Transportation-Related Questions on the Decennial Census

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ABSTRACT

The development in collection of transportation-related data by the Bureau of the Census for planning purposes of state and local governments is outlined. Types of data collected and changes are described in detail for the 1960, 1970, and 1980 censuses.

Over the years, the Bureau of the Census has collected various data that have been used by planners in many different applications. From an urban transportation planning perspective, the data available from the census have mainly been demographic data for areas of residence.

In the 1940s, the Bureau of the Census lent its expertise to the development of the now-classic home-interview origin-destination (OD) survey. The Census Bureau provided the method for expanding sample data to universes within small geographic levels. The Census Bureau also provided valuable information regarding sample size and the resulting variance of selected variables.

The 1950 census again provided basic demographic data as well as the occupation and industry of workers. Information was also collected on number of hours worked in the last week before the census but not on place of work or mode of travel to work.

1960 CENSUS

In 1960 the census began obtaining transportation-oriented data for the planning purposes of state and local governments. The data of importance included

1. Place of work,
2. Mode of travel to work, and
3. Automobiles available at home.

Data on place of work related to the calendar week before the date of enumeration. It related to the geographical location in which workers carried out their occupational activities. In 1960 the workplace was coded to (a) central cities of Standard Metropolitan Statistical Areas (SMSAs), (b) other cities of 50,000 or more, (c) counties, and (d) the remainder of the county in those counties where separately identified cities.

Data on the mode of travel to work were based on the principal mode used in the last week before the census. The categories identified were railroad, subway or elevated, bus or streetcar, taxicab, private automobile or carpool, walked only, worked at home, and other means. The smallest geographic area for which these data are currently available is the census tract and then only for the home end of the work trip; information is not available for the work end. Worker streamers are available in a special report for SMSAs of more than 250,000 population. The geography within an SMSA is (a) city of more than 50,000, (b) central city, (c) county, and (d) balance of county. The worker stream must have at least 50 workers to be reported.

Data on automobiles available were collected in each sampled household. The data were reported as the number of dwelling units with (a) no cars available, (b) one car, (c) two cars, and (d) three or more cars. The information is available for census tracts and larger units of geography in the housing series of reports.

In 1960, due to the lack of geographic detail for the workplace, urban transportation planners did not use the place-of-work data to any appreciable extent. In addition, most urbanized areas conducted extensive OD surveys during this time period and relied on their own primary data collection efforts. Demographic data were used to check the results of the household characteristics collected in the OD survey, but little use was made of the journey-to-work, mode-of-travel, or automobile availability data.

1970 CENSUS

The development of census data for urban transportation planning purposes continued in the 1970s. Most studies continued to use their basic OD survey data that were collected in the mid-1960s, but there was a desire to update some of the basic relationships.

As part of the 1970 decennial census, the Bureau of the Census collected basic data that were similar to the data collected in the 1960 census. The key items were, again, place of work, mode of travel to work, and automobiles available at home. The main difference between the 1960 and 1970 data was found in the level of geographic coding for the workplace and the means of travel to work.

The place-of-work data were coded to census block in 1970, and if the information available to code to census block was not available, the work address was coded to the same geography as in 1960, that is, central city of SMSA, cities of more than 50,000, county, and balance of county. Nationwide about half of the work locations were coded to census blocks; the other half were coded to large geographic areas.

In 1970 states and metropolitan planning organizations (MPOs) were given the option of ordering a special package of census products not otherwise available from the Bureau of the Census. The basic geography for these packages was the locally developed traffic analysis zones that were used in the 1960 OD surveys. Coding of workplace to traffic analysis zones allowed the analysts to update relationships for the local work-trip file, which can contain as much as 40 percent of all travel in a metropolitan area. The problem in 1970 was that the workplace responses were not coded to census blocks. Local planners were required to allocate these work locations to traffic zones. This was difficult and lessened the usefulness of the journey-to-work trip tables.

The categories for mode of transportation to work were similar in 1970 to the 1960 set but were expanded to include automobile driver and automobile
passenger. This enhanced the use of census data many times by allowing a calculation of the number of cars used in the journey to work for energy and environmental quality calculations. Another difference between 1960 and 1970 data was that in 1960 the mode usually taken "last week" was requested. In 1970 the question was worded to obtain data on the "last day of work last week." The question was on the 15 percent sample in 1970.

Data on automobiles available in 1970 again included four categories: none, one, two, and three or more passenger automobiles per household.

In the mid-1970s the Bureau of the Census conducted the Annual Housing Survey (AHS) for a national sample and for 60 specific SMSAs. Attached to the AHS was a transportation supplement that included questions on the journey to work for each worker in the household over 14 years of age. Key items included in the transportation supplement were

1. Place of work,
2. Mode of travel to work,
3. Type of shared ride (carpool),
4. Number of persons sharing the ride to work,
5. Time of day worker leaves home for work,
6. Mode of travel to work,
7. Travel distance to work,
8. Change of mode of travel to work in last year,
9. Comparison of satisfaction with new mode of travel with that for previous mode, and
10. Automobile and truck or van availability.

The transportation supplement returned to the 1960 concept of usual place of work and usual means of transportation last week. In 1960 data on private automobile or carpool were collected without any differentiation between the two or any indication of vehicle occupancy. In 1970 data on automobile drivers were specified separately from that on automobile passengers. In the AHS, driving alone and carpooling are tabulated separately and a vehicle occupancy question was asked.

The AHS transportation supplement was essentially a pretest of the 1980 census, although certain questions were not asked in the 1980 census due to space limitations. The supplement could also be viewed as a base for the 1990 census with the inclusion of questions such as the time workers leave for work and the distance to work. The other modes surveyed in the supplement were similar to those in the 1960 and 1970 listing, with the addition of the motorcycle and the bicycle.

In addition to the transportation supplement, the main AHS survey included questions on automobile and truck or van availability. The categories for automobile availability were none, one, two, three, and four or more; for trucks or vans, the categories were none, one, two, and three or more.

1980 CENSUS

In the 1980 census both the type of questions asked and the level of geographic coding were superior to those used in prior years. The excellent coding of the workplace, with as much as 80 to 95 percent of all workplaces coded to block-level geography, gives the states and MPOs a nearly complete file of the traffic flows in their area for those who traveled to work in the week preceding the census.

The 1980 census included several data items not collected in 1970, although they had been collected in the AHS transportation supplement using personal enumeration. The questions were structured so that they would be readily understood in the mail-back interview that was used in 1980. The key items collected in 1980 were

1. Place of work,
2. Mode of travel to work,
3. Type of shared ride (carpool),
4. Number of persons sharing ride to work,
5. Travel time to work,
6. Automobile availability, and
7. Truck or van availability.

The exact wording of these questions can be found in the census questionnaire appended to this Record.

The distinctions between the 1970 and 1980 censuses are found in

1. The number of workplaces coded to block-level geography,
2. The extent of the questionnaire devoted to transportation subjects, and
3. The number of travel-to-work modes (addition of motorcycle and bicycle).

In 1980 the place-of-work data were coded to census tract and block, and in those cases in which reference material was not available to code the data to tract and block, place-level geography was used as the next aggregation. For further discussion of place-of-work coding, see Allocating Incomplete Place-of-Work Responses in the 1980 Census Urban Transportation Planning Package by Philip N. Fulton in this Record.

In 1980 as in 1970, the states and MPOs had the option of purchasing a special Urban Transportation Planning Package (UTPP) from the Bureau of the Census. The basic geographic areas tabulated were locally developed traffic zones, the basic building blocks of urban planners that were established in the 1960s. The 1980 UTPP was similar in structure to the 1970 package but was more detailed and more extensive, including travel from up to 20 surrounding counties.

In the 1980 UTPP, SMSA work trips not coded to block and terminating in the portion of the SMSA covered by the reference file, the Geographic Base File and Dual Independent Map Encoding (GBF/DIME) file, were allocated to blocks based on industry, mode of travel, and travel time, so that in the 1980 UTPPs the majority of workers were coded to small-area geography.

The 1980 census included vehicle occupancy data so that the number of vehicles traveling to work could be derived. This is different from either the 1960 or 1970 approach and gives excellent information for analytical purposes. The 1980 census also included data on motorcycle and bicycle travel to work. The mode of travel reported in 1980 was the usual mode last week, similar to the 1960 approach. In contrast, in 1970 the mode reported was that used on the last day of the preceding week. The concept of "usual" mode will result in information different from that collected using the "last day" concept.

In the 1980 census most transportation-related questions were asked of 1 household in 6. However, place of work and travel time were only coded for every other sample unit, resulting in about 1 in 12 sample. Data were collected separately on automobile availability and truck or van availability. The categories for car availability and for truck or van availability were the same: none, one, two, and three or more.

The 1990 census will differ from any previous census in content, sample size, and coding of data, especially the place-of-work coding. State and local government staffs should advise the Bureau of the Census of their needs for 1990. Mail should be directed to Director (Attention: Decennial Census Planning Staff), Bureau of the Census, Washington, D.C. 20233.