Services for Use of Census Transportation Planning Package

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Working extensively with the Census Transportation Planning Package (CTPP), JHK & Associates, under contract to the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), developed and taught the Census Applications Workshops in 1991. The goals of the workshops were to inform transportation professionals about the availability and applications of the CTPP data and to provide hands-on experience with the data. The workshops were conducted in over 30 cities throughout the country with an average of 30 participants in each (about 900 transportation professionals attended). The workshops are no longer being conducted; however, a CTPP Handbook is available from FHWA that documents the topics covered and includes the Lotus 1-2-3 spreadsheet templates that participants used. A brochure and a video oriented toward managers and nontechnical staff that provide an overview of the CTPP and its uses are also available from FHWA. Because interest in the workshops continues to be strong, FHWA and the Bureau of Transportation Statistics have contracted with JHK to offer CTPP Urban Element technical assistance. Also detailed are other uses by the firm of census data, including the Topologically Integrated Geographic Encoding and Referencing (TIGER) File.

Work by JHK & Associates with the Census Transportation Planning Package (CTPP) includes training, use of census data with geographic information system (GIS) software, and model validation.

TRAINING

Census Applications Workshops

JHK developed and taught a three-day CTPP training course for FHWA and FTA. The purpose of the workshops was threefold: to inform transportation professionals about the CTPP, to demonstrate how the data could be used in a variety of transportation planning applications, and to enable course participants to work with the data in a series of applications-oriented case studies. The course was designed for a wide variety of interests, including a half-day overview session for nontechnical audiences and a series of sessions and case studies that provided hands-on experience to technically oriented participants. FHWA and JHK staff taught the course in over 30 cities throughout the country, with an average of approximately 30 participants per course (over 900 transportation professionals attended the workshop).

JHK prepared a course notebook that was distributed to all participants. The notebook included a diskette with the computer files used in the workshops, so participants had the opportunity to review course materials after completing the workshops. JHK also prepared a CTPP Handbook that was designed for those unable to attend the workshops. A brochure and a 20-minute video were also developed by JHK. The handbook, brochure, and video are still available from FHWA [contact Monica Francois (202-366-6072)].

The course was divided into three modules. The first module, a half-day session, was intended to inform the transportation profession about the usefulness of CTPP data by providing a comprehensive overview of the CTPP and its potential applications.

The second module provided instructions about how to download and present the CTPP data. Downloading the data to a format that could be read by personal computers proved to be one of the biggest challenges for the Census Bureau and FHWA. The CTPP is a huge data base that cannot be effectively stored on floppy disks for distribution. Furthermore, because of the size of the data base, the Census Bureau had organized it in mainframe formats, with record lengths that could not be read by personal computer software.

Recognizing this problem, the Bureau of Transportation Statistics (BTS) contracted with the Caliper Corporation to develop the TransVU software, which operates in a Windows environment. It uses pull-down menus and icons that simplify downloading CTPP data from CD-ROMs into data base or spreadsheet files.

Work on TransVU started after the CTPP workshops began, so earlier courses could only present what the software would potentially do. In the final few courses, an overview of the software was provided. Therefore, Urban Element Technical Assistance (discussed in the next section) will focus on how to use TransVU to download data.

The third workshop module included several case studies that provided hands-on experience with using the CTPP data in a variety of practical situations. The case studies used menu-driven Lotus 1-2-3 spreadsheet templates that uploaded simulated CTPP data (actual data were not available at the time the course was developed) and helped participants through the analysis procedures. The case studies included in the third module were as follows:

- Case Study 1: Downloading CTPP tables. This case study initially used simulated CTPP data files and spreadsheet templates to demonstrate how data were stored and could be downloaded into PCs. Case Study 1 was updated with a TransVU demonstration once the software became available for distribution.
- Case Study 2: Producing outputs. Course participants used the downloaded files from Case Study 1 to prepare tables and graphs in a Lotus 1-2-3 spreadsheet file. Templates were provided to assist participants. This case study was updated once the TransVU software was available.
- Case Study 3: Converting CTPP journey-to-work (JTW) data into home-based-work data for use in travel demand models. Two options were presented; the first was developed by William Mann and the second by Chris Fleet. The procedures were incorporated into a spreadsheet template that students received with the course materials.
- Case Study 4: Using the CTPP JTW tables directly for transportation analysis. This case study included four situations, each of which had a corresponding spreadsheet template for students to use. The four situations were
  - –Assessing tax incentives for commuters,
  - –Evaluating the effectiveness of commuter bus service, and
  - –Assessing the impact of a plant relocation and identifying carpool potential.
- Case Study 5: Using the CTPP for model validation. This case study demonstrated how the CTPP could be used to develop or check key travel demand model parameters. As with the other case studies, a spreadsheet template was provided.

Detailed case study instructions and spreadsheet templates are available in the CTPP Handbook available from FHWA.

CTPP Urban Element Technical Assistance

The Census Applications Workshops are no longer offered by FHWA; however, FHWA and BTS are offering CTPP Urban Element Technical Assistance free of charge to the host site. JHK has been retained by FHWA and BTS to coordinate with the host communities. The assistance was scheduled to begin in March 1996 to coincide with the release of specially indexed CTPP Urban Element data on CD-ROM. A brochure describing the assistance was sent to over 1,000 transportation professionals throughout the country and JHK has received a number of workshop requests. Interested communities should contact Whit Blanton at JHK (407-422-8813).

The technical assistance program will focus on the Urban Element of the CTPP, which summarizes the data by traffic analysis zone (TAZ) as defined by metropolitan planning organizations (MPOs). The Census Bureau is in the process of releasing the Urban Element on CD-ROM, along with the TransVU software, to all MPOs in the country. The technical assistance workshops are designed to allow participants to learn what is in the data set and how to apply actual data (which were not available in the Census Applications Workshops). Before providing technical assistance, JHK will contact each host community to learn what its issues and needs are. The workshop will then be tailored to address the specific needs of the host community.

The program will also cover the use of TransVU, which is designed specifically to access the CTPP Urban

Element data base. Participants will use TransVU to work through several case study applications.

GIS/CTPP Applications

JHK assisted several MPOs in Florida with their Transportation Plan updates, as required by the Intermodal Surface Transportation Efficiency Act (ISTEA). The Topologically Integrated Geographic Encoding and Referencing (TIGER) File and CTPP data were extensively used in these plan updates, with the help of PC ArcInfo geographic information system (GIS) software. The following sections describe the firm's use of TIGER and CTPP data.

TIGER File and Networks

The TIGER File was used to update TRANPLAN travel demand model networks. JHK developed a routine that automatically converts TRANPLAN networks into a GIS layer. A modified rubber sheeting process was used to match TIGER and TRANPLAN network layers. Detailed network checks were made with the overlay.

Several routines were developed by JHK to upload TRANPLAN network assignment results. Network links were grouped into longer segments and a routine was developed that calculates a weighted average segment volume from individual link volumes (link lengths were used as the weights). A second routine estimated the segment's level of service (LOS) using the Florida Department of Transportation's Generalized LOS Tables (based on 1985 *Highway Capacity Manual* procedures). A third routine (still under development) will determine a segment's LOS threshold using a lookup table and segment information entered by the user. This segmentation simplified the network evaluations using LOS thresholds (as adopted by the localities in the MPO study area) rather than model-estimated capacities.

The TIGER-based TRANPLAN GIS network became the base for a number of network data bases. For many MPOs, this layer will be used by the Congestion Management System (CMS) for existing and future year deficiency analyses. Other pertinent information attached to this layer included items such as functional classification (i.e., National Highway System, Florida Intrastate Highway System, local road), hurricane evacuation route, freight and goods movement route, and so forth.

TAZ Data

The TIGER File was used by JHK to create a TAZ polygon layer in GIS. The TAZ layer enabled a number of checks to locally developed data. JHK developed a routine that downloads CTPP data from CD-ROM (outside the TransVU software) and compares these data with locally developed data. As expected, the residential data (Part 1 in the Urban Element) closely matched local data; however, employment data (Part 2 in the Urban Element) did not match well. GIS was used to highlight TAZs on a series of maps where there were large differences between local and CTPP data. Corrections were made with aerial photographs, phone calls to large employers, and land use maps.

In Orlando, the TAZ layer was used to aggregate socioeconomic information from the CTPP and local sources and land use information from a Water Management District GIS layer into sector data needed by the DRAM/EMPAL land use allocation models. The models were used by the MPO to help determine future year development patterns based on transportation alternatives.

Model Validation Checks

JHK used the CTPP to check TAZ data and to review the accuracy of trip distribution and mode choice models. Home-based-work (HBW) trip tables estimated by the models were compared with factored JTW information in Gainesville, Florida, to determine the reasonableness of district-to-district trip interchanges (each district was an aggregation of TAZs). Results indicated that the models reasonably estimated interchanges; however, adjustments were needed between districts. In addition, the CTPP was used to check the reasonableness of peak-period (HBW) transit trip tables from the modal choice model. Again, adjustments were made to more closely match the CTPP.

The University of Florida is located in Gainesville, and bicycle trips represent a significant portion of the overall travel demand. The CTPP was used to develop a bicycle trip table (the MPO's model does not include bicycle or pedestrian trips) that was expanded to include all trips and factored on the basis of growth trends in individual TAZs and parking limitations on the University of Florida campus to estimate future year bicycle travel.

Summary

JHK prepared and conducted over 30 Census Applications Workshops for FHWA. As part of the contract with FHWA, JHK prepared a CTPP Handbook, which covers the same material as the workshops, and an informational brochure and video designed for managers and nontechnical staff. The workshops are no longer

available, but the handbook, brochure, and video are. Because of the demand for CTPP training, FHWA and BTS have contracted with JHK to provide Urban Element Technical Assistance to transportation professionals. The assistance will demonstrate how to use TransVU, a CTPP extraction software, and how to use TAZ-level data to address local issues. A number of requests have been received for the training, which will begin in March 1996.

JHK has also used the CTPP in several transportation planning applications. The firm used the TIGER File and the CTPP in GIS software to update Transportation Plans for MPOs in Florida. JHK also used the CTPP for model validation checks.