

Information for Transportation Decision Making: Institutional Challenges

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Helping to initiate a discussion of the appropriate institutional forms that a comprehensive transportation information program might take is the goal of this paper. The purpose and scope of such a discussion are delineated; some of the institutional forms and types now operating in this sphere are surveyed; and the functions that institutions must perform in order to be effective are examined. In the first part of this paper, the aim is to establish an overview of the scope and character of national transportation data development. In the second part, the major transportation data-collecting institutions, federal, state, local, and private are examined, with particular emphasis on those federal entities within the U.S. DOT. In the third part, the institutional functions to be performed in the development of a National Transportation Statistical System are reviewed. These include: assembling data needs; program design; funding; program coordination; and product delivery. Preliminary observations are presented in a brief concluding section, not to draw definitive final conclusions and make recommendations, but rather to help guide further discussion. Fundamentally, these observations examine the argument that the present national transportation data program needs new institutions and institutional arrangements to give structure to the scope and scale of its activities.

OVERVIEW OF A COMPREHENSIVE TRANSPORTATION DATA PROGRAM

Purpose

This paper is part of an overall effort to assess the capabilities and needs of a transportation information program to support better transportation decision making in general and the U.S. DOT's policy planning requirements in particular. The study finds its immediate cause in the Secretary's Strategic Policy Study that early rediscovered the serious lack of effective information to support the policy planning effort. Although it was not possible to develop the needed information in time to meet the needs of the Secretary's initiative, it was decided to begin the process of forming an effective transportation information program to better inform future applications. This is appropriate to the conception of the policy planning effort as a continuing activity. Perhaps more significantly, the programs and policies proposed as part of the new policy are in many respects very "data-intensive" compared with past policies. Emphases in the policy on strategic assessment and system monitoring, policy evaluation, and so forth will demand more of the national transportation data system than it is presently capable of delivering.

Institutional Framework for an Information Program

The component elements of a comprehensive transportation information program are varied and complex. They include the technical skills required to design, assemble, and produce information; the software and hardware and other logistical capabilities to collate, store, and manipulate data; and the financial resources to support ongoing activities.

But this description neglects the more intangible elements that often are the main ingredients of success of a large scale program of public activity. These intangible elements include the public and institutional support that ratifies a public program and substitutes for the market success that justifies a private endeavor; and the public and private institutions that design, manage, ratify, and sustain the program over time. These institutional elements and their role in the success of transportation information programs are the focus of this paper.

The elements for a viable transportation information program are the following:

- Technical skills must be assembled and organized,
- Effective program designs must be created or adopted,
- Financial and other resources must be acquired, and
- Public support must be developed and sustained.

All of these elements must be assembled, focused, and managed if a program is to be launched successfully and then able to sustain itself over time. The history of transportation information programs has been that they have been initiated, usually with some success, in response to an ad hoc need, but have been unable to sustain themselves over the years. Technical skills have not been lacking. Program designs have been generally responsive. Resources and support have been weak but usually adequate. However, the lack of an institutional framework to give permanence to the ad hoc efforts has fundamentally precluded the prospect for long-term effectiveness.

An effective transportation information program must be primarily focused on the development of continuing data series-monitoring trends in supply, demand, and system performance rather than in squandering resources in ad hoc projects and responses to perennial "fire drills." Continuing programs require the application of common definitions and procedures employed uniformly over time. Although it could be argued that it is possible to accomplish this definitional permanence with different organizational entities coming and going, the most likely opportunity for success will be produced by an institution with permanence that can operate and sustain a continuing process over time, particularly one with a resource base that does not fluctuate erratically.

Scope of Data Coverage

It is appropriate to be more specific about the nature and scope of the data activities to be included in this assessment. First, it should be clearly recognized that no definitive delineation of the data set that is the object of such an undertaking exists. This is not to criticize the current effort, but rather to establish that a long-term need for such delineation has existed since the inception of national programs of transportation information development. The only serious effort at explicit delineation of a scope for a national program is "The Red Book" produced at Congressional request by the Office of the Secretary, U.S. DOT in 1969. Although never receiving formal support from U.S. DOT or Congress, this document has served as the informal boundary of the appropriate scope of a national transportation information program for 20 years (1).

The general focus of the kinds of data programs of interest are those engaged in meeting policy and planning data requirements. This, of course, can be interpreted broadly to include almost every activity of the department, other public agencies, and the entire transportation industry. In this case, it is more narrowly defined to include the data that permits broad assessment of the present and prospective supply, demand, and performance characteristics of the transportation system. The Canadian program in transport statistics refers to this data set as statistics "in support of policy, legislative, planning, regulatory, forecasting and monitoring functions" (2). A key concept in defining the scope of this data set is that its focus is most often on the relationship of transportation to broader economic and social factors in the nation.

More generic criteria to help establish the scope of the data of interest are that it includes "general purpose" statistical data on transportation—for example, information applicable to more than one program and more than one application; it typically focuses on the development of recurring data series that provide time series trend information as opposed to one time ad hoc issue coverage. In this sense, it includes data about

- Facility inventory, condition, and performance,
- Equipment inventory, condition and use,
- Carrier performance and condition,
- Passenger and freight flows,
- Demographics and general economic activity,
- Safety and security, and
- Finance and program administration.

It is perhaps useful to define certain data and related activities out of the scope of interest of this assessment. Out of scope areas include engineering data on structures, facilities, and vehicles; administrative data on departmental, state, local, and private firm operating accounts and personnel matters generally characterized by the label of Management Information Systems; and regulatory data that support day-to-day departmental, state, and local regulatory functions such as licensing and inspections. There certainly are occasions when these sources are valuable for meeting the information needs of the policy planning process, but fundamentally they represent secondary applications of these activities.

The defining concept regarding the data set that is the goal of these efforts concerns whether the data are (a) those nec-

essary for the U.S. DOT to meet its internal needs and support its mandated programs, or (b) are the data needs to be extended to meet the needs of the U.S. DOT and those other agencies linked to the U.S. DOT programmatically such as states and localities, or (c) further extended to meet general policy needs regarding all of the transport industry, and (d) yet further extended to meet industry needs for data for marketing and competitive analysis. How the U.S. DOT and the Congress construe the requirement will be crucial for program development.

GENERIC INSTITUTIONAL TYPES

The array of institutions and institutional arrangements associated with transportation information is formidable. It is appropriate for the purposes of this assessment to review those institutions and arrangements, not with the intent to perform an exhaustive inventory of every entity in the transportation data field, but rather to identify the generic institutional types that are involved. Thus a typology of institutions, functions, and activities is intended rather than a comprehensive listing.

Federal Institutions

Fundamentally the federal system for producing all statistics, not just transportation statistics, is a decentralized system. Many agencies may engage in the production, use, and dissemination of statistics. There have been numerous discussions from time to time about the merits of shifting to a more centralized system, notably by Duncan and Clemence (3). In other countries, such operations may be more centralized with a single ministry or statistical office managing the nation's statistical efforts. In that ministry, typically a transportation division serves as the recognized center of national transportation statistics. Staffing would consist of people knowledgeable in all areas of transportation. Most, if not all, appropriations for statistical activities would go to that division, which would be in charge of delineating the national transportation information program. The Canadian approach is somewhat of a hybrid between a centralized system and the far more decentralized United States approach. The Transport Division of Statistics Canada is the source of most of the significant Canadian national statistical measures in transport. However, although 60 percent of its funding is directly appropriated, the remainder is "cost shared" with funding received from other federal agencies and provincial governments. A memorandum of understanding between agencies structures these arrangements.

In the United States, the central reality regarding the production and dissemination of national transportation statistics is that it is a multi-purpose system with multiple masters. Generally, the national system contains at least three elements: a system of national accounts (SNA); a regulatory system(s); and, for lack of a better word, a transport system. This is paralleled in other countries as well. A description of these elements follows.

System of National Accounts

This, fundamentally, amounts to the accounting "book" of the nation—the accounting of goods and services produced

and received, the gross national product system, and the foreign trade statistics. The indexes of prices and the statistics of employment can also be considered part of this system for functional purposes. In the United States, as in other countries, these statistics are the most rigorously defined and formal, and usually have the longest continuous history. In the United States, these systems are planned and managed by the Bureau of Economic Analysis (BEA) and the Bureau of Labor Statistics (BLS). Data collection is predominantly conducted by the Bureau of the Census from major funding provided by the user agencies. In support of these programs, "nation defining" statistical systems, such as The Standard Industrial Classification and The Classifications of Occupations and Industries, are developed.

Regulatory System

The existence of a "Regulatory System" in the United States can be questioned given the recent deregulation at the federal level. (The Canadian program defines its system in two parts (a) an SNA, and (b) Regulatory and Transport system. With deregulation, the United States system may soon be best described in the same way.) In an historical context, the statistical systems of the Interstate Commerce Commission (ICC) and The Civil Aeronautics Board (CAB) were a central, critical element of the nation's statistical knowledge about air, rail, bus, pipeline, and trucking modes. Although these systems are basically gone, the current national system is largely a residue of this regulatory past. Significant user groups grew up around these systems with both regulatory and nonregulatory applications. The CAB system, absent some of the more arcane statistical elements of regulation, has been carried over into the U.S. DOT's aviation statistical program. The ICC's program has diminished significantly in scope and coverage. Other activities of government such as Foreign Trade and Customs reporting, and Income Tax data sources can be construed as part of the regulatory system. In Europe, this system has been the centerpiece of the transportation statistical system. Particularly the customs system permitted the extensive organization of freight and passenger flow data. The decline of regulation as part of the Europe 1992 program will challenge the systems of many nations. The regulatory statistical system also can include the data gathered by the FMC, FAA, FRA, and NHTSA as part of their regulatory roles.

Transport System

The "Transport System" can be briefly, and inadequately, defined as the data developed by the U.S. DOT and other transportation-related agencies, such as the Corps of Engineers and the Department of Agriculture, to meet their policy, economic analysis, planning, and monitoring needs. The referenced regulatory elements of U.S. DOT agencies can also be included here.

The hallmark of this system is that the U.S. DOT is a late arrival on the statistical scene. Therefore, it has sought to meet its statistical needs by adopting and adapting the statistical products of the other systems. The U.S. DOT's history extends about 25 years, whereas the SNA and Regulatory

Systems had almost a century of background. This has proven detrimental in the following ways: (a) the concepts and modes of expression of the SNA, although entirely appropriate to it, are often imperfect or even misleading for transport purposes; (b) the regulatory system was characterized by explicitly, and sometimes arbitrarily, defined reporting criteria that constrained possible analyses; (c) the depth and power of coverage in the regulatory system has been a function of the degree of government regulatory involvement which can differ sharply from other policy needs; and (d) changes in the systems, often made without consultation with U.S. DOT or other transport data users, most particularly the demise of regulatory reporting in the 1980s, left nonregulatory users without information support. (This was particularly important because alternative duplicating data collection activities were precluded by law.)

One of the predominant institutions in the federal transport statistics picture has been the Office of Statistical Policy at the Office of Management and Budget (OMB). This organization, using various names, and functioning from various locations in government over the years, reviews applications by agencies for statistical undertakings based on statistical and political grounds and concerns for public reporting burdens. Because of a lack of staffing and appropriate expertise, it has never been able to fully develop its program coordination functions. At one time, OMB sponsored an interagency transportation statistics coordinating group, but it was suspended apparently because of a lack of available staff support. A recent Bureau of the Census group that coordinates services-oriented statistics has partially filled that role.

State and Local Institutions

Although individual states and local governments will undertake active statistical programs to meet their own needs, the national statistical system contains few data series produced by states designed to be comprehensive national data sets. To be sure, there are many state-generated data sets of value when summed nationally, particularly in the highway area such as highway traffic, spending, and fuel consumption reporting.

For the most part, state and local efforts consist of reporting programs mandated by U.S. DOT agencies as part of funding requirements. The Highway Performance Monitoring System (HPMS) of the FHWA is perhaps the best example of such a program. This program, along with additional summary reports, comprise an effective summary tool of the status and condition of the federal-aid highway system. It is to be noted that the process of reporting is required by Congress on a biennial basis. Similar reporting activities exist in UMTA's programs for program assistance recipients, generally transit properties. The FAA has similar reporting requirements for aviation properties. None of these activities truly represent joint undertakings of state or local agencies with federal authorities. Also to be noted is that these systems are victims of their original genesis in program reporting. Thus the HPMS does not represent nonfederal aid local roads, and UMTA reporting does not provide data on private transit facilities.

Increasingly these agencies or their public interest group representatives such as AASHTO, NGA, NARC, and NACO

are recognizing the importance of improved data for their organizational policy and planning functions and those of their members, and have moved to respond to these needs. They represent a powerful, potential force for effective data program development. One particularly significant activity may represent a model for future actions. In 1980, U.S. DOT, with the Bureau of Census, developed a package of special, uniformly defined transport-oriented tabulations of the decennial census. More than 160 metropolitan areas and states purchased this jointly defined tabular package with federal assistance. This approach saved time and money, and increased uniformity. For 1990, the approach is being expanded to include all states and metropolitan areas under the U.S. DOT program eligible assistance. There are other examples of joint state undertakings to produce national data sets. Most recently, this has been stimulated by the 2020 process. Of particular note is a soon-to-be released report by an AASHTO Committee of the data difficulties observed in the 2020 process.

Intra-U.S. DOT Institutions

It is almost impossible to characterize the diverse number of organizations within the U.S. DOT engaged in data development activities. The one clear indication to be obtained from a review of the U.S. DOT organizational structure regarding information programs is the lack of a central statistical organization. A number of organizations in the Office of the Secretary play parts of a central statistical role. The Office of Information Resource Management, under the Administrative Secretariat, performs the OMB statistical policy liaison and data collection review functions and other oversight functions in its Information Requirements Division. The Transportation Systems Center, no longer in the Office of the Secretary, contains the Center for Transportation Information within its Office of Information Resources, which performs departmentwide statistical reporting functions. Elements of the Policy Secretariat perform statistical overview functions as well.

In the administrations, offices involved with producing statistics are widely distributed and given names that may or may not signal their data-related functions. There is no simple way to identify the key statistical office in any administration, or to determine any functional equivalence between offices of the different administrations. No administration has a central statistical coordination office or function, other than for paperwork management. Fortunately, informal coordination and exchange of experience occurs between professionals in the various programs, but it is not supported by any formal structure. The following listing seeks to identify those offices in the U.S. DOT with significant information functions as here defined:

- Office of the Secretary
 - Office of Economics
 - Office of International Aviation
 - Office of Aviation Analysis
 - Office of Information Resource Management
 - Office of Intergovernmental and Consumer Affairs
- Coast Guard
 - Office of Law Enforcement and Defense Operations

- Office of Navigation Safety and Waterway Services
- Office of Command Control and Communications
- Federal Aviation Administration
 - Office of Management Systems
 - Office of Aviation Policy and Plans
 - Office of Planning and Programming
 - Office of Air Traffic Eval. and Analysis
 - Office of Aviation Safety Analysis
- Federal Highway Administration
 - Office of Policy Development
 - Office of Information Management
 - Office of Planning
 - Office of Motor Carrier Information Management and Analysis
- Federal Rail Administration
 - Office of Policy
 - Office of Freight Services
 - Office of Passenger Services
- National Highway Traffic Safety Administration
 - National Center for Statistics and Analysis
 - Office of Market Incentives
 - Office of Alcohol and State Programs
 - Office of Defects Investigation
- Urban Mass Transportation Administration
 - Office of Capital and Formula Assistance
 - Office of Planning
 - Office of Mobility Enhancement
- Maritime Administration
 - Office of Information Resource Management
 - Office of Trade Analysis and Insurance
 - Office of Policy and Plans
- Research and Special Programs Administration
 - Office of Aviation Information Management
 - Office of Research and Technology
 - Office of Program Management and Information
 - Office of Emergency Transportation
 - Office of Pipeline Safety
 - Office of Hazardous Materials Transportation
 - Office of Information Resources (TSC)

Private Institutions

The increased involvement in data development programs of some private sector organizations has been one of the bright spots in transportation data systems since deregulation. The process of establishing more active programs has been highly variable from organization to organization and it is unclear what stimuli have been at work to create effective programs in some cases but not others.

Some of the more active programs have been initiated at the Association of American Railroads (AAR) and the American Trucking Associations. These programs certainly reflect the greater needs for data among their constituents stemming from the market-driven effects of deregulation on competition within and between these industries. On the other hand, organizations such as the American Bus Association and Air Transport Association have seen real declines in their data-oriented activities. Importantly, one of the casualties of deregulation was the Transportation Association of America (TAA), which focused heavily on regulatory issues. Its information

programs and perspective on the industry were important elements in the transport data picture.

The residual effects of regulation and deregulation are still with us. Many private sector firms still have fears about government reporting based on years of unpleasant experience with the ICC or other regulatory organizations. They resist individually or through their associations any attempts at expanded industry reporting, often even resisting reporting that would be held confidentially within the industry. At the same time, deregulation has made the marketplace more data-intensive, engendering strong interest in marketing data to serve the industry, but not in reporting about the industry itself. One of the major changes generated by deregulation was the increasing importance of segments of the transportation industry that had been minor players before, and for which data reporting was minimal, notably package express carriers, freight forwarders, brokers, private carriers, and short line railroads.

In some cases, new institutional approaches have evolved. In the public sector, the Bureau of the Census has moved to fill important data gaps about transportation industries previously covered by regulatory reporting. The confidentiality rules of the bureau appear to help calm fears about individual reporting of some deregulated firms.

In the private sector, the AAR has developed a contractual relationship with the FRA and the ICC to manage and assist in developing data concerning its industry. This has proven to be an effective new data development instrument.

Another innovation has evolved from the program that produced Transportation Facts and Trends, a national summary of transportation activity in the TAA. When that association declined with deregulation, the document was continued privately by former TAA staff on an interim basis with the new name "Transportation in America." It has now been adopted and given new status and support by a private foundation, The Eno Foundation for Transportation, Inc.

The role of private firms in data development pertinent to transportation has been limited for the most part to niche filling. In the passenger sphere, most data are developed by organizations oriented to the intercity travel and tourism industry focusing on magazine advertising marketing. Primary data of value are produced by these organizations, most notably the U.S. Travel Data Center. Worth noting is that the most extensive surveying of intercity travel in the United States performed since the demise of the National Travel Survey in 1977 was conducted by the Canadian government to assist its tourism planning. In the freight data sphere, a mixture of economic consulting firms and ad hoc data development firms have sought to meet industry needs as a result of increased demand and reduced supply for data resulting from deregulation. The recent TRB-Transportation Research Forum on freight data needs documented those limited developments. The most important government-private vendor relationships to be recognized is that transportation data vendors are primarily value-added operators manipulating, modifying, and supplementing public data sources. They enhance, but do not replace, public sources.

Two developments may affect private sector data development capabilities. One is the growing interest in Geographic Information Systems (GIS) stemming from new developments in computer processing and geographic base files.

This may stimulate greater interest in the data sets appropriate to GIS systems. A related technological development is the growing use of computers for electronic data interchange (EDI) in managing freight shipments. This could expand opportunities for private and public data development but with very complex institutional ramifications. The means will soon exist for an industry to assemble its automated working files, purge them of individual identifications, and produce nationally useful vehicle, commodity, or passenger flow statistics on a current and continuing basis.

INSTITUTIONAL FUNCTIONS OF A TRANSPORTATION PROGRAM

A distinct set of functions is associated with the effective development and operation of a comprehensive information program which generates special institutional requirements. The following discussion treats these institutional requirements.

Assembling Data Needs

The assessment and determination of information needs is a critical professional function of an effective program. The needs assessment function has many facets.

Center of Comments

The community of transportation data users lacks a mechanism through which it can express its information needs. Users from all sectors, federal, state, and local agencies, private establishments, and private and public operators, have disparate information needs and no useful institutional entity to which to they can express their requirements and see those requirements collated with others into a comprehensive statement. In some instances, private operators may be able to take action to collect the information themselves. But when such action is beyond the capability of an individual actor or even an entire industry, or is more appropriately a public program, the private sector has no public source to which to express its needs. As an example of an approach to this problem, Canada established a Federal-Provincial Committee on Transportation Statistics in 1976 to provide a forum to discuss transport statistics issues.

One aspect of this function is linked to the ability to locate needed information. Often organizations will assume that data must exist somewhere to meet their needs, but that they have just failed to locate it. They may waste valuable resources in a fruitless search for nonexistent data.

Certain distinctions about the character and scope of this function differentiate it from other functions. First, the value of the function is in acting as a collector and collator of information requirements. This is distinct from the function of the action agency that might actually collect data to respond to deficiencies. Second, it is also distinct from the function of a data repository that may serve users as the prime source of information about information. These functions may all be well served by combining them in a single institution, but they need to be recognized as discrete functions.

Needs Identification

Aside from the value of an "assembly point" for expressions of public and private information needs, there is a further needs-related function. This is an analytical function that includes evaluation of existing available sources and identification of key gaps and deficiencies. Although the first function may be seen as one to be performed by a secretariat-type institution, this function must be the province of transportation analysts and statistical professionals. This function may also serve to discover opportunities in the statistical system for beneficial changes as well as identifying deficiencies.

Not the least of the professional functions involved is the construction of appropriate typological nomenclature for describing information and information requirements. Many elements of the transportation industry suffer from the lack of commonly accepted detailed definitions of terminology. Transportation is a complex, fascinating mix of engineering, economics, sociology, and other disciplines. This expands the range and scope of data requirements and adds to the semantic and definitional problems involved. The recent publication of an urban public transportation glossary by the Committee on Public Transportation Planning and Development of the TRB is one example of the kind of work that is needed.

Secondarily, an institutional entity engaged in assembling and organizing information needs may become "a locus of concern" for better transportation information.

Comprehensive Program Design

An important function allied to the identification of needs and gaps is the program design function. Fundamentally, this function involves both analysis and synthesis—analysis of future data demands based on long term policy trends and synthesis of existing needs and resources into a comprehensive needs statement as input to design.

Comprehensive program design is perhaps the most challenging professional task in an information program. It must be a prospective activity, taking into account future transportation trends and the likely directions for policy and analytical focus.

A current case serves well as an example. Departmental interest and support for intercity passenger travel surveys declined in the 1970s. The demise of the Census Bureau's National Travel Survey after 1977 was permitted without concern for a substitute. The element of the 1983 Nationwide Personal Travel Study (NPTS) focusing on long distance travel was limited in scope and depth. Even the presence of this minimal element in the 1990 NPTS has been threatened by funding troubles. At the same time, the national policy trend is toward extensive consideration of intercity travel congestion problems and ways to serve it by traditional means or by consideration of prospective opportunities for private or public high speed rail operations and new air technologies. Very soon, it will become clear that the kinds of data needed for the sophisticated analyses required are lacking. The development of intercity passenger data surveys will require a number of years to create, thus delaying the analytical and decision process. This demonstrates the clear need for the development of a design function which can anticipate future

data requirements and link disparate needs in an overall comprehensive program.

Funding

Lack of adequate funding and erratic variations in funding availability have damaged the effectiveness of some transportation data programs important for policy decision making. A critical function for any data program will be the assessment of resource needs and the building of a funding mechanism to sustain the program on a continuing basis. As noted elsewhere, interest in data programs suffers peaks and valleys. The weakness of past programs has been the inability to establish stable funding mechanisms during periods of peak interest to sustain project efforts during periods of declining concern. This has resulted in a cyclical funding process peaking when data subjects are in vogue, as during the energy crisis of the 1970s, and then trying to reconstruct viable programs again after periods of disinterest.

A number of funding mechanisms have been employed at various times to sustain programs or individual projects. All of them can be considered as options for future funding. The institutional variations involved in these funding alternatives are important to consider.

Centralized Funding

The most evident funding approach for public national data programs is Congressional appropriations. There has never been a centralized DOT line item for data. From time to time, individual programs have become line items, especially in the modal administrations rather than on a departmentwide basis. Other agencies concerned with transportation data, either as using agencies or collectors, such as the ICC, the Corps of Engineers, the Bureau of the Census, and so forth have rarely given transportation data the status of a budget line item on a sustained basis. This is important beyond the funding effects it implies, because it contributes to the lack of Congressional focus on the subject.

A number of variant forms of centralized funding are worth noting. These include U.S. DOT budgeting of data programs through specific data-related line items; U.S. DOT funding of data programs as part of program funding generally when data are highly related to and justified by a specific program; and funding from within the budget of a data collection agency as part of its overall program. Each of these approaches has been used from time to time in the evolution of developing a national transportation program. A central issue in such a decentralized approach is the question of whether an agreed-to program—for example, a national travel survey—should be funded at the U.S. DOT and contracted to the Bureau of the Census, or funded directly at the Bureau by the Congress. There are pros and cons associated with each approach not the least of which is deciding on the path most likely to produce the needed funding. (The Canadian system formalizes this process with a Memorandum of Understanding between the Ministry of Transport, The National Transportation Agency, and Statistics Canada in which the functional and funding obligations of each agency are spelled out. "A Base Pro-

gram," funded within Statistics Canada, is acknowledged and "A Cost Recovery Program," funded by the other agencies, is identified.)

Consortium Funding

One of the effects of a lack of centralized funding or the lack of a single large scale program funding source has been the tendency to develop consortia of interest around individual projects or programs to provide needed funding. In this approach, a "lead agency," usually self-defined, determines a need and establishes a project to respond. It seeks agencies with similar needs and interests that will contribute to financially support the effort. This approach has all the positive and negative aspects inherent in joint activity. It can be negatively characterized as "pass the hat financing," in which programs engage in a scavenger hunt for would-be supporters with money, while time and money are wasted in endless meetings and coordination. On the positive side, it represents something of a system of "checks and balances" in which appropriately related interests must be sought and properly represented to gain needed funding. Many of the U.S. DOT's major data programs have been funded in this way. Of particular importance as a case in point is the 1990 NPTS.

Pooled Funding

Pooled funding may be considered as a special case of consortium funding. It is akin to subscription funding often used in the private sector. In this approach, an idea for a project is advanced by "sponsors" who permit prospective users to "buy in" for a fee. These users are not sponsors and have no management responsibilities. This is most notably used in data collection programs developed jointly between the federal government and state and local governments. In 1980, this method was used by local government agencies (MPOs) working with states to purchase special tabulations of U.S. DOT-developed transportation-related decennial census data. A variant form will be used to develop the 1990 decennial package of census reports.

Cost Recovery Funding

In federal statistical programs, the question of cost recovery has been a major issue. In efforts to reduce costs, programs have been required to try to recover components of their costs from users. Problems of pricing policy then become significant. There are problems of seeking to recover the full costs of collection or only of processing, printing, and dissemination—akin to issues of average versus marginal cost pricing. There are problems of time value of data—for example, pricing early reporting higher than second or third hand distribution. The fact that government does not copyright its statistical products makes extensive recovery of costs highly unlikely. These issues are a product of the differing goals of private and public data collection programs. Private programs developed for profit rarely care about the broad use of their data except in a marketing sense; in fact, they have a strong interest

in curtailing uncompensated use, whereas public programs collect data they deem to be in the public interest and almost always have an interest in the broadest public use of their data. Charging fees for the data can conflict with this goal.

There are few examples of user fees paying a major share of data collection and processing costs in the transportation sphere. A significant exception was the approach to handling data requests in the program of aviation statistics of the former Civil Aeronautics Board. It contracted out its statistical reporting process to firms that would provide data processing services to requestors for a fee. The approach was apparently successful in the highly data-oriented aviation industry.

Private Funding

The private sector has been active in recent years in developing transportation statistics in certain sectors. Much of this has been as a result of losses in public data reporting and the increased demand for information among carriers resulting from deregulation. These private programs have enjoyed varying degrees of qualitative and financial success.

An important dichotomy needs to be made in private data collection between the limited number of primary source data collection efforts and the more typical value-added private efforts that market enhanced versions of publicly produced primary sources. In the latter case, in which the firms depend heavily on the public system for their sources, little is contributed to actual funding of data collection. In fact, the effects may even be deleterious as users become remote from the information sources. Where private industry is the primary source of data collection, a key question is whether public agencies, federal or other, are the major source of the revenue supporting the private venture. This is true in many cases. As a result, the public funding question remains a problem, whether to do a project or buy it from a vendor. Some cases do exist of private funding support of public data collection efforts usually on a partial basis but these efforts are quite rare.

Program Coordination and Monitoring

The funding process often serves as a monitoring and coordination system for information programs in that program sponsors, often working in a consortium, will meet regularly and receive reports on program status as part of their fiscal management responsibilities. But program coordination and program monitoring needs go well beyond this indirect tool. Literally dozens of federal agencies have the responsibility and means to collect data of transportation interest. For instance, the Department of Agriculture tracks arrivals and departures of farm product shipments at major freight terminals; the Customs and Passport agencies obtain information pertinent to international travel monitoring, and so forth. No mechanisms currently exist to assure coordination of decisions about data collection efforts between interested agencies.

One of the key events in the history of federal transport statistics was the dramatic changes in federal reporting as a result of deregulation of air, rail, truck, and bus travel. In many instances, significant data requirements were met by the regulatory reporting in these modal sectors outside the

needs of the regulatory agencies themselves. Large public and private user constituencies grew up depending on these sources, particularly because the general purpose statistical agencies, such as the Bureau of the Census, were precluded from duplicating regulatory efforts. The agencies took different perspectives regarding meeting the needs of outside users when regulatory reporting requirements declined. The CAB recognized an obligation to be responsive to outside users: The ICC did not. Varying degrees of coordination resulted in varying degrees of availability of data.

No formal or serious informal mechanisms exist in transport data collection to make user and producer agencies, whether public or private, aware of changes in reporting systems, publications of data, and so forth unless covered by federal register reporting requirements.

Delivery Systems

A key part of the functions of a comprehensive transportation information program is maintaining and improving the relationship between the producer and user of statistics. Any institution engaged in this function must recognize user needs and organize the institutional framework to be responsive. Among the key elements in the interface are the need for timeliness and for the appropriate design and availability of products.

One of the major weaknesses of publicly provided transportation data programs is the lack of timely reporting. This is often a product of inadequate resources—first in that data are collected infrequently; second, when collected take too long to process and prepare for release. This latter problem may result from problems of staff resources, financial capability, or lack of priority given to these needs.

Part of the concern regarding responsiveness to users is in the process of developing user products. Some data programs exist only for the purpose of meeting the internal needs of an agency. Even here, the ability to rapidly prepare requested tabulations in a cost-effective manner is important. But in the majority of cases, data programs, especially those producing general purpose statistics, must function as a wholesaler and retailer. Client needs in terms of data content, quality, timing, and costs must be considered.

The question of user costs for work products generates a number of policy issues. In some cases, a program with limited resources can do damage to itself in providing products at below cost or no cost to users, reducing funds available for other applications. In some programs, even where user products are properly priced, the program agency may not be permitted to receive funds. Consequently, responsive user products that "sell" well may be a net drain on resources. A further public policy question arises over pricing policies that may retard the distribution of important survey results obtained at substantial public expense. An argument can be made that such cost recovery approaches are not cost-effective. If substantial public funds were warranted to obtain information, a very small incremental increase in public costs would typically be warranted to assure broadest dissemination of the results.

All of these questions are part of the topic of building strong support for data programs among prospective constituents.

No public transportation information program in the United States has ever actively engaged in identifying and building rapport with prospective constituents.

Interrelated with this question of user support are the mechanisms by which data programs are justified. Fundamentally, these mechanisms reduce to being a function of the persuasiveness of the program officials involved. There are no objective tests of need for data, no measures of data adequacy in a program, and no cost-effectiveness tests that prove the value of additional information. Data program officials can assemble lists of users who requested certain information. They can appeal to the reason and objectivity of public officials and legislators, or use the arguments of professional judgment. Development of better means of assessing and proving data needs are required. This is particularly true given the dramatic costs that can be involved in large scale data programs.

CONCLUDING OBSERVATIONS

Helping to initiate a discussion of the appropriate institutional forms that a comprehensive transportation information program might take was the goal of this paper. It has delineated the purpose and scope of such a discussion; surveyed some of the institutional forms and types now operating in this sphere; and examined the functions that institutions must perform in order to be effective.

Observations at this stage are necessarily preliminary, but perhaps can help guide further discussion:

1. The present national transportation data program does need new institutions and institutional arrangements to give structure to the scope and scale of its activities.
2. It is too easy to suggest that a centralized institutional arrangement is needed for a transportation information program to succeed. This is usually the reflex response to statistical program problems in transportation. It may turn out that centralization is desirable, at least for certain functions, but much more discussion and analysis are required before arriving at such a conclusion. The transport sector is so multifaceted and diverse that a distributed system of statistical development reflecting that diversity may be more appropriate with some centralized coordinating elements. Minimally, discussion should focus on what program elements are appropriate to and benefited by centralization.
3. A National Transportation Statistical System (NTSS) needs to be explicitly defined. A context-setting document that explicitly includes and excludes the scope of data and data programs of interest is needed.
4. The forms and content of possible memoranda of understanding between producer and user agencies following the Canadian model should be explored.
5. Mechanisms for providing opportunities for input and assembly of expressions of data needs are required. Institutional mechanisms to accomplish this must be explored.
6. Separate Intra-U.S. DOT and interagency institutions are needed to coordinate data programs and plans.
7. An assessment of alternative institutional mechanisms to produce and manage data that are employed in other sectors of the economy and in transportation statistical systems abroad would be very valuable.

8. Private-public mechanisms for data development need to be assessed. The ability of the private sector to produce data and the ability of the public sector to purchase it needs to be better defined.

9. The opportunities for new forms of data development based on emerging technologies need to be seriously evaluated. The institutional structures necessary for their implementation are key to their prospective utility. Public actions needed to facilitate these institutional arrangements should be identified.

10. The Congress must be engaged in this discussion. Congressional requests for information in the past, particularly for recurring reporting such as HPMS, have led to the initiation of most of the effective programs that do exist. On

the other hand, congressional disinterest in transportation data needs, as manifested in its response to the "red book" 20 years ago, instilled a similar disinterest within DOT that caused most of the national transportation data program weaknesses until now.

REFERENCES

1. U.S. Congress. House. Committee on Appropriations. *Transportation Information*. OST, May, 1969.
2. Program Review, Transportation Division, Statistics Canada, July, 1989.
3. J. W. Duncan and T. Clemence. *Arguments for and Against a Decentralized Federal Statistical System*. *Statistical Reporter*, Dec., 1981.