas.

CHALLENGES:

For years, TxDOT has faced the challenge of getting its staff to share information, collaborate more effectively, and learn from each other to be highly effective problem-solvers. Striving to continuously build new skills is a strategic imperative in a state that has historically set a high bar for its transportation solutioning and covers a transportation system as big as Texas.

RESOURCES:

A work section was assigned specifically by the Director of Strategic Initiatives and Innovation (STR) Division to focus on innovation in 2023; complete with a section director, 2 subprograms of three members each, with one program focused on innovations and the other focused on technology intake. This dedicated team from diverse technological backgrounds is known as the Innovations Section of the STR Division. Among various tasks focused on building a culture of innovation at TxDOT, the Innovations Section established an interagency partnership with a public university to serve as "boots on the ground" and help augment STR Division staff and work with districts by coordinating this effort. The program budget for the first year was just under $1 million, allowing around $50,000 per project; for the second year was just over $1 million, which allowed $70,000 per project. A new contract was executed this year to cover a three-year period and is built on a strong foundation guided by the Director of Strategy and Innovation at the administration level.

LESSONS LEARNED:

As indicated in the Agency's Strategic Plan, the success of the Innovation Program is contingent upon how well the initiatives brought forth from the program are executed. To ensure strong leadership and effective collaboration across TxDOT, the agency needed to designate resources and organize dedicated staff to lead and coordinate the execution of innovation activities across Texas. To address this, TxDOT established a grassroots program where each district and division assign two individuals to serve as Innovation Champions and to stay apprised of the latest innovations and collaborative efforts that are facilitated through the Innovations Section and the broader TxDOT Innovation Community of Practice.

FUTURE PLANS:

Looking to the future, the Executive Director of TxDOT focuses on four pillars to serve as priorities in our agency's Strategic Plan: Safety, Delivery, Innovation, and Stewardship.

The Strategic Plan calls out TxDOT and its transportation partners' rapid evolution to support exciting technological innovations in the transportation arena. The plan clearly establishes the concept that by leveraging the collective wealth of expertise within TxDOT and staying attuned to the latest transportation needs, the TxDOT strategic plan is both robust and adaptable – positioning the agency for success.

In addition, the plan emphasizes a renewed focus on attracting and retaining workers who increasingly expect additional information technology (IT) resources and new equipment, requiring additional support, training, and continual innovation.

CASE STUDY 8: UDOT Employee Engagement: Awards & Recognition

NAME OF AGENCY: Utah Department of Transportation (UDOT)

DESCRIPTION AND SUMMARY:

Employee engagement activities conducted by the UDOT Innovation Program are intended to promote innovative work and help sustain a culture of innovation. Current activities are intended to attract employee attention to, and participation in, innovative improvements to save time, money, and improve safety. Two activities detailed include an annual award program and an individual recognition note from leadership.

Awards and Recognition:

1. **Annual Innovation Awards.** The UDOT Innovation Program runs an annual innovation collection cycle that begin September 1st each year. Implemented innovations collected during the period are automatically considered for the annual Innovation Awards. Four awards are announced each year:

   - Innovation of the Year Winner: In recognition of the innovation that advances safety, saves costs, and/or improves public service;
   - Enhance Award for Adaptive Innovation: Honors ingenuity, adoption, adaptation, or resourceful problem solving using available resources;
   - Flow Award for Process Innovation: Recognizes the implementation of a new or redesigned process that achieves excellence results; and
   - Spark Award for Inventive Innovation: In recognition of creativity in developing novel processes, tools, or technologies to solve problems and make improvements.

   Four innovations in each award category are selected (16 total) as a finalist. A scoring team composed of members of the UDOT Innovation Council review and score innovations for impacts. Final selection of winners is reviewed for approval by department leadership.

   Award winners are announced in an employee newsletter and at the annual transportation

conference. Certificates are presented to each member of the innovation development team by senior leaders. Winners, along with their supervisor, are recognized at an awards lunch.

2. "Innovator" sticker recognition. UDOT's Innovation Program prioritizes implemented innovations as compared with concepts or untested ideas. As innovation descriptions (Problem-Change-Result stories) are added to the online Innovation Catalog, every member of the innovation development team is recognized with a personalized recognition card from the executive director, along with a "UDOT INNOVATOR" sticker. A recognition card is sent for every innovation submission.

KEY RESULTS:

The Innovation Awards provide several benefits for the department.

- Knowledge Transfer: The award announcement raises employee awareness of high value/high impact innovations. More employees become aware of more innovations, including innovation outside their own discipline or unit location.
- Employee Engagement: Employees who are looking for ways to improve their work output, environment, and/or process tend to be those who are engaged and committed to their organizations. Projects that require collaboration and teamwork that yield positive outcomes may also benefit from innovation accomplishments.
- Performance outcomes: Awards help incentivize the drive of innovation work. It also simplifies the identification of high value/high impact innovations. Expanding implementation or upscaling good innovations is aided by awards recognition.
- Recognition Opportunities: Awards provide another way for the organization to highlight and celebrate both improved work and productive employees. The organization also benefits by memorializing accomplishments.

"Innovator" sticker recognition is a new program element and results are still to be determined. Some anticipated results include:

- Leadership Awareness: Because the executive director signs every card with the name of the employee and the developed innovation, the leader is aware of work being accomplished and who is doing it.
- Increased Recognition Opportunities: Every employee who contributes to the innovation effort is recognized, regardless of role, seniority, or degree of effort.
- Branding and Awareness: The "UDOT INNOVATOR" sticker becomes a recognized badge of accomplishment. Because the sticker item is novel, people are taking notice. It also serves as marketing collateral for the Innovation program. There are several sticker designs and sizes so stickers can be attached to hard hats, water bottles, tablet cases, etc. A new design for each year helps distinguish the recognition from year to year.

CHALLENGES:

The most significant challenge to employee engagement currently is the constant and daily work demands. Time to plan and fully develop an innovation is in scarce supply, as is the additional step of submitting information about an innovation.

RESOURCES:

The Innovation Program is staffed by two program-dedicated Full Time Equivalents (FTEs). An 18-member employee Innovation Council provides a link to regional offices and divisions. The budget for the annual Innovation Awards, certificates, and lunch is under $1000. The cost of the UDOT INNOVATOR stickers and recognition cards is minimal.

LESSONS LEARNED:

Incentives are needed to encourage sharing. It is the eighth year of the UDOT Innovation Program, and incentives may offset any diminished level of employee participation in the program. While the frequency of innovations may not have changed, the number of innovation stories collected has decreased. Employees and teams may be quietly innovating on their own, but they are less likely to take the time to write up and submit their innovation story. Submitting innovation information is optional and the daily work demands are higher priority. Incentives provide encouragement to do the extra work required to share an innovation story.

FUTURE PLANS:

We are currently planning to add cash prizes for the four Innovation Awards winners and the 16 award finalists. Each person who helped develop and implement the innovation will be recognized and awarded a prize. In addition to the cash prizes, we also plan to provide a celebration lunch for the whole unit/division from which the innovation originated.

To encourage innovation submissions throughout the year, we are beginning a new quarterly prize drawing. Three submitted innovations will be randomly selected to receive cash prizes. Frequent innovation news stories help keep awareness of the program at the forefront of employees' attention, which helps to nurture a culture of innovation.

Recommendations

Considering the findings and conclusions mentioned above, the scan team has the following recommendations.

Active **executive level leadership is essential** for a successful innovation program and, more importantly, to improve the agency's innovation culture. Building innovation into agency values, goals, and vision along with an innovation champion/sponsor at the executive level is a great place to start. Having enthusiastic innovation champions at all levels of leadership will ensure employees understand the agency's appetite for risk and that failure is acceptable.

Conduct an agency self-assessment or cultural assessment using survey tools to better understand the innovation culture as it stands. Focus initial efforts on addressing those gaps between employee values and behaviors and the agency vision and goals. Self-assessment can be re-visited periodically to determine innovation culture changes.

Empower employees by establishing innovation committee(s) consisting of a mix of managers, supervisors, and front line workers. These committees are charged with promoting innovation, vetting ideas and innovations, and prioritizing innovations for award recognition and implementation.

Establish a process to collect innovation ideas. Acknowledge and recognize all submittals. Use an innovation competition to encourage idea submissions. This gives a defined endpoint to a collection cycle. Employees will be more apt to remember and to participate when there is a known endpoint and recognition event.

Communications and marketing efforts should be done frequently and using methods tailored to the audience. The agency communications office should be involved from the start and efforts should be kept fresh and interesting. Effective communications and marketing are key so employees and external partners are kept in the loop.

Create a brand, logo, and clever name for the innovation effort that employees will remember and recognize. If possible, involve the innovation committee and employees in selection of the brand and logo.

Communicate examples of homegrown innovations as soon as possible to build credibility with the program. This will very likely encourage others to submit ideas and innovations.

Establish employee recognitions and awards. Consider using financial awards. However, if direct cash awards to employees is not allowed, consider awarding extra funds to maintenance shops or units for purchase of new equipment or supplies.

Leaders at all levels should look for opportunities to praise and recognize innovators. It could be a simple thank you in front of a field crew or a message in front of legislators. Seeing and hearing is believing. Employees will see their innovations are noticed and appreciated.

Measure innovation progress by tracking the number of innovations submitted and implemented and share this information with the agency. Develop a simple-to-use process to determine benefits of innovations, especially if it is implemented. Ensure this information is communicated via a website and other methods.

It is important for **agency collaboration** both internal and external. Establish teams to implement new and emerging technologies, solve problems, bring ideas to fruition, and improve processes. Provide networking and learning opportunities that enable employees to discuss innovations together. Work closely with federal partners, other state DOTs and local partners through STIC, and other means to identify and broaden the impact of innovations.

There are opportunities to leverage the national transportation innovation programs and initiatives to improve individual state agency programs and efforts. These opportunities could include a national database to share innovations, policy level discussions about the benefits of innovation programs, and elevating innovation within AASHTO.

Implementation Strategies

There are several strategies being used to disseminate the information and recommendations from this scan. This is being done in coordination with the U.S. Domestic Scan Program management consultants. These strategies include potential presentations at upcoming AASHTO meetings, for example, the Special Committee on Research and Innovation, the Research Advisory Committee, the Innovation Community of Practice, the regional and national AASHTO meeting, and more. Also, there are opportunities at several upcoming state DOT research peer exchanges and the annual Transportation Research Board meeting.

The scan team is considering submitting a proposal to the NCHRP Implementation Program.

Bibliography

Kline & Johnson, *Innovation Programs and Practices of State Departments of Transportation, NCHRP Synthesis* 633, 2024

Utah DOT, Research and Innovation Division, *Innovation & Efficiencies Report*, 2024

Minnesota DOT, *Office of Research & Innovation, Innovation Strategy Report*, 2022

Pennsylvania DOT, *Focus on Innovations*, 2022

Augustine, Mahdavi, Mason, Wainer-Katz, *Lessons Learned from State DOTs on Innovation and Knowledge Management Programs*, North Carolina Department of Transportation, March 2021

Lorenz, Rotert, Link, Crossett, *Research on Creating and Sustaining a Culture of Innovation for Department of Transportations*, NCHRP Report 885, 2018

Appendix A: Scan Team Biographical Sketches

Anne Freeman is the Washington DOT Research and Library Services Program Administrator since 2019. Prior to 2019, she held a position as a Tennessee DOT Transportation Planning Manager responsible for the research and policy programs while also administering the State Planning and Research program. An active AASHTO RAC member, AASHTO ICOP member, and the Transportation Research Board (TRB) Washington State representative, she has held several leadership positions over the years. Anne holds a master's degree in Planning from the University of Tennessee, Knoxville and a Bachelor of Science degree from Gannon University in Erie, Pennsylvania.

Amanda Gilman-Bogie is the Continuous Improvement Section Manager at the Vermont Agency of Transportation (AOT), in the Bureau of Innovation Learning and Development. Her team is tasked with identifying opportunities for process efficiencies, improving organizational structure, enhancing service delivery, and fostering a culture of innovation across AOT. As the Co-Chair of the Vermont State Transportation Innovation Council (STIC), Amanda collaborates closely with federal partners, AOT executive staff, and AOT senior management to review and collaborate on initiatives, research, and innovative ideas that support a culture of innovation within the state of Vermont. Amanda has spent over a decade in public service, working within Vermont state government and teaching as an adjunct professor at the Community College of Vermont. Amanda is a member of AASHTO's Innovation Community of Practice. She has a Master of Science in Organizational Leadership from Norwich University and completed her undergraduate degrees at Lyndon State College.

Shanté Hastings, P.E. serves at the Deputy Secretary and Chief Engineer for the Delaware Department of Transportation (DelDOT) where she's worked since graduating from the University of Delaware with a bachelor's degree in Civil Engineering in 2000. In her current and previous roles at DelDOT, she has had the opportunity to lead and drive innovation in a variety of spaces including e-Construction, performance management, safety, alternative project delivery, and accelerated bridge construction. Shanté serves as the Chair of AASHTO Innovation Management, Chair of AASHTO Committee on Design, Vice Chair of AASHTO Committee on Transportation System Operations, and is a member of the Innovation Community of Practice as well as the Special Committee on Research and Innovation.

Cameron Kergaye is Director of Research and Innovation at the Utah Department of Transportation where he has over 30 years of project engineering experience. He has held technical positions in materials, construction, design, and project management. He serves on the AASHTO Special Committee of Research and Innovation, and he is the current Chair of the AASHTO Research Advisory Committee. Cameron is a professional engineer in the state of Utah and a project management professional with the Project Management Institute. He holds a PhD in Civil Engineering from the University of Utah with a research focus on adaptive signal control, traffic simulation studies, and transportation system operations.

Todd May currently serves as the Director of Innovation and Process Improvement for Indiana Department of Transportation, focused on implementation and currently involved in leading the agency in implementation of sustainable practices such as renewable energy sources, pavement electrification, connected and autonomous vehicles, and overall reduction of the agency's environmental impact. Prior to his Innovation role, Todd served as statewide Director of Utility and Rail and Deputy Commissioner for the East Central District. He also is the Senior Director for Broadband Corridors, focused on improving connectivity for the agency and facilitating rapid broadband expansion for providers. Currently, Todd Co-Chairs The Innovation Community of Practice of AASHTO. He also is Chair of the Transportation Maintenance Innovation No Boundaries Group. Todd represents INDOT Indiana STIC, R&I and AII, and Indiana's LTAP through Purdue University. He has served as a panel member for NCHRP 20-123(10) Evaluation and Synthesis of Connected Vehicle Communication and NCHRP 23-10 Feasibility Study for a Platform to Capture Innovations from State Departments of Transportation and others.

Tyson Rupnow is the Associate Director of the Louisiana Transportation Research Center at the Louisiana Department of Transportation and Development. He has been with the DOTD for 16 years. He administers the research program for the department, integrating innovative ideas, materials, and procedures, and serves on the Department STIC Implementation Leadership Group. He is active in multiple NCHRP project panels, TRB Committees, and is a member of the STIC Enhancing Performance with Internally Cured Concrete FHWA Implementation Team. Tyson holds a Civil Engineering B.S., a Geotechnical Engineering M.S. and a Civil Engineering Materials Ph.D. from Iowa State University.

Linda Su is a Transportation Specialist in the Research and Analytics Bureau at Iowa DOT.

Linda received her degree in Chemical Engineering from San Jose State University, CA and is a licensed Civil Engineer with the states of California and Iowa. She spent her career in both the public and private sectors before joining the Iowa Department of Transportation in 2021. Her current role is within IADOT's Research and Analytics Bureau, as the STIC Innovation and Marketing Program Manager, where she manages federally-funded innovation programs including STIC and AID and provides support for administering the department's innovation initiatives. She is a member of AASHTO RAC (Research Advisory Committee) and ICOP (Innovation Community of Practice).

Alyson Tamer graduated from North Carolina State University with a Bachelor of Science degree in Biological Engineering. She has been working with the North Carolina Department of Transportation for over 21 years. She currently serves as the State Value Management Engineer and oversees the Value Management Office including the Value Engineering, Constructability Review, Risk Management, CLEAR Innovation and Knowledge Management programs, and the NC Transportation Innovation Council (NC-TIC). Alyson is a member of the AASHTO Committee on Knowledge Management and the AASHTO Innovation Community of Practice, and she serves on multiple NCHRP panels. She is a licensed Professional Engineer in NC and a Certified Public Manager.

Katie Walker currently serves as the Minnesota Department of Transportation's Director of Innovation and Research, where she is charged with creating a culture where research, innovation, and analysis bridges today with tomorrow to improve the quality of life for Minnesotans. As the Director, she provides statewide leadership for the MnDOT research and innovation programs to lead and encourage creation and implementation of innovative practices. These programs improve how the department delivers its products and services. In addition, she advances innovations that are "market ready" for broad implementation and spearheads internal and external partnerships to advance innovation. She is the Vice Chair of the AASHTO Innovation Community of Practice.

Prior to joining MnDOT, Katie served in a variety of roles at state, regional, and local governments, including stints as a planner for Hennepin County, Metro Transit/Metropolitan Council, Dakota County and the 494 Corridor Coalition. During her 20-year tenure with Hennepin County, she held a variety of roles, including Southwest Light Rail Transit (LRT) Project Manager, Southwest LRT Community Works Program Director, and Public Works Policy and Planning Manager. Most recently, she headed strategic initiatives for the county's Center of Innovation and Excellence. Katie holds a masters of Public Policy degree from the University of Minnesota's Humphrey Institute of Public Affairs, a mini-Master of Business Administration from the University of St. Thomas, and a bachelor's degree from the University of St. Thomas.

Dara Wheeler has enjoyed 33 years of public service, and currently manages the Research & Innovation (R&I) program at the California Department of Transportation (Caltrans). In addition to her research role, Dara also oversees the Caltrans innovation portfolio, which includes activities such as managing the Bi-Annual Statewide Innovation Showcase, Innovation Exchange (a crowdsourced portfolio), innovation training for managers, Director's Innovation Awards, an annual innovation report, as well as creation of a Caltrans Vendor Day.

Dara is actively engaged with national innovation groups and enjoys mentoring and coaching State DOT innovation programs and making connections. She is Co-Chair of the AASHTO Innovation Community of Practice (ICOP); Vice Chair of the AASHTO Innovation Management (AIM) committee; and appointed member of the AASHTO Special Committee on Research & Innovation (R&I). Additionally, Dara has served on several NCHRP projects such as: Feasibility Study to Capture Innovation at State DOTs; State DOT Innovation Programs and Practices; Developing and Maintaining a Culture of Innovation within DOTS; and a Domestic Scan on the Culture of Innovation. Dara has a Bachelor of Arts in Political Science from San Diego State University.

Jeffrey A. Zaharewicz (FHWA Liaison) has been with the Federal Highway Administration for 34 years and is currently the Director of the Center for Accelerating Innovation. In this role, he is responsible for providing support, guidance, and policy direction for FHWA's strategic innovation deployment programs, including Every Day Counts, State Transportation Innovation Councils, Accelerated Innovation Deployment Demonstration grant program, and Accelerating Market Readiness. He is active on AASHTO Innovation Management and the AASHTO Innovation Community of Practice as well as multiple NCHRP panels. He holds a B.S. in Civil Engineering from Penn State University.

Glenn Page (AASHTO Liaison) is the Program Director for Project Delivery at the American Association of State Highway and Transportation Officials.

Dale Peabody (Subject Matter Expert) is retired from the Maine Department of Transportation. He was the Director of Research and Innovation and served as the AASHTO Research Advisory Committee Chair and AASHTO Special Committee for Research and Innovation Vice Chair. He holds a Bachelor of Science degree in Civil Engineering from the University of Maine.

Appendix B: Scan Team Contact Information

Dara Wheeler – Team Chair
Division Chief of Research, Innovation and System Information
California DOT
T: 916-654-8877
dara.wheeler@dot.ca.gov

Todd May
Director of Innovation and Process Improvements
Indiana Dept. of Transportation
Indiana Government Center North
100 N. Senate
N655-PL
Indianapolis, IN 46204
T: 317-234-4858
ToMay@indot.IN.gov

Tyson Rupnow, Ph.D., P.E.
Associate Director, Research
Louisiana Transportation Research Center
Louisiana DOTD
T: 225-767-9124
Tyson.Rupnow@LA.GOV

Katie Walker
Director of Innovation & Research
Minnesota Department of Transportation
T: 651-366-3765
Katie.walker@state.mn.us

Cameron Kergaye, PhD., P.E., PMP
Director of Research & Innovation
Utah Department of Transportation
T: 801-633-0359
ckergaye@utah.gov

Jeffrey A. Zaharewicz
Director, Accelerating Innovation
FHWA Office of Technical Services
Office: 202.366.1325 (Room E73-311)
C: 571-384-9455
Jeffrey.Zaharewicz@dot.gov

Amanda Gilman-Bogie, MSOL
Continuous Improvement Unit Manager
Performance Section
Vermont Agency of Transportation
219 North Main St. | Barre, VT 05641
C: (802) 498-8231
Amanda.Gilman-Bogie@vermont.gov

Shante Hastings
Chief Engineer and Deputy Secretary
Delaware DOT
T: 302-760-2835
shante.hastings@delaware.gov

Alyson Tamer
State Value Management Engineer
North Carolina DOT
T: 919-707-6682
awtamer@ncdot.gov

Anne K. Freeman
Research & Library Services Program Administrator
Transportation Safety & Systems Analysis Division
T: 360-705-7961(RLS Office)
anne.freeman@wsdot.wa.gov

Linda Su, P.E.
Innovation programs
Research & Analytics Bureau
Iowa DOT
Office: 515.239.1423
Cell: 515.357.1558
linda.su@iowadot.us

Glenn Page – AASHTO liaison
Associate Program Director, Project Delivery
AASHTO
T: 202-624-5265
gpage@aashto.org

Dale Peabody – Subject Matter Expert
Retired Director of Transportation Research
Maine Department of Transportation
C: 207-649-2901
dpeabody22163@gmail.com

Appendix C: Invited Agency Contact Information

Missouri DOT

Ed Hassinger, P.E.
MoDOT Chief Engineer and Deputy Director
105 West Capitol Avenue, Jefferson City, MO 65102
Office: 573-751-3692
Cell: 573-508-7674
Email: Ed.Hassinger@modot.mo.gov

Kelly Backues
Transportation Planning Specialist
MoDOT's Statewide Innovations Challenge Coordinator
105 West Capitol Avenue, Jefferson City, MO 65102
Office: 573-751-5985
Cell: 573-301-9397
Email: Kelly.Backues@modot.mo.gov

Kate Bax
Senior Organizational Performance Analyst
105 West Capitol Avenue, Jefferson City, MO 65102
Phone: 573-526-3087
Email: Kate.Bax@modot.mo.gov

Sarah Kleinschmit, P.E.
Assistant State Constructional and Materials Engineer
1617 Missouri Boulevard, Jefferson City, MO 65109
Office: 573-751-7412
Cell: 573-508-8002
Email: Sarah.Kleinschmit@modot.mo.gov

Amy Bryant, P.E.
Assistant District Maintenance Engineer – Southeast District
3956 East Main Street, Willow Springs, MO 65793
Office: 417-469-6251
Cell: 417-252-4544 Utah DOT
Email: Amy.Bryant@modot.mo.gov

Utah DOT

Winston Inoway
Innovation and Implementation Program Manager
Utah DOT
Phone: 801-455-3911
Email: winoway@utah.gov

Quinten Klingonsmith
Innovation and Implementation Program Coordinator
Utah DOT
Phone: 801-386-0473
Email: qklingonsmith@utah.gov

Patrick Cowley
Director, Transportation Performance Management
Utah DOT
Phone: 801-648-5459
Email: patrickcowley@utah.gov

Pennsylvania DOT

Anja Walker
Pennsylvania Department of Transportation
Bureau of Innovations
Innovation Collaboration Manager
Phone: 717-425-6288
Email: anjwalker@pa.gov

Robert Snyder
Pennsylvania Department of Transportation
Bureau of Innovations
Program Analyst
Phone: 717-783-9661
Email: rolsnyde@pa.gov

Idaho DOT

Ned Parrish
Research Program Manager
Idaho DOT
Phone: 208-334-8296
Email: ned.parrish@itd.idaho.gov

Brenda Williams
Chief Innovation Experience Officer
Idaho DOT
Phone: 208-334-8010
Email: Brenda.williams@itd.idaho.gov

Doral Hoff
District Engineering Manager
Idaho DOT
Email: doral.hoff@itd.idaho.gov

Jaime Conley
Continuous Improvement Facilitator Business Analyst
Idaho DOT
Office: 208.334.81600
Cell: 208.629.6072
Email: jaime.conley@itd.idaho.gov

California DOT

Ben Bressette
Branch Chief, Innovation
California DOT
Email: benjamin.bressette@dot.ca.gov

Casey McKenzie
Innovation Station Program Manager
Email: Casey.mckenzie@dot.ca.gov

Texas DOT

Shelley D. Pridgen
Strategic Management Analyst
Strategic Initiatives and Innovation (STR) Division – Innovations Section
Texas DOT
Work Cell: 512-921-3260
Email: Shelley.Pridgen@txdot.gov

Darran Anderson
Director of Strategy and Innovation
Texas DOT
Phone: 512-486-5060
Email: Darran.Anderson@txdot.gov

Kevin Pete
Director of Research and Technology Implementation
Texas DOT
Email: Kevin.Pete@txdot.gov

Erika Kemp
Director of the Strategic Initiatives and Innovation Division
Texas DOT
Email: Erika.Kemp@txdot.gov

Benjamin King
Innovations Section Director, Strategic Initiatives and Innovations Division
Texas DOT
Email: Benjamin.King@txdot.gov

New Jersey DOT

Amanda Gendek
Manager, Bureau of Research
New Jersey DOT
Phone: 609-963-2242
Email: Amanda.Gendek@dot.nj.gov

Giri Venkiteela
Research Scientist, Bureau of Research
New Jersey DOT
Email: giri.venkiteela@dot.nj.gov

Pragna Shah
Administrative Analyst 4
Bureau of Research, Innovation & Information Transfer
Division of Statewide Planning
New Jersey Department of Transportation
Phone: 609-963-2232
Email: pragna.shah@dot.nj.gov

Minnesota DOT

Kerrie Workman
Special Projects and Implementation Coordinator
Office of Research and Innovation
Minnesota DOT
Phone: 612-616-2074
Email: kerrie.workman@state.mn.us

Micaela Kranz
Director, Communications, Office of Research and Innovation,
Minnesota DOT
Phone: 651- 366-3792
Email: micaela.kranz@state.mn.us

Michael Vrtis,
Principal Engineer
MnDOT Office of Materials and Road Research
Phone: 612-360-9852
Email: michael.vrtis@state.mn.us

Tara Olds
Transportation Planning Director, CAV-X (Connected and Automated Vehicles) Office
Minnesota DOT
Phone 651-368-4921
Email: tara.olds@state.mn.us

Jed Falgren
Director of Operations,
MnDOT Operations Office
Phone 507-720-8707
Email: jed.falgren@state.mn.us

Appendix D: Amplifying Questions (AQ)

The objective of this scan is to examine organizations that have successfully designed and implemented programs and/or initiatives that support a culture of innovation. Specifically, the team should examine and document:

- The characteristics of a strong organizational culture of innovation.
- How innovation culture differs by discipline within an organization.
- Examples within the state DOTs of successful initiatives to change organizational culture to one that encourages and supports innovation.
- Examples of specific programs within state DOTs aimed at supporting innovation.
- How improvements in a culture of innovation can be sustained.

NCHRP efforts as well as other literature[7,8] have identified Leadership, Employee Empowerment, Communication, Recognition, Measurement, and Collaboration as important qualities for generating a culture of innovation.

To effectively drill down to those organizations that best exhibit a culture of innovation, two levels of amplifying questions are proposed: Primary AQ's and Secondary AQ's. The Primary questions focus on the internal mindset, beliefs, and people of the organization while the Secondary questions focus more on innovation program business practices and strategies.

From Web Only NCHRP Report 833: "A culture of innovation encourages new ideas, allows room and time to try new ways of doing things, does not punish failed attempts but looks at them as experiments and learning experiences, listens to multiple perspectives, and tests ideas to determine their merit, even if they challenge conventional wisdom."

Primary Amplifying Questions

LEADERSHIP SUPPORT:
As leadership changes at the CEO level, has that affected the innovation culture? How is it sustained through charges in leadership?

How does the executive team promote innovation: empower staff, strategic plans & goals, individual expectations, leadership, training?

What are strategies being used to promote a culture of innovation? On meeting agendas, training, workshops, reports, staff expectations, empowerment, risk-taking.

Does agency leadership promote innovation as a core value? How?

What role did leadership play in the implementation of innovation programs? How involved did they get and did their involvement help increase interest within the organization?

Does the agency have innovation leaders/champions at all levels of the organization? Describe.

7 https://www.indeed.com/career-advice/career-development/characteristics-of-culture-of-innovation
8 https://bigthink.com/plus/creating-a-culture-of-innovation/

What steps and actions have been adopted to change organization culture to one that encourages and supports innovation? Please provide examples.

Is risk-taking and failure accepted by the agency? Examples

EMPOWERING EMPLOYEES:
How does your agency encourage new ideas?

How does your agency allow employees room and time to try new ways of doing things?

How does your agency encourage ideas and opinions from multiple perspectives?

How does your agency determine the merit of ideas that challenge conventional wisdom?

How do you make time for innovation and creativity?

Are staff at all levels empowered to propose ideas and evaluate the risks in terms of costs, benefits, likelihood of success? What does this look like? Any tools or training to promote empowerment?

Do you have an employee-driven innovation effort/program?

COMMUNICATION:
Does the agency have branding and constant communication to keep employees informed and reminded about why and how an organization has embraced innovation? Describe

What are some creative and practical ways to draw attention to the importance of innovation, and to frequently remind employees that new ideas are valued in a transportation agency?

Show us your innovation brand and what does it communicate about you? Communication is key, has your brand been challenged by new leadership? How do you protect your vision with changes in leadership external and internal to your organization?

How does communication evolve over time due to the changing workforce? How does communication stay relevant?

How does the DOT Communication office coordinate with the innovation program?

MEASUREMENT:
Does the agency have performance measures/targets for innovation? Are these targets promoted and documented? Please describe.

Does the agency measure and report innovation? Please describe.

Does the agency have annual reporting, dashboard, etc.? Please describe.

RECOGNITION:
Does the agency recognize and reward innovators? Please describe.

If there are limited funds/resources to implement a formal recognition or rewards program, what strategies were employed to incentivize employees to continue to participate in an innovation program?

How is the engagement sustained?

COLLABORATION:
How does agency involve creativity of academia and private industry?

Are innovations shared internally so that other units can take advantage or even improve upon the idea? Please describe.

Are problems solved by collaborative group efforts? Please describe.

GENERAL:
What does a successful culture of innovation within your agency include? Examples: strong leadership support, employees not afraid to take risk/fail, employee recognition, measuring success, etc.

Is there training of any type that helps support a culture of innovation within the agency?

How did your agency institutionalize a culture of innovation?

Who has the most influence over changing the culture of innovation at your agency? Is it one person, an organized committee, geographic location of your state DOT, a legislative initiative etc?

Any advice for state DOTs interested in developing an innovation culture?

Do you have any lessons learned, barriers to overcome? What are the common roadblocks to innovation? (e.g. culture of "no", risk averse culture, etc.)

Where does your creative genius sit in the organization? Answer could be all employees, staff in M&O, etc.

Has your agency used the self-assessment tool or other methods/surveys to gauge innovation?

What jump started the innovation movement within their organization? (e.g. top down or bottom up approach?)

For organizations that have successfully institutionalized innovation, did they make changes to their organizational structure – like creating new roles within their organization – as part of implementing innovation?

Did organizations that have implemented innovation have any false starts? What are some of the lessons learned or pitfalls to avoid they could share?

What resources – human, financial, or other – did their organization dedicated to innovation as far as implementation and longevity to make innovation sustainable at their organization?

<u>Secondary</u> Amplifying Questions

Is Innovation included in performance expectations of offices, units, individuals?

Briefly describe your agency in terms of staff size, annual budget, assets, etc. Where does the Innovation Program fit into your agency?

Describe your innovation program in terms of organization, decision-making, governance, autonomy, etc.?

What happens if something fails? Rewards system, monetary and/or acknowledgements. Why don't they offer more support?

Do DOTs need a verifiable ROI to better pursue an innovation program?

Give examples of innovation capture or sharing. How was this done? Is this a routine effort?

Does your agency differentiate between research and innovation? For example, research may have a longer time frame to implementation while an innovation can be much quicker.

Are there categories for innovations: separated by divisions or geographic areas?

How are innovations shared and implemented statewide?

Is there a budget for innovation and how are innovations selected for funding?

Where do your innovations come from: homegrown, other agencies, research efforts, etc.?

National ecosystem-type questions:

How does the national transportation innovation ecosystem support/add value to your state DOT innovation program? AASHTO ICOP, AII, No Boundaries, EDC, etc.

What is missing from a national transportation innovation ecosystem?

How are state DOT innovations shared nationally?

Does your DOT target innovations published by other states? Why not?

Appendix E: Virtual Scan Agenda

NCHRP 20-68 – “US Domestic Scan Program”

Domestic Scan 23-04

“Developing and Maintaining a Culture of Innovation within DOTs”

Virtual Workshop

April 15, April 16, April 17 and April 18, 2024

10am - 6pm Eastern (9am-5pm Central, 8am-4pm Mountain, 7am -3am Pacific)

Monday **15-Apr**	**Day 1**		
Time	Speaker	Presenter	Moderator
* 10:00 am- 11:00am ET (9-10am CT, 8-9am MT, 7-8am PT)	Introduction --Principal Investigator --Team Chair --Self introduction for all participants	Harry Capers Dara Wheeler	
*11:00am-1:00pm ET (10:00am -12:00pm CT, 9:00-11:00am MT, 8:00-10:00am PT)	Missouri DOT Presentation	Ed Hassinger Kelly Backues Kate Bax Sarah Kleinschmit Amy Bryant	Todd May
*1:00pm - 1:30pm ET (12pm - 12:30pm CT, 11am-11:30am MT, 10am-10:30am PT)	Break		
*1:30pm - 3:30pm ET (12:30pm - 2:30pm CT, 11:30am - 1:30pm MT, 10:30am -12:30pm PT)	Missouri DOT Presentation (continue)	Ed Hassinger Kelly Backues Kate Bax Sarah Kleinschmit Amy Bryant	Todd May
*3:30pm - 4:00pm ET (2:30pm - 3:00pm CT, 1:30 pm-2:00pm MT, 12:30pm-1:00pm PT)	Break		
*4:00pm - 6:00pm ET (3:00pm - 5:00pm CT, 2:00pm-4:00pm MT, 1:00pm-3:00pm PT)	Utah DOT Presentation	Winston Inoway Quinten Klingonsmith Patrick Cowley	“Cameron Kergaye (introduce presenters) UDOT staff do the session moderation for Q&A”
*6:00pm - 6:30pm ET (5:00pm - 5:30pm CT, 4:00pm-4:30pm MT, 3:00pm-3:30pm PT)	Daily Wrap up (roundtable)		“Dara Wheeler Dale Peabody”

Tuesday **16-Apr**	**Day 2**		
Time	Speaker	Presenter	Moderator
* 10:00 am- 12:00pm ET (9-11am CT, 8-10am MT, 7-9am PT)	PennDOT presentation	Anja Walker Robert Snyder	Tyson Rupnow (Scan Team Member introduce presenters) PennDOT staff do the session moderation for Q&A
* 12:00 pm- 12:30pm ET (11:00am - 11:30am CT, 10:00am - 10:30 am MT, 9:00 - 9:30am PT)	Break		
*12:30pm - 2:30pm ET (11:30am-1:30pm CT, 10:30am-12:30pm MT, 9:30-11:30am PT)	Idaho DOT Presentation	Ned Parrish Brenda Williams Doral Hoff Jaine Conley	Amanda Gilman-Bogie
*2:30pm - 3:00pm ET (1:30pm - 2:00pm CT, 12:30 pm-1:00pm MT, 11:30am-12:00pm PT)	Break		
*3:00pm - 5:00pm ET (2:00pm - 4:00pm CT, 1:00pm-3:00pm MT, 12:00pm-2:00pm PT)	Caltrans Presentation	Ben Bressette Casey McKenzie	Shante Hastings
*5:00pm - 6:00pm (4:00pm - 5:00pm CT, 3:00pm-4:00pm MT, 2:00pm-3:00pm PT)	Daily Wrap up (roundtable)		Dara Wheeler Dale Peabody

Wednesday 17-Apr	Day 3		
Time	Speaker	Presenter	Moderator
* 10:00 am- 12:00pm ET (9-11am CT, 8-10am MT, 7-9am PT)	Indiana DOT Presentation	Todd May	Alyson Tamer
* 12:00 pm- 12:30pm ET (11:00am - 11:30am CT, 10:00am - 10:30 am MT, 9:00 - 9:30am PT)	Break		
*12:30pm - 2:30pm ET (11:30am-1:30pm CT, 10:30am-12:30pm MT, 9:30-11:30am PT)	Texas DOT Presentation	Darran Anderson Erika Kemp Benjamin King Kevin Pete Shelley Pridgen	Anne K. Freeman
*2:30pm - 3:00pm ET (1:30pm - 2:00pm CT, 12:30 pm-1:00pm MT, 11:30am-12:00pm PT)	Break		
*3:00pm - 5:00pm ET (2:00pm - 4:00pm CT, 1:00pm-3:00pm MT, 12:00pm-2:00pm PT)	NJDOT Presentation	Amanda Gendek Giri Venkiteela Pragna Shah	Linda Su
*5:00pm - 6:00pm (4:00pm - 5:00pm CT, 3:00pm-4:00pm MT, 2:00pm-3:00pm PT)	Daily Wrap up (roundtable)		Dara Wheeler Dale Peabody

Thursday **18-Apr**	**Day 4**		
Time	Speaker	Presenter	Moderator
* 10:00 am- 1:30pm ET (9-12:30pm CT, 8-11:30am MT, 7-10:30am PT)	Minnesota DOT Presentation	Katie Walker Kerrie Workman Micaela Kranz Ben Worel Tara Old Jed Falgren	Katie Walker and other MnDOT staff
* 1:30 pm- 2:00pm ET (12:30pm - 1:00pm CT, 11:30am - 12:00pm MT, 10:30am - 11:00am PT)	Break		
* 2:00pm - 3:00pm ET (1:00pm - 2:00pm CT, 12:00pm - 1:00pm MT, 11:00am - 12:00pm PT)	FHWA Presentation	Jeffrey A. Zaharewicz	Todd May
*3:00pm - 6:00pm ET (2:00pm - 5:00pm CT, 1:00pm - 4:00pm MT, 12:00pm - 3:00pm PT)	*Group Discussion *Adjourn the Workshop		Dara Wheeler Dale Peabody Dara and Harry

Friday 19-Apr	Day 5 SCAN TEAM ONLY	
Time	Speaker	
* 10:00 am- 10:30am ET (9-9:30am CT, 8-8:30am MT, 7-7:30 PT)	*Principal Investigator Opeing comments *Team Chair and SME comments	Harry Capers Dara Wheeler Dale Peabody
*10:30am - 11:30pm ET (9:30-10:30am CT, 8:30-9:30am MT, 7:30-8:30am PT)	Scan Team discussion and finalization of Significant Findings, Conclusions and Recommendations	Dara Wheeler Dale Peabody
11:30am -12pm ET (10:30am -11am CT, 9:30am -10am MT, 8:30-9am PT)	Break	
12pm-1:30pm ET, (11am-12:30pm CT, 10am-11:30am MT, 9am - 10:30am PT)	Scan Team - Development of Report Outline	Dara Wheeler Dale Peabody
1:30pm - 2:00pm ET (12:30 pm-1:00pm CT, 11:30am-12:00pm MT, 10:30am - 11:00am PT)	Break	
2:00pm - 3:00pm ET (1:00pm-2:00pm CT, 12:00pm-1:00pm MT, 11am -12pm PT)	Scan Team - Development of Report Outline (continue)	Dara Wheeler Dale Peabody
3:00-4:45pm ET (2:00-3:45pm CT, 1:00-2:45pm MT, 12pm -1:45pm PT)	Scan Team - Development of Draft Dissemination Plan	Kirsten Seeber, CTC and Associates
4:45pm -5pm ET (3:45 -4pm CT, 2:45-3pm MT, 1:45 - 2pm PT)	Adjourn the final team meeting	Dara Wheeler


INNOVATION
Improvement
Values
Accountability
Education
Deliverable
Mobility
INDOT
Creativity
Strategic
Great Service
Cost Effective
Quality
Trust
Diversity
Respect
21st Century Workforce
Safety
Efficient Communication
Expertise
Performance
Responsibility
Vision
Partnership
Excellence
Mission