

Department of Transportation Planning for Bureau of the Census Transportation Surveys

GEORGE F. WIGGERS

ABSTRACT

An overview and options are presented for a U.S. Department of Transportation (DOT) strategy for sponsorship of and participation in transportation surveys conducted by the U.S. Bureau of the Census. The purpose is to provide a focus for discussion and debate on DOT's need for census data, on the current and future programs supporting these data-collecting activities, and on how DOT should best coordinate its efforts to meet its needs for census transportation data. Each of the surveys used within DOT is also described.

The U.S. Department of Transportation (DOT) spends millions of dollars annually on data required to develop policy, manage programs, evaluate the impact of DOT policies and programs, and respond to national emergencies within its area of responsibility. Much of this information is provided by the U.S. Bureau of the Census as part of its program to gather general demographic and economic data or by special surveys the Bureau conducts under sponsorship of DOT and other federal agencies. The Bureau occupies a unique place within the federal establishment because it is authorized by law, Title 13, United States Code, to require responses to many of its surveys. It has an unquestioned reputation for maintaining confidentiality, and it enjoys credibility for its published statistics. These attributes are often essential for the credibility of the policies and programs of the DOT.

Most of DOT's needs for census data may be categorized into person and commodity movements. The person movement data are obtained from household surveys in which residents are asked to report on trips by all modes of transportation, to provide supplemental information on the socioeconomic characteristics of the household (including household-owned vehicles), and to report other information, such as use of seat belts. This information is used for a wide variety of purposes within DOT including

- Forecasting future passenger and vehicle travel, which is used in estimating public investment needs for the various passenger modes;
- Analyzing the demographic and socioeconomic characteristics of travelers as a means of assessing equity and income transfer characteristics of federal transportation programs;
- Effectively managing DOT highway and public transportation grant programs by advising grantees on the effective use of grant funds; and
- Estimating exposure rates for classes of automobile passengers and vehicle types; this information is used in formulating highway safety regulations.

Commodity movement information is collected in several forms by the Bureau of the Census for many uses within the DOT including

1. Preparing research reports to support DOT initiatives, such as economic justification of waterway user charges, equitable allocation of highway user charges, deregulation of highway and rail industries, and federal investment in highways and waterways;
2. Responding to national emergencies (such as a nationwide strike against the railroads that cuts off the movement of goods required for the health and safety of the country, an embargo on the importation of petroleum, port congestion delaying exports of coal and grain, or a major earthquake) and support of defense mobilization planning;
3. Making determinations of maritime subsidies based on reports of cargo carried by U.S. and foreign vessels in the various foreign trade services; and
4. Responding to congressional requests for major studies on issues such as truck size and weight, highway cost allocation, and the movement of energy materials.

The uses of census data cited in this paper are only a small sample of those within DOT. Many of the uses are ad hoc, although information on the nature or extent of a problem often has a profound influence on decisions made by the public and private sectors.

PAST AND CURRENT CENSUS SURVEYS

Ten census surveys are of major interest to DOT. The first three are sponsored every 5 years by the Census Bureau as part of the Census of Transportation.

1. The National Travel Survey (NTS) collects information on intercity passenger travel by all modes of transportation. The 1982 NTS was cancelled because of budget cutbacks.
2. The Commodity Transportation Survey (CTS) provides data on manufacturers' shipments by all modes of transportation. Technical and budget difficulties resulted in postponement of the 1982 CTS.
3. The Truck Inventory and Use Survey (TIUS) collects information on the characteristics and use of registered trucks. The 1982 TIUS is now in progress.
4. The Nationwide Personal Transportation Survey (NPTS) has been sponsored by several agencies within DOT. It collects information on all personal travel by all modes of transportation. The 1983 NPTS is now in progress.
5. The Annual Housing Survey (AHS) is sponsored by the U.S. Department of Housing and Urban Development (HUD). A DOT-sponsored supplement to this survey provided journey-to-work data for national, state, and local transportation analysis. The AHS had been conducted annually until about 1980, but budget limitations have curtailed the frequency of this survey.

6. The Decennial Census (DC) is conducted every 10 years, and every U.S. resident is required to respond. The information used by DOT is reported on 5, 15, and 20 percent samples of the population from the DC.

7. The Commodity Transportation Survey Expansion (CTSE) would expand the CTS to cover nonmanufacturing industries. The next CTS is expected to include the mineral and grain wholesale industries, with possible expansion to other wholesale groups in 1987.

8. The proposed Truck Activity and Commodity Flow (TACF) survey would obtain origin, destination, highway use, and other information on trucks and their loads for a sample of truck trips over a year. It would be based on the results of the TIUS survey described above.

9. The survey Inland Movement of U.S. Foreign Trade (IMFT) has been sponsored at various intervals by DOT and other federal agencies and was last conducted in 1976. It obtains information on the inland origins or destinations of exports and imports and the mode of domestic transportation for these goods.

10. Foreign Trade Data are collected by the U.S. Customs Service and the U.S. Department of Commerce but compiled and processed by the Census Bureau. This data set contains information about each import and export shipment into and out of the United States by all modes. The information is used by the U.S. Maritime Administration in designating essential trade routes, finding the extent of foreign competition on such routes, and determining subsidies for American flag vessels.

SURVEY ISSUES AND OPTIONS

A number of issues and options are addressed that are related to each of the major census surveys of interest to DOT. These issues are framed in the context of three overall budgeting considerations:

1. For surveys sponsored by the Census Bureau, funding is usually planned and committed about 6 years in advance. Although this approach generally ensures stability in the census program, it reduces program flexibility.

2. DOT's shorter budgeting cycle generates different problems. Because many of these surveys are conducted at 5-year intervals, the uneven level of expenditures strains the modest research budgets that fund the surveys.

3. A single agency in the DOT can rarely justify the cost of a census survey based on its needs alone; therefore, the surveys are usually sponsored by several agencies that pool their funds. Pooling increases survey efficiency and helps reduce the burden on respondents, but it requires substantial coordination.

The years 1985 and 1986 are critical to several of the surveys covered in this paper. Planning for the 1987 Census of Transportation surveys must begin early next year. Major issues for each survey are

1. Supplementing NTS home interviews with telephone interviews should be considered for 1987 so that the sample size can be increased while holding down survey costs.

2. Coordination of the NPTS with the NTS will be needed in 1987 to ensure maximum utility of person movement data. Substantial coordination will be required to ensure that user agencies obtain needed data at a reasonable cost. The methodology should be

improved to increase the utility of the survey for analysis of public transportation and safety issues.

3. Negotiations for the content of the AHS are now ongoing between the Census Bureau and HUD. DOT should become involved quickly to ensure collection of mid-decade journey-to-work data.

4. Planning for the DC should be completed in the next year or two because of the long lead time necessary to put together this large survey. This is important because of major changes in the design and conduct of the DC that are now being debated.

5. The methodology planned for the 1984 CTS needs to be evaluated for 1987. It should be expanded to include grain and other wholesale shippers. A substantial increase in funding is needed for this survey or a line item should be added to DOT's budget to cover the increased cost.

6. Consideration should be given to incorporating the TACF survey as an element of the 1987 TIUS. The TACF survey promises a major advancement in DOT's ability to monitor the movement of goods on the nation's highway system.

7. A fiscal year 1984 study effort should consider the need for repeating the IMFT survey, including coordinating it with the Economic Censuses and including export movement data in the CTS.

8. Efforts should be continued to determine the feasibility of including inland origin and destination data in the regular reporting of the Foreign Trade Data.

PROGRAM ISSUES AND OPTIONS

Three major program issues related to census surveys are addressed in this section. Although specific recommendations for resolving these issues are not provided, several management options and their pros and cons are identified. The issues are as follows.

1. Assuming that DOT will continue to make substantial investments in census transportation surveys, how should DOT fund and budget for these amounts?

Although some of the census surveys may not continue to meet the needs of DOT agencies in the future, DOT will continue to be dependent on many of the surveys. Consequently, it makes sense to address the broader issue of planning and budgeting for these surveys as a whole, without passing on the merits of individual surveys.

One option is to establish one or more line items in the DOT budget to fund census projects. The primary advantage of this approach is that it would avoid draining research budgets in those years when large amounts are needed to finance census surveys and avoid arbitrary cutbacks in census projects when research budgets are cut. The primary disadvantage is that a line item may make the program more vulnerable to a congressionally mandated cancellation or cutback.

2. Should DOT and other user agencies provide an increased level of funding for census transportation surveys, or should the Census Bureau be responsible for the basic costs of these surveys, with user funding covering only one-time specialized needs?

Unless DOT obtains a budget line item to fund census projects, as discussed, the only practical way for DOT to provide the basic funding required for these surveys would be to continue to pool the funds for the various user agencies. Coordinating pooled funding for a census program is an expensive undertaking in itself (i.e., in the time and effort it takes to obtain commitments from potential cosponsors). It also may increase the risk of the

project being cancelled if one sponsor develops budget problems. For example, the 1982 NTS was cancelled when the Research and Special Programs Administration was unable to honor its commitment to support that survey.

On the other hand, financial sponsorship by the user of a survey provides substantial leverage to ensure that the survey is responsive to the needs of the sponsor. The Census Bureau is continually under pressure from many federal agencies, Congress, state and local governments, and the private sector to accommodate many different and sometimes conflicting data requirements. Consequently, the greater control a user has over the funding for a survey, the more leverage the user has in determining the scope and content of that survey.

3. How should DOT coordinate and negotiate its requirements with the Bureau of the Census and other user agencies regarding transportation surveys?

Historically, DOT has always had an identifiable organizational unit with specific responsibilities

for articulating the information needs of DOT and for coordinating interagency projects required to satisfy these needs. The resources currently assigned to this function have been cut back to the point that coordination, if done at all, is often accomplished by individuals in the various DOT agencies without reference to an organizational focal point within DOT. Consequently, opportunities for developing more efficient survey projects, articulating DOT data needs in interagency forums, and reducing the burden on respondents, have been diminished. Three options for improving the DOT's statistical coordination function are suggested: (a) creating a larger staff, (b) centralizing data responsibilities for census projects, and (c) making the program more visible to higher management.

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Methodology for Assessing and Predicting Pavement Performance in Oil Field Areas

JOHN M. MASON, JR., BRYAN E. STAMPLEY, and THOMAS SCULLION

ABSTRACT

A basic methodology for estimating the amount and type of oil field traffic on a selected roadway is outlined. The Texas Pavement Distress Equations were used to predict reductions in pavement service life caused by oil field truck traffic. The procedure used a case study example to identify and delineate major oil field activity centers. Several density maps were developed to depict the extent of drilling and production activity in the study area. Truck traffic generated in these centers was converted to 18-kip equivalent single axle load repetitions; these were analyzed for their effect on 6- and 10-in. surface-treated pavements. Resulting pavement service lives were compared for various measures of pavement distress (pavement serviceability index, rutting, alligatoring, flushing, and raveling). This technique can be used to anticipate resurfacing intervals and rehabilitation requirements.

had an adverse effect on many light-duty rural highways. These highways were intended to service low volumes of passenger cars and light trucks and were not built to withstand the impact of the load-intensive, special-use oil field traffic.

The Texas State Department of Highways and Public Transportation (TSDHPT) found it necessary to determine the effects of oil field development on rural highways. Phase I of the research identified traffic and vehicle characteristics associated with oil field development and estimated a reduction in pavement service life due to this specialized user (1).

Phase II of the research involved developing and applying a method of assessing the current effects, and predicting the future effects, of oil field development on any particular rural highway. The method is in the form of a computer program, Oil Field Damage Program, fully described in Research Report 299-2 (2). Although it was developed as a means of predicting the present and future effects of oil field development, the same basic principles can be used to develop programs for examining the effects of other types of load-intensive, special-use traffic.

STUDY PROCEDURE

The Arab Oil Embargo of 1973 spurred an increase in oil field development throughout the nation. In the oil-rich regions of Texas, this increased activity

An overall picture of oil field development was necessary to estimate and describe oil field traffic on a specific roadway. Once an impacted region was