

# Lessons Learned from State DOTs on Innovation and Knowledge Management Programs

CLEAR Program

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# Contents

- 1. Introduction ..... 4**
  - 1.1 Innovation and Knowledge Management Program Connections..... 4
- 2. Program Launch & Integration ..... 5**
  - 2.1 Building Innovative Culture..... 5
    - 2.1.1 Building Empathy ..... 5
    - 2.1.2 Fostering Ownership..... 6
    - 2.1.3 Normalizing Risk..... 6
  - 2.2 Change Management Process ..... 6
    - 2.2.1 Setting Realistic Goals..... 7
    - 2.2.2 Building Buy-In Deliberately..... 7
  - 2.3 Program Champions..... 7
    - 2.3.1 Leadership Champions..... 8
    - 2.3.2 Staff Champions ..... 8
  - 2.4 Metrics and Measurement ..... 8
- 3. Program Structure ..... 9**
  - 3.1 Staffing Resources and Structure..... 9
    - 3.1.1 Broad Steering Groups..... 9
  - 3.2 Innovation/KM Councils and Involvement across the DOT ..... 10
  - 3.3 Challenges and Events ..... 10
    - 3.3.1 Kaizen/Lean Style Events ..... 10
    - 3.3.2 Outreach and Publicity Events ..... 11
  - 3.4 Databases for KM and Innovation ..... 11
    - 3.4.1 Large, Automated Databases..... 11
    - 3.4.2 Small Databases ..... 12
- 4. Program Outreach ..... 12**
  - 4.1 Communications ..... 12
    - 4.1.1 Communications Materials..... 13
    - 4.1.2 Communications Platforms and Events ..... 13
  - 4.2 Reward Structures and Incentives ..... 13

<b>5. Common Themes: Challenges, Successes, and Future Plans .....</b>	<b>14</b>
5.1 Challenges .....	14
5.1.1 Culture Based Challenges: .....	14
5.1.2 Process and Platform Based Challenges: .....	15
5.2 Successes.....	15
5.3 Plans for future development of program.....	16
<b>Appendix A: Interviewees.....</b>	<b>18</b>



# I. Introduction

The U.S. Department of Transportation’s John A. Volpe National Transportation Systems Center (Volpe Center) interviewed seven states on behalf of NCDOT to assess the current state of the practice for implementing innovation and knowledge management (KM) programs. This report summarizes the findings of these interviews and provides a broad overview of the various state departments of transportation (DOTs) approaches to managing innovation, methods for collecting and disseminating knowledge, and common themes and challenges among the various DOTs. The Volpe Center developed this report on behalf of the North Carolina DOT (NCDOT) to inform NCDOT’s own innovation and knowledge management development efforts under the Communicating Lessons, Exchange Advice, Record (CLEAR) Program.

These semi-structured interviews were conducted by telephone in late 2020 and early 2021 with the following state DOTs (see appendix for full listing):

- California DOT (Caltrans)
- Idaho Transportation Department (ITD)
- Illinois DOT (IDOT)
- Iowa DOT
- Michigan DOT (MDOT)
- Utah DOT (UDOT)
- Wisconsin DOT (WisDOT)

## I.1 Innovation and Knowledge Management Program Connections

The overall structure of and connection between innovation and KM programs varied widely across state DOTs. While NCDOT’s intent is to closely link its innovation and KM programs as a singular effort, most other state DOTs had two distinct programs with separate missions:

- Caltrans has a KM program based on the six sigma model, and a distinct statewide innovation challenge. The program staff work collaboratively, though each focus on their own program, and stress the need for coordination across programs.
- ITD gathers innovation ideas internally and documents these in a SharePoint portal. Their continuous improvement KM program is adjoined but separate and uses a distinct idea tracking system, but does include some of the same staff.
- IDOT has an internally run Innovative Ideas Contest, which is separate from their KM program, Rapid Results. Rapid Results is run statewide across all government departments, and thus is separate from DOT-focused innovation efforts. DOT staff note that integrating these programs would be beneficial.

Separate but Collaborative Programs	Completely Distinct Programs
<ul style="list-style-type: none"><li>• Caltrans</li><li>• ITD</li><li>• MDOT</li><li>• UDOT</li></ul>	<ul style="list-style-type: none"><li>• IDOT</li><li>• WisDOT</li><li>• Iowa DOT</li></ul>



- Iowa DOT is the only participant with a **public facing innovation program**. Their portal allows both internal and external parties to submit ideas, and involves the public in voting on ideas. Iowa DOT did not discuss a formal KM program in the interview.
- MDOT's KM and innovation programs are separate in function and intent, but staff do collaborate across the programs and see them as complimentary.
- UDOT's KM and innovation programs work in tandem, but are housed in separate departments and do not have significant overlap in daily work, though UDOT staff discussed the benefits of collaborating.
- WisDOT has distinct innovation and KM programs, and the innovation program seemed to operate independently from the KM program.

## 2. Program Launch & Integration

### 2.1 Building Innovative Culture

Interviewees stressed a few major themes when developing a culture of innovation and encouraging employees to engage with innovation/KM programs. These themes centered around using **empathy to understand employee needs, fostering staff ownership over their work and the programs, empowering staff to take risks**, and providing **clear, accessible roles for employees** to partake in programs.

#### 2.1.1 Building Empathy

ITD in particular based their program around empathy for their employees and a desire to empower employees in their workspace. The program's strong emphasis on empathy for employees led ITD to **catch and correct missteps early in the program's development**, such as the practice of 'rejecting' ideas submitted to the program portal. The program leaders recognized that the emotional impact of rejecting ideas was creating a risk averse culture, and focused instead on explaining why an idea wasn't selected to move forward, or connecting owners of duplicate ideas to encourage group work. Their empathetic approach also led them to discover that employees did not enjoy large recognition ceremonies where they were 'on the spot' to answer questions about their innovations. The group revised these ceremonies to make them smaller and more welcoming. Using emotional intelligence to understand the reasons behind employee responses to aspects of ITD's program strengthened the agency's culture, and allowed ITD to tailor approaches to increase participation. WisDOT noted a similar case in which its initial email inbox for ideas came to feel like a 'black box' to employees. Employees didn't want to submit ideas due to a lack of transparency about what happened after submission. Creating an open, agency-wide tracking system addressed this fear, and encouraged employees to re-engage with the program.



### 2.1.2 Fostering Ownership

Multiple states stressed the importance of staff's ownership over their work, particularly in a setting where staff are being asked to share work across departments/divisions. Caltrans described the impact its Innovation fairs has on staff, noting that allowing "staff to see their fingerprints on the innovations helps give them confidence and feel comfortable submitting" ideas. These events have increased interest across the program. ITD noted that direct supervisor recognition of employees' work also increased participation and feelings of ownership.

Multiple states created roles for innovation stewards and emphasized leadership development opportunities within their programs. WisDOT in particular stressed that employees should own not just their innovative submissions, but also the process of building innovative culture at the agency. WisDOT gave local innovation teams (LITs) complete autonomy, including the power to appoint members, determine meeting schedules, develop agendas, and create specific focuses. Devolving power from a centralized innovation team to these division-based teams helped give employees ownership and emphasized that innovation was not a 'flavor of the month' being pushed by a single person in the central office. WisDOT also emphasized the **value of showing incremental progress** – demonstrating early successes in the rollout of innovations, and attributing success back to the employees who developed these solutions.

### 2.1.3 Normalizing Risk

Other states emphasized how important it was to **embrace risk taking and communicate the value of innovation** from all areas of the organization. In 2017, Utah's governor put an emphasis on innovation, and the UDOT Director started an innovation group. This top-down support generated a lot of enthusiasm for change at UDOT. Caltrans' Director also made innovation a priority, and staff noted that this vocal support helped create a culture of innovation. Caltrans' leadership also directly expressed support for staff to take risks, and **normalized expectations that innovation will not always be successful immediately**. IDOT's staff emphasized that they need to see that leaders of innovation efforts are passionate and primarily dedicated to helping employees. IDOT also discussed the importance of carefully building trust, and providing clear roles for employees.

All states described their culture evolving over time, with some DOTs still in the beginning stages of culture change and development. Iowa DOT in particular noted that the release of their collaborative web platform in July 2020 was starting to change innovation discussions, but that they were still in the midst of change.

## 2.2 Change Management Process

Government agencies are large and complex and must carefully consider how any new approach, process, or initiative will be integrated into the agency's culture. Several of the states interviewed described explicit change management efforts they undertook to implement either their KM process, innovation program, or some combination of both. Many of the DOTs **pilot tested** their processes and



ideas before fully rolling out new programs. For example, UDOT's innovation program started slowly, with only 17 ideas submitted and 12 ideas fully implemented in its first year. However, as the DOT better integrated the process into its routines it saw far more ideas submitted; by the second year of the innovation program, UDOT received more than 170 ideas. IDOT completed a one year pilot of the Innovation contest in its Operations Department before rolling the contest out agency wide. However, the agency noted that staff are concerned an annual competition may be too frequent and will not yield new ideas, and is considering changing to every other year.

### 2.2.1 Setting Realistic Goals

Change does not often happen quickly – good change managers implement new agency processes by **setting realistic (long) implementation timelines** and measuring progress through incremental milestones instead of immediacy of the change. In Michigan, the DOT launched a new, comprehensive KM system to help collect, document, and transmit institutional knowledge and best practices across the agency. Launched about 18 months ago, senior management has defined a **seven year timeline for full implementation of the KM program**. In the early years, the lead implementers developed materials describing the new KM processes, the value of these processes to the organization, and individual employees' roles and duties in those processes. Later in the process, additional elements will be added to the KM program until it is fully built out, allowing incremental change to occur naturally throughout the organization.

### 2.2.2 Building Buy-In Deliberately

States commonly work hard to **build staff-level buy-in** for their new initiatives. UDOT's innovation program was borne within senior management, but that group quickly worked to build grass roots support. Innovation staff visited every DOT office across the state—92 stations—to publicize the program, ask for input, and explain the value of the work. ITD's innovation program was also developed through senior staff strategic planning, but then quickly focused on building buy-in at the division level. As ITD developed its program, the agency decided to develop a decentralized approach, helping to encourage staff to find ways to improve what they do in their own department and develop solutions. WisDOT emphasized the need to focus and tailor outreach efforts to particular groups to encourage adoption of the program. They noted that early on in the program development process, **early adopters should be a primary focus** and that these employees should be appointed to leadership roles. Having advocates at the table telling the story of innovation will be more relatable than a central innovation staff. The influence of these early adopters and their success in the program will drive change among others more skeptical of the program.

## 2.3 Program Champions

Interviewees noted that having champions, both at a program management level and at the staff level, is critical to success. This was true both in launching a program and in institutionalizing KM or innovation programs. IDOT and Caltrans both noted that having a **program manager or executive-level champion**



helped **drive a culture of innovation** and **get buy-in** throughout the organization.

### 2.3.1 Leadership Champions

In IDOT, the Deputy Secretary is involved in and passionate about the Innovative Ideas Contest. He sends messages to staff about the contest and highlights it in staff meetings. Having leaders champion the contest ensures that staff know its importance to the organization. In California, the new Director of Caltrans also emphasizes and promotes innovation as a top priority, which helps embed it into the culture of the department. Michigan's Chief Operating Officer, who oversees its KM initiative, writes program goals for each year and works with staff to find ways to implement and meet goal areas.

### 2.3.2 Staff Champions

In Idaho, ITD innovation stewards helped institutionalize the program. These stewards were key in breaking down silos between divisions, which were quite independent, and sharing knowledge across the agency to generate significant cost savings. As mentioned earlier, UDOT's 18-person innovation council is made up of innovation stewards in various departments. Having the stewards embedded across the organization allows them to champion innovation within their day-to-day roles. California also noted that having champions of the innovation/KM program in various districts serves as a **two-way channel for sharing information** to understand what is working well, what is being adopted, and what could be changed.

## 2.4 Metrics and Measurement

Most of the state DOTs interviewed utilize some kind of metric tracking for their innovation and/or KM programs. Tracking methods **range in sophistication** from manual entry of ideas into a SharePoint list or spreadsheet to an automated system tracking the process from idea submission through development, testing, piloting, and implementation. Utah DOT's Innovation Dashboard is one of the most complex systems, including a detailed, public facing set of performance metrics (dashboard available [here](#)). While at least one DOT expressed interest in moving from a spreadsheet based tracking system to something more robust, other DOTs emphasized the amount of time it takes to track metrics, and the need to **prioritize what information is necessary to track**. Caltrans noted that its tracking is legislatively mandated, and that a target of \$200M in savings per year drives its innovation and KM programs. Some of the metrics DOTs track include:

- Number of ideas submitted, selected, funded, implemented
- Dollars saved
- Staff time saved
- Topic addressed by ideas submitted
- Degree of implementation across DOT
- Safety improvements

Multiple DOTs also implemented new processes and tracking **methods for developing innovations** as part of their overall programs. WisDOT's process included a clear set of steps for moving from an idea to





a solution: incubate ideas, demonstrate value of innovation, create a pilot project, communicate the results, and implement the innovation across the DOT. WisDOT tracks ideas as they move through this process in a centrally located spreadsheet, allowing employees to see other efforts in progress and reduce duplicated effort. MDOT described a similar process for idea development, and the importance of this defined process for tracking progress and successes.

## 3. Program Structure

### 3.1 Staffing Resources and Structure

Interviewees differed significantly in their methods of staffing innovation and KM programs. Programs ranged from entirely volunteer-led efforts in a single department of a DOT, to a funded program with dedicated staff embedded across the agency. Most interviewees reported having **one or two dedicated staff positions** focused on innovation and/or KM activities, as well as a wider group of employee ‘stewards’ who participated in activities as a collateral duty (some funded and some not). IDOT noted that the agency does not have permanent dedicated staff, but would benefit significantly from a dedicated employee to lead these programs. There was near universal agreement that dedicated staff were necessary to run an effective program (Iowa DOT had perhaps the smallest program, and didn’t see an immediate need for a full-time staff position).

#### 3.1.1 Broad Steering Groups

Multiple agencies (including UDOT, ITD, and MDOT) host larger innovation councils or groups that help define the innovation program, set priorities for the year, and in some cases, evaluate submitted innovations. These larger councils often include a mix of dedicated innovation/KM staff, executive level representation, and staff level innovation stewards. ITD emphasized the impact of this distributed staffing model, and note that while their Chief Innovation Officer position was beneficial for the program, what really brought them success was robust staff engagement across the organization through their steward program. MDOT similarly maintains a successful Statewide Innovations Alignment team, made up of about 20 representatives from across MDOT who regularly meet, share innovations from their work areas, and work with MDOT headquarters staff to adopt the best innovations statewide.

Only one agency, Iowa DOT, directly referenced using contractor support to build their innovation program. Iowa DOT hired a software specialist to design their [innovation idea submission portal](#), the only paid portion of their volunteer run program support staff. While IDOT did not have any dedicated staff, they had support akin to a contractor through their unique state government-wide KM program. This program, Rapid Results, provides on-demand support to their DOT employees if staff wish to use a Lean/Kaizen evaluation in streamlining work processes. While this outside assistance was acknowledged as helpful, IDOT staff believed this resource would be better utilized if the program was housed within DOT and tailored to DOT needs more closely, or if it was linked to the DOT innovation program.



## 3.2 Innovation/KM Councils and Involvement across the DOT

Most states interviewed involved **participants across the entire DOT** in stewarding their innovation and KM programs. De-centralized structures increased participation, regardless of whether the program originated through a top-down or bottom-up initiative. In most cases, these positions were collateral duties, or involved a very small amount of dedicated time.

UDOT's Innovation Council is made up of 18 staff across UDOT departments, which allows for strong internal marketing of the program. These staff represent different geographic areas, levels of experience, and disciplines. In contrast, Caltrans' innovation leadership council, launched at the end of 2019, is a subcommittee of the executive board. While the council did not appear to include staff from across the DOT, the council has the ability to impact a wide range of programs, and can financially champion innovation efforts. At the far end of the spectrum, ITD's program allows innovation stewards to self-nominate and allows each district to have autonomy over who is included in their innovation steward roles.

Michigan's KM program is defined by MDOT headquarters staff, but implemented at an individual unit level across the state. Each individual employee of MDOT is expected to carry out KM duties, and managers have an employee development check-in twice a year to follow up on individual progress. Illinois' state wide Rapid Results KM program is administered somewhat differently, and can involve a multi-day training for all state government employees in Lean/Kaizen methodology. Illinois has reduced the training period for each staff member to a single day to encourage participation.

## 3.3 Challenges and Events

Several of the interviewed states bolstered their innovation programs by establishing innovation-focused events or 'challenges.' These events are typically finite in time and meant to **catalyze** an abundance of **creative thinking** all at once, or to **re-energize the workforce** toward creative problem solving. For example, IDOT hosts a successful 'Innovative Ideas Contest' with employees on an annual basis. DOT employees submit ideas for innovations in one of two tracks (Operations or Technical) and finalists participate in a showcase receive awards at a ceremony. Winners are awarded prizes such as lunches or funds to implement the idea. These events might also be used to solicit ideas on specific topics, such as Caltrans' statewide innovation challenges. Caltrans found that by asking for innovations in **specific, narrow topic areas** the agency was able to productively incorporate these ideas into its work, and that these submissions helped 'move the needle' on challenging topics.

### 3.3.1 Kaizen/Lean Style Events

In Idaho, ITD hosts [Design Thinking events](#) with large and diverse groups of DOT employees to capture and develop ideas into full solutions. The events are usually centered on a central question or problem; for instance, ITD described one event that asked "How can ITD better recognize employees who have submitted innovations which were later implemented within the organization?" The event concluded that manager and senior leader acknowledgement had the greatest impact—the direct communication



from supervisors encouraged a feedback loop for others to submit more innovation ideas. These events focus on a single topic to produce faster results.

### 3.3.2 Outreach and Publicity Events

UDOT hosts a recurring 'Float Your Ideas' event, designed to generate interest and enthusiasm for its innovation program. The event gives employees paper plane templates with space for submitting an innovative idea, and takes place in a wide, open atrium. Employees 'fly' their ideas, with prizes for the furthest flight and later entry of these ideas into their innovation tracking system. While the initial event only drew 20-30 employees, the second year drew around 80 employees, and helped reinvigorate the program with a low investment of time and energy. Film from the event was included in their marketing and outreach efforts. UDOT is considering more high visibility events in the future, including perhaps a 'shark tank' style event.

Much smaller scale events were also mentioned, particularly those that were hosted or tailored for individual districts or divisions. WisDOT described a regional event held called 'brewing innovation'. This event consisted of one or two hours booked in a conference room as an open house with coffee, where employees could stop by to talk to the innovation lead for their district. This type of light lift event helped **engage employees on a smaller scale**, and could be easily customized to fit into the culture and schedule within a division.

## 3.4 Databases for KM and Innovation

Most of the states interviewed reported the use of an online innovation/KM program or database to track ideas and share them within the organization. While many states used complex systems, some used simple spreadsheets that were stored in a central location and shared across the organization. A common concern across agencies seemed to be balancing the level of effort needed to administer a program with the burden to individual users for adopting new systems. All of the DOTs reported that having a **platform to manage and share ideas allowed their programs to be successful**.

### 3.4.1 Large, Automated Databases and Dashboards

UDOT integrated its ideas portal into its learning portal, where staff take web-based trainings. The learning portal allows for staff to view and comment on ideas. The ideas portal was rolled out with the launch of the innovation program. Later, UDOT created an [Innovation Program Dashboard](#), which uses Microsoft Power BI to show the number of ideas submitted and implemented by year, cumulative time and money savings, and the top ideas by return on investment. This dashboard was developed after an initial round of ideas were submitted.

Caltrans developed its Innovation Station over nine months using the platform Idea Scale. Caltrans launched 10 campaigns on the platform within the first year, and saw a great response. The platform allowed staff to share their ideas and to break down silos within the organization. Within two years the



contract with Idea Scale expired and Caltrans switched its platform to Bright Idea, which they saw as more user friendly, intuitive, and cost effective. Caltrans successfully relaunched the program, completing five campaigns within four months and garnering over 600 ideas. Caltrans noted the importance of a platform for staff discussion of ideas. Platforms enable staff to break down the traditional structure of submitting ideas to a supervisor, and to spread ideas more widely throughout the agency.

### 3.4.2 Small Databases

ITD houses its innovation ideas in Idea Funnel, a SharePoint-based platform where employees submit and share ideas, and where ITD encourages collaboration between staff. ITD reported that their SharePoint process is very manual, and they are trying to move toward using Microsoft Power BI and Microsoft Forms and **automating the process** of tracking idea submissions.

MDOT developed an internal SharePoint site to house resources and materials related to its KM program. The site is still in its infancy and MDOT has plans to continue developing the program. Iowa DOT also recently paid an external contractor to set up a research ideas intake website. The department paid around \$50,000 to \$60,000 upfront to set up the system, and are hoping that financial tracking and other functions built into the system will allow them to reduce dedicated staff positions in the future, recouping the costs.

## 4. Program Outreach

### 4.1 Communications

Although interviewees use varied communications strategies, all agreed that a strong communication plan is necessary for their program. Most programs use a mix of digital communications and in-person events (prior to COVID-19), and have developed a communications plan for their programs. Interviewees discussed the need to tailor these strategies over time – particularly as employees’ response to outreach efforts shifted.

Some agencies, such as ITD, did not initially have a strong plan to market their programs, but soon realized the importance of robust communications and brought their communications office into the process as a partner. The ITD communications office helped create branding for the program, including a category of innovations called ‘Times 7’ (indicating the innovation could be implemented in all 7 districts) to help communicate high value innovations. The communications team also helped the program leaders develop e-newsletters featuring innovations and short videos on the latest innovations to share across departments.



### 4.1.1 Communications Materials

All state DOTs created some form of **newsletter to highlight innovations**. UDOT initially published a quarterly innovation newsletter, but soon realized employees were not opening the newsletter, a problem noted by a couple of other states as well. In response, UDOT shifted to produce an annual [Innovation and Efficiencies Report](#), which catalogues a ‘best of’ listing of innovations and time/money saving improvements each year. The report showcases ideas that have been implemented and outlines the initial problem, change introduced, and result of the innovation. After publication, the UDOT Director distributes the report broadly. UDOT has also created podcast episodes and events to promote the program.

Multiple state DOTs noted that providing middle management with **templates, emails, posters**, etc. to push out communications to staff made it much easier **to internally market their program and increase engagement**.

### 4.1.2 Communications Platforms and Events

At Iowa DOT, all personnel are automatically enrolled in the program’s new research ideas web platform and system, which generates email newsletter updates to staff twice a month. The updates include ideas submitted that may be relevant to staff member’s work. The public platform is also set up like a social media feed, where **users can view, comment, and vote on submission ideas** they like. Research managers can also tag relevant department staff in conversations about their programs, facilitating top-down, bottom-up, and lateral communications across the department. The idea intake platform can currently only be used for research idea generation, but it is possible that as the project evolves, the web-based idea tracker platform will expand to cover the full project development and construction process.

Some states used in-person events to broadcast innovation successes and market their programs, though they also each noted the challenges of moving these events online after COVID-19. Both Illinois and Idaho host a showcase event to highlight finalists of their innovation contests. MDOT was the only DOT that hosts a **public facing transportation innovation highlight event** two times a year to communicate successes. The agency maintains a list of innovations that have been successfully implemented for communications with state legislature and the public. UDOT’s in person events include a yearly “roadshow,” where Innovation staff visits all Districts to publicize the program and talk in person with staff about how their day-to-day work is innovative. Almost every interviewee noted the importance of **convincing staff, particularly those outside central offices, that their work is innovative** and could produce benefits for the organization if shared.

## 4.2 Reward Structures and Incentives

Interviewees differed in their approach to rewards or incentives for employees participating in innovation and KM programs. The most common form of recognition is granting **innovation award plaques/trophies**, involving managers in giving **recognition to their employees** for participation, and



**featuring employees and their innovations in publications** and conferences. Most interviewees described tangible rewards in relation to their innovation programs, but not to their KM programs (IDOT noted that using their innovation reward structure might increase engagement in KM programs). Interviewees offer a wide range of tangible awards, detailed below:

- IDOT provides **cash incentives**, either directed to the employee, the employee’s department, or specifically earmarked for development and implementation of the employee’s suggested innovation. IDOT offers awards of up to \$50,000 to be used for department or employee rewards and implementation of ideas.
- UDOT created an **incentive program based on a point system**, and allows employees to exchange points awarded to them for prizes (mugs, sweatshirts, etc). The program switched from awarding points for ideas submitted to ideas implemented, to acknowledge that implementation of the innovation is where the organization gains value. The program provides double points if the innovation is able to be implemented statewide.
- MDOT provides non-cash rewards to employees in the form of **tours, trips, and training opportunities**. They noted that providing this type of reward is more aligned with their budgetary authority, which they said did not include cash awards.

## 5. Common Themes: Challenges, Successes, and Future Plans

### 5.1 Challenges

State DOTs noted many challenges to their program rollouts and integration into agency culture. The following themes emerged across multiple agencies.

#### 5.1.1 Culture Based Challenges:

- **Existing culture was one of the biggest challenges** when creating a KM/innovation program and proved to be a barrier if employees did not feel empowered to share their ideas.
- Interviewees acknowledged that **initial program rollout was a challenging process** that required a lot of communication. In this process, DOTs found that it was important to pay attention to employees’ feelings and how likely they are to get involved and feel valued.
- One emotional hurdle was overcoming a sense of **protecting work**, or preventing others from ‘taking your work’. Sharing innovations was challenging for employees who did not feel they would retain ownership over their innovations.
- Even if an agency had a lot of enthusiasm for change from employees, change did not always come easily. Interviewees found, however, that **in-person site visits and encouragement** helped in getting staff in construction who don’t use computers or those who don’t see themselves as innovative to use innovation portals.
- In order to create a cultural shift, states realized that it was important to **recognize submissions and be transparent in responses**. Agencies found that not responding to those who had



submitted ideas had a negative impact on the culture of innovation, and that past rejection of ideas could discourage some employees from submitting ideas. Responding in a sensitive way to submissions resolved this challenge.

### 5.1.2 Process and Platform Based Challenges:

- Facilitating the process of submitting and reviewing ideas proved challenging for agencies. Multiple states mentioned the difficulty of running a program without the support of dedicated full-time employees.
- States found that **having systems in place**, both for accepting and sharing submissions, was essential in rolling out their programs. Interviewees mentioned a need to improve the systems they had in place to capture and share knowledge, such as creating easily searchable portals or centers.
- Multiple states took approaches to **facilitate direct connection between employees** and their peers through their innovation/KM system. These approaches included listing the employees associated with each idea so users could directly reach out to the technical representative or project manager, providing a message board style communications platform to facilitate conversation on ideas, or even allowing users to ‘vote’ on idea submissions and show approval/disapproval. These measures helped increase transparency and engagement while cutting down on the confusion and questions raised to the program team.
- Some interviewees realized that they had to **be very specific on what type of ideas they were looking for**. If they asked people to submit ideas at any time, they would have a massive influx of submissions. Although this was great for promoting a culture of innovation, it created administrative difficulties. With fewer ideas, submissions were both easier to manage and higher quality.
- Multiple states also noted having **difficulty moving their events online** in 2020. Online events do not get the interaction and engagement that employees seem to enjoy during in-person events. One agency set up an online form of engagement that mimics the interaction participants have during the showcase when people stop by their booths and ask questions. Transitions to digital platforms are challenging, and agencies must figure out how to maintain engagement while moving towards an online format.
- One agencies stressed that determining the level of documentation necessary for the program can be a significant challenge, and that **requiring too much documentation can be a significant disincentive** for employee engagement. They recommended evaluating why documentation is necessary – and determining the shortest possible form of documentation that will satisfy any requirements. They also suggested centralizing documentation as an administrative function of the program, and perhaps having dedicated staff who document innovations as opposed to having practitioners spending their time documenting these processes and tools.

## 5.2 Successes

Across all State DOTs, communication, empathy, and staff recognition were found to be essential for success. They played a significant role in the process of empowering employees, increasing cross organizational sharing, and creating gradual cultural change.



- Overall, State DOTs noted that the most important aspect of creating a successful program was to **encourage innovation**. States took multiple approaches to encourage innovation, including strategies based on top-down messaging from leadership, bottom-up strategies empowering staff to lead change, and peer-to-peer outreach using champions.
- Multiple states found that newsletters, messages, videos, and other methods of outreach were very helpful in **creating a communication channel** and celebrating innovation. All interviewees stressed that sharing a story with staff and explaining the impact of an innovation went a long way in having a successful innovation program.
- Multiple states saw success in **changing the way they discuss innovation to focus on outcomes and impacts**. One participant switched from a categories-based research focus to an intent or outcome driven research focus, which has helped senior management communicate research ideas to the public. Whereas in the past, IDOT described its research in terms of what it was researching (for example, bridge research), it now categorizes its programs into areas that describe why it is doing research (for instance: using technology to work smarter, not harder). As a result of this, innovation staff noticed a shift in how innovation is discussed.
- Most programs were focused internally, but the two states with external components to their programs both **noted success in sharing their work and increasing public understanding** of the value of DOT's innovations. MDOT evolved their State Transportation Innovation Council (STIC) over the past year from a relatively small group to include many private partners, more local agencies, and other groups. The STIC started inviting the head of the State Senate and House Transportation Committees to meetings so that the council is apprised of the DOT's innovation activities. Transitioning meetings from a quarterly to monthly schedule was helpful in sharing more ideas regularly, and expanding the network of invitees outside of the DOT to have more people involved in the process was valuable. Similarly, Iowa DOT's portal allows members of the public to contribute submissions, and has increased conversation with local research partners.
- Interviewees also found it **important to have a robust and effective recognition plan**. Employees enjoyed receiving recognition for their ideas, especially from leadership and their direct supervisors. They also appreciated "goodies" such as t-shirts or other rewards. Rewards also encouraged people to get involved, particularly with participation in innovation contests. IDOT noticed that its contest was helping staff change their minds about participating in innovation and KM overall. The contests connected staff to the innovation team, who were passionate about helping them, and built the necessary trust to encourage further participation in innovation.

### 5.3 Plans for future development of program

Interviewees all have future development plans, including multiple focus areas like **streamlining processes, increasing engagement, and strengthening agency innovation/KM culture**. Caltrans wants to establish an innovation center on its website, which will be available for viewing by its external partners. Caltrans' is still working on creating a hub where it can manage the flow of innovation ideas through statewide depositories and ease information sharing with other agencies, departments, states, etc. ITD is also planning to update its innovation idea submission structure to be more automated and less labor intensive. Several states mentioned building out organizational charts so it is clear who is involved at which level, and continuing to involve a broad range of employees across the agency. Some





agencies noted plans to host events and send communications on a more/less frequent basis, depending on the responses they received from employees.

All DOTs were gradually tailoring their approaches based on past successes and failures, and constantly evaluating their tactics for effectiveness. Multiple agencies discussed future goals of measuring progress through tracking idea submissions, pilots, and implementation of ideas as well as time and money savings. They also discussed ways to automate data collection and use software for streamlined reporting.



# Appendix A: Interviewees

Organization	Interviewees	Contact Information
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