

# Knowledge and information—critical DOT assets

State transportation agencies are increasingly focused on knowledge management (KM), an umbrella term for a variety of techniques to preserve and enhance employee knowledge and use it as a productive asset. At the same time, DOTs are enhancing their capabilities for information management, a strategy that supports KM and improves information capture, storage, search, and retrieval. States are making the most of the extensive guidance that NCHRP provides in both areas.

## Capturing knowledge from a rapidly changing workforce

As DOTs lose employees to retirement, downsizing, and reorganization, the agencies face a critical challenge: how to retain those employees' knowledge and share it within the organization. To address this need, NCHRP Project 20-98 set out to develop a guide to help DOTs implement effective agency-wide KM practices.

"DOTs are increasingly concerned about the knowledge that is walking out the door with the retirement of long-tenure employees," says Maureen Hammer, NCHRP 20-98 panel member and former knowledge management director at Virginia DOT. "DOTs also contract out more and more work. It's critical that they document the knowledge of workers and contractors so that they don't lose it."

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KM can involve everything from succession management, leadership development programs, and mentoring programs to communities of practice, after-action reviews, and information management in support of KM. Despite the fact that KM practices and tools have been developed and adopted by a range of private- and public-sector organizations, they have not been systematically used by most DOTs.

"Knowledge management often goes on in DOTs in isolated pockets, such as succession planning or the use of a lessons-learned database," says Frances Harrison, principal investigator for NCHRP 20-98 and chief technical officer of Spy Pond Partners, Inc.



KM strategies ensure that the vital knowledge held by veteran employees is passed along and retained by DOTs.

"However, DOTs typically don't have an agency-wide function or point person who can help implement these strategies broadly."

The document resulting from the project, *NCHRP Report 813: A Guide to Agency-Wide Knowledge Management for State Departments of Transportation* ([www.trb.org/Main/Blurbs/173082.aspx](http://www.trb.org/Main/Blurbs/173082.aspx)), lays out principles and practices DOTs can use to capture, organize, and share critical knowledge in pursuit of their strategic mission.

"More and more, transportation agencies are making forays into knowledge management," says Hammer. "It helps to be able to point them to a very thorough document that explains the basics and says at a high level what knowledge management is."

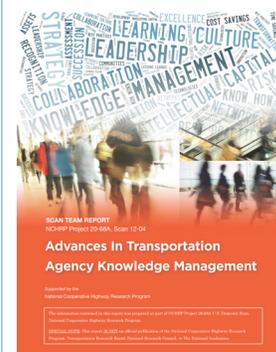
Published in 2015, the guide is already having a major impact on the transportation industry, and has been presented at numerous conferences and meetings.

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"Transportation agencies are becoming increasingly interested in knowledge management," says Leni Oman, knowledge strategist at Washington State DOT. "Some agencies are creating knowledge management initiatives and using NCHRP research results as a resource for developing their programs." According to Oman, such programs are helping Washington State DOT and other agencies identify risks for knowledge loss and develop strategies to protect critical institutional knowledge in the rapidly changing DOT environment.

The guide is designed to be a starting point for agencies interested in implementing KM, and will be helpful particularly to senior and mid-level management staff responsible for an agency's strategic direction, as well as others seeking to put KM into practice.

"The guide is a great resource for our agency," says John Halikowski, director of Arizona DOT. "Knowledge management is helping us run as efficiently as possible without wasting resources. Our mentoring program for new employees helps get them up to speed during the onboarding process, so that they can add value to our organization as quickly as possible. We also have a



A survey of public- and private-sector KM practices conducted through NCHRP's U.S. Domestic Scan Program ([domesticscan.org](http://domesticscan.org)) contributed to NCHRP Report 813.

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## NCHRP—Transportation research that works

Objective national highway research since 1962 • Focused on practical problems of state DOTs • Contract researchers competitively selected • Overseen by balanced panels of technical experts • Reviewed by TRB highway specialists

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lessons-learned process after major projects, and are looking at how our data is captured and how easy our information is to retrieve.”

### Information management: a key part of the KM toolkit

A related research project, NCHRP Project 20-90, focused on providing DOTs with guidance on information management. Information management encompasses data and documentation of all kinds, from reports and manuals to maps and photographs, any of which can be in print or electronic form. It includes information housed within libraries and functional units at DOTs, in organized bibliographic databases such as TRID ([trid.trb.org](http://trid.trb.org)), and on transportation websites.

While information management and knowledge management are not the same

### Related NCHRP Research

NCHRP is developing further guidance for DOTs on capturing knowledge and managing information. See [trb.org](http://trb.org) for more details.

**NCHRP Project 20-104, “Capturing and Learning Essential Consultant-Developed Knowledge within Departments of Transportation,”** is developing guidance for DOTs on how to capture and maintain essential, mission-critical knowledge from the work of external consultants and contractors.

**NCHRP Project 20-96, “Leadership Guide for Strategic Information Management for State Departments of Transportation,”** is creating a guidebook for state DOT executives and managers on how to allocate resources effectively to develop and maintain the agency’s capability to provide vital information when and where it is needed.

**NCHRP Project 20-97, “Improving Findability and Relevance of Transportation Information,”** is working to improve DOT information findability by defining a management framework, documenting successful practices for organizing and classifying information, and developing enterprise search procedures that a DOT can use to make transportation information available to users.

thing, information management can play a supporting role for KM. “Where knowledge management is about know-how and starts with what’s in people’s heads, information management is about what’s being stored in some other medium,” says Oman, an NCHRP 20-90 panel member. “Information management is an essential tool in the knowledge management toolkit. You can’t do effective knowledge management without it.”

Information management is especially important as DOTs move away from central filing systems and replace them with electronic records and modernized information practices. It is also critical for responding to public requests and providing transportation professionals with the information they need to make good decisions.



Even with vast stores of data online, transportation information still spans many physical and electronic platforms.

“The cost of public disclosure requests often goes up when finding information is more difficult,” says Oman. “Moreover, we need authoritative sources of information for decision makers.”

The research findings, published as *NCHRP Report 754: Improving Management of Transportation Information* ([www.trb.org/Main/Blurbs/169522.aspx](http://www.trb.org/Main/Blurbs/169522.aspx)), provide effective strategies that DOTs can use to improve information capture, preservation, and retrieval. “What we were trying to do with the project was understand the landscape of information management best practices,” says Anita Vandervalk, investigator for the project and principal with Cambridge Systematics, Inc. “To pursue cost efficiencies, DOTs need to understand the interconnectivity involved in managing records, data, library resources, and the Web.”

The NCHRP guidebook gives DOTs a go-to framework to refer to as they develop

data planning guides. It provides a baseline that illustrates opportunities for improving information practices at DOTs. It also gives the industry a good way to talk about what information management entails.

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“This report is building awareness of the need for information management,” says Oman. “We in the transportation sector are beginning to talk more commonly about information management needs.”

### New tools for new challenges

The need for knowledge and information management by DOTs is especially acute given changing social and economic pressures.

“Society and the economy are constantly changing, and changes in the economy in particular are putting pressure on departments of transportation to be more efficient in managing our systems,” says Halikowski. “This requires us to be able to use knowledge and information management to extract as much value from our efforts as we possibly can.”

Harrison agrees: “New demands and changing roles make it more important to have access to the right knowledge and information.” *NCHRP Reports 754 and 813* give practitioners the tools they need to face these challenges.

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“These guides give DOT officials and other transportation professionals a point of departure for developing knowledge and information management programs for their organizations,” says Oman. “Doing so will be critical to their having access to what they need to make decisions that ensure the performance of the nation’s transportation infrastructure.”

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