

## TRANSPORTATION KNOWLEDGE MANAGEMENT ~ EXPANDING BENEFITS

"As work requires ever-faster judgment and decision-making, workers need to find and apply the relevant knowledge from a barrage of content that is larger and more complex than before—especially difficult because much potentially critical knowledge is "messy."

Knowledge is often out-of-date (expired or not encompassing today's circumstances), out-of-reach (in someone's head, an obscure database or a co-worker's hard drive) or out-of-touch (not relevant for the individual worker or the task at hand). Meanwhile, managers struggle to improve corporate responsiveness by matching skills and knowledge to activities, even as the required knowledge is fleeting and competition forces compressed cycle times," said IBM in an executive brief called, "Tackling "messy knowledge": Combining the best of Knowledge Management with Learning and Development."

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### Introduction

As the United States strives to maintain and expand its economic role in the world, it is important that the nation not only address the physical transportation infrastructure, but also the invisible transportation knowledge network infrastructure.

While other countries improve their transportation infrastructure and services in the areas of construction, operations and maintenance, the U.S. must consider its competitive stake in the global economy. Transportation investment will be central to success in meeting the challenges of the future.

Four trends that will affect knowledge sharing are converging:

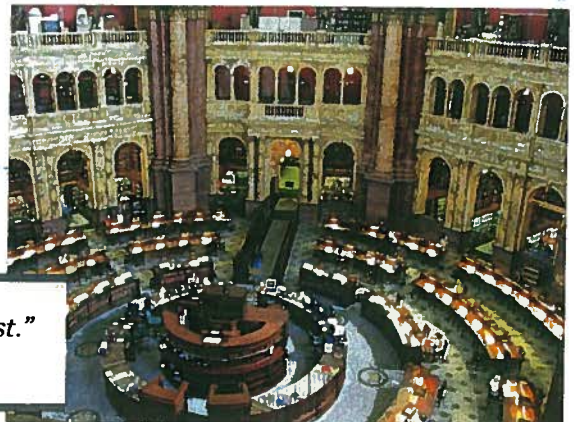
- Declining financial climate and program resource cutbacks
- Attrition of transportation employees as 20-30% enter retirement
- Complexity of organizations with transportation knowledge
- Rapidly changing technologies

What is the price of not capturing the cumulative knowledge based on experience before a transportation employee retires? How many hours are wasted trying to find information to support decision-making?

How does the transportation community find relevant information when web searches return thousands, or even millions, of hits?

Answering these questions and making those resources available through one common mechanism – Transportation Knowledge Networks – can pay high dividends.

*"An investment in knowledge pays the best interest."  
~ Benjamin Franklin*



## **Background**

Sharing the various and specialized tracks of transportation information is vital to the optimization of its economic benefits to our nation.

Transportation information and knowledge is spread across numerous transportation-related organizations and libraries. Online resources include search engines, databases, integrated catalogs, web portals, publication indices and interlinked federal and state web resources. Of vital concern to the transportation sector is the ability to find information on national mission-critical and strategic areas such as:

- the continued increases in the value of goods and services, demanding greater flexibility and reliability in transport<sup>1</sup>,
- the increasing dominance of just-in-time delivery systems in all facets of manufacturing and distribution<sup>1</sup>,
- the increasing internationalization of U.S. economic activity<sup>1</sup>,
- the increasing maturity of American markets, demanding broad market sheds for products<sup>1</sup>,
- the rising role of tourism traveler safety<sup>1</sup>,
- climate change (adaptation and mitigation strategies), sustainable transportation systems and programs,
- congestion reduction/reduce travel time,
- job creation through economic stimulus and/or sharing options for generation of revenue in support of transportation,
- safety,
- professional organizations, and
- communities of practice.

## **Lost Knowledge**

Researchers at IBM estimate that corporate workers spend up to 30 % of their time searching for information. Knowledge attrition is increasing at an extremely rapid rate as companies lose portions of their workforce. Veteran staff are let go, only to be rehired as consultants for double the rate they were previously paid<sup>2</sup>.

## **Investing in Access to Information ~ Return on Investment (ROI)**

Minnesota DOT Library<sup>3</sup>: Benefits to Costs Ratio = 12:1, Annual ROI = \$7,686,500

Virginia DOT's Knowledge Management Division / Research Library:

Work with the Environmental Division to refine the state environmental review process eliminated unnecessary reviews in maintenance projects resulted in a documented per annum cost savings of \$300,000 for the agency. Salem District reported an accumulated estimate of \$6 million in cost avoidance as a direct result of library assistance in FY 2009 to justify project costs to FHWA -- these two projects represent a ROI for the division of 725%.

## **Benefits of Sharing**

Capturing knowledge, sharing knowledge, and being able to find knowledge would benefit the transportation industry, especially because of the decentralization in the knowledge network and between modes.

Redundant work can be very costly. Finding out that another state has done a pavement evaluation on soil types and obtaining its research results could save an agency hundreds of thousands of dollars.

While efforts to consider intermodal transfers of freight and people have excelled in recent years, most of these improvements are focused on optimizing each mode in a vacuum. Long-term plans should consider adjacent modes and incorporate situational factors.

Sharing transportation knowledge in an organized and timely manner will not only help to reduce redundant efforts but should assist the transportation sector to determine best solutions. Consider the losses in air-line operations, especially in the operational costs of shorter flights. Many flights from non-hub airports operate at a loss in order to gather enough fliers to the hub to fill the longer distance flights. If all current stakeholders were both considered and offered the opportunity to share transportation knowledge, with the common goal to consider the potential advantages of replacing the current system of movement of light freight and transit with an integrated system of technologies, such as high speed magnetic levitation rail, wind turbine power corridor and personal rapid transit, a viable alternative may be discovered which would benefit all.

Planners, designers and engineers of our highway and bridge infrastructure may have limited exposure to the vast transportation knowledge base. Better access to a network of transportation information will equip them to design safe, economic solutions.

Designers looking for the best solution to a given crossing, for example, would benefit significantly from an organized system of shared transportation knowledge that would direct them to research and successful deployments of various traffic intersection and interchange designs such as the “dog-bone roundabout”, “diverging diamond”, “continuous flow” and “single point”.

Planners seeking alternative funding mechanisms could learn about innovative approaches such as agreements among agencies, local governments and public-private partnerships.

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## **Existing Transportation Knowledge Networks**

Three regional Transportation Knowledge Networks (TKNs) bring together members from state DOTs, MPOs, transit agencies, University Transportation Centers, professional associations, academic libraries and private companies. A National Transportation Knowledge Network Resource Sharing Project promotes and facilitates access to information under the direction of the National Transportation Library and the Transportation Pooled Fund Library Connectivity Study.

## Conclusions

The economic benefits of optimizing the existing knowledge network could be quickly realized via the expansion of transportation knowledge networking tools and procedures. Allowing government agencies better access to information and knowledge would greatly facilitate progress.

Implementing more computer and internet technologies, including Web 2.0 tools, would facilitate optimization of knowledge management training, information sharing, and data storage and retrieval.

Sharing of transportation information through an integrated process which enables extraction of relevant knowledge for each planning, research or design task would save time and money. With a well defined set of procedures through networking, a search for specific transportation knowledge would reap significant benefits for an organization.

Many states already mandate the distribution of publications and research reports. This distribution may be via hardcopy, electronic or both. State DOTs are using a variety of methods to enable knowledge sharing such as a virtual Transportation Knowledge Network, transportation thesaurus, metadata tagging of transportation information, shared library printed and electronic document management, shared databases. Other projects aim to identify best practices to capture corporate knowledge of the various technical and administrative processes and techniques.

Investments in knowledge-sharing efforts can help transportation knowledge seekers to find information, reducing research duplication, and facilitating a more efficient process to compile available data for a survey or special report. Agencies would also quickly realize the local economic benefits of sharing and accessing transportation knowledge via knowledge professionals and networking tools.

Transportation  
Information  
Resources /  
Knowledge  
Management



Transportation  
Professional /  
Organizations

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