

Current National Highway Data Requirements

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The Committee on Transportation Data and Information Systems deserves congratulations for sponsoring this conference. The committee has existed, under different names, for the past 25 years and has made numerous major contributions toward promoting the collection of meaningful transportation data for the nation. It has been an effective vehicle for disseminating information on available data. It has also been effective in helping to steer the efforts of data collectors, such as the FHWA's Office of Highway Information Management and numerous Bureau of the Census efforts. How fitting it is that as the nation contemplates the direction of our transportation policy, plans, and programs for the next several decades, this conference is being conducted to reanalyze our transportation data needs.

I was asked to talk about current data systems for highways, which I shall do, but I would also like to take this opportunity to offer some personal opinions on future data needs. Maybe some of these thoughts will be useful this afternoon at one of your concurrent workshops on the development of recommendations for future data improvements and information system needs.

The current FHWA data system for highway information is almost totally dependent upon the states. Those working in the FHWA evaluate, summarize, and interpret the data submitted, and maintain the information for national and state analyses. The staff also develops trend indicators and perform some of the national analyses. This cooperative federal-state arrangement was started in 1936 and has worked well over years. The data that the U.S. DOT and the FHWA need at a national scale are mostly derivative of the data that the states need to support their highway program. As the nation's socioeconomic characteristics and transportation demands have changed, so have our data needs. Through meetings such as this, data items and categories were modified and updated in a collaborative process.

The primary driving force behind this cooperative data program was to provide a wide range of information to serve a variety of transportation planning activities. Reasonable estimates for planning purposes were generally adequate to provide a basis for projections of future patterns.

However, a distinct change began evolving in recent years. This change was the use of some of the state-supplied data for the apportionment of federal-aid highway funds. The states and the FHWA took on new roles for which neither had much experience. Previously (and still for some programs), apportionment data was somewhat noncontroversial when the Census Bureau gave FHWA population figures every 10 years,

and the Post Office Department provided the Postal Road mileage. With that system, the recipients of funds had no input into data that was used in the apportionment calculations. Life was much simpler when the FHWA did not find itself in a "watchdog" position. The change to the use of data supplied by the states has slowly begun to significantly influence the cooperative process. A higher degree of accuracy is now needed for some data series to ensure that federal-aid funds are distributed to the states in a fair and equitable manner. This, as one would expect, has generated comprehensive dialogue between the state supplying the data and the FHWA, which must use the data in apportioning federal-aid funds. It has also resulted in a significant increase of FHWA's oversight of state-related data collection activities and the procedures in use by the states to derive certain data items. Because of the monetary implications, we have also seen, and will continue to see, a higher degree of program oversight by organizations such as the General Accounting Office.

PRIMARY DATA SERIES

The Office of Highway Information Management maintains three basic data series:

1. The Highway Performance Monitoring System and related data series consist of information about the highway system, its use, extent, condition, operations, and resulting performance.
2. The Highway Users and Finance data provide information regarding the users and economics of the system: tax structure, road users costs, and costs to build, maintain, and operate the system.
3. The Nationwide Personal Transportation Study (NPTS) provides data on the personal travel habits of the population, which is collected as part of the decennial census.

In addition to these activities, a fourth area will also be discussed here, the Bureau of the Census Truck Inventory and Use Survey (TIUS) and the follow-on Nationwide Truck Activity and Commodity Survey being sponsored by FHWA.

Also, there are a number of other important national data programs with which FHWA closely coordinates. The National Bridge Inventory concentrates on the type and condition of the bridges in the United States. Similarly, the Fatal Accident Reporting System (FARS) is maintained by the National Highway Traffic Safety Administration (NHTSA). Others are the Office of Motor Carriers' SAFETYNET truck accident reporting system and the FHWA Fiscal Management Infor-

mation System. There are many others. Because of time limitations, only the systems mentioned earlier will be discussed here.

Highway Performance Monitoring System (HPMS)

The Highway Performance Monitoring System, or HPMS was established by FHWA in 1978 in response to a series of earlier one-time special national studies requested by Congress. The system, established as an ongoing and continually updated statistical data base, has many uses. One primary use is to provide basic information for the Biennial Reports to Congress titled *The Status of the Nation's Highways and Bridges*. Another use is a source for our annual mileage and travel tables for the publication, *Highway Statistics*. Prior to the HPMS, each congressionally-mandated study required the collection of massive amounts of data for one point in time. It was difficult to develop any trend data from these studies because definitions, categories, standards, and geographical detail were different in each of the studies. Routine statistical reports were out of date and lacked correlation among the many data items. After much frustration, it was generally agreed that a continuous, comprehensive, and comparable data system was necessary.

The HPMS provides basic information on all roadway mileage in the nation, such as extent, functional classification, jurisdictional responsibility, and the like. Detailed information concerning the extent, performance, operating characteristics, usage, pavement type, composition, condition, and so forth, is obtained for a sample of about 102,000 arterial and collector roadway sections. Additional information is reported by the states in the form of areawide summary data, which includes fatal and injury accident data. HPMS data is reported by all states and is stratified into three sub-state components (rural, small urban, and urbanized). Six functional systems within each sub-state component are sampled separately. The HPMS provides consistent, accurate information for national and state purposes. It can and has been supplemented for sub-state areas in a number of states.

In addition to information on the physical highway system, the states also collect truck weight, vehicle classification, and traffic count data. Each month, the states provide information on traffic volumes by hour of the day, day of the week, and month of the year from some 3,500 permanent traffic counters throughout the United States. Annually, the states provide information on the vehicle classes using the nation's highways as well as the weight of the trucks.

Highway User and Finance System

Some of the characteristics of our Highway User and Finance System, or the data reported under the *Guide for Reporting Highway Statistics* merit attention. Comprehensive data on the economics of the highway system, tax structure, revenues, and expenditures by highway system that have been reported by the states are published in the annual *Highway Statistics*. Highway finance data encompass complete, comprehensive information on receipts and disbursements for highways by all units of government. This makes 43 years of data and

provides a continuing baseline of information for state and national policy deliberations.

Other data in the Highway User component of this series include motor fuel, vehicle registrations, and licensed drivers. Motor fuel data, reported monthly, are used for many purposes, including estimates of Federal Highway Trust Fund receipts attributable to each state. Thus, this data series serves as the basis for calculating the state 85 percent minimum allocation of funds. Therefore, motor fuel data are used indirectly in apportioning these funds. Motor fuel data have also been proposed by some as a candidate factor for apportioning funds in the new post-Interstate programs in the upcoming highway reauthorization bill.

Personal Travel Surveys

Another subject worth discussing is the travel data collected directly from highway users at the household level. There are two basic sources of such information. One is from the decennial Census, which includes a 16 percent sample of work trip characteristics. Others at this conference have focused on this important cooperative undertaking so the topic does not need elaboration here. The other is from the Nationwide Personal Transportation Study (NPTS), which has been conducted on a 5- to 7-year basis since 1969.

The NPTS is a nationwide inventory of households to determine the residents' travel characteristics on a typical day. The travel characteristics collected include all person-trips for all lengths by all modes. The sample, distributed over each day of the week for a full 12-month period, also contains an inventory of the motor vehicles available to the households and their use in the previous year. Various other socioeconomic and demographic data related to the travel characteristics in subsequent analyses are also obtained. The NPTS is a cooperative survey sponsored by four agencies of the U.S. Department of Transportation (OST, UMTA, NHTSA, and FHWA). FHWA has the technical and administrative lead for the survey, as well as for the coordination of the analyses and publication of results. The NPTS is the only nationwide continuing, comprehensive survey of personal travel, and is used by researchers, policy development staff of various organizations, national associations, other federal agencies, state, and local governments, students, and private sector organizations concerned with the relationship of travel to demographics. It is an excellent source of current personal travel characteristics and, because of its relative consistency and similarity from survey to survey, it is a valuable tool for assessing trends in these travel characteristics over time.

It is hoped that the next survey will commence in February 1990, with data collection from 18,000 households spread over 12 months. All household members, ages 14 and older, will be personally interviewed, with proxy interviews for household members 5 to 13 years old.

Previous surveys in 1969, 1977, and 1983 were conducted by personal interviews by the Bureau of the Census. Two significant changes were introduced for the 1990 survey. It will be conducted by a private contractor, Research Triangle Institute of North Carolina, using a computer-assisted telephone interview technique otherwise known as CATI. Observations by my staff of the pretest activity conducted this past

summer, as well as the review of preliminary pretest results, are encouraging and reinforce the position that CATI is an effective data-collection technique.

In addition to the 18,000-household national sample, arrangements have been made whereby interested Metropolitan Planning Organizations (MPOs) can contract directly with RTI to enhance the sample for their respective areas. Enhanced samples would be available to the MPOs in addition to their portion of the sample included in the national survey and would provide valuable travel data and related characteristics at a reasonable cost. Many MPOs have expressed an interest in doing this.

The OMB clearance request for data collection is currently being finalized within the department. Inasmuch as the Office of Management and Budget (OMB) cleared the pretest earlier this summer, we are optimistic. The schedule for the NPTS is for data collection from February 1990 to January 1991; receipt of dataset from RTI in the spring of 1991; release of public-use tape in the summer of 1991; and report of survey results in late 1991.

Truck Surveys

Although the Census and NPTS focus heavily on personal transportation, two other important studies focus heavily on freight movement on our highways. The quinquennial Truck Inventory and Use Survey (TIUS), conducted by the U.S. Bureau of the Census, provides data on the physical and operational characteristics of the nation's truck fleet. The data are developed for a sample of private and commercial trucks drawn from vehicle registration files for the 50 states and the District of Columbia. Data related to truck activity for calendar year 1987 was collected in 1988. Processing the data has been underway during 1989. Survey results are expected to be available at the end of this year.

The TIUS is the most important single Census survey for truck policy analysis. Among the data items collected are average weight, maximum gross weight, annual miles of travel, miles per gallon, products carried, and areas of operation for different truck configurations operated by a variety of motor carriers.

The Nationwide Truck Activity and Commodity Survey (NTACS) is financed primarily by FHWA and conducted, under contract, by the Bureau of the Census as a follow-on to the TIUS. The NTACS measures detailed trip characteristics and other information for trucks on randomly sampled days. The sample includes all trucks which were reported as carrying commodities over long distances in the 1987 TIUS, approximately half the trucks which were reported as carrying commodities locally in the 1987 TIUS, and a small portion of the remaining 1987 TIUS respondents. The NTACS questionnaires are being distributed for sample days throughout a year, recently starting in fall of 1989.

The NTACS provides the only effective, empirical link between data on truck characteristics, travel patterns, commodity flows, and highway condition. The NTACS is also the only source of data on commodity flows by truck and on the interactions between trucking and other economic activity. These data are essential for long-range forecasts of highway use, for analyses of the economic performance of the trucking

industry, and for analyses of impacts of trucking and highways on other sectors of the economy.

The combined TIUS and NTACS cover all forms of trucking (except that done by government trucks), and offer unprecedented detail on vehicle, shipment, and economic characteristics. Results of this study are anticipated by the end of calendar year 1990.

ANTICIPATED CHANGES

A number of improvements should be incorporated into the highway statistical system.

HPMS

Several major changes have been made to the HPMS over the past 5 years, the most significant change being in the area of pavement data. Recent changes were made to enrich our knowledge of pavements by collecting standardized calibrated roughness data (the International Roughness Index which is reported in inches per mile) so that pavement roughness can be compared among states. This valuable information will be available next year. Similarly, FHWA and the states have made significant efforts to improve the quality of the traffic data. More work remains in this area, however.

Additional changes will be needed in HPMS in the next 5 years for at least three reasons. First, the 1990 decennial Census will significantly change the urban boundaries. Second, it appears that the highway reauthorization legislation will offer new challenges in system designation. The proposed System of National Significance (SONS) has been mentioned by other speakers, and the selection of that system must be reflected in the HPMS. Third, it is important to be sure that HPMS is fully sensitive to current and emerging issues. In this vein, some fine-tuning may be necessary to adequately reflect urban and suburban congestion issues. Next might be the geographical identification of the location of the sampled roadway segments. Maybe the TIGER system can help here. The traffic data must continue to improve as it becomes more extensively used for apportionment. Truck data must also continue to improve. As for new data items, there will not be many, or perhaps any, but that does not mean that there will not be any improvement or changes to the system.

Highway User and Finance

Changes in highway finance data series are likely to focus on improving the completeness and accuracy of information on local government capital outlay by functional system. Some states have not developed the capacity to report this information on a continuing basis although the data series was established 10 years ago. Improvements are needed to better serve the needs of the transportation community.

Motor fuel reporting is well established and considered complete and fairly reliable. However, there are some problems in achieving complete, accurate reporting by the states for interstate motorcarrier fuel use and gasohol sales. Continuing cooperation of the states is needed to strengthen the

reporting in these areas. The data will, likewise, become even stronger as state and federal initiatives to eliminate tax evasion and fuel diversion are implemented.

Another data item that needs strengthening is on heavy truck registrations, which is very incomplete. It is necessary to fill in the holes on this one now that trucking has become so important in moving freight.

OTHER GENERAL CHANGES

We hope to see some standardization of data categories and definitions. We must also enhance data transfer and accessibility by use of microcomputers. Also, we will see a more statistical approach in which one data collection cell will be part of a larger universe of some data item; the data collected can do double duty. This is the approach advocated in the FHWA *Traffic Monitoring Guide*. In addition, data must be more quickly transferred from the observation point to electronic media. An illustration of this is the Computer-Assisted Telephone Survey being used for the new NPTS. It is essentially a "paperless" survey in which edits and rationality checks are done on-line as the data are being collected. With paperless surveys, summaries can be made hourly, daily, monthly, or in whatever time frame the customer wants. Similar initiatives to assemble selected traffic data at a central location will also, no doubt, evolve.

In addition, data must be more easily and readily available to all who need it in a timely manner. To that end, efforts are underway to bring on-line an extensive historical data base that will be accessible to everyone through the use of modems and microcomputers. Queries will allow analysts to cross-

correlate finance, travel, and system usage in ways only limited by their imagination. If there is enough interest in this historical data base, it may be expanded and a CD-ROM data file issued.

Data collection, of course, is not the objective of these efforts. Rather, the goal is to obtain the right information in order to be responsive to current and emerging issues. In order to be responsive, it is important to carefully consider actions that make the right data become the right information. Two good illustrations are the recent Urban Land Institute booklet on *Myths and Facts about Transportation and Growth*, (1) and Alan Pisarski's *Commuting in America* published by the Eno Foundation (2).

Over the next few years, we will need to confront the problem of replacing the experience of the people involved with the data collection activities in the states as they reach retirement age. Of course, there will be new personnel filling the jobs, but the experience gained by 30 or more years of data collection and analysis activities cannot be easily replaced. Correct data are mandatory in our business, and an experienced person can quickly spot inaccurate data. This experience is hard to replace. We must take the necessary steps to ensure that our expertise is maintained.

REFERENCES

1. Urban Land Institute. *Myths and Facts about Transportation and Growth*. Washington, D.C. 1989.
2. Pisarski, Alan. *Commuting in America: a National Report on Commuting Patterns and Trends*. Eno Foundation for Transportation, Westport, Conn. 1987.