# User Evaluations of the Urban Transportation Planning Package: 1974 and 1984 Perspectives

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The purpose of this paper is to document the information received from the conference participants regarding the quality and use of the Urban Transportation Planning Package (UTPP) and to compare these responses with similar information presented by Robert C. Stuart and Michael R. Hauck in The Census and Transportation Planning: Survey of Evaluations and Recommendations as to the Usefulness of the 1970 Census Data in Urban Transportation Planning (1). The 25 participants who provided information at the conference represented both states and metropolitan planning organizations (MPOs). Of the MPOs, some were from small areas such as Sioux Falls, South Dakota, and Colorado Springs, Colorado. Large metropolitan areas were well represented by New York, Chicago, Los Angeles, St. Louis, and Dallas-Fort Worth. States were represented by Florida, Michigan, Arkansas, and Alabama.

## TYPES OF CENSUS DATA USED

In 1980 the majority of the respondents used Parts I and IV of the UTPP more than any of the other parts. Part VI, the county-to-county data set, which was not available in 1970, was the next most widely used part of the package. Part III was also extensively used. Part II was used by only one of the 25 areas, and there were no reports on the use of the data shown in Part V.

In addition, use of Summary Tape Files (STFs) 1 and 3, which were available from the Census Bureau almost 1 year sooner than the UTPP, was extensive. In 1980 the STFs were available through State Data Centers, which were not in existence when the 1970 data were released. Some MPOs are adjuncts to or affiliates of State Data Centers, and this close relationship is an important organizational change between 1970 and 1980 that brought census data closer to the MPOs and other users.

The STFs provided single data elements for various geographic levels. They are similar to the data shown in the UTPP, Part I, except that the UTPP cross-classified up to three different data elements into unique tables. Parts I and II of the 1970 package contained information that was directly available on the many census tapes or publications. In 1980 there were many cross-classifications available in Parts I and II that were not available from any other census product. The major criticisms in 1970 were directed toward Parts III and IV. It was reported that MPOs also used the GBF/DIME files, printed reports, population tabulations (at the block level), and the Master Area Reference Files (MARFs) (to determine the distances between the centroids of census tracts).

The types of census data used by urban transportation planning agencies after the 1970 census were similar to those used after the 1980 census. Initially all agencies purchasing the UTPP in 1970 planned to use all four parts of the standard package. The overall quality of the package was initially considered to be favorable. However, after local agency review of Parts III and IV by the

early recipients of the package, it was determined that these parts did not produce reliable information. Therefore, other MPOs decided not to purchase the package, expecting problems in their areas also. These problems with the 1970 data were primarily the decisive factor in an agency's decision not to purchase the package in 1970 or 1980.

In 1980 purchasers could return a package for retabulation if errors were found, an option that was not available to purchasers of the 1970 UTPP. This allowed for a more complete product in 1980 and demonstrated the excellent cooperative attitude of the Census Bureau staff.

The 1970 UTPP was available for full Standard Metropolitan Statistical Areas (SMSAs) only. In 1980 the UTPP was based on counties, but purchase areas could include more or fewer counties than those in a particular SMSA and include counties from adjacent SMSAs.

Census items most frequently used in the 1970 UTPP, according to the Stuart-Hauck report, were population, households, age, sex, race, income, automobile availability, occupation, industry, class of worker, place of work, mode of journey to work, Spanish origin, number of units at address, value, and contract rent.

## USES OF THE DATA

Most MPOs purchased the UTPP to establish a new data base for their area. This was reported by many participants and was often given as the basis of the need for census data. The data were used for existing model applications in most of the areas that purchased the package. In some cases existing models were validated against census data and then differences between the two sets of data were reconciled.

New models such as shared ride and transit use were developed. With a 10 percent sample of journey to work by transit available from the 1980 UTPP, old mode-split models were discarded as not being reflective of the present or as unreliable because they were developed on samples of 1 percent or less. Many participants mentioned the development of ridesharing and transit models for transit planning purposes and for UMTA grant information as important uses of the 1980 UTPP data.

Other reported uses of the data were subarea planning; alternatives analysis; air quality analysis; determining the unserved transit patron; providing Title VI transit information; energy analysis; impacts of hazardous waste transportation (night and day); land use forecasting; and providing data to local governments for many different types of planning studies and traffic impact analyses. In 1970 the UTPP was used as input to the three major models at the traffic-analysis-zone and district levels. These models were the trip-generation model, socioeconomic data for the trip-distribution model (gravity model), and the regional-growth model. Census data were used for studies of bus routes, carpools, economic bases, and housing; for analysis of unemployment and air pollution impacts; for energy conservation; and for retail location and marketing. In 1970 there were plans for similar uses, but the poor quality of Parts III and IV precluded using them for substantial planning analysis such as employment distribution.

There were two major differences between the uses of the 1970 and 1980 data. They were used extensively in 1980 for development of new models, for example, shared-ride and mode-split models. In the Stuart-Hauck report, however, there was no mention of using the 1970 data for developing new models. The second major difference was the data on external travel available in 1980 from 20 surrounding counties. In 1970 these data were not available. This was one serious problem mentioned in the Stuart-Hauck report that was apparently rectified in 1980 with Part VI of the UTPP. Without these trips there was

significant underreporting of journey-to-work data. It was estimated that underreporting could be as high as 20 percent of all work trips, although for the median SMSA it was probably about 4 percent.

In 1980 workplaces of residents of adjacent SMSAs were coded to block level in what were called commutersheds. Also, Part VI reported travel by mode and shared-ride arrangements from 20 adjacent counties into individual SMSA counties. This correlated well with external travel in typical planning study surveys.

## ACCURACY OF WORKPLACE CODING

There were seven attendees at the conference who reported that no work had yet been done on determining the accuracy of the workplace coding for the 1980 data. Others reported that although they had done some analysis, their effort was not complete. Nevertheless, there were enough general comments to determine the overall condition of the products received.

Five respondents reported that the data were generally good and that they had found no problems to date. Of the respondents that did mention specific problems, the predominant ones were GBF/DIME file coverage and errors within the GBF/DIME file area. Generally, the areas that caused problems were military installations, major retail centers that covered more than one census block, and industrial parks where workplace locations were not known by their street addresses.

Easily corrected errors were those in which workplaces were miscoded to adjacent tracts or across an arterial highway. The allocation process resulted in workplace errors at the traffic-zone level because certain land uses were coded to the tract only. These were easily corrected based on occupation and industry codes.

The accuracy of the workplace coding was directly related to the extent of the GBF/DIME file area and the accuracy of the file. Nine respondents indicated that the GBF/DIME file coverage was much improved over that in 1970. Generally, 1980 UTPP purchasers expressed a need for the GBF/DIME file to cover the entire SMSA or at least the entire MPO planning region. With the advent of federal planning (PL) funds in the mid-1970s, urban planning studies expanded to include full-county areas whose boundaries coincided with those of the jurisdictions that match the PL funds.

In 1970, according to the Stuart-Hauck report, there were similar problems regarding the accuracy of workplace coding. The main problem was the Address Coding Guides (ACGs), which were the 1970 version of the GBF/DIME files. Areas that were satisfied with their UTPPs in 1970 also had ACGs of high quality. Most agencies rated the need for improved ACGs as a critical element in planning for the 1980 census. Not only were there major errors in the 1970 ACGs, but the areas covered did not extend far enough into the suburbs to include the entire transportation planning area, which was defined as the current developed area plus the area expected to be developed in 20 years. There was little need in 1970 for coverage of the entire SMSA.

In 1980 workplace coding errors were corrected by the Bureau of the Census for those who requested the service. In 1970 if the workplace was not coded to block, it was coded to Universal Area Code (UAC), and it was not possible to make corrections for missing data. In New England UACs were towns that were small enough so that workplaces could be reallocated manually. In the sections of the country where UACs were counties, however, it was difficult to allocate to small areas manually. This aspect of small-area workplace data in 1970 precluded many data planning activities. In 1980 many places of work that were identified as "not reported" were allocated to small areas using a method developed by the Census Bureau. The uses of Parts III and IV of the 1980 UTPP

were extensive because of the improvement in the proportion of work trips tabulated to small areas.

Although it was not reported directly, the sample size for the data on the journey to work, which was 10 percent in 1980, was not a problem. In 1970 the sample size was 15 percent. It does not appear that in 1970 or 1980 the sample size contributed to any major errors in the data, except for those modes of travel that are in the minority. For those modes a substantially larger sample would be required than the 15 percent used in 1970. It should be pointed out that in 1980 the mode question was coded at the full 1 in 6 sample rate; only the place-of-work coding was limited to the one-half rate (1 in 12 in large areas and 1 in 2 in smaller areas).

## UTPP FILE DOCUMENTATION, FLEXIBILITY, AND FORMAT

In 1980 there was little criticism of the documentation of the UTPP. The only comments received were that it could be improved but there were no specific recommendations. The extensive data dictionary provided in 1980 solved many potential documentation problems, although one respondent indicated that it was too cryptic.

Tape format problems in 1980 included the noncompatible IBM data set names, which caused universal consternation until the simple solution of the label bypass was found. The issue of long record length had to be solved, but once understood was quickly resolved. There was a general desire by the Urban Transportation Planning System users to have received the file in typical Z-file and J-file format. Also, it was noted that the print program at the beginning of the tape did not work for specific areas. A reformat by local users rectified this problem.

In the 1970 report the issue of file flexibility was raised. Basically in 1970, more cross-tabulations at the traffic-zone level of geography were needed than those provided. A study of the specifications of the 1980 UTPP file show that this issue was overcome by additional three-way cross-tabulations at small-area geography.

## ALTERNATIVE DATA SOURCES

The participants reported extensive use of other data sources besides the decennial census data: local employment surveys, state employment files, and data from private commercial sources. In addition there were on-board transit surveys, data from utility companies, building permits, and other data collected by local governments.

In the Stuart-Hauck report, very little is mentioned about alternative data sources, probably because at that time funds were not so scarce as they are now and local urban planning organizations collected their own data. Also, in 1974 most of the primary data had been collected only a few years before, making the data bases of fairly recent vintage. By 1984 these data bases were obsolete, and a new sources need to be found, hence the current reliance on secondary sources of information such as state employment files and private commercial sources. In the Stuart-Hauck report it was concluded that alternative data sources were inferior, too expensive, or nonexistent.

## CONCLUSIONS

The attendees at this conference who responded to queries about the UTPP were on the average more satisfied than those in the Stuart-Hauck survey of 1974.

Lessons learned in the 1970s were put into action in preparing for the 1980 census, resulting in significant improvements. Lessons learned from the 1980 census will be taken into account in planning for the 1990 census and for the data products that will be produced. With efficient transportation being a national goal, the value of a comprehensive data collection effort such as the census (conducted uniformly throughout the country and used to evaluate the investments required to provide for a safe, efficient, and cost-effective transportation system) cannot be overstated.

REFERENCE

1. R.C. Stuart and M.R. Hauck. The Census and Transportation Planning: Survey of Evaluations and Recommendations as to the Usefulness of the 1970 Census Data in Urban Transportation Planning. FHWA, U.S. Department of Transportation, March 1976.