The State of California

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The California Department of Transportation uses data from the U.S. Census of Population and Housing in many areas of transportation planning. Based on that use, the following suggestions are offered for improving the format of the data for transportation planning purposes.

URBAN TRANSPORTATION PLANNING PACKAGE

The Urban Transportation Planning Package (UTPP) was designed jointly by the Bureau of the Census and the Federal Highway Administration to provide a standardized set of census data for the specific use of transportation planners and to eliminate the need for transportation studies to order individual cross tabulations of data of similar format and at a duplication of costs. In addition, the UTPP was designed to provide these data at the geographic level of traffic analysis zones or groupings of census blocks not heretofore available.

The California Department of Transportation had received data for only 3 of the 17 SMSAs in California by July 1973, and only preliminary analysis results were available. In the process of obtaining data from this package, we have encountered a variety of problems. The more significant of these are summarized below.

Time Lag

Although the census was conducted in April 1970, by August 1973 we had acquired and were analyzing data for only 3 of the 17 SMSAs in California. Part of this delay was caused within our own organization in funding and processing the actual contract. Part of the delay was understandably the time required to format and program for processing, although this lead time was probably underestimated. However, one major cause of delay was the restriction of a 5-digit code for traffic analysis zones. This restriction required the creation of 2 sets of geographic correspondence tables and precluded the use of computer coding.

Many transportation studies in California had already prepared on tape correspondence tables that equated traffic analysis zones to 1970 census tracts. However, both the zonal numbering system used in California and the census tract numbers are 6 digits. An additional correspondence table was required to equate these zone-tract numbers to a new 5-digit number. This problem was resolved in the Los Angeles area by asking the census bureau to assign sequential numbers to each census tract, zip code (ZC), and Universal Area Code (UAC) within the equivalency printouts for the four SMSAs in the region since their traffic zones are for the most part census tracts. Additional time will be required to process the data records, to reformat to allow space in the record for 7 digits of traffic zone identification, and then to recode all the records in all the data tapes to a usable traffic zone number.

In the design of future packages, we recommend a more flexible format for traffic zone coding.

Coding of Place of Work

To provide the place-of-work information during the 1970 census, respondents were asked the following question:

c. **Where did he work last week?**

If he worked in more than one place, print where he worked most last week.

If he travels about in his work or if the place does not have a numbered address, see instruction sheet.

(1) Address *(Number and street name)* _____

(2) Name of city, town, village, etc. _____

(3) Inside the limits of this city, town, village, etc.?

○ Yes

○ No

(4) County _____

(5) State _____ (6) ZIP Code _____

Our understanding is that the locational information provided by the respon was coded by the census bureau as follows: Street address was matched against the address coding guide. If there was a match, the appropriate census tract and block were coded. If there was no match, the ZC was taken from the questionnaire. If there was no ZC recorded by the respondent, the UAC (CBD, city, or remainder of county) was coded based on responses 2, 3, and 4.

A summary of the geographic coding for 14 of the 16 SMSAs in California showed the following distribution: 57.0 percent of all workers were located to the census tract-census block level of their places of work, 20.8 percent were located to the zip codes of places of work, 14.8 percent were located to the Universal Area Codes, 7.0 percent did not report places of work, and 0.4 percent were located in UACs we did not specify to the bureau.

Preliminary analysis indicates that approximately two-thirds of the zip codes listed are erroneous in that they either conflict with the county code or such a ZC number does not exist. For the one-third of the zip codes that seem valid, proration of data to the census tract-traffic zone level will be difficult because of problems in obtaining maps, boundary descriptions, and hence correspondence of zip code to census tract.

At this time we do not have data for all of the SMSAs and, therefore, cannot determine the number of workers assigned valid or invalid zip codes. However, employment by place of employment is a critical variable in transportation planning. Given that 21 percent of this employment is coded to zip code and another 7.4 percent cannot be located, the reliability of this variable will have to be extensively evaluated.

We strongly recommend that the zip code be dropped from any future coding for transportation planning and that implementation of the CUE program be stressed.

Journey to Work

The cross tabulation of employed persons by zone of residence, zone of work, and by mode of transportation is the only trip table provided in the package. We wonder whether it would be feasible to provide additional tables stratified by variables that are also significant for planning evaluation. For example, in addition to mode of travel, tables of zone-to-zone work trips stratified by income classes, by structure type, and by automobiles available would be useful.

Employment Classifications

As mentioned above, employment by place of employment is used extensively in planning. In the future, can employment data be made available at a 2-digit Standard

Industrial Classification of some 41 strata rather than the current Major Industrial Group stratification of 14? We realize the reliability or suppression problems or both that may be involved. Such a breakdown would be extremely useful but may not be feasible. We also request that the inconsistencies among Parts I and III—count of employed persons age 16 and over, Part IV—count of employed persons age 14 and over, and Part II—count of work trips be resolved to a single employed person total consistent among parts.

Median

It would be helpful to have median as well as mean values where appropriate.

Table Totals

Part IV totals of trips by mode are available for zone of residence. However, it would be helpful to have totals by zone of employment as well. In Parts I, II, and III, in cases of stratification, subtotals are provided for each strata, but no grand total is provided.

Urban Transportation Planning Package Format Program

The UTPP format program as received from the census bureau was not operational. In addition to the conversion problems that we had anticipated, there were problems in program logic. The program did not select individual zones. It did not select individual tables. It could not handle more than one Part II series entry; that is, it would not accept more than one urbanized area code per SMSA. The program was designed for a smaller machine so that it was rather inefficient and expensive to run on the IBM 370/165. We have redone the program to meet the specifications listed in the program documentation. Listings and copies of the program deck have been sent to FHWA and are available from our Computer Systems Department. We expect to prepare a second version of this program that will include the capability of expanding the existing records and handling a 7-digit traffic zone identification.

OTHER CENSUS DATA

Although this report deals primarily with the urban area data needs, the nonurban areas of California use census data for transportation planning. The following is a brief description of some of their problems.

Maps

Three sets of maps from the census map series are used extensively in the transportation planning process: the Metropolitan Map Series, the County Maps, and the Place Maps. These maps contain both census and jurisdictional boundary lines that are of various degrees of shading and difficult to read. Prior to 1970, the bureau indicated these maps might be available as a series of overlays on a base map. Such a series would be much easier to work with, and we suggest that the bureau reconsider this approach for the next census.

Enumeration Districts

In areas where enumeration district boundaries are used for the delineation of traffic

zones, some consideration should be given to the shape of these districts and the use to which they may be put. In some instances enumeration districts have been split into 2 or more noncontiguous segments. It would be useful for statewide planning if some of the same detail in socioeconomic variables available at the census tract level could be available at the enumeration district level.

CONCLUDING REMARKS

A report that attempts to offer suggestions and recommendations to the Bureau of the Census and the Federal Highway Administration for improving data from the census for use in transportation planning tends to focus on the problems encountered in the use of these data and fails to emphasize overall how invaluable these data are. They provide the benchmarks, both geographical and socioeconomical, on which we base much of our analysis.

We wish to thank the personnel of the Bureau of the Census for their extensive cooperation and help in resolving many of the problems we encountered in processing the equivalency printouts. They modified their procedures to permit us to obtain unique urbanized area data by individual SMSA and were particularly helpful in locating lost or strayed census blocks and tracts. We trust they will be equally patient when we start processing and analyzing the data files, for we will surely provide them with an entirely new set of questions.