SCAN TEAM REPORT

NCHRP Project 20-68A, Scan 12-04

Advances In Transportation Agency Knowledge Management

Supported by the

National Cooperative Highway Research Program


STRATEGY
LEARNING
CULTURE
LEADERSHIP
MANAGEMENT
CAPITAL
RISK
COLLABORATION
KNOWLEDGE
INTELLECTUAL
NETWORKS
KNOW HOW
INNOVATION
BEST PRACTICES
TECHNOLOGIES
OPERATIONS
EXCELLENCE
COST SAVINGS
TRANSFORMATION
RECOGNITION
COMPETENCIES
SUCCESSION
ASSESSMENT
RECOGNITION
ASSETS
COMMUNITIES
LESSONS LEARNED
DEVELOPMENT
INTELLECTUAL CAPITAL
TIME SAVINGS

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The purpose of each scan and of Project 20-68A as a whole 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 application 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 20-68A Project Panel. Further information on the NCHRP 20-68A U.S. Domestic Scan program is available at http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=1570.

This report was prepared by the scan team for Scan 12-04, *Advances in Transportation Agency Knowledge Management*, 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 20-68A is guided by a technical project panel and managed by Andrew C. Lemer, Ph.D., NCHRP Senior Program Officer.

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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, the National Research Council, or the program sponsors. This document has not been edited by the Transportation Research Board.

Scan 12-04
Advances In Transportation Agency Knowledge Management

REQUESTED BY THE

American Association of State Highway and Transportation Officials

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Abbreviations and Acronyms

A3	Addo Agnitio Award (Accenture)
AASHTO	American Association of State Highway and Transportation Officials
ADM	Assistant Deputy Minister (Alberta)
ADOT	Arizona Department of Transportation
ADOT&PF	Alaska Department of Transportation & Public Facilities
ALKMS	Accenture Learning Knowledge Management Services
ARTS	Action Request Tracking System (Alberta)
CCMTA	Canadian Council of Motor Transport Administrators
CFIRE	National Center for Freight & Infrastructure Research & Education
CKO	Chief Knowledge Officer (NASA)
CMOSS	Community Mobilization Operational Support System (Alberta)
CMTA	Canadian Council of Motor Transport Administrators
CoP	Community of Practice
DOT	Department of Transportation
DSS	Discipline Support System (FHWA)
EEO	Equal Employment Opportunity (Georgia)
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GDOT	Georgia Department of Transportation
GIS	Geographic Information System
HR	Human Resources
IT	Information Technology
IM	Information Management
KDOT	Kansas Department of Transportation
KM	Knowledge Management
KMO	Knowledge Management Office (Virginia)
KX	Knowledge Exchange (Accenture)
LKM	Learning and Knowledge Management (FTA)
MAPSS	Mobility, Accountability, Preservation, Safety and Service (Wisconsin)
MnDOT	Minnesota Department of Transportation
MoDOT	Missouri Department of Transportation
MOSS	Microsoft Office Sharepoint
NASA	National Aeronautics and Space Administration
NCHRP	National Cooperative Highway Research Program

NEO	New Employee Orientation (FHWA)
ORLS	Office of Research and Library Services (Wisconsin)
OTS	Office of Traffic Safety (Alberta)
PennDOT	Pennsylvania Department of Transportation
RTSC	Regional Traffic Safety Coordinator (Alberta)
SHA	State Highway Association (Maryland)
SHCP	Strategic Human Capital Plan (FHWA)
TAM	Transportation Asset Management (Alaska)
TIG	Technology Information Group (AASHTO)
TIMS	Transportation Infrastructure Management System (Alberta)
TRB	Transportation Research Board
TRID	Transportation Research International Documentation (database)
TSS	Traffic Safety Services (Alberta)
TxDOT	Texas Department of Transportation
USDOT	United States Department of Transportation
VDOT	Virginia Department of Transportation
WisDOT	Wisconsin Department of Transportation
WSDOT	Washington State Department of Transportation

Executive Summary

This report summarizes the findings from a scan workshop of Knowledge Management (KM) within transportation agencies and other organizations. The purpose of this scan was to identify and document successful KM practices and identify additional needs to advance KM in transportation agencies.

A scan team consisting of state Departments of Transportation (DOTs) and United States Department of Transportation (USDOT) administration staff was formed to guide the scan and develop findings, recommendations, and implementation actions. Scan team members brought a diversity of KM implementation experience and an understanding of DOT management and workforce challenges to the table. Scan team members and representatives of 10 other organizations met for a scan workshop in November 2013 to share their practices. In all, the scan reviewed KM activities in seven state DOTs (i.e., Alaska, Georgia, Kansas, Missouri, Virginia, Washington and Wisconsin); three USDOT administrations (Federal Aviation Administration [FAA], Federal Transit Administration [FTA], and Federal Highway Administration [FHWA]); two private sector organizations (Kraft Foods and Accenture); the National Aeronautics and Space Administration (NASA); and Alberta Transportation.

Scan participants were asked to discuss these topics:

- **Context** – characteristics of their organization that provide a context for KM implementation
- **Innovation and Knowledge Sharing** – ways in which their organization fosters innovation through collaboration and knowledge sharing
- **Succession Management** – strategies for managing staff transitions to retain and acquire critical knowledge and minimize risk
- **Employee Orientation, Learning, and Development** – ways in which their organization facilitates new employee orientation and ensures continued employee development and organizational learning
- **Identification, Documentation, and Dissemination of Processes, Practices, and Expertise** – techniques used for identifying, capturing, storing, and providing access to knowledge about business processes, practices, and expertise

Most of the participants said that they were motivated to implement KM because of a concern about loss of staff knowledge due to retirements. A desire to support innovation and achieve efficiencies provided a second common motivation for KM. There was considerable variation across scan participants in their approaches to KM implementation. A handful of the participants reported that their organizations had established centralized and formal KM functions; others had implemented

KM practices in a more limited and decentralized fashion. After hearing the presentations, the scan team concluded that a formal KM function with a designated lead and staff resources is a strategy that should be considered to effect meaningful and sustained change. However, the team also acknowledged that organizations that cannot establish a central KM office can still derive value through implementation of KM techniques within individual business units.

Scan participants made it clear that KM is fundamentally a strategic endeavor that seeks to maximize value from the organization's human capital. As such, a cabinet-level position for the KM lead or a close working relationship between the KM lead and the leadership team is important to use effectively KM techniques to further the organization's mission. However, because KM is difficult to sustain in an organization through leadership changes and shifts in priorities, participants emphasized the importance of embedding KM from the bottom up through supporting the formation of networks.

Participants stressed the importance of organizational culture as a key enabler of innovation and knowledge sharing within an organization. A highly siloed organization in which employees are in the "every person for themselves" mode is not conducive to adaptation or innovation. Examples of strong leadership development programs and deliberate management efforts were provided, illustrating how organizations can not only articulate values that support teamwork and innovation, but also make sure they are actually "walking the walk."

A wide range of KM strategies and programs were discussed, including:

- **Workforce Planning** techniques to anticipate and address anticipated gaps in critical expertise
- **Recognition Programs** to reinforce organizational values of knowledge sharing and teamwork
- **Communities of Practice** that bring together groups within specific content or functional areas to share knowledge, support each other, and develop practice improvements
- **Knowledge Capture Methods** to codify, document, and retain valuable lessons learned and other know-how from employees with years of experience and/or highly specialized and unique expertise
- **Team Learning Techniques** to ensure that project teams learn from experience prior to starting work and take the time during the project to document lessons for use in future initiatives
- **Mentorship Programs** to provide on-the-job support to help less experienced staff get up to speed
- **Information Management** strategies to define common terminology across the organization and ensure that critical information (e.g., policies, procedures, and business processes) is accessible and usable

These techniques can be combined to develop a robust KM program that minimizes the impact of employee transitions and builds a strong foundation for innovation. This scan provides a rich base of materials that transportation agencies can use to investigate and implement KM practices. The scan team identified and is pursuing an extensive set of outreach activities to disseminate the scan's findings and support further adoption of KM practices (see Chapter 4.0).

CHAPTER 1

Introduction

Background

Transportation agencies face increased pressures to adapt to new demands and shrinking revenues. At the same time, many agencies are in the midst of a wave of baby-boomer retirements and struggle to attract and retain employees with the skills and experience needed for effective delivery of transportation services.

In this environment, agencies are seeking new approaches for better leveraging the resources available to gain efficiencies and deliver value to the traveling public. Knowledge Management (KM) is an established discipline that many public and private sector organizations have applied to improve performance, create a culture that enables innovation, and reduce disruptions associated with workforce transitions. While there are many examples of successful KM programs, KM experience within transportation agencies is limited.

Scan Purpose and Scope

A scan of "Advances in Transportation Agency Knowledge Management" was conducted under the National Cooperative Highway Research Program (NCHRP) 20-68A U.S. Domestic Scan Program. This scan was undertaken in recognition of the challenges that transportation agencies will be facing over the next decade related to loss of experienced staff due to retirements and workforce reductions.

The purpose of this scan was to identify and document successful KM practices in states, counties, metropolitan areas, and municipalities and identify additional needs to advance KM in transportation agencies. Specific topics of interest that were noted in the scan's problem statement include:

- Information sharing, coaching, and KM for staff development
- Differing approaches to capturing and providing for information/knowledge needs of various organizational functions (e.g., project management, preconstruction, construction, and maintenance operations)

Scan Team

A scan team representing six state DOTs and three United States Department of Transportation (USDOT) administrations was formed to guide the scan and develop findings, recommendations, and implementation actions. John Halikowski, Director of the Arizona DOT[1] (ADOT), chaired the scan team.

1 Arizona Department of Transportation, http://www.azdot.gov/

Scan Approach and Participants

The scan team first collaborated to develop a draft set of amplifying questions for the scan to establish a well-defined scope. Then a desk scan was conducted to identify transportation agencies with documented KM initiatives. Searches of the Transportation Research International Documentation (TRID) database, supplemented by searches of resources on selected KM and transportation research web sites, helped identify pertinent literature. From this review, the team compiled a list of agencies and sent follow-up e-mail to agency representatives, requesting further information on the status of their efforts. Since there is not yet a commonly understood definition of KM, the e-mail messages included an outline of the topics covered by the amplifying questions to communicate the scan's scope.

Dr. Maureen Hammer, a member of the scan team and director of the KM program at Virginia DOT[2] (VDOT) helped the team identify additional agencies by providing a list of individuals who had requested information about VDOT's KM program over the past several years. The team made follow-up phone calls with selected transportation agency representatives.

While the focus of the scan was on transportation agencies, the team also identified a limited set of non-transportation public agencies and private organizations with KM programs. Based on the information gathered, the team developed a prioritized list of agencies that merited further investigation, highlighting practices of interest.

The scan team held a daylong organizational meeting on July 31, 2013, to review the desk scan's results, refine the amplifying questions, and select organizations to include in the scan. Following this meeting, the team invited the selected organizations to participate and asked them to provide written responses to the amplifying questions in advance of the scan meeting.

The team held a scan meeting in Baltimore, Maryland, from November 19 through 22, 2013. During the first three days of the meeting, the scan team heard presentations from:

- Seven state DOTs (Alaska[3], Georgia[4], Kansas[5], Missouri[6], Virginia, Washington,[7] and Wisconsin[8])
- Three USDOT administrations (Federal Aviation Administration[9] [FAA], Federal Transit Administration[10] [FTA], and Federal Highway Administration[11] [FHWA])

2 Virginia Department of Transportation, http://www.virginiadot.org/
3 Alaska Department of Transportation & Public Facilities, http://www.dot.state.ak.us/
4 Georgia Department of Transportation, http://www.dot.ga.gov/Pages/default.aspx
5 Kansas Department of Transportation, http://www.ksdot.org/
6 Missouri Department of Transportation, http://www.modot.org/
7 Washington State Department of Transportation, http://www.wsdot.wa.gov/
8 Wisconsin Department of Transportation, http://www.dot.state.wi.us/
9 Federal Aviation Administration, http://www.faa.gov/
10 Federal Transit Administration, http://www.fta.dot.gov/
11 Federal Highway Administration, https://www.fhwa.dot.gov/

- Two private sector organizations (Kraft Foods[12] and Accenture[13])
- National Aeronautics and Space Administration[14] (NASA)
- Alberta Transportation[15]

On the final day of the meeting, scan team members discussed what they had learned and synthesized the scan's findings. The team also identified strategies and actions for disseminating the scan's findings.

Report Organization

This report documents the results of the scan meeting. It is organized in three major sections. The first presents the scan team's key findings, with relevant examples from the presentations and background material provided by participants. The second provides a brief summary of KM strategies, based on the scan's findings, that state DOTS can consider. The final section presents strategies and actions the scan team identified for disseminating the scan's findings and fostering adoption of beneficial KM practices.

The following information is provided in the appendices:

- Scan Team Contact Information – Appendix A
- Scan Team Biographical Sketches – Appendix B
- Key Contacts – Appendix C
- Desk Scan Results – Appendix D
- Amplifying Questions – Appendix E
- Scan Participant Responses to Amplifying Questions – Appendix F

12 Kraft Foods Group, http://www.kraftfoodsgroup.com/home/index.aspx
13 Accenture, http://www.accenture.com/us-en/pages/index.aspx
14 National Aeronautics and Space Administration, http://www.nasa.gov/
15 Government of Alberta Ministry of Transportation, http://www.transportation.alberta.ca/

CHAPTER 2

Scan Findings and Observations

Findings from the scan are organized into three categories:

- General Findings – the nature of KM and why organizations choose to implement KM programs and practices
- KM Implementation Strategies – how to design an effective and sustainable strategy for integrating KM within an organization
- KM Practices – specific programmatic elements of KM

General Findings

Definition and Evolution of KM

Knowledge management means different things to different people. There is no universally accepted definition of KM. In fact, the scan team observed that some people equate KM with information management (IM) and use the terms knowledge and information interchangeably. While the scan team acknowledged that these terms have been defined in different ways, it established the following working definitions: Information refers to data or facts that have been organized and presented with the context necessary for use or application. In contrast, knowledge typically is characterized as something that exists within a human brain, built over time from learning and experience and used as the basis for judgment, prediction, and decision-making.

In KM circles, a distinction is also commonly made between tacit knowledge and explicit knowledge. *Tacit* knowledge is knowledge that is difficult to express and document (e.g., intuition or know-how). *Explicit* knowledge is knowledge that has been codified (e.g., a set of rules for what should be done given specific circumstances). Explicit knowledge is, in effect, knowledge that has been transformed into information. In practice, KM programs may address creation and application of both tacit and explicit knowledge, as well as access to and use of other information that employees need to carry out their responsibilities (e.g., an organization's policies and procedures).

VDOT explains the difference between IM and KM this way:

> If we only needed information to get things done, then institutions would just be manuals and procedures, but it takes more than information to perform a function, particularly one as complex as VDOT's. It takes people who not only know what to do and how to do it, but why to do it a particular way. Understanding, negotiating, and fostering these ways of knowing to improve institutional effectiveness and efficiency may be described as *Knowledge Management*.

NASA's chief knowledge officer reinforced this view, observing that, "at the end of the day, success or failure is human," and that 90% of the need for knowledge sharing in an organization relates to know-how (i.e., techniques and craftsmanship, social knowledge) as opposed to codified knowledge (i.e., business processes and technical knowledge).

At the start of the scan meeting, Professor Denise Bedford observed that KM is an evolving, multifaceted discipline that is best defined by articulating its purpose. She offered this statement of purpose for KM: "to make the organization act as intelligently as possible, and realize the best value from its knowledge assets."

KM as a recognized practice began in the 1990s, according to Bedford. The first generation of KM emphasized using technology for information storage and discovery. In the 2000s, the second generation of KM emerged with more of a focus on how knowledge is created, transferred, and applied within a business context. The current and third generation of KM builds on the footprint established in the first two generations and adds applications of new technologies that can analyze the meaning of content to improve knowledge discovery. The three generations of KM are depicted in Figure 2.1.

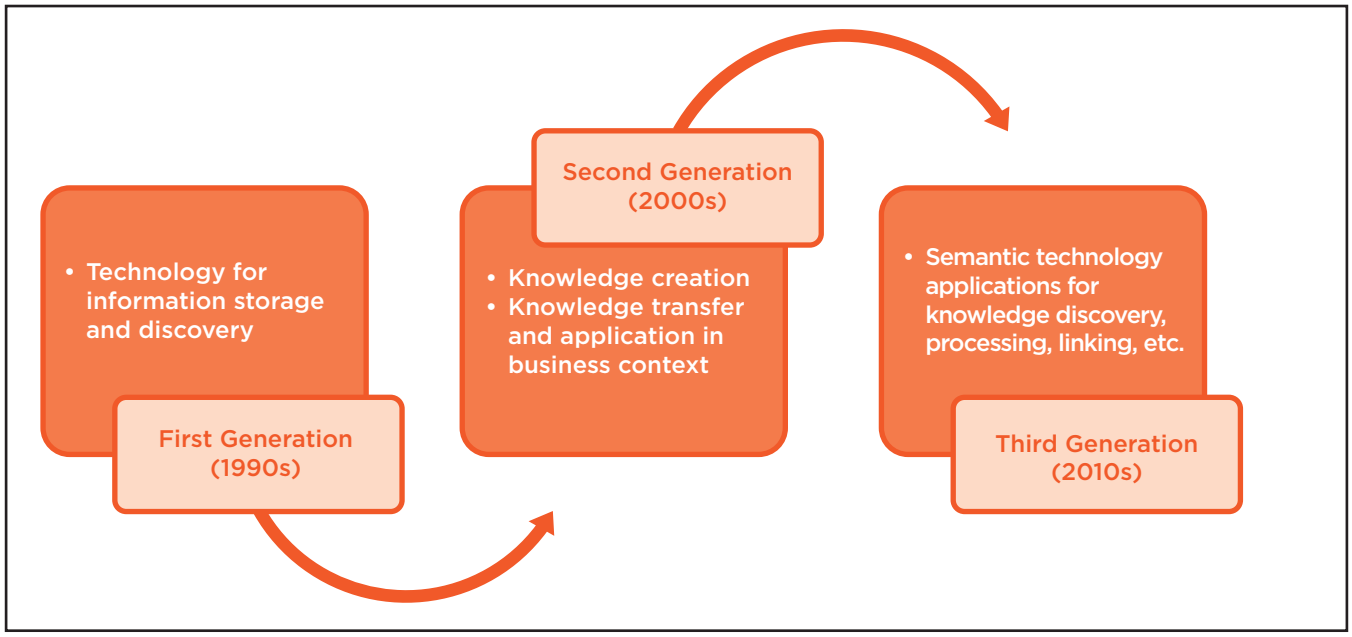

Figure 2.1 ***Generations of KM***

Context for KM

Several factors are creating the imperative for DOTs to consider new approaches to managing their information and institutional knowledge. First, many DOTs are losing their most experienced staff, and a growing number of DOT employees are eligible for retirement. In addition, younger and midcareer employees are changing jobs more frequently, transitioning both within the organization and across organizations. This increased level of movement within the workforce means that DOTs are constantly facing losses of valuable employee expertise. If not managed proactively, this loss of experience and know-how can impede organizational efficiency and effectiveness.

A second key driver of KM is the desire to improve organizational effectiveness and support both innovation and efficiency improvements. Organizations view KM techniques as a way to improve collaboration, teamwork, organizational learning, and employee development – all of which are seen as necessary ingredients for innovation and efficiency gains. Some organizations have linked KM to initiatives such as Baldrige Performance Excellence[16], Performance Management[17], and Lean Six Sigma[18].

A third factor that is driving interest in KM is the changing nature of the workforce. Newer generations of workers have different communication styles and expectations about information access. They are most comfortable with electronic means of communication and are less likely than their predecessors to pick up the phone. They expect online access to the information they need to perform their jobs. This creates an impetus for more disciplined efforts to capture, codify, and post mission-critical information. Such efforts would provide persistent access to a consistent information base and decrease employee dependence on an increasingly weakening "grapevine" for information. On the other hand, even the best information or knowledge repository cannot substitute for person-to-person communication, so there is also an impetus for more proactive efforts to support networking within the organization.

Finally, like most organizations, DOTs are seeing exponential increases in the amount and variety of available information – from both internal and external sources. There is growing recognition of the importance of having an organization-wide IM strategy so that information can be found when it is needed. Without a coordinated strategy, multiple efforts for information storage and management are initiated within organizational silos, resulting in duplication and inefficiency.

Table 2.1 summarizes key drivers for KM at the organizations participating in the scan.

Table 2.1: ***Driving factors for interest in KM at participating organizations***

Agency	Factors driving KM initiatives
U.S. DOT FHWA	■ Loss of employee knowledge through attrition ■ Need to provide guidance and technical assistance nationwide with increasingly constrained resources ■ Focus on innovation – in transportation finance, accelerated technology development, and internal business practices
U.S. DOT FTA	■ Commitment to organizational performance excellence – application of the Malcolm Baldrige framework, which includes a KM element ■ Increase use of innovative approaches for both long-range planning and day-to-day activities ■ Provide support for employee learning and development

16 Baldrige Performance Excellence Program, http://www.nist.gov/baldrige/

17 Transportation Performance Management: Insight from Practitioners, NCHRP Report 660, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_660.pdf

18 Lean Six Sigma Professional Services, Motorola Solutions, http://www.motorolasolutions.com/US-EN/Training+Home/Lean+Six+Sigma

Table 2.1: ***Driving factors for interest in KM at participating organizations (continued)***

Agency	Factors driving KM initiatives
Virginia DOT	■ Need to manage and mitigate loss of knowledge associated with major reductions in workforce (30% of employees are eligible to retire) ■ Shift in mission from construction to maintenance and system operations, requiring greater internal and external collaboration ■ Need to adapt the organization to meet new demands and increase efficiency
Washington State DOT	■ Loss of knowledge due to aging workforce on the cusp of retirement ■ Reduced resources and increasing need for greater efficiency ■ Commitment to innovation
Georgia DOT	■ Need to mitigate impact of retirements on loss of institutional knowledge ■ Organizational commitment to providing an effective environment for innovation and knowledge sharing
Wisconsin DOT	■ High workforce attrition and high retirement vulnerability ■ Commitment to innovation within transportation engineering-related functions ■ Lean Government[19] and Performance Management[20] initiatives
Alaska DOT&PF	■ High percentage of workforce is within five years of retirement, as well as industry shifts and changing workforce demands ■ Geographically dispersed workforce – many remote locations ■ Diverse agency functions (e.g., aviation, marine, and highways)
Missouri DOT	■ Deliver project benefits for reduced costs through innovative practices ■ Downsizing and reorganization – review and rethink all key business processes
Kansas DOT	■ Concern about "knowledge walking out the door" with large numbers of retiring employees
Alberta Transportation	■ Retirement of key staff with no knowledge transfer ■ "Lost generation" of employees due to cutbacks in the 1990s created need to quickly develop leadership qualities in new and existing staff ■ Need for innovative approaches – old solutions not appropriate given today's environment – and means of addressing different problems and attaining a greater level of integration ■ Inefficiency and risk associated with heavy reliance on a small percentage of staff for expertise; recognition that not distributing knowledge makes the organization vulnerable ■ Shift from paper to electronic records
NASA	■ Ability to deliver on established agency values of excellence, teamwork, safety, and integrity ■ Need to ensure effective teamwork given mission complexity and diverse teams (90 % of work done by industry, 80% of missions involve international partners) ■ Recognition that past failures were due in part to lack of effective collaboration and openness to varying perspectives
FAA	■ Improve organizational performance – productivity, agility – support Lean Six Sigma initiatives ■ Foster productive working relationships in a highly unionized environment – institutionalize collaborative work habits

19 Lean Government Center, http://leangovcenter.com/govweb.htm

20 Performance Management Overview & History, U.S. Office of Personnel Management, http://www.opm.gov/policy-data-oversight/performance-management/overview-history/

Table 2.1: *Driving factors for interest in KM at participating organizations (continued)*

Agency	Factors driving KM initiatives
Accenture	■ Nature of business (global and diverse consulting and technology firm) requires project teams to obtain quick access to content, approaches, and methods needed to deliver solutions ■ Desire to provide unencumbered access for all employees to the best content and expertise the company has to offer ■ Belief that collaboration leads to success for the company and its clients and provides competitive advantage
Kraft Foods	■ Foster innovation to create winning products, leading to competitive advantage ■ "Know what we know" – reuse rather than reinvent methods ■ Support faster decision making and efficiency ■ Support faster employee onboarding and employee development ■ In conjunction with a company split, ensure that each business unit has the technical knowledge required to ensure business continuity and self-sufficiency and to preserve competitive position

Value of KM

Workforce transition and the information explosion are creating both challenges and opportunities for DOTs as they seek to improve the delivery of transportation projects and services with increasingly limited resources. DOTs can draw upon KM techniques to navigate these challenges, foster innovation, and enhance organizational efficiency and effectiveness.

All organizations have large amounts of information and know-how. KM allows them to make sure these important knowledge assets are shared and applied across organizational units. Organizations that have implemented KM report that it has helped them to retain critical knowledge and leverage this knowledge to act in an intelligent manner. Examples of KM implementation in private sector organizations, including Accenture and Kraft Foods, indicate that substantial investments in KM over a sustained timeframe are being made because executive managers recognize the payoff from these activities.

KM Implementation Strategies

The KM Maturity Ladder

Many organizations begin by implementing KM techniques on a limited scale. For example, some may focus on workforce planning and succession management. Some work on creating opportunities for learning, networking, and knowledge sharing. Others might emphasize use of information technology and IM techniques to organize and provide access to information and explicit knowledge. While these piecemeal, selective implementations of KM can deliver value, mature KM programs take a more holistic approach. They involve formalizing responsibilities for KM and developing a comprehensive KM strategy to address business needs and priorities. A fully developed KM program is multifaceted and is woven into the fabric of the organization – evident in its leadership, culture, and ways of doing business. As organizations move up the maturity ladder and adopt a holistic and strategic view of KM, benefits are expected to increase.

As KM programs mature, they become more deeply embedded into the organization and their value increases. Figure 2.2, adapted from the FAA scan presentation, provides a concrete illustration of this point. It identifies what can be achieved from a community of practice (CoP), which is a core KM technique. In the initial stages, the community is able to help the organization reuse material and connect people. As the community matures, it becomes the vehicle for more extensive organizational learning and collaboration.

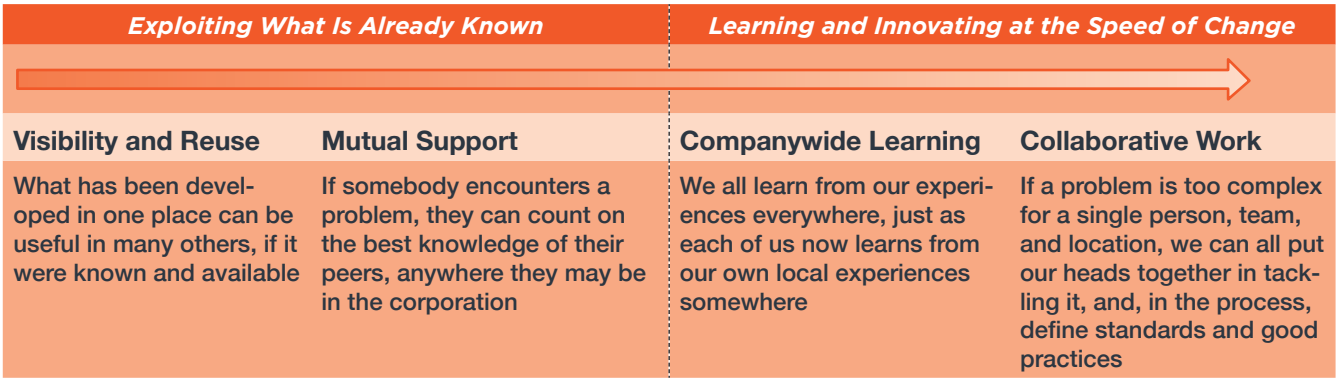

Figure 2.2 *FAA CoP maturity continuum*

Many of the organizations that participated in the scan are just beginning their KM implementation or are pursuing KM initiatives within limited areas. For example:

- ADOT&PF currently focuses in the workforce planning area and is actively pursuing other areas of KM and supporting IM efforts
- GDOT and WisDOT encourage and support grassroots KM applications within individual business areas
- KDOT implemented a mentoring program for district field inspectors
- WSDOT has piloted KM initiatives, including CoPs and knowledge-capture interviews
- Alberta Transportation has started a formal KM function within the Traffic Safety Services Division and is pursuing several pilot initiatives under this umbrella

In contrast, USDOT FTA, NASA, the FAA, and VDOT have established, centralized programs pursuing a multifaceted, strategic approach to KM.

It is important to note that many organizations are implementing KM activities without calling what they are doing KM. For example, at the FAA, the term *organizational learning* is used rather than KM. The FAA participant at the scan meeting commented, "If you asked FAA executives about KM, they would look at you like dogs watching TV." Nevertheless, the FAA is pursuing an extensive set of activities that fall under the KM umbrella.

The existence of wide variations across organizations with respect to how they define, refer to, and

apply KM is an important finding. While a common definition of KM across organizations is not required, future education and outreach activities to advance the state of the practice of KM in transportation need to be explicit about definitions and components of KM. Because some agencies may already be undertaking activities that are not recognized as KM, it is useful to communicate that DOTs can start by identifying and recognizing existing activities, and then get "on the maturity ladder."

Connecting KM to Business Outcomes and Measuring Success

There is no single right way to implement KM; however, it is essential to connect any KM initiative to business outcomes. KM will get executive attention and support if it addresses critical pain points or serves the needs of major projects or initiatives. Once they are implemented, it is important that KM programs produce metrics showing how these programs are adding value.

VDOT

At VDOT, the KM Office describes its function as one of providing "applied business research and analysis" to achieve outcomes of improved business practices, relationships, and management, and collaboration within and between functions. One of the services it offers is "wicked problem solving" for situations requiring skillful facilitation to work through competing and conflicting objectives and align processes across business units. Figure 2.3 shows VDOT's list of standard measurements and outcomes for KM.

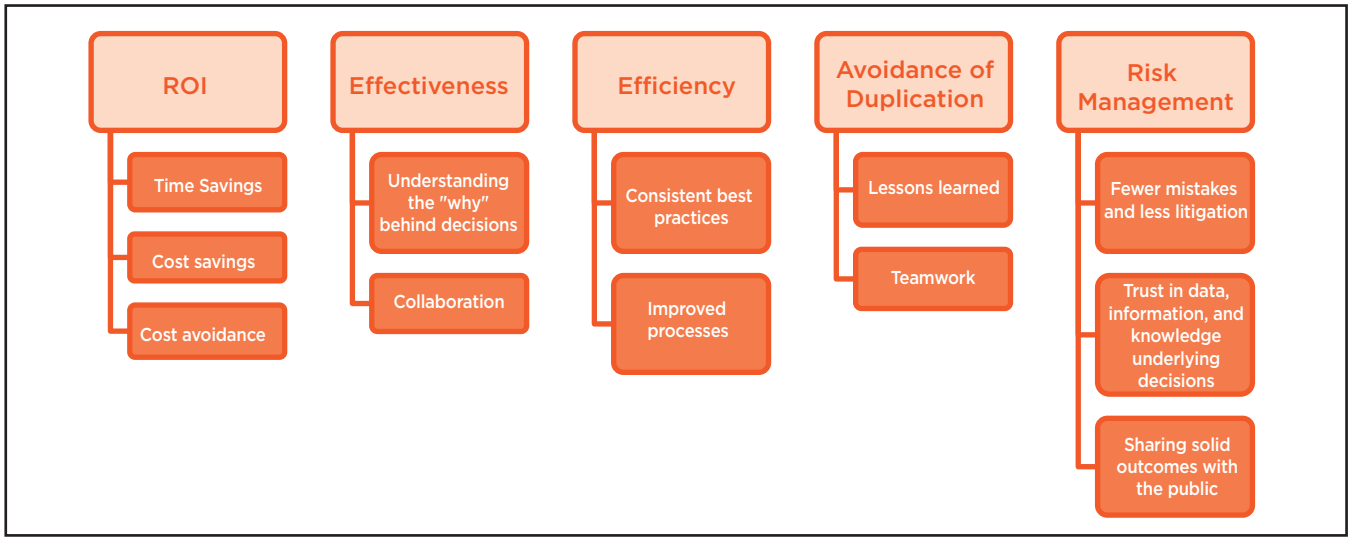

Figure 2.3 ***VDOT standard measurements and outcomes for KM***

Changing the Culture

Implementing KM is fundamentally about culture change. KM can add value to any organization by building a culture of learning, innovation, and collaboration. Common barriers to this culture change include:

- Lack of commitment on the part of agency leaders – perhaps because they are not aware of how the current culture is holding the organization back and what a shift in the culture would mean for improved effectiveness
- Perception that KM would require substantial startup costs
- Stretched resources, making it difficult to initiate new collaborative practices that may appear to be superfluous
- Low organizational tolerance for the kind of risk taking that is essential for innovation and learning
- Ingrained habits of information hoarding, combined with lack of incentives or rewards for information sharing
- Inherent difficulties working across organizational silos
- Resistance to changing entrenched practices

Culture shift is difficult and time consuming to achieve, but can provide long-lasting results. Organizations can work culture change into leadership messaging, recruiting, hiring, onboarding, and performance evaluation.

FAA

The FAA representative talked about the importance of establishing a vision for the future state of the culture. In the case of his agency, the goal was to move from:

- Strained relationships
- Micromanagement
- Mismatch between language and behavior
- Parochialism

to:

- Productive working relationships
- Knowledge transfer
- Common outcomes
- Connecting strategy to day-to-day actions
- Initiatives that have taken root

MoDOT

Over the past decade, MoDOT underwent a major change in philosophy and culture, motivated by a need to downsize, improve efficiencies, and focus on essentials. This culture shift was transformative: MoDOT is now considered a leader in innovation. The organization adopted a strong

performance management focus. It implemented a program that tracks performance quarterly. It evaluates all employees based on measures that link to established, tangible results and values for the organization. In addition, MoDOT adopted a philosophy of *practical design*, which eliminated the cookbook approach to design and emphasized creativity. Key elements of this philosophy are:

- The system is more important than the spot (i.e., rather than creating spots of excellence, it takes a more global perspective on performance).
- The goal is to make sure each project gets safer, but not necessarily as safe as it can be.
- Design with the life cycle in mind – collaborate and do not leave a maintenance headache.

MoDOT adopted strong values of innovation and teamwork. These values were infused throughout the organization – they became more than just words on a page. Agency leadership encouraged employees to embrace new ways of doing work. Employees understood that they were allowed to take risks without being penalized if they failed. Leadership also made a conscious decision to emphasize that the DOT was one team – employees were expected to work across the silos and ask others for help as needed. For example, rather than treating each district as an island, personnel and equipment are shifted across districts as needed to support snowplowing operations. The MoDOT representative commented, "If one district fails, then all seven districts fail and, ultimately, MoDOT fails. There is an expectation that districts help each other succeed by providing resources, equipment, or whatever it takes."

It took a great deal of leadership and commitment to effect this culture change at MoDOT; however, the agency has seen a real payoff. It is currently better equipped to maximize available resources through identifying and implementing innovative solutions.

Alberta Transportation

One of Alberta Transportation's participants talked about the "Reaching Our Full Potential" program within Alberta Public Service[21]. Although initiated at the deputy minister level, this program is fundamentally about changing the culture from the bottom up: it asks employees to lead from where they are, whether or not they are in positional leadership roles. It is based on this premise: *We are all coauthors of our culture, whether it is positive or negative in your individual unit, section, or branch. To start change, we all need to take small steps forward.* As part of the program, each employee is given three pins and is asked to pin their colleagues publicly when they see them doing something that embodies the program's values. The Alberta Transportation participant commented, "It is really special. You have your pin and you know what it means. It is a really easy, bottom-up way to drive this kind of cultural change."

Employee performance expectations and evaluations can explicitly define and take into consideration

21 Reaching our full potential: Alberta Public Service renewal, Canadian Government Executive, 19:2, 2013, http://www.canadiangovernmentexecutive.ca/category/item/1143-reaching-our-full-potential-alberta-public-service-renewal.html

knowledge-sharing behaviors. Policies, procedures, and management communications can reflect the organization's values for learning and knowledge sharing. For example, Alberta Transportation employees sign an annual performance agreement that includes a commitment to collaboration, teamwork, and knowledge and skills transfer to others.

Many of the organizations participating in the scan had mission and value statements that embraced excellence, innovation, and teamwork. While important, such statements are only a first step toward actual culture change. This is illustrated well in the following example of culture change.

NASA

The NASA representative began his remarks by telling a story that contrasted the agency's behavior during the 2003 Space Shuttle Columbia mission with that of the 2009 Endeavor mission. As illustrated in Figure 2.4, his analysis of the Columbia mission pointed to organizational behaviors that did not reflect the agency's four core values. The Columbia Accident Investigation Board Report[22] included the statement: "NASA's current organization … has not demonstrated the characteristics of a learning organization." As the agency's chief knowledge officer, he challenged the organization to ask the question, "Does what you do line up with what you say you do?" By the 2009 Endeavor mission, the organization's actions were more in line with its values.

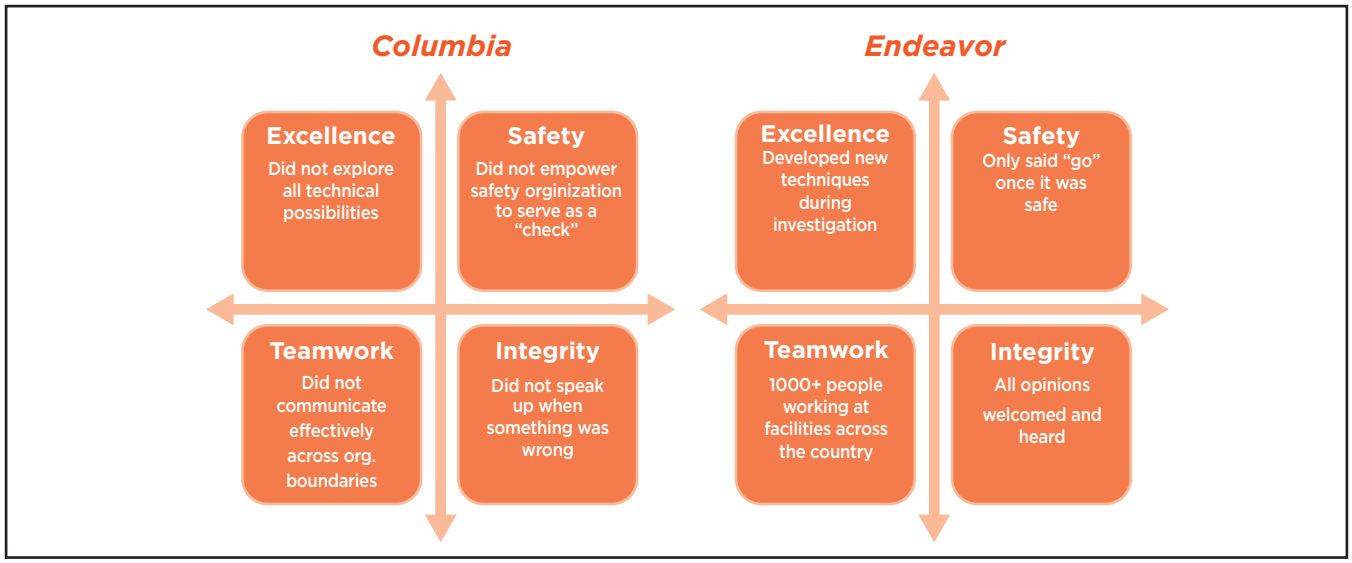

Figure 2.4 ***NASA's tale of two missions: changing the culture to deliver on core values***

Locating and Resourcing KM

One topic of interest to the scan team concerned whether DOTs should establish a lead role for KM and, if so, where this KM lead should be located in the organization. Table 2.2 summarizes the organizational home of KM functions for each of the scan participants.

22 Report of Columbia Accident Investigation Board, Volume I, Columbia Accident Investigation Board Report, http://www.nasa.gov/columbia/home/CAIB_Vol1.html

The scan team observed that while many organizations do implement KM programs on an informal or ad hoc basis, designating a KM lead and dedicating resources to the KM function is an effective strategy for making progress and sustaining momentum. However, this does not necessarily mean that new staff needs to be hired. There may be opportunities to leverage or repurpose existing staff resources. The team noted that every worker in an organization is developing and managing knowledge. A KM lead plays an important role in supporting and leveraging this knowledge for strategic use.

KM works best if the KM lead is a member of the senior leadership team. This ensures that KM is not viewed as a lower level support function, but rather an important strategic lever for achieving the organization's mission and managing risk. The NASA representative believed that the hybrid approach (i.e., having an agency champion in addition to KM leads within each center and unit) worked well, providing a connection to agency leadership at multiple levels and responsiveness to local needs.

Lead responsibility for KM can be housed in different parts of the organization. Possible homes for KM include Administration, Human Resources (HR), Training, Research, or Project Management. Some KM programs have been housed within Information Technology (IT) departments; however, it is important to recognize that while IT can play a useful support role, KM programs are not fundamentally technology-centric. The VDOT KM representative observed that it is helpful for the KM function to be located in a part of the organization that is considered neutral (i.e., serves the needs of both central office and field offices). This makes it easier to work effectively across organizational silos.

It is important to select the right person to serve as a KM lead. In addition to having expertise in KM and related organizational development disciplines, an effective KM lead must:

- Have the ability to serve as a champion and function as an agent for change in the organization
- Be a good communicator and negotiator, skilled in the art of persuasion
- Have political and business savvy
- Have a customer service orientation

Table 2.2 *Location of KM function at participating scan organizations*

Agency	Organizational home of KM function
US DOT FTA	Learning and Knowledge Management (LKM) Group, under the Office of Administration
US DOT FHWA	Office of Technical Services, under the Administrator
Virginia DOT	Knowledge Management Office (KMO), under the Virginia Center for Transportation Innovation and Research (The Research Library function is under the KMO.)
Washington State DOT	Office of Research and Library Services, under the Strategic Planning Division[23]
Georgia DOT	Functions distributed across multiple offices
Wisconsin DOT	Functions distributed across multiple offices
Kansas DOT	Informal program; no single home
Alaska DOT&PF	Strategic workforce planning and knowledge sharing function within the Administrative Services Division; activities related to IM are being pursued under the Transportation Information Group within the Program Development Division
Missouri DOT	Functions are distributed across multiple offices. Innovations engineer within the Design Division coordinates Value Engineering studies. The Engineering Policy Group within the Design Division is responsible for the consolidated Engineering Policy Guide.
Alberta Transportation	The Canadian Council of Motor Transport Administrators KM Advisory Subcommittee is pursuing a pilot project. Traffic Safety Services Division, Business Knowledge and Coordination Unit
NASA	Federated model: Agency chief knowledge officer (CKO) serves as champion and facilitator; each NASA center and mission directorate also has a CKO
FAA	Organizational Effectiveness Office; focus on collaboration
Accenture	Social Learning Team, includes groups for Infrastructure, Strategy & Enablement, Catalyst, and Learning Knowledge Management Services
Kraft Foods	Intellectual Property, Knowledge Management and Training unit under the Executive Vice President for Research, Development, Quality and Innovation

For example, the FTA representative reported that, "the KM group includes strengths in leadership, strategy, management, logistics and implementation, design, IT, communications, organizational development, entrepreneurism, and a good political sense. The KM lead has stressed developing a can-do attitude and customer focus among all staff and created an environment that supports them, which is viewed as important to its continuing success."

KM Sustainability

Interest in KM activities can be difficult to sustain. Several examples of short-lived KM programs were identified during the scan's literature review. Implementation occurred in reaction to an identified risk or failure or due to efforts on the part of a single individual. Once the crisis had passed or the advocate moved on, the program faded. The "great leader" model of KM is not sustainable, because once the leader departs, complacency can set in and other needs may appear to be more exigent. For example, initiatives to produce projects faster, better, and cheaper may have the unintended consequence of eliminating practices that were designed to support innovation.

23 Since the scan meeting, the KM lead has been relocated to the Engineering Policy & Innovation Division.

The sustainability of KM in an organization depends on it being institutionalized and demonstrating clear benefits. Organizations can demonstrate their commitment to KM by including it in their strategic plan and backing this up with specific implementation steps. While this is a good start, the most effective way to ensure that the KM program grows roots is to build strong networks and communities throughout the organization that recognize the benefits.

KM Practices

KM encompasses a wide range of practices for building networks and communities, promoting information sharing and collaboration, fostering individual and group learning, and capturing knowledge and making sure it is used. Many agencies consider strategic workforce planning, business process documentation and improvement, and some IM strategies to be part of KM since they reinforce knowledge capture, retention, and application.

Findings on specific practices are presented in Table 2.3, organized by category. However, it is important to recognize that KM practices serve multiple purposes and are mutually reinforcing. For example, building networks supports employee learning and development, information sharing and collaboration, and employee retention (part of workforce planning). WisDOT's KM Tools Matrix provides a good illustration of how KM techniques can be packaged into a coherent toolbox. WisDOT developed this toolbox through a research effort aimed at identifying low-cost KM strategies.

Table 2.3 WisDOT KM tools matrix

Topic and tasks	Brief description	Might be good for	Resources
Documenting process			
Writing down processes	Incumbent writes down steps in key tasks	Stable, routine tasks; quick reference	Low
Videotaping processes	Incumbent is videotaped performing key tasks	Quick capture, including context	Low
Formalizing process			
Formalizing process	Manually require steps be completed in certain way	More complex tasks	Low
Automating process	Automation requires steps be completed in certain way	Highly complex tasks with many players	Med
Expert decision system	Incorporates expert judgment; provides decision	Complex decisions that can be modeled	High
Experiencing together			
Double-filling key positions	New employee and retiring employee work together	Critical positions with sole complex knowledge	Low
Cross-training	Train employees to do a range of overlapping work	Positions with sole knowledge	Med
Communities of practice	Employees with similar work regularly communicate	Positions scattered throughout agency	Med
Sharing experience			
Exit interviews	HR or supervisor asks questions of departing employee	All departing employees	Med
Expert interviews	Interviewer asks questions of knowledgeable employee	Employees with extensive specific knowledge	Med
Last lectures	Departing employee gives open-ended talk	Departing employees with extensive tacit knowledge	Med
Storytelling	Current employees share stories of challenges faced	Current employees with extensive tacit knowledge	High
Developing leaders			
Rotation program	Selected employees work in one or more new areas	Employees showing leadership promise	High
Leadership program	Selected employees receive agency exposure	Employees showing leadership promise	High

Communities of Practice

CoPs are a proven KM element that offer an opportunity for joint problem solving and collaboration. Formal CoPs can be established to complement informal networks that may exist and involve staff with similar functions across geographically distributed offices. CoP meetings should be considered legitimate business functions, as opposed to extracurricular activities. In addition, organizations should be aware of how management policies may positively or negatively impact informal networks that are in place.

Scan participants reported several examples of networks and communities:

- **VDOT** has supported CoPs for over 10 years and views them as a cornerstone of its KM program. CoPs are used to support the transfer of tacit knowledge from one employee to another. These have resulted in significant savings in cost or time that have been integrated into normal business practice. The agency has from 40 to 70 active communities at any given time. Groups meet monthly, bi-monthly, and quarterly and many have a team site for collaboration on the agency's intranet (based on SharePoint). The KM office directly manages some CoPs, while others self-manage and keep KM informed. The KM office helps many CoPs with structuring, focusing, and documenting outcomes. The office also helps the CoPs communicate with executive leadership about the value of the community to ensure continued support.
- **FTA's** KM function supports and facilitates CoPs and offers them electronic collaboration space on its TransPort platform. CoPs at FTA typically are groups of peers led by someone who has had a strong interest in interacting and learning. Meetings may be weekly, semi-weekly, or monthly, and their agendas are set by request and consensus. Especially for remote participants, communities are important lifelines to others doing similar things that can provide information and mentoring along with friendship and even emotional support during difficult periods.
- At **GDOT**, two formal CoPs are organized around project management functions and meet monthly to share experiences and identify common issues and lessons learned. Several informal communities also exist based on topics including environmental issues, geographic information systems (GISs), and roundabouts.
- **Alberta Transportation** staff participates in CoPs set up by the provincial government to facilitate information sharing across ministries for topic areas including enterprise risk management, business planning, finance, and performance measures. The finance community worked to implement a finance internship program to address an emerging skills deficit in this area.
- **Accenture** has over 1,500 online CoPs on its Knowledge Exchange portal, where people come together in virtual groups spanning geographic and organizational boundaries to collaborate with each other, connect with peers and experts, and access the latest thinking on a specific topic or practice area.

Information Sharing and Collaboration

KM practices seek to facilitate information sharing and collaboration. These practices can improve work quality and reduce the risk of project failures by ensuring that multiple perspectives are considered. It is particularly valuable when individuals who are not invested in a particular way of doing things can weigh in on a decision. A high-functioning organization supports collaboration internally and externally.

Several effective techniques to build a culture of collaboration were identified. Timely and meaningful recognition and awards for employees who exhibit collaborative behaviors are relatively easy to implement (e.g., the use of "pinning" in Alberta Transportation) and can make a big difference.

Accenture's "Gamification" Approach to Rewarding Collaboration

Accenture encourages and incentivizes its employees to display everyday work-related behaviors that embrace what it calls the 3Cs:

- Connect – to people and content
- Contribute – their ideas, insights, experience, and knowledge
- Champion – encourage their colleagues to go the extra mile

These behaviors are reinforced through employee performance-management processes, with performance factors linked directly to collaborating effectively. The company calculates a quarterly "collaboration quotient" for each employee as a means of motivating employees to engage more actively in effective collaboration and sharing. The score is based on over 50 activities tied to the 3Cs. Scores are weighted toward quality, rather than quantity. For example, an employee who writes blog posts is rewarded more based on the number of views and downloads the blog receives, not merely the number of posts he or she has written. Scores are reviewed quarterly, and the program recognizes top collaborators. Leadership gives these employees a recognition letter, a small monetary award, and virtual badges to display on their internal People profiles; these awards are noted in their annual performance reviews.

Accenture recently made a strategic decision to embrace the concept of gamification[24] as a means of motivating employees to engage more in collaboration and sharing through social learning and to influence their behaviors. The organization is at an advanced stage in preparing to deploy game dynamics and mechanics (e.g., player narrative, progression loops, feedback, visualization and status) to encourage employees to collaborate and share.

Social networking tools can be used to provide opportunities for asynchronous interaction. However, in designing a collaboration strategy it is important to recognize that collaboration requires a foundation of trust. Scan participants agreed that one of the most effective ways to establish the

24 Ryan M, A Sleigh, KW Soh, Z Li, Why gamification is serious business, *Outlook*, Accenture, http://www.accenture.com/us-en/outlook/Pages/outlook-journal-2013-why-gamification-is-serious-business.aspx

trust needed for collaboration is face-to-face interaction. Unfortunately, tightening travel policies are limiting opportunities for personal interactions across geographically dispersed employees.

Strategies for encouraging collaboration across organizational silos need to recognize that facilitation may be required to establish a common language and shared frame of reference. VDOT and other scan participants pointed out that KM functions can add value to this area.

Learning and Development

Learning and development begins with the employee's initial introduction to the organization. A strong orientation program not only provides practical information, but also communicates organizational values and introduces the employee to organized information resources and a network of contacts who can provide support. Learning, mentoring, and KM go hand in hand. The FTA scan participant noted that integrating KM with the agency's learning and development function was a logical step that provided valuable synergies and made it easier to explain KM's purpose.

One useful KM function is to develop an organizing framework for learning and development by identifying a set of core disciplines for the organization. In a DOT, these disciplines might include traffic engineering, bridge design, construction management, and procurement. Training, mentoring, networking, and information-sharing activities can be structured around the identified disciplines. These same disciplines can also be used to structure planning for future workforce needs.

FHWA's Discipline Support System

FHWA's Discipline Support System[25] (DSS) provides a strong model of how such an organizing framework can be applied. FHWA established DSS in 2008 to strengthen collaboration, coordination, and professional development opportunities within the agency. It is organized around 18 technical disciplines:

- Administrative and support service
- Air quality
- Civil rights
- Construction & project management
- Design
- Environment
- Financial management
- Freight
- Generalists
- Geotechnical
- Hydraulics
- Marketing and communications
- Pavement and materials
- Operations
- Planning
- Program and management analysis
- Safety
- Structures

25 Audet A, FHWA – Knowledge Management Discipline Support System (DSS), http://ashr.transportation.org/Documents/FHWA%20Knowledge%20Management%20Discipline%20Support%20System.pptx

A discipline sponsor and champion(s) lead discipline groups. They meet each month virtually and face to face once every two to three years. The DSS collaborates electronically on membership lists, discussion groups, training sessions, monthly meetings, and mentor/peer relationship building. FHWA has given the disciplines official status and supports and finances their activities. The DSS has served multiple purposes, including:

- Mitigating the effects of knowledge loss due to retirements and attrition
- Ensuring more effective workforce planning
- Providing clear, consistent job expectations for employees
- Creating an environment of knowledge sharing throughout the agency

FAA's Techniques for Learning Before, During, and After

A second valuable KM function is providing guidance and templates that support team learning. It is importantfor individuals and teams to set aside time for analysis about what they are doing, how to make it better, and how they will change their interactions in the future.

The FAA representative observed that "helping people and teams learn before, during, and after the work they do is the single most effective way to improve performance in the short term." The FAA has developed the following standard processes:

- **Learning Before** – Peer Assist provides an opportunity for a project team to learn about what it will be trying to execute, assisted by a visiting peer team. This is a one- to two-day event involving discussion of how the team will approach its assignment, drawing on its experiences.
- **Learning During** – Action Reviews are conducted while the project is active. In these reviews, the project compares what the team thought would happen with what actually happened. If there was a difference, the team analyzes the reasons for that difference and identifies how the action could be done better in the future. This process creates an explicit opportunity for learning in the moment.
- **Learning After** – Retrospectives are conducted when the project or a major project phase is complete. Each member of the project team (as well as customers, if applicable) is given an opportunity to identify what went well and what could have gone better. The retrospectives' results are documented, providing the context, what was learned, and advice for others undertaking similar initiatives.

Kraft Foods – Innovators Checklist

Kraft Foods developed an Innovators Checklist, which is a set of questions to be asked at the start of every project to reinforce best practices and desired behaviors. KM-related questions include:

- What has been done before and what did we learn?
- How will I document and share my learnings?
- Have I completed a prior art landscape search?

Mentoring: KDOT's Field Inspector Mentor Program

KM functions can also facilitate and support mentoring within the organization. Any person in the organization can have skills and experience to share with others. While a mentor is typically viewed as a senior employee guiding a newer employee, mentoring can go in any direction. For example, FTA has found that recent graduates can bring web development skills and insights into applications of social media to the table, and embraces this type of knowledge sharing within its mentoring program.

Mentoring programs do need ongoing support to be successful, as illustrated in the following example from Kansas. KDOT established a field inspector mentor position for each of its six districts in 2005. The goal was to capture the expert field knowledge of long-time employees and to pass this knowledge on to the next generation. This initiative had strong initial top management support. The program had mixed success, and KDOT learned some valuable lessons about the kind of management support it takes to make a mentoring program work, including the following:

- Allow mentors the freedom to go where they are needed and to guide those who need help.
- Encourage mentors to let field staff members and their supervisors know when things are going well or when they notice an exceptional individual.
- Use mentors to provide a fresh set of eyes on a project to identify things that may have been overlooked and then communicate with project staff about the issues in a diplomatic manner so that they do not feel criticized or scrutinized.
- Ensure that mentors make themselves available to help answer questions about any construction inspection practice or test procedure or offer to find answers if they do not have them. (Knowing where to look for the information is just as important as having it memorized.)
- Have mentors hold training classes either in their districts or across districts to pass on their knowledge.
- Use mentors to strengthen working relationships between contractors and KDOT inspectors.
- Encourage mentors to get their hands dirty and work alongside those who they are mentoring; this helps establish trust and respect.
- Allow mentors to fill in temporarily at an understaffed or undertrained office.
- Ensure that the individuals who are selected to be mentors have (or learn) the qualities needed to establish trust.

- Resist pressure to reassign the mentor position to meet pressing operational needs.
- Avoid assigning the mentor to be the "inspector of the inspectors"; this is detrimental to the mentoring relationship.
- Ensure that the mentors are used to their full potential.

Workforce Planning

Workforce planning is a systematic process for identifying and addressing gaps between an organization's current workforce and its existing and future needs. KM techniques are available to support this process by identifying the intellectual capital attributes that are important to the organization and nurturing the development of required expertise. Workforce planning can include a risk assessment element to identify cases where employees with difficult-to-replace skill sets are eligible for retirement. KM practices also can be used to provide an awareness of existing knowledge resources, both internally and externally.

ADOT&PF's Workforce Excellence Program

The ADOT&PF representative described her agency's comprehensive workforce planning program. The agency began in 2009 with an extensive data-gathering and -analysis effort to understand workforce demographics and retirement projections. In 2011, the agency launched the Workforce Excellence Program department-wide as a three-year initiative that was tied directly to the department's strategic plan. The program was designed to address industry shifts and changing workforce demands and encompasses strategic recruitment, employee retention, and leadership development. The strategic recruitment element focuses on mission-critical, hard-to-fill vacancies and incorporates both internal development strategies and external outreach through targeted advertising. The employee retention element includes regular satisfaction surveys, training, mentoring, and recognition. The leadership development element incorporates multiple strategies to build a pipeline of leaders to fill key positions.

As illustrated by FHWA's Discipline Support System (see page 1) example, KM functions can support the establishment of networks of employees organized around discipline or function. These networks make it easier for organizations to understand existing workforce needs and competencies and how to place people in the right position in the right place at the right time. Organizations that have established networks can leverage them to quickly onboard both new employees and existing employees who are transitioning into new positions.

Capturing and Applying Knowledge

Knowledge capture involves a structured process of eliciting and documenting key insights, decision rules, methods, and lessons learned from experienced individuals. Capture of detailed knowledge and experience can be time consuming; however, opportunities can be prioritized based on the value to be added.

Knowledge Capture at Kraft Foods

The Kraft Foods participant shared the company's approach to knowledge capture and transfer. The company identifies at-risk knowledge based on the following considerations:

- Mission critical – needed to support current and future business strategies and/or current core competencies that help drive competitive advantage
- Not readily accessible – difficult-to-find documentation, no cohorts to leverage
- Rare or unique – resides within a single expert the agency is at risk of losing and expertise that is not available externally
- Stabilized – a knowledge area not likely to evolve and become obsolete or be replaced

As shown in Table 2.4, different techniques are applied to capture knowledge, depending on the need. The scan team was particularly interested in one of these techniques: the creation of Knowledge Books. These books are developed when there is little existing documentation of critical knowledge within an area, where multiple individuals would benefit, and where a champion can be clearly identified to keep the information updated. Knowledge Book topics are prioritized based on four criteria pertaining to that knowledge: its rarity, its strategic breadth, the difficulty of its acquisition, and the difficulty of its use.

Knowledge Books are created through a formal, intensive interview process with the identified champion/expert. Following a standard methodology called MASK (Method for Analyzing and Structuring Knowledge), each book covers six viewpoints: basic phenomena, concepts, processes, history, know-how, and evolution. Knowledge Books are not intended to provide an exhaustive coverage of a topic area; rather, they focus on capturing the "why" and are rich with commentary and examples. The product is an editable PowerPoint file with embedded hyperlinks. Kraft has completed 20 Knowledge Books in key technology areas.

The Kraft Foods participant shared an example Knowledge Book at the scan meeting. The book's topic was concentrated dairy products, and it was 300 pages long, took six months to develop, and covered topics such as bubble size and foam complexity. These books, which are systematically shared, have proved helpful for troubleshooting and new-employee orientation and are complementary to technical training.

Table 2.4 *Knowledge capture and transfer methods at Kraft Foods*

Approach	Description	Best used when
Job shadowing/ apprenticeship	Successor works on the job with expert	■ Successor identified ■ Time and resources can be freed up for the individuals to work together for several months
Short-term assignment	Successor spends two to three weeks intensively doing work with the expert	■ Successor identified ■ Time and funding available ■ Clarity on knowledge areas to focus on
Knowledge Books	Knowledge capture through in-depth interviews; champion uses and socializes knowledge	■ Benefits multiple individuals ■ Champion clearly identified ■ Little documentation on critical knowledge exists
Job and knowledge mapping	Detailed mapping of job responsibilities and knowledge needed to complete tasks/role	■ Successor identified to review map with subject matter expert ■ Limited time for 1:1 discussions ■ Adequate supporting documentation exists or can be developed
Documentation	Required tech reports identified for documentation.	■ Deep understanding of knowledge not required ■ Experts remaining with some knowledge and experience on the topic with existing documents available ■ Complement to other methods above

VDOT's Lessons Learned Initiative

The VDOT Lessons Learned Initiative was formalized in 2007 in conjunction with a CoP for construction quality managers. Its purpose is to capture lessons learned from experiences that are shared across VDOT, transforming tacit knowledge to documented, explicit knowledge for future use. Over 75 lessons learned have been documented and peer reviewed by multiple functions throughout the agency to ensure accuracy prior to publishing. In 2009, the Construction Quality Managers CoP won an award from AASHTO[26].

WSDOT's Knowledge Interviews

The Office of Research and Library Services (ORLS) at WSDOT has conducted knowledge interviews modeled after the exit interviews conducted by VDOT. Supervisors requested interviews of retiring employees, and ORLS offered employees the opportunity; most employees accepted. Generally, these individuals were within weeks of retirement. One of three individuals conducted each interview. The audio files were sent to University of Washington doctoral students in communications for development of summary documents, which were shared with the each interviewed employee and the supervisor. The interviews yielded useful job-specific information, and several common themes

26 VDOT Receives top 25 Awards in 2009, Press Release, Virginia Department of Transportation, March 18, 2010, http://virginiadot.org/newsroom/statewide/2010/vdot_receives_25_top45772.asp

emerged. The products were useful for incoming staff and for their supervisors. However, the effort was very labor intensive and, without dedicated resources, infeasible on a large scale.

Many knowledge repositories have been developed and populated; however, they were not used enough to justify their cost. It is important to recognize that captured information is only valuable to an organization if it is applied. Therefore, efforts to capture knowledge are only successful if the products of these efforts promote reuse. Information needs to be captured in a way that allows potential users to understand the implications and context. In addition, the organization must define and communicate expectations for how, when, and by whom this captured information is to be used.

FAA's Best/Next Practice Transfer Cycle

The FAA participant pointed out that getting value from knowledge capture requires:

- Someone to market and encourage its use by others
- Someone who needs it
- People with experience using it to help in its application and adaptation
- Highly visible, easily accessible, rich content in the form of a guide and stories in its use

The FAA views practice transfer as a cycle of activities, as illustrated in Figure 2.5.

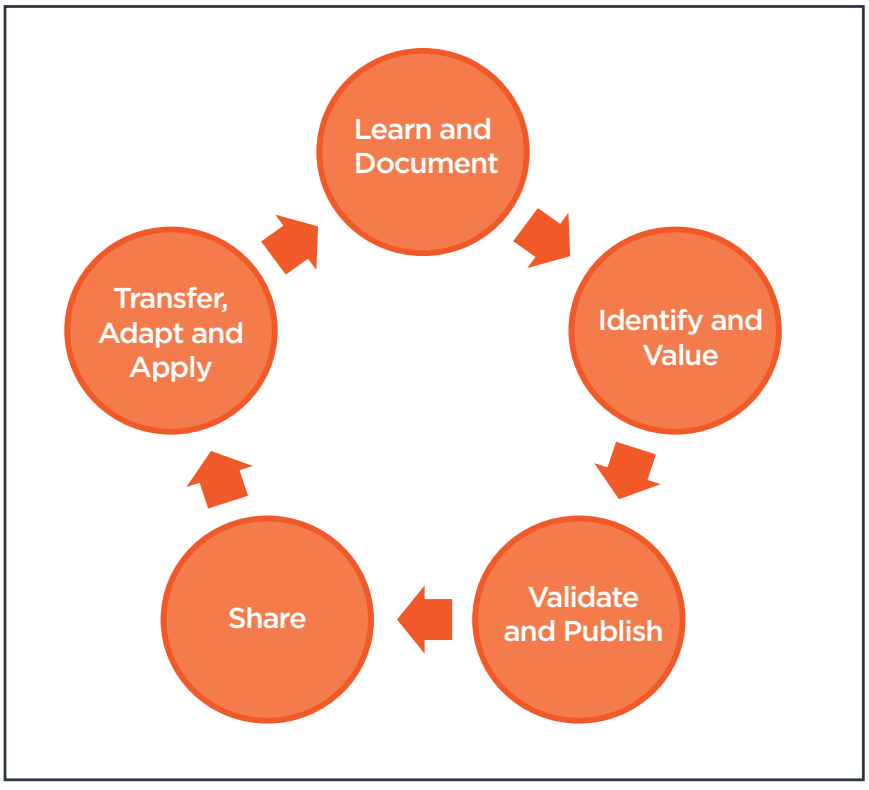

Figure 2.5 ***FAA best/next practice transfer cycle***

The FAA representative warned against building large, expensive repositories that are not well used and turn into "elephant graveyards". He identified the following key elements of a useful knowledge repository:

- The business context in which the learning occurred
- Key learnings and insights in the form of FAQs, guidelines, checklists, best practices, and stories, both local and common
- Guidance on what needs to be addressed at each stage of the process
- Links to people who have the experience to contribute
- A reference library of documents that might save the end user time
- A network to manage, validate, and renew the asset content
- Feedback from the end user to keep it relevant and alive

Highly functioning organizations will consider contractors and other working partners in their policies, procedures, and practices for knowledge capture. For example, documentation of lessons learned can be included as work tasks in contract language.

Documenting and Improving Business Processes

Some KM functions can assist with business process mapping and improvement. For example, at the FTA, the KM group helps offices identify bottlenecks and ineffective processes, and develop strategies for improvement. At VDOT, the KM office offers process mapping and "wicked problem solving" services to help the organization respond to changing requirements and improve processes that span different functional areas. Many DOTs that do not have a formal KM function have undertaken business process mapping efforts. For example, at WisDOT, business areas are expected to document their critical processes

Improving Access to Information

KM contributes to and is supported by effective IM. In layman's terms, the purpose of IM is to create a situation where there is a place for everything and everything in its place. This ensures that information that is created and stored is easily found when needed. IM requires deliberate policies and procedures that govern how information is managed throughout its life cycle.

Kraft Foods: Information Storage Guidebook

As shown in Figure 2.6, Kraft Foods has developed an Information Storage Guidebook that provides guidance on where different types of content should be stored.

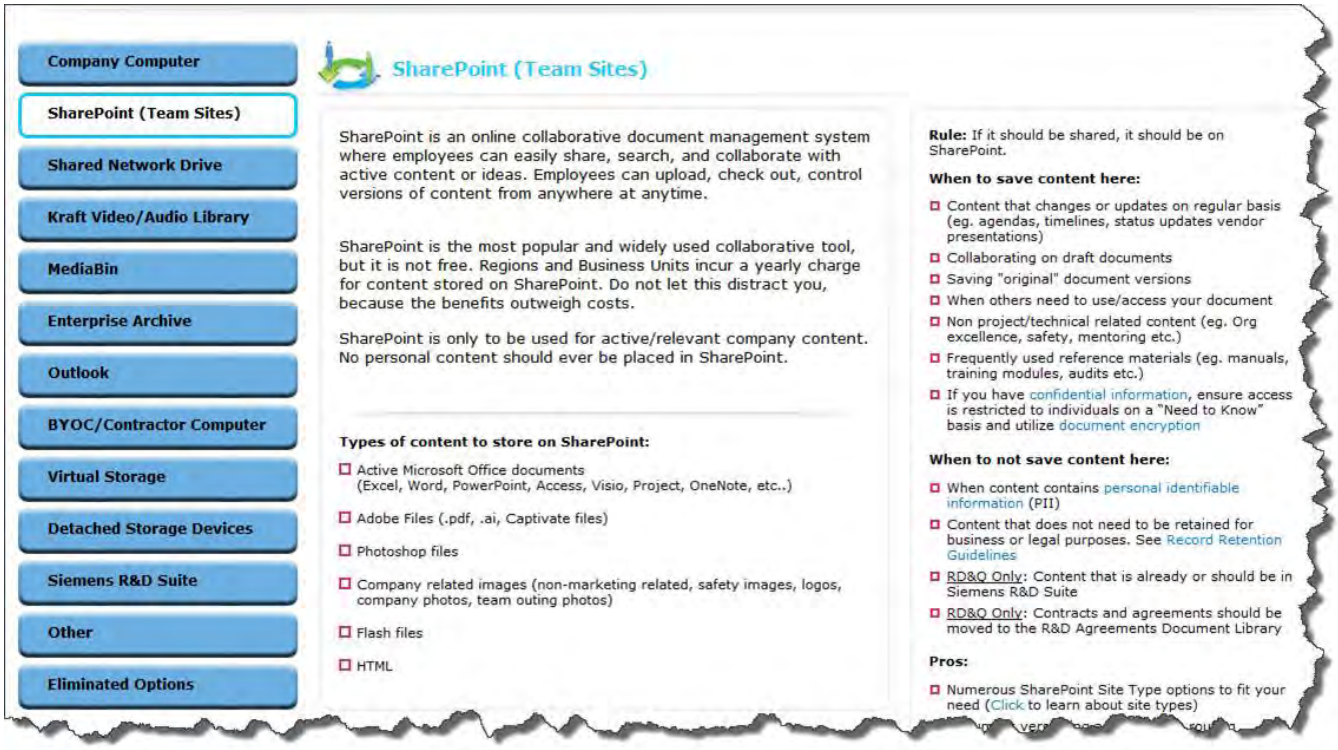

Figure 2.6 ***Kraft Foods Information Storage Guidebook***

Organizations seeking to improve information access will benefit from developing an information governance structure and an overall blueprint (a.k.a. architecture) for information organization that considers multiple sources, content types, and needs. Such a blueprint allows a decentralized approach to information collection and storage while ensuring that all of the pieces are accessible, fit together, and are not duplicative.

WSDOT: Information Governance

WSDOT has established an Enterprise Information Governance Group, which has developed principles for data and IM, and is working to create domain stewards for explicit information resources. Data and information principles are intended to serve as guideposts for the development and management of data and information resources. Efforts are underway to engage the Secretary of Transportation's Office in supporting these efforts.

IM is a challenging area for many organizations. Leadership may not understand IM and may not consider it mission-critical. This can make it difficult to marshal the necessary management attention and resources for success. The KM function in an organization can play an important role in defining how IM should support business processes and reinforce knowledge-sharing activities. Strong partnerships between KM and IT units can be formed to pursue information access improvements, taking advantage of complementary skill sets and leveraging available organizational resources.

FTA: Information Management Challenges

FTA is in the process of implementing the "TransPort" transit knowledge portal – transitioning away from a situation in which principal content repositories are shared network drives with no consistent scheme for information organization. Offices have the option of whether and how to implement metadata, while being cautioned that if they forego it at first, they still will need to undertake categorizing their content in the near future. For many, starting with simple folder structures similar to what they were used to with shared drives has eased adoption. FTA recognizes that it risks disorganization like that on the shared drives if folders are allowed to proliferate in an unmanaged fashion on SharePoint.

In its activities connected with the launch of the TransPort transit knowledge portal, the LKM Group[27] found it difficult to separate KM from IM activities, especially in the area of document management. The LKM group is working with the Office of IT to distribute the workload appropriate for their respective strengths. The Office of IT recognizes that the LKM Group's strengths are in process analysis, consulting, communications, and change management, and wishes it to continue contributing those strengths to IM applications, while the LKM Group appreciates the Office of IT's depth of technical expertise, responsive orientation, and capacity. Coordinating the activities of the two groups can make it challenging to deliver high-quality service. This is an ongoing effort in developing a smooth, effective collaboration.

Another area of overlap between KM and IM is in defining common terminology and schemes for classifying content. Knowledge sharing is fundamentally about communication, and effective communication can be thwarted when different interpretations exist for a given term. Creation and use of common terminology is a successful KM practice. This is not something that can be done in a vacuum; it requires a process of collaboration and negotiation to make progress. The following example from MoDOT illustrates how developing a common vocabulary is more than an academic exercise: it can be essential to breaking down organizational silos and developing unified guidance.

MoDOT: Consolidated Engineering Policy Guidance

In 2005, MoDOT incorporated the value engineering philosophy into its daily operations through Practical Design[28]. This philosophy challenged engineers to throw out the standard cookbook design and specifications to allow more innovation to deliver the same project benefits at a reduced cost. The program has flourished, saving more than $1 billion. The Practical Design approach was extended to the department's engineering policies and specifications.

In 2005, MoDOT began developing a new Engineering Policy Guide[29], which would replace the existing paper manuals from multiple divisions, including construction, maintenance, design,

27 Dexter T, Knowledge Management and its practice at the Federal Transit Administration, January 9, 2014, http://www.nccaiim.org/Downloads/AIIM_dexter_20140109.pptx

28 Practical Design develops efficient solutions to solve today's transportation project needs, Missouri Department of Transportation, http://www.modot.org/business/PracticalDesign.htm

29 Engineering Policy Guide, http://epg.modot.org/index.php?title=Main_Page

traffic, right-of-way, environmental, and planning. A single group coordinated and supported the effort, but experts were enlisted to write the policies. The effort involved gaining consensus on common definitions across the different groups (e.g., what is the definition of an edge drop-off?). The new online guide (see Figure 2.7 for a screen shot of the main page) was launched in 2007 and consolidates information that was formerly spread across multiple locations (e.g., a single section on guardrail describes how to design, construct, and maintain it). It also includes links to the latest research. This guide is maintained in a wiki format, which can be easily updated and searched, and maintains a change history, which is required for legal reasons. The format allows internal and external practitioners to discuss transportation engineering successes and challenges.

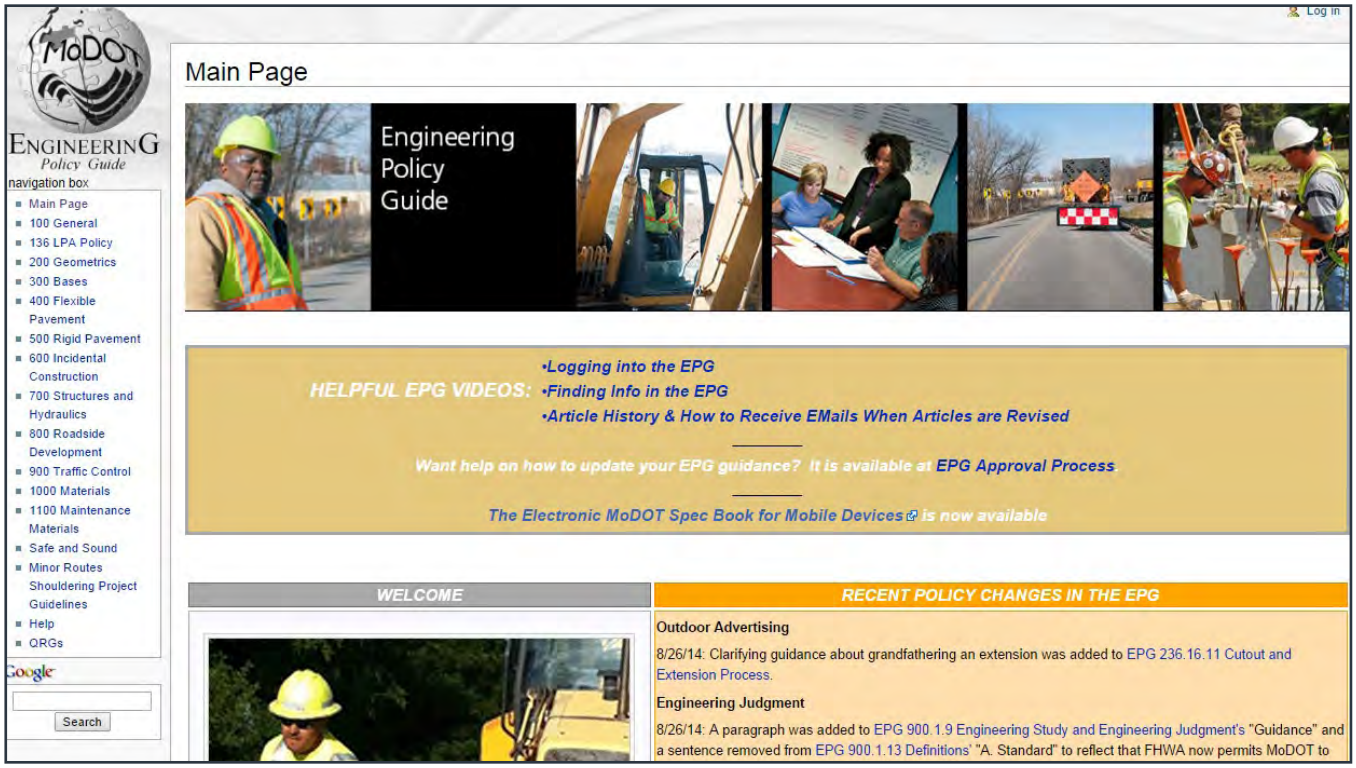

Figure 2.7 *MoDOT online Engineering Policy Guide*

CHAPTER 3

KM Implementation Strategies for State DOTs

Based on the scan findings, the scan team identified a set of strategies that DOTs can consider when investigating and implementing KM practices.

Leadership

- Request and obtain a briefing on KM from a KM expert or a peer agency with an established KM program.
- Demonstrate engagement and commitment to KM principles.
- Provide documented direction to ensure that their organizations follow established successful practices for managing corporate information.
- Establish metrics for KM linked to critical business outcomes. The agency performance-management function should be involved in developing a framework for these metrics.
- Consider integrating organizational learning, collaboration, and information sharing values into leadership training.
- Engage work groups to establish the level of trust needed for productive collaboration.

Human Resources and Intellectual Capital Management

- Develop a briefing book describing the different organizational functions and identifying the key people within each function. This book can be used for orienting new employees, including new CEOs.
- Track training provided and skill sets acquired as employees progress through their careers to make the best use of available talent.
- Integrate KM-related criteria into employee performance evaluations.
- Assign new employees a buddy to assist with their orientation to the agency.

Recognition for Collaboration and Information Sharing

- Review and update hiring practices and position descriptions to support the agency's values with respect to collaboration and information sharing. Provide HR, hiring managers, and

selection panels a clear understanding of the qualities the organization seeks.

- Consider establishing an award for employees and teams that model exemplary collaborative behavior.
- Consider developing a program for new and existing employees to communicate organizational values and desired behaviors.

Fostering Networks and Communities of Practice

- Develop and make available searchable expertise directories.
- Establish CoPs that enable employees to exchange information and share knowledge. These communities can be leveraged to bring new employees up to speed quickly so that they can contribute to the organization sooner.
- Identify and document existing formal and informal networks or communities that are in place and make this information widely accessible, especially to new employees.
- Develop policies for incorporating employees into networks based on their primary discipline. The FHWA Discipline Support System (see page 1) provides a model for this.
- Encourage and reward employee participation in CoPs.

Knowledge Capture and Application

- Develop and support processes for peer reviews (before a project or initiative), action reviews (during a project or initiative), and retrospective reviews (after a project or initiative) to ensure that available knowledge is applied, teams learn from experience, and key lessons are captured for future use.
- Capture the stories and perspectives of technical experts and leaders within and outside the organization by inviting these individuals to speak and creating podcasts or videos that can be shared across the organization.
- Capture institutional knowledge by looking at significant events in the agency's history, examining and discussing what led up to these events and how they were handled, and making this information available for future use.
- Establish criteria to prioritize the information and knowledge that are to be captured and shared.
- Develop standard contract language to ensure that information and knowledge are captured from contractors and other working partners.

Information Management and Dissemination

- Institute IM practices to ensure that important information can be found in a timely and reliable manner.
- Develop a blueprint for information organization that considers multiple sources, content types, and needs.
- Engage the business units in developing and maintaining common terminology and definitions.
- Review policies and procedures to eliminate duplication and inconsistencies, and use a common language.

CHAPTER 4

Dissemination Strategies and Actions

The scan team identified strategies and actions that scan team members, AASHTO, the Transportation Research Board[30] (TRB), USDOT, and other organizations can pursue to disseminate the results of this scan and foster awareness and support implementation of KM techniques within DOTs. These strategies and actions are summarized in this section. Many of the recommended actions were initiated directly following the scan meeting.

Strategies to Foster KM Implementation

Increase Understanding of KM Across the DOT Community

- Distribute scan material through broad and multiple channels within DOTs.
- Develop a list of experts who can speak about KM to different DOT audiences.
- Develop a set of webinars tailored to different DOT audiences.
- Develop a resource base of written and/or videotaped KM case studies, drawing on the scan materials.
- Form a cross-DOT CoP for KM implementation support.
- Incorporate KM principles into the curriculum for AASHTO's two-week leadership training institute.

Develop Tools and Resources to Support KM Implementation in DOTs

- Identify or develop an assessment tool for DOTs to use to inventory existing KM efforts.
- Develop a research needs statement for a transportation agency-specific KM maturity model.
- Collect and disseminate a set of standard job descriptions for KM leads and different KM roles.
- Survey organizations that have a designated KM lead, and document where this is located and what its specific functions are.
- Develop a road map to implementing sustainable KM.

30 Transportation Research Board, http://www.trb.org/Main/Home.aspx

- Scope a research effort to assess productivity loss and risk that result from lack of information sharing.

Actions to Foster KM Implementation

Conference Presentations

TRB

- TRB Annual Meeting
  - Highlight key findings as part of already scheduled sessions:
    - Session 499 – Advancing DOT Practice in Knowledge Management
    - Session 724 – Managing Information and Knowledge: Tools of the Trade
    - Present a summary of the scan findings at the meeting of the TRB Task Force on Knowledge Management at the 2014 Annual Meeting
  - Brief TRB committees on the scan
- TRB Executive Board Meeting

AASHTO

- AASHTO Annual Meeting
- Regional AASHTO meetings
  - Western Association of State Highway Transportation Officials (WASHTO)
  - Mid-America Association of State Transportation Officials (MAASTO)
  - Southeastern Association of State Highway and Transportation Officials (SASHTO)
  - Northeastern Association of State Transportation Officials (NASTO)
- AASHTO Subcommittee on Personnel and Human Resources
- AASHTO Research Advisory Committee
- AASHTO Standing Committee on Research (December 2014)
- Other AASHTO Committees and Subcommittees – (e.g. Standing Committee on Highways [SCOH], Subcommittee on Transportation Systems Management and Operations [SCOTS], etc.)
- AASHTO Leadership Academy

Other

- National Transportation Training Directors meeting
- State Smart Transportation Institute (SSTI)
- USDOT – internal staff presentations
- Utah DOT (and potentially other DOTs) – introduction to KM from VDOT

Webinars

- KM scan webinar series (potentially delivered via National Highway Institute)
  - Scan Overview
  - VDOT's KM Program
  - KM and Project Delivery
  - FHWA Learning Development Model Webinar
  - FAA Learning Before, During, and After Webinar
  - Alberta Transportation Leadership

Articles

- Article on KM for *TR News*[31] or *Public Roads*[32]
- Article on KM for Washington State LTAP newsletter[33]

Videos

- AASHTO TV Network – interview with scan team chair and other members
- KM for state DOTs – to be produced by ADOT
- Speaker's bureau video presentations on different KM topics (TBD)

31 *TR News* Magazine, http://www.trb.org/Publications/PubsTRNewsMagazine.aspx
32 *Public Roads*, https://www.fhwa.dot.gov/publications/publicroads/
33 *LTAP News*, http://www.wsdot.wa.gov/localprograms/ltap/news.htm

KM Resource Development/Research Initiatives

- Organize a KM speaker's bureau (including short video presentations from the available speakers).
- Develop unit on KM for National Highway Institute[34] two-week transportation leadership course.
- Organize a workshop on developing a knowledge book, modeled after the Kraft Foods program.
- Develop case studies based on the scan presentations.
- Identify available assessment tools to help DOTs inventory existing KM-related activities.
- Survey organizations with KM functions to collect and compile job descriptions for these functions.
- Scope and initiate a research effort to assess risk and lost productivity associated with lack of information sharing.
- Scope and initiate a research effort to develop a transportation agency-specific KM maturity model (longer-term initiative – no immediate action recommended).
- Scope and initiate a research effort to develop a road map to sustainable KM (longer-term initiative – no immediate action recommended).

Other

- Establish a CoP for KM scan participants to continue sharing information about KM practice.
- Coordinate with upcoming NCHRP research projects related to KM and IM (20-96[35], 20-97[36], and 29-98[37]) to identify opportunities to incorporate principles and practices into research products.
- Have scan team members conduct informal outreach within their organizations and communities.

34 National Highway Institute, https://www.nhi.fhwa.dot.gov/default.aspx

35 NCHRP 20-96 Leadership Guide for Strategic Information Management for State Departments of Transportation, http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3664

36 NCHRP 20-97 Improving Findability and Relevance of Transportation Information, http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3665

37 NCHRP 20-98 A Guide to Agency-Wide Knowledge Management for State Departments of Transportation, http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=3666

CHAPTER 5

Summary

Several DOTs have considered KM strategies as a way to mitigate impacts associated with the loss of valued and experienced employees. One state DOT (Virginia) and two USDOT administrations (FTA and FAA) have taken a comprehensive approach to KM implementation; other DOTs have implemented selected KM program elements. Agencies that have implemented KM have found that it can be much more than a workforce succession-management strategy. They view KM as an integral part of broader efforts to improve organizational effectiveness and foster a culture of learning and innovation. To realize and sustain benefits from KM, agencies must ensure that the KM function is strong and sustainable. This involves selection of an effective KM lead with political savvy and a customer service orientation, treating KM as a strategic function that reports to the leadership team, linking each KM initiative to core business objectives and building strong networks for knowledge sharing throughout the organization.

The field of KM has evolved from an early focus on IM to include broader consideration of employee learning, collaboration and mentoring. KM programs include a wide range of activities to:

- Understand the organization's knowledge base and identify gaps
- Capture and codify valuable knowledge (e.g., lessons learned)
- Facilitate access to critical knowledge, both online and person to person
- Ensure that knowledge is used and applied within business processes
- Foster a culture of collaboration and knowledge sharing

CoPs, in which groups of employees with similar or intersecting responsibilities meet periodically to share knowledge and discuss challenges, are one particularly effective, yet simple-to-implement KM strategy. Defining and managing common terminology is another important KM strategy that supports both IM and collaboration across organizational silos.

State DOTs wishing to pursue KM implementation can use the results of this scan to understand better KM objectives, potential benefits, implementation approaches, and specific programmatic elements. The scan team is undertaking an extensive set of communication activities to disseminate key findings from the scan.

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Members of the scan team whose organizations were included in the scan are identified with an asterisk (*)

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Appendix B: Scan Team Biographical Sketches

JOHN HALIKOWSKI (AASHTO CHAIR) is the Director of the Arizona Department of Transportation (ADOT). Early in his career, he spent six years with ADOT serving in various capacities, including Motor Vehicle Division Deputy Director and Operations Chief. He also served for 12 years at the Arizona House of Representatives as Director of Research. Halikowski received his bachelor's degree in communications from Arizona State University. He has also completed several professional training programs for transportation leaders, including the Wharton Transportation Executive Program and the AASHTO National Transportation Leadership Institute. Halikowski is the current WASHTO president, and serves on various transportation-related boards, commissions, committees, and councils, including the TRB Executive Board and the Subcommittee for NRC Oversight (SNO).

BECKY BURK is the Performance Management Manager at the Maryland State Highway Administration. She has been with MSHA since 1994 and has experience in a variety of areas, including auditing, human resources, finance, and now, at her current position, in performance management. Burk held similar positions in the private sector, specifically at General Electric, where she studied and trained on the Deming philosophy. She has presented at annual AASHTO meetings as well as the annual TRB conferences on subjects such as performance excellence and knowledge management. Burk received a bachelor's degree in business from Miami University of Ohio.

LORI DABLING was Utah Department of Transportation (UDOT) State Project Manager (She retired when this report is published.) Dabling began her transportation career with the FHWA in 1979, serving in a construction field office for four years. In 1983 she began work with the state UDOT Construction Division, later transitioning into region Preconstruction as a designer developing plan packages for rural and urban highway projects. During this time she completed the UDOT FE Engineering Program at the University of Utah and Brigham Young University. When UDOT initiated their project management program she served as a region project manager for eleven years, later leading UDOT's PMO as State Project Manager. After creating a variety of PM and team process guides, the PMO recognized that more efficient methods to share and transfer staff experience were needed due to the high volume of team member career movement within UDOT. The challenge to create more effective PM training tools led to explore knowledge management practices that could improve the ways team members share their knowledge and experience with new or transitioning staff. UDOT's PMO continues to pursue knowledge management techniques as a practical approach to expand the sharing of experience, organizational knowledge and the stories that support project teams.

ARTHUR "TURO" DEXTER is the Knowledge Resources Manager for the Federal Transit Administration (FTA), part of the U.S. Dept. of Transportation. In FTA's integrated Learning and Knowledge Management Group, Turo works with headquarters and regional offices to support the learning, development and engagement of FTA employees by facilitating knowledge sharing and sound information management. Among other activities, his team conducts and records interviews and roundtables with people in key FTA roles; maps business processes; and facilitates knowledge cafes, communities of practice, and lessons-learned sessions. He works to spark innovation and employee engagement via the award-winning DOT IdeaHub program, and to educate FTA employees

on the range of collaborative tools available to them, including FTA's SharePoint-based transit knowledge portal. A recovering technology consultant, Turo entered federal service in 2010 to make government better. He is a member of the Transportation Research Board KM Task Force, the AIIM standards committee on KM in organizations, and the Federal KM Community of Practice. He holds a Master of Public Administration degree, and is a CompTIA Certified Technical Trainer and AIIM Certified Information Professional.

DR. ANNE ELLIS is Assistant Deputy Director at the Arizona DOT, with responsibilities in the ITS and freight policy arenas as well as national issues research and policy development. She is a member of several AASHTO and TRB committees and task forces, including STRAP (TRB State Representatives' Advisory Panel), IDEA (NCHRP 20-30); Conduct of Research (AGB10); Management of Transportation Research (ABG05T); Context-Sensitive Solutions (AFB50T); and Transportation of Hazardous Materials (AT040), for which she is also Communication Coordinator. She co-chairs the Coordination and Collaboration Task Force, is the past Region 4 Chair for the Research Advisory Committee, and past Secretary for WASHTO. Dr. Ellis has worked in research for twenty-five years, in new product development and program management in the public, private, and academic sectors, and is an author on 11 patents and papers. She holds a bachelor's degree in Chemistry and an MBA in Strategic Marketing from SUNY/Buffalo, and a Ph.D. in Public Policy/Transportation and Environmental Policy from Arizona State University.

MAUREEN L. HAMMER is the Director of Knowledge Management of the Virginia Department of Transportation (VDOT) and has been with VDOT since 2003. Her focus is on knowledge identification, organization, and dissemination; library science; knowledge systems; change management; conflict management; management and leadership; organizational development; organizational behavior; and qualitative research and analysis. Hammer chaired the program committee for the 56th Virginia Transportation Conference in 2007. She is an active member of the Transportation Research Board (TRB), serving as chair of the Committee on Productivity and Management (ABC20), a member of the Knowledge Management Taskforce, and a friend of the Committee on Strategic Management Committee (ABC10). She is also a member of the Federal Knowledge Management Working Group and the e-GOV Knowledge Management Conference Advisory Board. Hammer is a frequent speaker and writer on knowledge management in government; has consulted with several government and nongovernment organizations developing knowledge management programs; and is a member of Beta Phi Mu, the National Library Science Honors Society. She is adjunct faculty for Business Administration, Baker College, in Michigan, where she teaches management theory, change management, and organizational behavior. Hammer has held several library and knowledge management positions in private industry, academic and health services organizations. Under her leadership, the VDOT Knowledge Management Program was recognized by the American Association of State Highway and Transportation Officials Performance Management Committee with the 2009 Trailblazer Award; was a finalist in the 2008 Harvard Innovations in Government Award; and was a finalist in the 2007 KM Reality Award for KM World. Hammer received her bachelor's degree in political science from the University of Nebraska, her master's degree in library science from Emporia State University, and her doctor of philosophy degree in organization and management from Capella University.

CARIN MICHEL is a special projects manager for the Department of Transportation's Federal Highway Administration in Baltimore. She currently serves as the program manager for the Second Strategic Highway Research Program (SHRP2) and, in that capacity, oversees FHWA's programmatic activities with regard to the program. While with FHWA, Michel also served as the Project Manager for the Federal Aid Essentials for Local Public Agencies initiative, Manager of the Communications & Marketing Team, and National Media Trainer. Prior to joining FHWA, she was a Public Affairs & Media Relations Specialist for the Internal Revenue Service. Michel is a certified mediator and facilitator, and holds both bachelor's and master's degrees (summa cum laude) in communications

LENI OMAN is the Executive Director of the Washington State Transportation Center (TRAC). She has been employed by the State of Washington for over 24 years and with the Washington State Department of Transportation for 17 years. She has been the Director of the Office of Research and Library Services with WSDOT since 2003. Oman's career includes a diverse mix of fish health management, information management, as well as water quality, spill response, watershed, and flood management. Prior to WSDOT, she was employed by the Northwest Indian Fisheries Commission; the Washington Department of Wildlife; the Washington Department of Fish & Wildlife. Oman is a member of the Pacific Northwest Transportation Consortium (PacTrans) External Advisory Board and the Board of Advisors for the National Institute for Transportation and Communities. She is also the Chair for the AASHTO Research Advisory Committee Task Force on Transportation Knowledge Networks, and of a member of the AASHTO Standing Committee on Research; RAC Region 4, the RAC Task Group on Collaboration and Coordination, and the RAC-CUTC Liaison Group. Oman is the Transportation Research Board (TRB) State Representative for WSDOT and serves on the State Representative Advisory Panel. She chairs the TRB Task Force on Knowledge Management and is a member of the Policy and Organization Group and Conduct of Research Committee. She is a member of the panel for the National Cooperative Highway Research Project titled Leadership Guide for Strategic Information Management for State Departments of Transportation (NCHRP 20-96). She holds a master's degree in veterinary science from the University of Idaho and a bachelor's degree in liberal arts from Goddard College (Vermont).

LEE WILKINSON is the Director of Operations and Finance Division of Iowa Department of Transportation (Iowa DOT). Wilkinson began his Iowa DOT career in 1996 as an area maintenance manager in District 6. In 2000, he was promoted to Director of the Office of Maintenance. He was named Director of the Operations and Finance Division in December 2006. Prior to coming to the department, Wilkinson worked at the Iowa Department of Personnel from 1991 to 1996 as a personnel officer. The Iowa DOT was one of the agencies he assisted while in this position. From 1989 to 1991, Wilkinson served as a management analyst in the Iowa Department of Revenue and Finance. Wilkinson is a graduate of the University of Northern Iowa with a degree in public administration, with an emphasis in personnel.

FRANCES D. HARRISON (SUBJECT MATTER EXPERT) is a founding partner of Spy Pond Partners, LLC, a consulting firm specializing in information and performance management for transportation agencies. She has over 30 years of experience in transportation consulting. Her career has encompassed a wide range of topic areas, including knowledge management, transportation decision support tools, transportation data integration, asset management, performance management, transportation maintenance and operations, corridor planning, special needs transportation, and project evaluation. Harrison has authored over 100 research reports, design documents, user manuals, and handbooks. She is currently serving as the chair of the Transportation Research Board (TRB) Information Systems and Technology Committee, and is a member of the TRB Task Force on Knowledge Management and the TRB Special Task Force on Data for Decisions and Performance Measures. She is also a member of the Boston Chapter of the Women's Transportation Seminar. Harrison has a bachelor's degree in civil engineering from the Massachusetts Institute of Technology and a master's degree in civil engineering-transportation from the University of California, Berkeley

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Appendix D: Desk Scan Results

Literature Review

KM Synthesis Documents

NCHRP Synthesis 365, "Preserving and Using Institutional Memory Through Knowledge Management Practices" [38] was published in 2007 and provides the most recent in-depth investigation of KM practices in transportation agencies. This synthesis featured case studies of KM programs in VDOT, Maryland State Highway Administration[39] (SHA), Texas DOT[40] (TxDOT), and FHWA. It also presents results of a detailed questionnaire on KM practices that was completed by 34 state DOTs, three Canadian provinces, and one Canadian city. In addition to these case study agencies, 10 other agencies were noted for having KM programs/practices (some in the rollout stage):

- Arizona – records retention policy, construction project document management, enterprise data warehouse, succession plan, training and mentoring
- California – agency-wide records manager, history program centered in the library
- Kansas – knowledge capture, intranet portals, training and mentoring
- Kentucky – knowledge capture, exit interviews
- Minnesota – emphasis on enterprise document management
- Missouri – intranet portal, procedures for how to find resources, training and mentoring
- Nebraska – records retention policy, library services, succession plan, training and mentoring
- New Brunswick (Canada) – after-action reviews, succession plan, training and mentoring
- Ohio – library services, succession plan, training and mentoring
- Pennsylvania – CoPs, after-action reviews

While many of these agencies reported having an agency-wide KM program, it appears from the more detailed survey results that the presence of an active library, document management function, or data warehouse program was the basis for this statement in most cases. The study's overall conclusion was that, "there is weak implementation among [state transportation agencies] of KM as an intentional, purposeful business process. Knowledge is generally not seen as an asset of sufficient importance to warrant organization-wide attention." It cited the five-part "European Guides to Good Practice in Knowledge Management"[41] published by CEN in 2004 as the most helpful overall reference on KM implementation.

38 NCHRP Synthesis 365 Preserving and Using Institutional Memory Through Knowledge Management Practices, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_365.pdf

39 Maryland State Highway Administration, http://www.roads.maryland.gov/Home.aspx

40 Texas Department of Transportation, http://www.txdot.gov/

41 European Guide to Good Practice in Knowledge Management – Part 1: Knowledge Management Framework, CEN Workshop Agreement CWA 14924-1, March 2004, ftp://cenftp1.cenorm.be/PUBLIC/CWAs/e-Europe/KM/CWA14924-01-2004-Mar.pdf

A 2010 KM research synthesis by CTC & Associates for Wisconsin DOT[42] presented the results of an extensive literature review that covered KM practices in the transportation and other sectors. This synthesis cast a broad net and included general references on KM, coverage of technology transfer activities, and efforts to build regional and national knowledge networks in transportation. Transportation agency programs identified in this synthesis included VDOT, Pennsylvania DOT[43] (PennDOT), Maryland SHA, TxDOT (pavement forensics), Maine DOT[44] (MaineDOT) (institutional memory project), and FHWA.

Published in 2011, NCHRP Report 685, "Guide to Implementing Strategies to Attract and Retain a Capable Transportation Workforce"[45] identified 13 critical workforce development functions, including KM and succession planning. Case studies of Minnesota DOT (MnDOT) and PennDOT were conducted in the succession planning area; a VDOT case study was featured for the KM area.

A 2012 report on "Succession Planning at State Departments of Transportation"[46] involved interviews with 13 state DOT Human Resources managers, and identified two state DOTs with, "knowledge libraries, which are used to crystallize institutional memory within the agencies." It also noted that "these state DOTs more easily identify workforce needs and more easily develop training solutions to ensure that their state DOTs have the human capital needed to meet agency missions." Subsequent follow up with the author identified Maryland and Alaska as the two state DOTs with notable succession planning programs.

Recent References – KM in Transportation

The following additional references related to KM in transportation were identified. The search focused on recent references (i.e., the past five to six years), given that NCHRP Synthesis 365 included a thorough literature review for sources prior to 2007.

- A 2013 TRB paper on the impact of outsourcing on KM at the Kentucky Transportation Cabinet[47]. This paper presented recommendations for implementing KM strategies at the cabinet; it did not identify existing advanced KM practices at that agency.
- A 2013 TRB presentation on "Knowledge Transfer in Organic and Mechanistic State Government Transportation Research Organizations"[48]. This paper recommends a less formal or organic approach to knowledge transfer, emphasizing relationships and project-oriented knowledge transfer partnerships.

42 CTC & Associates LLC. Knowledge Management in the Transportation Sector, Transportation Synthesis Report. WisDOT Research & Library Unit. April 9, 2010

43 Pennsylvania Department of Transportation, http://www.dot.state.pa.us/

44 Maine Department of Transportation, http://www.maine.gov/mdot/

45 NCHRP Report 685, Strategies to Attract and Retain a Capable Transportation Workforce, 2011, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_685.pdf

46 Wheeler AR, Succession Planning in State Departments of Transportation, 2012, http://131.128.106.203/uritc-org/media/finalreportspdf/0003082.pd

47 Gibson JB, and CY Wallace, Outsourcing and Its Impact on Knowledge Management: A Case Study of the Kentucky Transportation Cabinet, 2012, http://docs.trb.org/prp/13-1376.pdf

48 Crichton-Sumners C, M Mansouri, and B Sauser, Systems Thinking for Knowledge Transfer in Organic and Mechanistic Organizations, Transportation Research Record: Journal of the Transportation Research Board, February 24, 2014, http://trb.metapress.com/content/4146337625g2871u/?genre=article&id=doi%3a10.3141%2f2399-12

- A 2012 TRB paper synthesizing the KM aspects of NCHRP Project 20-81: Guide to Implementing Strategies to Attract and Retain a Capable Transportation Workforce[49] included VDOT as a case study.
- A 2012 research report on "Knowledge Transfer Needs and Methods" conducted for the Alaska Department of Transportation and Public Facilities[50]. The research involved interviews with 61 employees to identify how knowledge was being transferred. This report included a literature review and recommended a set of strategies for knowledge capture and transfer, including both tacit and explicit knowledge. A key observation from the literature review was related to the importance of human factors: fostering a culture of knowledge sharing, in contrast to the initial emphasis within KM on technology solutions. This report highlighted a couple of useful resources from the State of New Hampshire[51] and the State of Alaska[52] that provided compendia of knowledge transfer techniques.
- A 2012 TRB session on KM including presentations from:
  - Susan Camarena (FTA Chief Knowledge officer), who provided an overview of KM activities and challenges at federal agencies
  - Maureen Hammer (VDOT KM Program manager) on current IM activities, including Data Communities of Interest and re-architecture of the agency's SharePoint portal
  - Jay Liebowitz (Johns Hopkins University professor) on 10 "rules of the road" for implementing KM
- A 2011 report on a Georgia Tech project with GDOT that implemented CoPs[53]. An interview with Rick Smith at GDOT (see page 1 in this appendix) provided further information on this effort.
- A 2011 TRB paper on "Low-Cost Knowledge Management Techniques for Use in a Changing Workforce"[54] reporting a pilot KM initiative at WisDOT.
- A 2011 paper "Management of Technical Knowledge within a Road Authority"[55], presented

49 Cronin, Brian, et al. "Knowledge Management as Part of Strategic Workforce Development in Transportation Agencies," Transportation Research Board 92nd Annual Meeting, No. 13-2705,2013

50 Perkins RA, and FL Bennett, Knowledge Transfer Needs and Methods, 2012, FHWA-AK-RD-12-26 http://ine.uaf.edu/autc/files/2013/07/510009.Perkins.-FINAL.pdf

51 Knowledge Management & Transfer Model {Techniques and Forms}, Workforce Development Toolkit, Human Resources, New Hampshire Department of Administrative Services, http://admin.state.nh.us/hr/workforcetoolkit.html

52 Knowledge Transfer in State of Alaska, Division of Personnel & Labor Relations, Department of Administration, State of Alaska, 2008, http://doa.alaska.gov/dop/fileadmin/StatewidePlanning/pdf/WorkforcePlanning-KnowledgeTransferInStateOfAlaskaAgencies.pdf

53 Kingsley G, J Knox-Hayes, and J Rogers, Developing Strategic Systems Supporting Communities of Practice in the Georgia Department of Transportation, GDOT Research Project No. 10-05, http://www.dot.ga.gov/doingbusiness/research/Documents/1005.pdf

54 Wittwer E, and T Adams, Low-Cost Knowledge Management Techniques for Use in a Changing Workforce, Transportation Research Board 90th Annual Meeting, 2011, http://trid.trb.org/view.aspx?id=1092338

55 Casey J, Management of Technical Knowledge Within a Road Authority, 2011 Austroads Bridge Conference, https://www.austroadsforums.com.au/display/abc/Management+of+Technical+Knowledge+within+a+Road+Authority,+John+Casey

at the Austroads Bridge Conference on KM within the New South Wales (NSW) Roads and Traffic Authority.

- A 2011 report[56] describing an effort to transfer institutional memory of road design from retired engineers from the Maine DOT to University of Maine engineering students.
- A 2011 TRB presentation on KM at the FTA[57]. This presentation describes the formation of FTA's KM program in 2007, with establishment of a vision and strategic goals, and implementation of both technology and non-technology program elements, including legacy knowledge capture, after-action reviews, and a knowledge portal.
- A 2010 study of an organizational network analysis conducted for WSDOT – this study examined how two networks of work groups shared information[58]
- A 2010 paper by Michael Novak and Maureen Hammer that provides an excellent overview of KM, with a case study of VDOT's program. This paper reviews foundational literature within the KM field, tracing the emergence of the knowledge economy, identifying the multiple disciplines that fall under the KM umbrella (i.e., collaboration, innovation, organizational learning, knowledge repositories, quality improvement, and business process reengineering), and describing the characteristics of knowledge workers and knowledge work. The paper outlines issues of particular concern to public sector agencies, covering knowledge loss associated with retiring career employees and with the transition to a smaller and more transient workforce, with greater use of contractors. It presents a case study of how VDOT has used "tacit knowledge networks" to share institutional knowledge, and concludes by emphasizing the importance of leadership in the KM arena.[59]

Workforce Planning in Transportation Agencies

A search of the AASHTO Subcommittee on Human Resources web site was conducted. The Articles of Interest page60 includes sample materials on succession management/workforce planning from Alaska and Indiana. The web site also includes a link to the online AASHTO Workforce Toolkit[61] developed through NCHRP Project 20-72 in 2008[62]. A search of this toolkit identified workforce

56 Gårder PE, Institutional Memories of Road Design, New England University Transportation Center Project UMEE21-15, 2011, http://utc.mit.edu/uploads/UMEE21-15%20FP.pdf

57 Stoltzfuss, J, Strategic and Tactical Approaches to Knowledge Management in the Federal Transit Administration, P11-0631, Transportation Research Board Annual Meeting, 2011, http://amonline.trb.org/2011-1.191976/t-11-034-1.205743/416-1.205812?qr=1

58 Brown S, Organizational Network Analysis for Two Networks in the Washington State Department of Transportation, Washington State Department of Transportation, 2010, http://www.wsdot.wa.gov/Research/Reports/700/754.1.htm

59 Novak MJ and M Hammer, Tacit Knowledge Transfer in a State Transportation Agency, Ohio Transportation Engineering Conference, October 27 and 28, 2009, https://www.dot.state.oh.us/engineering/OTEC/2008%20Presentations/35A.pdf

60 Articles of Interest, AASHTO Subcommittee on Personnel and Human Resources, American Association of State Highway and Transportation Officials, http://ashr.transportation.org/Pages/ArticlesofInterest.aspx

61 Workforce Toolkit, http://toolkit.ashr.transportation.org/NCHRP.aspx

62 Tools to Aid State DOTs in Responding to Workforce Challenges, National Cooperative Highway Research Program Report 636, Transportation Research Board, http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_636.pdf

planning and development programs at Montana DOT, South Carolina DOT, WSDOT, West Virginia DOT, and VDOT. Additional searches and inquiries on DOT workforce topics identified:

- A 2011 ADOT&PF succession planning study[63]
- A 2007 West Virginia DOT workforce development study[64]
- A 2006 WSDOT workforce analysis report[65]

Other References of Interest

A general Internet search for KM in the public sector and KM in private engineering firms yielded the following additional sources of note:

- A 2011 Harvard Business Review case study of KM implementation at the World Bank[66]
- A 2008 paper by a Stanford University researcher on KM activities at Fluor Corporation[67], potentially relevant to the scan given the strength of the program and the engineering environment in which it was implemented
- A 2007 monograph by David E. McNabb, Knowledge Management in the Public Sector: A Blueprint for Innovation in Government[68], with discussions of KM implementations at NASA, Department of Homeland Security, the General Services Administration, the U.S. Army, and the U.S. Navy
- The Federal Knowledge Management Working Group web site[69], with links to information about KM programs in diverse agencies. A list of chief knowledge officers accessed on this site includes those at NASA, the Federal Bureau of Investigation, the U.S. Army, the U.S. Air Force, the Secret Service, the International Trade Commission, the USDOT Federal Transit Administration, the USDA Forest Service, the Department of Veteran Affairs General Counsel, and the Office of the Inspector General of the U.S. Postal Service.

63 Perkins RA, Serving Future Transportation Needs: Succession Planning for a State Department of Transportation Organization, Its People & Mission, Final Report, INE/AUTC 12.02 FHWA-AK-RD-12-01, Alaska University Transportation Center and Alaska Department of Transportation Research, Development and Technology Transfer, June 2011, http://ine.uaf.edu/autc/files/2012/05/309038.Perkins.-Final-Report.pdf

64 Workforce Development Study Report, West Virginia Department of Transportation, http://www.njrati.org/assets/reports/TRP%2008-04.pdf

65 Workforce Analysis Task, Draft Report, February 24, 2006, Washington State Department of Transportation and Statewide Program Management Group, http://www.wsdot.wa.gov/NR/rdonlyres/932BF085-4155-486E-B1F1-EFF5FAD8416E/0/WorkforceAssessment_SPMG.pdf

66 Oppenheimer D and L Prusak, Knowledge Management at the World Bank, Harvard Kennedy School, April 5, 2011, http://hbr.org/product/knowledge-management-at-the-world-bank/an/HKS673-PDF-ENG

67 Will AJ, The Institutionalization of Knowledge Management in an Engineering Organization, Working Paper #40, Collaboratory for Research on Global Projects, Stanford University, 2008, https://gpc.stanford.edu/sites/default/files/wp040_0.pdf

68 McNabb DE, Knowledge Management in the Public Sector: A Blueprint for Innovation in Government, M.E. Sharpe, November 2006, https://www.mesharpe.com/mall/resultsa.asp?Title=Knowledge+Management+in+the+Public+Sector%3A+A+Blueprint+for+Innovation+in+Government

69 Federal Knowledge Management Working Group web site, https://sites.google.com/site/fmwgroupnasa/home

- An article in Government Computing News[70] described the Defense Knowledge Online system, that includes a social networking MilSuite with a blog, a wiki, and a Facebook-like application. These components are linked via a virtual business card for each employee. If an Army employee writes a wiki entry on systems engineering, a Navy employee can view that person's profile and find other people with whom that person is connected.
- The American Productivity and Quality Center web site[71], including a knowledge base on KM topics, though most of the resources are only available to paid members. Based on a scan of the titles available, this site has a wealth of materials for those seeking to implement KM. However, no case examples of KM implementations within transportation agencies were identified. Presentations from the center's 2013 conferences provide useful materials on general trends and specific implementations within organizations, including at Kraft Foods, Aspen Technology, and Accenture[72].
- An Alberta government web page on KM[73] that provides a catalog of agency-wide and smaller scale techniques. (Follow-up contacts to learn more about their programs were unsuccessful.)

Interviews/E-Mail Communications

Rick Smith *Georgia DOT Office of Training and Development (July 10, 2013)*

- A GDOT KM Task Force was established in January 2013, led by the Training Office. The Task Force includes participants from Planning, Utilities, and HR. They meet monthly – and hope to draft a KM policy soon that will make it sustainable in the organization. The Task Force is about to conduct a survey on KM techniques currently in use throughout the department.
- There are four CoPs: GIS, environmental, roundabouts, and design (training course leaders/participants). The first two are well established; the second two are just getting started. It is currently in the second phase of a study Georgia Tech is conducting that will recommend methods for fostering development of CoPs. The first phase reviewed GDOT's existing CoPs. The study should be completed in the next six to 12 months.
- GDOT has a well-established succession management program; it just took applications for the third cohort of employees to be included. It has shared information on its program with the AASHTO HR Subcommittee. It has been doing mentoring and is starting to broaden this program. It is initiating a cross-training program – with a purpose beyond succession

70 Yasin R, How knowledge management became sexy again, Government Computing News, April 30, 2010, http://gcn.com/Articles/2010/05/03/Knowledge-Management-gets-hip.aspx?Page=3

71 American Productivity and Quality Center, http://www.apqc.org/

72 APQC 2013 Knowledge Management Conference Presentations, American Productivity and Quality Center, http://www.apqc.org/2013-knowledge-management-conference-presentations

73 Knowledge Management, Alberta Corporate Human Resources, Government of Alberta, http://www.pao.gov.ab.ca/Practitioners/?file=learning/knowledge/knowledge-mgmt&cf=9

management. One of the districts implemented a cross-training program, but wanted to keep it informal, so there are no evaluation results to share.

- GDOT has been doing employee interviews for a couple of years and is starting to get other people involved in this beyond the training office. It intends to expand its use to employees about to retire and to capture institutional memory. For example, it plans to videotape an interview with one of its senior bridge engineers who is nationally recognized.
- GDOT is halfway through a workforce planning effort to identify the "right size" of the organization; it is getting ready to sit down with each office to discuss training needs as part of this. GDOT spends about $800,000 annually on employee development. It also has standard new-employee orientations.
- The Office of Innovative Program Delivery (Darryl VanMeter is the administrator) does a good job of capturing knowledge – this is important since each project is unique (Public Private Partnerships and other innovative finance/delivery methods). It produces case studies/best practices and posts the information for both internal and external use (by the consulting community).
- GDOT just implemented SharePoint 2010, its platform for information sharing. It plans to use this for an expertise directory, but employees are responsible for updating their information. The IT group manages SharePoint; Jeff Hill is the contact.
- Rick suggests that we contact ADOT&PF, referring to the study done by the University of Alaska's Department of Civil Engineering. Also, he believes that Iowa DOT has been conducting knowledge interviews.

Leni Oman *Washington State DOT (July 22, 2013)*

Leni noted that, in general, WSDOT does not have a formal KM program. However, it has piloted several KM practices, including:

- Organizational network analysis[74]
- Knowledge interviews of departing employees – Seventeen interviews were conducted to capture undocumented operational knowledge. A WSDOT employee conducted the interviews, each lasting three to seven hours. Audio files were summarized by University of Washington doctoral students in Communications. The model is being used to help an office prepare a desk manual.
- CoPs – following the organizational network analysis, efforts were initiated to establish a clear CoP for the tribal liaisons in the department. A network has been loosely formed, but time to foster sharing of practices has been limited.

74 Brown S, Organizational Network Analysis for Two Networks in the Washington State Department of Transportation, Washington State Department of Transportation, 2010, http://www.wsdot.wa.gov/Research/Reports/700/754.1.htm

- HR assesses retirement potential broadly and focuses on specific job classes. This information influences recruitment and succession planning.
- Strategic management of explicit information resources – established an enterprise information governance group and is working toward streamlining the collection and retention of information and resources needed to meet agency business needs. As a first step, it established data and IM principles.

Professor Denise Bedford *Kent State University, Ohio (July 19, 2013)*

Professor Bedford had the following suggestions:

- Ohio DOT had indicated an interest in KM. (Follow-up contact indicated that Ohio remains interested, but has not yet established an active program.)
- Many agencies may have KM activities ongoing, but no formal designated KM programs; however, these would take some time to identify.
- We might try contacting port authorities and large cities (e.g., Los Angeles and San Francisco) – no specific contacts
- World Bank – Contact Julius Gwyer to identify an international program for the transportation sector (if the scan were to extend beyond the U.S. and Canada).
- NASA – Contact Ed Hoffman as a starting point. JPL used to have an active program, but this may have been discontinued.
- If the scan team is interested in programs at airports, we can follow up with Giora Hadar at FAA, who just did research on KM in aviation.
- State Farm Insurance has an active KM program, if the scan team is interested in private sector initiatives for organizations that exchange data with transportation agencies.
- Many KM programs have not been sustained because they were not integrated into business processes; an isolated KM function in an agency is difficult to sustain – there is no career path.

Amanda Holland *Workforce Planning Manager, Alaska DOT&PF (July 12, 2013)*

Amanda provided the following information about ADOT&PF:

> *Alaska is a highly unionized state and so we are fairly limited in our ability to implement a formal succession planning process – unions see this as pre-selection, which is strictly prohibited for positions covered by collective bargaining.*

ADOT&PF focuses on providing professional development opportunities to employees who are in positions that are in a union. These development opportunities need to be job-related, and the department must be careful to offer equal opportunities to qualified employees. The development opportunities typically include training, conferences, participation on national committees, special projects, and team assignments. Employees are expected to take the initiative and actively request and participate in development opportunities.

ADOT&PF has some politically appointed positions that are not in a union. We can and do perform succession planning for these positions (approximately 20 in ADOT&PF). Potential successors are identified and provided with opportunities to shadow, help in behind-the-scenes work, and assigned special projects designed to expand or develop specific areas of knowledge and/or skill sets.

We have a department new employee orientation. It has received mixed reviews, and HR is working on revisions. The department is working on business process documentation and expertise identification. There are several smaller initiatives, and the department is working to consolidate and organize these efforts.

Amanda also suggested that we look at programs in FHWA and in these state DOTS:

- Missouri (agency went through a reorganization that resulted in massive employee training and business process review)
- Arizona (leadership development program that might be related to KM)
- Georgia (workforce development/planning program)
- Minnesota (workforce development/planning program)
- Colorado (succession planning program – SAP Success Factors)

Jack Stickel *Transportation Information Group Manager, Alaska DOT&PF (July 20, 2013)*

Jack Stickel was contacted to follow up on KM activities outside of the scope of HR. He commented:

I would not classify Alaska as a knowledge management innovation hotbed, but we are doing a few good things to advance our cause … The one area that stands out to me is our work in using Unified Modeling Language to document our business processes (use cases, sequence diagrams, and activity diagrams).

Jack described the activities of Alaska's Transportation Information Group, a group staffed by 17 individuals responsible for GIS, traffic data, road inventory data, crash data, traveler information, Intelligent Transportation Systems, and the legacy mainframe to GIS-enabled highway data warehouse function. He provided copies of a data governance white paper and a crash data concept

of operations prepared as part of Alaska's data business planning activities. He also referred to the recent University of Alaska KM report on Knowledge Transfer Needs and Methods[75].

Jack also listed the specific activities that Alaska has undertaken related to four areas of KM included in the scan:

1. **Innovation and Knowledge Sharing**

- Established a framework for KM in the data governance, standards, and KM white paper
- Implemented a KM repository within the Stellant document management system; AASHTO TIG members can add and find transportation data related documents for seven key business areas:
  - Asset management
  - Highway safety
  - Intelligent transportation systems
  - Road weather
  - Traffic
  - Traveler information
  - Road network/GIS

  There are seven subcategory types for each business area:
  - Administrative
  - Archive
  - Events
  - Procedures
  - Reports/plans
  - Standards
  - Systems engineering
- Embarked on a department-wide transportation asset management (TAM) effort to develop a TAM plan and information system as required by MAP-21[76]. One of the first steps was to deploy a TAM knowledge exchange and information source. Additional details are provided on the internal TAM site.
- Revamped the AASHTO Technology Information Group web site to be functionally aligned with our core business areas. This is a knowledge exchange resource for both internal and external stakeholders.

75 Perkins RA, and FL Bennett, Knowledge Transfer Needs and Methods, 2012, FHWA-AK-RD-12-26 http://ine.uaf.edu/autc/files/2013/07/510009.Perkins.-FINAL.pdf

76 Federal Highway Administration, https://www.fhwa.dot.gov/map21/

- Established the first generation of the AASHTO TIG UPlan[77] to collaborate, exchange information, and transfer knowledge. Other states are ahead of Alaska in this area, but the UPlan site offers the great work these states have done as a best practice source.

2. Succession Management

- Reorganized the TIG for the new business environment that includes MAP-21 requirements, with an emphasis on performance measures, and transportation data being delivered as information in a spatial environment
- Reclassified two positions and rewrote six other position descriptions to provide all positions with an opportunity to advance within the TIG
- Developed cross training opportunities, particularly in the GIS area, to provide solid backup and career advancement opportunities

3. Employee Orientation, Learning, and Development

- Developed standard employee training plans for each position
- Established professional development training objectives and identified courses to meet these objectives.

4. Identification, Documentation and Dissemination of Processes, Practices and Expertise

- Established communities of interest (COIs) and working group (WG) structure in the initial Data Business Plan Concept of Operations (2005). These COIs and WGs were updated in the more recent concept of operations (2012) for the crash and traffic data system transition to a GIS-enabled environment.
- Documented the crash and traffic data system business processes using Unified Modeling Language activity diagrams
- Developed a transportation data business plan that includes a data governance structure, knowledge capture, preservation, and access

Professor Anthony Wheeler *University of Rhode Island (July 11, 2013)*

Professor Wheeler was contacted to follow up on his study of succession planning at state DOTs. In an e-mail communication, he wrote:

> *… from what I could gather, the State of Maryland runs the most integrated strategic workforce system among state DOTs …*
>
> *… the State of Alaska also has a very well integrated strategic workforce plan. This happens*

77 UPlan, American Association of State Highway and Transportation Officials, http://aii.transportation.org/Pages/UPlan.aspx

primarily because one person over a period of years developed and implemented a strategic HRM [Human Resources management] plan. She has been able to tie in data from ADOT&PF's branches and field offices …

What I mostly found was that DOTs that hired and staffed employees at high levels who had training in HR or org change developed and implemented integrated systems that allowed them to share knowledge (at least people practice knowledge) throughout the agency.

Professor Wheeler referenced a 2007 report by Ann Cotten published through IBM's Center for the Business of Government that includes a case study on Maryland[78]. Professor Wheeler also noted that other states that have made progress in succession planning include Virginia, Missouri, and Connecticut. He added that he heard good things about Ohio and Utah, but was not able to interview representatives from these states for his study.

Duane Brautigam *Manager of Specifications and Estimates, Florida DOT (July 10, 2013)*

Mr. Brautigam was contacted to see if Florida DOT had implemented a KM program, since requesting information on KM from VDOT. His response was:

As an agency, I am sad to report that Florida DOT has not advanced this effort. Within the Office of Design (my part of FDOT), we are proponents of KM and continue to discuss it with our managers and supervisors. We advocate the use of KM practices where they can be applied, and have experienced pockets of success here and there. However, on the whole, I would say we are not doing enough to be included in a scan.

Susan Barker, PE *Technology Transfer Engineer, Kansas DOT (7.11.2013)*

Ms. Barker responded to an e-mail to KDOT's current research engineer to follow up on an old request from Dick McReynolds for information on KM from Virginia DOT. Mr. McReynolds retired in 2009. Ms. Barker wrote:

When Dick was looking into this KDOT was looking at a lot of retirements and A LOT of knowledge walking out the door! Dick and the Secretary of Transportation at the time, Deb Miller, did put a high emphasis on capturing this knowledge. While KDOT has not put a formal KM system in place, we have done some things to encourage this type of environment (e.g., new employee orientation, employee development, and rotation of EITS before they are assigned a permanent job).

78 Cotton A, Seven Steps of Effective Workforce Planning, IBM Center for the Business of Government, http://www.businessofgovernment.org/report/seven-steps-effective-workforce-planning

KDOT did not implement a formal KM program. As an organization, it did realize that there was a need for it but at the time did not have the resources to make a full commitment.

KDOT did look at existing agency procedures and structure to see how to best capture the knowledge that soon could retire as well give new/young employees opportunities to grow. Listed below are things that were implemented and or emphasized:

- *If you work at headquarters request from your boss to spend a day in the field to expose yourself to such things as maintenance, road and bridge construction, pavement markings, and signing.*
- *Job shadowing*
- *Cross-training*
- *Advertise and stress the training opportunities that already existed at the agency (i.e., computer classes; tuition assistance; Professional Development Library; KDOT's Library & Librarian Services; Certified Inspector Training; HR courses, like leadership development and employee relations; Professional Engineer Preparatory course; and NHI technical training).*
- *Encourage management to send new employees to annual meetings, conferences, and presentations, even if it was done on a rotation basis due to costs.*
- *Encourage more-experienced employees to offer to bring a newer employee to tag along to public meetings, field checks, and prequalification meetings to see first-hand how things work.*
- *Brownbag meetings at noon held once month about a transportation topic.*
- *Support membership in national and local professional organizations (e.g., APWA, ASCE, NSPE, ASCE-Young Members, ATSSA, and AASHTO)*
- *Allow staff to represent the agency at local colleges, career days, and county/state fairs.*

The consensus was that there were opportunities for knowledge growth within the agency if management took an active role in leading the way. "Elders need to encourage opportunities for learning for newer employees."

One major thing that KDOT did invest in to promote KM was adding an inspector/mentor position to each of our six districts in 2005. These positions were created specifically not only to capture field knowledge, but their primary purpose was to pass their knowledge along to other employees. KDOT feels that this was an investment in our future that has paid off and will continue to pay off. The district mentors travel their districts sharing their knowledge were it is needed most so that KDOT has a well-trained workforce.

Felecia G. Caldwell *Director, Administration Division, Department of Planning & Development, City of Seattle, Washington (July 11, 2013)*

Ms. Caldwell responded to an e-mail to Seattle's current director of planning and development to follow up on an old request for information on KM from VDOT. She wrote:

> *In response to your inquiry to Diane Sugimura, DPD has not initiated any official succession planning or knowledge transfer program. In a couple of discrete areas where we attempted this work with an intern, we were not able to complete it successfully. However, because of the discussions held, we have begun the practice of hiring replacement employees prior to the date the exiting employee leaves to provide some limited time to transfer knowledge or bringing back a retired employee in a part-time temporary assignment to train the new employee. This practice has been limited to units where there were financial resources to do so.*

Victoria F. Beale, JD, SPHR *Ohio Local Technical Assistance Program Center Director & Assistant Administrator, Office of Local Programs, Ohio DOT (July 11, 2013)*

Ms. Beale responded to an e-mail to follow up on an old request for information on KM from Virginia DOT. She wrote:

> *I wish I could report that we were doing these items, but, unfortunately, we are not. We perform a few of the tasks in silos, but not as part of a KM program. I am attempting to champion a KM program within ODOT, but it is going to take some time. I would be very interested in the results of your scan.*

Randy Sarver *HR Director, Wisconsin DOT (7.12.2013)*

> *I am the HR Director for the Wisconsin DOT and was on the team with Ernie Wittwer and Teresa Adams for the KM project.*
>
> *The department continues to encourage program areas to complete activities related to KM in everyday business. The tools developed and presented in our project were shared with department management to keep the momentum moving. While we experience some attrition in certain program areas, the higher level of retirements we saw from a few years ago has decreased. This has allowed the department to spend the necessary time on formal and informal knowledge management techniques.*
>
> *In addition, the department is currently partnering with other Wisconsin state agencies on the analysis and implementation of an enterprise resource planning system. This is requiring us to complete business process mapping efforts on hundreds of processes, which will also be able to be used for knowledge transfer/management activities.*

Giora Hadar *Federal Aviation Administration (July 18, 2013)*

Mr. Hadar was contacted based on 2010 article on the FAA's use of an online KM tool for FAA inspectors[79]. He noted that his colleague Francisco Rivera[80] has developed a lessons learned repository (Learning from Experience and Operations) for the air traffic organization; in general, he feels that KM efforts have not yet taken root at the FAA.

When asked why KM had not advanced further at the agency, Mr. Hadar responded that KM "requires a strategic approach," but agencies are typically more tactically focused. He said that KM takes place "in the white spaces" between functions and, therefore, it is difficult to get management interest and traction. However, recently leadership at the agency has become more interested in doing something.

Mr. Hadar is currently developing a plan to include some pilot projects. The IT unit is also starting a KM initiative presumably emphasizing the repository tool side of things. He believes NASA, Secret Service–Department of Homeland Security, and the World Bank have the most advanced KM programs; EPA has a program as well.

Chris Hatfield *Chief, Office of Workforce Development, California DOT (July 22, 2013)*

> *We have not implemented a KM program, but we are undergoing reorganization and will be looking into developing a program in the near future. We will certainly be interested in the NCHRP study results.*

Assessment

Rich Body of Literature

There is extensive literature on KM that describes objectives, key elements, and best practices and includes many case study examples of implementation within private industry and the federal government. Several guides to best or good KM practice are available (e.g., from the American Productivity and Quality Center, the World Bank, and the European Knowledge Management Forum. In addition, several state governments have published useful resource materials on knowledge transfer techniques.

79 Bain B, Online Knowledge Management Tool Keeps FAA Inspectors on Same Page, GCN, May 6, 2010, http://gcn.com/articles/2010/05/06/web-knowledge-management-faa.aspx

80 Rivera, FE, WH Howard, and MS Wei, From Organizational Memory to a Learning Organization: A Government Experience in Transition, *International Journal of Information and Education Technology*, Vol 2, No 4 August 2012, http://www.ijiet.org/papers/161-T10021.pdf

Few Mature Programs in Public-Sector Transportation Agencies

Within the transportation domain, a comprehensive synthesis of KM practice was published in 2007 (NCHRP Synthesis 365). This synthesis identified many DOTs reporting elements of KM; however, since this information was gathered in 2006, it is now old, and many of the efforts that existed at one time were not sustained (e.g., Maryland SHA and PennDOT).

While the literature review and follow-ups did identify a handful of transportation agencies with current KM-related activities, the only formal, robust KM programs identified were those at VDOT and USDOT. It is possible that individual work units within transportation agencies have implemented KM practices (without necessarily labeling these practices as KM) and could have useful information on these practices to share. However, it is difficult to discover these without a more comprehensive survey of individual agency divisions.

Key Lessons and Trends

Based on the literature review, the following key lessons stood out with respect to implementation of successful KM programs:

- KM is fundamentally about organizational change management. It takes time to achieve changes in management and staff views and behaviors with respect to knowledge preservation and sharing. It also takes the right skill sets within the KM implementation unit and strong leadership from the top.
- KM can be implemented incrementally, but care must be taken to ensure that the whole life cycle of knowledge is considered: assess, create, capture, find, share, and use. For example, only limited benefits, at best, can be achieved through implementing a repository of lessons learned without a plan to populate this repository, to make sure that the lessons are findable, and to encourage that they be used.
- KM must be tied to business/organizational priorities to be successful. A strategic approach is needed to ensure KM activities are clearly linked to desired outcomes.
- Knowledge capture, sharing, and use must be embedded within business processes. Efforts to implement KM as a separate parallel process are not sustainable.

In addition, the following newer or emerging trends and topics were identified in the KM arena:

- Social networking within the enterprise (e.g., use of social media tools within the defense agencies) may include wikis; micro blogging; recommendation systems; and ranking, rating, and sharing of documented practices

- Gamification (i.e., using game mechanics for employee motivation and recognition) – See the Accenture presentation from the 2013 American Productivity and Quality Center conference[81]
- Use of mobile/cloud technology to provide access to explicit or tacit knowledge (e.g., procedures or experts)
- Embedding knowledge capture and sharing practices within normal workflows; building learning cycles into projects and processes
- Opportunities for synergies with the current emphasis on business analytics
- Opportunities for synergies related to the Open Government and Open Data movements

Candidate Agencies for Inclusion in the Scan

The following transportation agencies were recommended for inclusion in the scan:

- VDOT continues to be the model for other DOTs, with the most formalized and active KM program identified.
- The FTA and FHWA both have implemented several KM initiatives. The FTA has a chief knowledge officer charged with KM program oversight.
- GDOT has experience to share in the areas of CoPs, succession management, and employee interviews/institutional memory capture.
- ADOT&PF is worth considering for inclusion in the scan given its comprehensive workforce planning model. It also has other smaller KM initiatives in progress, including data communities of interest.
- WSDOT has experience to share in the areas of organizational network analysis, knowledge interviews, and enterprise IM.
- KDOT added an inspector/mentor position in 2005.
- MoDOT integrated training and business process reviews with its restructuring effort.
- WisDOT's "low-cost KM" technique implemented warrants review; this technique has already been documented in a research report.

The following other organizations with active KM programs were also recommended for consideration:

- The World Bank
- NASA

81 Angry KM'ers and How to Make them Happy … Using Gamification, 2013 American Productivity and Quality Center conference, Accenture, http://www.apqc.org/sites/default/files/files/Presentation%20for%20Sharing_Gamifying%20Enterprise%20Social%20Collaboration.pdf

- Boeing
- Kraft Foods
- Accenture (specifically, its approach to gamification for knowledge sharing)
- FAA
- The Centers for Disease Control and Prevention
- The Federal Bureau of Investigation
- Fluor
- Siemens
- HP
- State Farm Insurance
- Parsons Brinckerhoff
- Ernst & Young

Appendix E: Amplifying Questions

The scan team developed a set of amplifying questions and asked each scan participant to provide responses to these questions in advance of the scan meeting and orient their scan meeting presentations around aspects of these questions.

The following questions are designed to inform the scan team about activities within your organization related to KM. We are aware that many activities that fall under the KM umbrella are not necessarily called "KM." While we are very interested in organization-wide KM functions, we are also seeking effective practices that have been initiated within individual work groups.

Questions are organized into five broad topic areas:

- **Context**: descriptive information about your organization
- **Innovation and Knowledge Sharing**: fostering innovation through collaboration and knowledge sharing
- **Succession Management:** Managing staff transitions to retain and acquire critical knowledge and minimize risk
- **Employee Orientation, Learning, and Development**: Facilitating new employee orientation and ensuring continued employee development and organizational learning
- **Identification, Documentation and Dissemination of Processes, Practices, and Expertise:** Identifying, capturing, storing and providing access to knowledge about business processes, practices and expertise

We request that each scan participant provide answers to each question. If your organization (or some of your business units) has a particularly successful practice to share, please provide a more in-depth description of the practice, using the bullet lists of questions as guidance for the type of information that is of interest.

1. CONTEXT

Tell us a bit about your organization to provide a context for your responses – size (number of employees, annual budget), nature and scope of responsibilities, organizational structure (degree of decentralization, location of offices, etc.), special challenges that may have created the impetus for knowledge management initiatives.

2. INNOVATION AND KNOWLEDGE SHARING

Fostering innovation through collaboration and knowledge sharing

A. **Designated Function:** Do you have an established function within your organization specifically charged with fostering innovation and knowledge sharing? If so, tell us about its objectives, activities, achievements and success factors.

Specific topics of interest:

- Where is this function located within the organizational structure?
- Why was it established? When? What has enabled it to be sustainable across changes in leadership?
- What are its objectives? How does it measure success?
- How is it currently resourced – staffing and budget?
- What activities/initiatives has this function pursued?
- How has this function defined "knowledge" – as distinct from "information"?
- Has this function developed knowledge maps for the organization or individual units – to track who knows what, and how knowledge is shared?
- How are knowledge sources and recipients identified and targeted?
- What barriers to knowledge transfer/innovation has this function identified and how has it tried to address them?
- Has this function taken steps to understand and manage the informal knowledge and communication networks that exist in the agency? How?
- What competencies have been important for developing and managing the knowledge management function?
- What has worked well? What lessons have been learned? What advice do you have for the first steps an agency should take to encourage knowledge sharing and collaboration?

B. **Leadership and Culture:** How does your organization work to foster a culture of collaboration and knowledge sharing? We are particularly interested in stories about how noticeable cultural change has been accomplished.

Specific topics of interest:

- How does the agency leadership show that they value collaboration and knowledge sharing?
- How is collaboration/knowledge sharing encouraged – part of formal statement of organization values, considered in job descriptions or performance, training evaluations, included in formal and informal communication to staff, etc.?

- What has contributed most to fostering/supporting your organization's culture of collaboration – what techniques have been effective for getting staff engaged in knowledge sharing?
- What improvements would you like to make if you had additional resources?

C **Recognition Programs and Reward Systems:** In what ways does your organization recognize or reward innovation that results from collaboration and knowledge sharing?

Specific topics of interest:

- How was the recognition program or reward system started and why?
- Who manages it?
- How are employees/groups identified for recognition/rewards?
- Is collaboration a factor considered in performance reviews?
- What impact has the recognition/reward program had?
- What has worked well? What lessons have been learned?

D **Communities:** How do people in your organization get together (in formal or informal ways) for learning, development and information sharing? We are particularly interested in hearing about examples of how these communities are making a difference in your organization.

Specific topics of interest:

- Are there groups that meet in person or by phone on a regular basis to share information? If so, who organizes or leads them? How often do they meet? What drives their agenda?
- What has the organization done to foster or support these groups (e.g., encouragement, leadership, time allowance, space/facilities, etc.)?
- Are there groups that collaborate electronically (e.g. e-mail lists, discussion boards, wikis, etc.)? If so, who organizes or leads them? What technologies do they use for collaboration?
- Are you aware of specific accomplishments or success stories that have resulted from these communities?
- What lessons has your organization learned about how best to foster information sharing and learning communities?

E **Storytelling:** Has your organization encouraged "storytelling" as a way of sharing institutional history or experience?

Specific topics of interest:

- In what contexts has storytelling been used? What are some notable examples?
- What impact has it had?

2. SUCCESSION MANAGEMENT

Managing staff transitions to retain and acquire critical knowledge and minimize risk

A **Succession Planning:** How does your agency anticipate and plan for future workforce needs and key staff transitions?

Specific topics of interest:

- If there is a formal succession planning initiative, what was the impetus and who leads it? What are the products? How often are they updated?
- What approaches are used to identify critical knowledge – existing or new – that the organization needs?
- How are risks identified? How are target individuals/work units for succession management strategies identified?
- Have measures of success been established? What are they? How are they tracked?
- What has worked well? What lessons have been learned?

B **Staff Retention:** What strategies does your agency use to retain valuable employees and provide career paths? (e.g. cross training, step programs)

C **Employee Interviews:** Does your agency conduct employee interviews as part of succession planning and management?

Specific topics of interest:

- Who conducts the interviews?
- How are employees targeted for interviews?

- Are interviews conducted on exit only or before departure for key employees nearing retirement age?
- What is the product of the interview? How is it used? How is it shared?
- What has worked well? What lessons have been learned?

3. EMPLOYEE ORIENTATION, LEARNING AND DEVELOPMENT

Facilitating new employee orientation and ensuring continued employee development and organizational learning

A **New Employee Orientation:** What techniques have proved successful in your agency for onboarding new employees – to get them quickly up to speed and aware of policies, procedures, resident experts, etc.?

Specific topics of interest:

- What is your onboarding process, how was it developed and what was the impetus for it?
- What is included in the orientation for new employees?
- What resources are provided to new employees to help them learn about available information sources?
- What resources are provided to new employees to help them identify appropriate people within the organization to contact for different purposes?
- Is there a process to obtain feedback from employees on the process? If so, how has this feedback been used to change the process?
- What measures of success have been established for the employee orientation process?
- How is progress tracked?
- How well understood is the informal onboarding/orientation process?

B **Employee Growth and Development:** How does your agency guide employee growth and development?

Specific topics of interest:

- What are the key elements of your agency's employee development program? How do these program elements relate to the areas of strategic importance to the organization?

- How are employee development opportunities communicated within the organization?
- To what extent do employees take advantage of the opportunities that are offered?
- What measures of success have been established?
- How is progress tracked?
- Do you have a formal mentoring program? If so, how are mentor/mentee pairs matched and supported? Do you face any issues related to perceptions that certain employees are being favored or pre-selected for advancement?

4. IDENTIFICATION, DOCUMENTATION AND DISSEMINATION OF PROCESSES, PRACTICES, AND EXPERTISE

Identifying, capturing, storing and providing access to information about business processes, practices and expertise

A **Organizational Functions for Content Management:** Tell us about your organization's policies, processes and functions for managing how content is captured, stored and made accessible/findable. We use the term "content" in a broad sense – to include documents, plans, manuals, directories, maps, data sets, web pages, etc. This content may be accessed via a physical library, a file server, an online repository, an intranet site, etc. We are particularly interested in integrated/enterprise approaches to content management and how they are used to support capture and dissemination of critical knowledge within the organization.

Specific topics of interest:

- What units in your organization have content management responsibilities? Where in the organization chart do they fall? How are they currently resourced – staffing and budget? What services do they provide?
- Have taxonomies or classification schemes been established to facilitate searching for information? How are these managed and updated? Who assigns classifications to content – users or content managers or both?
- Have policies for records retention been established? How are these supported and enforced?
- Have policies for information confidentiality and intellectual property protection been established? How are these supported and enforced?
- How are policies and expectations for records retention and storage communicated to organization managers and staff?

- How do you provide access to external content – is this a separate function or integrated with how you provide access to internal content?
- How do you identify topics of interest to particular staff members to effectively target knowledge dissemination activities?
- How do you target knowledge dissemination media/methods based on user preference?
- What challenges have been encountered? What has worked well?

B Lessons Learned and Case Studies: Has your organization conducted "after action reviews", or documented lessons learned or case studies?

Specific topics of interest:

- Are there any formal processes in place to develop this information? If so, when were they established? What was the impetus?
- Are the reviews/lessons/case documentation mandatory or optional?
- Are opportunities provided for field personnel to develop and/or review lessons learned or case studies?
- Who in the organization manages lessons learned/case study information?
- Where are the lessons learned/case studies stored and how are they organized and classified to facilitate access?
- Is there any process in place for actively disseminating the lessons learned/case study information?
- Are the lessons learned/case studies shared outside of the organization?
- Is there any information available on how the information has been used and what benefits they have had to the organization?
- What has worked well? What advice would you give to other organizations initiating an initiative to document lessons or case studies?
- If more resources were available, what else would you like to do?

C Institutional Memory/Retention of Critical Knowledge: Has your agency undertaken any initiative to capture and retain critical knowledge from (a) staff that have retired or are nearing retirement age, (b) contractors that have completed an assignment and are moving on, or (c) project teams completing their work?

Specific topics of interest:

- What was the nature of the effort? When was it conducted?
- What kind of information was captured?
- How was it captured – e.g. videotaped interview, written description?
- How was it shared?
- How has the information been used?
- What worked well about this effort? What lessons were learned?

D **Process Documentation:** Has your agency documented business processes and made these available as reference information for managers and staff?

Specific topics of interest:

- When was the process documentation effort started? What was the impetus?
- Which organizational units have led or supported these efforts?
- What is the scope of the business process documentation? What technical and administrative processes have been included?
- Are opportunities provided for field personnel to develop and/or review process documentation?
- What is the format for the business process documentation? Were standards established to ensure consistency?
- How is the documentation kept up to date after it is initially produced?
- Where is the process documentation stored and how is it organized and classified to facilitate access?
- How can employees access the documentation?
- Is the process documentation shared outside of the organization?
- What has worked well? What lessons have been learned?

E Expertise Identification: How do staff in your organization go about identifying experts available to help on particular topic areas – both within and outside of your organization?

Specific topics of interest:

- Are there formal processes in place to identify and document internal and/or external expertise and facilitate access to this expertise? When were these processes established? What was the impetus?
- Which organizational units have led or supported this effort?
- How do you classify expertise? How do you identify experts?
- Where is the information on expertise stored and how is it formatted, organized and classified to facilitate access?
- How is the information kept up to date?
- What has worked well? What lessons have been learned?

F Tools and Technologies: How has your organization made effective use of social media, knowledge portals, intranets or other tools & technologies for capturing, preserving and providing access to knowledge artifacts?

Specific topics of interest:

- What specific tools are used for knowledge capture and dissemination and how are they used?
- What tools are available for external knowledge discovery?
- What steps are taken to ensure information is findable and retrievable (e.g. use of taxonomies/standard metadata)?
- Who is responsible for configuring/managing use of your agency's knowledge capture/sharing platforms to maximize their success?
- What requirements are in place for record keeping/archiving (e.g. on project closeout)?
- What has worked well? What lessons have been learned?

Appendix F: Scan Participant Responses to Amplifying Questions[82]

82 This appendix was developed largely based on material submitted by scan participants. This material was selectively edited for clarity. The main body of the report includes extracts from this appendix to illustrate key findings of the scan.

Federal Highway Administration

Response provided by	Carin Michel Special Projects Manager, FHWA Office of Technical Services
Context	The Federal Highway Administration (FHWA) was created in 1966 from the previous Bureau of Public Roads. FHWA is headquartered in Washington, DC, and has approximately 3000 employees nationwide. Its offices are geographically dispersed in the following manner: ■ One division office in each state, the District of Columbia, and Puerto Rico ■ Three Federal Lands Highway Division offices serving the eastern, western, and central portions of the country ■ One Office of Technical Services with six locations comprising the Resource Center, the National Highway Institute, and Transportation Partnerships Programs offices. Approximately 40% of employees are in the division offices, 31% in HQ, 23% in Federal Lands, and 6% in OTS. Like many federal agencies, FHWA is concerned with the loss of knowledge through attrition and the balance of providing guidance and technical assistance nationwide even with increasingly constrained resources.

Innovation and Knowledge Sharing

Designated Function for KM	While FHWA does not have a designated KM office, innovation is a priority for FHWA, as stated in our Strategic Implementation Plan under the National Leadership goal. It refers to all types of innovation, including transportation financing and accelerated technology deployment, as well as being innovative in the way we do business corporately. The idea of knowledge sharing emerges in our corporate capacity goal area with respect to our learning and development program and specifically, the Discipline Support System (DSS). Through the DSS, FHWA has shown a considerable investment in and commitment to knowledge sharing.

Leadership and Culture	As evidenced in FHWA's work on the Learning Highway (the FHWA competency-based learning and development system) and DSS, there is a strong commitment to collaboration and knowledge sharing, and that commitment comes from leadership and permeates all levels of the agency. The agency transitioned from previous methods of knowledge sharing (CoPs) to more robust vehicles, such as the DSS, including key tools, such as SharePoint. Formal and informal mentoring programs also provide a transfer of knowledge and guidance from senior leaders through the ranks. FHWA made a substantial effort to inculcate knowledge sharing into the agency's culture. This effort has been very successful.
Recognition and Rewards	There is no award for KM, innovation, or knowledge sharing; however, our Administrator's Award for Superior Achievement considers knowledge sharing and innovation in its selection criteria. Within our DSS, we do provide discipline-based awards for individuals who have made significant contributions in furthering their disciplines. The executive director announces these awards, which are seen as a significant honor.

Communities	Our learning and development system is the focal point of our KM activities. The DSS serves multiple purposes. It: ■ Creates a coordinated approach within discipline groups ■ Helps the agency respond to growing constraints on travel and training dollars ■ Mitigates the effects of knowledge loss due to retirements and attrition ■ Ensures more effective workforce planning ■ Provides clear, consistent job expectations for employees ■ Creates an environment of knowledge sharing throughout the agency. Prior to the inception of the Learning Highway, learning was done primarily in a decentralized fashion. The Learning Highway created a clear path for learning for all employees and centralized nearly all training in the agency. DSS is the prime model for learning and development, KM, and workforce planning in FHWA. A discipline sponsor and champion lead discipline groups. They meet virtually each month and face to face once every two to three years. Their agenda is driven by a mandated set of activities that each discipline has to undertake. This adds structure to the overall process, ensures parity across disciplines, and adds a measurable aspect to the DSS activities. FHWA has conferred official status on the disciplines and supports and finances their activities, including both virtual and in-person meetings. The DSS is a FHWA-sanctioned and corporately led mandatory activity. The DSS collaborates electronically with membership lists, discussion groups, training sessions, monthly meetings, and mentor/peer relationship building. FHWA has had to adjust the way we do business because of shrinking budgets and increased workloads. The agency has learned to rely on virtual communication and meetings because the feasibility of frequent face-to-face meetings is lessened. With members of a discipline spread across the country, virtual communication, resource sharing, and knowledge sharing are keys to sustaining and growing the discipline. While an increased emphasis has been put on virtual learning and collaboration, FHWA is still committed to and understands the importance of the face-to-face gathering. The agency is willing to make the investment to have in-person gatherings, but ensures that virtual options are explored in every situation.

Succession Management	
Succession Planning	The DSS has enabled FHWA to be stronger in workforce planning by tracking all members of a discipline by location, grade, expertise, and career aspirations. Workforce planning is discipline-based and cross-cutting. The agency has a strategic human capital plan (SHCP) that provides a five-year road map for identifying, obtaining, and retaining the right mix of people and skills to achieve the agency's mission. In conjunction with the agency's strategic plan, the SHCP is designed to advance the FHWA vision, provide the framework needed to accomplish strategic goals, and affect a culture of change in FHWA. The SHCP is a valuable management tool – a blueprint for effective workforce planning to ensure that the agency's mission requirements drive all workforce activity and all staff members contribute directly to achieving results. It focuses on closing the gap between current workforce and the vision and strategic direction of the agency. Additionally, FHWA completes a workforce plan each fiscal year. Conversations with senior managers, between HR specialists and hiring managers, trend analysis, and employee surveys provide a corporate picture of anticipated hiring needs, skills gaps, and challenges across discipline offices and the leadership pipeline. This information goes into the workforce plan, and the resulting plan focuses on those disciplines with the highest number of anticipated vacancies, highest retirement eligibility, and/or learning and development gaps.
Staff Retention	FHWA believes in leadership at all levels and makes leadership learning available to all employees. Rotational assignments provide cross-training, and the agency has a rotational assignment clearinghouse to ensure that all staff is aware of all opportunities.

Employee Orientation, Learning, and Development	
New Employee Orientation	FHWA conducts a new employee orientation (NEO) session twice yearly. Additionally, the DSS is the key mechanism for employee learning and development. Employees are invited to the first NEO session held after their onboard date, and their appropriate discipline representative immediately contacts them. This allows them to learn both the agency's corporate business and their specific discipline information at a very early date after onboarding. Individual offices have onboarding processes, with some mandatory core elements. At each NEO session, employees meet with and hear from key leaders in each of the agency's discipline areas. This serves as a holistic overview of FHWA so that the employees gain an immediate awareness of business units other than the one into which they are hired. Employees also receive information from cross-cutting areas (e.g., HR, chief counsel, CFO, and public affairs). This helps employees to gain an understanding of how the agency's pieces fit together. The NEO also features an overview of resources available to employees to help them learn key contacts and more information about FHWA.
Identification, Documentation and Dissemination of Processes, Practices and Expertise	
Organizational Functions for Content Management	FHWA established the Policy and Guidance Center, which is an online repository of laws, policies, and guidance about the Federal-Aid Highway Program, including legal documents and links to relevant legislation, memos, directives, and guidance to support the FHWA's mission and goals. The center provides electronic access, via links, to the documents maintained by the program offices. Documents can be accessed by browsing by categories or searching by keywords, date, or office. Documents are categorized by document type (i.e., Legislation, Regulation, Policy, Guidance, and Information). Documents are also organized by discipline and subdiscipline. All documents have been tagged with identifying information to enable quick and easy access.
Expertise Identification	The DSS links members of the discipline so they can quickly get access to others in their discipline who may have greater expertise in a particular area. Likewise, the DSS also serves as a Rolodex of senior knowledge contacts in all disciplines, so employees in any discipline can quickly find who to ask for help in an area outside their own.

Tools and Technologies	FHWA uses social media to inform multiple audiences about current and completed projects and initiatives, recruit employees, and promote events. FHWA has a Facebook page[83], a YouTube channel[84], and Twitter[85] and Flickr[86] accounts. At this point, social media is used primarily to communicate with our customers, stakeholders, and potential employees, rather than internally with our existing workforce.

83 FHWA's Facebook page: http://on.fb.me/sECEWk
84 FHWA's YouTube channel: http://www.youtube.com/user/USDOTFHWA
85 FHWA's Twitter account: https://twitter.com/USDOTFHWA
86 FHWA's Flickr account: http://www.flickr.com/photos/fhwa/

Federal Transit Administration

Response provided by	Arthur "Turo" Dexter, Knowledge Resources Manager
Context	The Federal Transit Administration (FTA) assists in developing improved mass transportation systems for cities and communities nationwide. Through its grant programs, FTA helps plan, build, and operate transit systems with convenience, cost, and accessibility in mind. While buses and rail vehicles are the most common type of public transportation, other kinds include commuter ferryboats, trolleys, inclined railways, subways, and people movers. In providing financial, technical and planning assistance, the agency provides leadership and resources for safe and technologically advanced local transit systems while assisting in the development of local and regional traffic reduction. Recent transportation legislation, Moving Ahead for Progress in the 21st Century[87t] (MAP-21), grants FTA the authority to establish and enforce a new comprehensive framework to oversee the safety of public transportation throughout the United States as it pertains to heavy rail, light rail, buses, and streetcars. The goal of FTA's Office of Transit Safety and Oversight[88] is to achieve the highest practical level of safety and security for all modes of transit. The Learning and Knowledge Management (LKM) Group is a unit of the Office of Administration, which also houses IT, HR, Procurement, and Management Planning. In 2013, the central learning and development management function was split off from HR and formally combined with the central KM function. The other FTA governance and administrative support offices are the Office of the Administrator, Office of Budget and Policy, Office of Communications and Congressional Affairs, and Office of the Chief Counsel. The Office of Research, Demonstration and Innovation oversees transit research and related matters. FTA's program, planning, oversight, and grants management offices are the Office of Program Management, Office of Planning and Environment, new Office of Transit Safety and Oversight, and Office of Civil Rights. About one-third of FTA's approximately 500 employees work out of one of 10 regional offices, where they directly oversee transit construction and operations around the country.

87 MAP-21, Moving Ahead for Progress in the 21st Century, Federal Transit Administration, U.S. Department of Transportation, http://www.fta.dot.gov/map21/

88 Transit Safety & Oversight (TSO), Federal Transit Administration, U.S. Department of Transportation, http://www.fta.dot.gov/tso.html

Innovation and Knowledge Sharing

Designated Function for KM

Formal support for innovation and knowledge sharing is the responsibility of the LKM Group, housed within the Office of Administration. The Chief Knowledge Officer, Dr. Susan Camarena, was hired in 2007.

Dr. Camarena initially was brought in to manage FTA's preparation to compete for the Malcolm Baldridge National Quality Award[89]. During that time, a need for formal KM methods was observed. Following the Baldridge Award competition, Dr. Camarena performed an audit of FTA's knowledge capabilities and developed a strategy for improvement.

Dr. Camarena was able to hire her first staff member to work on KM in 2010. Merging with the Learning and Development team in 2013 brought three more FTEs, who now are being cross-trained on KM principles and methods. Contract support has been procured for LKM activities in fiscal years 2013 and 2014, effectively delivering two additional FTEs, for a total of seven. At this time, these resources are more focused on learning and development than on KM.

Since their inception, formal KM activities at FTA have enjoyed strong support from FTA's executive director and the associate administrator for administration and deputy, to whom the chief knowledge officer reports.

The group proactively reaches out to offices to market its broad array of services in support of employee learning and development and sound KM practices across the agency. It is viewed as a resource to help employees achieve their learning and development goals, and a source of assistance through KM that makes FTA's work easier and more effective. Its habit of trying never to say no to a request, and doing legwork to get answers to questions received that really are in the domain of other offices, have earned it a reputation of responsive service and a place to go for solutions.

FTA's KM objectives are expressed in the Vision and Mission Statements from its 2009 strategic plan:

> *Vision:* FTA knows what it knows; it is continuously filling the gaps of what it does not know. We have, therefore, increased the use of innovative approaches for accomplishing both our long-range planning and our day-to-day activities.

89 Malcolm Baldridge National Quality Award (MBNQA, American Society for Quality, http://asq.org/learn-about-quality/malcolm-baldrige-award/overview/overview.html

> *Mission:* Implement the procedures and tools required to easily find and share the experience, knowledge, and information that support proactive and responsive decision-making at all levels for FTA.

The activities of the combined LKM Group draw upon the synergy of the two previously separate disciplines. A combined LKM Strategic Plan is being written that will further develop their integration. It seems easier for people to understand what KM is when it is discussed alongside learning and development activities.

Learning and development activities include:

- Conducting periodic learning needs assessments
- Developing and maintaining curricula for several different populations of learners
- Procuring and delivering centralized training courses
- Coordinating and advising on the procurement and travel connected with individually scheduled outside training
- Managing and improving FTA's online learning management system
- Improving the quality and management of various kinds of mandatory training
- Coordinating FTA's job rotation program
- Developing and coordinating a multifaceted mentoring program
- Producing several kinds of knowledge cafés for group learning

KM activities include:

- Forming, facilitating, and supporting CoPs
- Conducting after-action reviews, whereby the group responsible for a project or activity discusses its outcome and the original intention to analyze what went well and what could be improved, and other types of workshops
- Establishing and guiding the ongoing development of the SharePoint-based TransPort transit knowledge portal, an intranet and collaboration platform, and working closely with offices to employ it strategically to best serve their needs
- Producing legacy capture sessions where an FTA employee in a key role or planning to retire participates in a video recording of a private interview, a roundtable with one or two peers, or a town hall meeting with many coworkers to share knowledge and insights for posting on TransPort

- Producing video recordings of office leadership speaking briefly about their offices' main functions, for posting on TransPort for the benefit of new or unfamiliar employees
- Assisting offices to give visibility to their business processes, identify bottlenecks and ineffective processes, and develop strategies for improvement
- Serving as FTA's liaison to the DOT-wide Idea Hub90 program, which provides a platform and process for employees to suggest and collaborate on improvements to FTA and DOT business processes and work-life factors
- Supporting FTA's use of web conferencing technology to give every employee another means of meeting, collaborating, presenting, and teaching that reduces the limitations of geographic distance and time

The new, larger LKM Group staff has a diverse skill set that serves the combined needs of learning and development with KM. Apart from technical skills in its specific disciplines, the team has strengths in leadership, strategy, management, logistics and implementation, design, IT, communications, organizational development, entrepreneurism, and a good political sense. Dr. Camarena has stressed developing a can-do attitude and customer focus among all staff and created an environment that supports it, which is viewed as important to its continuing success.

In its activities connected with the launch of the TransPort transit knowledge portal, the LKM Group found difficulty separating KM from IM activities, especially in the area of document management. Depending on how one defines knowledge as distinct from information, there usually remains considerable overlap, at least such that it can be counterproductive to try to explain the distinction to non-technicians. That overlap is not viewed as a problem in itself. However, the LKM Group's limited resources do not allow it to support effectively needs that, in many cases, should lie in the domain of the Office of IT. These two offices at FTA are working to distribute the workload appropriate for their respective strengths, although they are finding that easier said than done. The Office of IT recognizes the LKM Group's strengths in process analysis, consulting, communications, and change management and wishes it to continue contributing those strengths to IM applications. The LKM Group appreciates the Office of IT's depth of technical expertise, responsive orientation, and capacity. Coordinating the activities of the two groups can make it difficult to deliver high-quality service. This is an ongoing effort in developing smooth, effective collaboration.

90 ` Idea Hub, U.S. Department of Transportation, http://www.dot.gov/tags/idea-hub

Dr. Camarena's 2009 knowledge audit focused on identifying capabilities, capacities, and perceived problems. In the course of FTA's work to give visibility to business processes and to improve interfaces to the functions of offices via its portal platform, some structures of knowledge will be identified and begin to be documented. The process of identifying individuals for legacy capture activities, speaker programs in knowledge cafés, and mentoring programs, also shines light on key human stores of knowledge.

Heavy day-to-day workloads are the principal barriers to greater knowledge sharing at FTA. It is a lean organization and initiatives to improve performance on activities such as grant review and project oversight take precedence over planning for knowledge transfer. An increasing focus on business processes within the LKM Group offers the promise of directly relevant improvements, although that still does nothing to free people to work on the improvements they seek. The LKM Group accepts that adoption will be slow as it works to marshal the resources needed to provide greater support, and it points to successes by early adopters to encourage managers to make resources available when they can.

Those who have adopted TransPort, FTA's transit knowledge portal, have had compelling reasons to invest the time to plan and learn to use it. FTA's intranet functions will be rolled into TransPort over the coming six months; this will lead many people to it daily who otherwise may not have had a strong reason to learn about it. A key objective of the LKM Group, when this integration is complete, is to communicate effectively TransPort's capabilities beyond the intranet functions, and especially to highlight the functions that illuminate and expose business processes, connect people to one another, and disseminate documented knowledge.

Success in many cases is judged by the satisfaction of office leadership in their employees, improving access to the information and expertise needed to make decisions, ease of communication, understanding, and continuing improvement of FTA business processes, employee development, smooth successions, and employee satisfaction with their jobs. Surveys and direct feedback are principal means of gauging these factors.

Leadership and Culture	FTA's 2009 KM strategy outlines three strategic goals with associated objectives: Goal 1: FTA Encourages a Culture of Knowledge and Experience Sharing ■ FTA has a common understanding of KM and its goals. ■ FTA staff knows of, and uses, KM tools and procedures. ■ FTA provides incentives for sharing knowledge and experience. Goal 2: FTA Employs Efficient and Effective Business Processes ■ KM tools and procedures are integrated into FTA's daily business process. ■ FTA uses KM tools to document its business procedures. ■ FTA harnesses its knowledge and experience. ■ FTA staff can easily access knowledge, experience, and information to conduct the Transit Mission. Goal 3: FTA Leverages Its Knowledge and Experience for Decision Making and Strategic Planning ■ Decision-making and strategic planning are augmented by enhanced business processes resulting from implementation of KM procedures and tools. ■ Data and knowledge formulate the foundation for comprehensive decision-making. LKM Group activities are tied to the organizational excellence objectives of the DOT Strategic Plan, as well as to those stressing employee engagement. LKM Group members' job performance rating elements also are linked to agency strategic goals. FTA is not yet mature in broad employee adoption of KM. In large parts of the agency, the goals above remain distant. Culture varies quite a bit from office to office. KM adoption seems proportional to employee engagement and inversely proportional to workload. Direct leadership advocacy for KM, where it is forthcoming, has a powerful positive effect on adoption.

	FTA's LKM Group has put a great deal of effort into the design of its weeklong training program for new supervisors. Most of the participants have been FTA employees for some time, but all are new to the supervisory role. New training elements help to build competencies in the areas of motivation, innovation, engagement, and KM – in addition to other topics – that FTA expects will yield considerable benefits in how employees are supported, and positively affect FTA's culture. This is yet another significant benefit of FTA's having integrated its learning and development with KM functions. Leadership development at all levels is a significant goal that would be enhanced by access to additional resources.
Recognition and Rewards	FTA's existing Administrator's Awards, along with DOT's Secretary's Awards, are the formal awards programs that support KM at FTA. In 2013, Dr. Camarena nominated 15 people who collaborated on the TransPort transit knowledge portal for the FTA Business Process Improvement Team Award – they won. Collaboration is specified in a set of general performance objectives for all FTA employees, but success or failure on that point may not materially affect an employee's rating. Informal peer-to-peer recognition motivates employees to collaborate and contribute in those offices where the culture supports engagement. Strong employee contributions to the DOT Idea Hub program are evident through the peer ranking function of the Idea Hub platform itself, leading to recognition. Ideas contributed to Idea Hub that are accepted for implementation are brought to the attention of executives, who may act to acknowledge or reward those employees independently. Availability of cash for awards is limited or nonexistent due to federal budget cuts.

Communities	FTA's communities typically are groups of peers led by someone who has had a strong interest in interacting and learning. They may be special interest groups for users of specific technologies, or meetings of people performing the same functions in different offices, such as deputy regional administrators. They may have been participants in a class together, or be new supervisors. They may exist at any level, from analysts to associate administrators. The geographic location of nearly half of FTA's workforce away from headquarters creates additional needs for peer interactions. Meetings may be weekly, semi-weekly, or monthly. Agendas are set by request and consensus. Conference rooms, plus video, telephone, and web conferencing facilities are all available. Heavy workloads impact participation, because work comes first. A leader who holds meetings regularly and actively networks with participants outside meetings contributes a lot of support and stability to a community. Especially for remote participants, communities are important lifelines to others doing similar things who can provide information and mentoring, along with friendship and even emotional support during difficult periods. FTA's LKM Group initiates and facilitates some communities itself, and for others it offers KM support and collaboration space on the TransPort platform.
Storytelling	FTA's formal encouragement of storytelling has been limited to legacy capture sessions recorded by the LKM Group.

Succession Management

Succession Planning	The formal succession management that the LKM Group is directly involved with at this time is the legacy capture program previously described. Individual office leaders, in cooperation with agency leadership and the Office of HR, manage succession needs on a case-by-case basis. The LKM Group's mentoring programs and efforts that give visibility to and improve business processes further lessen the burden of succession management.
Staff Retention	Like succession management, the leaders of individual offices in conjunction with senior leadership manage retention activities. The limited number and narrow range of jobs at FTA makes this process difficult.

Employee Interviews	See the previous discussion of legacy capture interviews and forums. The LKM Group has found that certain formats are better for some subjects or people, depending on their roles and their comfort speaking about their work. The town hall style, where a large group of employees from a key individual's office has a conversation with the employee, is working best for shy people. The LKM Group facilitates the process, conducts the interviews, and is responsible for video recording and editing. The time required for video editing and captioning has resulted in a backlog of videos.
Employee Orientation, Learning, and Development	
New Employee Orientation	HR handles FTA's formal onboarding process. The LKM Group conducts new employee orientations. Material now distributed in paper form will be placed online where it can be augmented easily and kept most up to date. The LKM Group already has gained the ability to provision accounts in its online Learning Management System, which employees can access prior to their enter-on-duty dates, so that certain required training optionally can be completed before reporting for work, thus streamlining the process of qualifying for network access.
Employee Growth and Development	See the previous sections on Designated Function and Culture for basic information on learning and development activities. They are communicated by curriculum listings on the TransPort transit knowledge portal, by e-mails with links to relevant new information posted to TransPort, and by announcements to the executive management team. Most or all seats for learning and development activities are typically booked. Surveys are conducted following activities to determine learner satisfaction. Local administrators in each office, who have been given special access and training to maintain training histories, track employee-training histories in FTA's Learning Management System.

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management

FTA's principal content repositories are shared network drives. Individual offices manage their own file organization, and the quality of organization varies from office to office. Most report that their file organization is poor, and employees sometimes have difficulty locating files quickly. The TransPort transit knowledge portal is built on Microsoft SharePoint and provides file storage functions that some offices are beginning to adopt. Offices are being given the option of whether and how to implement metadata, while being cautioned that if they forego it at first they still will need to undertake categorizing their content in the near future. For many, starting with simple folder structures in a fashion similar to what they were used to with shared drives has eased adoption. FTA recognizes that it risks disorganization like that on the shared drives if folders are allowed to proliferate in an unmanaged fashion on SharePoint.

TransPort is a branded implementation of SharePoint 2010 that imposes some standardized governance and structure on offices (e.g., a consistent web-like interface with a section for private office content and one for content to be shared across FTA, and consistent formats for office home pages). Offices that have adopted TransPort have input into which SharePoint features are enabled for their use, or hidden; they receive demonstrations and basic training from the LKM Group on content and document management. The LKM Group requires offices to designate a single point of contact for its TransPort implementation, plus:

- Content managers, who receive extra training and are intended to be offices' local source of support and to perform central editing and management functions
- Security managers, who receive extra access and training on setting security permissions and are intended to be offices' local experts on ensuring that permissions are set correctly
- Approvers, who are typically managers or directors in a position to vet content proposed for agency-wide consumption

Records management is handled outside the SharePoint environment: managed by a records liaison in each office and coordinated by an agency records officer in the Office of Information Technology. Training on records management is among the mandatory courses employees are required to take periodically.

	In addition to the challenges listed in the Designated Function section relating to the division of responsibilities between the LKM Group and the Office of IT, the principal challenges relate to: ■ Limitations on the available time of both LKM staff and the staff of offices who may wish to adopt TransPort or better organize their files on shared drives ■ Difficulty enforcing governance ■ Limited general computer skills of some workers that impede their ability to effectively learn to use a platform like TransPort for more than just browsing ■ Bandwidth limitations between HQ and regional offices Senior leadership recognizes the problems with FTA's current content management and supports the LKM Group's strategy, for now, of working with offices to adopt TransPort at their own pace.
Lessons Learned and Case Studies	The LKM Group offers to facilitate after-action reviews for FTA offices at any time. Offices may rely on the LKM Group for facilitation or learn to conduct their own. The offices involved manage the results of their reviews internally; no standard methodology exists for ensuring that they are taken into consideration at the launch of similar projects in the future. The LKM Group has successfully conducted after-action reviews with remote participants using interactive web conference technology, which enabled the use of a virtual flipchart to record participant input.
Institutional Memory/ Retention of Critical Knowledge	See previous sections for information on videotaped legacy capture interviews, roundtables and town hall meetings.

Process Documentation	Some FTA offices have mature process documentation. FTA's internal Grants A to Z database contains extensive information on grant application, review and oversight processes. The Office of IT continuously refines a set of standard operating procedures documents on using technology tools. All FTA offices maintain process documentation in various forms, but not in a standardized way. The LKM Group has recently raised the priority of helping offices to document, add visibility to, and work to improve their administrative processes. The TransPort transit knowledge portal's standard office home page layouts will be modified soon to include a list of office functions with links to wiki pages with more information about each function and how FTA employees can interface with it. For FTA's administrative offices, like HR, these will be long lists of functions. For program and regional offices, the lists will be much shorter. These resources will not only facilitate better understanding of what FTA does, how it does it, and who does it, they also will cast valuable light on the processes themselves and facilitate thinking about how they can be improved.
Expertise Identification	The SharePoint-based TransPort transit knowledge portal includes a personal profile page for each user that people are being encouraged to populate with a professional bio, short self-reported list of special skills, projects for which they are points of contact, and a photo. TransPort's search engine will include profile entries in search results where search keywords match those used in profiles.
Tools and Technologies	FTA's tools and technologies are described in various sections above.

Virginia Department of Transportation

Response provided by:	Dr. Maureen Hammer, Knowledge Management Director
Context	The Virginia Department of Transportation (VDOT) is responsible for the third largest state-maintained highway system in the country, behind Texas and North Carolina. VDOT is responsible for building, maintaining and operating the state's roads, bridges, and tunnels, and, through the Commonwealth Transportation Board, provides funding for airports, seaports, rail, and public transportation. The 57,867-mile state-maintained system is divided into these categories: ■ Interstate – 1,118 miles of four- to 10-lane highways that connect states and major cities ■ Primary – 8,111 miles of two- to six-lane roads that connect cities and towns with each other and with interstates ■ Secondary – 48,305 miles of local connector or county roads, generally numbered 600 and above (Arlington and Henrico Counties maintain their own county roads.) ■ Frontage – 333 miles of frontage roads A separate system includes 10,561 miles of urban streets, maintained by cities and towns with the help of state funds. Virginia's cities are independent of its counties. Henrico County (1,279 miles) and Arlington County (359 miles) maintain their own roads with VDOT funds. An additional 39 miles of toll roads are maintained by others. We inspect and track more than 20,900 bridges and structures, including 13,300+ National Bridge Inventory structures and 7,600+ non-inventory structures in Virginia. The agency's annual budget for fiscal year 2014 is $4.7 billion, representing an 11.2% increase from the previous year. It is based on the most recent official state revenue forecast from April 2013 and estimated federal funding. Funds that will be provided for highway maintenance and operations represent 40% of the total budget, followed by 31% for highway construction. Smaller portions of the budget address the needs and requirements of debt service, support to other agencies, tolls, administration, and other programs.

Dedicated state and federal revenue sources provide VDOT's revenues. Funding for transportation was addressed during the 2013 General Assembly Session by House Bill 2313[91] (Chapter 766). It will provide substantial, sustainable revenues to eliminate the state maintenance crossover during the six-year financial plan and will provide funding for construction formula distributions. Estimated revenues for 2014 reflect the first year of implementation of major changes to revenue dedicated to transportation.

VDOT employs about 7500 people full time, compared to 10,380 at the close of fiscal year 2001. That is the lowest level since 1965.

The agency has nine highway districts divided into 29 residencies and two district satellite offices, which are responsible for one to four counties each. There are 176 maintenance area headquarters. VDOT's Central Office is in Richmond, with 28 divisions providing policies, procedures, and support to the districts.

The Commonwealth Transportation Board guides the department's work, much like a board of directors. The Secretary of Transportation serves as chair and the Commonwealth Transportation Commisioner as vice-chair. The governer appoints and the General Assembly approves the 17 board members. The director of the Department of Rail and Public Transportation serves as a nonvoting member. Meetings are usually held monthly and are open to the public.

91 Howell, WJ, et al, HB 2313 Revenues and appropriations of State; changes to revenues collected and distribution, report, http://leg1.state.va.us/cgi-bin/legp504.exe?131+sum+HB2313

Impetus for KM	VDOT was founded in 1906 as the Department of Highways to engineer and construct Virginia's primary roads, transforming mud routes into a modern roadway network. In the 1950s, this mission was expanded to participate successfully in the construction of the interstate highway system. Both of these endeavors were well served by an organizational structure that was originally modeled on that of the U.S. Army and staffed by former military officers and soldiers. Today, however, transportation needs can no longer be met by simply building more roads; yet there is an ever-increasing demand for transportation capacity and efficiency. VDOT must shift its focus from roadway construction to maintenance and system operations, which requires tremendous collaboration both between previously distinct internal agency functions and with exterior state agencies, with which there is little or no historical connection. The hierarchical organization that served the demands of the first century so well must change to meet the needs of the new; however, the transition depends on successfully integrating new strategies with experienced practices. Simply put, massive organizational change must be managed in a way to meet new demands and increase efficiency. VDOT currently has about 7000 employees, of whom approximately 30% are eligible for retirement within the next five years. The agency experienced a loss of knowledge in the mid-1990s during two statewide workforce reductions that cut 20% of total staff in less than five years. This resulted in an unforeseen loss of productivity and effectiveness. To mitigate these losses, the agency hired contractors to continue the work, and many of these contactors hired former employees. These former employees are now approaching second retirements or have retired. To prevent a recurrence of knowledge loss, the agency created a Knowledge Management Division in late 2003 to address critical knowledge identification, collection, organization, and dissemination.

Innovation and Knowledge Sharing

Designated Function for KM

VDOT's KM function is provided by the Knowledge Management Office, currently housed within the Virginia Center for Transportation Innovation and Research[92], better known as the Research Council. The current KM Office organization chart and 2014 budget are shown in Figure F.1 and Table F.1.

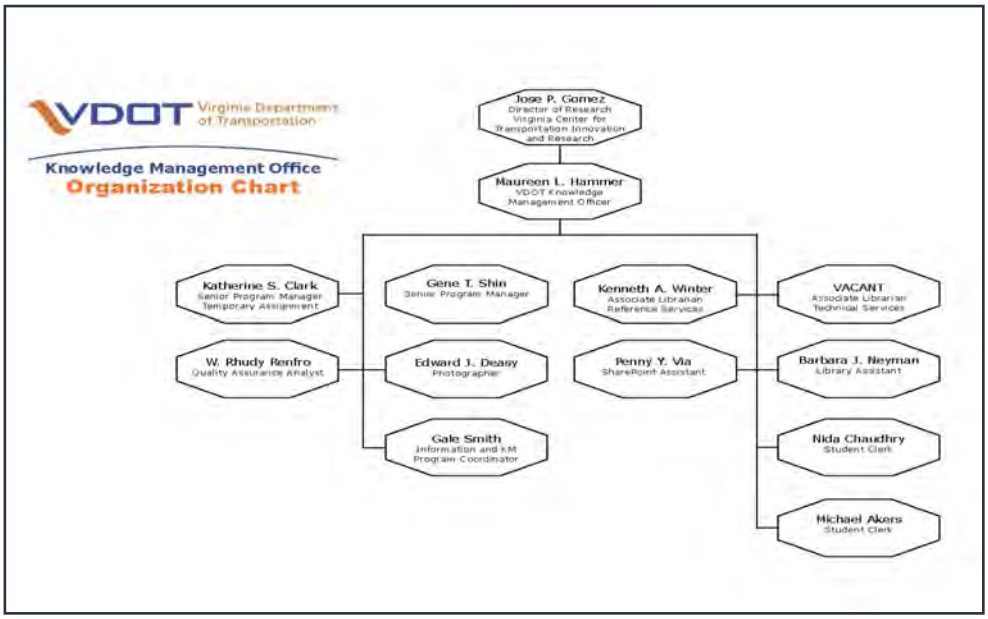


Figure F.1 VDOT KM Office organization chart

Table F.1 VDOT KM Office 2014 budget

	KM	Library	IT	SPR	Total
Personnel	$477,419	$159,242			$636,661
Equipment		$10,000		$98,000	$108,000
Services	$73,000	$48,000	$135,000		$256,000
Supplies	$8,230			$2,000	$10,230
Travel/Training	$16,900				$16,900
Total	$575,549	$217,242	$135,000	$100,000	$1,027,791

92 Virginia Center for Transportation Innovation & Research, http://vtrc.virginiadot.org

Evolution of the KM Function	When Philip Shucet joined the agency as the new commissioner in 2002, he introduced the concept of two new incubator programs to address the intellectual assets of the agency, one of which was KM. His expectation was that the KM program would address the identification and sharing of critical institutional knowledge. The KM Division was established in the spring of 2003 and a director was hired in November of that year. Due to a hiring freeze in state government, hiring for additional positions in the division was put on hold for six months. Because the new director came from outside the agency, the Chief of Technology, Research and Innovation, Dr. Gary Allen, assigned a research scientist and long-term employee, Bill Bushman, to temporary duty with the new division to act as a guide to the agency for the new director. The research council, located in Charlottesville, provided administrative support. The KM Division was given two directives: 1) establish a CoP for the project managers of the major construction projects, and 2) take baby steps but make this happen quickly. In Virginia state government, there is a new governor every four years and, hence, a new commissioner for the agency. Greg Whirley became acting commissioner following the departure of Shucet and ensured that the KM Division was closing the loop on the knowledge identified or created so that policies and procedures were impacted (confirmed, adapted, or introduced), thus ensuring process improvement and efficiencies and acknowledging employee contributions. This oversight and support continued under the next commissioner, Dave Ekern, and then by Greg Whirley, beginning with his commissioner tenure in 2009. Each commissioner ensured that participants in KM projects received recognition for their contributions and knowledge sharing and that process, policy, and procedures improvements were implemented. This strong executive leadership ensured the program's success. Executive staff and management further supported the program and encouraged employees to participate. We have continued to enjoy this support due to identifying and tracking qualitative and quantitative measures developed for each project to ensure a positive return to the agency. In 2010, VDOT underwent an agency-wide reorganization designed to decrease both staff (1500 employees) and the number of divisions. As part of this reorganization, the KM Division became the KM Office as part of a merger with the Research Council.

Definition of Knowledge Management

VDOT's primary functions are to build, maintain, and operate the roadway system, and it has a rich tradition where people develop deep expertise to do so over decades. To support this primary mission, VDOT has also developed ways to:

- Train people both formally and informally
- Provide logistical support
- Manage finances
- Negotiate with the public
- Work with outside contractors
- Partner with other agencies
- Comply with local, state, and federal regulations
- Conduct research

Each of these activities also requires a specialized knowledge discipline, and, in an organization that is divided into both divisions and regional areas of responsibility, the manner in which those diverse knowledge disciplines interact grows exceedingly complex, even conflicted.

Handling this complexity and minimizing conflict requires the institution to manage information and knowledge simultaneously. These are often treated as the same thing because of the way they interact; however, it is important to understand that they are different things, with specific properties, and therefore present different challenges and require different support structures and management strategies.

Information is captured in documentation and stored in all manner of media, from Post-It notes to libraries and databases. IM emphasizes "findability," accessibility, and accuracy. **Knowing** resides only within the person. KM is supported by technology, but focuses on people and emphasizes understanding, collaboration, and choice.

If we only needed information to get things done, then institutions would just be manuals and procedures; however, it takes more than information to perform a function, particularly one as complex as VDOT's. It takes people who not only know what to do and how to do it, but why to do it a particular way. Understanding, negotiating, and fostering these ways of knowing to improve institutional effectiveness and efficiency may be described as KM.

	Ultimately, KM may be defined as an effort to develop self-awareness in a corporate context and on an institutional scale. The benefit of developing a KM program along these lines is, once self-awareness is institutionalized, it becomes part of the way people know their work. Together, IM and KM may be seen as an interactive spectrum of activities. Where IM deals primarily with questions like who, what, when, where, and how, KM deals primarily with why. Of course, we need all the informational details to do our jobs, but people work best when they know that what they are doing and how they are doing it matters, and that means they need to know why. Why are we doing this? Why are we doing it this way? When people know why, they can choose to do the extraordinary.
Knowledge Management Program Elements	The concept of KM starts with the premise that people in an agency such as VDOT need to rethink and encourage knowledge transfer within the agency: both tacit knowledge and explicit knowledge. Tacit knowledge refers to understanding and wisdom that is housed intellectually and often not articulated or documented. Tacit knowledge builds up over time as experience and learning, then takes root in individual abilities and performance. Explicit knowledge is information that has been codified and documented in a means that can be physically accessed by others. Formerly, technology served as the foundation of KM, often leading to knowledge capture rather than KM. This method focused more on explicit knowledge or the attempt to transform tacit knowledge into explicit knowledge. Literature now suggests that KM must focus on the *who* as much as the *what* in terms of information, thus promoting an intra-agency dialogue between leaders and employees to share knowledge. Research is necessary first to determine where the knowledge is held and then to create the best means of relaying it throughout the organization. KM now relies building and sustaining a learning culture and requires nontraditional combinations of disciplines, such as psychology and information systems. VDOT's KM program focuses on the transfer of tacit knowledge by identifying what groups or individuals hold knowledge. KM then develops a method of sharing that knowledge with other individuals or groups to improve how business processes are approached, considered, or handled. The intention is to promote collaboration, create a fully competent workforce, and learn from others within the agency; thus, the effort is agency-wide and not focused on the individual employee.

The KM Office fosters explicit knowledge primarily through acquiring and easing access to the resources in the VDOT Research Library and sharing codified information from tacit knowledge capture. This exchange relies more on the employee's self-motivation than on a group's collaborative efforts.

The KM Office uses a variety of methods for achieving results, including CoPs, knowledge mapping, lessons learned, process mapping, electronic access to research and reference material, and research synthesis bibliography. All of these methods rely on the KM Office's ability to bridge silos within the agency and provide objective analysis and solutions. It is important to note that KM efforts are from a broad perspective – how VDOT is enhanced overall by using KM tools.

VDOT's KM products and services are illustrated in Figure F.2.

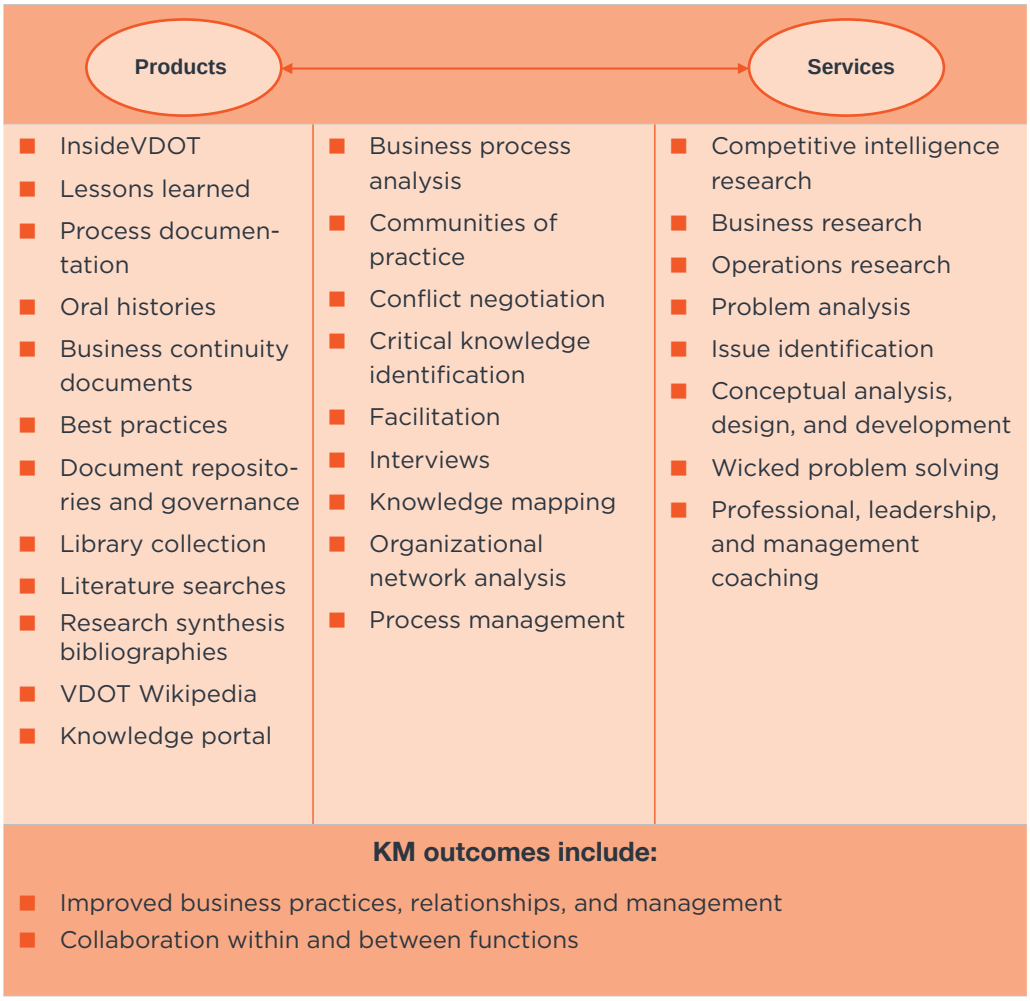


Figure F.2 VDOT KM products and services

Leadership and Culture	Necessity has driven knowledge sharing. As noted earlier, the shift to maintenance and operations requires greater collaboration and knowledge transfer. With a smaller staff, we cannot afford to reinvent the wheel – hence we have CoPs to ensure that knowledge is shared. While KM sponsors all of the communities, in truth, they now develop on their own, and we are told about them and support them as needed. The tools work. Given more resources, the KM office would map all the knowledge networks, promote informal knowledge sharing, and create an agency-wide taxonomy to support "findability."
Recognition and Rewards	VDOT has established a Commissioners Award program to provide the highest form of recognition for specific, measurable, and outstanding accomplishments that have positively impacted the agency's business and public service. Such accomplishments should be above and beyond the usual expectations of work and clearly recognizable as specific, outstanding achievements. Two categories of awards have been established: ■ **Innovation and Quality Improvement** – Innovation demonstrates creative solutions to challenges in the work environment. Quality improvement is the positive change to a system, process, or product because of innovative thinking, which may include increased productivity or a reduction in costs. ■ **Teamwork** – Teamwork represents a group of employees (minimum group size is three VDOT employees) that consistently exhibits the qualities that make teamwork essential to the agency's success, including coordination of efforts to produce quality service or innovative results. Both of these categories support KM initiatives. The KM Office has had two wins and several nominations.

Communities

Communities are a cornerstone of our KM program. CoPs support the transfer of tacit knowledge from one employee to another through project teams for increased efficiency and effectiveness. Their intent is to better the agency as a whole through enhancing employee communication. Communities work to create intra-agency networks and share best practices. CoPs span geographic regions, use dialogue and learning to ensure agency consistency, and foster innovation through the discovery of new ways to perform functions and obtain results. For engineers, they can create an atmosphere that fosters the solving of similar problems. VDOT CoPs have resulted in new tools and changes in processes. These have resulted in significant cost or time savings that have been integrated into normal business practice. The table below illustrates some of the outcomes of CoPs at VDOT through KM Office facilitation.

Community type	Purpose
Best practice	Develop, validate, codify, index, and disseminate proven practices
Helping	Facilitate informal knowledge sharing, Q&A, mentoring
Knowledge stewarding	Collect, select, update, organize, and distribute day-to-day knowledge
Innovation	Foster innovative ideas and practices

VDOT has been using CoPs since December 2003. We have anywhere from 40 to 70 communities at one time that we integrate horizontally and vertically to ensure there is awareness and knowledge sharing across the organization's functions and levels. Groups meet monthly, bi-monthly, and quarterly and many have a team site for collaboration on the agency intranet (based on SharePoint). Some communities have a finite beginning and end; some extend over a long period. The term CoP has become well known, and CoPs have been adopted within the agency and are seen as a viable and successful approach to solve problems, share knowledge, and ensure continuity within the organization.

Our support of the CoPs ranges from indirect to direct, depending on the community's needs at a given point in time. KM directly manages some CoPs, while others self-manage and keep KM informed. Many communities need assistance in structuring, focusing, and documenting outcomes – that is where the KM Office plays the largest role. KM also assists the communities to communicate with executive leadership about the value of the community to ensure continued support.

Succession Management

Succession Planning	VDOT identified the need for a formal succession management program to facilitate organizational stability within key leadership positions and ensure ongoing organizational vitality through focused employee development, particularly at the management and executive levels. The impetus for this initiative was awareness of the retirement eligibility for incumbents in several key executive positions and the knowledge that, with improvement in the economy, risks to retention for many professional disciplines within the organization could significantly increase. The succession management initiative is currently in the planning and development stage, with a combined team of IT and HR professionals leading the effort. Once established, the program will be a part of the HR and Training Division and will be led by a succession management program manager who will be tasked with overall management of the program, including coordination and oversight of annual talent reviews at various levels within the agency. Given the current planning and development phase of the project, specific products have not yet been selected. The agency is conducting analysis to determine whether the organization's needs are best met through internal development of a succession management technology solution or whether purchase of an existing product is a better alternative. Frequency of updates will be contingent upon the final determination. As part of the development stage of the succession-planning project, the agency will use the business plan to help identify strategic areas of organizational focus and support definition of key positions that will form the basis for the initial launch of the succession management program. Once defined, the program will be piloted in one or two divisions to start. Implementation across the agency will follow within a defined period. Risks will be identified through an annual strategic talent review process focused on identifying organizational vitality and readiness of the workforce to meet future agency needs. This process will occur at multiple organizational levels and ultimately facilitate an executive level identification and review of key positions within the organization and the readiness level of individuals holding key positions to assume positions of greater responsibility and authority.

	The program will provide the platform for a strategic assessment of organizational vitality and readiness of talent to support the business plan and achieve organizational goals. Measures of success will include the annual talent review, identification of high-potential employees, and individual readiness assessments. This step will support analysis of available and ready talent as compared with key positions, thus enabling organizational risk assessment and strategic planning. Additional success measures will be developed once the technology platform has been identified. Tracking will be managed electronically. The employee and manager will jointly manage tracking of adherence to performance development plans with electronic maintenance of all associated documents. The Succession Management Program manager will be responsible for tracking associated with talent reviews; this will be maintained electronically as a part of the Succession Management System.
Staff Retention	In addition to offering challenging stretch assignments, acting assignments, and cross-training opportunities to increase the knowledge, skill, and competency of valuable employees, VDOT uses a number of recognition and retention incentive options to reward and retain talent in our organization. These include the following: ■ **Competitive Offers** – match up to outside offer not to exceed salary range maximum ■ **In-Band Adjustments or Bonuses** – increase up to 10% for retention, acquisition/application of new knowledge/skills/abilities, internal alignment, and change of duties ■ **Retention Bonus** – up to $10,000 during a fiscal year to remain in a critical position ■ **Project-Based Incentives** – incentive for project completion or milestone bonuses not to exceed $10,000 for any one project in a fiscal year ■ **Annual Leave Grants and Payouts** – up to 240 hours of annual leave grant or payout of unused leave balances to retain existing employees in critical positions

- **Recognition Leave and/or Bonus** – to acknowledge individual and team contributions; awards vary based on scope and impact of accomplishments, but may extend up to 40 hours of leave per year and up to $2,000 per employee per fiscal year

VDOT also has pipeline programs designed to recruit and retain talent in critical program areas and encourage career employment with our agency. These programs include:

- **Summer Intern Programs** – summer and part-time hourly employment opportunities for undergraduate and graduate students in engineering and nonengineering programs from accredited colleges and universities
- **Engineering Scholarship Students** – undergraduate tuition assistance for rising juniors and seniors through stipend and summer and part-time hourly employment opportunities. Scholars are required to enter the Core Development Program in civil engineering upon graduation following completion of their degree. Scholars may defer entry to the Core Development Program to attend graduate school while working part-time for VDOT; however, they do not receive a stipend and are still required to enter the Core Development Program upon graduation.
- **Construction Inspector Trainees** – 24-month (approx.) on-the-job and classroom training program designed to recruit and retain individuals with limited construction experience and/or related educational background in math and science to inspect highway construction projects to ensure compliance with plans and specifications

To develop and enhance the skills of leaders within our organization, VDOT offers in-house development programs and partners with other reputable organizations within the commonwealth. Currently we offer a Leadership Development Program for Supervisors in VDOT, which is a cohort-based course that includes a combination of classroom and self-paced learning. For senior leaders, we partner with the Commonwealth Management Institute[93] and the Virginia Executive Institute[94] to provide developmental opportunities to enhance the skills of managers who have more recently accepted senior leadership roles.

93 Commonwealth Management Institute, VCU Performance Management Group, Virginia Commonwealth University, http://www.pmg.vcu.edu/development/cmi/

94 Virginia Executive Institute, VCU Performance Management Group, Virginia Commonwealth University, http://www.pmg.vcu.edu/development/vei/

Employee Interviews	Employee interviews currently are limited to exit surveys. VDOT does not currently conduct employee engagement surveys as part of our succession planning and management programs. As noted previously, VDOT's succession program is in the initial stages of development, and the possibility exists for using employee interviews and other tools in the future. The HR & Training Division is responsible for managing the exit survey process and, as such, distributes questionnaires to separated employees, receives the responses, and tabulates the results for management review. At the local level (on an ad-hoc basis), individual supervisors of employees in the process of separation from the agency may conduct informal discussions prior to the employee's departure; however, results of these discussions are not aggregated nor formally analyzed by the agency. All separating employees (including those separated for cause) are offered an opportunity to participate in the exit survey process. The exit survey is sent and completed after the employee's separation from the agency. The HR & Training Division compiles a list of separated employees and initiates the solicitation semi-monthly. Exit survey responses are tabulated into basic reports (i.e., Excel spreadsheets) and shared with agency executives monthly. These reports serve as a general barometer to gauge employee satisfaction; however, to date no management actions have been taken in direct response to these reports. VDOT is currently relying on a paper survey, which may be responsible in part for low response rates and possible data quality issues. Exiting employees are often more vocal about their employment experience than active employees, which is helpful, but the low response rate raises concerns with the validity of the data. The survey questions are currently being reviewed for revision along with the exit survey process itself.

Employee Orientation, Learning, and Development

New Employee Orientation	VDOT has a two-part orientation for new employees. KM does not formally participate; however, we are included in an overview of the agency, and the new employees are introduced to the agency intranet, InsideVDOT[95], managed by KM. In addition, library personnel (a department of KM) contact new employees to introduce them to available resources.

95 Hammer, M, VDOT Intranet: InsideVDOT, 2012, http://vimeo.com/50644121

Employee Growth and Development

VDOT has several employee development programs, including Pipeline Programs designed to build bench strength in VDOT's future workforce, leadership development programs, and technical training programs.

- Pipeline Programs
  - The *Civil Engineering Scholar Program* (CESP) is a strategic pipeline program that allows VDOT to recruit talented future professional civil engineers. This program focuses on preparing student civil engineers for progressive career growth in VDOT areas where high vacancy rates exist or where retirement eligibility is high and to help maintain a high-caliber workforce in important areas of agency need. The Learning Center works closely with ABET[96]-accredited civil engineering schools to recruit rising juniors and seniors who meet VDOT's academic and residency criteria. As part of the scholar contract, VDOT provides a stipend each fall and spring semester while the student is in the program, as long as the student maintains a 2.5 grade-point average. Once scholars graduate, they are placed in the Core Development Program as full-time employees in a civil engineering position. The five-year retention figure for this program averages 64%.
  - The *Core Development Program* builds the pipeline by recruiting, selecting, on-boarding, developing, and managing performance of diverse top-notch talent. The program targets roles that require specialized education and skills critical to the long-term success of VDOT. There are two tracks within the program: one for engineering and one for business. The Core Development Program combines technical, leadership, and core competencies through on-the-job training, workshops, and individual and group assignments. Additionally, the program has a rigorous coaching component. At the end of two years, participants graduate into a full-fledged role within their discipline. Since January 2000, 65% of participants are still employed with VDOT.
  - The *Internship Program* hires college students as wage employees with potential to become future employees and is part of a pipeline development strategy for hiring individuals in areas where high vacancy rates exist or where retirement eligibility is high. VDOT interns cover a wide spectrum of disciplines. Over the summer months, the program includes structured curricula, carefully defined on-the-job training and coaching, developmental assignments for selected projects, and some cross-training opportunities. This program restarted in 2011 and, since that time, 40% of participants have matriculated into full-time VDOT positions.

96 ABET (Accreditation Board for Engineering and Technology, Inc.), http://www.abet.org/

- The *Construction Inspector Trainee Program* is a pipeline program developed to ensure that an adequate, qualified staff is in place to effectively deliver the construction and maintenance programs. The program is imperative to the success of VDOT's construction and maintenance programs because it fills the pipeline that provides our future inspectors, senior inspectors, and construction managers. This development program is also a two-year program in which each participant works in the field under the supervision of another inspector or senior inspector. The training consists of nine safety courses, 10 construction courses, five computer software courses, 11 human resource courses, 10 personal development courses, 12 material certification courses, and 67 construction job elements which are learned through on-the-job training.

- Leadership Development Program

  - VDOT's *Leadership Development Program for Supervisors* began in response to a fiscal year 2012 business plan goal and was successfully accomplished by June 30, 2012. It has now been institutionalized, and we typically graduated 1.5 cohort groups each year, with around 40 supervisors per group. The nine-month program optimizes learning based on the competency model for first-line supervisors and uses online learning, video teleconferencing, instructor-led training, coaching, and a capstone learning event that synthesizes the various principles learned during the program. Because participants are from all areas of the state, the program emphasizes "One VDOT, One Team." The measure of success for this program will be career advancement beyond the first-line supervisor; because this program is new, data on this measure is not yet available.

  - *Maintenance Leader Workshops* (MLW) - After downsizing in 2010, this program was designed to focus on 1) planning maintenance work, 2) assigning work, 3) monitoring work, and 4) measuring work. Additionally, a coaching component was incorporated and participants were mixed across district boundaries. Maintenance leaders from every district participated in a train-the-trainer session and assisted with workshop facilitation. In 2012, before and after assessments that measured the change in performance in the four previously mentioned areas were done. Overall, using a 5-point scale, participants showed an improvement of 1.5 points in the four areas on average. Additionally, superintendents began sharing more equipment cross boundary lines and began developing best practices that are continuing to improve the work performed.

- Technical Training
  - The entire workforce receives training and/or development as part of their Individual Development Plan, which is part of the employee performance plan. These types of activities are wide ranging and may be additional technical training, a certification, test preparation for a license, license renewal, attendance at an outside public training program, tuition reimbursement, or attendance at a conference. In fiscal year 2013, VDOT provided 2289 classroom sessions, with 36,069 aggregate student completions; 355 unique employees used the online, off-the-shelf SkillSoft courseware.
  - The Maintenance Training Academy[97] partners closely with the Maintenance Division's Equipment Section and with the Safety and Health Division to design and to deliver training to field maintenance and operations personnel. The focus of training is to provide instruction on procedures to properly inspect and maintain each piece of equipment and how to use it properly and safely in accomplishing the activity it was designed for. The academy also provides certifications recognized by Virginia Occupational Safety and Health in the use of Industrial Trucks (forklifts) and Aerial Lift Trucks (bucket trucks). The Maintenance Training Academy also produces job aids for use in the field and videos that can be used when needed or during safety meetings. During fiscal year 2013, 2922 employees completed the training requirements of the 24 different classes.
  - In 2013, the VDOT Materials Certification Schools[98] offered certifications in 13 specific subject areas. In all, 2222 participants were trained in a combination of instructor-led and self-study training.

97 Maintenance Training Academy, Virginia Department of Transportation, http://www.virginiadot.org/jobs/mainttrainacademy.asp

98 VDOT Materials Certification Schools, Virginia Department of Transportation, http://www.virginiadot.org/business/matschools.asp

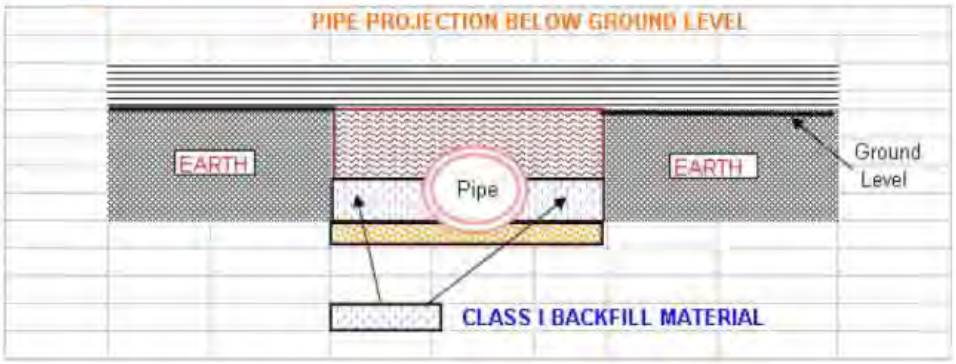
Identification, Documentation and Dissemination of Processes, Practices and Expertise	
Organizational Functions for Content Management	There is no single group responsible for content management, with the exception of KM oversight of the intranet. We do have two sets of corporate metadata (one for corporate documents and one for construction projects) that must be used for applicable content. We have recently hired an IM & KM Program coordinator to develop an agency-wide taxonomy for the intranet that will allow for individual metadata sets for different functions. We also have an extranet and will be building an archive repository to complete the document life cycle. A records management section under the Administrative Services Division oversees records retention and schedules that meet both the Library of Virginia and VDOT standards. This is a well-established and long-running section and compliance is high. The policy division has established intellectual property guidelines in partnership with the attorney general's office, and those guidelines are readily accessible. The VDOT Research Library serves the entire agency with a strong print collection and multiple subscription databases. VDOT has a state-of-the-art library catalog and access to several transportation- and business-related databases (e.g., the National Technical Reports Library with more than 500,000 articles and books 24/7 with more than 18,000 books). Over the last two years, we have moved to primarily electronic resources (e.g., ASTM, ASCE, Knovel[99] – which includes AASHTO standards, Ebsco business, and e-books) and are now planning for mobile access. Materials are accessible to all VDOT employees. We also offer quick and in-depth literature searches and research synthesis bibliographies on request. We use targeted e-mails and Linked In[100] to promote materials. The greatest challenges involve IT security. We must ensure that access is granted only to VDOT employees and work within the structure of a statewide IT agency. The second challenge is resources to provide these services.

99 Knovel, http://why.knovel.com/

100 Linked in, https://www.linkedin.com/?trk=nav_logo

Lessons Learned and Case Studies	The Lessons Learned Initiative was formalized with VDOT's Construction Quality Managers in 2007. A CoP was established specifically to encourage a culture of sharing knowledge by construction field staff. Its purpose was to capture lessons from previous experiences that are shared across VDOT, moving tacit knowledge to documented, explicit knowledge for future use. The CoP reviewed the lessons for best practices that resulted in changes in processes, procedures, and contract language. At this time, 176 physical lessons learned documents have been produced from these learning sessions, spanning a wide array of topics. Of these documents, 100 were written and distributed by a single unit of engineers. These are now archived and were created prior to the formalization of the Lessons Learned Initiative and therefore were not peer reviewed. The remaining 76 documents were peer-reviewed by multiple functions throughout the agency to ensure accuracy prior to publishing. Fifty-eight are current and 18 archived. In 2009, the Construction Quality Managers CoP won an award from AASHTO. Figure F.3 shows the result of one of the Lessons Learned Initiatives regarding soil moisture content.

VDOT **Construction Lesson Learned**



March 2009

Moisture Content for Class I Pipe Backfill

Lesson

The field density technician has the responsibility to utilize current specification requirements for moisture content when performing and assessing density tests.

VDOT Specification Number and Title

2007 Road and Bridge Specifications – 302.03(a) 2.g. Drainage Structures:

Moisture Content for Class I Pipe Backfill

Explanation

Field density rate requirements were revised by MD 288-07. This document can be accessed through the VDOT Portal on the Materials Division website.

Audience
VDOT & consultant inspection staff

Contributors
Wade Smith, Culpeper Construction Manager
Roger C. Riner, Culpeper District Materials
Robbie Lawson, Salem District Materials
Rob Marshall, CQIP Regional Engineer

Figure F.3 VDOT soil moisture content lessons learned

Institutional Memory/ Retention of Critical Knowledge	Knowledge mapping is used to help identify areas of need for succession planning and to build networks. This tool is used on a case-by-case basis and can take different forms (e.g., a network analysis map or a matrix). KM employs this method at the request of executives, and it is used in reference to specific knowledge areas

Process Documentation	KM uses a standard process that brings together experts to help map out processes and provides supporting documentation for the map that clearly outlines steps and accountability. The maps attach processes across separate functions, providing a clearer picture of how VDOT operates and documents methods for shared knowledge.
Expertise Identification	VDOT identifies most experts through communities. We are in the process of adding this information to the intranet via mySites.
Tools and Technologies	The agency uses a SharePoint platform for its intranet and extranet. SharePoint will also be the platform for the planned archive. We recently filled a position that will be responsible for taxonomy and metadata sets on all platforms. This person will work closely with the business to develop appropriate tags and structure that will be extensible across the organization. We have a research library that provides access to external content with an online catalog and several electronic resources and subscription databases. The goal is now to push those resources to mobile devices so that they are available to staff in the field. Records management is in place and compliance is high. The archive will assist with historical documents as well.

Washington State Department of Transportation

Response provided by	Leni Oman, Research Director
Context	Washington State DOT (WSDOT) is a multimodal agency: ■ Highways: 86 million vehicle miles/day (18,600 state highway lane miles) ■ 310 lane miles of the 320 miles funded for HOV systems are in place (including transit and HOV treatments on arterials and ramps) ■ More than 3700 bridges and structures (includes 68 ferry, 5 railroad, and 74 pedestrian structures and 118 culverts) ■ Ferries: More than 22 million passengers/year (22 ferry vessels, 20 terminals in Washington, and 450 total sailings per day with 900 total sailings) ■ Aviation: 16 WSDOT-managed airports (136 public-use airports) ■ Passenger rail: Nearly 840,000 passengers in 2012 (partner in Amtrak Cascades state passenger rail) ■ Freight rail: 3600 miles of operated public and private freight railroads move 103 million tons of freight (2009 data) ■ Grain Train has delivered more than 1.6 million tons of grain since 1994, 100 tons per car in 2010 (The Grain Train program runs 118 cars.) ■ WSDOT owns 297 miles of short-line railroad (During 2011, shipments on the Palouse-Coulee City removed 36,900 truckloads from roadways.) ■ Traveler choices: 570,000 workers statewide participate in commute trip-reduction programs (160 million vehicle miles traveled reduced annually) ■ Vanpool program includes more than 2800 vans (largest public fleet in the nation) ■ WSDOT maintains more than 2000 miles of bicycle touring routes, 1000 miles of bike trails, and 300 miles of sidewalk.

The budget for the current biennium (13-15) is just over $9 billion. Sources include:

- Fuel tax: $2,538 million
- Bond sales: $2,239 million
- Tolls, ferry fares and other state revenue/ fees: $984 million
- Vehicle/driver licenses, permits and fees: $1,289 million
- Local funds: $330 million
- Federal funds: $1,770 million

$6,151 million of this revenue funds WSDOT. Expenditures for the 13 to 15 biennium are:

- $4,678 million capital
- $1,473 million operating
- $1,336 million debt service

Remaining funds are distributed to Washington State Patrol, Department of Licensing, cities/counties, and other programs.

WSDOT has actively been right-sizing to align with diminished resources. Two special transportation taxes are sunsetting.

- 75% of highway program dollars are contracted to the private sector.
- 54% of the design effort for the Nickel Transportation Package and the Transportation Partnership Act (TPA) revenues was delivered by the private sector.
- $6 billion of the $16.3 billion in Nickel and TPA is delivered through design-build.

WSDOT currently has 6839 employees:

- 6480 full-time permanent
- 80 part-time permanent
- 279 nonpermanent

Since June 2008, the workforce has declined by 1474.

WSDOT is fairly decentralized. Headquarter offices are distributed throughout several buildings; some divisions are also distributed across buildings, and sometimes between Olympia, Seattle, and Arlington. The agency has six regional offices distributed throughout the state. Planning, programming, design, construction, maintenance, traffic management, environmental services, real estate services, HR, and IT are all decentralized. Non-highway modal administrations are primarily centralized (i.e., ferries, public transportation, aviation, rail, freight, bicycle/pedestrian).

WSDOT is currently in a state of transition under a new governor and secretary of Transportation. The organizational structure was changed. The agency has shifted from a flatter organization to more stacked structure (see Figure F.4). A new division was created to focus on multimodal planning and community engagement. A new strategic plan is in review; leading indicators and outcomes are being developed for each new goal.

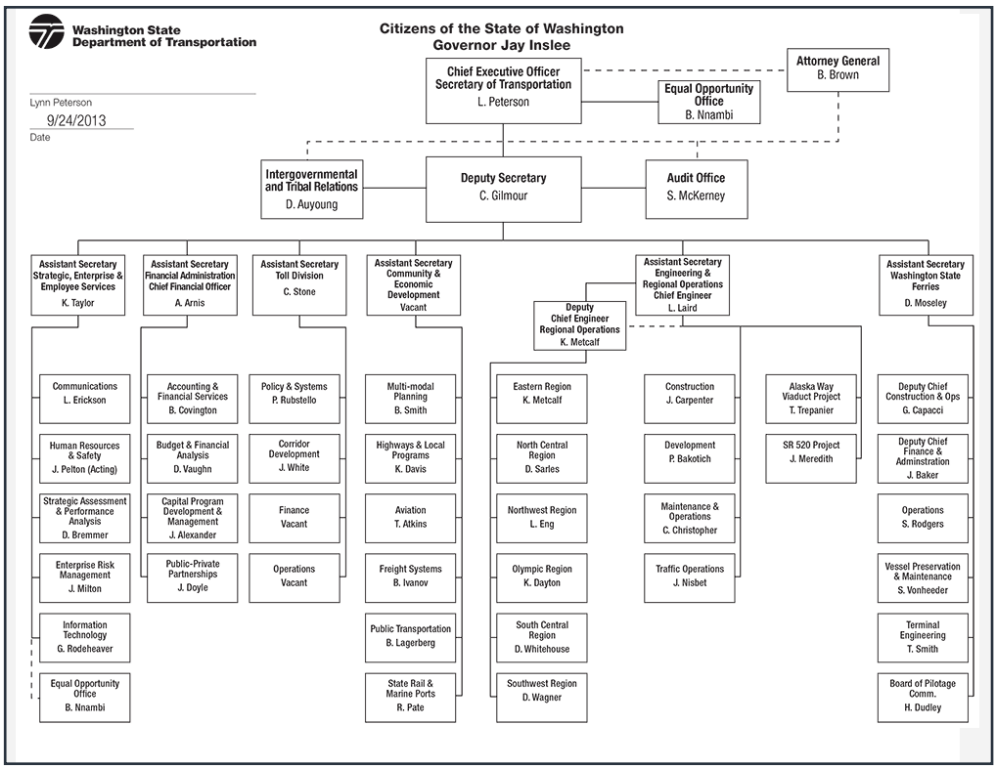


Figure F.4 WSDOT organization chart

Innovation and Knowledge Sharing

Impetus for KM	Reduced resources, reduced work force, staff churning, and the need for efficiency have contributed to interest by senior managers in KM practices. Some pilot activities have been conducted, and more senior managers are interested and supportive; however, a strategic vision for KM has not been embraced by executive management and no additional resources have been provided.
Designated Function for KM	Innovation is a department value and is a broadly distributed function. Employees are encouraged to be innovative. Research and KM are led by the Office of Research & Library Services, which currently resides within the Strategic Planning Division. KM activities have been conducted as pilot projects under the umbrella of research to help address the loss of knowledge due to an aging workforce on the cusp of retirement. No additional resources have been provided for KM; activities are conducted through research funding or within the availability of staff in various offices interested in capturing knowledge. Performance measures for KM to date have been based on the number of activities conducted. KM initiatives include: ■ **Knowledge mapping for two communities.** Both were informative, though one committee significantly changed purpose and organization and did not derive an outcome it could use. Despite that, some of the findings proved true as individuals central to communication left, the network communication lapsed. The other community for which a knowledge map was developed initiated recommended strategies but has been hampered by workload and resource limitations.. ■ **Knowledge interviews**: 16 with retiring staff and one to help develop a desk manual. These interviews proved to be very labor intensive. ■ **Distribution of guidance to help senior managers capture information from employees**. This includes what to do with materials when an office is cleared, thinking about electronic files, and the opportunity for knowledge interviews. ■ **Currently working to strengthen enterprise information governance.** WSDOT formed an Enterprise Information Governance Group, which has developed principles for data and IM and is working to create domain stewards for explicit information resources.

	Barriers to progress in KM have included securing commitment from executive management and resource limitations. Current development of a new agency strategic plan may offer opportunities to link KM initiatives with the established strategic goal of organizational strength.
Leadership and Culture	The new administration supports the values of collaboration and knowledge sharing. Collaboration happens broadly – within the agency and also with industry, academia, TRB, AASHTO, and nongovernmental organizations. It is important to articulate the real value of collaboration in terms of, for example, time or funding saved or practices adopted.
Recognition and Rewards	Many awards are tied to business activities that have been collaborative. Within the agency, HR manages awards. Some awards are provided by and managed within Divisions. The state has an award program for employee ideas, though WSDOT has had to suspend participation in this program due to reduced workforce. The Office of Research & Library Services manages a list of available external recognition opportunities and serves as the repository for awards received. It is helpful to find and share information on nomination schedules so people can predict and plan ahead. A centralized national resource for sharing information on the awards offered by different organizations would be of value. Managing award nominations from an enterprise perspective takes time and resources. Lack of resources has hampered our efforts to manage awards. Award winners were recognized at the quarterly senior managers meetings, but there were so many that it was difficult to fit them in within the limited time available. In addition, some managers feel that nominating individuals and groups for awards is a disincentive for others.
Communities	Many groups within WSDOT meet to share information. Most are based on organizational position (e.g., the statewide design engineers) or are topical (e.g., Highway Safety Executive and Highway Safety Improvement Group). Individuals with some responsibility for the topic drive the agendas. Senior managers support and participate in these groups. They support many initiatives, and their products are acknowledged and used. Many groups use technology to facilitate collaboration, including e-mail list servers, SharePoint team sites, and face-to-face meetings with remote meeting support. One externally hosted wiki was initiated through a WSDOT-led Transportation Pooled Fund Project. This wiki has had limited contributors, though several people use the site. There may be opportunity to derive more knowledge exchange through more guidance on managing CoPs.

Storytelling	Storytelling occurs very informally within offices and as part of various collaborative efforts. WSDOT has a retirement community, and there is probably more opportunity to tap their knowledge.
Succession Management	
Succession Planning	HR regularly monitors staffing changes and periodically assesses retirement risk based on employee age and program patterns. Some program managers have voiced concerns about workforce reduction and knowledge loss. They have sought resources to meet knowledge needs, including assistance with recruitment, knowledge interviews, training resources, and increased interaction within the discipline. However, WSDOT is in a period of significant transition and active downsizing. As a result, some programs supporting succession planning have been reduced or terminated.
Staff Retention	The state-classified service ranges include step increases. A performance incentive program is on hiatus due to the economic downturn.
Employee Interviews	HR requests exit information from employees through a standard online tool. In addition, as noted previously, the Office of Research and Library Services has conducted knowledge interviews modeled on the exit interviews conducted by VDOT. Supervisors requested interviews, and employees were offered the opportunity; most employees accepted. Generally, these individuals were within weeks of retirement. Interviews were conducted by a group of three individuals. Audio files were sent to University of Washington doctoral students in Communications for development of a summary document. These documents were shared with the interviewed employee and the supervisor. Several lessons were learned from this experience. Most employees appreciated the opportunity to be interviewed. Interviews yielded useful job-specific information, and several common themes emerged. HR thought it was advantageous for the interviews to be conducted by a third party (other than HR) given the content of the interview. The products were useful for incoming staff and for their supervisors. However, it is labor intensive and, without dedicated resources, infeasible on a large scale.

Employee Orientation, Learning, and Development	
New Employee Orientation	HR provides an initial orientation for employees to provide a consistent foundation. This orientation focuses on mandatory training and programs and services available for all employees. The orientation directs divisions and offices to provide new hires with additional information specific to the position, usually through the supervisor. The person performing the orientation may point the employee to experts and pertinent information resources, but this is not supported in a consistent way.
Employee Growth and Development	The Performance Management Program serves as the backbone of employee development, guiding employees on work skills and training opportunities needed for their position and providing opportunities to develop desired skills through goal-setting and identification of training interests. Each supervisor and employee is expected to understand how his or her work aligns with the agency's strategic goals. Employees and supervisors are expected to discuss career development interests and opportunities. The agency's intranet also provides information. Employees have direct access to the Learning Management System and SkillSoft. Measures of success include the number of performance reviews conducted on time (they are due annually on the employee's anniversary month in the current position). These are reported quarterly to the governor's office. The agency has a mentoring program, but it has limited use due to the thinning of the workforce.
Identification, Documentation and Dissemination of Processes, Practices and Expertise	
Organizational Functions for Content Management	Content management functions are distributed throughout the organization. There is no single individual or organizational unit with responsibility for configuring/managing enterprise knowledge sharing. Classification schema have been developed independently for different repositories (e.g., aerial photos, records, library materials, and databases). We are discussing strategies to advance an agency taxonomy. The Communications Office is responsible for the Internet as well as intranet, though no resources are dedicated for intranet management. Topics of interest to employees are identified in a variety of ways: through supervisors, periodic surveys, open-ended interest in feedback by the Secretary of Transportation's Office, and search word clouds. While customization of sources is available for external sites, the agency does not have the resources to support internal targeting of knowledge dissemination media/methods based on user preference.

Information confidentiality practices begin with state law and are carried through policies, procedures, and application design. The Office of IT is a primary leader in compliance. There are no policies for intellectual property protection. We are currently gathering information on practices in other organizations. The Office of Research & Library Services is leading this effort.

The Records Management Office has established policies for record retention and provides guidance and training. The agency has records retention schedules and practices related to the capture and retention of information for many business practices. Offices are expected to be self-enforcing. With staff churning and thinning of the workforce, these practices are at risk because people are not as aware of them.

Records Management also helps with document management systems. A new software program was purchased to help with e-discovery, but public disclosure requests still consume a substantial amount of time. This is elevating the discussion of "findability" and IM practice.

IM is a topic of active discussion in the department. An Enterprise Information Governance Group has been formed and has established principles for data and IM and is working on a governance model. Efforts are underway to engage the Secretary's Office in supporting these efforts.

WSDOT Data and Information Management Principles

The Enterprise Information Governance Group developed the following principles in February 2013. It is intended that these principles serve as guideposts for the development and management of data and information resources. At the time of the scan, a deployment strategy had not yet been developed.

1. Data and information are critical to effective business decision making at WSDOT and shall be maintained in a manner appropriate to meet business needs.

2. Data and information are strategic, long-term assets – owned by WSDOT, not by individual business units. They are findable, retrievable, and shared.

3. Data and information shall be collected once, stored once, and used multiple times.

4. Data and information that are not used shall not be collected or stored.

5. Data and information that are used by multiple applications or shared across business units shall be defined and managed from an enterprise perspective and fit for a variety of applications.

6. Data and information investments will consider business priorities, program impacts, and tradeoffs.

7. Data and information shall be managed to ensure availability, security, and integrity—they shall be both safe from harm and accessible by those who need them.

8. Data and information governance, costs, and stewardship processes will be transparent.

Challenges in this area include:

- Executive management is unaware of the problems in IM and consequences.
- There is resistance because the IM issue is large and unwieldy.
- The lack of resources or synchronicity between information resource improvement opportunities creates an uneven playing field.

Lessons Learned and Case Studies

Engineering programs used to conduct regular after-action reviews, but they are not commonly used today. Restoration of after-action reviews was one of the most common requests in the exit interviews that were conducted. A lessons-learned database has been created for design and construction activities and is managed by the Construction Office.

The Safety Office also uses lessons learned for workforce safety. Information is shared through periodic reports and some internal web sites.

It would be useful to have an enterprise lessons learned database with modules for different disciplines. VDOT's use of CoPs helps capitalize on the lessons learned and put improvements in play. The Safety Office uses this strategy.

Maintaining and using lessons learned requires consistent attention and resources.

Institutional Memory/ Retention of Critical Knowledge	Knowledge interviews, training programs, some double filling of positions, and desk manuals.
Process Documentation	The agency has many policies and manuals in place, which it updates on defined schedules. The Records Management Office is the responsible party for policy documents and works closely with program areas on updates. Engineering Publications is the process owner and technical support for manuals. Policies and manuals can be found through the intranet site and, if publically available, the Internet. Generally, this works well. An area of development the agency would like to pursue is a way to update related materials universally, so that, for example, an update to an environmental policy results in notice and appropriate updates to other manuals. Consistent maintenance of hotlinks is another area of need.
Expertise Identification	There are no formal expertise directories or processes in place.
Tools and Technologies	SharePoint Team sites, shared servers, and Internet/intranet sites are used to share information. The Internet is a primary tool for external knowledge discovery. Resources may also be found on Facebook, LinkedIn, SlideShare[101], Flickr, Twitter, a mobile app, Blogger[102], and YouTube. People may sign up for information through the agency's list serve. Most employees are not allowed to use social media through their work computers or with WSDOT information. The Communications Office uses many forms of social media to communicate with the public. Senior managers are allowed to use some resources (e.g., YouTube). The Secretary of Transportation intends to increase use of social media.

101 SlideShare, http://www.slideshare.net/

102 Blogger, https://www.blogger.com/

Georgia Department of Transportation

Response provided by	Rick Smith, Training and Development Manager
Context	The Georgia Department of Transportation (GDOT) has a $ 2.7 billion annual budget and a workforce of approximately 4150 employees. The department is responsible for planning, constructing, operating, and maintaining a safe transportation system for the travelling public. It is also responsible for ensuring internal and external compliance with federal and state laws/guidelines as they relate to fair and equitable employment and business practices. The department is a hybrid organization, with a commissioner, who reports to the State Transportation Board, and the Division of Planning director, who reports to the governor. The commissioner's leadership team includes a deputy commissioner, chief engineer, and treasurer. The DOT is physically separated into a general office with satellite offices in the Atlanta Metro area and seven district offices. A district engineer is responsible for the transportation function, including construction, operations, and maintenance in his or her respective district. With few exceptions, all units within a district fall under the direction of the district engineer. The director leads the Division of Planning and is responsible for the state's transportation planning activities, including development of the statewide Transportation Plan and statewide Strategic Transportation Plan; development of the statewide Transportation Improvement Program; development of the freight network; design traffic development; travel demand model development; administration of air quality activities around the state. The Office of Planning (the only office in the division) is organized in a hierarchal structure, with an administrator and three assistant administrators. There are six branches under the three assistants. The Office of Planning has an annual office budget of $18.5 million, including funding the department does with the Metropolitan Planning Organizations and for our consultant contracting.

Innovation and Knowledge Sharing

Designated Function for KM	There is no single function or unit at GDOT designated to foster innovation and knowledge sharing. The needs of the offices drive the creation of innovation and knowledge sharing activities. Offices that have come about because of recent reorganization implement innovation and knowledge sharing out of necessity. Office administrators are charged with providing an effective environment for innovation and knowledge sharing to occur. The assistant office administrator assists in this responsibility while transferring the function to staff for practical application on actual projects. Many of the KM activities are bottom up. As managers have moved up in the department, their protégés continue the practices and improve them. Many of the department's offices have been conducting knowledge sharing activities for some time. Others have recently become active in promoting, sharing, and documenting knowledge. Perhaps the earliest attempt to capture knowledge was the Office of Materials and Testing. This office (formerly the Office of Materials and Research) has long recognized the impact of retirements on the loss of institutional knowledge. At the turn of the century, the office conducted a research project to capture the knowledge and experience of the retiring state geotechnical engineer. The Office of Environmental Services fosters innovation and knowledge sharing by making these activities routine aspects of project team meetings, management team meetings, and roundtable discussions with other offices that have different expertise. Organizational Performance Management shares information with the public regarding the achievement of agency performance metrics through our External Dashboard[103] that we launched in 2011. An internal dashboard is also under development that will display information to the management team to help guide and assist with decision making. Organizational Performance Management is also responsible for asset management and shares with internal and external partners the department's Transportation Asset Management Plan[104] that it developed with input from subject matter experts throughout the agency.

103 Welcome to the Georgia DOT Performance Management Dashboard, Georgia Department of Transportation, http://www.dot.ga.gov/informationcenter/statistics/performance/Pages/default.aspx/

104 2014-2018 Transportation Asset Management Plan, Georgia Department of Transportation, http://www.dot.ga.gov/Projects/programs/Documents/AssetMgmt/TAMPlan.pdf

The Division of Engineering's Office of Road Design and Design Policy Support has for several years conducted internal practical design training on geometric design, capacity analysis, pavement design, drainage design (urban and rural), erosion sedimentation and pollution control plans, roadway signing and marking design, and traffic signal design.

Senior and junior engineers provide formal instruction to freshman engineers on applicable design policy and the fundamentals of engineering practice, including case studies and exercises that involve calculations and use of the design software. Class discussion and interaction is highly encouraged. In addition, engineering staff members conduct regular meetings within and across divisions to discuss issues, current events, and lessons learned.

GDOT leadership promotes sharing of knowledge by supporting employee development initiatives (e.g., cross-training, the use of internal SMEs as instructors, and encouraging the attainment of professional licensure and certification) by way of informal communications and through programs designed to promote professional development.

KM in the Innovative Program Delivery Office

This office requires tailored processes to be successful in delivery and is the "poster child" for KM. Formed in 2005, the unit became a standalone office in 2008 and has delivered positive precedent-setting events and results while demonstrating continuous improvement through regular evaluations of its project-specific goals. Healthy engagement with both industry and internal staff has led to broader flexibility from legislative regulations. The office seeks to:

- Provide an open-minded environment for innovative ideas to take root
- Provide for genuine engagement of stakeholders on innovative delivery strategies
- Provide for a sense of leadership and ownership to accept responsibility for when innovation does not yield the expected results and sharing the rewards with the team when innovation achieves good results
- Provide for a sense of urgency and commitment to follow through and execute on agreed-upon innovation strategies

Success of innovation fostering and knowledge sharing generally is achieved by documentation of lessons learned and project-specific goal achievement.

KM activities are currently a part of the office head and assistant office head responsibilities, coupled with outsourced services through a specialized support contract. No specific budget is assigned to this function. Project-specific efforts derive from capital project costs in the course of project development. Activities include:

- Routine staff meetings to share design-build project management experience
- Regular outreach to engineering and construction industries
- Develop language for legislation fostering knowledge of greater innovation
- Drafting board rules for adoption that will foster innovation
- Periodic updating of GDOT's Design-Build Manual[105]
- Periodic updating of office web site
- Post-construction design-build project evaluation
- Periodic update of post-design-build project evaluation reports on web site
- Development of white paper to convey rationale of innovation to stakeholders
- Publication of white papers on web site
- Participation and leadership in research projects to advance innovation
- Participation in formal and informal national peer exchanges
- Development of design-build manual, periodic updates, and posting on web site
- Implementation of "submit feedback" feature on design-build web site[106]
  Posting of all design-build contracts on web site
- Conducting internal and external workshops for innovative contracting.

105 Design Policies & Guidelines, Georgia Department of Transportation, http://www.dot.ga.gov/doingbusiness/PoliciesManuals/roads/Pages/DesignPolicies.aspx

106 Design-Build, Georgia Department of Transportation, http://www.dot.ga.gov/doingbusiness/Pages/DesignBuild.aspx

- Periodic consultation with stakeholder offices
- Proposed procedural changes to allow more efficient risk transfer
- Maintain ownership of all responses

A key issue in the innovative contracting area is that there is much more information than there is *useful* knowledge. Using research efforts and stakeholder engagement, information can be mined and refined into useful knowledge.

Barriers to knowledge transfer/innovation have included:

- The institution tends to continue doing things the way it always has. This proves to be a barrier when the entities are not open to the knowledge to be shared.
- Industry can be a barrier if it feels uncomfortable with its ability to get work in the new fashion.

Addressing these barriers requires maintaining a healthy, open-minded dialogue, listening to concerns that are raised, and obtaining buy-in from key leadership to move things along.

Leadership and Culture	The organization fosters a culture of knowledge sharing and collaboration through the daily execution of the work and via routine project team meetings, management team meetings, and roundtable discussions with other offices. Organizational Performance Management is charged with encouraging and fostering performance management and asset management throughout the agency. Senior leadership is briefed monthly on the key performance metrics. This began about a year ago. Through discussion of individual metrics, the leadership team can determine if the metric and targets are still appropriate and discuss changes to drive the metric in the right direction. In addition, meetings are currently being held with several divisions/offices that report to the chief engineer to assist in development of key goals, objectives, metrics, and targets. Each of these activities could have a role in changing the agency's culture. Each member of the Engineering Services Office is responsible for preparing a "How I Do My Job" book. This book will be a reference guide for future employees, and also helps current employees share their knowledge and prepare for promotions. The office is divided into three sections and, in the past, there was no cross-training or shared learning. However, we are making efforts to have members of one part of the office participate in tasks assigned to other parts of the office. The cross-training not only provides additional areas for learning, but it also helps employees see how their current job fits into the bigger picture.

Recognition and Rewards	Recognition programs at GDOT include: ■ **Engineering Services** – As part of our mitigation for the 2012 Employee Survey, the office has committed to nominating at least one employee for quarterly awards and/or annual meeting awards. Because members of the office work in 10 different locations across the state, the entire office has never been together in one place at one time. Earlier this month we held our first-ever office meeting, and each section of the office gave out awards recognizing teamwork, flexibility, and innovation. ■ **Environmental Services** – Once a year we present certificates of "above and beyond" performance to deserving employees; they often share and collaborate to a high degree in their daily performance. ■ **Communications** – Three quarterly recognition initiatives currently garner certificates for the Commissioner's Commendation: Excellence in Customer Service, Excellence in Performance, and the Shape-Up Award. Each quarter, employees are encouraged to nominate their colleagues, staff, managers, or supervisors for the Customer Service and Performance awards. Nominations are also accepted from the public/external customers. Starting in January 2013, the Shape-Up Challenge has encouraged employees to participate individually or as teams in activities and other health-conscious initiatives (e.g., exercise and weight loss) and report their results. Winners in each category are recognized quarterly with certificates. In addition, the Our GDOT Challenge was implemented in September 2013 to further boost employee morale. The challenge encourages employees to "focus on us" in four areas: innovation, professionalism, volunteerism, and being healthy. This initiative carries a donated cash prize of at least $250 for winners in each category. Feedback from employees about each program has been mostly very positive. As expected, there are still a few who would like to see more than certificates.

Communities	We have two communities that meet regularly: junior project managers and senior project managers. These groups meet in person, with tele-conferencing available for those unable to attend in person. The Office of Program Delivery office head and assistant office heads support and help organize the meetings and agendas. Meetings are held monthly, and the agendas are drafted by the group to include such things as new policies/procedures and lessons learned. These meetings are used to share experiences with the group and identify issues that the group may be facing in the performance of its duties. A great deal of "informal" knowledge-sharing taking place in GDOT, indicating the prevalence of CoPs. A 2010 study of 515 agency employees found that more than half of them engage in "informal" knowledge sharing at least once per week. Further examination of the types of knowledge that is being shared and the types of persons that they share knowledge with identified at least four CoPs within GDOT. In this case, the communities are formed around diverse "professional" areas of research: roundabouts and alternative intersection designs, geographical information systems, practical design training, and environmental issues. While the groups vary in their levels of activity, there are examples of communication by phone, in-person meetings, and team meetings to share knowledge. The roundabout group holds "knowledge exchange" meetings where engineers from different parts of the state get together to share their individual designs of roundabouts and discuss their respective experiences. The group also runs a listserv, which allows them to share questions and answers to common questions. Because of the listserv and the knowledge exchanges, a number of sub-communities have formed among the group to allow for continued knowledge sharing. The practical-design training program facilitates their own training program to provide tacit and explicit knowledge to young engineers. The program not only trains young engineers, but also provides opportunities for skill-development among more senior engineers. The GIS group coordinates Q&A through a SharePoint site, which allows members to troubleshoot technical questions with one another. The environmental group holds informal meetings to exchange and share information. The roundabout group and the practical-design training group are developing SharePoint sites to facilitate knowledge-sharing. These sites are developed through support from a research team at Georgia Tech[107] and are led by two to three leaders from each community.

107 Georgia Tech, Georgia Institute of Technology, http://www.gatech.edu/

Storytelling	Storytelling has not been identified within the four CoPs; however, the groups are being trained in techniques for carrying out this kind of exchange.

Succession Management

Succession Planning	GDOT does have a formal succession planning initiative. Our program has a rigorous selection process and, once selected, participants undergo 18 months of mixed learning. Our program has customized (competency-based) evaluation tools, partnerships with local universities, internal mentoring opportunities, stretch assignments and projects, and 18 months of competency-based learning events. A team of two HR employees manages the program, a recruiter leads the application and selection process, and a training program manager oversees the cohort and its learning activities. A steering committee consisting of division directors provides guidance and is active in the participant selection process. The impetus for the program was the retirement of leaders in critical positions. The management team and steering committee reviews the program at key points. GDOT began conducting knowledge interviews in 2011 to identify critical tacit knowledge of employees nearing retirement. Individual offices mine SharePoint team sites to identify critical knowledge. Other practices include job shadowing and double encumbering critical positions (i.e., appointing a person to a position that is currently occupied by an incumbent.) Department leadership initiates a workforce analysis every five to six years or as determined by budget adjustments to determine staffing level. Executive management uses the results of the analysis to develop or adjust succession management strategies. The Office of Planning conducts continual informal succession planning. The management team is aware of staff and changes in staff, and we regularly discuss staffing issues and needs. We have a good handle on our strengths and weaknesses in the staffing area and have our thoughts on who is “on the bench” as far as moving up in the organization goes, when appropriate.

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	The Office of Organization Performance Management staff assists offices/divisions and executive management in identifying, developing, and documenting performance measures that gauge how well critical business processes are being executed. The new or updated measures are tracked using external and internal dashboards. Our program has a very strong mentoring component that has been very beneficial to both protégés and mentors. While not every mentoring partnership "clicks," some continue well after the program ends. We use a 360 evaluation at the beginning of each cohort. We customized the 360 to address our leadership competency model and identified behaviors. This assessment forms the backbone of the individual development plans. As a public organization, we have a selection process that makes our program unique. Essentially employees can apply for the program if they meet minimum established competencies. Members of the steering committee interview the candidates who pass the initial screening process. Candidates are selected based on the interview and information provided on the application, which includes references and a written essay.
Staff Retention	We recently added positions of intermediate level of responsibility on critical career ladders. Executive leadership has worked closely with HR in providing staff with promotion opportunities through the Critical Skills Gap process. The process provides promotional opportunities to work unit members. It is a closed process to any employee outside of the target job function. For example, when an equipment operator 2 position vacancy is advertised, only equipment operators are eligible to apply.

Employee Interviews	Members of the succession program steering committee, which includes the deputy commissioner, chief engineer, division directors, and the program management team previously described, conduct employee interviews. Candidates who pass the application screening phase are interviewed. We have learned to identify candidates and begin the knowledge interview process as early as possible. We consider it a lost opportunity if we interview retiring employees as they walk out the door. The product of the knowledge interview is an audio file of the interview(s) and a transcript of the interview. We envision the product to be an electronic or physical document that a team has content analyzed to identify the critical knowledge. We are creating a repository site on the intranet to publish the documents for easy access by employees. In one case, we interviewed our most experienced bridge design engineer on camera. The few interviews we have conducted have benefitted the interview team from being involved in the process and the interview more so than any knowledge revealed through the process. Early lessons include involving lower-level staff from the office of the retiring employee in the process, beginning with the selection of the questions and continuing through content analysis of the transcript. At the rate employees are retiring, it will require a greater effort to capture and retain the knowledge.

Employee Orientation, Learning, and Development

New Employee Orientation	No response provided.
Employee Growth and Development	See previous responses.

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management	Our project documents are electronically created and stored on a file server, as are our procedures manuals and other data (e.g., survey data). The Office of Planning houses all study/project information electronically. Project-specific information is stored on a specific drive and in a specific manner. For example, if a planner prepares a project justification statement for PI123456, that statement would be stored in file folder for District X/particular county/PI123456/. Study information is also stored in a similar manner. We also place all of our major studies, the Statewide Transportation Plan, The Statewide Strategic Transportation Plan, and the Statewide Transportation Improvement Program on the internal and external webpage. The Office of Equal Employment Opportunity (EEO) provides access to information about business processes, practices, and expertise in many ways. Our information consists of documents, plans, manuals, directories, maps, web pages, and web sites. Internal staff can access this content by internal file servers. The EEO office also has documented business practices and processes that have been made available to our external and internal customers, contractors, managers, and staff. Those practices and procedures that include plans, manuals, directories, maps, and forms are on the organization's web site, with a specific page dedicated for the Office of EEO. This office also captures critical knowledge from staff that retired or is nearing retirement. The director of the EEO office has asked each staff member to create a how-to manual of critical information/knowledge to give to new employees who may assume their job in the future. Another way we capture and store information is to identify experts who are available to help in particular areas or with particular topics of need. Although there is no formal process, we use various internal SMEs from offices and departments within the organization to provide the office with knowledge about their business processes, practices, and expertise. This office also captures knowledge from experts outside of our organization, such as our federal partners, other state agencies, and local governments, contractors, planning organizations, colleges, universities, and even private organizations. The Office of Program Delivery uses a SharePoint site and our office server to capture and store content. As items are posted, we use mass e-mail to inform the office of new information.

Lessons Learned and Case Studies	We do capture lessons learned, though this is typically not proactive but more reactive after something has gone wrong.
Institutional Memory/ Retention of Critical Knowledge	See previous responses on employee interviews.
Process Documentation	Our procedures manual contains most of the information needed or links to additional resources and is readily accessible. In addition, we have produced the Project Management Handbook[108], which outlines a lot of our processes. This handbook is available on our external web page. Also, on our office server, we have a folder titled Office of Program Delivery Manuals of Guidance and one titled Administration. They both have various folders that document business processes. Within the Office of Planning, we created what we call the Planning Manual probably about 10 years ago. Documentation began when the office was created. The impetus was to have everyone on the same page when it comes to processes. Similar to today, we were experiencing a loss of staff in the office and decided that there needed to be a repository of basic information/processes needed to make the office function. The development/maintenance of the Planning Manual is the responsibility of one of the branches in the office. It includes the business processes that are needed to work with the FHWA, the metropolitan planning organizations, and other agencies and with internal GDOT offices. Most of the processes relate to how the planner is to develop studies, long-range plans, and transportation improvement programs, as well as the process to gather the necessary data to inform these processes. We try to document as much as possible. One example is in the Administration folder. A folder titled Office of Program Delivery Draft Letters contains templates of all the letters described in the Plan Development Process. Staff members are encouraged to identify areas of the manual that need updating or improvement. The updating process is the responsibility of the branch chief in charge. This person verifies that a change/update is needed based on new regulations, data, and other factors.

108 Project Management Handbook, Department of Transportation, State of Georgia, 2012, http://www.dot.ga.gov/doingbusiness/consultants/Documents/ProjectMgmt/PMHandbook.pdf

	GDOT also has a system called R.O.A.D.S.[109] (Repository for Online Access to Documentation and Standards), which provides internal and external Internet access, with automatic notices provided to subscribers. Subscription details are provided on the web site. Documents listed are plan development process, design policies and guidelines, policy announcements, plan presentation committee, construction standards and details, software-specific files and documentation, and design-related resources. The Office of Design Policy & Support publishes policy announcements and communicates internally to relevant GDOT divisions and offices and externally to American Council of Engineering Companies[110], American Society of Highway Engineers[111], and Georgia Partnership for Transportation Quality/Consultant Relations Committee[112] officers by combination of letter, e-mail, a link to the policy announcements web page, and automatic notice to R.O.A.D.S. subscribers. The knowledge we share via our server is invaluable. It is the biggest resource for new and veteran employees. Because our office is decentralized, it has been the best tool for documenting practices and sharing information.
Expertise Identification	Expertise is identified through daily interactions and word of mouth.
Tools and Technologies	See previous responses.

109 R.O.A.D.S. Repository for Online Access to Documentation and Standards, Georgia Department of Transportation, http://www.dot.ga.gov/doingbusiness/PoliciesManuals/roads/Pages/default.aspx

110 American Council of Engineering Companies, http://www.acec.org/acecmainsite/issue-transportation

111 American Society of Highway Engineers, http://www.ashe.pro/

112 Georgia Partnership for Transportation Quality, American Council of Engineering Companies of Georgia, http://acecga.le8.getliveedit.com/pages/GPTQ

Wisconsin Department of Transportation

Response provided by	Randy Sarver, Human Resources Director
Context	**WisDOT Facts** 1. Current number of permanent employees: 3,400 2. Current number of temporary (limited-term) employees: 180 3. Overall budget for current 2013-2015 biennium: $7.024 billion 4. Headquarters: Madison 5. Composed of six divisions and the executive offices; division administrators and chief legal counsel appointed by secretary a. Executive offices i. Office of the Secretary (secretary, deputy secretary, and assistant deputy secretary – all appointed by governor) ii. Office of General Counsel iii. Office of Policy, Budget, and Finance iv. Office of Public Affairs b. Division of Transportation System Development i. Five regions (eight offices – some regions have offices in two different locations) ii. Statewide bureaus/office 1. Bureau of Project Development 2. Bureau of Highway Maintenance 3. Bureau of Structures 4. Bureau of Traffic Operations 5. Bureau of Technical Services 6. Office of Business Opportunity and Equity Compliance c. Division of Motor Vehicles d. Division of State Patrol e. Division of Transportation Investment Management f. Division of Business Management

6. Five Consistent Regional Boundaries for Division of Transportation System Development (DTSD), Department of Motor Vehicles (DMV), and Division of State Patrol (DSP)
    a. Southwest region
    b. Southeast region
    c. Northeast region
    d. North central region
    e. Northwest region

Special Challenges/Importance of Knowledge Management

- KM has been part of WisDOT's formal workforce planning process since 2006.
- Age of workforce, high attrition and high retirement vulnerability
- 2011 – significant changes to Wisconsin state government
    - Collective bargaining laws changed
    - Increase in premiums for health insurance
    - Increase in contributions to retirement
    - Increase uncertainty in state benefits
    - Very high attrition

Innovation and Knowledge Sharing

Designated Function for KM	There is not one specific organizational function/location for fostering innovation and knowledge sharing. Each division has these responsibilities built into existing positions. Each division is responsible for reporting to the Secretary's Office on their innovation activities. The Division of Transportation System Development is creating an innovation manager position to assist in the efforts of innovation with transportation engineering-related functions.

The Bureau of Human Resource Services is responsible for working with divisions on workforce planning issues. This includes providing guidance and direction on any KM tools. The Bureau of HR Services has been involved in two research projects related to KM. One was an internal research project with the Office of Policy, Budget, and Finance in 2009 and in 2010-2011; the second was an external research project partnering with the Bureau of Rails and Harbors Section (Division of Transportation Investment Management) and the National Center for Freight & Infrastructure Research & Education[113] (CFIRE) through the University of Wisconsin-Madison. Both research projects identified KM tools supervisors and managers could use across the department for key positions or programs.

The Office of Policy, Budget, and Finance has a performance measures manager position, which leads the department's Lean Government[114] efforts and performance measures (Mobility, Accountability, Preservation, Safety and Service[115] [MAPSS]). This position was created in March 2012 and provides guidance to divisions on identifying processes to be examined under the Lean Government steps, including value stream mapping. This position coordinates project completions and presentations of final recommendations to the WisDOT Board of Directors.

The tools for KM provided in the two research projects identified above have been valuable. Some supervisors have embraced these tools and are using them in the course of regular business. Some areas have not found the time to formally implement KM tools due to vacancies and the high workload.

One lesson we learned is that not all knowledge needs to be captured. We have had employees in their positions for up to 30 to 35 years. We have seen in some circumstances that these employees have a great deal of knowledge about their program area, but have focused on creating efficiencies in their processes. We have found it important to identify and document critical processes; however, when long-term staff members are replaced with new employees, we challenge the new employees to look at current process and recommend changes for efficiencies. We have found on many occasions that new staff can bring in new, innovative, and efficient ideas.

113 National Center for Freight & Infrastructure Research & Education, The Board of Regents of the University of Wisconsin System, http://www.wistrans.org/cfire/

114 Lean Government, Wisconsin Lean Government Initiative, Wisconsin Department of Transportation, http://www.dot.state.wi.us/about/performance/lean.htm

115 MAPSS Performance Improvement Program, Wisconsin Department of Transportation, http://www.dot.wi.gov/about/performance/index.htm

	Some of the barriers WisDOT has seen in the KM area include time and available resources to document processes. It has been difficult over the past seven years to accurately anticipate retirements/attrition.
Leadership and Culture	The WisDOT Board of Directors is very supportive of collaboration and knowledge sharing. Innovation and sharing is done annually with all WisDOT senior managers at a two-day meeting. In addition, the business areas are expected to participate in Lean Government efforts and Business Process Mapping to ensure critical processes are documented. The WisDOT Strategic Directions include the mission, vision, and values, which provide the strategic foundation for the department. ■ **Mission**: Provide leadership in the development and operation of a safe and efficient transportation system. ■ **Vision**: Dedicated people creating transportation solutions through innovation and exceptional service. ■ **Values**: ● *Accountability*. Being individually and collectively responsible for the impact of our actions on resources, the people we serve, and each other. ● *Attitude*. Being positive, supportive, and proactive in our words and actions. ● *Communication*. Creating a culture in which people listen and information is shared openly, clearly, and in a timely manner – both internally and externally. ● *Excellence*. Providing quality products and services that exceed our customers' expectations by being professional and the best in all we do. ● *Improvement*. Finding innovative and visionary ways to provide better products and services and measure our success. ● *Integrity*. Building trust and confidence in all of our relationships through honesty, commitment, and the courage to do what is right.

- *Respect*. Creating a culture where we recognize and value the uniqueness of all our customers and each member of our diverse organization through tolerance, compassion, care, and courtesy to all.

- *Teamwork*. Creating lasting partnerships and working together to achieve mutual goals.

In 2011-2012, the department also created a formal Performance Improvement program (MAPSS), which focuses on five core goals and associated performance measures that guide WisDOT in achieving its mission:

- **Mobility** – delivering transportation choices that result in efficient trips and no unexpected delays
- **Accountability** – the continuous effort to use public dollars in the most efficient and cost-effective way
- **Preservation** – protecting, maintaining, and operating Wisconsin's transportation system efficiently by making sound investments that preserve and extend the life of our infrastructure while protecting our natural environment
- **Safety** – moving toward zero deaths and injuries on our roadways
- **Service** – excellent service for our customers means high quality and accurate products and services delivered in a timely fashion by a professional and proactive workforce

We have found that establishing goals and measuring results are essential to running a successful organization, achieving its mission, and meeting public expectations. The department reports progress quarterly on our MAPSS program, with updates published in February, May, August, and November.

WisDOT has incorporated "Innovation and Excellence" as one of the six overall department performance expectations for all employees. As part of the annual performance evaluation process, employees are evaluated on the following expectations under "Innovation and Excellence":

- Seeks and implements process improvements and change management
- Conducts research and analysis to create efficiencies and best practices for accomplishing work activities
- Anticipates problems and develops strategies to address deficiencies
- Uses creativity in resolving complex and sensitive issues affecting the department

Management is encouraged to create specific performance goals and expectations in the supervisors' annual performance evaluation process to identify areas for KM and process documentation. This has proven successful where deadlines are provided and attention is given to these efforts.

Another recent effort that resulted in significant collaboration across the divisions was an external customer service survey. This was used to gather feedback on WisDOT performance and to "market" the department to the citizens. Nearly 1900 individuals completed a customer service survey that WisDOT sent out to Wisconsin residents. The results show that 70% of respondents are satisfied or very satisfied with the department; only 5% are dissatisfied. This overall performance rating is significantly higher than the 55% average for other departments of transportation in the north central U.S. Customers gave especially high marks to DMV mail service, availability of DMV information on the Internet, DSP response to crashes and vehicle breakdowns, highway operations and maintenance and clearly signing construction work zones. Respondents also voiced strong support for making infrastructure investments in the state's multimodal transportation system, with 45% of those responding indicating the level of funding for transportation should increase over the next five years. In addition:

- 95% believe repairing and maintaining existing highways is important
- 86% want added turning/passing lanes
- 82% believe reducing traffic congestion is important

- 78% want the state to make it easier to move freight
- 77% believe it is important to expand transit for seniors and/or disabled individuals
- 75% think the state should add lanes to increase capacity

This survey allowed the department to identify areas for improvement and set goals across business areas. While the survey indicated that WisDOT is moving in the right direction, customers identified some opportunities for improvement. Customer priorities include increasing the use of the state's 511 traveler information system, improving DMV phone and customer service centers, enforcing traffic laws and helping to prevent traffic crashes, keeping highways smooth and free of potholes, removing snow and ice from highways, and ensuring striping on highways is visible at night and during wet weather.

If WisDOT had additional resources, we would like to be able to increase the number of employees who see a direct tie-in of their work to the performance measures of the MAPSS program. Additional resources would also allow the divisions to create programs or identify positions to focus on innovation and KM.

Recognition and Rewards

The department has several recognition and reward systems in place. Several divisions have internal employee recognition programs, which provide aware recipients with small tokens of appreciation for their efforts. These include certificates, pins, and items with the WisDOT logo. For completion of larger efforts, a formal celebratory event/reception is scheduled and attended by upper management.

In addition, the department is able to provide Discretionary Merit Compensation awards for outstanding performance. While the majority of our monetary awards are tied to the annual performance evaluation process in the spring of each year, the department does review management nominations quarterly for the completion of any special projects. Divisions can allocate up to 1% of their salary budget for funding these awards. Approximately 10% to 15% of eligible employees receive Discretionary Merit Compensation awards annually. The Bureau of Human Resource Services and the Secretary's Office manages and implements the Discretionary Merit Compensation program.

	Management has found value in being able to reward top performers across the agency. We have seen some morale problems with employees who did not receive any financial rewards, which is something we expected. We try to reinforce the importance of performance and use this reward program to motivate employees to continually push themselves and achieve outstanding performance.
Communities	A lot of collaboration is done across the department, where employees get together for learning, development, and information sharing. This includes: ■ Classroom training sponsored by the department's Training Section ■ Technical training for engineering-related functions sponsored by department experts, consultants, or universities ■ Peer/user group meetings where individuals in the same program areas meet to discuss programs, projects, and innovations ■ Management meetings where statewide managers gather to share information, discuss initiatives, and complete business/strategic planning ■ Teleconferences where individuals in program areas meet to discuss issues The applicable business areas typically coordinate and lead these efforts; current department programs or efforts drive the agendas. One success we have seen in user group meetings is to send newer employees to these meetings with more-experienced peers. The new employees are introduced to their counterparts and experts and can build relationships with them. After the meeting, the new employees are required to provide a summary of the meeting at a staff meeting to share what they learned. Management is supportive of collaboration and having employees attend these meetings. To help with cost savings for travel, the department purchased several Smart Boards to encourage information sharing and meetings with the elimination of travel. In addition, e-mail exchanges between groups occur regularly on topics.

Storytelling	We have used storytelling as one of our KM tools. It is not currently widely used in the typical formal storytelling format. Storytelling was primarily used a couple of years ago with the Rails and Harbor Section research project with CFIRE (discussed previously). The section chief of that business area coordinated this formal effort. He scheduled time for participants to join him and one other supervisor to share their stories and examples of work. More recently, we have started to include management and supervisory panels in several of our classroom training programs (WisDOT Leadership Development Program, New Supervisory Training, Handling Difficult HR Issues, and the Young Professionals Group). The Bureau of HR Services coordinated these efforts. We choose specific managers, supervisors, or key staff to participate in these panels to provide examples of situations to attendees. We have received excellent feedback from attendees, as they get to learn one-on-one from experienced department staff in areas of leadership, supervision, organizational/staff development, and specific technical areas.

Succession Management

Succession Planning	Wisconsin follows a civil service/merit system for selection; therefore, succession planning and specific identification of individuals to take on roles in the future is not possible. However, we still allow for planning and discussion of growing leaders and training individuals to take on key roles in the department. The Bureau of HR Services has coordinated the department's formal workforce planning efforts since 2006. In addition to providing divisions with employee demographic data and retirement projections, HR staff meets with upper management in the divisions to identify challenges and strategies to address those challenges. This is where critical knowledge or positions are identified for workforce planning purposes.

	These workforce planning efforts have resulted in the creation of several successful department initiatives. One recent initiative is the WisDOT Leadership Development Program[116]. All employees are eligible to apply for this formal one-year program. Approximately 25 individuals are selected for the program, which features a combination of classroom curriculum, management panels (informal storytelling), project management training (Lean Government and value stream mapping), and group projects. In addition, participants may be partnered with a mentor, create an individual development plan, have access to SkillSoft online learning packages and have the opportunity to present in front of the Board of Directors. The first year of this program ran from September 2012 to August 2013. Of the 20 participants, approximately 40% have been successful in changing positions or being promoted into higher level leadership positions. For staff retention purposes, management is mindful of identifying key programs or positions faced with retirement vulnerabilities. In these cases, management may provide employees temporary assignments to learn different parts of the organization or business. This allows for cross-training, as well as a way to retain employees who may be interested in other parts of the organization.
Staff Retention	No response provided.
Employee Interviews	Formal interviews are not completed for succession planning purposes. However, supervisors are encouraged (or assigned goals in their annual performance evaluation process) to speak with employees about their positions and identify key processes that may need to be documented. The department does provide a formal exit interview program for employees leaving their positions or the agency. The exit interview is not mandatory. Employees have the option of completing an online survey about their position, the organization, and ideas for improvement, or can have a face-to-face exit interview with HR or a member of a group of volunteers vetted by management. The Bureau of HR Services reviews the results of the exit interviews, and this information is discussed with division management when strategies are being developed to address workforce-planning initiatives.

Employee Orientation, Learning, and Development

116 Fostering Future Transportation Leaders, MAASTO 2013, Leadership Development Program, Wisconsin Department of Transportation, http://www.maasto.net/documents/Sarver%20-%206C%20WisDOT%20Leadership%20Dev%20Program.pdf

New Employee Orientation	WisDOT has an online new employee orientation program as part of our LearnCenter (Learning Management System). When new employees start with the department, they are set up with a logon ID and given access to the LearnCenter. The Training Section in the Bureau of HR Services assigns the new employee orientation training into the employee's LearnCenter account. Employees are provided two weeks to complete the online training. The training includes the following topics: • Getting Started at WisDOT • How WisDOT Excels • New to State Service? • Your Pay and Benefits (and additional insurance benefits) • Your WisDOT Services (HR overview, including wellness) • Additional Resources (safety and fleet) • Employee Handbook and Work Rules There is a survey evaluation of the new employee orientation program. Employees evaluate the program and can provide suggestions about the information presented. The current version of the new employee orientation has been in effect since the summer of 2013. Prior to that, it was in an electronic version using the Moodle[117] site. Several changes were made in the current version, including an online link and verification of reading through the employee handbook and department work rules, use of video for certain components, and benefit information being presented in a more succinct manner. In addition, the department has a robust intranet where employees have access to information about each division and department policies, procedures, and initiatives. The department also has some guidelines for supervisors to use on what they should cover in the first two weeks with new employees. These guidelines include such things as reviewing the position descriTption, assigning and reviewing their formal performance evaluations goals/expectations, getting their IT access set up, and introducing them to others.

117 Moodle, http://moodle.com/

Employee Growth and Development	The department's Employee Growth and Development program has several components. The Training Section (comprising one manager and three staff) in the Bureau of HR Services is responsible for providing a range of training services aimed at improving individual and organizational performance through education on topics related to employee and management development and engineering and related technical training. In addition to managing training efforts through a network of internal and external instructors, this group develops training materials, produces videos for information and/or training, conducts training sessions, and develops training courses on special topics on request. The Training Section has developed and implemented the WisDOT LearnCenter, which is an online Learning Management System. It provides online registration, approval, and tracking of training requests for both classroom and online courses. Employees also have access to 45 online courses through SkillSoft and Microsoft. The system allows supervisors to assign training to employees' LearnCenter accounts. In addition, the system includes a Thought Leader video series, which includes short, internally produced videos about significant efforts or programs in the department for employees to learn more about. The LearnCenter also includes a Knowledge Bank feature, which has not been developed and populated yet. For leadership training, the department has a formal Leadership Development Program (described previously). This program requires an application process, a written paper, and references for selection. Selections are made to ensure that the employees are diverse (e.g., from different divisions and of different classifications). In addition, three other divisions have specific leadership programs they self-administer, but include HR in the delivery of some topics. As of November 4, 2013, the Division of Transportation System Development has announced a DTSD Leadership Initiative to help "grow leaders at all levels." This program includes coursework, leadership opportunities, and mentorships for all staff who want to participate to learn about leading organizations and functions. There is no application process for the program, and employees can participate in the activities they wish to pursue (i.e., those that are currently offered by the department or external sources they find on their own). The division provides recognition for completion of various levels of leadership training in the program.

Wisconsin's Division of Motor Vehicles has a separate long-standing DMV Leadership Program, which provides curriculum for about 30 people each year who are interested in learning more about being a leader in DMV. Curriculum includes some specific technical courses, as well as information about preparing resumes and preparing for interviews. The Bureau of HR Services also provides mock interviews for the participants.

Finally, the Division of State Patrol has a Professional Development Supervisory Program, which began in 2012. This two-week program focuses on technical supervisory issues facing law enforcement, including investigations. The program also includes components on evaluating law enforcement performance, motivating employees, and other specific technical programs within the division. All supervisors in the division will be rotated through this program, which is given twice a year.

Formal mentoring was provided in the first year of the WisDOT Leadership Development Program. The mentoring component is now a discretionary piece available to participants. The DTSD Leadership Initiative will have a mentoring component to it.

With the variety of leadership efforts and training programs, we have little concern about perceptions that certain employees are being favored or preselected for advancement.

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management

As a public agency, WisDOT has several state policies we follow for maintaining records. Each division is responsible for maintaining records related to their programs. Following are a variety of ways the department houses information.

- **Internet** – The main WisDOT Internet site is populated with information about the department for our external customers. The information includes organizational structure, services, resources, guidelines, performance measure updates, and traffic safety information.

- **Intranet** – The "dotnet" stores information related to internal employee programs, information about payroll and benefits, work rules, policies and procedures, information about divisions, and department initiatives.
- **Transportation Administration Manual** – This manual, located on the intranet, is the central repository for all department-wide policies and procedures.
- **Transportation Employees Automated Management System** – The TEAMS database houses employee and position information. Its security features are set so that employees can only see their records, and supervisors can only see nonconfidential information about their direct reports.
- **Shared network drives** – Divisions use shared network drives to store electronic information related to their programs and services. Some of this material could include project records, scanned records, and process maps/documentation. This is probably the most widely used form of content management within specific program areas. Security access to shared network drives is built in.
- **Personnel files** – The Bureau of HR Services maintains the official hard copy personnel file for each employee.
- **Research and Library Section**. The physical library is housed in Madison and offers an online catalog of reference services to transportation databases and other resources complied from regional, national, and international sources.
- **Extranet** – The department maintains an extranet to provide information and resources to external partners, such as consultants.

	The department has four policies and procedures related to the development and maintenance of records and forms. These policies are available in the Transportation Administrative Manual. All employees are expected to be familiar with the location and content of department-wide policies. Employees sign off on this acknowledgement when they review the department work rules and policies on starting employment and every three years thereafter. The department also complies with records retention policies and guidelines; many are statewide, enterprise-wide retention policies. Records officers in each state agency, including WisDOT, enforce them. The Bureau of IT Services in the Division of Business Management is working on a project to deploy SharePoint across the department. This will greatly improve the way we manage and store information for learning purposes and documentation.
Lessons Learned and Case Studies	The department has used the after-action review process for documenting significant events. These have included building closures, large or high-profile traffic events, law enforcement activities (e.g., the National Governor's Association conferences or high-speed pursuits with potential significant liability), weather occurrences, natural disasters, and highway/structure issues. Written summary documents are prepared and stored for historical purposes. They are maintained by the division or program area and are used for reference or training for other similar events. We have had experience reviewing completed after-action reviews for other purposes, and the documentation has been useful for learning purposes, especially for situations that only occur every few years, where the affected parties may change due to retirements, attrition, or position changes. If more resources were added, I suspect the department would pursue looking for an option for a central repository of all after-action reviews, which could include SharePoint in the future.

Institutional Memory/ Retention of Critical Knowledge	WisDOT routinely documents completed projects and maintains this information for future use. In addition, over the past eight years, the department has spent time documenting processes from key staff MEMBERS with critical knowledge who are approaching retirement. Most of the documentation is written and maps out processes or key contacts (refer to the next section).
Process Documentation	The Division of Business Management has a business process consultant position that leads the department's efforts in business process mapping. This position was created in March 2013 and is responsible for coordinating training on business process mapping and value stream mapping, as well as working with business areas to identify processes to be mapped. The department has recently completed phase 1 of a large business process mapping project. This effort (started in May 2013) is being used to document agency processes as the state government looks at developing and implementing an enterprise resource planning system. Department processes have been mapped so best practices/requirements are incorporated into the functionality of the system. In addition, the process maps can now be used for training purposes and KM. So, the benefits are extensive. To be effective in mapping processes, the department trained 58 employees in business process mapping tools. As of October 1, 2013, 279 administrative and core business processes have been mapped using Visio[118]. Each process includes a process map and a spreadsheet/worksheet indicating key inputs, outputs, and products of the process. A dedicated intranet site has been developed for employees to access the project charter, reports, metrics, and process maps. These maps have been shared outside of the agency, with other state agencies and the Department of Administration, which is coordinating the enterprise resource planning system effort.
Expertise Identification	Division management will typically identify experts in areas to work on projects or significant issues. The department does not maintain a formal list of experts in each area.

118 Visio Professional 2013, Microsoft Corporation, http://office.microsoft.com/en-us/visio/

Tools and Technologies	For social media, WisDOT uses the following tools: ■ **YouTube** – WisDOT has an external YouTube site[119] that provides videos on various projects, safety efforts, and commercials. The department also has a YouTube site for internal purposes, such as the Thought Leader Series on the LearnCenter. ■ **Facebook** – WisDOT has a general Facebook[120] page to disseminate information related to highway closures, special events, road construction, and recruitment for positions. In addition, WisDOT uses individual Facebook pages for specific high-profile, major projects to provide information to the public on just those projects. ■ **Twitter** – WisDOT uses our Twitter[121] account to disseminate information similar to that on our Facebook pages. In addition, the department provides external customers with a variety of information on our Internet site, including online capability for DMV products/services, other resources, manuals, guidelines, and performance measures. Our use of social media was a primary strategy the 2011-2013 workforce plan. We were able to use these tools to market positions, keep current with technology and share information with the public and employees.

119 http://www.youtube.com/user/wisdot

120 https://www.facebook.com/WisDOT

121 https://twitter.com/WisconsinDOT

Kansas Department of Transportation

Response provided by	Susan Barker, Technology Transfer Engineer
Context	KDOT has 2700 employees and is responsible for the state's highway system, 10,000 lane miles with a current annual budget of $1.6 billion. KDOT also provides resources and support for aviation, public transit, local partnership programs, rail crossings improvements, and rail services in the state. KDOT is centrally located, with its headquarters in Topeka and six district offices throughout the state. KDOT also administers and maintains a statewide radio communications system to support KDOT, the Kansas Highway Patrol, and other public safety organizations. KDOT's biggest challenge is to keep its funding from being donated for other state needs in times of economic hardship.

Innovation and Knowledge Sharing

Designated Function for KM	KDOT does not have a designated function for KM.
Leadership and Culture	Our District Mentoring Program provides an experienced person to mentor and share knowledge district wide for field inspectors. While this is a great idea on paper, it has met challenges and must be supported by all management to function the way it was intended.
Recognition and Rewards	KDOT has the following programs: ■ **KDOT Service Award** – Acknowledging our KDOT employees for their service to the state for one, five, 10, 15, 20, 25, 30, 35, 40, 45, 50 or more years. This includes a certificate and small gift (e.g., a coffee cup, blanket, or shirt, all with the KDOT logo). Our Personnel Department administers this. ■ **Orange Hero Award** – First awarded by the KDOT Secretary in 2006 to recognize KDOT employees who have gone above and beyond the call of duty. The prize for being responsive and responsible is a KDOT-style Oscar figurine with an orange safety vest, called an Orange Hero. These are given out at a leadership meeting either annually or biannually. ■ **State Employee Suggestion Program** – Rewards state employees for innovative thinking that leads to documented cost savings. The state's Administrations office administers the program. The employee or group of employees with cost saving suggestion is awarded 10% of the documented first-year savings of the idea. The agency that the idea comes from also receives 10%. The rest of the savings goes to the State General Fund.

Communities	The biggest form of information sharing is through annual meetings. These include: ■ KDOT's Operations Meeting, held biannually ■ KDOT's Leadership Meeting, held biannually and hosted by our Personnel Bureau ■ Kansas State University's Transportation Engineering conference[122], hosted jointly by KDOT and Kansas State University and held annually with over 400 participants; only half are from KDOT ■ Other industry-sponsored conferences (e.g., Asphalt, Geotech, and ACPA) ■ Individual bureaus are encouraged to have an offsite one-day retreat once a year or every other year. ■ Brownbag Lunch, held monthly with diverse topics and either KDOT speakers or special guest; a committee sets these up (These lunches were originally designed to provide professional development hours for engineers.)
Storytelling	KDOT has not formally encouraged use of storytelling for information sharing.

Succession Management

Succession Planning	Informal process currently in progress.
Staff Retention	KDOT encourages cross-training, but we have no formal program for it; it is left up to individual management. KDOT does have an engineer-in-training rotation program so that these individuals can visit different parts of KDOT before they choose where to start their career. KDOT has a progression program for engineering technicians, equipment operators, and equipment mechanics. This is usually a two-year program with formalized training, progression steps, and written tests.
Employee Interviews	We conduct exit interviews when employees leave KDOT.

Employee Orientation, Learning, and Development

122 Kansas Transportation Engineering Conference, K-State Conference Services, Kansas State University, http://www.dce.k-state.edu/conf/transportation/

New Employee Orientation	KDOT's onboarding process is conducted both online and through a one-day orientation class. It is mandatory for all new employees to go through this within the first six months of being hired. The onboarding courses include: ■ Emergency Procedures (online) ■ Employment in Public Service – restrictions and expectations of public employees (online) ■ The Engineering Technician, Engineering Operator, and Engineering Mechanic Progression Programs (online) ■ Family Medical Leave Act (online) ■ KDOT Employee Council (online) ■ KDOT Overview – KDOT's mission, vision, and values; KDOT's Standard Operating Manual, online basic organizational chart, state employee benefits, important contacts, and where to find information (online) ■ Learning center overview (online) ■ New commercial drivers (online) ■ Performance Management Process – KDOT's evaluation process (online) ■ Position description, work hours, and compensation (online) ■ Respecting Others (online) ■ Technology Use and Security for New Employees (online) There is version of this course that every employee is required to take every year. ■ Supervisor Onboarding class – provides background to a supervisor for the onboarding process and what is covered (online)

	The four-hour required course includes: ■ KDOT's mission, vision, and values ■ Appropriate use of KDOT resources ■ Agency rules and regulations for common workplace situations ■ An employee's role in preventing and detecting fraud ■ Role in supporting workplace diversity ■ Relation of individual job responsibilities to lager agency initiatives All of the online courses and be revisited so that employees can find the information and/or reacquaint themselves with information when needed. Progress is tracked through our online Learning Management Center. Employees and their supervisor can track their progress. E-mails are sent out to remind individuals and their supervisor when requirements are met and/or not met.
Employee Growth and Development	In addition to the progression program described previously (see Employee Retention), KDOT provides a one-week review class for engineers in training who are getting ready to take the professional engineer exam. KDOT engineers, guest instructors from other state agencies, and possibly expert instructors from a local university teach this class. Unfortunately, there will always be perceptions that certain employees are being favored or preselected for advancement, especially when management asks someone who is retiring or leaving to start training a certain individual to take over, even if that individual is not next in line.

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management	KDOT has a physical library with a full-time librarian. KDOT's librarian provides research references to save valuable time to many of our engineers, geologists, and other KDOT professionals. KDOT's library is housed in the Bureau of Research at KDOT. The librarian also sends out e-mail to interested individuals at KDOT for all new publications received to keep them informed of new resources and information. All KDOT research publications are available to the public, either by download or hard copy. KDOT has a Standard Operating Manual for Records Management that covers open records, records preservation, and public records policies.

Lessons Learned and Case Studies	I am not aware of any formal efforts to capture these.
Institutional Memory/ Retention of Critical Knowledge	There are no formal efforts, though the need for this has been discussed.
Process Documentation	KDOT has developed several documentation/procedure manuals over the years and updated them as needed. They include: ■ Documentation Manual for Field/Construction Operations ■ Administrative Reference Manual for Operations ■ Fiscal Procurement Manual ■ Fiscal Procurement and Inventory Control Manual
Expertise Identification	KDOT has no formal process for this other than using the electronic organization chart and phone book.
Tools and Technologies	KDOT uses social media and technology to promote itself to the public, and keep the public informed of KDOT's mission. Unfortunately, KDOT employees are not currently allowed to access any form of social media from a work computer or cell phone. In the past, we had an individual to design and maintain much of the social media; however, now it is disseminated to our public involvement staff members as part of their normal duties. In 2008, transportation officials wanted Kansas stakeholders themselves to think about the complexities of funding priorities for the state highway system. To that end, the T-LINK calculator[123], an interactive tool that will allow users to create and fund their own theoretical Kansas transportation program, was developed. The T-LINK calculator allows users to develop their budget by making assumptions about current funding sources and choosing from a variety of potential new funding sources. Users then allocate their budget on a variety of transportation modes and highway programs. The purpose was to help Kansans understand the possibilities and tradeoffs associated with various transportation and funding priorities. A committee must approve all content that is posted to the Internet.

123 LINK (Transportation Leveraging Investments in Kansas) Financial Overview, prepared for Special Committee on New Comprehensive Transportation Plan on November 12, 2008, http://www.ksdot.org/PDF_Files/Special%20Committee%20on%20CTP%2011-12-08.pdf

Alaska Department of Transportation and Public Facilities

Response provided by	Amanda Holland, Administrative Services Division Operations Manager
Context	ADOT&PF has approximately 3500 employees and an annual operating and capital budget of $2 million. ADOT&PF's mission is to "Keep Alaska moving through service and infrastructure." To do this we provide for the safe and efficient movement of people and goods, provide statewide access and connectivity, and provide access for exploration and development of Alaska's resources. ADOT&PF designs, constructs, operates, and maintains the state's transportation infrastructure systems, buildings, and other facilities used by Alaskans and visitors. These include more than 5600 miles of paved and gravel highways; more than 300 aviation facilities, including 254 airports; 43 small harbors; and a ferry system covering 3500 nautical miles serving 35 coastal communities. The department is administratively divided into three regions: ■ The **Northern Region**, headquartered in Fairbanks, is the largest, most geographically diverse region and maintains more centerline miles of highway, including all of the Alaska, Richardson, Taylor, Denali, and Dalton Highways and portions of the Parks and Glenn Highways. ■ The **Central Region**, headquartered in Anchorage, includes the state's most urban areas, as well as some of the most remote villages on the Kuskokwim delta, the Alaska Peninsula, and the Aleutian Chain. The Central Region maintains the Seward and Sterling Highways, as well as parts of the Parks and Glenn Highways. ■ The **Southeast Region**, headquartered in Juneau, serves a coastal population of 70,000 hardy residents of the Alexander Archipelago. Currently, only three Southeast communities are connected by road to the outside world: Skagway, Haines, and Hyder.

The Alaska Marine Highway System is headquartered in Ketchikan. From there, system management directs the operation and maintenance of our fleet of 11 vessels, ranging in size from the 181-foot M/V Lituya to the 418-foot M/V Columbia.

The Alaska International Airport System, comprising Ted Stevens Anchorage and Fairbanks International Airports, is home to over 30 international and domestic airlines, providing passenger and cargo service throughout Alaska, the United States, Europe, and Asia. Both airports are state-owned.

Transportation challenges include:

- Alaska Marine Highway connects 33 coastal communities via 3500 waterway miles
- Aviation operations include two international airports and 252 rural airports – approximately 82% of Alaska communities are not served by roads
- Diverse and extreme geologic and climate conditions
- Employees are highly geographically dispersed, with little contact

As of August 2013, 12.3% of ADOT&PF's current employees are eligible to retire; by the end of calendar year 2015, 18% of the current employees are eligible to retire; and by the end of calendar year 2017, over 23% are eligible to retire. ADOT&PF is still recovering from the steady drain of employees who left beginning in 2008. In addition, continued eligibility to retire is still in double-figure percentages. Table F.2 shows fiscal year 2012 retirement projections by occupational group for DOT&PF.

Table F.2 ADOT&PF fiscal year 2012 retirement projections

Occupational Group	Total employee count	Retire < 1 year	Retire between 1 and 5 years	% retirement eligible within 5 years	Retire > 5 years*	% retirement eligible > 5 years
Admin Support	72	10	11	29.2%	42	58.3%
AMHS Shoreside	102	18	10	27.5%	32	31.4%
AMHS Vessel	754	109	94	26.9%	273	36.2%
Clerical	131	16	14	22.9%	31	23.7%
Eng Geologists	10	1	0	10.0%	6	60.0%
Engineering	462	89	30	25.8%	216	46.8%
Environmental	46	7	3	21.7%	13	28.3%
Financial	99	17	8	25.3%	43	43.4%
Int'l Airports	107	10	10	18.7%	46	43.0%
IT	62	10	6	25.8%	25	40.3%
Leasing	25	7	5	48.0%	9	36.0%
LTC	1154	163	137	26.0%	431	37.3%
M&O SEF	44	8	4	27.3%	24	54.5%
Miscellaneous	35	8	2	28.6%	18	51.4%
MS&CVEO	36	7	4	30.6%	16	44.4%
Planning	68	18	7	36.8%	21	30.9%
Procurement	38	7	4	28.9%	14	36.8%
ROW	60	20	8	46.7%	17	28.3%
Grand total	**3305**	**525**	**357**	**26.7%**	**1277**	**38.6%**

* Includes data not available

Innovation and Knowledge Sharing

Designated Function for KM

There is no single, centralized function at ADOT&PF. That said, active workforce planning began in 2009 with comprehensive workforce data gathering and analysis. ADOT&PF identified an initial need for education and raised awareness of workforce planning based on the preliminary findings of the 2009 data. The years 2009 and 2010 focused exclusively on establishing data gathering and analysis processes and preparing the department for implementation of a workforce planning program. Follow-up workforce surveys in 2010 and 2011 demonstrated a higher overall awareness and understanding of workforce planning and assisted the department's leadership team in fine-tuning the developmental needs of the department.

In 2011, the Workforce Excellence Program[124] launched department-wide. Tied directly to the department's strategic plan and with complete executive sponsorship, the Workforce Excellence Program is a three-year initiative with a focus on leadership, strategic recruitment, professional and personal employee growth, employee retention, and effective workforce planning processes. The program will be evaluated in 2014 and then made a permanent function of the department.

The program has been designed to accommodate industry shifts and changing workforce demands to maximize its effectiveness; it is administered via web site and is accessible throughout the department's duty stations. ADOT&PF began design and development after researching trends in workforce demographics and planning. The program is located in the Administrative Services Division and includes knowledge sharing.

ADOT&PF is actively pursuing effective KM through document imaging technology/practices and person-to-person knowledge transfer. Employees are encouraged to share information and resources; the department is also participating in identifying KM best practices in transportation on the national level.

ADOT&PF began a mentorship program that is currently in the infancy stage:

124 Workforce Excellence Program: Comprehensive Workforce Planning Model for Transportation Agencies, State of Alaska Department of Transportation and Public Facilities, http://docs.trb.org/prp/13-1088.pdf

	■ Many employees expressed interest; few signed up for the program
	  ● Most wanted mentors from the same location
	  ● Difficult to match mentors and learners – topic of interest and location
	■ Currently, revamping the mentorship program – options:
	  ● Pilot in one unit (pro – same location; con – limited topics)
	  ● Scrap formal and stick to informal (pro – easier to make happen; con – little to no internal quality control)
	  ● Rewrite criteria and have leadership select qualified few for mentorships; currently happens informally (pro – more likely to target high potential employees; con – favoritism; union involvement)
	Process documentation:
	■ The state is implementing an enterprise-wide financial, procurement, and HR system
	  ● ADOT&PF is systematically reviewing its business processes and documenting them
	  ● Future state – with the new system, process improvements will be documented and made available to future users
	  ● Everybody will learn the same processes (across departments)
	  ● Inside ADOT&PF, everybody will learn the same ADOT&PF-specific processes
	  ● Cross-training is automatic – built-in (no hidden spreadsheets, no knowledge hoarding)

Leadership and Culture	Some units within the organization have stronger collaboration and knowledge-sharing practices than the department as a whole. With its diverse focus (e.g., aviation, highways, and marine) and remote locations, a cohesive department-wide knowledge-sharing culture is particularly challenging to foster and sustain.

Recognition and Rewards	Statewide, we have an Employee Safety Incentive Award Program, established in 2007, to formally recognize employees and organizational units for significant contributions to workplace safety; supervisors make the nominations. In addition, the Southeast Region has a formal recognition program for its employees to recognize outstanding performance; peers and supervisors make the nominations. It is in its 28th year and is being considered the model for a department-wide program (scheduled for 2014). Alaska has an Executive Branch employee recognition program called "Denali Awards" [Governor's Denali Peak Performance Award[125]] and is the Governor's Office's program. ADOT&PF employees are nominated for this program every year, and many have been award recipients. ADOT&PF also nominates employees for AASHTO awards. Department-wide, workforce planning has just begun an Extra Mile award mandated by the ADOT&PF commissioner. ADOT&PF is also exploring a department-wide Employee Recognition Program, slated for 2014. Additionally, on the internal ADOT&PF web site, an Employee Spotlight boasts individual accomplishments and awards. **Observation:** Recognition programs are extremely beneficial in retention and recruitment. That said, inconsistent programs can prove detrimental. Programs should be sustainable and objective – employees must be able to rely on the program to occur regularly and to mean something. ADOT&PF is cautious and conscientious about establishing or revising recognition programs.
Communities	Multiple special interest groups hold regular meetings and conferences within the state (e.g., construction, preconstruction, right-of-way, environmental, and maintenance and operations). Specific examples include the following: ■ **Northern Region** – preconstruction uses technology and has a chat room to discuss solutions, ideas, and questions ■ **Maintenance and Operations** – monthly training teleconferences for employees across the state

125 Governor's Denali Peak Performance Awards, Personnel and Labor Relations, Alaska Department of Administration, http://doa.alaska.gov/dop/denaliawards/

Storytelling	Nothing formal. Leadership is working on incorporating storytelling into its presentations. Storytelling must focus on facts and avoid anecdotes to increase validity and effectiveness. A goal of the Workforce Planning Program is to develop a 15-20 minute video on the history of DOT&PF – to share with new employees, the Legislature, public, etc. – to tell DOT&PF's "story."

Succession Management

Succession Planning	Due to collective bargaining restraints, ADOT&PF is not allowed to identify successors in advance. The department provides growth opportunities to multiple individuals whenever possible. Succession planning looks a little different: workforce demographics are used to identify critical job classes where a large percentage of the current employees are eligible to retire. Then, ADOT&PF focuses its strategic recruitment and knowledge-sharing efforts on those critical job classes. Other strategies include double-filling positions for training purposes and bringing in experts to work with new hires.
Staff Retention	We use the following strategies: ■ Encourage participation in national transportation organizations ■ Cross-training (more successful in some areas) ■ Employee recognition ■ Transfer opportunities ■ Training opportunities ■ Interesting variety of work (e.g., Roads to Resources Program Initiative[126]) ■ Career ladders in sections

126 Roads to Resources, Alaska Department of Transportation and Public Facilities, http://www.dot.state.ak.us/roadstoresources/index.shtml

Employee Interviews	ADOT&PF has both an entrance survey for new employees and an exit survey for those leaving the department to gather information on what is working and identify problem areas. ADOT&PF has also sent out periodic employee satisfaction surveys to all employees to gather information on what their most specific needs are. The survey is administered through SurveyMonkey[127] and is available to all. The majority of people leaving the department do not take the time to fill out the survey. We are trying to figure out a way to make that a more favorable percentage. Every two years, ADOT&PF conducts a workforce planning survey (using SurveyMonkey) and select in-person interviews. The results are incorporated into the program's goals and objectives.

Employee Orientation, Learning, and Development

New Employee Orientation	All new employees are required to go through a State of Alaska new employee orientation. In addition to required forms to fill out, it also gives them an introduction to state government in general, their responsibility as an employee, general information, and resources and policies. In addition, ADOT&PF has its own new employee orientation in PowerPoint form on its intranet that all new employees are required to review. It explains ADOT&PF's mission, vision, and core services and reviews each division and its particular responsibilities. It lists the department's budget, explains the history and heritage of ADOT&PF, and gives contact information. In some areas, supervisors walk through the PowerPoint with the employee; in others, it is employee self-paced. Progress is tracked through performance evaluations, which are given half way through employee's probationary period, at the end of the probationary period, and then annually thereafter.

127 SurveyMonkey, https://www.surveymonkey.com/

Employee Growth and Development	Refer to previous sections for information about our formal mentoring program. The following training opportunities are provided: ■ AASHTO National Transportation Leadership Institute (two-week training) – ADOT&PF paid for one to go to this training out of state in 2012 and another in 2013. Anticipate continued participation. ■ AASHTO National Transportation Management Conferences (four-day series of workshops) – ADOT&PF paid for two nominees to go to this training out of state in 2012 and two nominees in 2013. Anticipate continued participation. ■ ADOT&PF Workforce Excellence Program delivered a peer-to-supervisor training (developed in 2012) eight times to 219 department employees in four different locations. ■ ADOT&PF held a week-long Maintenance Leadership Academy (developed in 2012), delivered in October 2012 and April 2013 in two different locations for leads, foremen, and superintendents in the maintenance field for a total of 62 employees, with another planned for October. ■ In December 2011, launched an online learning and performance management system called STARS (State Training and Reporting System) – available to all DOT&PF employees via intranet and log-in; includes calendar of available training, training transcripts, information ■ Through our Research, Development & Technology Transfer (RD &T2) section, employees can view available training that is outside of regularly scheduled training offered by the state for its employees. ■ RD&T2 also lists meetings for different societies, such as Society of Women Engineers, American Society of Civil Engineers, Alaska Society of Professional Engineers, and Institute of Transportation Engineers–Alaska Section, giving employees a chance to participate with others outside of ADOT&PF in their professional arena. ■ State of Alaska, Division of Personnel and Labor Relations, training classes (state-paid)

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management	Alaska has begun the Integrated Resource Information System (IRIS) Project[128]. This is a statewide effort to implement a new accounting, financial, procurement, payroll, and HR management software solution for the state with all systems in phases; the last one will go live in 2016. ADOT&PF is actively involved in this project and anticipates business process changes and efficiencies. Currently, ADOT&PF has official social media sites on Facebook, Twitter, Vimeo[129], and YouTube. Through the ADOT&PF Intranet pages, employees can log on to eDocs (Electronic Document Management System), which provides record storage of all electronic and paper-based documents available to all authorized parties; provides backup and archival; integrates business process workflow management capabilities; and can be accessed via web browser or Windows desktop integration. Additionally, through the intranet, employees have access to ADOT&PF organizational charts, glossary, policies and procedures, user manuals, project reporting and other information. The state has a records retention policy that all state employees must follow.
Lessons Learned and Case Studies	As the statewide IRIS project continues and is implemented in its various functions and phases, people and systems are monitored to ensure adoption of the new system is successful.
Institutional Memory/ Retention of Critical Knowledge	ADOT&PF currently does not have a formal initiative for knowledge transfer. Some positions have been dual-filled for training purposes prior to staff retiring or leaving their position for another reason. Some retirees have been brought back for a limited time in a temporary position for training purposes. Some contractors have been hired to transfer knowledge (e.g., federal grant management).
Process Documentation	Formal policies and procedures are set in place for some processes. There are program procedure manuals, desk manuals, and guides for other business processes. Most are administered via the employee intranet, requiring log-in, and are available in hard copy to employees. Some are statewide policies and procedures available to all state employees.

128 Integrated Resource Information System, Division of Finance, Alaska Department of Administration, http://doa.alaska.gov/dof/iris/

129 Vimeo, http://vimeo.com/upgrade1?utm_source=search&utm_medium=google-upgrade1-brand_vimeo_alone_vimeo_exact-us&utm_campaign=1587&utm_term=vimeo&gclid=CMKK7NXVjb8CFVFp7Aod0B4AxQ&dclid=CJrm_NXVjb8CFYUQOgodHxUA5w

Expertise Identification	ADOT&PF does not have a formal process in place to identify subject matter experts. Historical knowledge, word-of-mouth, contact information, and links on external and internal web sites, are all used as resources for help on a particular topic. Collective bargaining rules make creation and maintenance of an employee talent inventory problematic.
Tools and Technologies	See previous responses.

Missouri Department of Transportation

Response provided by	Kathy Harvey, Assistant Chief Engineer
Context	The Missouri Department of Transportation (MoDOT) employs roughly 5100 employees located in seven regional offices, a central office, and operations and maintenance buildings across the state. Those employees work to plan, design, build, and maintain the seventh largest highway system in the U.S., with nearly 34,000 miles and more than 10,000 bridges. In addition to highways, the department administers federal grants to maintain and improve public-use airports, passenger and freight rail, river ports, transit, along with bicycle and pedestrian walkways and trails. The department is also home to a federally funded highway safety program and a one-stop shop for motor carrier services. The department's annual budget is approximately $2.3 billion. The budget available for transportation improvements has been around $1.2 billion. However, because 70% of funding comes from federal and state fuel taxes, funding available for transportation system improvements has been cut in half. In 2010, MoDOT launched its Bolder Five-Year Direction[130] to cut operating costs by $512 million to redirect to roadway improvements. To accomplish this, the plan cut full-time employees by 1200; eliminated 131 department facilities, including three regional offices; and reduced the department's fleet by 740 units. While this approach has been successful in putting more dollars toward road improvements, it is not possible for the department to cut its way to sufficient transportation funding. In fact, going forward, diminishing revenue and increasing prices will barely keep the existing system maintained, and it is projected MoDOT will be unable to match federal funding by 2019. The answer is finding new revenue sources and leveraging innovation to deliver the most for each taxpayer dollar.

130 Bolder Five-Year Direction, Missouri Department of Transportation, http://www.modot.org/bolderfiveyeardirection/

Innovation and Knowledge Sharing

Designated Function for KM

Innovation sharing exists in multiple locations within the agency. The Design Division has an innovations engineer who is responsible for coordinating value engineering studies on projects. This position was established in 1989 to trim overdesigned projects and reduce project costs. It has continued over the years because the studies have produced real savings for the department.

In 2005, MoDOT incorporated the value engineering philosophy into its daily operations through practical design. The philosophy challenged engineers to throw out the standard cookbook design and specifications to allow for more innovation to deliver the same project benefits at a reduced cost. The program has flourished at MoDOT, saving more than $1 billion.

The practical design approach was extended to the department's engineering policies and specifications. A group of design employees began working in 2005 to revise all department policies and specifications to allow for more innovation. In 2007, the Engineering Policy Group was officially formed, and the department launched an online Engineering Policy Guide[131] that consolidated all policies into one location and allowed internal and external practitioners to dialogue regarding successes and problems.

The Construction and Materials Division also coordinates a value engineering process with contractors. The Construction Division's value engineering process began in 1990 to capture contractor innovations to cut costs and speed up projects. The program allows contractors to share up to 50% of the project savings, which makes the program popular with the contracting industry. Since 2009, the department has approved 378 contractor value engineering proposals, which saved nearly $23 million.

Also within the Construction and Materials Division is the research section, which administers in-house and contracted projects to identify new and improved materials, products, and processes. In 2005, the research program was refocused to deliver innovations faster, with applications that are more practical. For instance, one study on the length of drilled shafts will save the department about $45,000 on a typical bridge.

131 Engineering Policy Guide, Missouri Department of Transportation, http://epg.modot.org/index.php?title=Main_Page

	The Solutions at Work program is coordinated through the Customer Relations Division to collect, evaluate, and share best practices in all areas of the department. The Solutions at Work program began in 2006 to replace an ineffective employee idea system. The new system recognizes employee innovations that are in use and producing desired results. To date the program has evaluated more than 800 employee innovations and approved 117 best practices. Within the Solutions at Work program is an annual innovations competition called Innovations Challenge[132]. The challenge began in 2007 to better evaluate equipment and tool innovations. It was recently expanded to include innovations from all areas of department work.
Leadership and Culture	MoDOT leadership has shown it values innovation by choosing "Be Bold" as one of the department's organizational values. This is supported through the department's performance measurement system, cascading through the organization, and linked to employee performance reviews. Executive managers regularly talk about the importance of innovation to the success of the organization. The department's performance management system, known as the Tracker[133], shares innovations as part of the narrative for individual performance measures. The Tracker is published each quarter and published on MoDOT's public web site. It has taken a number of years for MoDOT to change its culture from a wait-and-see attitude to one of being an innovations leader among DOTs.
Recognition and Rewards	The value engineering program with contractors awards 50% of actual project cost savings. The Solutions at Work program offers employees a choice of leave time or monetary awards. The awards range from four hours or $75 to 12 hours or $300 based on the scoring by statewide evaluators. The Innovations Challenge programs offer employee monetary awards from $75 to $500 per person, up to $2,000 per team. Showcase winners identified as statewide best practices earn an additional $10,000 for the host division's or district's budget.

132 Dickson J, Showcase Spotlights Top Employee Innovations, Connections, April 24, 2014, Missouri Department of Transportation, http://modot.org/newsandinfo/Connections/documents/April24.pdf

133 MoDOT Tracker, Measures of Performance, Missouri Department of Transportation, http://www.modot.org/about/Tracker.htm

Communities	The Innovations Challenge culminates in an Innovations Showcase where a panel of judges selects the best innovations. The program was recently expanded to include projects and productivity innovations to include more areas of department work. The Innovations Showcase attracts about 600 employees to view an exhibit hall full of employee innovations and talk with department innovators. The Solutions at Work program conducts monthly coordinator meetings to discuss evaluations of employee submissions. This same group of department managers coordinates replicating innovations across the state. Department executives, managers, and supervisors meet each quarter to discuss department performance. Innovation is a common topic during these discussions. Employees are invited as guests to the review meetings to help them understand department direction and management processes. Divisions and districts also conduct similar quarterly review meetings on local performance and innovation. Value engineering processes with contractors is discussed during pre-construction meetings for projects and annual industry meetings.
Storytelling	Interviews with Innovations Challenge winners are posted on the department's internal web site. The dialogue function within the Engineering Policy Guide is a form of storytelling.

Succession Management

Succession Planning	MoDOT has a formal succession planning approach in place known as the Accelerated Leadership Development program. Senior managers identify high-potential employees to participate in the program. Managers and peers evaluate participants against a set of leadership qualities. While the HR Division tracks the program, the development process is self-paced by participants, with regular meetings with senior managers to identify development opportunities.
Staff Retention	MoDOT recently used its mentoring program to partner minority and female employees with senior managers to support diversity during staff reductions.

Employee Interviews	MoDOT does not conduct employee interviews as part of its succession management activities.
Employee Orientation, Learning, and Development	
New Employee Orientation	MoDOT has recently launched a new onboarding process called Gear Up. The focus of the new program is to get new employees on the job and able to do the work safely and effectively sooner. The standard orientation program was trimmed down to only what the employee needs to know on the first few weeks on the job. This is supported with a formal job mentor and a formal on-the-job training process, complete with trainer's guides and proficiency checklists.
Employee Growth and Development	Numerous jobs within the department have career ladders. Employees progress from entry to intermediate and senior positions by completing a formal checklist of skills, knowledge, and abilities. The jobs within each career ladder have individual pay grades providing more pay for more-proficient employees. MoDOT has a formal mentoring program coordinated by the Employee Opportunity and Diversity Division. Mentees are allowed to select their own mentors. The mentor and mentee customize the process to fit individual employee needs.
Identification, Documentation and Dissemination of Processes, Practices and Expertise	
Organizational Functions for Content Management	MoDOT maintains engineering policies and specifications through the Engineering Policy Guide administered by the Engineering Policy Group in the Design Division. MoDOT also publishes an electronic specification book for employees and contractor use. Official department documents are maintained through work unit SharePoint sites with a formal document retention process established by the Missouri Secretary of State.
Lessons Learned and Case Studies	No formal program for this.

Institutional Memory/ Retention of Critical Knowledge	Nothing formal, but some job-shadowing has been used on large, complex projects.
Process Documentation	MoDOT conducted a key process review in 2009. A few areas have revisited reviews following recent reorganizations. Several of the key process reviews were used during department reorganization in 2010.
Expertise Identification	Nothing formal, but some work units maintain expert lists. The department's customer service centers maintain an online contacts list for each region.
Tools and Technologies	Nothing notable to report regarding our use of social media, knowledge portals, intranets, or other tools and technologies for capturing, preserving, and providing access to knowledge artifacts.

Alberta Transportation

Response provided by	Kelly Foisy, Information Analyst, and Colleen Delany, Policy and Information Analyst, Business Knowledge and Coordination Unit
Context	The Transportation Annual Report 2012-2013[134] provides a useful overview of the organization. The Ministry of Transportation comprises: ■ Minister ■ Deputy minister ■ Engineering Services – Responsible for developing long-term investment and capital planning strategies, delivery of Edmonton and Calgary ring roads, major water management projects, innovation initiatives, 511 Alberta[135] system, and the procurement of consultant and construction services. ■ Regional Services – Provides guidance and direction in the efficient delivery of the ministry's highway and bridge construction and maintenance throughout the province in collaboration with our partners inside and outside of government, and is responsible for municipal grant programs. ■ Traffic Safety Services (TSS) – Responsible for developing, planning, and delivery of traffic safety programs and implementation of the Alberta Traffic Safety Plan[136]. The major piece of legislation is the Traffic Safety Act[137]. ■ Policy and Corporate Services – Responsible for providing the ministry with financial services, strategic policy and planning support, legislative planning, freedom of information and protection of privacy support, and IM support. ■ Human Resources – Responsible for supporting the ministry's workforce. ■ Communications – Responsible for providing Albertans with information for programs and decisions carried out by the ministry.

134 Transportation, Annual Report 2012-2013, Alberta Transportation, http://www.transportation.alberta.ca/Content/Publications/production/AnnualReport2012-13.pdf132

135 511, Alberta's Official Road Reports, Alberta Transportation, http://511.alberta.ca/

136 Alberta Traffic Safety Plan, Alberta Transportation, http://www.transportation.alberta.ca/3112.htm

137 Traffic Safety Act, Province of Alberta, June 1, 2014, http://www.qp.alberta.ca/documents/acts/t06.pdf

- The Alberta Transportation Safety Board[138] – Conducts driver review hearings and independent appeals of driver, vehicle, and safety decisions from the Registrar's Office in accordance with the Traffic Safety Act. Conducts hearings under the Railway (Alberta) Act.

The Ministry has 800 full-time employees. Including interns and students, the number of people working full-time is close to 1000.

Annual Budget information:

- 2011-12 Actual:
  Operational – 436,066,000; Capital – 2,563,575,000
- 2012-13 Budget:
  Operational – 474,662,000; Capital – 2,288,692,000
- 2012-13 Forecast:
  Operational – 496,462,000; Capital – 2,322,554,000
- 2013-14 Estimate:
  Operational – 478,126,000; Capital – 1,999,322,000

Degree of Decentralization: Transportation has major offices in Edmonton, Calgary, and Red Deer, as well as smaller offices throughout the province. For example, TSS has 14 regional Transportation Service coordinators across the province and one-person Dangerous Goods Inspection Services offices across the province. Other divisions also have many locations across the province (see Figure F.5).

Special challenges that have created the impetus for KM:

- At the corporate level – The "lost generation" of employees created by cutbacks in the 1990s and the need to bring new and existing staff up to speed very quickly to be ready to be leaders.
- In Traffic Safety Services –
  - Recognition that we need to develop systems thinking capacity and that, "We can't keep building what we've been building. Our human and systems networks are different now – they are increasingly integrated and will continue to change. Unless we start to look ahead now our future transportation systems will fail" (Shaun Hammond, Assistant Deputy Minister [ADM]).

138 Transportation Safety Board, Alberta Transportation, http://atsb.alberta.ca/

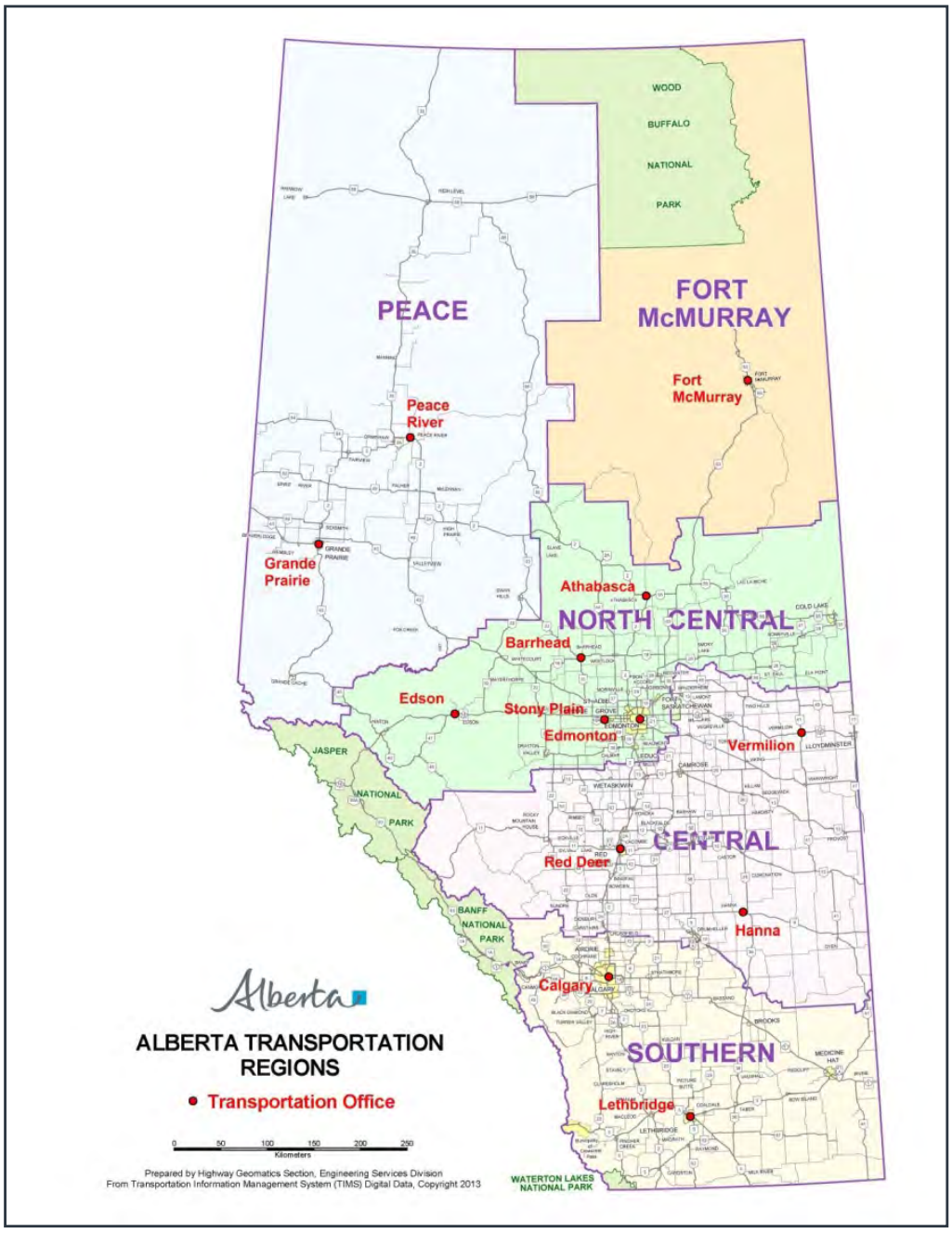

Figure F.5 Alberta Transportation offices

	• Recognition that KM is key to our success in traffic safety in particular because of the key need to influence and change public behavior • Recognition that important knowledge about why Traffic Safety Act provisions and other policy decisions came into being was not being transferred • Recognition that heavy reliance on a small percentage of staff for all expertise was both an ineffective use of their time and a poor approach to succession planning • Loss of core knowledge as people retire or find work in other areas • Transition from paper to electronic systems • Generational differences in how language is used to express policy and legislation • New challenges: "There's no way to shoehorn today's problem into yesterday's regulation" (Shaun Hammond, ADM). For example, how are we going to take into account self-driving cars in legislation that focuses on driver behaviour?

Innovation and Knowledge Sharing

Designated Function for KM	At the corporate level there is recognition of the importance of KM. Retirement of key staff with no knowledge transfer has been a major driver for development of many KM-type programs. At one time, a formal KM program provided funding to assist with knowledge transfer for people who were nearing retirement. However, there was not significant interest from ministries, and the program no longer exists. Currently, KM activities and functions are distributed throughout the organization. The Alberta Government Knowledge Management Framework[139] is provided as basic information.

139 Alberta Government Knowledge Framework, http://www.pao.gov.ab.ca/learning/knowledge/framework.pdf

Despite the lack of a formal corporate KM program, many corporate, ministry, and divisional programs support KM throughout the organization, but are not primarily identified as KM initiatives. "There is a shift across government from siloed thinking to systems thinking. Government strategic outcomes are framed in such a way that we must form communities of practice" (Shaun Hammond, ADM). These initiatives include:

- Pods
  - "Pods create a venue for conversation and information sharing among ministries who have a common purpose to their work or who serve common client groups. They are not decision-making bodies, nor are they intended to replace the responsibility or accountability of ministries. Instead, pods enable departments to engage in policy discussions before decisions on complex initiatives are made by elected officials, thus ensuring resources are used most effectively, duplication and unintended consequences are mitigated, and policy is coordinated and integrated"[140]
  - Pods were established in 2011 by Premier Alison Redford and the deputy minister of Executive Council to facilitate cross-ministry "systems thinking," enable integrated policy development, and foster positive culture change. "The intent is to better integrate policy development and service delivery across government and drive progress on government's agenda" (Pods. Internal document).
  - Pods allow for flexibility in managing discussions and agendas.
  - Pods "create a venue for conversation and information sharing among those who have a common purpose to their work and serve common client groups." "Pods are part of the culture change that Premier Redford and Peter Watson, the deputy minister of Executive Council, are bringing to the Alberta Public Service, where the focus is on providing the best possible outcomes for Albertans by working together as members of a single government team" (Pods. Internal document).
  - Pods are organized around three strategic themes: investing in families and communities, securing Alberta's economic future, and advancing world-leading resource stewardship.

140 From Giberson P and A Neuman, Policy in a Pod, Canadian Government Executive, 19:7, September 23, 2013, http://www.canadiangovernmentexecutive.ca/category/item/1352-policy-in-a-pod.html

- There are Deputy Minister Pods and ADM Pods. Departments are members of one or more of these Pods, and may temporarily join Pods when necessary. Transportation is a member of the Securing Alberta's Economic Future Pod. Staff from Executive Council's Policy Coordination Office support Pods.

- Leadership Development Program

  - This in-house-developed program is intended to develop "a common understanding and expectation of leadership in the Alberta Public Service," and is based on "a principle-based leadership model … based on values, competencies, and the five practices of exemplary leaders." The program was built around The Leadership Challenge[141] by Kouzes and Posner.

  - This program is a primary cultural change agent for the Alberta government. "We have the most comprehensive longstanding leadership development program in Canada" (Ken Freier).

  - The program is aimed at developing leadership capacity at all levels and is open to anyone, whether in positional or non-positional leadership roles.

  - The program, which began in 2001, has developed and expanded in scope and influence since then. The Leadership Development Program is well-supported by the current Deputy Minister of the Executive Council. The program has had strong leadership and strong continuity of leaders, and now has its own momentum. There are spinoffs from the program, including a Leadership Fundamentals course, the Leader's Guild (a Community of Learning), and an annual conference. People who have gone through the program now have positional leadership and return to the program as mentors. The program also builds leadership at all levels. "Could positional leadership erode it? It is now embedded in the culture. Probably any attempt would make somebody lose credibility" (Ken Freier).

Within Transportation there are formal KM functions:

- Alberta Transportation is a member of the Canadian Council of Motor Transport Administrators[142] (CCMTA).

141 The Leadership Challenge, Kouzes JM and BZ Posner, http://www.leadershipchallenge.com/home.aspx

142 Canadian Council of Motor Transport Administrators, http://ccmta.ca/en/

- From the CCMTA Fall 2013 Newsletter[143]: "A jurisdiction was in a position of quickly needing to understand and assess the Canadian situation regarding studies done about the effectiveness of the suspension/seizure provisions for excessive speeding/racing/stunting. E-mails were sent out to jurisdictions and an attempt was made at gathering this information quickly for a Minister awaiting a response. It proved rather challenging to obtain the information in a timely fashion, despite the ongoing commitment of the members to be responsive."

- The purpose of the KM pilot project is to ensure that CCMTA members will have effective KM business practices to make it easy for CCMTA members to find, transfer, and share knowledge; facilitate the reuse of CCMTA member knowledge assets; and enable CCMTA member cooperation and collaboration at all levels.

- The CCMTA has formed a KM Advisory Subcommittee. Shaun Hammond, ADM of TSS, is the board sponsor of this subcommittee.

- One of the subcommittee's projects is to develop a KM pilot project that has the following objective: "to design, develop and deploy a single-themed, multi-layered platform to support the capture, storage, exchange and use of knowledge among CCMTA members." (from CCMTA working group members-only wiki) This project commenced in 2013. It is intended to help jurisdictions more easily access and share transportation and road safety information across Canada. The CCMTA pilot project is relatively new; however, there is strong executive support for this initiative.

- TSS Division staff serve on the cross-Canada multi-jurisdictional KM Pilot Project working group. A tool prototype is anticipated by year-end; full deployment is projected for March 2014.

143 Fall 2013 Newsletter, Canadian Council of Motor Transport Administrators, http://archive.constantcontact.com/fs159/1111139991720/archive/1113429070080.html

- Traffic Safety Services Division:
  - Although TSS has been deliberately implementing KM practices for many years, formal implementation of a KM function was established in 2013. Leadership's stated long-term vision of a world-class, collaborative, systems-based strategic division has driven the KM agenda, and strong practical executive support has been critical in moving KM initiatives forward. A major spur for developing a KM program was the recent loss of some senior executives and, along with them, substantial "knowledge wisdom." Additional impetus for KM initiatives within TSS were: no standard approach to capturing knowledge from staff nearing retirement; divisional information silos; no central system for capturing and sharing information; lack of documentation in general; information saved on personal hard drives; need for standardized information and processes for maintaining standardized information; and challenges in keeping policies and procedures current with changing legislation and directives.
  - To begin to address these issues, TSS initiated a pilot project to share documents of division-wide interest on the intranet and created a new correspondence coordinator position to help with development of standardized information.
  - The Business Knowledge and Coordination Unit Operational Plan states that "the branch collects, compiles, and stores pertinent information from all branches of the division for the purposes of improving divisional communications, policy coordination, and KM."
  - Designated KM activities for 2013 include establishing a cross-divisional working group to design and develop a common area on the intranet to share documents of cross-divisional interest, and direction to develop a KM strategy for the division.

  - The TSS Office of Traffic Safety (OTS) Branch has regular contact with a wide variety of stakeholders. OTS employs 14 regional traffic safety coordinators who work in 14 different geographical areas of the province. The OTS identified succession management as a major vulnerability. To begin to address this vulnerability, it developed the Community Mobilization Operational Support System (CMOSS), a stakeholder database to capture information about who these stakeholders are, what interactions have occurred in the past, and the major areas of concern for stakeholders across the province. The CMOSS system (which was developed outside of any formal KM program, but in conjunction with a consultant who specializes in KM) allows regional traffic safety coordinators to rate the strength of their relationship with their stakeholder groups to provide a window on the community and a perspective on how to engage stakeholders.

- At one time, there was discussion of a designated Transportation KM Branch; however, there was insufficient interest.

There are at least a few different definitions used in the Alberta government to distinguish knowledge from information:

- Alberta government KM framework: "Knowledge management is a systematic approach to ensuring ready and available access to knowledge and collective expertise in order to carry out the business of the government of Alberta through capturing, sharing, using, and leveraging what people know."
- CCMTA: Information + Experience = Knowledge; Knowledge + Processes = Knowledge Management

Skills needed for effective KM include leadership skills, community development skills, HR skills, IT skills, and IM skills. These skills come from a variety of people and divisions throughout the organization. Formally, within TSS we focus on four core, foundational skill sets for all employees: leadership, policy development, contract management, and project management.

In Alberta's experience, successful approaches and lessons related to encouraging knowledge sharing and collaboration are:

- A holistic approach to KM.
- Use of a formal project management approach that incorporates KM elements, such as knowledge transfer (through formal identification of veteran project advisors), quality assurance (through review by experienced staff), and lessons learned. For example, we use a Project Brief template for all TSS projects. Another ministry has adopted this approach.
- A well-connected, passionate executive champion with an ambitious long-term vision has been important for the development of KM in TSS. "Visionary leadership is helping to move the agenda and establish practices that will set us apart" (Shaun Hammond, ADM). Building and supporting a culture that values and feels secure in sharing is also valuable. The Alberta government's broad "systems thinking" and strong positional leadership support for this approach has begun to break down silos.
- Use of cross-divisional and cross-ministry teams for mission-critical projects gives us a multidisciplinary approach to resolving issues and builds in a learning process. The connection of learning and doing is important to KM.
- Dedicated staff time is needed to organize and implement the sorts of activities that result in culture change, leadership development, and effective information-sharing. Activities that are not formally under the umbrella of KM (e.g., the Leadership Development Program) have built a foundation for some of the KM practices that we hope to implement in TSS.
- Not all parts of the organization have been interested in, or capable of, pursuing KM activities at the same rate or to the same degree. However, participation on cross-departmental or cross-ministry project teams facilitates knowledge transfer and development.
- As we develop our KM capacity in TSS and share our activities, other areas express interest in learning about our experience.

Leadership and Culture

The Leadership Development Program is "the primary cultural change agent for the Alberta government. It started in one ministry and has spread to 20 ministries" (Ken Freier, Manager, Leadership Development). The program:

- Began in a single department in 2001, added a second partner in 2003, and third in 2006
- Has been implemented across the Alberta Public Service (20 departments and 25,000+ employees)
- Enrolls 450 new participants in two intakes per year
- Currently has 373 participants and is recruiting 225 participants to begin in September
- Has 2,000+ graduates and 350 mentors who participate in advanced leadership series opportunities .

An HR person advised, "The Reaching Our Full Potential program, [which is aligned with the Leadership Development Program,] was an attempt to try to change the way people treated each other. The environment has shifted, there are technology changes, there is direction for a 10% management reduction, and there is upcoming pension reform that may encourage people to retire earlier than they had planned. We are facing challenges at a different pace. We cannot respond, cannot proactively address this unless we make a cultural transformation. We need to build a culture where people can lead from the position they're in."

> *"Reaching Our Full Potential is about leading from where you're at. This is not a top down initiative, although [Deputy Minster, Executive Council] Peter Watson started the ball rolling. Each one of us plays a role in this change. We are all co-authors of our culture, whether it be positive or negative in your individual unit, section or branch. In order to start change we all need to take smalls steps forward" (Reaching Our Full Potential internal document).*

Collaboration and knowledge sharing are integral and foundational parts of the Leadership Development Program, the Reaching Our Full Potential program, and the Rewards and Recognition program. Each year, employees sign a performance agreement that includes a commitment to "actively support my team and collaborate with others to achieve branch, divisional, department or GOA goals" and to "develop … skills and competencies for current and future roles, including teamwork, collaboration, and leadership and/or work actively to support knowledge and skills transfer to others." Employees also develop and sign a flexible and adaptable Performance Plan that allows employees to detail how the commitments made in the performance agreement relate specifically to their work, and track the results of their efforts. Performance reviews are structured as two-way "performance excellence conversations," as opposed to performance rating or scoring.

Alberta Public Service's vision and values are integrated in leadership programs and daily business:

- "The vision of the Alberta Public Service (APS) is: Proudly working together to build a stronger province for current and future generations.
- "Our values are respect, accountability, integrity and excellence.
  - Respect: We foster an environment in which each individual is valued and heard.
  - Accountability: We are responsible for our actions and for contributing to the effectiveness of the public service.
  - Integrity: We behave ethically and are open, honest and fair.
  - Excellence: We use innovation and continuous improvement to achieve excellence.
- "Our vision and values are the foundation of our work in meeting the needs of Albertans, and provide clear direction on what the public service is striving to achieve. Given the complexity of our environment now and into the future, it is important that we review and renew our leadership practices, learning and engagement skills, business processes and communication with each other — in essence 'how we work' — to ensure excellence right across the APS. We need to build on good practices occurring today and consider how we change processes and behaviours, to 'Reach Our Full Potential' in all areas of our work" (Reaching Our Full Potential internal document).

Pods: The Policy Coordination Office has noticed an improvement in the quality of decision-making.

TSS is transitioning from a division of silos to a "horizontally coherent" and coordinated division through deliberate action.

- **Removal of physical barriers** – For example, in 2006, TSS Driver Fitness and Monitoring was isolated by walls, doors that required that staff be buzzed in, and thick glass. These barriers were originally installed to protect staff from the threat of physical violence from the public. However, these barriers also physically separated branches that needed to be working closely together. To integrate the division, leadership worked to have these physical barriers removed while still maintaining a safe environment.
- **Leadership Development Program principles** – TSS implemented the Leadership Development Program principles to quickly develop new staff. TSS moved from a project-based model where new people led mostly administrative projects to a mission-critical model where new people were put in leadership positions on important projects and given appropriate mentoring and expert support. There is also strong support for TSS staff participation in the Leadership Development Program, Reaching Our Full Potential, and the Rewards and Recognition program. For example, staff are given time to attend professional development programs, are mentored by veterans through the Leadership Development Program, and many staff are recognized for their contributions through the Rewards and Recognition program. Posters supporting these programs are posted throughout the workspace. Staff dialogue about these programs is positive and feels genuine.
- **Cross-branch project teams** – TSS project teams purposefully include members from different branches. For example, a current Traffic Safety Act amendment team lead by the policy branch includes members from Driver Programs (including a new intern) and Legislative Planning. All members of this team are assigned mission-critical work that will enable them to develop professionally (i.e., not just minute-taking or providing feedback on others' work). This is an example of how the project management approach and project brief support KM. In addition, there is strong support for TSS staff participation in project teams and projects. TSS encourages project team work across the Ministry of Transportation and across the Alberta government.

For example, the ADM for TSS works on a wellness team in the Ministry of Health because of TSS's work in preventing traffic injuries.

Key factors contributing to fostering the culture of collaboration have been:

- A concerted and defined effort to create a positive, collaborative culture and strong leadership support
- Cross-divisional and cross-ministry work groups and project teams (e.g., inclusion of staff from other branches on policy teams) improve awareness and increase broad understanding of the organization.
- Formal recognition. For example, in 2008, TSS's ADM was given the Minister's Award for Process Innovation for the TSS Community Mobilization Strategy (this strategy was a plan for hiring 17 regional traffic safety coordinators – six in aboriginal communities – establishing community-based traffic safety networks, and addressing local issues under an overarching provincial traffic safety umbrella). The TSS Community Mobilization Strategy was the basis of community health networks developed in the Ministry of Health.

If additional resources were available, the following improvements would be considered:

- Leadership Development Program
  - More electronic resources
  - Better supports for mentors
  - Continuum of leadership development – the current Leadership Development Program is all or nothing: you are enrolled or not – there are no opportunities for anyone else
  - Improve how learning streams are tailored
  - Develop HR capacity to so that we are doing a better job of recruiting for leadership qualities.
- TSS: Generally improve how we collaborate and coordinate activities within our area and across the ministry.

Recognition and Rewards

The Rewards and Recognition program, launched in 2000, was established before a reorganization separated Transportation and Infrastructure into two departments.

"In Spring 2008, when the department split to become Alberta Transportation and Alberta Infrastructure, the decision was made to continue offering a recognition program, now in a 'joint' format, serving both departments. The Deputy Ministers and Executives of both Infrastructure and Transportation are in support of the Rewards and Recognition program." "The Deputy Ministers and Executives of both Infrastructure and Transportation are in support of the Rewards and Recognition program." "The [Rewards and Recognition] committee has recommended that to provide stability and continuity of the program over time, there be an organized engagement period for committee members. Committee members are asked to make a commitment to serve a minimum three-year period" (Rewards and Recognition Program Administration Manual, 2013).

Southeast has a formal recognition program for its employees to recognize outstanding performance (nominated by peers and supervisors). It is in its 28th year and is being considered as the model for a department-wide program (scheduled for 2014).

The Rewards and Recognition program's stated mission is to "provide a formalized program to assist the organization in recognizing employees' loyalty, dedication, and superior work; motivating employees to reach their full potential."

Several awards are available through the program:

- The **Milestone Award** recognizes an individual's service with the Alberta Government in five-year increments.
- The **Acclaim Award** provides immediate recognition to employees who have demonstrated service excellence above the requirements of their job (frequently awarded).
- The **Bright Idea Award** is awarded to those who share their ideas on how to improve the way we do business.
- The **Innovation Award** recognizes employees or teams that create or adapt a process, technique, product, or service that yields measurable results in terms of efficiency, effectiveness, and/or improved service.

- The Teamworks Award recognizes teams when they achieve an outstanding level of performance. The focus of the award is on how the group collaborates and operates as a team.
- The **Standing Committee Award** recognizes ongoing committees established by the departments' Executive Committee. The focus of the award is on how the group works collaboratively and productively in leading the Ministries to achieve their goal(s).

Award recipients receive time off with pay or a cash award, and a certificate of achievement.

Transportation HR manages the Rewards and Recognition program budget. A volunteer committee manages the Rewards and Recognition program (during work hours). This committee has a mandate to educate, provide leadership and support, monitor and evaluate, provide opportunities for involvement, develop the program, and report to the HR executive sponsor. Committee members share the responsibilities of administering the program on a volunteer basis (during work hours), and consult with their supervisors to obtain the necessary support. The committee is composed of staff from all divisions and includes management, professional/technical, and administrative staff.

The recognition Process is formally established for each award. For a Milestone Award, recognition is provided as soon as a milestone eligibility date is reached. For an Acclaim Award, individuals can nominate other individuals or teams by sending a memo to the nominee's supervising manager; the supervising manager then decides whether a nominee will receive an award based on the award's criteria. At this time, there is a self-nomination process and rigorous evaluation process for other awards, although as noted earlier this process is changing.

One staff member described their experience of working on a team to develop, through a very collaborative approach, a new IT tool for the branch that effectively meets its needs. "It's amazing now – it's the best thing ever. It really helped our section out. Before we physically had to look through boxes. For coming up with new, innovative ideas for the section, we won a Teamworks Award. The whole team got an award. I was recognized for coming up with an idea for speeding up the process. Every member of the team was specifically recognized for their contribution.'

	In conversation with a Transportation HR staff member, "I was not here when the program was started, but at this time we are redesigning the program because we were not necessarily seeing a correlation between the objectives of the program and business goals. The program has been in place for a number of years. It served the organization well in the past but the format and design is no longer meeting the business needs. The program needs to be realigned to ensure that people are motivated to help meet business goals. Rewards should help us achieve culture and business goals. Currently, people are able to self-nominate. We are moving to a model where peers or supervisors provide the nominations. There will be a new manual. The redesign is intended to ensure that the more formal recognition process is prestigious and that there are many more opportunities for informal recognition."
Communities	Communities for learning, development, and information sharing include: ■ **PODS** – Described previously. ■ The **Assistant Deputy Minister Network**, which has many members that are supportive of and interested in KM. Much KM innovation happens at the ADM/divisional level rather than at the departmental level. Through the ADM Network, a team from TSS was invited to demonstrate a leadership practice for another ADM's team. Because of this, the Ministry of Municipal Affairs adopted the Ministry of Transportation's concept of four core skill sets (i.e., leadership, policy development, contract management, and project management) as well as doing development through the project management model where experienced staff supports new teams through mission-critical projects. The ADM Network has been a place for sharing KM ideas. ■ In TSS, "We were a division of silos. [Then] we adopted a **'systems thinking' approach**. There are three departments doing this: Environment, Transportation, and Human Services. 'Systems thinking' is about getting outside of the silos and building not communities of skills and work, but communities that can adjust depending on the situation so that we are working together" (Shaun Hammond, ADM). ■ **New Policy Professionals Network** (cross-ministry). This group meets monthly to share information and network. This group also hosts learning sessions.

	■ **CCMTA KM CoP** was initiated and is led by the CCMTA KM Working Group. The consultant hired for the project coordinates and manages the electronic Basecamp site that facilitates group interactions. The KM CoP, which comprises CCMTA members from across Canada, has also met in person for project development purposes. ■ The **Leadership Development Program** includes formal participation in a team, and each team is assigned a mentor. Teams are expected to meet regularly with each other and their mentor throughout the program. ■ Transportation staff participate in **cross-ministry CoPs**. These communities are intended to facilitate information-sharing between people who are working in similar types of job, including, for example, enterprise risk management, business planning, finance, and performance measures communities. Subcommittees are also formed to address specific issues, such as developing processes around performance measures. The formal and informal Finance CoP worked to implement a finance internship program, based on the Alberta Public Service Policy Internship Program[144]. The finance community observed that there were not enough finance skill sets in the existing finance community to bridge the succession gap, and one manager championed the idea of an internship. Former interns develop the program for incoming interns. Former interns contribute their experience of why they stayed with government. This project has been a success and has moved past the pilot into full implementation. ■ Transportation staff participate in cross-ministry Communities of Learning. The Leaders Guild is a **Community of Learning** associated with the Leadership Development Program.
Storytelling	There is at least one person working in a storytelling position at the corporate level (team lead, Organizational Renewal Story Telling). Transportation does not have a storyteller; however, a storyteller from Corporate HR has worked with at least one Transportation staff member to develop her story for presentation at a variety of events. In TSS, we speak to other groups on the processes we use. Once a month TSS speaks to a policy development group on lessons learned. Formal mentoring provides opportunities for storytelling.

144 Alberta Public Service Policy Internship Program, Internship Program Descriptions, Alberta Transportation, https://www.jobs.alberta.ca/students/program_descriptions.html#apspolicy

Recent severe flooding in Alberta has required the formation of an Alberta Flood Recovery Task Force[145]. Employees have been seconded from all ministries to work on this task force. A storyteller from Corporate HR advises that because of the complexity of the flood problem and the emotional challenges, "story is a huge component" for the Alberta Flood Recovery Task Force The Task Force is using after-action review, a structured approach borrowed from the military to capturing lessons learned and working through emotional challenges.

Recently, a Transportation team won an innovation award for developing an idea for a transportation-related mobile app. The corporate storyteller worked with the founding member of the project team to develop her story of challenging the process and persistence through adversity. The project lead and her team have been invited to a number of internal and cross-ministry events to present their story and idea. The Deputy Minister to Executive Council has also used the story at a leadership workshop as an example of positive culture change, of taking risks, and of the implementation of the Reaching Our Full Potential philosophy. This story has raised the profile of the Policy Innovation Competition. Below are the speaking notes used by Peter Watson Deputy Minister, Executive Council at a leadership workshop:

"Changing our habits and patterns is some of the hardest work that people can do. And the public sector is notoriously risk adverse. So earlier this year, the government of Alberta hosted its first Policy Innovation Competition. It was an open call to people across our government to submit a proposal for a policy idea. The ideas were reviewed and three ideas went forward to a judging panel of three Deputy Ministers. Not only was it a great opportunity to consider some innovative policy concepts for our government … it was a great way for different departments to network and share both their ideas and proposed processes to achieve the ideas.

As a side note, I have great faith that one day, in the near future … we won't need a competition to explore policy innovations. But for now, a competition is a powerful way to give people permission to bring forward ideas that might otherwise be overlooked.

145 Work: Alberta Flood Recovery Task Force, Alberta WaterPortal, http://albertawater.com/work/research-projects/flood-recovery-task-force

We had a great response – which is a good sign for the future of policy innovation. And the winning idea came from Jinting Zhao, Ryan Reichl, and Jayda Pinkoski at Transportation. The team proposed a smart phone application to give responsible drinkers direct access to online information that helps them make smart choices. And while these three public servants were thrilled to win the competition … it is their pre-competition story that I want to share.

The pre-competition story starts with Jinting … who first came up with the idea for the smartphone application a couple years ago. She brought it forward to her team and it was deemed to be too risky. Instead of dropping the idea, she tucked it away and brought it up with her colleagues from time to time. She kept exploring the obvious risks and refining the idea. When the 2013 Policy Innovation Competition was announced, she was still carrying the idea … which, thanks to her perseverance, had gone from a rough stone to a polished stone.

With a new opportunity to bring the idea forward, Jinting sought out some skilled colleagues to help her work through the risks. As it turned out, seeking out a team was a challenge in itself. It took some time to seek out a team with both the necessary skills and a strong belief in the idea. Not to mention all of the time to put together a thorough proposal … and a clean, focused 10-minute presentation to explain the concept to the judges. But with the team's hard work, they went from a polished stone to a gem of an idea. Both their Executive Team and Transportation Minister Ric McIver strongly support the idea and want to follow it through to completion.

And while some would call this a success story, I want to remind you of the continuity story. The story that compels us to keep stepping forward … despite barriers, stumbling blocks, and, sometimes, outright rejections. The story that includes small wins – like overcoming one barrier or pulling together a supportive team. The story that allows us to eventually look back and see how far we've come."

he Policy Innovation Competition story is very recent and "it might be too soon to tell" what impact it has had. However, "it was actually framed to inspire people to demonstrate three things that Deputy Minister, Executive Council Peter Watson has abeen talking about: perseverance, humility, and courage in the context of Reaching Our Full Potential. Jinting was already going down the path of innovation, and she hit a number of barriers. Her story is about working through the barriers. It demonstrates that innovation is not just about having a good idea. It is also about timing, support, the right relationships, continuing to hone the idea until it sits right with the decision-makers/supporters. It's a story of inspiration to help other public servants find their way through things and keep their chins up when faced with challenges and the complexity of large systems."

Succession Management

Succession Planning	HR is working to "[e]nsure human capital is planned and managed effectively and efficiently to mitigate shortages, disruptions, or gaps in the workforce which impacts business operations: 'getting the right people, in the right jobs at the right time, doing the right things.'" HR has implemented Workforce Continuity processes such as Talent Management and Succession Planning in response to human resources risk caused by the large number of employees (50%) who are eligible to retire by 2016, upcoming potential pension reforms that may encourage retirement, a projected shortage of critical occupational sectors, and a shortage of mid-career employees.[146] HR works as a business partner with divisions, providing services, including labour market scanning. Divisions and managers own the Talent Management process. HR integrates workforce continuity planning with business planning for a variety of reasons, including that "it aligns an organization's workforce with the government's priorities, and the organization's mission, strategic plan, and budgetary resources … and it helps develop and ensure sustained, strong leadership across the department"[147]. In TSS, when we are aware of impending retirement we try to bring in a successor six months prior to the incumbent's retirement. Budget constraints sometimes impact this. We have tried to prioritize and identify key operational positions where there is potential for movement and bring people in earlier than six months to ensure knowledge transfer. For example, the executive director of the OTS will retire within the fiscal year. The division has created a developmental opportunity for a member of staff to develop executive director skills in preparation for succession. HR mitigation strategies for workforce risk include: ■ Implementing workforce continuity processes, including talent management and succession planning ■ Identifying HR strategies to attract, develop, and engage employees

146 Enterprise Risk Management Human Resources, April 2012

147 Supplement to the Integrated Workforce Continuity and Business Planning Checklist, 2009

- Building leadership and talent pipelines
- In conjunction with Workforce Continuity Planning, ensuring that development plans are in place for all employees (training, experiential learning, and knowledge transfer)
- Identifying critical positions (at risk), strategic roles, core/operational roles, support roles, and misaligned roles
- Doing scenario planning for key occupational sectors at risk

Each branch in TSS is required to develop a succession plan. TSS is piloting a succession planning initiative using Transition-Path Inc.[148] to capture and document the tacit knowledge of one member of senior management, who will soon be retiring. HR coordinates this process, which is run by a Transition-Path Inc. consultant. A second part of the initiative, to determine how to transfer this tacit information back to staff, will be, in part, developed internally. The process is expensive, and participants have been selected based on their critical position in the organization. Succession planning is seen as one part of the big picture of KM: "It's all very well to identify successors, but what if they all leave?" (Shaun Hammond, ADM).

In addition, TSS deliberately implements a number of initiatives intended to facilitate knowledge transfer and the succession process, including:

- Job-shadowing
- Cross-branch ride-alongs (e.g., staff from the Driver Programs branch could ask to be taken out in the field to see the type of work done by the Transport Engineering branch; experienced staff bring new staff along to important meetings and work activities)
- Job rotation and secondments (temporary assignments) as development and stretch opportunities
- Assigning new staff mission-critical (rather than just administrative) work and ensuring that they have adequate support from veteran employees to develop capacity quickly and effectively

148 Transition-Path, Inc., http://transition-path.com/

	TSS has a Talent Management Process – a full-blown annual analysis of what is needed to develop each member of staff to the next level. Staff development activities are planned around experiential learning, knowledge transfer, and formal training. This process recognizes and respects that some staff are comfortable and well-established in the positions they are in and leverages these staff members for their ability to mentor and transfer knowledge to other staff. One staff member advised: "Definitely my concern is when senior staff leave. You can have someone job shadow, but the work tasks need to be written as well – step by step. There is no manual now. The only way knowledge sharing is being transferred is job shadowing. We need to record information [how things are done] with different scenarios."
Staff Retention	We use mentoring, learning and development opportunities (e.g., the Leadership Development Program), and provide succession planning development opportunities (described previously). One staff member related, "We're trying to really develop from within. I have taken my supervisor's certificate and I can go to any courses that I want. I fill in for my supervisor. They're supportive in that way."
Employee Interviews	We have two initiatives: ■ The Transition-Path Inc. pilot is being used to **capture the tacit knowledge of a retiring executive director** because of her important mission-critical role and unique skill set. Her replacement was identified in the branch's succession management and talent management plans. The process is being conducted before departure, and is being done in conjunction with a development opportunity secondment. For the Transition-Path Inc. process, a consultant is conducting interviews. HR is developing a process to translate the information back to the division.

- A recent addition to the OTS's CMOSS "knowledge management platform" is **structured, transcribed, searchable interviews with traffic safety experts**. These stored, well-organized interview transcripts are intended to capture process understandings and tacit information and assist with knowledge transfer and succession. The transcribed interviews follow a specific, predictable format so that information can be searched efficiently in the future. This information is loaded onto the CMOSS platform and is accessible to CMOSS users. For the initial stages of the new CMOSS function, the database consultant team conducts interviews, although staff interviewers may be trained for full implementation.

These processes are new and still in developmental phases. They are intended to address the lesson learned that a knowledge wisdom void is created when people with expertise leave the organization.

Employee Orientation, Learning, and Development

New Employee Orientation

Within TSS:

- TSS 101 is a program for new employees that is intended to introduce them to the division and branches, outline basic branch functions, and help them see how their branch's work relates to the whole division. It is intended to provide new employees with an overview and introduce them to key contact people.

  TSS 101 was designed to break down silos and integrate the division. It provides an opportunity to meet executives and staff from other branches. It is not a skill-based program. One branch presents each month; the entire cycle takes nine months. A certificate of completion is awarded to participants once they complete the cycle. We have just awarded our first certificates. Another useful outcome is that new employees have the opportunity to meet each other and form their own support network.

  There is a feedback sheet that staff are requested to fill in after each TSS 101 session. Feedback is compiled and sent to the presenter. Since the presentation cycle is quite long and presenters may only present once in a year, the most useful comments from all sessions are also compiled and sent to the next presenter. In response to feedback, we have encouraged presenters to continue not only sharing statistics and basic information about their area, but also telling stories about their daily work activities.

- TSS Division has a checklist for new employees (see Figure F.6 at the end of this section). In addition, the division has a draft employee orientation handbook intended to be useful to all employees across the division. This handbook was drafted to address a common complaint from new employees about a lack of orientation and training. An employee drafted the handbook, which is based on this individual's experience of looking for information and discovering that not everyone knew common things about the organization.
- Intern orientation is an intern-only introduction to the public service environment designed to develop broad-based skills that are valuable cross-program, cross-division, and cross-ministry. In addition to attending TSS 101 sessions, interns attend sessions designed to introduce and build skills required for public service work, such as project management. The intern orientation was designed to meet a request from branch management that new interns receive training to develop certain broad-based skills.
- New staff members are paired with a buddy to help show them how the organization works.

Alberta Transportation offers the START (Striving Toward a Rewarding Tomorrow) program to familiarize new staff with the department, Alberta public service values, leadership values, and career planning and preparation.

Every employee signs with his or her supervisor an annual performance agreement to commit to job duties, organizational goals, building a positive work environment through commitment to formal Alberta Public Service values, to career and learning, and to resolving issues that conflict with delivering on these commitments. Employees also develop a Performance Plan "intended to help you and your supervisor track your commitments, results, and conversations." The plan is not placed in an employee's file unless there is a specific request by the employee or supervisor that it be added to the file.

At one time supervisors assigned a numeric ranking to employee performance. However, this system was replaced because of the perceived punitive aspects of the ranking and because many people simply cut and pasted their job tasks into the document, which resulted in a document that was not very valuable. The new performance excellence model is built around conversations between staff and their supervisors, which are meant to provide a forum for staff to identify skills they would like to build to develop their careers, for supervisors to help plan how staff can develop those skills, and for both to revisit progress throughout the year.

Supervisors schedule regular one-on-one meetings to discuss day-to-day work progress and issues. Supervisors also schedule quarterly "performance excellence" conversations to discuss progress made on the Performance Plan. The Performance Plan may be changed because of discussions at the meeting, but is not added to the employee file as a regular practice.

Informal onboarding is done on a branch-by-branch basis; it is not standard and is often not well understood.

Employee Growth and Development

The Alberta government and Alberta Transportation strongly support staff development and endeavor to provide staff with the tools necessary to learn and grow. The Reaching Our Full Potential initiative establishes the foundation for employee development. Staff can use work time to participate in work-related communities (including community-oriented groups like the United Way), can use government meeting rooms and facilities, have access to advisors to help move projects along, and can participate in the mentor program.

Employee development opportunities are communicated to staff in a wide variety of ways. The Alberta government offers a wide variety of training programs, which are outlined in a training catalogue; staff may also take external training. Staff members develop an annual training plan with their supervisor. Some areas host learning opportunities, such as the Tech Talks hosted by Engineering Services Branch. Transportation's deputy minister issued an e-mail invitation to all employees to participate in a one-day Leadership Fundamentals course (with supervisor's approval).

The Leadership Development Program is well attended. "The program began in a single department and now is implemented across the entire Alberta Public Service (20 departments and over 25,000 employees). It enrolls 450 new employees annually, over 2000 employees are graduates of the program, and 350 mentors participate in Advanced Leadership Series opportunities." (Leadership in Government: An Oxymoron? PowerPoint slides were presented at the 2013 Leadership Challenge Forum[149]). Anecdotally, we understand more course dates were added to accommodate the significant interest in the one-day Leadership Fundamentals course.

The Alberta government also has a mentoring program. A veteran staff member formally mentors six-member teams in the Leadership Development Program. Each department is required to provide a mentor for a set number of students it enrolls in the program. Each department uses a slightly different method of selecting mentors. Some use past graduates of the Leadership Development Program, some only use senior management, and some ask for management staff volunteers. Alberta Transportation uses nominations from the ADM and deputy minister. In addition, the Alberta Public Service Policy Internship Program includes a formal mentoring component. Mentors and mentees have the opportunity to meet each other in a large group setting and later are matched up based partly on the intern's interest in working with a particular mentor.

149 Leadership in Government: An Oxymoron?, Government of Alberta Leadership Program, The Leadership Challenge Forum, July 25-26, 2013, http://www.leadershipchallengeforum.com/UserFiles/FreierJacques_TLCForum2013_SlideDeck.pdf

	The Transportation Corporate Employee Survey is conducted annually to track the results of employee development activities. This survey allows all permanent employees to rate their organization, their job, and their general experience with their supervisor. The results are distributed through branch heads and executives to allow the whole organization to gain an understanding of how employees are feeling about the organization.

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management

Transportation has access to the IM program that resides in the Corporate Services Division of the Infrastructure Ministry. The IM program provides support to business units to manage their content. This support consists of advice, best practices, toolkits, and resources for specific projects. The IM program provides services to Transportation under the terms of a Memorandum of Understanding, currently in draft. The IM team consists of a manager, two senior business analysts, and an IM analyst. There are also temporary positions for one to three part-time people.

Under the memorandum, Transportation also shares the Senior Records Officer position with Infrastructure. Records Management is responsible for managing official records in any format. Physical records are stored either in on-site file rooms or at off-site storage. Staff can request a specific file or request a more general search. File room staff access the tracking system and provide the results to staff.

Electronic information is held in shared drives, SharePoint, and OpenText. Each unit has been responsible for organizing its own electronic information.

Specialized information is also contained in a number of databases managed in various branches. Databases include the Transportation Infrastructure Management System (TIMS) and the CMOSS.

The Alberta government has recently released a business classification scheme for common administrative functions, and the IM program is piloting the scheme with business units in Infrastructure. The IM program is also developing function-based taxonomies business units will use to manage their operational documents by mapping the business unit's business processes and designing the taxonomies to match. Processes have not yet been established to maintain the classification scheme. Business units will be trained to use the business classification scheme and will be expected to classify their own documents. The IM program will provide support for business units when challenges arise. A controlled vocabulary is also being developed for the CCMTA KM Pilot Project.

Policies for record retention are established at a government level in the Government Organization Act. The Government Organization Act, RSA 2000, Schedule 11, Section 14 identifies the government organizations that must comply with the records management program and provides for the enactment of regulations related to the program. Records Management Regulation AR 224/2001:

- Defines terms
- Outlines the membership and roles of the Alberta Records Management Committee
- Assigns responsibility for the government program to the Minister of Service, Alberta
- Assigns responsibility for the program within each department to the deputy head
- Controls the scheduling and disposition of records

No official record can be destroyed without approval, which is granted in the form of a records retention and disposition schedule. All physical records are processed through file rooms, which apply the appropriate schedule and dispose of records as per the schedule.

An IM policy has been drafted and is being proposed at Infrastructure. Once approved, it will be proposed for Alberta Transportation as well. All staff are required, as part of their employee orientation, to take an online "Managing Information at Work" course that discusses general records management responsibilities. Records management and IM awareness sessions are held biannually to inform staff of specific responsibilities. Retention and disposition schedules are available to all on the corporate intranet. RM staff will provide training and information sessions to smaller groups of staff on request.

Access to external-facing content is provided to the public through the Alberta government and ministry web sites. A Microsoft Office Sharepoint (MOSS 2007) intranet supports communication within a ministry. A MOSS 2007 extranet is used for cross-ministry communication and communication with authorized contractors and clients. The intranet and external-facing content are on the same platform/server. However, there is a different process for providing external content; it passes through different firewalls and applications.

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Lessons Learned and Case Studies	Within TSS, discussion of lessons learned is included as a component of each Project Brief (see Figure F.7 at the end of this section). We understand that some business units are designing ways to capture lessons learned; however, no processes encompass the entire ministry or the Alberta government. For example, one branch in Engineering Division keeps detailed updates and logs of all the problems it runs into from the conception phase of new design to the end (i.e., final detailed design). After the project is completed, the team develops a rough list of problems encountered during the project and discusses lessons learned and potential strategies to capitalize on those lessons.

150 Yammer, https://www.yammer.com/

151 Socialcast, https://www.socialcast.com/

Institutional Memory/ Retention of Critical Knowledge	Refer to succession planning initiatives for retiring staff described previously. We are not aware of initiatives designed to capture critical knowledge from contractors or project teams, although we understand that it is a topic that has been raised at the executive level as an important issue.
Process Documentation	There are areas of Transportation that have documented their business processes, but there is no ministry-wide initiative at this time. The Transportation/Infrastructure Information Management Program is working with some business units in Infrastructure to map their business processes. In TSS, process documentation was begun in 2012 to help address a disconnect between what staff was doing and manager expectations and, ultimately, to determine how to effectively use staff. The process mapping initiative was supported in TSS in part because of the ADM's engineering background; the Business Knowledge and Coordination Branch is leading this initiative. We identify critical knowledge through a process efficiency structure. Each branch is working on process mapping, which provides a detailed look at business processes and allows identification of whether processes are needed, whether they have value, and whether there are better ways to organize the processes. The intent is to document all processes, technical and administrative. TSS has found a lot of "archaeological processes" – things we do without knowing why. The first branches are finishing their process mapping and are beginning to look at key knowledge that they need for their processes to work. TSS has developed process maps for 75% of their processes. These processes initially were recorded as pen-and-ink diagrams, and have been translated into Microsoft Visio. At this time, TSS has started a process to standardize the language across the division's process maps; all new maps will be created using PowerDesigner[152]. Decisions about how and when process mapping are made at the division level. General training sessions on process mapping were available to staff through Excellence Canada[153]. TSS field personnel are receiving training in PowerDesigner so that they can update the new process maps as required. Standards for consistency have been established across TSS branches.

152 SAP Sybase PowerDesigner, http://www.sybase.com/products/modelingdevelopment/powerdesigner

153 Excellence Canada, http://www.socialcast.com/

Process maps are currently stored on each branch's network drive. At this time, process maps are not easily shared between branches. Once the new process maps have been developed in PowerDesigner, the intention is that these maps will be stored on a central server, and designated employees will have access to and manage the maps. At this time, process maps created in Visio are stored within each branch's network drive, and branch heads make decisions about access to these maps. In the Business Knowledge and Coordination Branch, all unit staff members have access to the Visio process maps. The new PowerDesigner maps will be made available to designated employees. The process documentation is not shared outside the organization.

There was a proposal for the Information Management Program to coordinate ministry-wide process mapping; however, this was not funded as Transportation had already commenced business process mapping on a division-by-division basis. Standards for consistency have not been established across the ministry.

Well-defined processes have provided clarity in the roles and responsibilities for each branch in the division. They have also provided the foundation for adapting to new requirements. For example, when TSS was given the task of introducing low-level blood alcohol interventions (0.05 legislation), the division mapped out the process before legislation was introduced. Process mapping allowed the division to understand what the process would look like, determine where the division was short on skills, and ensure that the legislation matched the optimum process. The process mapping involved several ministries (Justice and Solicitor General, Service Alberta, and Transportation). Process mapping resulted in recognition of an opportunity to standardize training and testing for breathalyzer use as well as standardization of the breathalyzer device. Process mapping also allowed identification of the need for a web site for information about breathalyzer calibration ("defense lawyers were always looking for this information"), which was then developed as a concurrent project using a U.S. model.

One lesson learned for undertaking a process mapping initiative is to coordinate the software or standards before starting process mapping. This was not done initially and, therefore, we have needed to go back and redo the maps.

Expertise Identification	Part of the Canadian Council of Motor Transport Administrators (CCMTA) KM pilot project will be to construct an expertise directory to facilitate information sharing between Transportation employees across Canada. At this time, the intention is that members will create individual profiles and self-identify their areas of expertise and interest. The CCMTA initiated and leads the KM Pilot Project and will manage and store the expertise directory on its site. The directory will likely be managed by participating CCMTA members. The CMOSS has a stakeholder directory of over 2,000 stakeholders. This directory includes detailed information about contacts (e.g., position title, organization, committees, and the topics they deal with) and a system to rank the "closeness" of the working relationship between the stakeholder and the regional Traffic Safety coordinator (RTSC). CMOSS is hosted on an external server and is accessibly only to authorized staff. The RTSCs keep information on the stakeholders in their regions up to date.
Tools and Technologies	The Alberta government has Yammer communities, including a Records and Information Management Group ("A place to discuss RIM issues and bridge the gap between RM and IT") and a SharePoint Help group. These communities do not appear to be very active. There is also a pilot project using Socialcast. The Alberta government currently uses MOSS 2007 for intranet and is working towards implementing SharePoint 2010. There are intranet communities and team sites; however, there is no information on the effectiveness of these sites for collaboration. How the intranet is used varies between divisions and branches. Within TSS, some branches use MOSS 2007 for basic document sharing. Within Transportation, many specialized databases are used for distributing and providing access to knowledge artifacts. These include: ■ **CMOSS**: – This system contains information that is the basis for presenting orientation or process-mapping material to the regional Traffic Safety consultants. It includes Wikipedia-style topic overviews, built-in instructional videos on how to use the database, centralized access to information resources (e.g., presentations that RTSCs can use), storage for documents (e.g., agendas and minutes), and a contact/organization directory with a "degree of relationship" ranking system. There are plans to expand this system to facilitate connections between stakeholders.

- **Action Request Tracking System (ARTS)** – (from ARTS training manual) ARTS is a web application used for tracking "action requests" (e.g., a required response to public correspondence or preparation of a briefing note). ARTS assigns a unique identifier, automates a workflow, maintains a record of documents and processes, incorporates comments, and creates reports. Information can be searched by fields (e.g., subject, correspondent name, originating branch, and dates). ARTS does not include vocabulary control for subject.

- **Transportation Infrastructure Management System**[154] – (from the TIMS intranet page) TIMS is a unique web–based knowledge system designed to ensure that $69 billion worth of highway assets and annual capital investments of $1.5 billion are managed for optimum lifetime performance by measures of safety, economics, environmental sustainability, and innovativeness. Users obtain access to information in TIMS through a knowledge portal and can create information in the format they need. The system comprises 25 software applications integrated into a single system. TIMS applications:

  - **Information Applications** – Advanced network mapping and satellite and digital video log imaging capabilities; highway network asset inventory data and other data needed for the planning, creation and maintenance of assets during their entire service life

  - **Decision Applications** – Techno-economic models for lifetime rationalization and optimization of programs and plans for the creation, enhancement, and maintenance of assets

  - **Management Applications** – Information needed for asset delivery and maintenance

  - **TIMS Data Repository** – Correct, current, and complete information generated and used by various applications and users

  - **Communications Applications** – Multimedia display of information, including reports and visual representations of information

154 Transportation Infrastructure Management System (TIMS), Alberta Transportation, http://www.transportation.alberta.ca/3605.htm

All staff have Internet access. The Government of Alberta Library provides access to a number of licensed databases and a central list of links for relevant free databases. The library also provides subject guides for each ministry. The GOA library is a member of a consortium and has catalogue access to resources held by member libraries.

Much information is stored in network drives. Although electronic filing guidelines exist, naming conventions are not used consistently. At this time, many systems do not include capability for taxonomies. CMOSS requires standard metadata.

Responsibility for configuring and managing use of agency knowledge platforms varies. For example:

- The overall configuration and management of MOSS 2007 is managed by an Information Management Branch (the IT Branch – different than the Information Management Program) that Transportation shares with Infrastructure. Staff members who pass a site manager exam are granted site manager permissions.
- The OTS Branch of TSS, in conjunction with a third-party vendor, develops and manages CMOSS.
- TIMS is developed and managed in-house in conjunction with a team of third-party vendors.

NOTE: this checklist has been modified from its original format – please request an official version if needed

Government of Alberta
Infrastructure/
Transportation

New Employee Orientation Checklist

EMPLOYEE INFORMATION	
Name:	Start date:
Position:	**Supervisor:**

1. CUSTOMIZE YOUR ORIENTATION PLAN

Prepare your orientation plan by completing this checklist. It will help you determine what to do, who will do it, and when to schedule each activity.

When	What	Who	Notes
	☐ **Set employee-specific orientation goals.**		
	☐ **Plan the employee's first work assignment.**		
	☐ **Schedule time.**		
	☐ Schedule time to meet with the new employee on Day 1.		
	☐ Schedule time to meet with the new employee regularly for the first few weeks.		

2. GET READY

When	What	Who	Notes
	☐ **Stay in touch with the new employee.**		
	☐ **Spread the word. Let people know a new person is joining your team.**		
	☐ **Rally your team. Plan, assign, schedule and share orientation activities and tasks.**		
	☐ Prepare orientation materials. Key contacts list. FAQs		

Figure F.6 Alberta Transportation new employee orientation checklist

2. GET READY (continued)			
When	**What**	**Who**	**Notes**
	☐ Plan welcome activities. Day 1. "Meet the team" icebreaker.		
	☐ Plan and schedule introductions to key people. Your team. Buddy(ies)?		
	☐ Arrange or schedule commencement paperwork and oath of office.		
	☐ Assign and schedule worksite tour.		
	☐ **Assemble the infrastructure.** ☐ office/workspace		
	☐ desk		
	☐ chair		
	☐ computer		
	☐ computer account and passwords		
	☐ telephone/voice mail		
	☐ keys/building access cards		
	☐ name tags, signs		
	☐ office supplies		
	☐ business cards		
	☐ identification cards		
	☐ parking		
	☐ floor plan		
	☐ exits and evacuation procedures		

3. ROLL OUT THE WELCOME MAT. Circumstances permitting, it's a good idea to complete the asterisked* activities on the employee's first day.			
Time	**What**	**Who**	**Notes**
	☐ Meet and greet the new employee.*		
	☐ Conduct a welcome activity.*		
	☐ Have lunch or coffee with the new employee.		
	☐ Hold a "meet the team" icebreaker.		

3. ROLL OUT THE WELCOME MAT (continued) Circumstances permitting, it's a good idea to complete the asterisked* activities on the employee's first day.			
Time	**What**	**Who**	**Notes**
	☐ Celebrate the employee's 3-month anniversary.		
	☐ Review the "Introductory Guidelines for New Employees" booklet		

4. COVER THE BASICS			
Time	**What**	**Who**	**Notes**
	☐ **Schedule commencement paperwork and the oath of office.**		
	☐ **Tour the facility. (Introduce department staff and key personnel during the tour.)**		
	☐ bathrooms ☐ mailroom ☐ courier drop-off ☐ parking ☐ photocopiers ☐ fax machines ☐ printers ☐ office supplies ☐ kitchen ☐ coffee/vending machines ☐ lunch room/cafeteria		
	☐ **Review administrative procedures.**		
	☐ keys/building access cards ☐ identification cards ☐ mail (incoming and outgoing) ☐ couriers ☐ telephones/ voice mail ☐ room bookings ☐ expense claims ☐ office supplies ☐ purchasing ☐ records management ☐ parking options ☐ Outlook calendar/granting permission ☐ Learning and Wellness Account		
	☐ **Provide a brief overview of relevant government, ministry and office policy.** ☐ Review the job schedule and hours of work (coffee and lunch breaks, holidays). ☐ Explain timesheets, absence and overtime reporting, vacation planning, sick leave, leaves of absence. ☐ Review Smoking arrangements		

4. COVER THE BASICS (continued)			
Time	**What**	**Who**	**Notes**
	☐ **Occupation Health & Safety** ☐ **Review and sign off Employee Health & Safety Orientation checklist.** ☐ Review and sign off Hazard Assessment & Control Report. ☐ Introduce Floor Wardens		
	☐ **Introduce technology.**		
	☐ accounts and login procedures ☐ passwords ☐ email ☐ Internet ☐ My Agent ☐ shared drives ☐ databases ☐ backups ☐ Microsoft Office ☐ home computer access		
	☐ **Provide an orientation to your work unit.** ☐ Explain the function of the work unit and the divisional or regional unit, as appropriate.		
	☐ Provide organizational charts for the work unit and region/division.		
	☐ Identify key contacts, committees and teams.		
	☐ Discuss reporting relationships, and how the employee's role relates to that of other staff.		
	☐ Advice re work unit meetings and other scheduled events.		
	☐ Introduce team charter, norms, ground rules, etc.		
	☐ Explain formal and informal communication norms.		

5. MAKE CONNECTIONS			
When	**What**	**Who/Where**	**Notes**
	Introduce key people.		
	☐ buddy		

5. MAKE CONNECTIONS (continued)			
When	**What**	**Who/Where**	**Notes**
	☐ work unit staff (Schedule your next team meeting.)		
	☐ others (Set up 15-minute meetings with key colleagues.)		
	☐ wellness committee		
	Other orientation resources		
	☐ GOA Employee Orientation	CHR Website	
	Job-specific policies and procedures.		
	Job-specific information systems.		

Human Resources Overview				
Time	**What**		**Who**	**Notes**
	☐ **Performance Management Process**			
	☐ **MYAGENT**			
	☐ pay and benefits ☐ salary ☐ pension plan ☐ casual days ☐ EAP ☐ time sheets	☐ vacation ☐ leaves ☐ flex days		

6. PLAN FOR PERFORMANCE. **You and your employee should be active partners in managing work flows, developing performance expectations and reviewing progress.**		
When	**What**	**Notes**
	☐ **Discuss the employee's role.** ☐ Discuss the job description.	
	☐ Discuss job duties and accountabilities.	
	☐ Discuss the employee's role vis-à-vis the ministry's business and strategic plans.	
	☐ Discuss job objectives and performance expectations through performance contract development.	
	☐ Discuss the skills the employee brings to the position.	
	☐ Review the required competencies.	

6. PLAN FOR PERFORMANCE (continued) You and your employee should be active partners in managing work flows, developing performance expectations and reviewing progress.		
When	**What**	**Notes**
	☐ **Assign first tasks to create immediate engagement.**	
	☐ **Schedule frequent check-ins.**	
	☐ **Schedule the employee's six-month performance review.**	

7. PLAN FOR LEARNING AND CAREER DEVELOPMENT.			
When	**What**	**Where**	**Notes**
	☐ **Schedule mandatory training.**		
	☐ FOIP training		
	☐ Ergonomics Training & Workplace Violence Training		
	☐ **Identify and address other training needs.**		
	☐ Outlook?		
	☐ **Identify and schedule information systems training.**		

8. TRACK YOUR PROGRESS		
What	**Date**	**Notes and Feedback**
Orientation		
The employee has completed the following: ☐ **GOA New Employee Orientation**		
☐ **Branch/Division specific Orientation**		
Training		
The employee has completed the identified training:		
Directories		
☐ The employee is listed in the following: ☐ GOA website directory		
☐ Outlook Global Address Book		
☐		

8. TRACK YOUR PROGRESS (continued)		
What	**Date**	**Notes and Feedback**
Skills		
☐ Employee has successfully accessed the following: ☐ Voice mail		
☐ Computer network		
☐ Outlook		
☐ Other business systems required for the job		
OH & S		

Please provide your comments regarding the orientation process and any recommendations you may have and forward the completed checklist to Human Resources Branch. Thank you!

Employee's Comments:

Supervisor's Comments:

Employee's Signature: _____ Date:

Supervisor's Signature: _____ Date:

Questions? Comments? Need more information?

Human Resources Branch Alberta Infrastructure Alberta Transportation 3rd floor, Infrastructure Building 6950 113 Street Edmonton, Alberta T6H 5V7	
Phone:(780) 427-8326 Fax: (780) 422-5138	

Adapted by permission by Human Resources Branch, Alberta Infrastructure and Alberta Transportation 2009 Updated: January 2010

Figure F.7 Alberta Transportation project brief

<Project Title>

Project Brief

Transportation Safety Services Division

Alberta Transportation

Version 1.0 (04 May 2009)

Title:	<Project Title>
Objective:	What is the aim of this project?
Background/Context:	Provide a brief explanation of the background and/or context of the project. (Try and keep this to a little more than half a page)
Output(s):	What things will be delivered by the project?
Outcome:	What outcome will the project achieve?
How will the success of the project be measured:	Describe the measure(s) that will be used to indicate that the project has been successfully completed.
Budget:	What is the allocated budget for the project?
Executive Sponsor:	<Name, Title>
Project Manager:	<Name, Title>
Governance:	Describe the management arrangements that will be put in place to govern the project and briefly describe the accountabilities of each party.
Project Team:	<Name, Title>
Project Team Advisors:	<Name, Title>
Resources:	What human resources, internal, external, consultants and/or working groups will be required for the project?
Reporting Requirements:	What is the reporting frequency, format and to whom do you report?
Stakeholders & Communication Strategy:	List the key stakeholders or stakeholder groups who will affect or be affected by the project and describe how they will be engaged.
Assumptions and Constraints:	Provide a list of any underlying assumptions and/or constraints.
Major Risks & Minimisation Strategies:	What are the barriers to achieving project success (i.e., the major risks)? For each of these risks, what steps will be undertaken to minimise them?
Risk Management:	What will be the process used to manage risks throughout the project, particularly in relation to risk identification, review and reporting?
Issues Management:	What will be the process used to manage issues throughout the project, particularly in relation to issue identification, review and reporting?
Related Projects:	List any projects which are dependent on this project, or projects that are interdependent on this project, or projects upon which this project is dependent. Briefly describe the relationship.
Guidelines/Standards:	What guidelines, standards or methodologies will be applied to the work undertaken in the project?
Quality Assurance:	What levels of review will be undertaken throughout the development of the project outputs? For example, the timing of output reviews, how the reviews will be conducted and who will be involved.
Capturing the Lessons Learnt:	Describe any review process (internal or external) to capture the lessons learnt throughout the project.

Project Activities & Milestones: *List the major activities, scheduled start, scheduled finish and who has been assigned accountability. Milestones are indicated by a blank scheduled start date.*

Id	*Description*	*Who*	*Scheduled Start*	*Scheduled Finish*	*Predecessor*[155]

155 The activities appearing in the predecessor column must be completed before the activity described can begin.

Accenture

Response provided by	Stephen D. Kaukonen, Senior Manager Thomas Hsu, Social Collaboration and Gamification
Context	Accenture is a global management consulting, technology services, and outsourcing company with more than 275,000 people serving clients in more than 120 countries. Combining unparalleled experience, comprehensive capabilities across all industries and business functions, and extensive research on the world's most successful companies, Accenture collaborates with clients to help them become high-performance businesses and governments. The company generated net revenues of US$28.6 billion for the fiscal year ended August 31, 2013. The nature of our business is focused around selling and delivering solutions through project teams to our clients. Whether these are consulting-based projects ranging from three months to 3+ years, or long-term outsourcing deals (three to 10+ years), it is important that our teams have quick access to the content, approaches, and methodologies they need to efficiently and effectively develop and deliver on these solutions.

Innovation and Knowledge Sharing

Designated Function for KM	Accenture has a dedicated social learning team that is responsible for developing the organization's strategy for collecting and managing content, fostering community among employees with regard to knowledge sharing, and connecting employees with internal expertise. The team also executes established social-learning processes and oversees the technologies that support these processes. In short, the team is responsible for taking Accenture's social learning capabilities and applying them to solve business challenges. The social learning team is located at the middle of a loop that encompasses Accenture's employees and its collective knowledge (see Figure F.8). The team essentially acts as a catalyst to get knowledge flowing to and from both ends of the loop. Ultimately, the team's approach is focused on providing unencumbered access for all employees to the best content and expertise Accenture has to offer.

Figure F.8 Accenture's social learning mission

The team consists of four groups that report to the director of Social Learning and is funded through the Growth and Strategy organization. The organizational chart for the social learning organization is shown in Figure F.9. The four groups within the team are:

- Social Learning Infrastructure
- Social Learning Strategy and Enablement
- Social Learning Catalysts
- Accenture Learning Knowledge Management Services

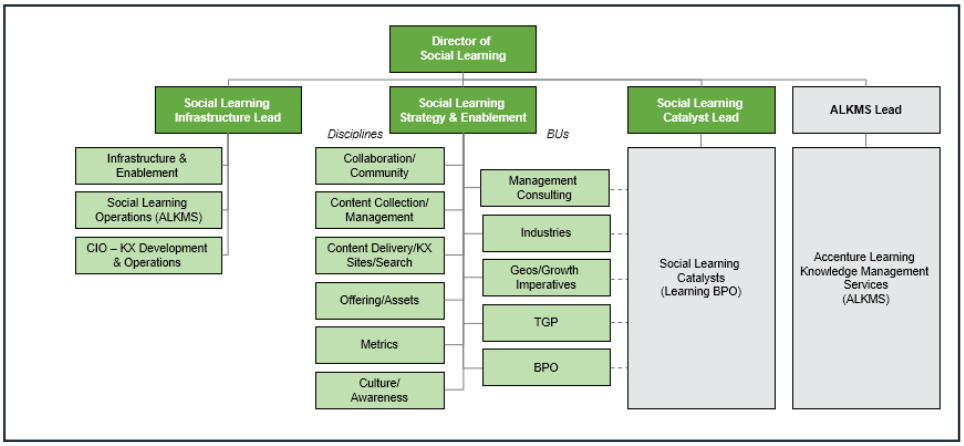

Figure F.9 Accenture's Social Learning organizational chart (fiscal year 2014)

Leadership and Culture	Accenture has adopted a holistic approach to KM and embedding a culture of collaboration across its global workforce, focused on: ■ Strong leadership buy-in ■ Embedding collaboration in the employee life cycle ■ Enablement ■ Recognition and motivation ■ Ongoing marketing and communications activities to ensure that the importance and value of social learning remains top of mind for all employees Accenture's social-learning program, which has evolved over a period of almost 25 years, aims to ensure that all employees: ■ Demonstrate behaviors that signal engagement in the social learning program ■ Understand why social learning is critical to Accenture's success ■ Are aware of and understand how to use Accenture's social learning capabilities ■ Feel motivated by leadership to engage in social learning activities ■ Understand how engagement in social learning impacts others ■ Experience professional growth through social learning participation Accenture's approach to embedding a collaborative culture through social learning is based on encouraging and incentivizing its employees to display everyday work-related behaviors that embrace what it calls the 3Cs: ■ Connect – to people and content ■ Contribute – their ideas, insights, experience, and knowledge ■ Champion – encourage their colleagues to go the extra mile

	Accenture reinforces these behaviors through its performance-management processes, with performance factors linked directly to collaborating effectively. The program also calculates a quarterly collaboration quotient for each employee as a means of motivating employees to engage more actively in effective collaboration and sharing. In addition, leadership has identified collaboration as part of the Accenture Way. The Accenture Way is how Accenture does things. It is the way Accenture collaborates, innovates, operates, and delivers value – for its clients and its shareholders. It is how the organization participates in the technology ecosystem and engages with the business community to drive sustainable economic growth. It is grounded in Accenture's core values, shared business ethics, and uncompromising standards for high performance. It differentiates Accenture in the marketplace and is brought to life every day, in everything Accenture does, through a unique combination of passion, energy, and style. Collaboration is core to our individual, collective, and, ultimately, client successes, helping each other bring the best of Accenture to clients by working together to collectively be "greater than" in everything we do.
Recognition and Rewards	Accenture has a dedicated reward and recognition program for collaboration and sharing, called the Addo Agnitio Award (A3), that has been in place since 2006. All employees receive a score (i.e., a collaboration quotient) that measures their collaborative behaviors. The score is based on over 50 activities tied to the 3Cs: A3 scores are weighted toward quality, rather than quantity. For example, employees who write blog posts are rewarded more based on the number of views and downloads their blogs receives, not merely the number of posts they have written. Employees can access a portal for the award program to track their collaboration activities and determine their scores (see Figure F.10).

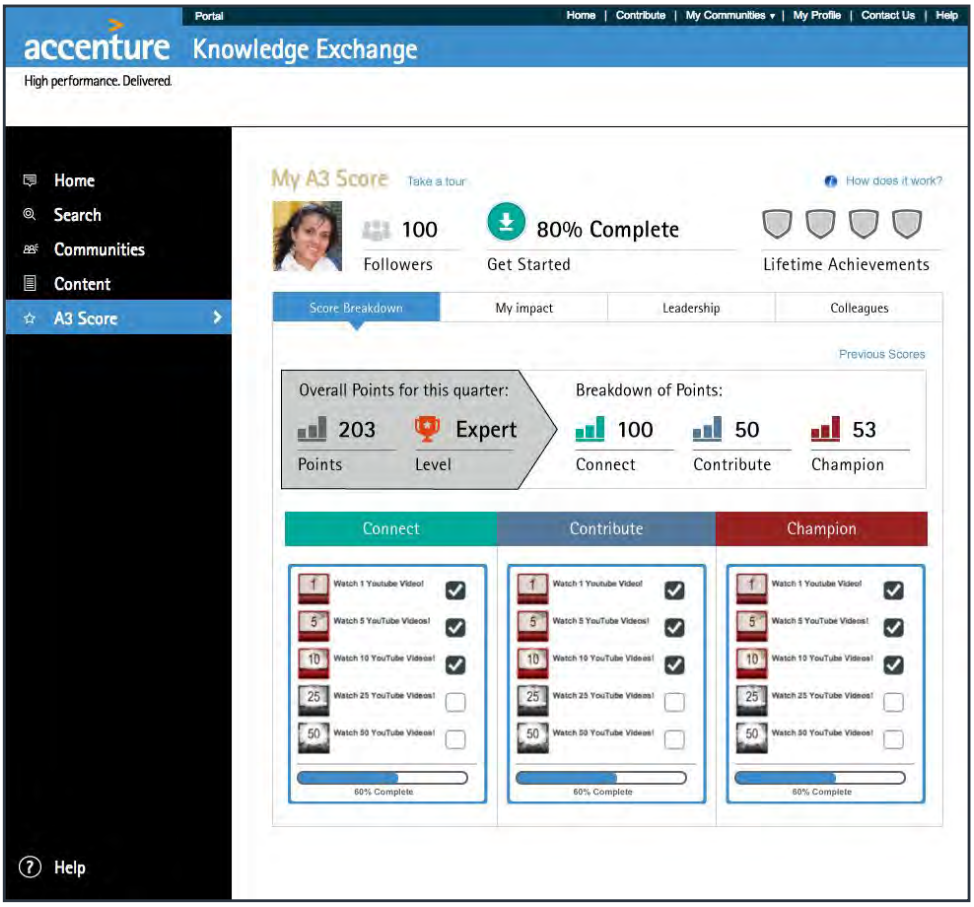

Figure F.10 Accenture's Addo Agnitio Award portal

Scores are reviewed quarterly, and top collaborators receive recognition through the program. These employees receive a recognition letter from leadership and a small monetary award. They also receive virtual badges to display on their internal profiles and their awards are noted in their annual performance reviews.

Accenture has recently made a strategic decision to embrace the concept of gamification as a means of motivating employees to engage more in collaboration and sharing through social learning and to influence their behaviors. The organization is at an advanced stage in preparing to deploy game dynamics and mechanics (e.g., player narrative, progression loops, feedback, visualization, and status) to encourage employees to collaborate and share.

Communities	There are over 1,500 online CoPs on the Knowledge Exchange (KX), Accenture's proprietary collaboration and knowledge-sharing portal, where people come together in virtual groups spanning geographic and organizational boundaries to collaborate with each other, connect with peers and experts, and access the latest thinking on a specific topic or practice area. All employees are encouraged to join and follow communities relevant to their role so that they can stay connected to current news, events, and key assets, and engage in thought-provoking and enlightening exchanges with like-minded individuals who have come together to better network with one another and collaborate around common goals.
Storytelling	Accenture uses storytelling to capture real-life examples of how the organization leverages collaboration and knowledge sharing to deliver high-performance outcomes for both its workforce and its clients. The Social Learning team compiles simple, one-page "myStory" profiles of A3 award winners to record their collaboration story and to inspire others by their example. It has also used storytelling to illustrate the power of collaboration and sharing in a more detailed format, for a forthcoming credential on the subject. Following are three such examples: **Collaborating to Drive Competitive Advantage: A Game-Changer for the Client** Julie and her team were brought in to help a major U.S. insurance client develop and deliver a learning and curriculum strategy for its retained IT workforce – a modest, three-month, $90,000 project. However, as Julie began working with the client team, she discovered a bigger opportunity to help the client's organization navigate its transformation more effectively. Leveraging the power of collaboration and sharing across our global network, Julie began by researching what Accenture had done previously in IT transformations at other clients. Tapping into Accenture's Talent and Organization's CoP on the KX, she connected with change-management and IT-transformation experts to access some great content, including industry white papers on evolving IT roles, IT workforce transformations, and IT competency models.

This led to a series of conversations with the client around developing competency models and career guides for not only the IT retained workforce, but the entire company. When the work, now a multiyear, $2.5 million project, was completed, the company's CEO described the solution Accenture delivered as a "game changer" for his organization.

Collaborate to Innovate – Turning Ideas into Solutions

Tammy is focused on increasing the overall pace of innovation to help the firm's clients with their toughest issues. She is inspired by creativity, new ideas, new thinking, and new ways of doing things. So when one of the largest electric utilities in North America sought Accenture's assistance in solving a major business challenge – how to drive energy efficient consumptions patterns from their domestic retail market – Tammy was already thinking outside the box.

In line with Accenture's overall growth strategy, Tammy and the account team decided to leverage Accenture's collaboration resources to develop a creative proposition for the client: a countrywide Innovation Challenge. This essentially meant exploiting Accenture's broad array of knowledge, expertise, and creativity to crowdsource ideas from across all workforces as a means of developing a series of innovative proposals to help the client achieve its goals. There was a positive response from across the organization as some 40 teams (comprising more than 200 employees) collaborated together and across teams to submit detailed proposals that an internal evaluation board then reviewed and assessed. A shortlist of the best proposals was drawn up and presented to the client.

It is expected that the highly innovative ideas these proposals contain will ultimately enable the client to achieve its objectives. The Innovation Challenge has been described by Accenture's leadership as a tremendous success that absolutely exceeded expectations and represents an exemplar of the power of collaboration and knowledge sharing across a disparate and dispersed organization.

Collaborate to Deliver – 31 Sprint Releases, 0 Defects

Vandana, a digital data manager based in Stockholm, knows all about the benefits of collaboration and sharing across "One Global Network." Without it, it is fair to say that she would not be able to do her job in the manner she does, and her client would not be reaping the rewards either. Vandana and her team work for a Europe-based global telecommunications client whose IT strategy involves offshoring a minimum of 80% of its project work. Since the arrangement is based on a capacity-service model, the client essentially pays by the hour. As a result, it is critical that all work is executed in an agile and flexible fashion to keep the client's costs low and improve its time to market.

Vandana believes that a key success factor in successful project delivery – with 31 sprint releases with 0 post defects – is the access she and her team have to Accenture's KX and its communities of experts. When team members need answers to the wide variety of project queries that arise daily, they use the communities for feedback and suggestions. Leveraging Accenture's global network of expertise and insights, Vandana and her team are able to identify and reach out to colleagues around the world to provide the kind of invaluable input that regularly assists her client. Without the KX and its communities, Vandana acknowledges that providing best-in-class solutions would take exponentially longer, so having the ability to leverage these resources quickly and easily is very important to her, her team and, of course, the client.

The benefits arising from Accenture's commitment to collaboration and sharing are both qualitative and quantitative. From a qualitative perspective, the validation of ideas and designs that Vandana's team receives from other Accenture experts improves the quality of its final deliverables. In quantitative terms, being able to reuse content freely available on the KX saves Accenture – and, by extension, the client – significant time and costs.

Succession Management

No response. Accenture highlighted its activities in other areas for the scan meeting.

Succession Planning	
Staff Retention	

Employee Interviews	

Employee Orientation, Learning, and Development

No response. Accenture highlighted its activities in other areas for the scan meeting.

New Employee Orientation	
Employee Growth and Development	

Identification, Documentation and Dissemination of Processes, Practices and Expertise

Organizational Functions for Content Management

Accenture has developed a content-management life cycle with four phases (see Figure F.11). The first phase involves identifying and harvesting content and then getting the content into Accenture's KX system. The second phase is managing the content, which can include tagging and sanitizing it to make it easier for employees to find and use. The third phase involves content delivery to employees and obtaining feedback on content. The final phase is the archive process, when content is reviewed and eliminated, if necessary.

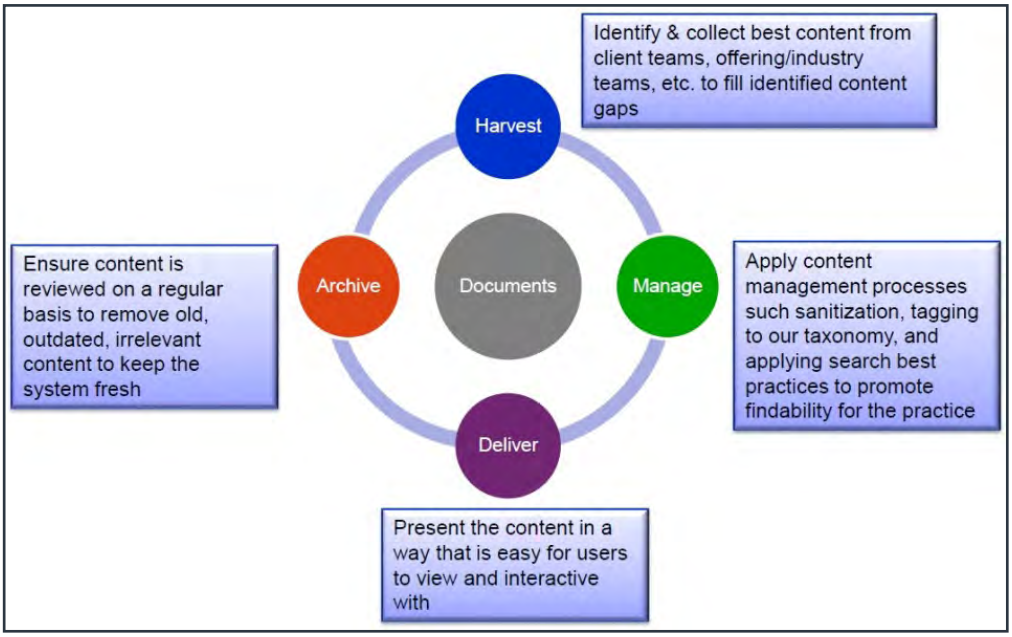

Figure F.11 Accenture content management life cycle

Accenture has also established numerous ways to obtain content that can be uploaded into its KX system. These include

- Gaining sponsorship, which establishes the involvement of business groups in the knowledge-sharing process
- Identifying gaps and target engagements, which creates focused harvesting efforts and enables Accenture to develop new assets if no content is available to harvest (see Figure F.12)
- Identifying reusable content, which focuses on engagement profiles, proposals and project deliverables
- Accepting contributions, which includes providing employees with easy ways to submit content to the KX system
- Rewarding and recognizing, which motivates employees to participate in the knowledge-sharing process
- Marketing, which communicates content availability to employees via newsletters, the activity stream, postings on community sites, discussions in town hall meetings, and other channels

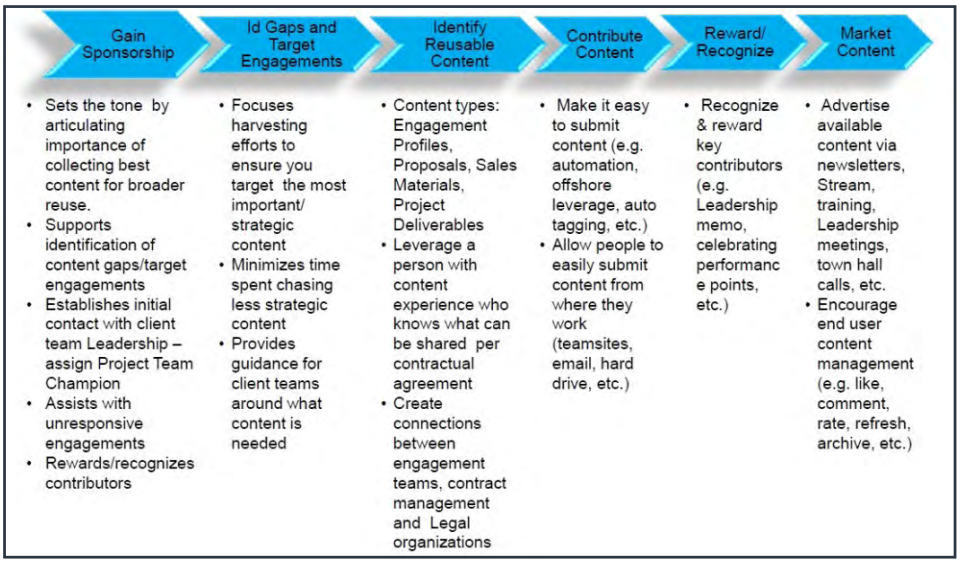

Figure F.12 Accenture best practice content harvesting approach

For example, the Accenture Learning Knowledge Management Services (ALKMS) group processes contributions made by individual employees. This team has processed about 18,000 to 20,000 submissions per year (about 1500 per month) to the KX system. Because each submission can have multiple documents, this team has processed about 60,000 to 70,000 documents.

Figure F.13 details the ALKMS organization structure. The group's primary customers are Accenture's functional areas. Each of these areas has an ALKMS content integrator who works to understand the area, develops functional expertise for the area, and translates the area's needs into services provided by the ALKMS group. The group is organized into small, service-area teams that specialize in particular services. Although the broader ALKMS group used to be organized in subgroups that provided all services to assigned customers, it now has a more transactional organization in which teams provide services across all customer groups.

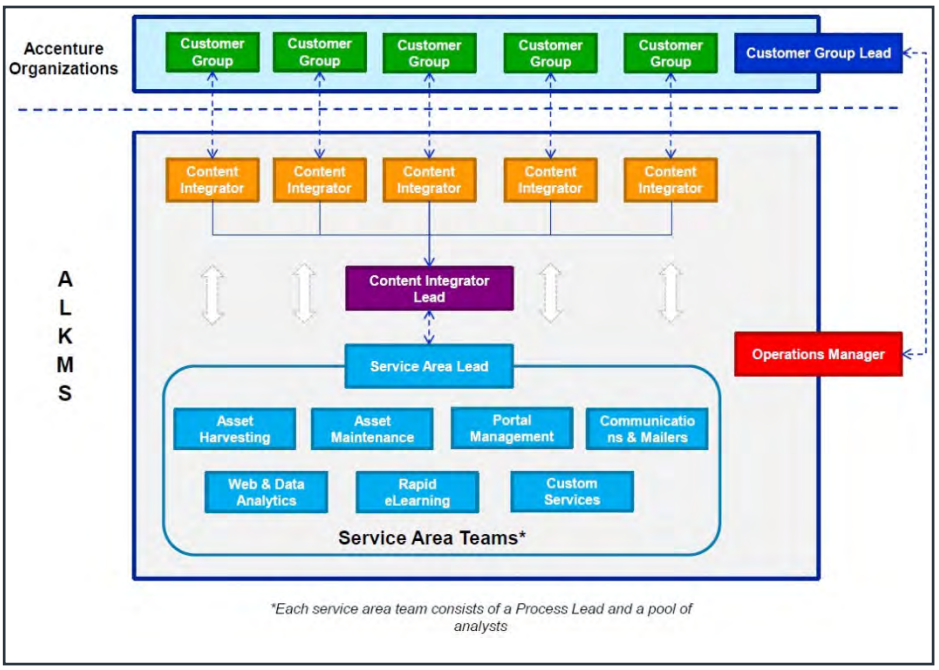

Figure F.13 Accenture LKMS organization structure

Accenture's content managers are tasked with assessing content that is available and quickly taking any action needed to maintain the content. Accenture's recently adopted content owner dashboard features an interface with various tabs that present information on the number of contributions, the content's age, and the tags assigned to content items. Content owners can click directly to a content item from the dashboard or export results to give tasks to an ALKMS team. The dashboard also provides the current date for content, the age of and expiration dates for content items, and how often content has been downloaded. Content archiving can be done directly through the dashboard.

The social learning team is debuting new processes for submitting content that are easy to use and incorporate content sharing into daily work activities. For example, the team is simplifying the existing content submission form in the KX system to make it more flexible. In addition, employees now have the ability to submit content via e-mail attachment. Users specify the title of the submission in the e-mail's subject line and include descriptive information in the e-mail's body. Submissions are received through a shared e-mail address and automatically added to the system. The ALKMS group tags and reviews the content submissions to add additional details manually and contacts the user for more information, if necessary.

The social learning team has also created a desktop tool for submitting content. Employees can download the tool to their computers and launch the software to access a form with minimal required fields for a content submission. Users then upload the content item and submit it through the software. The same process for tagging via ALKMS mentioned previously holds true for this method as well. The desktop tool also allows users to access the software by right-clicking on an individual file that they want to submit. They then see an option to submit the file.

Content can also be submitted through Accenture's Microsoft SharePoint sites. Site owners can elect to install a content sharing feature on their sites, which allows users to right-click on any document stored on the site for an option to submit the file to the KX. Selecting this option brings up the same submission form as the desktop application.

Accenture's ALKMS group is responsible for reviewing submitted content and assigning tags for individual items. Within some business units, Accenture has begun conducting monthly reviews of submitted content to ensure that it is being tagged properly.

Accenture uses a standardized taxonomy and regularly conducts a rationalization effort to reassess which fields and values are necessary. It established a monthly process during which new keywords are submitted. A governance team reviews all submissions and implements the suggestions that are approved.

	Accenture has implemented a semi-automated quarterly archiving process that looks at the age of content and number of downloads. Flagged content is put into archive status based on predefined criteria and will be deleted after one year in archived status. Accenture recently developed a mechanism for keeping content contributors engaged in the content management process. Contributors will begin receiving quarterly reminders that outline the content they have submitted; its age and popularity; and actions they can take to review, update, or archive content. Accenture has recently focused on ways to make it easier for users to find and use content. The organization has looked at multiple ways to accomplish this, including personalizing search results for users, getting users to interact more with communities to share expertise, using analytics to identify potential content of interest, and improving mobile access to content. The social learning team at Accenture has also made improvements to the organization's content search capability. The goal behind these improvements is to provide users with faster and more relevant search results. Accenture has expanded filter options for search results and built in feedback capabilities so that users can rate their search results. The social learning team is also working to improve the taxonomy tags for content and to ensure that fresh content is being added to the KX. Accenture has a search center of excellence that invests in search capabilities and educates employees on the proper maintenance of content and proper tagging that will ensure quality search results. Accenture is also leveraging analytics to anticipate user needs. When a user conducts a search for content, the KX directs the user to other content that may be of interest. When users view a piece of content, they can see what others have downloaded in addition to that content item. The portal also provides users with recommendations on communities that are related to specific content items.
Lessons Learned and Case Studies	At the client level, there is a quality assurance process in place for every client and project. It is a mandatory part of the project and client life cycle. This process is not formally fed back into the knowledge repository system due to confidentiality. At the same time, our methodologies and approaches are managed through the Methodology team, which manages and develops these based on best practices and lessons learned.

Institutional Memory/ Retention of Critical Knowledge	Responsibilities for managing and retaining critical knowledge within Accenture vary depending on the employee's title and location within the organization. There is a standard process used during the separation process (whether voluntary or involuntary); however, it is not meant to be a knowledge capture process. Given we are an organization that focuses on social learning, it is more about ensuring the natural knowledge transfer during the employee's time with Accenture versus waiting for separation/termination to occur.
Process Documentation	Accenture is well known for its methodologies that document our business processes for selling and delivering work to our clients. It is foundational to our business. Access to the content is available through the KX and is leveraged by project teams and client personnel throughout the delivery life cycle. Consistently high-quality solutions are vital for the success of our business.
Expertise Identification	Every Accenture employee has an individual profile page on the organization's internal People microsite, which they are strongly encouraged to complete with all relevant data, including photograph, location, role, responsibilities, previous experience, and contact details. Using the tag-line "Discover … and be discovered," the social-learning team routinely engages in marketing and communications activities to remind employees of the importance of completing and updating their People profile, thereby making themselves and their expertise visible to their 275,000 colleagues across the globe. Employees are also strongly encouraged to join KX communities, which are online groupings of people sharing common professional interests. These communities not only enable knowledge sharing to take place, but also encourage cultivation of existing knowledge and the generation (or crowdsourcing) of new ideas and insights through open discussion and debate. Lastly, the KX search engine enables employees to identify and locate experts wherever they may be across Accenture's global network

Tools and Technologies

KX is Accenture's proprietary collaboration-and-sharing portal, providing access to the organization's best content (both internal and externally available content and research available through the Research organization) and offering a means for its 275,000 employees to connect with each other in online CoPs.

The KX home page includes a prominent activity stream, a search function, a customized section with the user's contributions and recommended content, and easy access to Accenture's CoPs.

KX interacts with and is complemented by other applications that help round out the core suite of tools that help our employees connect to the people and content they need to do their jobs, including:

- **Accenture personnel** – a company directory that provides a space for employees to share a photo, highlight their background and experience, build their personal network, and add a bit of personal interest
- **Blogs** – a place for our employees to share an experience, perspective, or point of view on a topic and allow others to comment on their perspectives
- **Media Exchange** – Accenture's internal video- and audio-hosting solution where every employee can view, like, comment on, share, and upload content

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The Social Learning team is responsible for the metrics used to evaluate the performance of the social learning program. The ALKMS group supports efforts to capture and report on the necessary data. This group also collects qualitative feedback from both seasoned users and non-users. The team conducts pulse surveys on the utility of the content and collaboration tools and on employee participation in communities. Surveys are administered every six months to assess the performance of new programs and to draw a correlation of investment to benefit.

The Social Learning team is also rolling out new reporting capabilities. With these new capabilities, it will have better visibility into the number of "likes" a piece of content has and the number of times it has been shared.

Accenture has a social learning scorecard that is presented to business leaders quarterly to show how employees are participating in social learning. The scorecard provides leadership with information on whether employees are:

- Joining communities
- Subscribing to e-mail digests
- Using the search functions within community sites to find content
- Contributing to blogs
- Using the activity stream to interact with their peers
- Updating their internal profiles
- Downloading and contributing content

The scorecard enables leadership to look for groups that stand out with regard to social learning participation. This can help both leadership and the Social Learning team to understand the program features that are successful, as well as identify the practices of engaged groups that can be applied to other areas of the organization. Scorecard results can also lead to additional engagement efforts.


STRATEGY
LEARNING
LEADERSHIP
CULTURE
COLLABORATION
MANAGEMENT
CAPITAL
KNOWLEDGE
INTELLECTUAL
NETWORKS
INNOVATION
RISK
KNOW HOW
ASSETS
RECOGNITION
SUCCESSION
ASSESSMENT
EXCELLENCE
COST SAVINGS
TRANSFORMATION
TECHNOLOGIES
BEST PRACTICES
LESSONS LEARNED
COMMUNITIES
DEVELOPMENT
INTELLECTUAL CAPITAL
TIME SAVINGS