Toward a National Transportation Library

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What the transportation community needs is a program to get the right information to decision makers in the fastest way possible. Imagine that a transportation planner in Chicago wants to do a study. Rather than reinventing the entire study design, he goes to his computer and searches a well-organized body of literature. He finds relevant reports, downloads them, and saves weeks of design work because he can copy the design from a study recently conducted in Indianapolis. Such a capability would save time, money, and effort, while allowing small planning offices to do research they have not been able to do before.

There are some rather obvious problems with this scenario. First, doing things electronically may sound good, but the whole world has not yet collapsed into bits and bytes. There is still a great deal of paper on which researchers rely. The transportation community cannot afford to get lost in a digital daydream while the answers in the book on the shelf remain undiscovered. The universe of potentially useful literature includes not only databases and diskettes, but also old-fashioned materials such as maps, journal articles, and commercial books. Indeed a broad range of search tools have been developed to help bridge the gap between researchers and these analog materials. The Transportation Research Board's Transportation Research Information Services (TRIS) database, the PATH database, and numerous hard-copy indexes of journals are popular front ends to low-tech stores. Unless it could merge with the existing schemes, a new, completely electronic information system would require researchers and information specialists to abandon tools to which they have spent years becoming accustomed.

The Problem

Although not yet ready for a purely electronic information system, the transportation community clearly has a serious information problem. In fact, the fall of the Tower of Babel probably caused less frustration than the disorganized information infrastructure currently being used by the nation's transportation community. The U.S. Department of Transportation has no central repository for its reports. Public documents are buried in piles and lost. The mind shudders to imagine the number of "last known copies" that might be steadying the shaky legs of pieces of broken furniture in various bureaucratic offices in Washington. Anecdotal evidence suggests that 50 percent of all requests for U.S. DOT reports are unfilled because the reports either cannot be found or are out of print. Unless one happens to know the right individual in the office that produced the report one is seeking, chances are one will not find it.

Unfortunately, the problem is bigger than Washington. "Conspiracy not to distribute" is a state and local offense as well. There is no effective way to find reports from most state DOTs or local transportation agencies. Transportation planners at state and local agencies are stymied by their inability to find information on current practices in sister jurisdictions. No single agency has the resources or mission to collect reports produced by local transportation authorities. Planners are continually forced to reinvent the wheel (and the rail terminal, and the bus stop, and the highway interchange...) as they start new research projects to answer questions they suspect others have already addressed.

And it is not just public information that is difficult to find. Tools such as on-line catalogs have made it possible to learn that a particular book has been written, but these tools have not made it any easier to actually get the materials one needs. One does a search and finds there is a great book from the 1950s that seems to have all the answers one is seeking—and one could actually read it if one could just afford the plane ticket to the only library in North America that has a copy.

The problem boils down to this: the information infrastructure for transportation has been underfunded and woefully neglected. The point is illustrated by the annual national spending on library services of three roughly comparable sectors of the economy. The National Library of Medicine spends $151 million a year to organize the literature produced by a sector that employs 10.6 million people—or about $13.30 for every person in the sector. The National Agricultural Library spends $18 million to provide services to a sector that employs 3.3 million workers—or about $6.00 per person. U.S. DOT, on the other hand, has three major (but disjointed) library programs

that spend a total of about $3 million a year to try to organize the literature produced by a sector that employs 8.5 million people. It simply is not possible to make the information machinery hum for less than 40 cents per person.

When building highways and bridges was the nation's top transportation priority, it was possible to neglect information exchange without seriously compromising the ability of the transportation profession to achieve its mission. As the focus has shifted from concrete to more abstract notions, however, access to a wide range of information has become increasingly important. The transportation field is diversifying and broadening its attention. Engineers are being joined by social demographers, economists, market researchers, computer scientists, and lawyers. The purview of local transportation agencies has expanded beyond construction and maintenance to include social research, information management, training and education, economic analysis (domestic and international), environmental analysis, cartography and geospacial analysis, statistical analysis, and more. The "transportation" profession has become a complex amalgam of disciplines. The need for a system to organize transportation-relevant information from each of the component fields is now acute.

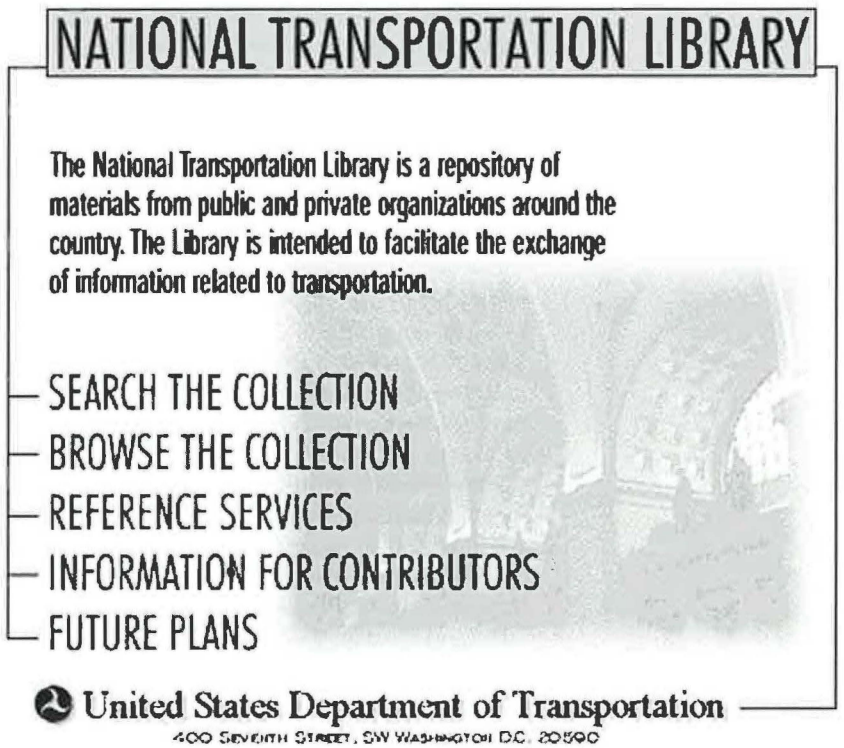
A Solution

How is this need to be met? Thirty years ago, a group of dedicated librarians and information specialists sketched out a plan for sharing information among transportation agencies. They developed an elaborate architecture for a network that would facilitate the exchange of transportation materials from the collections maintained at libraries across the country. They designed an abstracting service and cataloging strategy to ensure that information about the nation's shared resources would be available to the entire community. In short, they solved every problem described above, at least in theory. But the network was never built. Some of the pieces were put on the table—such as TRIS, a repository, a rough cataloging program, and, most recently, a thesaurus (see article page 17)—but the puzzle was never assembled.

U.S. DOT is now proposing legislation to create a true National Transportation Library (NTL) network. The agency is encouraged in making its recommendation by a pilot effort led by the Bureau of Transportation Statistics (BTS). BTS has been working with the Federal Highway Administration, the Federal Transit Administration, the Transportation Administration Services Center, and more than 100 state and local agencies to collect and (roughly) organize transportation-related documents and post them to the World Wide Web. The NTL pilot currently provides access to almost 5,300 full-text documents on transportation planning, including documents from more than 30 state DOT and university Web sites. About 10,000 visitors a month receive documents from the small but growing collection. Nearly 1,000 organizations around the world refer their employees and customers to the collection through links to the library on their Web sites. Many transportation planners have come to rely on the on-line collection, some using it as the primary reference to their own state or agency documents.

The NTL pilot started in January 1995. Since then, BTS has conducted a number of focus groups and posted a questionnaire on its Web site (www.bts.gov/toolbar/survey) to gather user feedback on the NTL. Users have recommended that the pilot be expanded in every way—from increasing the collection, to preparing catalogs and indexes, to developing systems for the delivery of nonpublic documents.

Much work will have to be done for an expanded NTL. The first task will be to pull the scattered puzzle pieces together—to do an inventory of existing resources. It will then be necessary to find the box top that shows what the puzzle is supposed to look like when completed—to develop a plan for using those resources.



National Transportation Library Web site.

The whole solution sounds like a simple three-step process: step 1—learn what is out there, and document the current strengths and weaknesses of the information exchange system; step 2—identify priorities for collaboration and additional spending; and step 3—spend strategically and collaborate.

Of course, nothing is ever that easy. There will have to be committees, feasibility studies, and ample opportunities for bureaucratic showboating. The content of the inventory and methods used in its development will be debated. The plan will be revised numerous times. But if we are committed to improving access to information, we will do so—byte by byte, bit by bit. We will develop new institutional relationships. We will share technology. We will eliminate social and technical barriers, and data will flow across institutional boundaries as seamlessly as vehicles move across the borders between states.

National Transportation Library Features

A comprehensive inventory of the transportation information environment would include all users and producers of transportation information, public or private, foreign or domestic. It would be a long list—too long. A better approach would be to start with a list of major nodes on the information network: U.S. DOT, the 50 state DOTs, metropolitan planning organizations, and transportation research centers at universities, as well as key intermediaries, such as the libraries at TRB, the University of California at Berkeley, the Texas Transportation Institute, and Northwestern University. This may not be a short list, but it is a manageable one.

Where is the picture that shows what the whole puzzle is supposed to look like? The ideas and strategies described in the literature of the transportation information community since the late 1960s provide a good overall guide to the initial pieces. We know that an NTL network must have at least the following characteristics.

It is a widely distributed network. Public documents of interest to the transportation community are produced in every state and every city in the country. Key intermediaries have been providing important services from places as remote from one another as Washington (D.C.), Minneapolis, and Seattle. The distribution of service providers is a strength of the current system and certainly belongs in the completed picture toward which we are working.

It gives users tools for finding out what is available. TRIS is the best example of a successful tool of this type. A team of abstractors scours professional journals and summarizes articles of interest to transportation professionals. The abstracts are posted on line and can be searched from anywhere in the world.

It provides full access to federal reports. If any piece of the puzzle is easy to identify, it is this one. A national information system should provide access to materials produced at the expense of the nation's taxpayers, period. Access to U.S. DOT reports should be reliable, not random.

It supports the sharing of documents across state and local boundaries. Recommendations from government employees in Washington may be good, but solutions from people in state and local agencies who have actually solved problems are often better. The national information infrastructure should support the direct exchange of good ideas without the need to filter them through Washington.

It provides document delivery services for commercial articles and books. This is currently a missing piece of the puzzle. Public-sector transportation libraries do not spend enough money on the acquisition of commercial publications—a significant lack given the fact that many good ideas come from nongovernmental sources. Chances are that the librarian in a local public agency knows about the great things being written by for-profit authors, but cannot afford to buy the books. The solution to this problem looks something like a series of strategic acquisition and loan agreements between and among libraries, publishers, and commercial document delivery services.

It ensures the preservation of nonelectronic materials of significance to the community. For a long time into the future, there will be a need to preserve materials that cannot or should not be made electronic. Copyrighted materials, photographs, maps, and historic collections that are either too fragile or too expensive to digitize fall clearly into this category. When the Interstate Commerce Commission was eliminated in 1995, its library holdings were rescued from disposal and are currently being stored in a warehouse in Denver. The University of Denver plans to find a permanent housing for the collection. However, policies regarding use of the collection have not been developed. The NTL network should work with the University of Denver and other holders of historic collections to (1) build and maintain these important stores of endangered information, and (2) develop policies that allow for the broadest possible access to the materials.

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It captures international materials for use by U.S. researchers and firms. International documents represent a wealth of untapped and often undiscovered resources. Underutilization of foreign resources results in duplication of costly research and waste of the valuable time of researchers. However, acquisition of foreign documents is often a difficult and lengthy endeavor. Problems associated with use of foreign documents include a lack of document ordering information, inadequate bibliographic citations, a lack of abstracts in English that can be used to determine a document's relevance, delays in obtaining a hard copy, the high cost of translation services and of foreign document acquisition, a lack of knowledge of what is accessible or available, and a lack of familiarity with foreign government organizations.

It applies rational and common information policies. To be effective, the NTL will have to be flexible. It would be counterproductive to replace fragmentation with rigid controls or arbitrary conformity requirements. U.S. DOT, as a leader in the development of the NTL network, will have to remain open and responsive to a wide range of information producers and users. The agency will have to work with the transportation community to identify the most pressing needs for better information and address those needs first. It will have to adapt its priorities as the needs of the community change. The policies and standards developed will have to be based on community-wide consensus.

It serves as an information advocate. As part of the NTL pilot, BTS has held a number of discussions with transportation librarians during the past year. A theme that keeps emerging is that the transportation research community needs strong advocates—one or more organizations that can sound the call for measures such as those discussed here. The advocates' ongoing goals should include identifying areas in which information requirements remain unmet and highlighting promising collections that are not generally accessible.

The rest of the pieces are more difficult to figure out, and it will not be possible to assemble the whole puzzle at once. But U.S. DOT and professionals around the country have taken two important steps. First, they have started to imagine or reimagine the possibilities of a full national transportation library system. Second, they have started to build such a system, using modern networking tools that may provide the efficiency and ease of construction that will finally make the NTL a reality.

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Using TRT

In indexing a document, the indexer uses as many postable terms from as many facets as needed to describe the document fully—typically from 6 to 10 terms per document. For example:

Title: Measuring traffic congestion and delay on an urban freeway following a ramp accident

Postable Term	Notation
Traffic measurement	Bte
Traffic congestion	Bthfc
Traffic delay	Bthd
Freeways	Pmrccdf
Ramps (Interchange)	Pmrcpjsrr
Traffic accidents	Hbbgt

In searching, the user constructs a search statement consisting of postable terms that together represent the request. The KWOC index provides the most comprehensive access since it shows all contexts of any word, even if buried within a phrase. The KWOC index also shows use references and the notations for all terms, thus allowing easy cross-reference to the hierarchy so the user can consult all the family relationships. The user may also double-click on a term in any display to see its full display with all notes and relationships.

If the search statement does not retrieve a satisfactory set of citations, it must be modified. The user refines the search to get fewer documents by adding terms with the AND operator or by using more specific terms within a hierarchy. The user broadens the search by dropping an ANDed term from the search statement or by adding more terms with the OR operator.

Availability of TRT

The latest version of the TRT will be published on CD-ROM by the Bureau of Transportation Statistics and will be available at no charge in the spring of 1998. It will also be available on the BTS Web site. Meanwhile, CDB Enterprises is issuing it at no charge on a set of three diskettes with a printed manual. CDB Enterprises is also prepared to make available a printed version of the hierarchical and KWOC listings at a cost of $50, plus shipping, anywhere in the world. For information, contact the author (telephone: 301-593-8901; fax: 301-593-1867; e-mail: davidbatty@aol.com).