

Transportation Data—Getting More, but Avoiding Information Gridlock

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Short Circuit was the name of a recent motion picture featuring a robot who, through an accident, became “humanized.” The robot had the unique skill of being able to quickly skim books and other materials, and store all the contents in its memory. One of the film’s appealing comic features was the robot’s habit of frequently saying “more input” after devouring a shelf of books, as he sought to enlarge his information bank about everything.

The motion picture was a hit in modern America because the robot helped us find humor in today’s computerized, complex world. The phrase “more input,” and its predecessor, “more data,” have become standbys of modern decision making, in both government and the private sector. We are told that our era can be called the beginning of the “Information Age.” Writing in the current issue of *Omni* magazine, futurists Marvin Cetron and Owen Davies tell us that: “About half of all service workers (43 percent of the labor force by 2000) will be involved in collecting, analyzing, synthesizing, structuring, storing, or retrieving information as a basis of knowledge.” (1)

Looking toward the year 2000 in their *Omni* article, the two futurists also predict a number of trends that will continue to complicate our transportation system, including:

- More development in the suburbs, and increased urbanization of the suburbs with more “downtowns,” office parks, shopping centers, and entertainment districts,
- Creation of “penturbia,” as population expands beyond the suburbs into outlying towns and urban areas, and
- Increased job mobility, meaning more changes in home-to-work trip routes.

The transportation profession is one that relies heavily on data and information processing, ranging from the conceptual planning of transportation projects, through their program planning and project development, financing, and on through construction, operations, and maintenance. But in the words of that great entertainer Al Jolson, “Folks, you ain’t seen nothing yet.”

Complicated as is today’s transportation world, tomorrow’s will be far more complicated. This will be true for many reasons, including the increasing globalization of America’s economy and life-style, changing demographics, and a society that will require even greater mobility. The movement needs of goods and commodities will change, and our transportation systems must be able to respond. Transportation professionals from all modes and disciplines will be seeking “more input.”

Two great challenges await us in the area of transportation data and information systems as we approach the 21st century. The first is to find more effective ways to collect and analyze needed data and information. The second challenge will be to avoid information gridlock, as we are deluged with data and increasingly high-speed computers capable of whirling out more information than transportation professionals can digest and use.

This TRB Conference is concerned with both of these challenges and comes at an important time when we are engaged in a once-in-a-generation examination of America’s transportation requirements. The conference precedes the 1990 Federal Census, when we hope to acquire a collection of new data that will help us keep this nation mobile over the coming decade. And it comes at a time when many transportation professionals in FHWA, other agencies of U.S. DOT, and AASHTO are completing reports that have presented many of the problems with current data-gathering and analysis systems.

It is not my role here to prescribe what should be done to improve our transportation data-gathering and information-handling, for the eminent participants in this conference are far more capable of doing this than I am. But I would like to suggest some areas where attention is needed, and briefly describe some activities that AASHTO has been involved with.

In January 1987, AASHTO launched “Transportation 2020,” led by the Task Force on a Consensus Transportation Program. The initial goal within AASHTO was to seek a new consensus on the future direction of the nation’s highway and public transportation systems, a goal that was later expanded within AASHTO to include all five transportation modes and transportation research. AASHTO’s objective was to produce state transportation officials’ recommendations for the future direction of the five transportation modes transportation research, and national transportation policies. This work has been essentially completed and the state recommendations have been provided to the U.S. DOT as it works to develop federal recommendations for national transportation policies.

In the course of AASHTO’s work, professionals worked closely with FHWA, UMTA and other federal agencies. Using the state-supplied data contained in the FHWA’s Highway Performance Monitoring System (HPMS), the Task Force tried to draw from it useful information for developing policy recommendations. The following observations stem from that experience:

1. The HPMS information proved to be the best highway data available to AASHTO, and enabled the task force to

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make many projections that the transportation professionals in the states believe are sufficiently sound for deciding upon overall national highway policies. But at the same time, the data was insufficient in several areas:

—Although good data on the condition of the Interstate highway system is available from the HPMS, the data is weaker for primary and secondary highways, and of limited use for local systems, partly because of progressively weaker statistical sampling and data reporting difficulties.

—Because the HPMS is based on statistical sampling of existing highways and roads, and designed to consider improvements to those facilities, by definition it does not deal effectively with new roads on new alignments. To gather limited data on the need for new facilities that are not taken into account by the HPMS, AASHTO had to poll the states.

2. Data on America's transit systems is incomplete and subject to different interpretations. AASHTO and the American Public Transit Association proceeded to make an independent analysis using its own sources of information and data from the UMTA and could not fully agree on the results.

3. Information on the aviation mode was reasonably complete for AASHTO's purposes, except with respect to airport access.

4. With respect to airport access and other intermodal access questions, AASHTO found no reliable data and had to develop its own.

Based on the experience with existing data, several clear weaknesses are evident in the highway area. Some of these come about because of progressively weaker sampling as one moves down through the functional classifications of highways from the Interstate system. In fairness, it must be noted that many states and their local governments dislike data collection and reporting, and have objected to increased sampling on the lesser systems. In any case, clearly, good, reliable data on local roads is not gathered regularly. Data on the lower level state systems is not as solid as it should be for effective planning.

Certainly every participant in this conference can cite his or her concerns about today's transportation data, so I do not want to take further time here to review AASHTO's experiences over the past 3 years. Suffice it to say that AASHTO's work would have been much easier with better data, and better analyses techniques for the data that was available.

Looking ahead, there is reason to hope for better information with regard to our highway system. In particular, the pavement management system now being placed in operation by the states will provide much better information, as will the coming bridge management systems. During Tom Larson's term as FHWA Administrator, a concerted effort will be made to modernize and improve the HPMS. One goal of this conference should be to develop recommendations on how best to do this.

Based on AASHTO's experience, it is also hoped that during this conference data needs in all transportation modes, and intermodal data needs, will also be considered. AASHTO is becoming more involved in intermodal issues, because it is believed that many of tomorrow's transportation issues will be intermodal. To make good intermodal decisions, it is imperative to have adequate data and effective ways to ana-

lyze it for public policy purposes and to assist private sector decision making.

Three transportation issues of the 1990s in particular will provide a data challenge—where it is imperative to generate more meaningful data and learn how to use it.

The first challenge is in the area of highway safety, particularly for sound accident data which will support highway project decision making in a more meaningful way than is currently possible. I recognize the difficulty of law enforcement officials in gathering on-site accident data, and the problems faced by engineers in analyzing collected accident data seeking cause-effect relationships. This is a difficult area, but doing a better job with the data may help further reduce the highway death rate, something that is important as VMT at least doubles over the next decades.

The second challenge is with respect to the congestion problem. Polls sponsored by AASHTO, the media, and politicians all point to congestion as one of the top transportation issues faced by America, and how to relieve it or live with it is the subject of thousands of conversations every day. And yet, currently there is no consistent, effective way to measure congestion and analyze why it is occurring and what might be done about it. At least for city-suburban areas with a population of 1 million or greater, it is important to have more solid, consistent data and learn how to effectively analyze it.

The third challenge is related to the second: how to collect and analyze data that will support mobility planning, as opposed to only planning for individual modes. Looking at the problems of maintaining mobility for both people and goods in the nation's congested metropolitan areas, it is increasingly recognized that mobility planning and programming may be the best way to develop solutions. But currently tools are not available to do this on a consistent, effective basis. An effective congestion-monitoring system is basic for analyzing mobility needs and developing meaningful metropolitan mobility plans.

It is clear that transportation in America needs "more input." I believe that with the help of those gathered here we will get it. We must be certain that the transportation data we gather is meaningful, to both public and private sector transportation agencies, at all levels. I would hope that tomorrow's transportation data base will be effective not just at the national level, but at the state and local levels, too, and for metropolitan regions. And I also hope that as new data systems are established, we will recognize the problem of possible transportation information gridlock.

Every decision maker knows there is such a thing as "too much data," or as it was put in one political campaign in the Washington area a few years ago, "paralysis by analysis." Curiosity should not carry us away in the search for new data mines to open. The data sought should be useful and meaningful, not simply "interesting."

The possibility of information gridlock grows as our computer-based society progresses, and is a concern to the member departments of AASHTO. Increasingly decision makers recognize the need for a systematic approach to data management, one that will bring together from all relative sources the vital information required to manage a state transportation agency. In October 1989, AASHTO approved an overall guide for states to follow in establishing executive information management systems. More work will be done in this area.

One of the next projects is to develop a glossary of terms agreed to by all states, with the goal of establishing data banks in all states that are both compatible and comparable. This would make possible state-to-state comparisons that often cannot now be made, because of the "apples and oranges" problems that too often exist.

As you work at this conference, please consider how data can be both managed and coordinated through compatible

federal, state and local systems, so that further Balkanization of our data files can be avoided.

REFERENCE

1. M. Cetron and O. Davies. Future Trends. *Omni*, Vol. 12, Oct. 1989.