Travel Research

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Members of the workshop hold different pespectives on the concept of research. To some, research is the scholarly activity that produces fundamental contributions to knowledge; this usually requires highly disaggregate data of the type not commonly available from the census because of disclosure limitations. Some researchers focus on examination of trends in demography, the economy, or travel, and they are able in some cases to use census data.

Others, particularly those working with or for public agencies, consider policy analysis, especially in its exploratory stages, to be research. Others in similar environments engage in a variety of technical service applications, including model building, calibration, and forecasting, which they classify as research. In each of these categories, there are important opportunities to utilize census data.

In our deliberations we considered all of these activities to be research. It is relevant to note that only two members of our workshop are engaged in so-called pure research; the others are concerned with the more applications-oriented activities described earlier.

USES OF CENSUS DATA

Census data are less frequently used in travel behavior research, though they are commonly used in trend analysis studies, where both transportation and nontransportation data are in frequent use. Applications-oriented researchers make extensive use of census data for travel model calibration and recalibration, as inputs to forecasting, and for a variety of policy studies at the local, regional, state, and national levels. Census, and particularly UTPP, data are used directly and as a means for updating aging data bases collected through special-purpose studies (e.g., origin-destination surveys).

Bootstrapping one data set with another appears to be increasingly common as the resources for--and the political interest in--special-purpose data collection have declined. For example, census data may be used to update OD surveys, data from the Nationwide Personal Transportation Study (NPTS) may be used to update the census, and so forth. The use of census data along with new, special-purpose studies appears common when analyses are required for new services in rapidly developing areas where preexisting data offer incomplete coverage or no coverage at all. Obviously, geographic and definitional compatibility becomes a major requirement to the extent that the use of multiple data sets becomes more common.

EVALUATION OF CENSUS DATA

In general, the recent experience with the use of census data, particularly the 1980 data, has been favorable. To a significant degree this may be because census data are so attractive relative to the alternatives, that is, using an obsolete data set, collecting a new data set, or doing without the desired data and thus not performing the analysis or research. That is not to say that census data are an inferior good, only to be used when there are no other reasonable options. But it is useful to put the census in the perspective of the market and to recognize its relative attractiveness given its current quality.

That quality is viewed as relatively good, particularly compared with what has been available through the census in the past. It is clear that great strides have been made in data content and quality, and although there are clearly opportunities for improvement, the current level of use of census data is a measure of its success in meeting selected market needs.

Members of this workshop agreed that although it would be desirable to get 1980 data before 1983 (as was the case with most UTPP users), the timeliness of the data relative to alternative sources is acceptable. And, although some expressed frustration with the difficulty of finding funds to purchase the UTPP, there was agreement that the investment has become cost-effective.

The availability of census data on transportation now and in the future will not eliminate the need for special data collection efforts--small-sample OD surveys and on-board and cordon studies--but there seems no question that census data make the planning (and planning research) function more efficient.

ISSUES AND PROBLEMS

A number of issues and problems associated with currently available census data suggest opportunities for improvements in the 1990 census. These include the following:

1. There is concern for the delivered sample size of geocoded (workplace) data, especially for studies of fast-growing areas that were outside the urbanized area when data were collected. This is an important concern as the focus of transportation planning shifts from the regional scale to corridor, neighborhood, and special service planning.
2. There is agreement on the need for reasonable continuity in the questions and methods of data collection among census efforts, to assure that the capability to conduct trend analyses is retained.
3. There are a number of needs for better data. These include (a) more accurate determination of work-trip travel times, perhaps achieved by asking trip start and end time rather than travel times; (b) separation of peak and nonpeak trips by asking trip starting time; (c) collection of more accurate information on mode used, perhaps to encompass mixing of modes across days and/or within a single trip; (d) collection of data on access modes to the line-haul portion of the trip; (e) selection of a particular day for the work-trip mode questions rather than use of the previous day (this may permit controlling for biases in travel patterns across days, and it would clarify the meaning of the information gathered); and (f) collection of more information on transportation handicaps, perhaps including automobile-related handicaps and handicaps that are of shorter duration than 6 months, a definition based on the concept of disability.

OPPORTUNITIES FOR THE FUTURE

The use of multiple data sets in a single application suggests the importance of the capability to merge files from different sources. For example, a typical transportation application for forecasting or research on model development might involve matching and merging records on level of service (from a transportation survey) with travel and demographic records from the census. In an applications environment, this might be satisfactorily done at the traffic-zone, block, or even tract level. For research, this would normally be done at the household level. It is important that both the methodology and the technology to merge such data sets be available and efficient. To the extent necessary, methodological developments should be made to facilitate this. It appears that the required technology is either available or soon will be.

We suggest that, for the sake of efficiency, it may be desirable in some cases for the Bureau of the Census to perform such file merges and to supply the requesting organization with a data set of demography, travel, and level of service at the appropriate geographic scale. This would be done on a fee-for-services basis, with the level-of-service file supplied by the planning agency.

For purposes of more fundamental research, where household data are required, disclosure rules prohibit the Bureau of the Census from releasing the required data. It was suggested that perhaps the bureau could perform the required analysis, again on a fee-for-services basis. But a more attractive option would be for qualified transportation researchers to spend extended periods within the Bureau of the Census under the American Statistical Association/Census Bureau Research Fellowship and Associateship Program. In this way, researchers could gain access to unique data resources of a variety of types. No transportation researchers are known to have participated in this program, and it is worth promoting this opportunity within the transportation community because of the potential, long-term payoffs.

There are other, more specific needs for research and development related to the census. These include determining appropriate sample sizes, the most effective way to ask the questions denoted earlier, as well as techniques for merging data sets. Finally, it would be desirable to make use of census and other recent data to update generic planning tools that are in common use, such as the quick-response methods described in NCHRP Report 187 and implemented in the QRS microcomputer software.

DETAILED RECOMMENDATIONS

Questionnaire Content

As stated earlier, we believe that the priority should be on doing the field research necessary to resolve question content issues. But we have reached a tentative consensus on some of these:

1. There is little support for separating trucks and automobiles in the census.
2. We rejected proposals to attempt to collect data on school and shopping trip behavior and nonwork transit trips through the census.
3. The time of day for the work trip seems equally as important to users in this workshop as travel time. Consequently, it appears desirable to ask starting time and travel time (or stopping time).
4. Mode of access to the line-haul mode is important to planners; research is needed to determine effective and efficient ways to determine this through the census.

5. On the day of travel (related to the principal-mode question), we suggest asking questions in the following form:

(a) How many days last week did you work at home?
(b) How many days last week did you work elsewhere?
(c) Where was your place of work last Thursday?
(d) Was that the usual place?
(e) What mode did you use last Thursday?

More detailed data on work style (work at home sometimes, multiple jobs, female head of household, use of day care, etc.) are likely to be increasingly important from a variety of policy perspectives--including transportation--in the future. Some significant restructuring of census questions to capture these patterns appears warranted. Such efforts will benefit a variety of user constituencies. Yet these nuances may be more appropriate for the NPTS, which allows more questions to capture and refine transportation concepts.

Procedures and Sample Size

Because the geographic focus of much transportation planning has become more localized (corridors, growth areas, special market segments, routes), it is becoming increasingly difficult to rely on UTPP trip tables for planning. This is particularly true where there is a need to disaggregate further (race, ethnicity, sex, etc.) to support policy decisions. The use of higher sampling rates is desired by some census users, particularly those from large and rapidly growing areas. The possibility of areal variability of sampling rates based on user needs was discussed. This is likely to pose a cost problem, because the Census Bureau would probably want to recover incremental costs from user agencies. This may be resolved if the actual travel sampling rate is really 1 in 6 (rather than half that rate, as in 1980).

We believe that it is cost-effective for the U.S. Department of Transportation (DOT) to participate in efforts to prepare for the decennial census. This conference is an important element in that preparation, as is the role of DOT on the Federal Advisory Council and its advocacy of the census in negotiations with the Office of Management and Budget.

Because there are important questions about what transportation data should be collected by the census as well as widely differing opinions regarding how census questions should be asked, we think it appropriate for DOT to invest in research in support of the 1990 census. The need is for empirical tests to determine the efficacy of different ways to ask questions as well as to develop logical conversion procedures so that census users who need data in a form different from the way in which it was collected will still get good use from the available data. For example, if the principal-mode question is asked for a specific day (e.g., last Thursday) and a user is interested in average-week behavior, there is a need for a conversion procedure.

Issues that may be resolved by a single field survey include the following:

1. Trip time (length in minutes versus departure and arrival times),
2. Principal mode of travel (for a specific day or the typical mode, treatment of trips using several modes),
3. Workplace (better ways of asking the location of the place of work might reduce coding problems),
4. Principal workplace versus alternative workplaces, and
5. The general question of the costs and benefits of using travel analysis zones as opposed to converting to census aggregation units.

We envision a survey that asks one or several groups questions in different forms, for example, usual-day behavior, specific-day behavior, and weekly travel diaries. These results could be compared to support choice of census questions and to develop conversion procedures.

The need for solid answers to these questions warrants research. And this research must be initiated soon if the results are to affect the 1990 census. Indeed, it would be desirable to have results before the census pretests so that the latter opportunity can be used to verify the results.

An important problem associated with this recommendation is that DOT (or at least FHWA) research budgets are locked in for the coming year. Still, exploring options for securing research funds would be worthwhile; this research could be done for about $250,000 or less, and the results are likely to have an important effect on the usefulness of the 1990 census data. Funding from outside FHWA should be explored, as should the possibility of reprogramming committed funds. Because of the state and local interest in these issues, it may be worth trying to get money from nonfederal sources or from the National Cooperative Highway and National Cooperative Transportation Research Programs of TRB.

Even if funds cannot be programmed to accomplish this work in time to affect the 1990 census, the research is still worthwhile to assist users in interpreting and applying results derived from the questions used in 1990.

There are other research needs and opportunities related to the census that can be treated in a longer time frame, but which should be considered. First, the potential usefulness of the TIGER system for mapping and data analysis in noncensus (and particularly nonfederal) agencies appears significant. For example, it was suggested that TIGER be used to develop estimates such as vehicle miles of travel useful in planning and cost and revenue allocation. A modest research investment appears worthwhile to determine how TIGER might make interfacing travel, land use, infrastructure, and demographic data more efficient. This research appears to be a logical candidate for one or both of the cooperative research programs.

Second, the potential for accomplishing advances in travel behavior research through the use of individual census records linked to level of service and other data appears very real. Census disclosure rules prohibit releasing these disaggregate records, but the research fellows program in the Census Bureau, mentioned earlier, offers an important opportunity for accomplishing such studies. We encourage DOT and TRB to publicize this program and to work toward getting one or more qualified travel researchers to apply for it.

Geographic Coding

The promised enhancements in geocoding methods (TIGER), if they are achieved, seem likely to ameliorate a significant portion of the coding problems associated with the place of work, a data element that has become essential to transportation planning. Indeed, the transportation need for geocoding is so important that we urge the use of a failsafe strategy in the TIGER development process so that if the system does not work as planned, we can still get data of the quality delivered from the 1980 census.

The MPOs and other knowledgeable user agencies seem willing and able to participate in the geocoding process. Satisfactory mechanisms for taking advantage of their willingness should be found. In particular, it would be desirable to have primary workplace geocoding done at the census collection center nearest the point of survey, so that more local officials can provide support. The Census Bureau should provide local agencies with lists of uncodable locations from the 1980 census so that these problems can be resolved in advance of the 1990 census.

The use of computerized telephone directories should be considered to make

the census coding process more efficient; perhaps some elements of this task can be contracted out to telephone companies.

Data Products

The TIGER system and census outreach and cooperative efforts, as well as the interest in cooperation among state and local agencies, all appear to promise important improvements in workplace geocoding in the 1990 census. These developments, along with the evolution in computer technology and availability, suggest that rather than focusing on upgrading and standardizing the contents of the UTPP, the 1990 census may provide an opportunity to increase flexibility and responsiveness in UTPP products. For example, it would be desirable to give (at least to the major users) the freedom to define the contents of their UTPP more fully. To accomplish this, it will be important for the profession to work together, again perhaps under the aegis of the TRB Committee on Transportation Information Systems and Data Requirements to specify not the UTPP but the capabilities required in the preparation of the UTPP.

Comparability

Because census data alone cannot meet all transportation planning needs and because of the absence of resources and interest for large-scale local O-D surveys, specialized national transportation data collection efforts are likely to grow in importance. In particular, we believe that it is critically important to retain, enhance, and regularize NPTS, the use of which is growing, particularly in conjunction with census data. We suggest that NPTS be more closely coordinated with the decennial census, in terms of both content and timing. DOT and the Census Bureau should work together to find efficient ways to meet the need for other specialized national data collection efforts.

Institutional and Administrative Concerns

Because of the importance of census data to transportation planning and because transportation professionals represent a major census user group, there appears to be a need for ongoing and more formal communications between the transportation users and the Bureau of the Census. The important connection between DOT and the Census Bureau through the Federal Advisory Council serves as one mechanism for achieving this. Yet the interests of the wide variety of users might be better represented by the formation of a Transportation Census Users' Advisory Council, which can provide ongoing advice, ideas, and another channel for building cooperation between data users and suppliers. The TRB Committee on Transportation Information Systems and Data Requirements might serve this function.