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TRANSPORTATION RESEARCH FORUM

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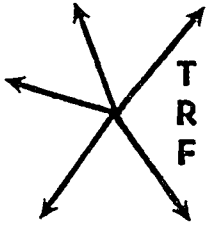

TRANSPORTATION RESEARCH FORUM

Diverging Information Needs and Resources In Transportation Research

by Rolf R. Schmitt and *Alan E. Pisarski*

THE REGULATORY, economic, and operational environments in which transportation exists have undergone major changes in the last half-decade. These changes, in conjunction with developments in data processing, have had major affects on the information needs and resources of transportation research Unfortunately, these needs and resources are diverging to the detriment of quality transportation research by private firms and public agencies. This paper examines the divergence of information needs and resources in transportation, with particular emphasis on the roles of institutions and transportation researchers in the divergence and on efforts to develop more effective and efficient information resources for the transportation community.

TRENDS IN INFORMATION NEEDS

Information needs are derived from the public issues and entrepreneurial activities which require transportation research, and from the methods and tools which are available to the researcher. Public policies and research tools have both undergone major changes in recent years, and have affected the quantity and specific types of needed data; however, those changes have not affected basic needs for information on costs of, uses of, and potential markets for transportation services and facilities. The stability of basic information needs is particularly important to recognize during the current period of deregulation. Private firms still need marketing and cost data, although their statistics are now designed to help improve operations and profitability rather than to meet the reporting requiremnts of a regulatory agency. Public agencies also have a continued interest in basic data following deregulation. Residual public responsibility often remains, and continued data collection is needed for before-and-after studies and for continued monitoring of the deregulated sector. If data on an industry are collected only when it is regulated, then, by definition, the decision to regulate will always be made in ignorance. Of course, specific types of data requirements have changed with general information needs. For example, the requisite precision of commodity flow data is much less for an in-house marketing study than for evidence to support a branch-line abandonment proceeding before a regulatory agency.

Basic information needs are perhaps more significantly affected by the tools which are now available to the transportation researcher. The popularity and affordability of micro-computers, turnkey computer graphics systems, and similar technology has put data-hungry machines in schools, businesses, and agencies of all sizes. The same technology has created a potential for major improvements in the timeliness, accuracy, and cost of data collection and access. Transportation researchers are now performing sophisticated analyses without significant concerns over costs and availability of behemoth computers. As the new technology becomes increasingly "user friendly" and becomes a common element of liberal education, more executives and managers are becoming active and perceptive users of transportation and other data. The resulting interest in and use of major information resources is no longer limited to esoteric researchers in large companies, universities, and public agencies.

TRENDS IN INFORMATION RESOURCES

The growing appetite for data is antipodal to recent trends in the quantity and quality of transportation data resources. Mandates and budgets for public data collection have been reduced, and not always at the expense of unneeded or inefficient data programs. Furthermore, the private sector is not always fit, willing, or able to fill the resulting data gaps.

Budget cuts are the most obvious cause of reductions in the quantity and quality of transportation data. The depressed national economy and popular reaction against high taxes and high deficits have placed major fiscal pressure at all levels of government on programs to collect and provide access to public data. As a very senior official with the U.S. Office of Management and

Budget explained, "When you are up to your armpits in alligators, you don't worry much about statistics." (U.S. Congress, 1982, p. 6)

Of course, budget cuts do not always affect true information resources. Much data collected by the public sector are not relevant, valid, or accessible. Such data can hardly be called a resource, and their demise or replacement would be a benefit rather than a loss. For example, the U.S Department of Transportation maintained an inventory of steam locomotives until about 1971, long after they were a significant concern to public policymaking. Unfortunately, many relevant, valid, and accessible sets of data have been damaged or destroyed. One congressional hearing on the impact of budget cuts on Federal statistical programs generated almost 500 pages of concerned testimony by representatives of State and local governments, universities, and the private sector (U.S. Congress, 1982).

Data collection activities are held to a shrinking temporal budget in addition to a declining financial budget. The Paperwork Reduction Act of 1980 (PL 96-511) requires that less time be demanded from the public for responding to questionnaires and other Federal forms. As with financial cutbacks, this requirement to reduce paperwork burdens can provide an opportunity to eliminate unnecessary or useless data, or it can destroy a needed information resource. Unfortunately, many of the institutional arrangements which were recommended to assure the former have not been fully implemented (U.S. General Accounting Office, 1980).

Another major cause of decline in transportation data resources is deregulation. Many data collection programs have been developed to support regulatory activities. Even when the data are used for many other public activities, the data collection activities are often terminated when regulatory activity is reduced or eliminated. For example, no provision was made in the Airline Deregulation Act of 1978 (PL 95-504) to maintain the widely used data series of the Civil Aeronautics Board (Transportation Research Board, 1980). As in the cases of financial and paperwork cutbacks, these data resources must be identified and justified if they are to survive.

Much of the decline in data collection at the Federal level is rationalized by the expectation that the private sector or State and local governments will replace truly needed information This is a quick, and perhaps deadly, way of finding out how much local entities and private firms really care about adequate information. Too many researchers and data managers have found it easy, and very convenient, to justify their programs based on Federal reporting requirements. It is not clear how readily the profession will be able to make its case for data programs based on local needs. Even when the need is clear, it is not asy to shift from a reactive role (the Federal Government is making us do what we secretly desire) to a role of active advocacy. The magnitude of this problem is difficult to assess since the secret desires of public officials and private executives are rarely documented.

The problems of private and local data development also raise questions of completeness and comparability—or at least compatibility—of data from place to place. Local and private data development also increases the importance of researching what others have done and how they have done it. The track record of the transportation industry and local governments in these areas is not encouraging, as illustrated by the "Section 15" program. This program requires uniform annual reporting of operating data from all federally-aided transit properties to the Urban Mass Transportation Administration (49 USC 1611). This program has improved the quality of individual reporting and has assured its comparability to other properties. State and local governments, as a result, have better data about themselves, and can compare themselves to similar properties. These data are also extremely useful to private manufacturers of transit equipment. While the local and industry needs for comparable data have long been known, Federal action was necessary to develop the information resource.

In addition to the problems of data coverage and comparability, the private sector is also limited in its ability to provide needed information by economic incentives and credibility. Economic incentives are a problem because information often has the attributes of a public good. In other words, the use of the information by one party does not "consume its value" so that other users cannot consume it as well. Moreover, the benefits of producing information rarely can be fully captured by the producer, and significant economies of scale are very frequently possible in producing or assembling the required information in a centralized activity. These economies of scale are so large that private vendors, who are in the business of manipulating and tailoring public (usually Federal) data for clients, could not survive if they had to pay their share of the cost of data collection.

There are also response rate problems in many areas where public authority, or at least public sponsorship, is essential to a useful product. Finally, there is a very important issue of credibility, or at least acceptability, especially when the private sector provider is self-interested as in the data provided by associations. We only have to go back to the days of the energy crisis to remember how dependent the Federal Government and the rest of us were on the data provided by the petroleum associations.

THE ROLE OF INSTITUTIONS

Much of the divergence between information needs and resources has been attributed to Federal divestment of data collection activities and to the institutional constraints on others to replace these activities effectively. This provides a strong case for reversing the Fedral abandonment of data programs, but it does not suggest a return to past institutional arrangements. The Federal Government's past role as an activist in data development has not solved the Nation's information needs for four reasons.

First, Federal data sources and local data needs have gone in opposite directions. Local needs for modeling, planning, operations, and management require more finely disaggregated, small-area data. Federal sources, with growing dependence on the Census Bureau and its serious financial and privacy constraints, have shifted toward more aggregated geography.

Second, Federal and local needs and interests have been diverging. Local planning and subsequent data needs have often involved the use of Federal funds to accomplish federally mandated goals in federally mandated ways. For example, metropolitan planning organizations (mandated by 23 USC 134) have used funds from the U.S. Department of Transportation and the Environmental Protection Agency to plan locally unpopular actions (such as vehicle inspection programs) to meet the Federal requirements under the Clean Air Act (42 USC 1857).

Third, the Federal Government has not been institutionally stable to produce data on a comprehensive and consistent basis. The life-expectancy of policy officials has been less than two years in many Federal agencies. Most data collection projects take far longer to design and implement. Thus, an official who invests in data is making a bequest to his successor, or to his successor's successor. Such interested and public-spirited officials are not common.

Finally, the Federal Government has never created an effective and lasting mechanism for systematic input of user needs. (Past efforts are described in the U.S. Department of Commerce, 1978; 1981.) There remains no consistent institution or persons to which those needs can be expressed. Some agencies, such as the U.S. Bureau of the Census, do encourage user input, but the discussions are generally focused on individual surveys. The results of this disjointed Federal statistical community are often inconsistent definitions and methods, unnecessary overlaps, and unmet data needs which have fallen between the cracks.

Clearly, a fresh approach is needed to restructure the institutional arrangements by which transportation data resources are developed and managed. To be successful, the approach must move closer to a synthesis of three dichotomies: collection agency versus functional agency, Federal versus local, and public versus private.

An important split in the arguments for and against alternative institutional arrangements is the collection agency approach versus the functional agency approach (Duncan and Clemence, 1981). Most European nations place their statistics programs in Ministries of Statistics which are separate from the functional agencies. Their data functions are also centralized within municipal governments (Zwingli, 1975). This assures continuity, but has often been found to reduce responsiveness and pertinence of statistical programs. The institutional issue is to find an organizational structure that balances responsiveness with continuity. An organization too close to daily needs may become too responsive, in the sense of losing a grasp of long-tern needs, and be rduced to answering "fire drills" and producing on-call statistics to buttress decisions after the fact.

The division of responsibility for information resources between Federal and local agencies can best be described today as "passing the buck." At present, no clear cut technical or political rules exist for placing responsibility at the Federal versus State and local levels. There are often scale economies involved in such programs. Neither these nor local needs are adequately considered. The role of the Federal Government acting as an agent for the States, local governments, or private sector in data development remains almost nonexistent.

The final dichotomy — that between public and private — is the most difficult and sensitive area of institutional concern. Replication of privately provided

data series can be seen as the ultimate in government waste and abuse. On the other hand, government dependence on the private sector for data in critical areas can be disastrous. The energy sector, where all supply and production statistics are privately generated, is the best example, but any sector where regulation is dependent on the regulated for information suffers the same problem. This can often debilitate public decisions where data are selective and self-serving. Federal data programs that parallel and duplicate private sector programs seem wasteful; however, these programs may be essential to assuring the protection of public needs. No decision process which is applied to transportation data to date adequately treats this question.

THE ROLE OF TRANSPORTATION RESEARCHERS

While much of the divergence between information needs and resources is institutionally caused and requires institutional solutions, the transportation researcher also has a share of the blame and a role in the solutions. The researcher is, after all, the critical link between the collected data and the executive or legislator who is the ultimate user of the information.

The link is often tenuous when others intervene between the individual researcher and the original data. For example, many researchers and their bosses or clients are not concerned about the possible demise of the U.S. Census Bureau's Commodity Transportation Survey (CTS) because commodity flow data are available from a host of private vendors. The reliance of virtually all private vendors on the CTS to calibrate their commodity flow estimates is generally unseen.

Few incentives exist for the private vendors and other transportation researchers to fight actively to preserve or improve a data collection activity. In most settings, the researcher is rewarded for answering questions from a decisionmaker. The decisionmaker usually has little interest in the data behind the answer, and rarely provides time or funds to collect substantial data beyond that which is readily available. Academic research is also limited by the lack of resources to finance major data collection activities. As a result, the researcher must make do with current information resources, and is unlikely to highlight the weakness of the data and thus shoot down the credibility of his own findings. The same disincentives have discouraged private vendors from fighting publicly for the CTS and other threatened surveys.

The data user community is not entirely without defendents. Particularly in the Federal Government, some researchers and decisionmakers have the opportunity to improve information resources. Their success is often limited, however, by their failure to develop effective justifications and priorities for providing transportation data. Such justifications and priorities are essential since the Nation's appetite for data collected by public agencies cannot — and should not — be satiated.

Both decisionmakers and researchers have generally failed to develop sufficiently strong justifications for adequate transportation data. Much desired data are expensive to obtain, take long periods of time to develop, and are highly perishable. These data must be seriously justified to survive, yet most benefit-cost analyses of data programs are cursory efforts which point to the existence of a data gap and to cost-effective ways to fill the gap. The benefits of filling the gap are not quantified, largely because such analysis raises very difficult questions. What are the benefits of a good decision versus a bad one? What share would better data play in reaching a better decision? Who would benefit from the informed decisionmaking (or be hurt by ignorance), and who would pay for the information? How can the benefits and costs be organized into a rational and acceptable list of priorities?

The need to justify information resources has been compounded by past failures to control the rising costs of data collection and information systems. Much controversy surrounded the $1 billion cost of the 1980 Census, and that cost could escalate four-fold by 1990 (U.S. General Accounting Office, 1982). While much has been said about potential gains in efficiency from new computer technology, the full potential is still unrealized in the public sector (cf. U.S. General Accounting Office 1978, 1981). Whether the private sector can do better remains to be seen.

Most efforts to justify a data program or improve the program's efficiency fall short because the efforts are focused on individual surveys. For example, the case for saving the CTS is incomplete when the value of the CTS is not placed in the context of other programs for collecting data on commodity flows and transportation activity. In other words, priorities among transportation data programs need to be established. Furthermore, portions of the CTS could be enhanced or replaced by the "allocation of transportation questions to other sur-

veys that are conducted by the Bureau of the Census." (Transportation Research Board, 1981). In summary, a comprehensive approach is needed to improve both the productivity of data collection and the support of information resources in transportation.

CONCLUSIONS

The divergence between information needs and resources in transportation has been instigated by budget cutbacks, paperwork reduction, and deregulation; however, the actual loss of needed information resources can be attributed to failures of institutions and of transportation researchers to identify and justify the valuable data, to improve the productivity of data collection, and to establish priorities. These trends will continue to the detriment of informed decisionmaking in both the public and private sides of transportation unless the institutions which develop and manage information resources are restructured with the active support of the transportation research community.

The prescribed form of needed institutional arrangements remains unclear. Certainly, new mechanisms are needed to permit joint design, development, and funding of data programs with local, Federal, and private sector participation. Severe institutional impediments now exist that inhibit the Federal Government from playing such a coordinative role. Private sector and local government relationships have been fundamentally bilateral relationships with the Federal Government. Few mechanisms exist currently at the local level for substantive, continuing interaction among the private sector, local planning agencies, and other groups. Both local governments and the private sector must seek for new mechanisms for cooperation and joint effort to improve information resources in transportation.

Local agencies and private firms must also shift from a reactive to an active mode, developing systems responsive to local goals and needs rather than Federal mandates. Meeting local, rather than Federal, data needs can become an important activity of regional agencies.

Coordination of local data collection activities between communities needs to become an activity of local governments or the private sector activity through their national organizations. The Federal Government probably will not do it, and when it wanted to, did not do it very well. Similarly, access to the experience and work of others in areas of concern will become an important activity of professional and civic associations at the national level. The Federal Government may become a major user of such systems, and perhaps an ombudsman for their activities, but it cannot be looked upon as a source and supporter in the future.

Both local governments and the private sector will need new mechanisms for obtaining a strong and common voice on transportation data needs, establishing new mechanisms to make their needs known at the national level. Mechanisms for achieving local or private needs at the national level using Federal capabilities, but without Federal funds, Federal input, or Federal control, need to be discovered.

Most importantly, the problem of supplying adequate information resources for transportation research must be recognized in its full scale and scope. The problem is not a lack of this data item or that, to be treated symptomatically on an ad hoc basis. It is a generic problem which requires systematic, institutional resolution. Transportation researchers can contribute to this resolution by determining the degree to which the validity of their products is dependent on existing data, and by exposing the subsequent vulnerability of their products to their clients. Perhaps then, a broader constituency of researchers and decisionmakers will develop to help close the gap between information needs and resources in transportation research..

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