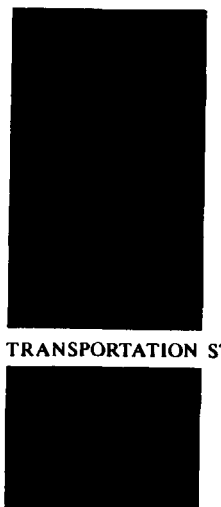
# CATS HOUSEHOLD TRAVEL SURVEY
## VOLUME ONE

**SEPTEMBER 1989**



CHICAGO AREA TRANSPORTATION STUDY

# CATS HOUSEHOLD TRAVEL SURVEY

## VOLUME ONE

Documentation for the
Chicago Central Business District

Chicago Area Transportation Study
300 W. Adams Street
Chicago, IL 60606

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# Executive Summary

In 1988 the Chicago Area Transportation Study embarked upon a multiyear Household Travel Survey. The purpose of this effort is to collect travel data for use in forecasting/planning in the 1990s by surveying household travel characteristics, including trip purposes, modes and lengths. This information will be used to replace the 1970 home interview survey data and to complement the 1990 Census journey-to-work data. Under the scope of the project, CATS will survey the region on a county-by-county basis with the Chicago Central Business District being surveyed separately. In terms of technique, the survey features a self-administered mail-back questionnaire. Because the residents in the region will be surveyed over a period of several years, the questionnaire is designed to allow the results to be factored and adjusted to the 1990 census data.

Presented in this report are the results of the first survey effort, which was conducted in the Chicago Central Business District during November 1988. The contents of this report are intended to provide enough documentation and direction to begin the development of a program to factor and adjust the data base. Once the 1990 census is completed the data base will be adjusted and certified.

When the need for a household travel survey was being discussed there was a great deal of concern over who could use the data. It was decided in the Unified Work Program forum that the entire survey effort would be performed in conjunction with the member agencies and the results would be available to all participants. This report is the beginning of that effort.

This report contains descriptions of the surveying concepts, the editing and coding logic, the data base structure, several summary tables and the data base for the Chicago Central Business District. Also, because the data at this time are unfactored and unadjusted, references are made to the future steps that should be pursued prior to using it data to develop policy and funding scenarios.

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## 1.0 Introduction

In 1956 CATS conducted it's first region-wide home interview survey. This survey provided detailed origin-destination (O-D) data on trip purposes, modes of travel and trip lengths (1). In 1960, the U.S. Census Bureau initiated an effort to collect journey-to-work (JTW) travel data. For the next decennial census in 1970, the Census Bureau greatly improved the JTW data source. In conjunction with the Census Bureau's effort, CATS conducted its own home interview survey. The CATS efforts had three notable purposes: to provide a check on the census JTW data; to develop factors for areas where the census data was incomplete; and to provide O-D travel information on non-work related travel. There were, of course, many other secondary uses of the CATS travel survey (2). Since the Census Bureau was improving its JTW survey and would again conduct it in 1980, CATS performed a sample update of its 1970 data base in 1979 (3).

With the advent of the 1990 Census, the JTW supplement has been further refined and improved. After having worked with three prior census JTW data bases (1960, 1970 and 1980) CATS recognized the need to augment this information with data on non-work related travel and embarked upon a household travel survey.

The survey is a five-year effort that will collect a body of information on both work and non-work trips to replace CATS' 1970 home interview survey data and to complement the 1990 census JTW data. Under the scope of the project CATS will be surveying the region on a county-by-county basis with the Chicago Central Business District (CBD) being surveyed separately. In terms of technique, the survey features a self-administered mail-back questionnaire. Because the residents in the region will be surveyed over a

period of several years the questionnaire is designed in a manner that will allow the results to be factored and adjusted to the 1990 census. Specifically, it is designed with two types of variables: transportation related variables including the origin and destination of each trip, its purpose, travel time, mode used, auto occupancy (for auto trips), and walking distance if transit modes are involved; and census relatable variables such as the number of persons per household, age, vehicle availability, sex, employment status, occupation and income. Shown as Exhibit 1 is an outline of the survey design.

Presented in the remainder of this report is the documentation for the most recent effort that was conducted in the Chicago Central Business District during November 1988. A map identifying the boundaries of this area is presented in Exhibit 2. Because this report is the first of several relating to the survey effort, there is also a general discussion of the surveying concepts and sampling procedures, questionnaire design and editing logic, the data base structure, and several summary tables (unfactored or adjusted). Following this is a discussion of future steps to be taken to establish the quality of the data. Accompanying the data tables for the CBD effort are several summaries of the control variables as they relate to the 1980 census.

The contents of this report are intended to provide the analyst with enough information and direction to take the data base and begin to work with it in a meaningful way. Currently, CATS is developing a program to factor and adjust the data base. When the 1990 census is complete, this data, as well as the data obtained from the other sub areas will be factored, adjusted and then certified.

Comments on the structure of the data base are encouraged and should be directed to Division 4 at CATS (312) 793-3467.

Exhibit 1

CATS Household Travel Survey Features

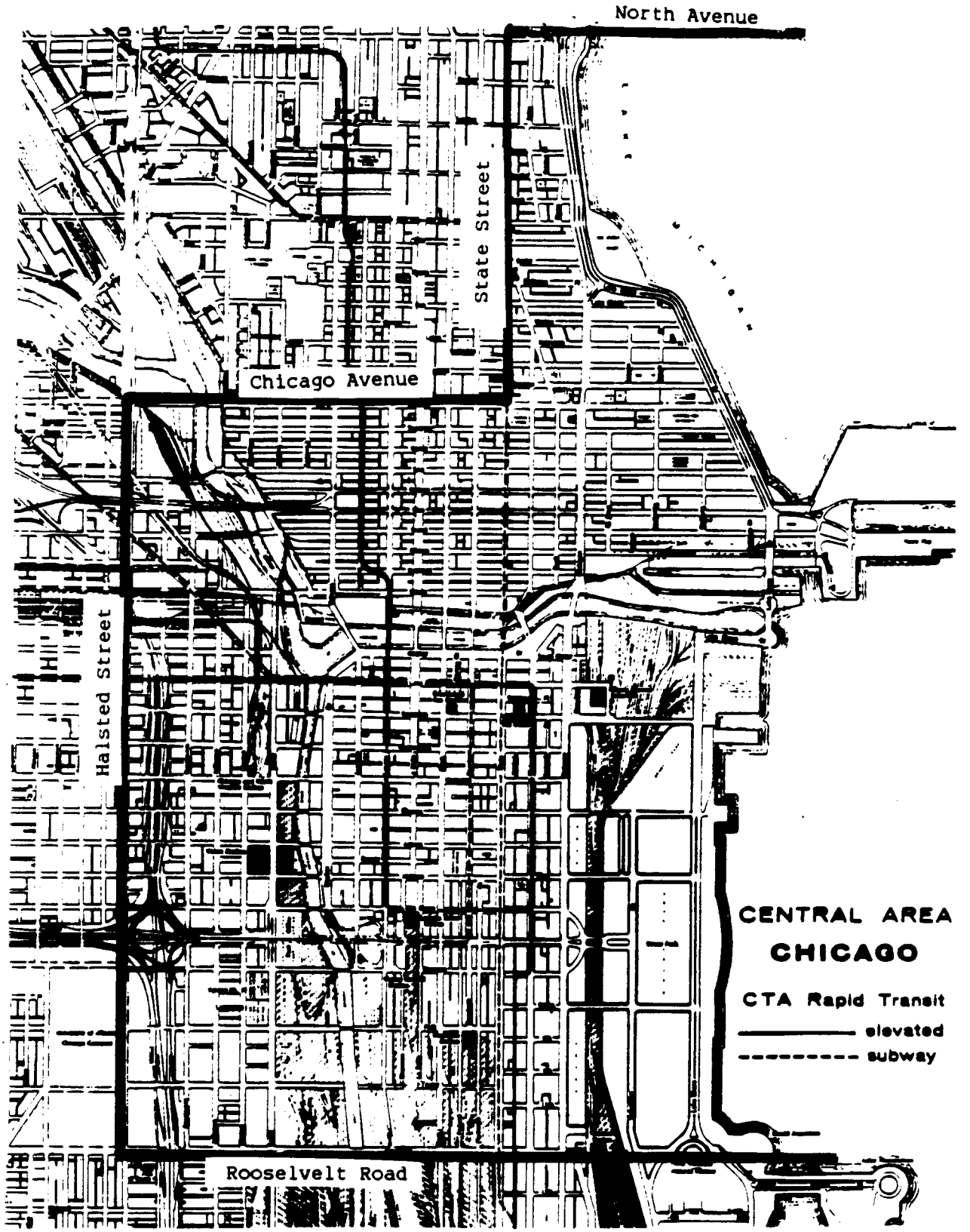
- Self-administered mailback.
- Targets individuals through their place of residence.
- Survey group will be drawn using the Commonwealth Edison Company residential meter listings.
- Yields household travel data for a specified reference day. For this effort Thursday will be the travel day.
- Data items include several U.S. Census relatable items as well as several transportation specific variables. The transportation variables will be limited to those individuals over the age of 14.

| Census Items | Transportation Items |
|---|---|
| Number of persons per household | Origin of each trip |
| Age of individuals | Destination of each trip |
| Vehicles ownership | Trip purpose, mode and length |
| Sex | Travel time |
| Employment status | Trip frequency |
| Occupation | Auto occupancy |
| Household income | Total number of trips |

- Emphasis will be on capturing link trips, walking to transit trips, and non-work related trip purposes.
- Solicits respondent's name and telephone number for follow-ups.
- Technique has been sucessfully tested in other regions and in Chicago's Central Business District.
- Survey will serve several purposes which include answering some basic questions relating to household trip rates and trip lengths while providing new trip records for the region's modelling and forecasting efforts.
- Survey procedure has four main elements. Distribution of an introduction letter to selected households; distribution of the questionnaires and instructions; sending out reminder letters; and, telephoning selected individuals to verify their information.

Exhibit 2

Map of the Study Area



## 1.1 Survey Overview

Following is a brief discussion of several of the key issues surrounding CATS' household travel survey. Included in this section is a discussion of the target population, sampling unit, sampling frame, survey technique, sampling method, the sample size, and sampling error and bias. This information is provided to answer many of the basic questions that are most often asked and to document the technical details of the effort.

### 1.1.1 Target Population

The target population is the group about which one would like to collect information. For the household travel survey the target population is defined as all individuals who live in northeastern Illinois and are 14 years old or older.

### 1.1.2 Sampling Unit

The sampling unit represents the unit of aggregation of the individual elements in the target population. For this travel survey, households rather than individuals will be used as the sampling unit. The primary reason for using the household as the sampling unit rests with the level at which transportation planning takes place. Through CATS' experience with travel forecasting, it has been found that the household is the best predictor of travel behavior and the basic unit of travel. As a result, CATS has focused its travel forecasting process at the household level (1 and 4).

### 1.1.3 Sampling Frame

The sampling frame is the base list, or reference, which identifies

every sampling unit in the target population. In one respect, the sampling frame simply defines the universe from which the sample will be drawn. For the household travel survey the primary sampling frame will be the residential meter listing (addresses) of Commonwealth Edison customers. This listing was successfully used for the 1970 Home Interview Survey and is frequently used by the Northeastern Illinois Planning Commission (NIPC) for its work. For areas where Commonwealth Edison files are not available, specifically the cities of Naperville, St. Charles, Batavia, Geneva and Winnetka and major sections of unincorporated Kane County, residential addresses will be sought directly from the cities and other sampling frames. When identifying the additional sampling frames, care will be taken to assure that the frame is current, accurate and complete, does not contain any duplications, and is adequate for sampling purposes.

### 1.1.4 Survey Technique and Instrument

It should be understood that any survey technique is the result of a compromise among the objectives of the survey, the resources available and the amount of data to be collected. For the household travel survey three different techniques were reviewed: a self-administered mail-back, a face-to-face home interview and a telephone assisted. Taking into consideration the survey objectives, anticipated costs and effectiveness of each technique, and the experience of other regions, a self-administered mail-back was pursued. Based upon the results obtained in Albany and Ithaca, New York using this technique, CATS was able to utilise their experiences and survey tools as a starting point. The mail-back was also attractive since it

was achievable with existing staff and agency resources. For a cursory comparison of a mail-back technique with a telephone assisted survey, refer to Appendix A.

The survey instrument drew heavily from the one used in Albany, New York in 1983 (5). Although the questionnaire is self-administered it does solicit the respondent's name and telephone number to provide for telephone follow-ups. On the questionnaire the respondent is asked to provide U.S. Census relatable items and specific transportation variables. The survey is limited to those 14 years old and over. For a detailed description of the variables, refer to sections 2.0 and 3.0 of this report.

The survey technique has four main elements: distribution of an introduction letter to selected households; distribution of the questionnaire and instructions; mailing out reminder letters; and telephoning selected individuals to verify their information. A copy of the materials distributed to the selected households is shown in Appendix B.

As can be seen, the layout is designed to solicit straightforward information regarding household size, composition, employment status, vehicle availability and household income before the respondent is asked to complete the travel/trip records. Prior to completing the trip records the respondents are asked to assign a "person number" to each household member (14 years and older) and provide their sex, age, relationship to the head of the household, employment status and current occupation. Using the assigned person number, the respondents were then asked to note whether or not each person traveled on the reference (travel) day. If the person traveled they were asked to provide the details for each trip in sequential order. This includes the origin and destination, travel time, purpose and mode. In addition, there are several

questions regarding any walk links that may have been involved in connection with any transit trips.

When working with this data the analyst should understand that this data represents a reference day as opposed to a typical day. Throughout the development and evaluation of the technique CATS staff were consulted. It was decided early on that collecting the travel data for a reference day would be adequate. By taking a "snapshot" of people's travel for one day it is possible to adjust the data according to the type of analysis to be pursued.

Because one of the stated goals was to capture non-work and linked trips it was decided that Thursday would be the optimal reference day. It is a well established fact that midweek is the best time to study work trips and that Thursday is also a shopping day in this region.

### 1.1.5 Sampling Method

The object of sampling is to obtain a small sample from an entire population that is representative of the entire population. Although many different sampling methods exist, a simple random sample was defined for predetermined clusters (the six counties and the CBD). To pare down the region into manageable components, each county will be sampled separately which, in essence, will act as a clustering technique. With the county identified, a predetermined number of household addresses will be selected for the survey. The method used to calculate how many addresses to include will be discussed below.

The results of this sample will be cross checked with several census variables, adjusted where needed and then analyzed. This cross checking will

be conducted utilising all the survey responses collected through the household travel survey. The concept of cross checking is not new and it is frequently performed when the needed controlling information will not be available until after the survey has been performed. A good example is the one at hand, where the survey will be completed well before the census results are available.

### 1.1.6 Sampling Error and Bias

A discussion of the sampling procedures and concepts would not be complete without an acknowledgement of error and bias. Even with the best methodology and design, sampling error and bias must be recognized and understood.

Sampling error is the error that occurs because the study is dealing with a sample and not the total population. No matter how well a sample is designed, sample error can always occur. As a result, the largest feasible sample sizes will be drawn. Although sample error can be assumed to be minimal the data user should always be aware that it may exist.

Sampling bias, on the other hand, arises because of mistakes in choosing the sampling frame, the survey method, data falsification, and non-response effects. Assuming the sampling frame and survey method are adequate and data falsification can be caught in the editing stage it is important to monitor non-response effects carefully and take corrective measures when they are observed. One study in 1981 found that for postal questionnaires, non-response is generally an indication of a low level of interest in the subject by the non-respondents. For travel surveys this often means that non-respondents travel less than respondents and are less inclined to complete

the questionnaire. It can be further suggested that for home interviews, non-contact is a problem for respondents who are more mobile. Consequently, for postal questionnaires, non-responses will bias the travel estimates upward, whereas for home interviews non-responses will bias the travel estimates downward.

There are several ways to assure that non-response bias does not jeopardize the validity of the study. Foremost on this list is the use of reminder letters. For the household travel survey, the questionnaires will be serialized so that targeted reminder letters can be used. Some argue that this lowers the response rate however, the use of this technique in CATS' past survey efforts has proven to be successful.

Another technique that can be used is to determine if the non-response bias is geographical. By comparing the respondents' home locations with those in the total population, it is be possible to determine if the non-response is spatially based. If it is, the data can be adjusted accordingly. For the CBD this adjustment can be made at the CATS zone level (cross-checks of other variables should be made to assess the representativeness of the respondents). According to the survey literature, one cannot overdo this type of cross checking.

Although cross-checks should be performed, non-response effects can be assumed away or further analzyed. To determine if there is a significant difference between those who responded and those who did not, the analyst could look at the responses received last and use those as a basis to adjust the data upward to the total population. The concept is called "tail-end" factoring and is addressed in the survey literature and in Section 5.0.

### 1.1.7 Sample Sizes and Expected Errors

The sample size estimates were based on an assumption of a standard deviation in the population mean approximately equal to the standard deviation of the sample mean. In addition, it was assumed that a little over half this basic variation can be explained by suitable stratification where the corresponding explanatory variables are known (e.g. persons per household, vehicle availability, workers per household, etc.) resulting in a smaller residual standard deviation of 0.75. The sample size calculations were based on this number, and the results are presented in Exhibit 3. These assumptions are good for several items, including household trip rates, average trip length and mode.

Exhibit 3

Sample Sizes and Expected Errors

| Sample Size | Standard Error Of the Mean | Error at 95% Confidence Level |
|---|---|---|
| 225 | .05 | .098 |
| 400 | .0375 | .074 |
| 600 | .0306 | .060 |
| 800 | .0265 | .052 |
| 1000 | .0237 | .046 |
| 1600 | .01875 | .037 |
| 3200 | .01326 | .026 |

## 1.2 Chicago Central Business District

As noted, the region will be surveyed on county-by-county basis with the Chicago Central Business District (CBD) being surveyed separately. There were two reasons for this structure, the most notable being the ability to accomplish the survey without over-burdening staffing levels while developing the survey methodology and technique. By staging the survey and subsequent workload it has been possible to improve upon the technique without seriously jeopardizing the continuity of the data.

The CBD was targeted first for at least four reasons. First, it is considered as a separate entity within the travel demand modeling process (4). Second, it is a small area in terms of its overnight population and compactness. Third, the need for travel data in this area is most urgent due to the influx of housing units over the past eight years. Fourth, it was speculated that the education, income and social awareness of the residents are such that they might be more likely to complete the survey forms. In short, the CBD seemed like a good place to begin to test the survey technique while establishing such important factors as response rates, completion rates, coding and editing procedures and overall survey management.

### 1.2.1 CBD Population

The CBD population that was targeted for the study included those households with Commonwealth Edison residential meter listings as of September 1988. It was assumed that this group will most closely approximate the census household population when those living in group-quarters are eliminated from the census data (in 1980 there was this distinction). To be consistent with Edison's geographic boundaries, CATS sections and quarter-sections, the

Central Area Access Study (CAAS) zone structure and the Census Bureau's UTPP geography, the CBD was defined as the area surrounded by Roosevelt Road, Halsted Street, Chicago Avenue, State Street, North Avenue and Lake Michigan. This area is depicted in Exhibit 2. A list of these zone structures is presented in Appendix C. In all, there were 30,968 households in the Commonwealth Edison (CWE) File (sampling frame). Exhibit 4 presents a zonal summary of the housing units in the sampling frame and as reported by the Census Bureau for 1980.

1.2.2 Distribution Summary

After reviewing expected error rates presented in Section 1.1.7 it was decided that a data base of 400 completed household records would be sufficient. Using 400 as a beginning point and assuming a 20% response rate, a two stage sampling process was employed. The first step consisted of "shuffing the household deck" (ie. randomizing the order of the 30,968 households in the CWE File). This was done to eliminate any bias that could be present since the original CWE File had a logical sort order roughly approximating the zone number, street address and unit number. Once this step was complete 2,000 records were randomly selected for inclusion in the survey.

Realizing that the CWE File did contain vacant and some non-residential units the file of 2,000 was edited and 180 units were dropped. To assure that the final data base did not go below 400 an additional 180 units were randomly selected and merged with the first group. Subsequently 2,000 survey introduction or "teaser" letters were mailed on October 14, 1988. Two weeks later, the survey materials, shown in Appendix B, were distributed with the

travel day set for Thursday, November 3, 1988. On the Monday following the travel day a reminder letter was distributed to all 2,000 households. Since the first travel day had passed, a substitute travel day (Thursday, November 10, 1988) was suggested. The reminder letters were not sent to those households whose materials were returned as undeliverable. One week after this reminder was mailed a second reminder was sent to those households from which no response had been received. This second reminder offered Thursday, November 17 as the substitute travel day.

Out of the 2,000 households that were mailed survey materials 116 packets were returned as undeliverable. It should be noted that a 6% non deliverable rate was built into the original 20% response estimates. Added to the 116 were 15 questionnaires that were completed by people who moved from the CBD. These forms were also considered to be undeliverable and therefore unusable. Of the remaining 1,869, 415 were returned and 404 were usable. Presented in Exhibit 4 is survey response summary.

As can be seen the mail-out mail-back method captured the expected 20% or 400 travel surveys. Overall, 1 out of every 15.5 households were surveyed with the total data base representing 1 out of every 76.7 households or 1.3%.

Exhibit 4

Comparison of the Number of Households in the Sampling Frame and the 1980 Census

| CATS Zones | Edison Zones | Sampling Frame(1) Households | Percent | 1980 Census (2) Households | Percent |
|---|---|---|---|---|---|
| 57 | 705 and 505 | 11,052 | 35.7 | 13,843 | 56.3 |
| 62 | 305 | 7,400 | 23.9 | 4,176 | 17.0 |
| 65 | 105 | 3,252 | 10.5 | 2,321 | 9.4 |
| 70 | 205 | 0 | 0.0 | 77 | 0.3 |
| 73 | 405 | 1,283 | 4.1 | 1,031 | 4.2 |
| 60 and 61 | 306 | 2,496 | 8.0 | 783 | 3.2 |
| 63 and 64 | 106 | 110 | 0.4 | 1,057 | 4.3 |
| 68 and 69 | 206 | 2,619 | 8.5 | 827 | 3.4 |
| 71 and 72 | 406 | 2,756 | 8.9 | 476 | 1.9 |
| | Total | 30,968 | 100.0 | 24,591 | 100.0 |

Notes: Percentages represent column percents.

Source: 1. Commonwealth Edison residential meter addresses as of September 1988.

2. 1980 Census UTPP Part 1 excluding group residences.

Exhibit 5

CBD Household Travel Survey
Response Summary

| | | |
|---|---|---|
| Households in sampling frame | 30,968 | |
| Total mailed survey materials (1 in 15.5 households) | 2,000 | (6.5% of all HH) |
| Number returned as undeliverable | 116 | |
| Moved from CBD | 15 | |
| Net mailout | 1,869 | |
| Total number of returned questionnaires | 415 | |
| Number unusable or blank | 11 | |
| Total usable questionnaires (1 in 76.7 households) | 404 | (1.3% of all HH) |
| Total usable/total mailed | 20.2% | |

## 2.0 Questionnaire Design and Edit Logic

The information in this section is intended to provide some insight into the logic behind the design of the questionnaire and the editing that staff performed. With an in-depth understanding of each of the data items it will be easier to use the data for special analysis and investigation. As will be seen, many of the data items are straightforward and do not need a detailed discussion. Overall, the questionnaire is divided into two sections: a household section that identifies the characteristics of the household and its members, and a trip record section that identifies the characteristics of each trip. In the household section, information was sought about the household and its individual members. On the trip forms individual trip records were sought for each household member for the specified reference day. As noted, 404 household forms were completed by 573 people who reported making 1,965 trips.

### 2.1 Household Form

On the household form the first group of questions asked the respondent to identify how many people live in the household and to distinguish between those less than 14 years old and those 14 or older. It was decided early on in the planning stages of the study that complete trip information would be sought for those 14 or older. From an historical perspective there are two age related items worth noting. First, the Census Bureau collects JTW travel data from the head of the household only. This was the case in both 1970 and 1980 and will be the case for 1990. Second, in the 1970 CATS home interview survey travel data was sought from each household member 16 years of age or older.

The next item solicited a telephone number and the respondent's first name so that follow-up telephone calls would be possible. Although this information was solicited on the household form, it will not appear in any of the files related to the survey. This information has been edited out to assure the confidentiality of the respondents.

Although the next question, vehicle inventory, appears straightforward, there are several issues to recognize. In the 1970 CATS survey only the number of cars kept at the housing unit and used by members of the housing unit were sought. Specifically, the question was asked "What is the number of vehicles owned or garaged at this location?" If clarification was needed the "concept of cars kept and used" was added by the interviewer. In 1980, the Census Bureau asked about automobiles, vans and trucks (one-ton or less) through the use of two separate questions. For the 1990 census the exact wording of the question will be "How many automobiles, vans and trucks of one-ton capacity or less are kept at home for use by members of your household?" Additionally, CATS broadened this concept in the survey at hand to allow respondents to report motorcycles, bicycles and any other vehicle types. By broadening this question, not only is the same information that the census collected obtained, but so are those modes that tend to be associated with recreational travel (non-work related travel).

The next several items on the questionnaire make up the "individual matrix" and include age, relationship to person completing the form, sex and school enrollment. These items are all straightforward and do not need an explanation. Not only are they consistent with the census data, but with CATS 1970 data as well.

The following section of the "individual matrix" entitled employment status requires some clarification for the analyst. When designing the questionnaire there was a great deal of discussion regarding employment status. For trip generation there needed to be a means to identify individuals who are employed and those who are not employed. However, when asking for this information from household members it was realized that an individual could be both employed and retired at the same time. Also, knowing the complete employment status for an individual provides useful information to assist with the editing of the trip forms.

To obtain the most detailed information, while providing a means to identify workers and non-workers, an editing step was added to the coding process. Presented below is an outline of the steps and logic used at this edit stage. With this edit it is be possible to identify those individuals who are employed (full-time and/or part-time) as well as those who are not. By being able to break down the information this way it will be possible to summarize the number of work trips made by each employed individual.

A. Employed Full-Time. It is totally acceptable for an individual to check this box and not have reported any work trips. However if a "work" or "work related" destination activity (trip purpose) is given, either the "employed full-time" or "employed part-time" box must be checked. This box may be checked in combination with any of the other boxes.

B. Employed Part-Time. As with full-time employees this box may be checked even though no work trips were made. It must be noted that if a trip is made that involves "work" or "travel related to work" either employed full-time or part-time must be checked. This box may be checked in combination with any of the other boxes.

C. Homemaker. This is the first category that requires close examination. If only this box is checked the editor is instructed to make sure that no "work" or "travel related to work" trips were made. If a work trip is reported a determination is made (using the length of time at the work location) if the individual is also a full or part-time worker. If this cannot be determined, a telephone call to the respondent is made.

D. Student. Same logic as homemaker.

E. Unemployed. Under no circumstances can someone check this box in conjunction with either of the two employed related boxes. However, this box may be checked in combination with Homemaker, Student, Retired and/or Other. Additionally, if this box is checked there cannot be any trips with a destination activity of "work" or "travel related to work".

F. Retired. Same logic as homemaker.

G. Other. Same logic as homemaker.

The last item of the individual matrix is the current occupation of the respondent. When designing the survey there was a concern that the questionnaire would be collecting the respondent's current occupation when the industry they work in is what is used in the transportation planning context. There are two issues here that must be clarified. First, occupation is asked as a controlling variable capable of being linked back to the census. It is not intented to be a travel forecasting variable. Second, the forecasting process does not look at the home-end (trip productions) for the variable "industry". This variable comes into play during the trip distribution phase and is associated with the trip attraction side of the equation. In short, the worker's industry is not a home-based variable but instead is an employer-based variable. Censequently, it is beyond the focus of the household travel survey.

Completing the household form, the household income before taxes is sought. This information is asked for at the end of the form as a means of down-playing its importance. This is one of the most difficult data items to collect. It receives the most incomplete responses. Of the 404 households, 45 or 11% did not respond to this question.

In designing the survey one goal was to develop specific income brackets that could be compatible with the 1990 census. However, it was learned that

the Census Bureau will not have its brackets developed until the census is completed. As a result one can only hope that there will be some compatability.

## 2.2 Trip Form

The trip form, like the household form, was derived from the questionnaires used in the Ithica survey and can be found in Appendix B. The layout was designed with the goal of minimizing confusion on the part of the respondent. Arrows were provided to direct the respondent from question to answer for each trip. Check-off answers were included wherever possible. As a means of providing the link between trips, the last question asked the respondent, "Did you go anywhere else after this trip?" If the yes box is checked an arrow was provided to link the trips in such a way as to eliminate the need to duplicate the destination of one trip as the origin of the next trip. Consequently, just the destination of the next trip was requested, eliminating the confusing "from and to" issue. To start the trip chain, the respondent was asked "Where did your first trip begin "Home" or "Elsewhere... Specify". Since the forms where serialized, staff already knew the home location. One trip form has enough room to report on seven trips with one form to be completed for each household member 14 years of age or older who traveled during the designated travel day. Respondents were asked to indicate the "person number" of the household member for which the trip form applied. Up to four household members were identified (pre-coded) with the additional trip forms allowing for either additional trips by persons 1, 2, 3 or 4 or

trips by additional household members.

Regarding the coding of the trip origins and destinations, the standard convention used by CATS was employed. Trips within the six-county are coded down to the quarter-section level of detail. For trips outside the region, a code was used which represents a state/city coding scheme. This code begins with two '9's followed by a 2-digit state code and a 4-digit city code. The city and state codes can be found in PHC80-R5, Geographic Coding Scheme, Bureau of the Census, Department of Commerce.

Looking closely at the trip form one can see that what is commonly referred to as the trip purpose is listed under the heading "destination activity"--the question reads "Why did you go to this destination?" When designing the trip form one goal was to improve on past efforts while assuring some compatibility. Specifically, the trip purpose (now destination activity) identified in CATS 1970 survey as "personal business" was eliminated. Experience has shown that personal business trip purposes tend to be confused by those who are self-employed. Further, because of the "catch-all" nature of the variable, trips that should properly be reported as shopping or recreation tend to be reported as personal business. As a result, this category was dropped and a category entitled "other" was added. Through several tests and past survey work, staff have found this to be an acceptable way of dealing with over-reported personal business travel. It should be noted that the new categories can be collapsed into the 1970 home interview "personal business" category to facilitate direct comparisons.

Another destination activity problem concerned the lack of a means for reporting each leg of multiple modal trips separately. For the CBD travel

survey, an edit step was added to create a "priority" mode for trips that used more than one mode. The priority order for the modes were auto, commuter rail, rapid transit, CTA bus and other bus. This edit was manually performed and was interpolated from the other information given regarding the trip. So as not to lose any information, all secondary modes used were coded in the "other, specify" field should the need to analyze them present itself. To alleviate this situation in future survey efforts, a new destination activity will be added to the form. The new wording lists "changed type of transportation" as another potential destination activity. This should cause respondents to report separately each segment of those multi-modal trips where transit is used. By instituting this change, not only will the multi-modal trip issue be clarified, but it will also be possible to examine the actual time spent traveling in each mode to complete each segment of the trip. However, with this change, the analyst will have to bridge trip segments with the next trip to conform to the traditional ways trip types are classified (home to work, work to home, home to non-work, non-work to home, work to non-work, non-work to work, work to work and non-work to non-work).

Other items on the trip form include the date for which travel was reported, the time and location of each destination, the number of blocks walked if transit modes were used and the number of persons riding in the automobile if the trip was made by auto.

Regarding the date for which respondents reported travel, four different Thursdays were acceptable. As may be recalled, the survey technique featured the use of substitute travel Thursdays and reminder letters. Through this process three Thursdays were acceptable. However, when conducting the survey it was found that several respondents reported their travel for the Thursday

the week before the "official" travel day. After reviewing these forms and comparing them with the trip forms received for the subsequent Thursdays, it was decided that the data would be usable. Presented in Exhibit 6 is a summary of responses by the day for which travel was reported. One point to note is the importance of follow-up reminder notices.

One other item that should be noted relates to the "type of transportation" used for a particular trip. For transportation planning purposes, pick-ups and vans can be considered synonymous with automobiles. An edit was done to include those individuals who reported traveling by van or pick-up in the other category as auto drivers or passengers. This edit was done to align the responses with the way the Census Bureau treats its data as well as the CATS 1970 data. On subsequent household surveys the wording auto was dropped and the new categories will read as "Driver" or "Passenger in auto, van or Truck." The "Other, please specify" will be maintained if an individual gets confused.

Exhibit 6

Summary of Responses by Travel Day

| Day | Date | Number of Individuals | Percent |
|---|---|---|---|
| Thursday | October 27, 1988 | 68 | 11.9 |
| Thursday | November 3, 1988 | 360 | 62.8 |
| Thursday | November 10, 1988 | 57 | 9.9 |
| Thursday | November 17, 1988 | 88 | 15.4 |
| | Total | 573 | 100.0 |

Source: CBD household travel survey, November 1988.

## 3.0 Data Base Structure and Documentation

Up to this point the analyst has been presented with background information on the household travel survey. In this section the data base that resulted from the survey will be discussed. Included in the data base are two types of variable, those that represent direct responses to the travel survey questionnaire and those such as trip length which have been derived from the survey data.

It should be pointed out that the data base was created by a relational data base program produced by Data Ease International. Included on the diskettes that contain the data base are two different versions. The first represents the actual DATAEASE files capable of being accessed, updated or summarized by DATAEASE 2.5 or greater and an ASCII file suitable for importing to whatever software the analyst deems appropriate. In its work, CATS has found DATAEASE to be more than adequate for developing, editing and checking the data. However, for higher powered analysis SAS is the preferred software. By presenting the data files in the ASCII format an analyst can not only import the data to most software packages but can also institute any variable naming scheme that is personally acceptable.

There are three separate (but related) data files that comprise the data base. The organization and content of these files is the result of a compromise between the layout of survey questionnaire and data processing needs. As will be seen several of the variables are derived from the information collected on the questionnaire. Presented below is a description of each of the data files.

## 3.1 Household Form Part 1 (HHPART1)

In the data base this file is known as HHPART1. Contained here is the information that is specific to the household. Overall there are 404 records (households) represented in the data base. Presented below is a verbal description of each of the data items. For a more complete description of each of the fields refer to Appendix E.

| Variable Name | Description, Code and Notes |
|---|---|
| 1. DATE-RCVD | This is the date that the questionnaire forms were received. Because the response period did not overlap two years, the date is expressed in day and month format (DDMM). |
| 2. SEQ | This variable represents the identification number assigned to each household unit. Because the surveys were serialized as part of the original mailing and distribution process, the numbers will not be in perfect order. Overall there are 404 household records with SEQ numbers ranging from 1001 to 4004. |
| 3. PERSONS | Represents the total number of people in the particular household. For the CBD survey there were 593 people in the data base. |
| 4. P.LT.14 | Indicates the total number of people in the household who are less than 14 years old. No travel data was collected for this group. For the CBD survey there were 20 individuals in this group. |
| 5. P.GE.14 | Indicates the total number of people for each household who are 14 years of age or older. It was for this group of 573 individuals that travel data was collected. |
| 6. AUTOS | The number of vehicles available to the household. Refer to Section 2.1 for a definition of vehicle availability. Overall, 244 vehicles were reported. |
| 7. MC | Number of available motorcycles. Overall, 3 MC were reported. |
| 8. V/P | Number of available vans and pick-ups. Overall, 4 V/P were reported. |
| 9. BYC | Number of available bicycles. Overall 184 BYC were reported. |
| 10. OTH | Number of available other vehicles. None were reported. |
| 11. OTHSP | Type of vehicles specified as other available vehicles. |

12. HINC — Contained under this variable is the income as reported for the household. This variable is encoded with each number representing an income range. For a complete outline of this, as well as the othe codes used for the travel survey, refer to Appendix E.

13. CUTD — This is the Central Area Access Study zone number where the household is located.

14. CATSZN — Represents the CATS zone number where the household is located.

15. QS — Represents the quarter-section geocode where the household is located.

## 3.2 Household Form Part Two (HHPART2)

Contained in this file are those variables that describe the individuals in each of the households. A complete description of the field definitions are presented in Appendix E as well as a description of the codes for the encoded variables. Overall there are 573 records in this file, representing each person 14 years of age or older. These individuals can be linked back to their households through the SEQ number.

| Variable Name | Description, Code and Notes |
|---|---|
| 1. SEQ | This represents the identification number assigned to each household. It is included in this file as a means to relating the individuals back to their household information. |
| 2. PER | This is the person number assigned to each individual in the household who is 14 years of age or older. |
| 3. REL | Included here is a code number representing the individual's relationship to person 1 in each household. For the CBD survey there are 24 separate relation codes. The codes and their description can be found in Appendix E. |
| 4. DATE-RCVD | This is the date the survey quesionnaire was received. It is a derived variable that corresponds to the date-received variable found on the HHPART1 form. |
| 5. BIRTH | Identifies the year the individual was born. |

6. SEX — Gender of the individual.

7. AGE — The age of the individual at the time the survey was administered.

8. SCHOOL — This is an encoded variable identifying if the individual is in school full time, part time, or not at all. A blank should be treated as missing data.

9-15 EMPLOYMENT — The data items represent each of the employment status areas (e.g. full time, part time, homemaker...etc.) and was discussed in Secton 2.1. This data item was asked as a "check all that apply" question. As such each item was coded separately.

16. OTHSP2 — This field completes the employment status by allowing a verbal description to be included if the predetermined boxes are inadequate.

17. WORKER/NOT — This variable was created as a result of the edit of the employment status discussed in Section 2.1. It is included here to assist the planner working on trip generation. This variable is coded as a 1 if the individual is a worker as defined in Section 2.1 or a 0 if the individual is not a worker.

18. OCCUP — This is an encoded variable that represents the occupation of the respondents. Overall, there are 15 codes which are defined in Appendix E.

19. TRIPS — This is the total number of trips that the individual took.

20. REASONS NO TRIPS — Describes the reason given for those individuals who did not travel on the travel day.

21. N/H/E — Variable that identifies the location where the day's travel began. This variable is coded N if no travel was made; H if the trip began at home; and E if it began elsewhere.

22. NOLVE/INTER — This is a 35 character field that allows for the nearest intersection to be entered for those trips that did not begin at home.

23. M/D — Describes the date for which the respondent reported his travel.

24. ORIGIN — This field contains the eight digit geocode description for the origin of the first trip.

## 3.3 Trip From (TRPFRM)

Contained in this file is the trip data obtained for each individual A complete description of the field definitions is presented in Appendix E, as well as the codes for the encoded variables. In all, there are 1,965 individual trips reported. Again, this file can be linked to HHPART1 through the SEQ number and to the HHPART2 file through the SEQ and PER variables. Presented below is a brief description of variables contained in the TRPFRM file.

| Variable Name | Description, Code and Notes |
|---|---|
| 1. SEQ | This is the identification number assigned to the household where the respondent resides. |
| 2. PER | This is the person number assigned to each individual in the household who is 14 years of age or older. |
| 3. TRIP# | This is the trip number assigned to each trip a particular individual makes. |
| 4. STRT | This is the time when the trip started. |
| 5. DESTCD | The eight digit geocode for the trip's destination. |
| 6. ORIGIN | Contains the eight digit geocode for the origin of the trip. |
| 7. ENDT | The time the trip ended. |
| 8. PURPOSE | This is the trip purpose. When reviewing the trip form, this variable is identified as the "destination activity". |
| 9. POTH | This field completes the trip purpose by allowing space for a verbal description of the trip purpose when the check off boxes are insufficient. |
| 10-18 | Contains the various modes that can be used for the trip. For the CBD survey this was asked as a "Check all that apply" question with a coding step being used to prioritize the mode. For a detailed explanation of this coding step refer to section 2.2. |

19. OTHSP — This is a text field allowing modes not listed to be written in. As indicated in section 2.2 this field was also used to house information when more than one mode was used. This field is 15 characters long.

20. BLK-TO — If the individual walks to a transit mode, the distance (in blocks) that they walked is coded here.

21. BLK-FROM — Same as 20, except this information represents the number of blocks walked from a transit mode to the final destination.

22. AUTOOCC — Represents the number people traveling together if the trip was via an auto related mode.

23. MORE — Indicator that tells the analyst if there are more trips to be reported by the individual.

24. HYDIST — Distance in feet of the trip. Note that this is the straight line airline distance from the center of the origin zone to center of the destination zone.

25. EGDIST — Represents the straight line distance (in feet) summing the change in the X and Y coordinates for the origin and destination pairs for the trip.

26. HYMILE — Same as 24 above but scaled in miles.

27. EGMILE — Same as 25 above but scaled in miles.

28. ORX — State plane X coordinate for the trip origin.

29. ORY — State plane Y coordinate for the trip origin.

30. ODX — State plane X coordinate for the trip destination.

31. ODY — State plane Y coordiante for the trip destination.

## 4.0 Summary Tables

Presented in this section are three groups of data relevant to the CBD Household Travel survey. These include summaries of the 1980 census data as it relates to the CBD, quantitative information about the sampling frame and the numerical results of the CBD household travel survey. It should be noted that the CBD household survey data is unadjusted and unfactored. It is the intent of the project to factor the data using the census relatable items collected as part of the 1990 decenial census. As a result, none of this information should be used to assess policy concerns until the data is certified for that use.

The summaries presented here are intended to assist with the development of the non-response error corrections and population expansion factoring. Because of the survey methodology and design, it is imperative that these issues be considered.

As will be seen, many of the data items, especially those relating to the 1980 data, are presented at the CATS zone level. This was not done to induce inference at that level of detail. Instead, it was done as a means of preserving the data that was assembled without losing (through accidential omission) any of the pieces. It is provided only as a matter of convenence.

## 4.1 1980 Census Items

Presented in this section are 1980 census related data items that were assembled during the course of executing the CBD household travel survey. Although the travel survey data will not be adjusted back to 1980 this information will prove useful for comparisons once the 1990 census is complete. The data items contained in this section consist of the following exhibits.

1980 Census Data Items

| Exhibit Number | Data Items |
|---|---|
| 7 | Number of People, Households, Workers and School Enrollees by CATS Zones. |
| 8 | Persons Per Household by CATS Zones. |
| 9 | Number of Households With and Without Workers by the Number of Workers Per Household and CATS Zones. |
| 10 | Number of Households With and Without Vehicles by the Number of Vehilces Per Household and CATS Zones. |
| 11 | Age Distribution of CBD Household Members. |
| 12 | Income Distribution by Household and CATS Zones. |

Exhibit 7

Number of People, Households, Workers
and School Enrollees by CATS Zones for 1980(1)

| CATS Zone | Total Population | Number of Households | Number of(2) Workers | School(3) Enrollment |
|---|---|---|---|---|
| 57 | 21,157 | 13,843 | 13,537 | 3,049 |
| 60 | 121 | 62 | 45 | 8 |
| 61 | 1,208 | 721 | 516 | 203 |
| 62 | 5,708 | 4,176 | 4,099 | 966 |
| 63 | 133 | 133 | 46 | 0 |
| 64 | 1,264 | 924 | 994 | 44 |
| 65 | 3,402 | 2,321 | 2,133 | 165 |
| 68 | 335 | 314 | 50 | 14 |
| 69 | 601 | 513 | 348 | 59 |
| 70 | 77 | 77 | 62 | 338 |
| 71 | 0 | 0 | 0 | 0 |
| 72 | 665 | 476 | 244 | 55 |
| 73 | 1,295 | 1,031 | 565 | 121 |
| | 35,966 | 24,591 | 22,639 | 5,022 |

Notes: 1. Data indicates that in 1980 there were 1.46 people per household, with 0.92 workers per household and 0.2 students per household.

2. To be considered a qualified worker one must be 16 years of age or older.

3. School enrollment might be slightly overstated since it includes those enrolled in school who live in group quarters. Group quartered residents account for 2,785 or (7%) more individuals than just those living in households.

Source: 1980 Census UTPP Part 1, Tables I-1 (Population), I-10 (Workers and Households), and I-5 (School Enrollment).

Exhibit 8

Persons Per Household
by CATS Zones for 1980

| CATS Zone | Household Size (Persons) (1) | (2) | (3) | (4) | (5) | (6) | (7+) | Total Households | Total Persons | Persons Per Household |
|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 8,468 | 4,196 | 726 | 318 | 102 | 25 | 8 | 13,843 | 21,157 | 1.53 |
| 60 | 37 | 0 | 16 | 9 | 0 | 0 | 0 | 62 | 121 | 1.95 |
| 61 | 511 | 115 | 28 | 10 | 16 | 32 | 9 | 721 | 1,208 | 1.68 |
| 62 | 2,993 | 951 | 149 | 53 | 30 | 0 | 0 | 4,176 | 5,708 | 1.37 |
| 63 | 133 | 0 | 0 | 0 | 0 | 0 | 0 | 133 | 133 | 1.00 |
| 64 | 702 | 218 | 4 | 0 | 0 | 0 | 0 | 924 | 1,264 | 1.37 |
| 65 | 1,455 | 736 | 87 | 21 | 21 | 1 | 0 | 2,321 | 3,402 | 1.47 |
| 68 | 294 | 20 | 0 | 0 | 0 | 0 | 0 | 314 | 335 | 1.07 |
| 69 | 432 | 56 | 25 | 0 | 0 | 0 | 0 | 513 | 601 | 1.17 |
| 70 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 77 | 77 | 1.00 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 337 | 101 | 27 | 11 | 0 | 0 | 0 | 476 | 665 | 1.40 |
| 73 | 824 | 171 | 18 | 15 | 2 | 1 | 0 | 1,031 | 1,295 | 1.26 |
| Totals | 16,263 (66%) | 6,564 (27%) | 1,080 (4%) | 437 (2%) | 171 (.7%) | 59 (.2%) | 17 (.1%) | 24,591 (100.0%) | 35,966 | 1.46 |

Source: 1980 Census UTPP Part 1, Table I-9.

Exhibit 9

Number of Households With and Without Workers by the Number of Workers per Household and CATS Zones

| CATS Zone | Workers Per Household | | | | | | Total HH[1] W/Workers | Total Households |
|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5+ | | |
| 57 | 2,859 | 8,556 | 2,308 | 115 | 5 | 0 | 10,984 | 13,843 |
| 60 | 25 | 29 | 8 | 0 | 0 | 0 | 37 | 62 |
| 61 | 359 | 252 | 84 | 17 | 0 | 9 | 362 | 721 |
| 62 | 864 | 2,589 | 672 | 38 | 13 | 0 | 3,312 | 4,176 |
| 63 | 87 | 46 | 0 | 0 | 0 | 0 | 46 | 133 |
| 64 | 101 | 656 | 163 | 4 | 0 | 0 | 823 | 924 |
| 65 | 615 | 1,303 | 379 | 24 | 0 | 0 | 1,706 | 2,321 |
| 68 | 273 | 32 | 9 | 0 | 0 | 0 | 41 | 314 |
| 69 | 180 | 318 | 15 | 0 | 0 | 0 | 333 | 513 |
| 70 | 15 | 62 | 0 | 0 | 0 | 0 | 62 | 77 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 282 | 144 | 50 | 0 | 0 | 0 | 194 | 476 |
| 73 | 528 | 457 | 37 | 2 | 7 | 0 | 503 | 1,031 |
| Total | 6,188 (25%) | 14,444 (59%) | 3,725 (15%) | 200 (.8%) | 25 (.1%) | 9 (.1%) | 18,403 (75%) | 24,591 |

Notes: 1. Workers are defined as being 16 years of age or over.

Source: 1980 Census UTPP Part 1, Table I-10.

Exhibit 10

Number of Households With and Without Vehicles
By the Number of Vehicles Per Household
and CATS Zones (1)

| CATS Zone | Households Size (Vehicles) None | 1 | 2 | 3+ | Total Vehicles | Total Households | Vehicles Per Household |
|---|---|---|---|---|---|---|---|
| 57 | 6,752 | 6,142 | 876 | 73 | 8,186 | 13,843 | 0.61 |
| 60 | 62 | 0 | 0 | 0 | 0 | 62 | 0.00 |
| 61 | 549 | 172 | 0 | 0 | 172 | 721 | 0.24 |
| 62 | 2,801 | 1,237 | 138 | 0 | 1,513 | 4,176 | 0.36 |
| 63 | 133 | 0 | 0 | 0 | 0 | 133 | 0.00 |
| 64 | 550 | 346 | 28 | 0 | 402 | 924 | 0.44 |
| 65 | 1,010 | 1,033 | 201 | 77 | 1,703 | 2,321 | 0.73 |
| 68 | 305 | 9 | 0 | 0 | 9 | 314 | 0.03 |
| 69 | 401 | 112 | 0 | 0 | 112 | 513 | 0.22 |
| 70 | 67 | 10 | 0 | 0 | 10 | 77 | 0.13 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 234 | 219 | 23 | 0 | 265 | 476 | 0.56 |
| 73 | 683 | 287 | 61 | 0 | 409 | 1,031 | 0.40 |
| Totals | 13,547 (55%) | 9,567 (39%) | 1,327 (5%) | 150 (1%) | 12,781 | 24,591 | 0.52 |

Notes: 1. Assumes households with 3+ automobiles have a true rate of 3.2 vehicles and households with 3+ vans and pick-ups have a true rate of 3.1 per household. It should be noted that the overall rate nationwide is 3.4 vehicles per household.

Source: 1980 Census UTPP, Tables I-14, I-15, I-16.

Exhibit 11

Age Distribution of CBD Household Members

| Age Cohort | Number Of Individuals | Percent | Extended Cohort |
|---|---|---|---|
| 0-13 | 1,472 | 4.1 | |
| 14-15 | 204 | 0.6 | |
| 16-18 | 547 | 1.5 | |
| 19-20 | 354 | 1.0 | 7.2% |
| 21-24 | 2,071 | 5.8 | |
| 25-34 | 8,142 | 22.6 | |
| 35-44 | 5,243 | 14.6 | |
| 45-54 | 4,907 | 13.6 | |
| 55-59 | 2,975 | 8.3 | |
| 60-61 | 1,247 | 3.5 | |
| 62-64 | 1,377 | 3.8 | 72.2% |
| 65-74 | 4,372 | 12.2 | |
| 75+ | 3,052 | 8.5 | 20.7% |
| Total | 35,966 | 100.1 | 100.1% |

Source: 1980 Census UTPP Part 1, Table I-1.

Exhibit 12
Household Income (in thousands) by the Number of Households In Each Income Level By CATS Zone

| CATS Zone | Income Level In Thousands | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Less Than $ 5 | $5 to $7.9 | $8 to $9.9 | $10 to $14.9 | $15 to $19.9 | $20 to $24.9 | $25 to $34.9 | $35 to $49.9 | Over $50 | Total |
| 57 | 900 | 535 | 564 | 1,351 | 1,622 | 1,286 | 1,754 | 1,760 | 4,071 | 13,843 |
| 60 | 13 | 8 | 12 | 12 | 17 | 0 | 0 | 0 | 0 | 62 |
| 61 | 340 | 95 | 46 | 109 | 55 | 17 | 10 | 23 | 26 | 721 |
| 62 | 444 | 323 | 133 | 612 | 503 | 543 | 604 | 425 | 589 | 4,176 |
| 63 | 113 | 14 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 133 |
| 64 | 33 | 17 | 35 | 89 | 276 | 33 | 220 | 132 | 89 | 924 |
| 65 | 268 | 165 | 111 | 265 | 262 | 260 | 384 | 254 | 352 | 2,321 |
| 68 | 273 | 0 | 0 | 0 | 9 | 32 | 0 | 0 | 0 | 314 |
| 69 | 155 | 129 | 62 | 10 | 23 | 34 | 50 | 25 | 25 | 513 |
| 70 | 8 | 0 | 7 | 29 | 8 | 14 | 0 | 11 | 0 | 77 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 147 | 163 | 19 | 27 | 16 | 25 | 33 | 23 | 23 | 476 |
| 73 | 375 | 137 | 90 | 163 | 63 | 75 | 86 | 24 | 18 | 1,031 |
| Totals | 3,069 (12.5%) | 1,586 (6.4%) | 1,079 (4.4%) | 2,673 (10.9%) | 2,854 (11.6%) | 2,319 (9.4%) | 3,141 (12.8%) | 2,677 (10.9%) | 5,193 (21.1%) | 24,591 |

Source: 1980 Census, UTPP, Part 1, Table I-11.

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## 4.2 Sampling Frame Summary and Comparisons

Contained in this section are several summary tables that relate the 1980 population to the sampling frame and the survey responses. Where possible the information contained on the tables is summarized at its lowest level of geography. Keep in mind that these tables are presented as a reference source for future analysis of the travel survey.

Exhibit 13

Comparison Of the Number of Households in the Sampling Frame, Responding to the Questionnaire and from the 1980 Census by CATS and CWE Zones

| CATS Zones | CWE Zones | Sampling Frame(1) Households | Percent | Survey Respondents(2) Households | Percent | 1980 Census (3) Households | Percent |
|---|---|---|---|---|---|---|---|
| 57 | 705 and 505 | 11,052 | 35.7 | 133 | 32.9 | 13,843 | 56.3 |
| 62 | 305 | 7,400 | 23.9 | 82 | 20.3 | 4,176 | 17.0 |
| 65 | 105 | 3,252 | 10.5 | 67 | 16.6 | 2,321 | 9.4 |
| 70 | 205 | 0 | 0.0 | 0 | 0.0 | 77 | 0.3 |
| 73 | 405 | 1,283 | 4.1 | 21 | 5.2 | 1,031 | 4.2 |
| 60 and 61 | 306 | 2,496 | 8.0 | 13 | 3.2 | 783 | 3.2 |
| 63 and 64 | 106 | 110 | 0.4 | 8 | 2.0 | 1,057 | 4.3 |
| 68 and 69 | 206 | 2,619 | 8.5 | 29 | 7.2 | 827 | 3.4 |
| 71 and 72 | 406 | 2,756 | 8.9 | 51 | 12.6 | 476 | 1.9 |
| | Total | 30,968 | 100.0 | 404 | 100.0 | 24,591 | 100% |

Notes: Percentages represent column percents.

Sources: 1. Commonwealth Edison residential meter addresses (Sept. 1988)
2. Questionnaire responses, November 1988.
3. 1980 Census UTPP Part 1 (excludes group residences).

Exhibit 14

Number of Households in the Sampling Frame,
Sample and Responses by CWE and CATS Zones

| CATS Zones | CWE Zones | Sampling Frame(1) | Mailout(2) | Usable Responses(3) |
|---|---|---|---|---|
| 57 | 705 and 505 | 11,052 | 644 | 133 |
| 62 | 305 | 7.400 | 488 | 82 |
| 65 | 105 | 3,252 | 246 | 67 |
| 70 | 205 | 0 | 0 | 0 |
| 73 | 405 | 1,283 | 90 | 21 |
| 60 and 61 | 306 | 2,496 | 90 | 13 |
| 63 and 64 | 106 | 110 | 66 | 8 |
| 68 and 69 | 206 | 2,619 | 204 | 29 |
| 71 and 72 | 406 | 2,756 | 172 | 51 |
| | Total | 30,968 | 2,000 | 404 |

Notes: Sampling frame represents Commonwealth Edison residential meter address listings as of September 1989.

Source: 1. Commonwealth Edison residential meter addresses as of September 1988.
2. Random sampling technique.
3. Questionnaire responses. (November 1988)

Exhibit 15

Comparison of the Number of Households
in the Sample and Survey Population
by CATS Zones

| CATS Zone | Sample[1] | | Survey Respondents[2] | |
|---|---|---|---|---|
| | Households | Percent | Households | Percent |
| 57 | 644 | 32.2 | 133 | 32.9 |
| 60 | 8 | 0.4 | 0 | 0.0 |
| 61 | 82 | 4.1 | 13 | 3.2 |
| 62 | 488 | 24.4 | 82 | 20.3 |
| 63 | 4 | 0.2 | 1 | 0.2 |
| 64 | 62 | 3.1 | 7 | 1.7 |
| 65 | 246 | 12.3 | 67 | 16.6 |
| 68 | 190 | 9.5 | 25 | 6.2 |
| 69 | 14 | 0.7 | 4 | 1.0 |
| 70 | 0 | 0.0 | 0 | 0.0 |
| 71 | 0 | 0.0 | 0 | 0.0 |
| 72 | 172 | 8.6 | 51 | 12.6 |
| 73 | 90 | 4.5 | 21 | 5.2 |
| Total | 2,000 | 100.0 | 404 | 99.9 |

Source:
1. Sample drawn from Commonwealth Edison residential meter listings in September 1988.
2. Responses to the CBD household travel survey, November 1988.

## 4.3 CBD Numerical Results

Below are the results obtained from the travel survey responses. Note that these summaries were developed to assist the analyst when factoring and adjusting the data. Also all data summarized is unfactored and unadjusted and should not be used to evaluate policy related issues until such time as the data is validated. Included are the census related variables as well as several of the transportation variables. Since the data has not been validated, no attempt to analyze it was pursued. The data items in this section consist of the following exhibits.

| Exhibit | Data Items |
|---|---|
| 16 | Number of People, Households, Workers and School Enrollees by CATS Zones. |
| 17 | Persons per Household by CATS Zones. |
| 18 | Number of Households With and Without Workers by the Number of Workers per Household and CATS Zones. |
| 19 | Number of Households With and Without Vehicles by the Number of Vehicles per Household and CATS Zones. |
| 20 | Age Distribution of CBD Household Members. |
| 21 | Income distribution by Household and CATS Zones. |
| 22 | Summary of Household Members Over the Age of 13 by Their School Enrollment Status and CATS Zones. |
| 23 | Employment Status Crosstabulation for Those Individuals Reporting 1 or 2 Characteristics. |
| 24 | Percentage Breakdown of Employment Status for Individuals with Multiple Responses. |
| 25 | Total Number of Trips by Their Destination Activities. |
| 26 | Total Number of Trips by Mode for All Trip Purposes (Destination Activities). |
| 27 | Summary of Trip Purposes (Destination Activities) by Primary Travel Mode. |
| 28 | Summary of Trip Purposes (Destination Activities) by Primary Travel Mode as a Percent of All Travel. |
| 29 | Trip Length Summary. |

Exhibit 16

Number of People, Households, Workers and School Enrollees by CATS Zones

| CATS Zone | Sample Population | Number of Households | Number of Workers[1] | School Enrollment Full Time | School Enrollment Part Time |
|---|---|---|---|---|---|
| 57 | 196 | 133 | 145 | 13 | 12 |
| 60 | 0 | 0 | 0 | 0 | 0 |
| 61 | 19 | 13 | 17 | 1 | 1 |
| 62 | 111 | 82 | 90 | 8 | 13 |
| 63 | 1 | 1 | 1 | 0 | 1 |
| 64 | 11 | 7 | 9 | 1 | 1 |
| 65 | 103 | 67 | 80 | 3 | 4 |
| 68 | 36 | 25 | 30 | 4 | 0 |
| 69 | 7 | 4 | 6 | 1 | 0 |
| 70 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 |
| 72 | 81 | 51 | 67 | 8 | 10 |
| 73 | 28 | 21 | 17 | 0 | 1 |
| Totals | 593 | 404 | 462 | 39 | 43 |

Notes: 1. Includes individuals 14 years of age or older.

2. Data is unfactored and anajusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 17

Persons per Household by CATS Zones

| CATS Zone | Household Size (Persons) (1) | (2) | (3) | (4) | (5) | Total Households | Total Population | Persons Per Household |
|---|---|---|---|---|---|---|---|---|
| 57 | 80 | 45 | 6 | 2 | 0 | 133 | 196 | 1.47 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 61 | 9 | 2 | 2 | 0 | 0 | 13 | 19 | 1.46 |
| 62 | 59 | 17 | 6 | 0 | 0 | 82 | 111 | 1.35 |
| 63 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1.00 |
| 64 | 3 | 4 | 0 | 0 | 0 | 7 | 11 | 1.57 |
| 65 | 39 | 23 | 3 | 1 | 1 | 67 | 103 | 1.54 |
| 68 | 17 | 5 | 3 | 0 | 0 | 25 | 36 | 1.44 |
| 69 | 2 | 1 | 1 | 0 | 0 | 4 | 7 | 1.75 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 25 | 23 | 2 | 1 | 0 | 51 | 81 | 1.59 |
| 73 | 16 | 4 | 0 | 1 | 0 | 21 | 28 | 1.33 |
| Total | 251 (62%) | 124 (31%) | 23 (6%) | 5 (1%) | 1 (...) | 404 (100.0%) | 593 | 1.47 |

Note: This data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 18

Number of Households With and
Without Workers by The Number of
Workers per Household and CATS Zones

| CATS Zone | Workers Per Household (0) | (1) | (2) | (3) | (4) | Total Workers | Total Households | Workers Per Household |
|---|---|---|---|---|---|---|---|---|
| 57 | 23 | 77 | 31 | 2 | 0 | 145 | 133 | 1.09 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 61 | 1 | 8 | 3 | 1 | 0 | 17 | 13 | 1.31 |
| 62 | 11 | 53 | 17 | 1 | 0 | 90 | 82 | 1.10 |
| 63 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1.00 |
| 64 | 2 | 1 | 4 | 0 | 0 | 9 | 7 | 1.29 |
| 65 | 5 | 46 | 14 | 2 | 0 | 80 | 67 | 1.19 |
| 68 | 2 | 16 | 7 | 0 | 0 | 30 | 25 | 1.20 |
| 69 | 0 | 2 | 2 | 0 | 0 | 6 | 4 | 1.50 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 5 | 26 | 19 | 1 | 0 | 67 | 51 | 1.31 |
| 73 | 7 | 12 | 1 | 1 | 0 | 17 | 21 | 0.81 |
| Totals | 55 (14%) | 242 (60%) | 99 (24%) | 8 (2%) | 0 (0%) | 462 | 404 (100.0%) | 1.14 |

**Note:** Data is unfactored and unadjusted and has not been validated.

**Source:** CBD household travel survey, November 1988.

Exhibit 19

Number of Households With and Without Vehicles by the Number of Vehicles per Household and CATS Zones[1]

| CATS Zone | Households with Vehicles | | | | Total | | Vehicles Per Household |
|---|---|---|---|---|---|---|---|
| | None | 1 | 2 | 3+ | Vehicles | Households | |
| 57 | 62 | 63 | 8 | 0 | 79 | 133 | 0.59 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 61 | 5 | 7 | 1 | 0 | 9 | 13 | 0.69 |
| 62 | 37 | 40 | 4 | 1 | 51 | 82 | 0.62 |
| 63 | 1 | 0 | 0 | 0 | 0 | 1 | 0.00 |
| 64 | 6 | 0 | 0 | 1 | 3 | 7 | 0.43 |
| 65 | 29 | 32 | 6 | 0 | 44 | 67 | 0.66 |
| 68 | 12 | 12 | 1 | 0 | 14 | 25 | 0.56 |
| 69 | 2 | 2 | 0 | 0 | 2 | 4 | 0.50 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 20 | 24 | 7 | 0 | 38 | 51 | 0.75 |
| 73 | 14 | 6 | 1 | 0 | 8 | 21 | 0.38 |
| Total | 188 | 186 | 28 | 2 | 248 | 404 | 0.61 |
| | (46%) | (46%) | (7%) | (1%) | | (100%) | |

Note: 1. This combination of vehicles which includes automobiles, vans and pick-up represents the same vehicle types that the Census Bureau uses for its "Vehicles Available" statistic.

2. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 20

Age Distribution of CBD Household Members

| Age Cohort | Number of Individuals | Percent | Extended Cohort (-NR) |
|---|---|---|---|
| LT 13 | 20 | 3.4 | |
| 14-15 | 4 | 0.7 | |
| 16-18 | 4 | 0.7 | |
| 19-20 | 6 | 1.0 | 5.7% (5.9%) |
| 21-24 | 22 | 3.7 | |
| 25-34 | 141 | 23.8 | |
| 35-44 | 127 | 21.4 | |
| 45-54 | 80 | 13.5 | |
| 55-59 | 46 | 7.8 | |
| 60-61 | 11 | 1.8 | |
| 62-64 | 22 | 3.7 | 75.7% (77.8%) |
| 65-74 | 67 | 11.3 | |
| 75+ | 27 | 4.5 | 15.9% (16.3%) |
| No Response (NR) | 16 | 2.7 | 2.7% (----) |
| Total | 593 | 100.0 | 100.0% |

Notes: 1. When excluding those who are 13 or younger the mean age is 45.5 years.

2. Cohorts conform to those used by the Census for 1980.

3. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 21

Income Distribution of CBD Households

| Income Range | Number | Percentage | |
|---|---|---|---|
| | | With No Response | W/O No Res. |
| Less than $15,000 | 17 | 4.2 | 4.7 |
| $15,000 to $24,999 | 37 | 9.2 | 10.3 |
| $25,000 to $39,999 | 81 | 20.0 | 22.6 |
| $40,000 to $59,999 | 85 | 21.0 | 23.7 |
| $60,000 to $74,999 | 39 | 9.7 | 10.9 |
| $75,000 to $99,999 | 31 | 7.7 | 8.6 |
| More than $100,000 | 69 | 17.1 | 19.2 |
| No Response | 45 | 11.1 | ---- |
| Totals | 404 | 100.0 | 100.0 |

Note: Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 22

Summary of Household Members
Over the Age of 13 by Their School
Enrollment Status and CATS Zones

| CATS Zone | School Enrollment (Persons) | | | | Total Persons |
|---|---|---|---|---|---|
| | Full-Time | Part-Time | Not In | No Response | |
| 57 | 13 | 12 | 162 | 4 | 191 |
| 60 | 0 | 0 | 0 | 0 | 0 |
| 61 | 1 | 1 | 16 | 0 | 18 |
| 62 | 8 | 13 | 86 | 0 | 107 |
| 63 | 0 | 1 | 0 | 0 | 1 |
| 64 | 1 | 1 | 9 | 0 | 11 |
| 65 | 3 | 4 | 86 | 6 | 99 |
| 68 | 4 | 0 | 29 | 1 | 34 |
| 69 | 1 | 0 | 6 | 0 | 7 |
| 70 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 |
| 72 | 8 | 10 | 59 | 1 | 78 |
| 72 | 0 | 1 | 26 | 0 | 27 |
| Totals | 39 (6.8%) | 43 (7.5%) | 479 (83.6%) | 12 (2.1%) | 573 (100.0%) |

Note: Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 23

Employment Status Crosstabulation for
Those Individuals Reporting 1 or 2 Characteristics

| | Full Time | Part Time | Home Maker | Student | Unemployed | Retired | Other |
|---|---|---|---|---|---|---|---|
| Full Time | 413 | | | | | | |
| Part Time | 0 | 25 | | | | | |
| Homemaker | 1 | 4 | 20 | | | | |
| Student | 1 | 11 | 0 | 24 | | | |
| Unemployed | 0 | 0 | 0 | 0 | 3 | | |
| Retired | 0 | 6 | 0 | 0 | 0 | 62 | |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

Notes: 1. Of the 573 individuals, 549 (96%) reported only one characteristic, 23 (4%) two, 1 (0.2%) three.

2. The diagonal values represent those individuals who checked one characteristic. All other values represent those individuals who checked two. In addition, 1 individual reported 3 characteristics (part time, homemaker and student).

3. For trip generation purposes 80.63% of the people 14 years of age and older can be considered to be employed while the other 19.37% are not.

4. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 24

Percentage Breakdown of
Employment Status After Adjusting for
Individuals with Multiple Responses

| Employment Status | Number of Persons Reporting | Percent of Total |
|---|---|---|
| Full Time | 414.0 | 72.2 |
| Part Time | 36.8 | 6.4 |
| Homemaker | 23.8 | 4.2 |
| Student | 31.4 | 5.5 |
| Unemployed | 3.0 | 0.5 |
| Retired | 62.0 | 10.8 |
| Other | 2.0 | 0.3 |
| No Response | 0 | 0.0 |
| Totals | 573.0 | 99.9 |

Notes: 1. Multiple responses were solicited.

2. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 25

Total Number of Trips
by Destination Activity (Trip Purpose)

| Destination Activity | Number | Percent |
|---|---|---|
| Work | 504 | 25.64 |
| Work Related | 124 | 6.31 |
| School | 59 | 3.00 |
| Shopping | 162 | 8.24 |
| Recreation | 154 | 7.84 |
| Pick Up/Drop Off | 45 | 2.29 |
| Other | 219 | 11.15 |
| Return Home | 698 | 35.52 |
| Total | 1,965 | 100.00 |

Notes: 1. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 26

Trips by Mode for All
Trip Purposes (Destination Activities)

| Mode | Number | Percent |
|---|---|---|
| Walk Only | 719 | 36.59 |
| Auto Driver | 468 | 23.82 |
| Auto Passenger | 136 | 6.92 |
| Commuter Rail | 22 | 1.12 |
| Rapid Transit | 78 | 3.97 |
| CTA Bus | 311 | 15.83 |
| Other Bus | 34 | 1.73 |
| Taxi | 193 | 9.82 |
| Other | 4 | 0.20 |
| Total | 1,965 | 100.00 |

Notes: 1. Assumes a modal priority of commuter rail, rapid transit, CTA bus, other bus or taxi when more than 1 transit mode was specified.

2. Walk refers to walk only trips.

3. For trips involving an auto and a transit mode the priority mode was the one in which most of the travel occurred. When this determination could not be made the transit mode was assumed to be the priority mode.

4. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

Exhibit 27

Summary of Trip Purposes (Destination Activities)
by Primary Travel Mode

| | Work | Work Related | School | Shopping | Recreation | Pick-Up Drop-Off | Return Home | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| Walk | 197 | 34 | 26 | 76 | 42 | 4 | 246 | 94 | 719 |
| Auto Driver | 99 | 35 | 12 | 35 | 49 | 33 | 163 | 42 | 468 |
| Auto Passenger | 25 | 10 | 2 | 13 | 11 | 5 | 48 | 22 | 136 |
| Commuter Rail | 7 | 1 | 0 | 1 | 2 | 0 | 9 | 2 | 22 |
| Rapid Transit | 24 | 7 | 6 | 2 | 9 | 0 | 25 | 5 | 78 |
| CTA Bus | 88 | 11 | 8 | 26 | 14 | 1 | 132 | 31 | 311 |
| Other Bus | 7 | 2 | 1 | 3 | 3 | 0 | 12 | 6 | 34 |
| Taxi | 56 | 24 | 3 | 6 | 23 | 2 | 62 | 17 | 193 |
| Other | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 4 |
| Totals | 504 | 124 | 59 | 162 | 154 | 45 | 698 | 219 | 1,965 |

Note: Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel Survey, November 1988.

1327L

Exhibit 28

Summary of Trip Purposes (Destination Activity)
by Primary Travel Mode
as a Percent Of All Travel

| | Work | Work Related | School | Shopping | Recreation | Drop-off Pick-up | Return Home | Other | Total |
|---|---|---|---|---|---|---|---|---|---|
| Walk | 10.03 | 1.73 | 1.32 | 3.87 | 2.14 | 0.20 | 12.52 | 4.78 | 36.59 |
| Auto Driver | 5.03 | 1.78 | 0.61 | 1.78 | 2.49 | 1.68 | 8.30 | 2.14 | 23.82 |
| Auto Passenger | 1.27 | 0.51 | 0.10 | 0.66 | 0.56 | 0.25 | 2.44 | 1.12 | 6.92 |
| Commuter Rail | 0.36 | 0.05 | 0.00 | 0.05 | 0.10 | 0.00 | 0.46 | 0.10 | 1.12 |
| Rapid Transit | 1.22 | 0.36 | 0.30 | 0.10 | 0.46 | 0.00 | 1.27 | 0.25 | 3.97 |
| CTA Bus | 4.48 | 0.56 | 0.41 | 1.32 | 0.71 | 0.05 | 6.72 | 1.58 | 15.83 |
| Other Bus | 0.36 | 0.10 | 0.05 | 0.15 | 0.15 | 0.00 | 0.61 | 0.30 | 1.73 |
| Taxi | 2.85 | 1.22 | 0.15 | 0.30 | 1.17 | 0.10 | 3.16 | 0.86 | 9.82 |
| Other | 0.05 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.20 |
| Total | 25.65 | 6.31 | 3.00 | 8.24 | 7.84 | 2.29 | 35.52 | 11.15 | ---- |

Notes: 1. Totals may not add due to rounding.
2. Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

1337L

Exhibit 29

Trip Length Summary

| Trip Lengths (Miles) | Number | Percent |
|---|---|---|
| Less Than 0.51 | 596 | 30 |
| 0.51 to 0.99 | 420 | 21 |
| 1.00 to 1.99 | 461 | 24 |
| 2.00 to 2.99 | 66 | 3 |
| 3.00 to 4.99 | 94 | 5 |
| 5.00 to 9.99 | 114 | 6 |
| 10.00 to 11.99 | 50 | 3 |
| 12.00 to 14.99 | 31 | 2 |
| 15.00 to 24.99 | 87 | 4 |
| 25.00 to 49.99 | 35 | 1 |
| More Than 50.00 | 11 | 1 |
| Totals | 1,965 | 100 |

Notes: Data is unfactored and unadjusted and has not been validated.

Source: CBD Household Travel Survey, November 1988.

1585L

## 5.0 Conclusion/Next Steps

Presented at the end of this section are two tables. The first compares the 1980 Census demographic data to the 1988 travel survey data. The second table presents the overview summary of the transportation related data collected in the CBD. As can be seen from the first table, the data resulting from the travel survey does not replicate the 1980 census data for the control variables. What this means is that either a true sample was collected and significant changes occurred or the data needs to be adjusted. Keep in mind that, according to the design of the household travel survey the data will be factored and adjusted to the 1990 Census. It should be noted tht any time sample dataq is collected it must be factored to the population. Following is a brief discussion of the future steps that need to be taken to bring the data base through the validation and factoring phases.

Although the survey was carefully designed and executed there will always be factors that interfere with obtaining correct and true representation of the population. People do not always respond as the survey designer would wish. As a result, the data should be scrutinized before any population expansion factors are developed. Recognizing that three major sources of error affect any surveys (non-response, non-reporting and inaccurate reporting) special attention should be given to non-response bias.

When designing the survey, special attention was given to the issue of not reporting (non-reporting) all trips. To help combat the propensity for short trips, non-motorized and discretionary trips not to be reported, special instructions were included with the questionnaire that specifically asked people to make sure they reported everything. In addition, a trip check list of over 50 possible destination activities was also included. It was hoped

that by taking these precautions this source of bias would be minimized.

Inaccurate reporting is another source of "noise" for which little can be done. Certain obvious inaccuracies were taken care of in the editing stage, but more legitimate travel lies are next to impossible to control. However, based upon many call-back conversations it can be assumed with confidence that people were responding sincerely and honestly.

The last area of bias, non-response, is one that can be examined and adjustments made if warranted. Non-response pertains to those households that never responded. Is their travel somehow different than those who responded? Although several ways of answering the question and adjusting for this bias exist, including special follow-up surveys of the non-respondents, the household travel survey was designed to allow for what is sometimes called "tail-end factoring" or "response order coding". According to this concept the analyst can look at the responses received by each of the follow-up mailings to determine if the characteristics of the respondents to the reminder mailing differ from the early responders. If a consistent trend emerges then an adjustment can be made. However, it must be pointed out that this is a very complex step and should not be done haphazardly.

Once the possible sources of bias have been taken care of, it will be necessary to develop and apply expansion factors to the sample survey data to enable it to properly represent the population from which it was drawn. According to the survey design, the travel data will be expanded and adjusted to the 1990 decennial census data. However, adjusting it back to the 1980 census could prove useful in two ways. First, it will provide a real test for the concept of adjusting while the survey is still underway. If changes need to made to the survey design it will be possible to correct for them without

jeopardizing the entire survey. Because this is a complex task it could be beneficial to go though the adjusting exercise to make sure it will work. Conceptually, it is the same as an architectural engineer who builds a mock-up before embarking on the real thing. A secondary reason for adjusting to 1980 is to compare 1980 travel with 1988 travel, holding the demographic control variables constant. That is, if one assumes that the control variables have not changed what would the travel scenario look like?

Regarding the control variables, there are atleast four that need to be considered. Household size, workers per household, vehicles per household and to a lesser degree, household income. Household income is downplayed because it is impossible to use the same coding frame as the Census Bureau. For purposes of the census, the income coding frame (income brackets) will not be developed until the census is complete. However, to optimize the responses to the household travel survey income question, specific brackets were developed. Age is another variable that has a similar coding frame problem except that for the household travel survey it was possible to obtain a specific age.

The preceding discussion was intended to help point the analyst in a direction. It was not intended to be the definitive statement on the subject. Many of the issues raised are conceptual and require an experienced statistical planner trained in error correction, factoring and weighting. It will be the analyst who determines, after careful scrutiny, which variables would be the best controls to base the adjustment on. Once the data has been factored, adjusted and expanded it will be necessary to resummarize and analyze it. One type of analysis that will be important to pursue will be the spatial distribution of the trips. Specifically, where do people who live in the CBD have a propensity to work? Where do they shop? Does the concept of reverse commuting apply to the CBD dweller?

Exhibit 30

Comparison Between 1988 Raw Survey Data and the 1980 Census

| | Census | Travel Survey |
|---|---|---|
| **Persons per Household** | | |
| 1 | 66% | 62% |
| 2 | 27% | 31% |
| 3+ | 7% | 7% |
| **Workers per Household** | | |
| 0 | 25% | 14% |
| 1 | 59% | 60% |
| 2 | 15% | 24% |
| 3+ | 1% | 2% |
| **Vehicles per Household** | | |
| 0 | 55% | 46% |
| 1 | 39% | 46% |
| 2 | 5% | 7% |
| 3+ | 1% | 1% |
| **Age Distribution** | | |
| LT-13 | 4.1% | 3.5% |
| 14-20 | 3.0% | 2.4% |
| 21-64 | 72.2% | 77.8% |
| 65+ | 20.7% | 16.3% |
| **Income Distribution** | | |
| LT 15K | 12.5% | |
| $5K to $7.9K | 6.4% | |
| $8K to $9.9K | 4.4% | |
| $10K to $14.9K | 10.9% | |
| LT $15K | | 4.7% |
| $15K to $19.9K | 11.6% | |
| $15K to $24.9K | | 10.3% |
| $20K to $24.9K | 9.4% | |
| $25K to $34.9K | 12.8% | |
| $25K to $39.9K | | 22.6% |
| $35K to $49.9K | 10.9% | |
| $40K to $59.9K | | 23.7% |
| $50+K | 21.1% | |
| $60K to $74.9K | | 10.9% |
| $75K to $99.9K | | 8.6% |
| $100+K | | 19.2% |

Note: Travel survey data is unfactored and unadjusted and has not been validated.

Sources: 1980 Census (UTPP) files and CATS 1988 CBD household travel survey.

Exhibit 31

Summary of Transportation
Related Variables

| | | |
|---|---|---|
| **Employment** | | |
| | Employed | 83.63% of those 14 years of age or older. |
| | Not Employed | 19.37% of those 14 years or age or older. |
| **Rates** | | |
| | Trips per Household | 4.86 |
| | Trips per Person | 3.43 |
| **Trip Ends (Destination Activities)** | | |
| | Work or Work Related | 31.95% |
| | Non Work | 32.52% |
| | Returning Home | 35.52% |
| **Modes** | | |
| | Auto | 30.74% |
| | Transit | 22.65% |
| | Walk | 36.59% |
| | Taxi | 9.82% |
| | Other | 0.20% |
| **Lengths** | | |
| | Longest Trip | 307.62 Miles |
| | Shortest Trip | 0.00 Miles |
| | Mean Distance | 4.07 Miles |
| | Mediun | 0.95 Miles |
| | Miles per Person per Day | 13.97 |

Note: Data is unfactored and unadjusted and has not been validated.

Source: CBD household travel survey, November 1988.

## References


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# Appendix A

## Comparison of Mailback and Telephone Survey Techniques

## Discussion Issues

| | Mailback | Telephone |
|---|---|---|
| POPULATION | Fixed number of households based on residential electric meters. | Unknown quantity of assigned numbers. Types? (45% unlisted) |
| NON-RESPONSE | Exact household location known. | Random telephone number. |
| STRENGTH | Very specific (trip) level of detail. Proven travel dairy and/ or panel abilities for a single reference trip, day or week. | General level of detail. Travel diary or complete trip record questionable. |
| POTENTIAL | Provides check on trip tables produced by distribution process. | Provides disaggregate data for current distribution models. |
| COSTS PER COMPLETED QUESTIONNAIRE | Diminishes with experience. Has ability for significant unit cost reductions as quantities increase. | Fixed. No potential for cost reductions through increase amount of questionnaires. |
| QUALITY OF INFORMATION | Albany-Reliable<br>Ithaca-Reliable | Metra-Reliable<br>San Fran-Reliable |
| RESPONDENTS SATISFACTION | Very high, strong feeling of making contribution. | Unknown. |
| | Respondents offer many comments. Comments shed light on issues that are of importance. Forms can be completed at the respondent's liesure. | Comments difficult to deal with. Person must respond when called or special arrangements must be made. |
| ABILITY TO FOLLOW-UP | Very easy, capable of obtaining mode split data for selected households (individuals) at a later date. Sub-questionnaires based upon information from first survey. Can follow up either by phone or mail. | Difficult. Must follow-up at time of initial interview. Must have sub-questionnaires at hand or other arrangements must be made. |
| STAFF | Task trained. Do not directly interact with respondents unless specially trained. | Highly trained. Must interact with respondents. |

# Appendix B

## Survey Materials and Questionnaires Distributed to Each Household

INTRODUCTION LTR

CHICAGO AREA TRANSPORTATION STUDY
300 W. Adams Street Chicago, Illinois 60606

October, 1988

Dear Downtown Chicago Resident,

The Chicago Area Transportation Study, in cooperation with the City of Chicago Department of Planning, will soon begin a comprehensive study of the travel patterns of persons who live downtown. Your household, along with several thousand others, has been randomly selected to participate in a travel survey which will provide vital information to be used in making transportation improvements throughout the downtown area.

As you may know, the population of downtown Chicago has grown substantially since 1980. This area is bounded by Halsted Street on the west, Roosevelt Road on the south, Lake Michigan on the east and North Avenue, State Street and Chicago Avenue on the north. As of 1988, the population has grown to approximately 47,000 persons.

Downtown Chicago has traditionally been a destination for persons coming to work, shop or visit and transportation facilities have been designed to move people in and out of the area. With the tremendous growth in the downtown residential population, new travel patterns have developed and new transportation needs have arisen. Presently, little information exists on how, why and where downtown residents travel. Such information is essential if we are to plan transportation facilities for persons who have travel patterns geared to a downtown lifestyle.

In approximately two weeks, you will be mailed a survey package. It will contain a questionnaire that will ask for information about how you and members of your household travel on a typical weekday. The information that you provide will be strictly confidential and will be used for statistical purposes only. If you have any questions, please call Mr. Ed Christopher at 793-3467. He will be able to provide you with additional information about the study. We look forward to your cooperation in this important project. Thank you for your participation.

Very truly yours,

Aristide E. Biciunas
Executive Director

SURVEY LTR

CHICAGO AREA TRANSPORTATION STUDY
300 W. Adams Street Chicago, Illinois 60606

October, 1988

Dear Downtown Chicago Resident:

Your household has been randomly selected to participate in a downtown travel survey being conducted by the Chicago Area Transportation Study. This effort is designed to generate information which will be used to plan transportation improvements in and around downtown Chicago during the next several years.

The objective of this survey is to identify the trips made by all members of your household, and by many other residents throughout the downtown area on a single travel day. The information you provide will be used to determine the travel patterns of all downtown residents. We also need to ask some questions describing your household and the people in it. Because we will only be surveying a small percentage of the population in this area, it is important to the success of this study that those who have been selected do indeed respond. Any information you provide will remain confidential and will be used for statistical purposes only.

We know that you will agree with us that the information obtained in this survey is important for planning future transportation facilities in the downtown area. Only by collecting reliable information on travel patterns can we plan for the efficient movement of people and traffic throughout downtown Chicago. We thank you for your assistance.

Sincerely,

Aristide E. Biciunas
Executive Director

AEB:ls-0491L:

INSTRUCTIONS

# DOWNTOWN CHICAGO TRAVEL SURVEY 1988

Conducted for: City of Chicago
Chicago Transit Authority
Illinois Department of Transportation

Conducted by : Chicago Area Transportation Study
Survey Office : 793 3467

# WHAT TO DO NOW

In completing this survey, you should

1. Fill out **PARTS 1 & 2** of the **HOUSEHOLD FORM** (pages 3 and 4)

2. Fill out a **TRIP FORM** for each person 14 years of age and older.

3. Have each of these people **RECORD ALL THE TRIPS** they make on the **HOUSEHOLD'S TRAVEL DAY** on these forms.

   If any person is unable to complete the form, another household member should assist them.

   Detailed instructions for recording trips can be found on page 2.

4. Return the completed **HOUSEHOLD FORMS** and all completed **TRIP FORMS** in the **ENCLOSED POSTAGE PAID ENVELOPE.**

   (Please **DO NOT** return unused forms)

INSTRUCTIONS

# IMPORTANT! HOW TO FILL OUT THE TRIP FORMS

* Please complete a **TRIP FORM** for every person in the household who is 14 years of age and older.

* The **OLDEST PERSON** in the household should fill out **TRIP FORM NUMBER 1,**
the **SECOND OLDEST** in the household should fill out **TRIP FORM NUMBER 2,** and so on.

Please fill in **ALL THE TRIPS**
you make on this day.

YOUR HOUSEHOLD'S TRAVEL DAY IS:

THIS COMING **THURSDAY**

* You should complete this form **ONLY** for your household's **TRAVEL DAY,**
**EVEN IF YOU MAKE NO TRIPS ON THAT DAY.**

* A **TRIP** is defined as a **ONE-WAY** movement from one location or destination to another.
If you travel to a destination and then return home, this is counted as **TWO** separate trips.
If you travel to two destinations (to work and then a store) and then return home,
this is **THREE** trips.

* Fill in **ALL YOUR TRIPS** starting at **4:00 AM** on the **TRAVEL DAY** through 4:00 AM the next day.

* Please return the completed **HOUSEHOLD FORMS** and the **TRIP FORMS**
in the **ENCLOSED POSTAGE PAID ENVELOPE. (Do NOT return unused forms)**

* Please try to mail the forms on **THE DAY AFTER** your household's **TRAVEL DAY.**

# SOME OTHER THINGS YOU MIGHT NEED TO KNOW

* If more than 4 people in your household make trips on the travel day,
then use the Supplemental Trip Forms (write the person number in the blank space).

* If someone in your household makes **MORE THAN 7 TRIPS ON THE HOUSEHOLD TRAVEL DAY:**
– the Supplemental Trip Forms can be used (please fill in the person number on the form).
– if you make a lot more than 7 trips (such as a truck driver or commercial traveler),
phone the Survey Office because we have a much simpler method for you.

* If you have any problems or other questions about this survey, please phone the Survey Office
at 793 – 3467 between 8:30 AM and 6:00 PM.

*Thank you for answering the questionnaire and contributing to the success of this survey.*

Trip Check List

# TRIP MAKING CHECK LIST

Sometimes it is difficult to remember all of the trips that we have made during the day. The check list below shows typical travel destinations. It can be useful in determining whether you have remembered all of the trips you made on your assigned travel day.

__ Antiques Shop
__ Art Gallery
_ Bank
__ Bar
__ Barber Shop
__ Beach
__ Book Store
__ Bowling Alley
__ Butcher
__ Car Dealer
__ Car Repair
_ Church
__ Concert
__ Court
__ Dentist
__ Department Store
__ Doctor
__ Druggist
__ Dry Cleaners
__ Fast Foods
__ Furniture Store
__ Gas Station
__ Grocery Store
__ Hairdresser
__ Health Club
__ Hospital
__ Jury Duty
__ Laundromat
__ Lawyer
__ Library
__ Liquor Store
__ Medical Clinic
__ Movie Theatre
__ Museum
__ News Stand
__ Night Club
__ Park
__ Post Office
__ Restaurant
__ Savings & Loan
__ School
__ Sporting Event
__ Temple
__ Train Station
__ Travel Agent
__ Theatre
__ Veterinarian
__ Video Store
__ Visit Family
__ Visit Friend

SAMPLE FORM
HHPART 1

# DOWNTOWN CHICAGO TRAVEL SURVEY 1988

Conducted for: City of Chicago
Chicago Transit Authority
Illinois Department of Transportation

Conducted by : Chicago Area Transportation Study
Survey Office : 793 3467

**PLEASE READ THIS FIRST**

* Please fill out **PART 1** of the **HOUSEHOLD FORM** first.
* Then fill out **PART 2** of the **HOUSEHOLD FORM.** for every household member aged 14 years or older
* Then for every household member aged 14 years or older fill out the **TRIP FORMS** for the specified **TRAVEL DAY**

**CONFIDENTIAL**

## HOUSEHOLD FORM–PART 1

**A household consists of All persons who live together and share the same mailing address.**

**How many persons** (including yourself) live in this household? 5 Persons

Of these people; **How many are less than 14 years old ?** 2 Persons

**How many are 14 years or older ?** 3 Persons

WE MAY NEED TO CALL YOU TO MAKE SURE THAT WE UNDERSTAND ALL OF YOUR ANSWERS. WHAT IS YOUR TELEPHONE NUMBER AND THE FIRST NAME OF THE PERSON WE SHOULD CONTACT ? ALSO, WHAT WOULD BE A CONVENIENT TIME TO CALL ?

PHONE NUMBER: 793-3467 FIRST NAME: Alan TIME: 5:15 AM ☐ PM ☒

**HOW MANY of the following vehicles are owned by members of this household ?**
**(Please include all vehicles usually kept in the downtown area overnight)**

1 AUTOS
____ VANS & PICKUPS
____ OTHER (specify) _____
____ MOTORCYCLES
2 BICYCLES

Now please answer the questions on **PART 2** of the **HOUSEHOLD FORM** for all persons aged 14 years or older.

SAMPLE FORM
HHPART 2

# HOUSEHOLD FORM – PART 2

PLEASE ANSWER THE FOLLOWING QUESTIONS FOR ALL PEOPLE IN THE HOUSEHOLD WHO ARE 14 YEARS OF AGE AND OLDER.

| PERSONS AGED 14 AND OLDER | Oldest Person | 2nd Oldest Person | 3rd Oldest Person | 4th Oldest Person | 5th Oldest Person | 6th Oldest Person | 7th Oldest Person |
|---|---|---|---|---|---|---|---|
| Person Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Year of Birth → | 1945 | 1946 | 1971 | | | | |
| RELATIONSHIP to Oldest Person (e.g. spouse, son friend etc.) | | SPOUSE | DAUGHTER | | | | |
| SEX — Male | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| SEX — Female | ☐ | ☒ | ☒ | ☐ | ☐ | ☐ | ☐ |
| ARE YOU CURRENTLY ENROLLED IN SCHOOL ? — Yes, Full Time | ☐ | ☐ | ☒ | ☐ | ☐ | ☐ | ☐ |
| ARE YOU CURRENTLY ENROLLED IN SCHOOL ? — Yes, Part Time | ☐ | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ |
| ARE YOU CURRENTLY ENROLLED IN SCHOOL ? — Not In School | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| EMPLOYMENT STATUS (check as many boxes as apply) | | | | | | | |
| Employed Full Time | ☒ | ☒ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Employed Part Time | ☐ | ☐ | ☒ | ☐ | ☐ | ☐ | ☐ |
| Homemaker | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Student | ☐ | ☐ | ☒ | ☐ | ☐ | ☐ | ☐ |
| Unemployed | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Retired | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Other (specify) | | | | | | | |
| CURRENT OCCUPATION | Survey Specialist | Teacher | Store Clerk | | | | |

WHAT WAS THE COMBINED HOUSEHOLD INCOME, BEFORE TAXES, FOR THE YEAR 1987 ?
(Total for all household members listed above )

HOUSEHOLD INCOME (1987)

- ☐ Less than $15,000
- ☐ $15,000 to $24,999
- ☐ $25,000 to $39,999
- ☐ $40,000 to $59,999
- ☒ $60,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ More than $100,000

Now please complete the Trip Forms for each person listed above.

TRIP FORM
TRPFRM

# TRIP FORM for Person Number 1

Fill in for all trips on **THURSDAY**

If you did not leave the house at all on this day please give reason _____

Where did your first trip (after 4:00 a.m., Thursday) begin ?

Home ☒ Elsewhere ☐ (specify) _____ nearest major intersection

NOTE: If you go to and from a location, record this as two separate trips.

| | FIRST TRIP starting after 4:00 a.m. | SECOND TRIP | THIRD TRIP |
|---|---|---|---|
| On which DATE did you make THESE TRIPS month 10 day 20, 1988 | | | |
| At what TIME did you begin this trip ? | Time Started 7:21 a.m. ☒ p.m. ☐ | Time Started 12:03 a.m. ☐ p.m. ☒ | Time Started 12:50 a.m. ☐ p.m. ☒ |
| WHERE was your DESTINATION ? Please give street name or best description. | Destination Location Adams/Franklin nearest major intersection; Chicago name of city, town or village | Destination Location Michigan/Oak nearest major intersection; Chicago name of city, town or village | Destination Location Adams/Franklin nearest major intersection; Chicago name of city, town or village |
| At what TIME did you ARRIVE at this destination ? | Arrival Time 7:48 a.m. ☒ p.m. ☐ | Arrival Time 12:20 a.m. ☐ p.m. ☒ | Arrival Time 1:15 a.m. ☐ p.m. ☒ |
| WHY did you go to this DESTINATION ? | Destination Activity: WORK ☒; WORK RELATED ☐; SCHOOL ☐; SHOPPING ☐; RECREATION ☐; PICK UP/DROP OFF PASSENGERS ☐; RETURN HOME ☐; OTHER (specify) ☐ | Destination Activity: WORK ☐; WORK RELATED ☐; SCHOOL ☐; SHOPPING ☒; RECREATION ☐; PICK UP/DROP OFF PASSENGERS ☐; RETURN HOME ☐; OTHER (specify) ☐ | Destination Activity: WORK ☒; WORK RELATED ☐; SCHOOL ☐; SHOPPING ☐; RECREATION ☐; PICK UP/DROP OFF PASSENGERS ☐; RETURN HOME ☐; OTHER (specify) ☐ |
| HOW did you make this trip ? Please check all types of transportation that you used. | Types of Transportation: WALK ☒; AUTO DRIVER ☐; AUTO PASSENGER ☐; COMMUTER RAIL ☐; RAPID TRANSIT ☐; CTA BUS ☒; OTHER BUS ☐; TAXI ☐; OTHER (specify) | Types of Transportation: WALK ☒; AUTO DRIVER ☐; AUTO PASSENGER ☐; COMMUTER RAIL ☐; RAPID TRANSIT ☐; CTA BUS ☒; OTHER BUS ☐; TAXI ☐; OTHER (specify) | Types of Transportation: WALK ☐; AUTO DRIVER ☐; AUTO PASSENGER ☒; COMMUTER RAIL ☐; RAPID TRANSIT ☐; CTA BUS ☐; OTHER BUS ☐; TAXI ☐; OTHER (specify) |
| If you used BUS, RAPID TRANSIT or RAIL, how far did you walk TO the bus stop or train station | 2 BLOCKS | 1 BLOCKS | — BLOCKS |
| If you used BUS, RAPID TRANSIT or RAIL, how far did you walk FROM the bus stop or train station | 1 BLOCKS | 1 BLOCKS | — BLOCKS |
| If you traveled by AUTO (driver or passenger) how many persons INCLUDING YOURSELF were in the auto? | — PERSONS | — PERSONS | 4 PERSONS |
| Did you go ANYWHERE ELSE after this trip ? (e.g. back home, on to another location etc.) | NO ☐ YES ☒ | NO ☐ YES ☒ | NO ☐ YES ☒ |
| | Next trip in next column | Next trip in next column | Next trip on back of page |

TURN PAGE OVER FOR TRIPS 4 THROUGH 7

TRIP FORM CONT

TRIP FORM

**TRIP FORM** for Person Number **1**

Fill in for all trips on **THURSDAY**

NOTE: IF YOU ARE REPORTING ON MORE THAN SEVEN TRIPS PLEASE USE SUPPLEMENTAL TRIP FORMS

NOTE: If you go to and from a location, record this as two separate trips.

| | FOURTH TRIP | FIFTH TRIP | SIXTH TRIP | SEVENTH TRIP |
|---|---|---|---|---|
| Time Started | 4:30 p.m. | 7:30 p.m. | 10:15 p.m. | 11:40 p.m. |
| Destination Location | Randolph & Field Dr. | Michigan & Congress | Ohio & Orleans | Randolph & Field Dr. |
| nearest major intersection | | | | |
| | Chicago | Chicago | Chicago | Chicago |
| name of city, town or village | | | | |
| Arrival Time | 5:03 p.m. | 7:45 p.m. | 10:32 p.m. | 12:05 a.m. |
| Destination Activity | | | | |
| WORK | | | | |
| WORK RELATED | | | | |
| SCHOOL | | | | |
| SHOPPING | | | | |
| RECREATION | | X | X | |
| PICK UP/DROP OFF PASSENGERS | | | | |
| RETURN HOME | X | | | X |
| OTHER (specify) | | | | |
| Types of Transportation | | | | |
| WALK | X | X | | |
| AUTO DRIVER | | | | |
| AUTO PASSENGER | | | | X |
| COMMUTER RAIL | | | | |
| RAPID TRANSIT | X | | | |
| CTA BUS | | | | |
| OTHER BUS | | | | |
| TAXI | | | X | |
| OTHER (specify) | | | | |
| | 1 BLOCKS | — BLOCKS | — BLOCKS | — BLOCKS |
| | 3 BLOCKS | — BLOCKS | — BLOCKS | — BLOCKS |
| | PERSONS | — PERSONS | — PERSONS | 2 PERSONS |
| | NO ☐ YES ☒ | NO ☐ YES ☒ | NO ☐ YES ☒ | NO ☒ YES ☐ |
| | Next trip in next column | Next trip in next column | Next trip in next column | List additional trips on Supplemental trip form |

# Appendix C

## CBD Zonal Cross Reference Guide Including Edison, CATS Quarter-Section, CATS TAZs and CATS Zones

# CBD Zonal Cross Reference Guide

| EDISON | CATS | TAZ | QUARTER |
|---|---|---|---|
| 105 | 65 | 294 428 | 1451 3971 |
| 105 | 65 | 294 427 | 1452 3971 |
| 205 | 70 | 294 446 | 1451 3952 |
| 205 | 70 | 294 445 | 1452 3952 |
| 305 | 62 | 294 426 | 1451 3972 |
| 305 | 62 | 294 425 | 1452 3972 |
| 405 | 73 | 294 448 | 1451 3951 |
| 405 | 73 | 294 447 | 1452 3951 |
| 505 | 57 | 294 400 | 1451 3981 |
| 106 | 63 | 294 424 | 1441 3971 |
| 106 | 64 | 294 423 | 1442 3971 |
| 206 | 68 | 294 450 | 1441 3952 |
| 206 | 69 | 294 449 | 1442 3952 |
| 306 | 60 | 294 422 | 1441 3972 |
| 306 | 61 | 294 421 | 1442 3972 |
| 406 | 71 | 294 452 | 1441 3951 |
| 406 | 72 | 294 451 | 1442 3951 |
| 705 | 57 | 294 398 | 1451 3982 |

# Appendix D

## CBD Household Travel Survey
## Micellaneous Data

CBD Household Travel Survey

Number of Vehicles Owned
by CATS Zone

| CATS Zone | Number of Households | Autos | Vans and Pick-ups | Motorcycles | Bicycles | Other | Total # of Vehicles |
|---|---|---|---|---|---|---|---|
| 57 | 133 | 78 | 1 | 0 | 65 | 0 | 144 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61 | 13 | 9 | 0 | 0 | 4 | 0 | 13 |
| 62 | 82 | 49 | 2 | 1 | 29 | 0 | 81 |
| 63 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 64 | 7 | 3 | 0 | 0 | 1 | 0 | 4 |
| 65 | 67 | 44 | 0 | 1 | 33 | 0 | 78 |
| 68 | 25 | 14 | 0 | 0 | 11 | 0 | 25 |
| 69 | 4 | 2 | 0 | 1 | 1 | 0 | 4 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 51 | 37 | 1 | 0 | 36 | 0 | 74 |
| 73 | 21 | 8 | 0 | 0 | 4 | 0 | 12 |
| TOTALS | 404 | 244 | 4 | 3 | 184 | 0 | 435 |

**NOTES:** Question was worded "How many of the following vehicles are owned by members of this household? (Please include all vehicles usually kept in the downtown area overnight.)

SOURCE: CBD household travel survey, November 1988.

1291L:

Automoboile Ownership for Households
by CATS Zones

| CATS Zone | Automobiles None | 1 | 2 | 3 | Total Autos | Household | Automobiles Per Household |
|---|---|---|---|---|---|---|---|
| 57 | 63 | 62 | 8 | 0 | 78 | 133 | 0.59 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 61 | 5 | 7 | 1 | 0 | 9 | 13 | 0.69 |
| 62 | 37 | 42 | 2 | 1 | 49 | 82 | 0.60 |
| 63 | 1 | 0 | 0 | 0 | 0 | 1 | 0.00 |
| 64 | 6 | 0 | 0 | 1 | 3 | 7 | 0.43 |
| 65 | 29 | 32 | 6 | 0 | 44 | 67 | 0.66 |
| 68 | 12 | 12 | 1 | 0 | 14 | 25 | 0.56 |
| 69 | 2 | 2 | 0 | 0 | 2 | 4 | 0.50 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 20 | 25 | 6 | 0 | 37 | 51 | 0.73 |
| 73 | 14 | 6 | 1 | 0 | 8 | 21 | 0.38 |
| TOTALS | 189 | 188 | 25 | 2 | 244 | 404 | 0.60 |
| | (47%) | (47%) | (6%) | (---) | | | |

Note: No household reported more than 3 automobiles.

Source: CBD household travel survey, Novbember 1988.

Van, Pick-up and Motorcycle Ownership For Households
by CATS Zone

| CATS Zone | Vans, Pick-ups & Motorcycle 0 | 1 | 2 | 3 | Total Vans,PU,M | Households | Vehicles Per Household |
|---|---|---|---|---|---|---|---|
| 57 | 132 | 1 | 0 | 0 | 1 | 133 | 0.008 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0.000 |
| 61 | 13 | 0 | 0 | 0 | 0 | 13 | 0.000 |
| 62 | 79 | 3 | 0 | 0 | 3 | 82 | 0.037 |
| 63 | 1 | 0 | 0 | 0 | 0 | 1 | 0.000 |
| 64 | 7 | 0 | 0 | 0 | 0 | 7 | 0.000 |
| 65 | 66 | 1 | 0 | 0 | 1 | 67 | 0.015 |
| 68 | 25 | 0 | 0 | 0 | 0 | 25 | 0.000 |
| 69 | 3 | 1 | 0 | 0 | 1 | 4 | 0.250 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0.000 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0.000 |
| 72 | 50 | 1 | 0 | 0 | 1 | 51 | 0.020 |
| 73 | 21 | 0 | 0 | 0 | 0 | 21 | 0.000 |
| TOTAL | 397 | 7 | 0 | 0 | 7 | 404 | 0.017 |

Source: CBD household travel survey, November 1988.

CBD Household Travel Survey

Bicycle Ownership for Households
by CATS Zone

| CATS Zone | Households with Bicycles None | 1 | 2 | 3+ | Total Bicycles | Total Households | Bicycles Per Household |
|---|---|---|---|---|---|---|---|
| 57 | 93 | 24 | 13 | 3 | 65 | 133 | 0.49 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 61 | 10 | 2 | 1 | 0 | 4 | 13 | 0.31 |
| 62 | 58 | 19 | 5 | 0 | 29 | 82 | 0.35 |
| 63 | 1 | 0 | 0 | 0 | 0 | 1 | 0.00 |
| 64 | 6 | 1 | 0 | 0 | 1 | 7 | 0.14 |
| 65 | 46 | 13 | 5 | 3 | 33 | 67 | 0.49 |
| 68 | 16 | 7 | 2 | 0 | 11 | 25 | 0.44 |
| 69 | 3 | 1 | 0 | 0 | 1 | 4 | 0.25 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| 72 | 26 | 16 | 7 | 2 | 36 | 51 | 0.71 |
| 73 | 17 | 4 | 0 | 0 | 4 | 21 | 0.19 |
| TOTAL | 276 | 87 | 33 | 8 | 184 | 404 | 0.46 |
| | (68%) | (22%) | (8%) | (2%) | | | |

**NOTE:** Three households have more than 3 bicycles including 1 with 4, 1 with 5 and 1 with 7.

SOURCE: CBD Households Travel Survey, November, 1988.

1284L

Population Summary for Sex[1] and
Travel Reporting Age by CATS Zones

| CATS Zone | 14 or Older | | | Total Population | | |
|---|---|---|---|---|---|---|
| | Male | Female | Unknown | Under 14 | 14 or older | Total |
| 57 | 79 | 109 | 3 | 5 | 191 | 191 |
| 60 | 0 | 0 | 0 | 0 | 0 | 0 |
| 61 | 6 | 12 | 0 | 1 | 18 | 19 |
| 62 | 42 | 65 | 0 | 4 | 107 | 111 |
| 63 | 1 | 0 | 0 | 0 | 1 | 1 |
| 64 | 5 | 6 | 0 | 0 | 11 | 11 |
| 65 | 44 | 54 | 1 | 4 | 99 | 103 |
| 68 | 17 | 16 | 1 | 2 | 34 | 36 |
| 69 | 3 | 4 | 0 | 0 | 7 | 7 |
| 70 | 0 | 0 | 0 | 0 | 0 | 0 |
| 71 | 0 | 0 | 0 | 0 | 0 | 0 |
| 72 | 31 | 47 | 0 | 3 | 78 | 81 |
| 73 | 9 | 18 | 0 | 1 | 27 | 28 |
| TOTALS | 237 (41%) | 331 (58%) | 5 (1%) | 20 | 573 | 593 |

Notes: 1. Sex was asked only for individuals over 13 years of age.

2. Data is unfactored and unadjusted.

Source: CBD household travel survey, November 1988.

# Appendix E

## Data Base DATAEASE Documentation and Coding Guide

CBD Household Travel Survey 1989
Coding Guide

## Household Form Part 1 (HHPART1)

| Item | Code |
|---|---|
| Date Received (DATE-RCVD) | 0518 through 0630 |
| Sequence Number (SEQ) | 1001 to 8074 |
| Home Location (QS) | 8 Digit Quarter-Section code within the six-county region. State/City codes outside region. |
| Total Persons in Household (PERSONS) | Number of People in the Household. 0 to 99 |
| Persons Less Than 14 Years Old (P.LT.14) | 0 to 99 |
| Persons 14 Years or Older (P.GE.14) | 0 to 99 |
| Number of Vehicles (Check All That Apply) | |
| Autos (AUTOS) | 0 to 9 |
| Vans and Pickups (V/P) | 0 to 9 |
| Motorcycles (MC) | 0 to 9 |
| Bicycles (BYC) | 0 to 9 |
| Other (OTH) | 0 to 9 |
| Specify | 20 spaces For Written Comment |

## Household Form Part 2 (HHPART2)

| | |
|---|---|
| Hoiusehold Income (HINC) | |
| Less than $15,000 | 1 |
| $15,000 to $24,999 | 2 |
| $25,000 to $39,999 | 3 |
| $40,000 to $59,999 | 4 |
| $60,000 to $74,999 | 5 |
| $75,000 to $99,999 | 6 |
| More than $100,000 | 7 |
| Unknown | 8 |
| Person Number (PER#) | 1 to 9 |
| Year of Birth (BIRTH) | 1850 to 1975 |

Relationship (REL)

| | |
|---|---|
| Self | 1 |
| Spouse | 2 |
| Son | 3 |
| Daughter | 4 |
| Friend/Roommate | 5 |
| Brother | 6 |
| Sister | 7 |
| Employee | 8 |
| Unknown | 9 |
| Nephew | 10 |
| Fiance | 11 |
| Daughter-in-law | 12 |
| Grandson | 13 |
| Granddaugher | 14 |
| Grandnephew-in-law | 15 |
| Grandniece | 16 |
| Great Grandnephew | 17 |
| Son-in-law | 18 |
| Grandson-in-law | 19 |
| Sister-in-law | 20 |
| Niece | 21 |
| Nephew-in-law | 22 |
| Brother-in-law | 23 |
| Mother-in-law | 24 |

Sex (SEX)

| | |
|---|---|
| Male | 1 |
| Female | 2 |

School Enrollment (SCHOOL)

| | |
|---|---|
| Full Time | 1 |
| Part Time | 2 |
| Not in School | 3 |

Employment Status (Check All That Apply)

| | |
|---|---|
| Full Time (FULL) | 1 |
| Part Time (PART) | 1 |
| Homemaker (HOMEMAKER) | 1 |
| Student (STUDENT) | 1 |
| Unemployed (UNEMP) | 1 |
| Retired (RETIRED) | 1 |
| Other (OTH) | 1 |
| Specify (OTHSP2) | 14 Spaces to Specify) |

Current Occupation (OCCUP)

| | |
|---|---|
| Professional, Technical and Kindred Workers | 0 |
| Farmers and Farm Managers | 1 |
| Managers, Officials and Proprietors | 2 |
| Clerical and Kindred Workers | 3 |
| Sales Workers | 4 |
| Craftsmen, Foremen and Kindred Workers-also Armed Forces | 5 |
| Operatives and Kindred Workers | 6 |

| | |
|---|---|
| Private Household Workers | 7 |
| Service Workers Except Private Household | 8 |
| Laborers and Farm Workers | 9 |
| Housewives and Unpaid Home Workers | X1 |
| Students | X2 |
| Unemployed | X3 |
| Retired or Permanently Incapacitated for Employment | X4 |
| Occupation Unknown or Not Elsewhere Classified | R |

Number of Trips (TRIPS) 0 to 99

Reason for Making No Trips (REASON) 20 Spaces to Specify

## Trip Form (TRPFRM)

| Item | Code |
|---|---|
| Origin of First Trip (N/H/E) | |
| Home | H |
| Elsewhere (specify) | E (Specify 8 Digit Geocode) |
| Travel Date | 0511, 0518, 0525, or 0627 |
| Trip Number (TRIP#) | 1 to 99 |
| Time Started (STRT) | 0000 to 2359 |
| Destination Location (DESTCO) | 8 Digit Geocode |
| Arrival Time (ENDT) | 0000 to 2350 (Military Time) |
| Destination Activity (Check All That Apply) | |
| Work | 1 |
| Work Related | 1 |
| School | 1 |
| Shopping | 1 |
| Recreation | 1 |
| Pick Up/Drop Off Passengers | 1 |
| Return Home | 1 |
| Other | 1 |
| Specify | 20 Spaces |

| | |
|---|---|
| Type of Transportation | |
| Walk Only (HOW WALK) | 1 |
| Driver | 1 |
| Passenger in Auto, Van, or Truck | 1 |
| School Bus | 1 |
| Pace Bus | 1 |
| Metra Rail | 1 |
| CTA Bus | 1 |
| CTA Rapid Transit | 1 |
| Taxi | 1 |
| Other | 1 |
| Specify | 15 Spaces |
| Blocks Walked To Transit | 1 to 99 or Blank |
| Blocks walked From Transit | 1 to 99 or Blank |
| Persons in Auto, Van or Truck | 1 to 99 or Blank |
| Next Trip (MORE) | |
| No | 2 |
| Yes | 1 |

FORM HHPART1

```
1        10        20        30        40        50        60        70
----+----+----+----+----+----+----+----+----+----+----+----+----+----+--
DOWNTOWN CHICAGO TRAVEL SURVEY 1988          HOUSEHOLD FORM-PART 1        HHPAR
=============================================================================
DATE-RCVD ____

SEQ ____

PERSONS  __

P.LT.14 _

P.GE.14 _

AUTOS _     MC  _

V/P   _     BYC _

OTH   _     OTHSP _______________

HINC  _

CUTD___  CATSZN ___   QS ________
=============================================================================
+-----------------------------------------------------------------------------
¦THE ALLOWED CODES FOR THE FIELDS ARE AS FOLLOWS:
¦SEQ == NOT BLANK
¦DATE-RCVD == NOT BLANK
¦PERSONS == NOT BLANK
¦P.LT.14 == BLANK OR 01-99
¦P.GE.14 == BLANK OR 1-9
¦AUTOS, MC, V/P (VANS,PICK-UP), BYC (BYCYCLE), OTHER == 0 OR 1-9
¦OTHSP == WRITTEN ANSWWER FOR OTHER CATEGORY == TEXT
¦HINC == HOUSEHOLD INCOME CODE : 1= LESS THAN 15,000
¦                                2= 15,000-24,999
¦                                3= 25,000-39,999
¦                                4= 40,000-59,999
¦                                5= 60,000-74,999
¦                                6= 75,000-99,999
¦                                7= 100,000+
¦                                8= NO RESPONSE
¦
¦CUTD ==       ALLOWED RANGES
¦CATSZN ==           "
¦QS ==               "
+-----------------------------------------------------------------MORE-----
+-----------------------------------------------------------------------------
¦
¦      THE EXTERNAL TRIP CODES ARE:
¦
¦        QS          AREA
¦
¦     99181550   Michigan City, IN
¦     99260160   Battale Creek, MI
¦     99261085   Grand Rapids , MI
¦     99260680   Detroit,       MI
¦     99182375   South Bend,    IN
```

```
99551280   Kenosha,       WI
99390900   Cleveland,     OH
```

```
+-------------------------------------------------------------------------------+
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
1        10        20        30        40        50        60        70        80
```

FIELD DESCRIPTIONS

| No. | Name | Type | Long | Reqd | Index | Unique | Derived | Rng Chk | Prevent | Record size | offset |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | DATE-RCVD | Text | 4 | No | No | No | No | No | No | 4 | 4 |
| 2 | SEQ | Text | 4 | Yes | Yes | Yes | No | No | No | 4 | 8 |
| 3 | PERSONS | Number | 2 | No | No | No | No | No | No | 1 | 12 |
| | Number Type : Integer | | | | | | | | | | |
| 4 | P.LT.14 | Number | 1 | No | No | No | No | No | No | 1 | 13 |
| | Number Type : Integer | | | | | | | | | | |
| 5 | P.GE.14 | Number | 1 | No | No | No | No | No | No | 1 | 14 |
| | Number Type : Integer | | | | | | | | | | |
| 6 | AUTOS | Number | 1 | No | No | No | No | No | No | 1 | 15 |
| | Number Type : Integer | | | | | | | | | | |
| 7 | MC | Number | 1 | No | No | No | No | No | No | 1 | 16 |
| | Number Type : Integer | | | | | | | | | | |
| 8 | V/P | Number | 1 | No | No | No | No | No | No | 1 | 17 |
| | Number Type : Integer | | | | | | | | | | |
| 9 | BYC | Number | 1 | No | No | No | No | No | No | 1 | 18 |
| | Number Type : Integer | | | | | | | | | | |
| 10 | OTH | Number | 1 | No | No | No | No | No | No | 1 | 19 |
| | Number Type : Integer | | | | | | | | | | |
| 11 | OTHSP | Text | 15 | No | No | No | No | No | No | 15 | 20 |
| 12 | HINC | Text | 1 | No | No | No | No | No | No | 1 | 35 |
| 13 | CUTD | Text | 3 | No | Yes | No | No | No | No | 3 | 36 |
| 14 | CATSZN | Text | 3 | No | Yes | No | No | No | No | 3 | 39 |
| 15 | QS | Text | 8 | No | No | No | No | No | No | 8 | 42 |

**Record size 50**

**Memory required for form: Text  3992, Fields 342, Total 4334 bytes.**

FORM HHPART2

```
1        10        20        30        40        50        60        70
----+----+----+----+----+----+----+----+----+----+----+----+----+----+---
DOWNTOWN CHICAGO TRAVEL SURVEY 1988          HOUSEHOLD FORM-PART 2        HHPAR
=============================================================================
SEQ ____     PER# __     REL __              DATE-RCVD____

BIRTH ____ (19XX)     SEX _ (M,F)     AGE __

SCHOOL _             (BLANK,1,2,3)

EMPLOYMENT
  FULL       _
  PART       _
  HOMEMAKER  _
  STUDENT    _
  UNEMP      _
  RETIRED    _
  OTHER      _      OTHSP2 _________________
  WORKER/NOT_
OCCUP _       TRIPS __          REASON NO TRIPS _____________________

 N/H/E_    nolve/inter_____________________________________
m/d____,1988 ORIGIN ________
=============================================================================
+---------------------------------------------------------------------------
| SEQ=HOUSEHOLD SEQUENCE NUMBER
| PER#==(PER)=PERSON NUMBER IN HOUSEHOLD
| REL==(REL)=RELATIONSHIP TO PERSON NUMBER ONE
| DATE-RCVD= DATE WHEN THE QUESTIONNAIRE WAS RETURNED
| BIRTH= YEAR OF BIRTH
| SEX=  M OR F
| AGE= COMPUTED AGE OF INDIVIDUAL
| SCHOOL= ENROLLMENT STATUS 1=FULL TIME, 2=PART TIME, 3=NOT IN SCHOOL OR'0'
| EMPLOYMENT    FULL,PART,HOMEMAKER,STUDENT,UNEMPLOYED
|               RETIRED,OTHER = 0 =NOT CHECKED
|                                1 =CHECKED
| OTHSP2=WRITTEN RESPONSE IF OTHER BOX IS CHECKED
| OCCUP= OCCUPATION CODES = 0-9,A,B,C,D,R
|          (SEE CODING GUIDE)
| TRIPS= NUMBER OF TRIPS THIS INDIVIDUAL MADE  1-99
| REASON NO TRIPS=WRITTEN RESPONSE
| N/H/E=WHERE THE FIRST TRIP STARTED HOME (H) , ELSEWHERE (E) OR
|                                  NOT KNOWN OR NO TRIPS (0)
| M/D= MONTH AND DAY OF MONTH THE FIRST TRIP STARTED ex. '0523'
| ORIGIN=GEOCODE OF THE PLACE OF START OF TRIP
+---------------------------------------------------------------------------
----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+--
1        10        20        30        40        50        60        70
```

FIELD DESCRIPTIONS

| No. | Name | Type | Long | Reqd | Index | Unique | Derived | Rng Chk | Prevent | Record size | off |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SEQ | Text | 4 | Yes | Yes | No | No | No | No | 4 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | PER | Number | 2 | No | No | No | No | No | No | 1 | 9 |
| | Number Type : Integer | | | | | | | | | | |
| 3 | REL | Number | 2 | No | No | No | No | No | No | 1 | 10 |
| | Number Type : Integer | | | | | | | | | | |
| 4 | DATE-RCVD | Text | 4 | No | No | No | Yes | No | No | 4 | 11 |
| | Field calculation formula : LOOKUP REL1 "DATE-RCVD" | | | | | | | | | | |
| 5 | BIRTH | Text | 4 | No | No | No | No | No | No | 4 | 15 |
| 6 | SEX | Text | 1 | No | No | No | No | No | No | 1 | 19 |
| 7 | AGE | Text | 2 | No | No | No | Yes | No | No | 2 | 20 |
| | Field calculation formula : | | | | | | | | | | |
| 8 | SCHOOL | Text | 1 | No | No | No | No | No | No | 1 | 22 |
| 9 | FULL | Text | 1 | No | No | No | No | No | No | 1 | 23 |
| 10 | PART | Text | 1 | No | No | No | No | No | No | 1 | 24 |
| 11 | HOMEMAKER | Text | 1 | No | No | No | No | No | No | 1 | 25 |
| 12 | STUDENT | Text | 1 | No | No | No | No | No | No | 1 | 26 |
| 13 | UNEMP | Text | 1 | No | No | No | No | No | No | 1 | 27 |
| 14 | RETIRED | Text | 1 | No | No | No | No | No | No | 1 | 28 |
| 15 | OTHER | Text | 1 | No | No | No | No | No | No | 1 | 29 |
| 16 | OTHSP2 | Text | 15 | No | No | No | No | No | No | 15 | 30 |
| 17 | WORKER/NOT | Text | 1 | No | No | No | No | No | No | 1 | 45 |
| 18 | OCCUP | Text | 1 | No | No | No | No | No | No | 1 | 46 |
| 19 | TRIPS | Number | 2 | No | No | No | No | No | No | 1 | 47 |
| | Number Type : Integer | | | | | | | | | | |
| 20 | REASON NO TRIPS | Text | 20 | No | No | No | No | No | No | 20 | 48 |
| 21 | N/H/E | Text | 1 | No | No | No | No | No | No | 1 | 68 |
| 22 | nolve/inter | Text | 35 | No | No | No | No | No | No | 35 | 69 |
| 23 | m/d | Text | 4 | No | No | No | No | No | No | 4 | 104 |
| 24 | ORIGIN | Text | 8 | No | No | No | No | No | No | 8 | 108 |

Record size 116

Memory required for form: Text 2425, Fields 623, Total 3048 bytes.

FORM TRIPFRM

```
1        10        20        30        40        50        60        70
----+----+----+----+----+----+----+----+----+----+----+----+----+----+--
DOWNTOWN CHICAGO TRAVEL SURVEY 1988          TRIP FORM                    TRPFRM
==========================================================================
SEQ _____    PER# __    TRIP# __
STRT _____    DESTCD _________  ORIGIN _________

ENDT _____

PURPOSE _   POTH ____________________

HOW  WALK          _
     AD            _
     AP            _
     COMM-RAIL     _
     RT            _
     CTA-BUS       _
     OTH-BUS       _
     TAXI          _
     OTH           _ OTHSP ________________
BLK-TO __   BLK-FROM __   AUTOOCC __   MORE _   HYDIST__________EGDIST________
                                                HYMILE______    EGMILE______
==========================================================================
ORX_________ ORY_________ DSX_________ DSY_________
+-------------------------------------------------------------------------
¦THE ALLOWED CODES FOR THE FIELDS ARE AS FOLLOWS:
¦SEQ == NOT BLANK
¦per == NOT BLANK
¦TRIP# == NOT BLANK
¦STRT == 0000 to 2359
¦DESTCD == MAY BE CODED AS CUTD ZONE (LENGTH IS 1-3)
¦                       OR RANGE/TOWNSHIP QUARTER SECTION CODE (LENGTH 8)
¦                       OR {99STCITY}  (LENGTH 8)
¦                             where ST == 2 DIGIT CENSUS STATE CODE(1980)
¦                                 CITY == 4 DIGIT CENSUS CITY CODE(1980)
¦ORIGIN == CARRIED FROM PREVIOUS TRIP RECORD OR PERSON RECORD (START OF TRIP)
¦ENDT == 0000 to 2359
¦PURPOSE == 1 to 8  1= WORK, 2= WORK RELATED, 3= SCHOOL, 4= SHOPPING
¦                   5= RECREATION
¦                   6= PICK UP/DROP OFF PASSENGERS
¦                   7= RETURN HOME, 8= OTHER
¦
¦
¦
+-------------------------------------------------------------------more-----
+-------------------------------------------------------------------------
¦POTH == WRITTEN RESPONSE
¦HOW WALK to HOW OTH == 0 or 1
¦OTHSP == WRITTEN RESPONSE
¦BLK-TO == 00-99 OR BLANK
¦BLK-FROM == 00-99 OR BLANK
¦AUTOOCC == 00-99 OR BLANK
¦MORE == 1 (MORE TRIPS THIS PERSON), 2 (NO MORE TRIPS THIS PERSON)
¦
¦HTDIST/HYMILE CALCULATED AIRLINE DISTANCE IN FEET/MILES
¦EGDIST/EGMILE CALCULATED BLOCK EDGE DISTANCE IN FEET/MILES
```

note: Several external cities wer travelled to. The codes are:

| | |
|---|---|
| 99181550 | Michigan City, IN |
| 99260160 | Battale Creek, MI |
| 99261085 | Grand Rapids , MI |
| 99260680 | Detroit, MI |
| 99182375 | South Bend, IN |
| 99551280 | Kenosha, WI |
| 99390900 | Cleveland, OH |

1 10 20 30 40 50 60 70 80

FIELD DESCRIPTIONS

| No. | Name | Type | Long | Reqd | Index | Unique | Derived | Rng Chk | Prevent | Record size | offset |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SEQ | Text | 4 | Yes | Yes | No | No | No | No | 4 | 6 |
| 2 | per | Number | 2 | No | No | No | No | No | No | 1 | 10 |
| | Number Type : Integer | | | | | | | | | | |
| 3 | TRIP# | Number | 2 | No | No | No | No | No | No | 1 | 11 |
| | Number Type : Integer | | | | | | | | | | |
| 4 | STRT | Text | 4 | No | No | No | No | No | No | 4 | 12 |
| 5 | DESTCD | Text | 8 | No | No | No | No | No | No | 8 | 16 |
| 6 | ORIGIN | Text | 8 | No | No | No | No | No | No | 8 | 24 |
| 7 | ENDT | Num.String | 4 | No | No | No | No | No | No | 4 | 32 |
| 8 | PURPOSE | Text | 1 | No | No | No | No | No | No | 1 | 36 |
| 9 | POTH | Text | 20 | No | No | No | No | No | No | 20 | 37 |
| 10 | HOW WALK | Text | 1 | No | No | No | No | No | No | 1 | 57 |
| 11 | AD | Text | 1 | No | No | No | No | No | No | 1 | 58 |
| 12 | AP | Text | 1 | No | No | No | No | No | No | 1 | 59 |
| 13 | COMM-RAIL | Text | 1 | No | No | No | No | No | No | 1 | 60 |
| 14 | RT | Text | 1 | No | No | No | No | No | No | 1 | 61 |
| 15 | CTA-BUS | Text | 1 | No | No | No | No | No | No | 1 | 62 |
| 16 | OTH-BUS | Text | 1 | No | No | No | No | No | No | 1 | 63 |
| 17 | TAXI | Text | 1 | No | No | No | No | No | No | 1 | 64 |
| 18 | OTH | Text | 1 | No | No | No | No | No | No | 1 | 65 |
| 19 | OTHSP | Text | 15 | No | No | No | No | No | No | 15 | 66 |
| 20 | BLK-TO | Text | 2 | No | No | No | No | No | No | 2 | 81 |
| 21 | BLK-FROM | Text | 2 | No | No | No | No | No | No | 2 | 83 |
| 22 | AUTOOCC | Text | 2 | No | No | No | No | No | No | 2 | 85 |
| 23 | MORE | Text | 1 | No | No | No | No | No | No | 1 | 87 |
| 24 | HYDIST | Number | 10 | No | No | No | No | No | No | 8 | 88 |
| | Number Type : Fixed point | | | | | | | | | | |
| | Digits to left of decimal = 9 | | | | | | | | | | |
| 25 | EGDIST | Number | 10 | No | No | No | No | No | No | 8 | 96 |
| | Number Type : Fixed point | | | | | | | | | | |
| | Digits to left of decimal = 9 | | | | | | | | | | |
| 26 | HYMILE | Number | 6 | No | No | No | Yes | No | No | 4 | 104 |
| | Number Type : Fixed point | | | | | | | | | | |
| | Digits to left of decimal = 3 | | | | | | | | | | |
| | Field calculation formula : HYDIST/5280 | | | | | | | | | | |
| 27 | EGMILE | Number | 6 | No | No | No | Yes | No | No | 4 | 108 |
| | Number Type : Fixed point | | | | | | | | | | |
| | Digits to left of decimal = 3 | | | | | | | | | | |
| | Field calculation formula : EGDIST/5280 | | | | | | | | | | |
| 28 | ORX | Text | 8 | No | No | No | No | No | No | 8 | 112 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 29 | ORY | Text | 8 | No | No | No | No | No | No | 8 |
| 30 | DSX | Text | 8 | No | No | No | No | No | No | 8 |
| 31 | DSY | Text | 8 | No | No | No | No | No | No | 8 |

Record size 144

Memory required for form: Text 4426, Fields 782, Total 5208 bytes.