# Issues Concerning Transportation Data in the 1990 Census Planning Process

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Although Census Day, April 1, 1990, still seems far distant, because of the many decisions to be made and the long lead time required, the Bureau of the Census has already begun extensive planning for the nation's 21st decennial census. Part of the planning process is to take a fresh look at the information collected and how that information is processed.

The fresh look includes being aware of the needs of the data users and the major issues with which they are contending. This conference provides one opportunity to inform an important user group of the planning process and to receive comment and instruction. In order to help this exchange, some detail will be given about how information is gathered about the concerns of data users and test procedures and methods. Also discussed are general content issues and ones specific to transportation. General content issues are presented in the first section, and transportation content issues are reviewed in the second section. Census Bureau criteria for selecting content are explained in the last part of the paper.

## PLANNING PROCESS

There are many difficult choices to be made before plans for the 1990 census are final. The process by which the Census Bureau will gather the information and advice it needs to make the decisions about which questions will be on the questionnaire is threefold and includes internal review, consultation with data users and the general public, and formal tests of procedures.

### Internal Review

Between the summer of 1982 and the fall of 1983, the bureau organized 17 internal committees so that bureau staff, especially those heavily involved with the 1980 census, could help plan the 1990 census. Each committee represented a cross section of the organizational units and staff involved in carrying out the census. The committees set to work gathering information, preparing issue papers, and making recommendations. Census managers then reviewed the papers and recommendations to determine which ideas should be developed further or tested in the coming decade. Some of the group assignments were basic design methodology, field operations, geography, outreach, and coverage improvements.

Two groups examined census content issues. One was concerned with content evaluations to be conducted after the 1990 census. The other analyzed 1980 content evaluation studies and will address 1990 pretest evaluations to determine 1990 content and wording of questions. Some examples of the critical population content issues identified thus far by the bureau include the following:

- Who should be included in the census? Should citizenship be determined on a 100-percent basis and how can these concepts be made operational?
- What population characteristic data are needed for tabulation and publication at the block level? At the block-group level? At the tract level?
- What are the federal and state requirements for race and ethnic data and how can the bureau best collect these data?
- What income measures are required, are these required on a 100-percent basis, and how can these concepts be put into operation?
- Will disability and health content be required and can it be reliably collected?
- Should small-area place-of-work coding or processing be funded by the U.S. Department of Transportation?

From a more general perspective, the major content problem to be dealt with internally is how best to meet user data requirements while ensuring that all critical data needs are met and that accurate response with minimal respondent burden is achieved. To help in this effort, the Census Bureau has asked for the counsel of numerous user groups as well as the general public.

## Consultation

Census consultants represent many segments of society with a stake in the outcome of the 1990 census, including federal agencies, state agencies, the general public, professional organizations, the private sector, and user groups. By including these groups in the planning process, the bureau hopes to take advantage of as many informed networks as possible to discuss its plans for 1990 and receive comments.

With federal needs in mind, the bureau has asked the Office of Management and Budget (OMB) to form a Federal Agency Council on the 1990 census to advise the bureau on federal data needs, questionnaire content, and tabulations. The 1960, 1970, and 1980 censuses all had such councils, organized and coordinated by OMB, consisting of representatives from the 90 or so federal agencies that are major users of census data. The council members provide liaison between their respective units and the bureau, making known the agencies' legislative and program needs while considering the bureau's capabilities to meet them.

Reflecting state and congressional concerns about data for state legislative redistricting, Congress in December 1975 enacted Public Law 94-171. This law required that the Census Bureau transmit population tabulations to the states 1 year after the census date. Also required was the submission of technical criteria to the states earlier in the decade and, in turn, submission of geographic plans by the states to the Census Bureau. To meet the requirements for 1990, the Census Bureau first held a conference in October 1983 to discuss the data needs of state officials and technicians. Among the many issues discussed was how to identify key personnel involved in legislative redistricting in the states to serve as contacts with the Census Bureau. In 1985, the bureau will initiate a series of meetings with the key agencies and persons responsible for redistricting. In addition, the bureau plans to work with three to five states to conduct pretests to examine the feasibility of implementing a block boundary program. To obtain information about the use of census data for state planning purposes, the bureau will hold a series of regional meetings with state officials and planning personnel in 1986.

In April 1984, the bureau began holding a series of open Local Public Meetings to obtain and review the recommendations of as many users and potential users as possible in planning the decennial census. The objective is to hold at least one meeting in every state, the District of Columbia, Puerto Rico, and the

Virgin Islands over a period of a year and a half. Census staff members speak briefly at each meeting about current census planning efforts, answer questions, and bring the local comments and recommendations back to the bureau for review. To date about one-fourth of the meetings have been held. Thus far, at each meeting many comments about the transportation items on the 1980 census and suggestions for improved data in 1990 have been received. The major issues that have surfaced to date can be categorized into three topics: geographic level of place-of-work coding, funding for block coding, and content improvement.

With regard to the geographic level of place-of-work coding, planners from many of the largest metropolitan areas generally have expressed satisfaction with the census-tract level. Those from small and mid-sized areas think data for census tracts is not detailed enough, because the tracts are large, and therefore argue for block data that can be aggregated into traffic analysis zones.

The topic of cost sharing elicits three general opinions. Some transportation planners have suggested that federal funds earmarked for planning be provided directly to the Census Bureau by the U.S. Department of Transportation. Another set of comments makes it quite clear that many local planning agencies are not in a financial position to share the cost of block coding. Perhaps surprisingly, there are some agencies, often located in the fastest-growing areas of the nation, who are willing to assist in meeting the cost of getting the data they want.

The two major suggestions heard at Local Public Meetings for improving transportation content are adding a question on time of departure from residence and workplace, to identify peak commuting hours, and collecting data on multimodal commuting, as contrasted with collecting data on the principal mode, as is now done. The common complaint is that principal mode underestimates commutation on public transportation.

Other subject areas often commented about including adding measures such as distance to work and nonwork travel, the usefulness and timeliness of the Urban Transportation Planning Package, and sample size. Although some suggestions are not feasible within the limits the Census Bureau accepts, all are recorded and reviewed by bureau planners and subject-matter specialists.

Among the professional organizations that have been contacted for planning assistance is the Council of Professional Associations on Federal Statistics (COPAFS), which will hold a conference on concepts related to residence rules, that is, where to count people. COPAFS members include more than 125,000 users of federal statistics in private business, governmental units, public interest groups, and the research community.

The bureau has contracted with the National Research Council Committee on National Statistics to take a look at several aspects of the next census, particularly the issue of adjusting census counts. The committee will

1. Identify and evaluate possible methods for adjusting net census error in 1990,
2. Investigate the uses of sampling to improve the accuracy of the counts for both total and minority populations, and
3. Investigate the types of administrative records, both local and national, that can be used for various parts of the 1990 census procedures.

The committee and its appointed panel will also be available for consultation on topics such as statistical methodology, statistical measurement of immigration and emigration and its use in estimating net undercount, and studies to be carried out during the 1990 census. In general, the panel is to address the issues from a technical point of view, and the bureau will then consider other aspects, for example, the legal and policy issues. The panel's first report is due in early 1985.

In planning the 1990 census, the bureau will also draw on the expertise of its advisory committees. The Census Bureau has four standing advisory committees that review and comment on decennial census plans. These represent the Population Association of America, the American Statistical Association, the American Economic Association, and the American Marketing Association.

The Census Bureau has established relationships with many of the varied segments of its data-user community, and these relationships have provided the bureau with information about data-user needs and the data products that best fit those needs. Three major sources of feedback about data-user needs are the Association of Public Data Users (APDU); State Data Centers, now established in most states; and the Census Bureau's own 12 regional offices and their 9 satellite offices.

APDU is an association representing academic, government, business, and nonprofit organizations concerned about data use, production, and distribution. In November 1983 Census Bureau personnel took part in the annual APDU Conference, where many comments concerning data-user needs for the 1990 census were received, including such varied concerns as geographic units used in Census Bureau publications and summary tape technical design, subjects, and geography.

State Data Centers have been set up through cooperative agreements between the Census Bureau and participating states to improve access to and use of Census Bureau and related statistical resources. A number of national and regional meetings have been held since 1980 at which census planners have explored with State Data Center personnel ways in which the centers can participate over the decade in planning the 1990 census. Also, the centers have formed a steering committee to provide a mechanism to present state views on census planning and other census programs, and a conference addressing these topics was held in September 1984.

Two major objectives of the Census Bureau's regional offices are to assist the public in accessing the data they need and to answer inquiries about Census Bureau programs and products. However, regional offices also serve as two-way channels of communication by providing feedback to census planners on strengths and weaknesses of the 1980 census and suggestions on improving the 1990 census, which are grounded on their extensive field contacts. This advice is received through informal discussions with regional directors and other field personnel and at regional director's conferences.

In addition to the preceding formal agenda, other special meetings are held. For instance, the bureau has held a number of off-site meetings to address specific topics related to the 1990 census. These meetings are held close enough to Census Bureau headquarters to keep travel costs down but far enough away so that participants are not interrupted by everyday work. Some of the meetings have been attended only by bureau personnel, but others have also been attended by selected individuals in or out of government. Examples of the latter type were meetings on the meaning of enumeration (July 1982), on 1990 redistricting needs (October 1983), with representatives of minority groups (January 1984), on automation (July 1984), and on outreach and publicity (September 1984).

In addition to the four standing advisory committees mentioned earlier, the bureau has requested that the Department of Commerce grant authority to form four committees to represent four minority groups: blacks, Hispanics, Asian and Pacific Islanders, and American Indians and Alaska Natives. If the committees are approved, the bureau hopes to begin meetings in the spring of 1985.

Of course, the list would not be complete without referring to special-purpose subject-matter conferences, such as this transportation meeting. This conference provides an important opportunity to receive comments from the transportation community and reach a clearer understanding of what should and can be accomplished in the next census.

## Testing

In addition to internal review and consultation with data users, the bureau is planned to conduct several tests between now and 1990. In 1984, the bureau conducted a test of procedures for compiling address lists. In 1985, it will carry out two pretest censuses, one in Jersey City, New Jersey, and the other in Tampa, Florida. In 1986, the bureau will continue to test alternative techniques and may conduct pretests in as many as three different sites. One of the 1986 tests will be devoted to special procedures for enumerating American Indians.

There will also be a national content test in 1986 to test new items proposed for the census questionnaire, as well as revisions of the standard questionnaire items to clarify the wording for respondents. This test, similar to one held before the 1980 census, is the major testing vehicle for determining questionnaire content, because it is national in scope. Special-purpose tests on certain types of questions are also planned.

The bureau will hold other pretests in 1987 and a full-scale dress rehearsal census in 1988. In the period 1985-1988, there will be a number of special-purpose tests related to the decennial census, including the test of an automated coding system to improve the accuracy of small-area place-of-work data.

In addition to the Census Bureau's internal deadlines, as the decade progresses there are a number of legal deadlines. The first comes on April 1, 1987, when Congress must be notified of the subject content of the 1990 census. This date also is the deadline for Census Bureau receipt of state redistricting plans (P.L. 94-171). One year later, April 1, 1988, Congress must be informed about all questions to be included in the census. These early deadlines of course provide an opportunity for congressional review and comment. Next in the series of legally mandated dates is Census Day, which will be April 1, 1990. Eight months later, December 31, 1990, reapportionment counts must be delivered to the President. These are used to reapportion the House of Representatives. The last legal deadline in the decennial census cycle is April 1, 1991, when delivery of final Public Law 94-171 data products for legislative redistricting is required.

# TRANSPORTATION ISSUES

Over the next 4 years, as part of the 1990 census planning process, the Census Bureau will be addressing several important issues that pertain to the transportation items in the census. These issues deal with the content of the questionnaire, coding, and tabulation.

## Questionnaire Content

If data from the decennial census are to be an acceptable alternative to origin-destination surveys, the issue of census content must be considered. Will all of the transportation data from the 1980 census still be needed in the 1990s? Are any modifications to the questions needed? Given such constraints as keeping respondent reporting requirements at a reasonable level, holding the line on costs, and conserving questionnaire space, are there still additional subject areas critical to transportation planning that the Census Bureau should consider for inclusion in the 1990 census?

Place of work and means of transportation to work were the heart of the journey-to-work items on the 1980 census, although questions also were included on carpooling arrangements, the number of commuters in the carpool, and travel

time to work. The 1980 housing items included two transportation-related questions: the number of automobiles available for use by the members of each household and the number of light trucks and vans available. Another question identified persons with a disability that limited or prevented them from using public transportation.

Several specific content issues for 1990 already have been raised by transportation data users. For example, can the means-of-transportation question be asked and processed to obtain all modes of travel used to get to work as well as the principal mode? What effect would it have on data users if the questions on cars and trucks and vans were combined into one question on total vehicles available? Is travel time to work still preferable to distance to work because of response accuracy? How important would it be to ask a question on peak hours of travel to improve the utility of the journey-to-work data? Were the data on public transportation disability used by local planners? Should the question have asked whether the person had a condition that limited or prevented him from driving a car instead of using public transit? These are just some of the questions that the Census Bureau must answer before the 1990 census.

## Coding

Foremost among the transportation issues that will receive a great deal of attention is continued improvement in the accuracy of small-area place-of-work coding. Since the place-of-work question first appeared in the census in 1960, responses have been coded clerically. The 1960 census asked only city, county, and state of work, so coding was fairly simple. In 1970, however, the development of Address Coding Guides provided the capability for the first time of geographically coding place-of-work addresses down to the level of the census block. For the 1980 census, place-of-work coding guides were prepared from the address reference files, in 1980 called th GBF/DIME files, and extensive precoded lists of major employers such as companies, businesses, office buildings, shopping centers, colleges, and military installations were created to help code responses that did not give complete addresses. Because many large employers do not have a commonly known street address--the Census Bureau is a good example--these lists resulted in a significant improvement in the quality of place-of-work coding in 1980. There is still progress to be made.

The bureau's ability to code places of work down to the block level varied from metropolitan area to metropolitan area. The reasons for this include variations in the quality of responses, the completeness of the coding reference materials, and the ability of the coders in different processing sites to carry out the complicated procedure of researching the block location of companies, businesses, buildings, shopping centers, or other workplaces. Wherever the rate of block coding was low, the detailed place-of-work data for that area were of limited utility.

Another issue to be examined is the geographic level of small-area place-of-work coding to be undertaken in the 1990 census. In the 1980 census, workers who lived within metropolitan areas were coded to the block level whenever possible. If the information in the place-of-work response was not sufficient to assign it to a block, the coders attempted to code to the census tract and so on up the hierarchy of census geography. One convenient measure of 1980 results is the proportion of workers who worked in central cities of metropolitan areas and were coded to census tract or block. In 1980, about 81 percent of the workers who reported working in central cities were coded at least to the census-tract level, whereas about 73 percent were coded to block.

As an alternative to block coding, coding the place-of-work questions to a

higher geographic level such as the census tract would have many advantages. Precoded reference files of addresses, companies and businesses, buildings, and other employment sites could be prepared more easily and could be more comprehensive. Coding itself would be more efficient because responses could be coded to a larger neighborhood type of unit rather than to individual blocks. The coding would be more accurate; more responses could be coded to census tract than to block. Many local planning agencies, notably in the largest metropolitan areas, are already using the census tract as an alternative to traffic analysis zones.

As part of the 1986 and 1987 pretest activities, the bureau plans to develop and test an automated coding system in an effort to improve the accuracy of small-area place-of-work data while providing savings in processing time and cost. Handwritten place-of-work responses from the questionnaires will be keyed and then matched against reference files by the computer to ascertain the appropriate geographic codes rather than being coded by clerks using computer-generated manuals. The reference files will include both address records and major employer records so that the coding algorithm can use whatever information the respondent provides. The success achieved by the automated coding approach will depend on obtaining as many complete address responses as possible during the enumeration phase of the census and on creating a comprehensive list of major employers from which to code those responses that are incomplete. Consequently, the pretests also will allow the evaluation of response quality and the identification of the best sources for obtaining lists of major employers. As in 1980, the bureau plans to contact local transportation planning agencies to obtain lists of traffic-generators with which to check the coverage of the major employer files.

## Tabulation

The issue of the cost of producing small-area place-of-work data must also be addressed as the bureau plans for the 1990 census. Most nontransportation applications of geographically detailed place-of-work data, such as daytime population analyses for marketing, environmental impact studies, and disaster planning, utilize the data at the census-tract level. In 1970 and 1980, the only reason that place-of-work responses were coded down to the level of the city block rather than the larger census tract was so that the data could be aggregated to traffic analysis zones for tabulation in the Urban Transportation Planning Package (UTPP), which is a special tabulation of census data that is tailored to the geographic areas used in transportation planning. Local transportation planning organizations submitted specifications to the Census Bureau for the blocks that made up each of their traffic zones, and the bureau then produced a standard set of tabulations for those planning areas on a cost-reimbursable basis.

With the increasing cost of conducting home-interview origin-destination surveys, not to mention the difficulty in obtaining the cooperation of respondents, the UTPP has developed into a low-cost alternative source for benchmark planning data. The emphasis placed on the package by the U.S. Department of Transportation, both through funding for the project and teaching local planners how to use it, has institutionalized decennial census data in the urban transportation planning process. Nevertheless, given the need to hold the line on the overall cost of the census, the commitment of census resources to the needs of a unique group of data users raises the inevitable question of whether user fees should be charged for coding to the block level. Therefore, during the planning phase of the 1990 census, the bureau will be investigating the desirability and the feasibility of several alternative approaches to

small-area place-of-work coding. One possibility is to code to the census-tract level except in certain tracts that have a high concentration of employment or where block detail is absolutely needed to divide the tract into smaller zones. These tracts could be identified and contracted for by local transportation planning agencies during the development of the 1990 place-of-work coding system. Thus, depending on the need for local agencies for blocks, place-of-work coding may be entirely to block, partially to block, or to census tract only.

## CRITERIA FOR CONTENT SELECTION

These are just some of the content issues that the Census Bureau must resolve before the 1990 content is set on April 1, 1988, when it is submitted to Congress. How will the choices be made? In all census planning, a number of criteria are considered.

First, the constitutional and legal requirements to deliver the counts for reapportionment to the President by December 31, 1990, and the counts for redistricting to the states by April 1, 1991, must be met. Also, the delivery of redistricting counts for those states that require them before April 1, 1991, will be expedited. In the course of planning, the ability to meet these dates must not be jeopardized.

Second, the total cost of the census must be kept reasonable. Considering the important uses of the census, the 1980 census costs were not out of line. Still, there is always room for cost efficiency, and the goal is keep the per-unit cost no higher, considering inflation, for the 1990 census than it was for 1980.

Third, the data will be produced in a more timely manner than ever before. Automation will be one of the keys to this goal, but there are many other decisions that will affect the ability to achieve this objective.

Fourth, the high level of accuracy of past censuses must be maintained, particularly in the area of coverage. This is a real challenge--to do the census faster and at a reasonable cost but not to lose, and in fact to improve, overall accuracy. One important aspect of this goal is to decrease the differential between the undercount rates for whites and for minorities.

Fifth, all decisions about the census must consider the necessity of maintaining the strictest confidentiality of each respondent's answers. This goal is one of the major considerations for 1990. Confidentiality must be protected at all costs, even if it means passing up the use of new technologies that can be perceived as a threat to confidentiality. As the public sees computers playing an even larger role in the census, they may fear for the protection of the data. Although automation and computers can have real benefits, the bureau must take care to ensure that the confidentiality of its data is maintained, not only in fact, which has always been the case, but in appearance as well. The success of the census depends directly on the willingness of the public to cooperate, and their trust in the pledge of confidentiality is the basis for that willingness.

Sixth, in deciding what questions will be asked, a proper balance must be struck between the need for information and the length of the questionnaire. There are more and more demands for data, and there are more reasonable questions than can be asked, so the challenge is to keep the questionnaire relatively short while trying to meet as many data needs as possible. As the bureau conducts the extensive testing and consultation program already described, it will be found that there are many more legitimate questions than can reasonably be asked. In making the final choices, the following six standards will be used:

- Demonstrated need
  Only essential data will be collected--those needed to describe the American population and housing stock--but those specifically needed to administer federal, state, and local programs have a high probability of being on the questionnaire.

- Small-area need
  If the data are needed for small geographic areas (census tracts, block groups, and blocks), the census is a good tool. If the data are only required for larger areas (such as the nation, regions, states, counties, and Metropolitan Statistical Areas), sample surveys might be more appropriate.

- Small population
  The small-area need refers to small geographic areas. Data needed for a small but dispersed population (for example, American Indians) are theoretically possible but quite difficult to collect on a sample survey. Therefore, the census may be more appropriate.

- Self-reportable and suitable for data processing
  The questions generally will be answered directly by respondents without an enumerator present; therefore the questions must be relatively easy to understand. In addition, the responses must be of a type that are easily translatable to machine-readable form and consistent with electronic data processing requirements.

- Public acceptability
  The 1990 census form will not contain any question that is intrusive or offensive. Also, the census will not include questions about opinions.

- Historical continuity
  Many of the questions asked in 1980 and earlier censuses will be reasked in 1990 to provide trend data on vital socioeconomic and housing characteristics.

Transportation is only one of the many subject areas in the census; similar analyses must be conducted with the others. Nonetheless, transportation is a critical issue, particularly considering ever-changing lifestyles affected by such decisions as migration from central cities and adoption of electronic communications advancements to eliminate journeys to the store or even journeys to work.