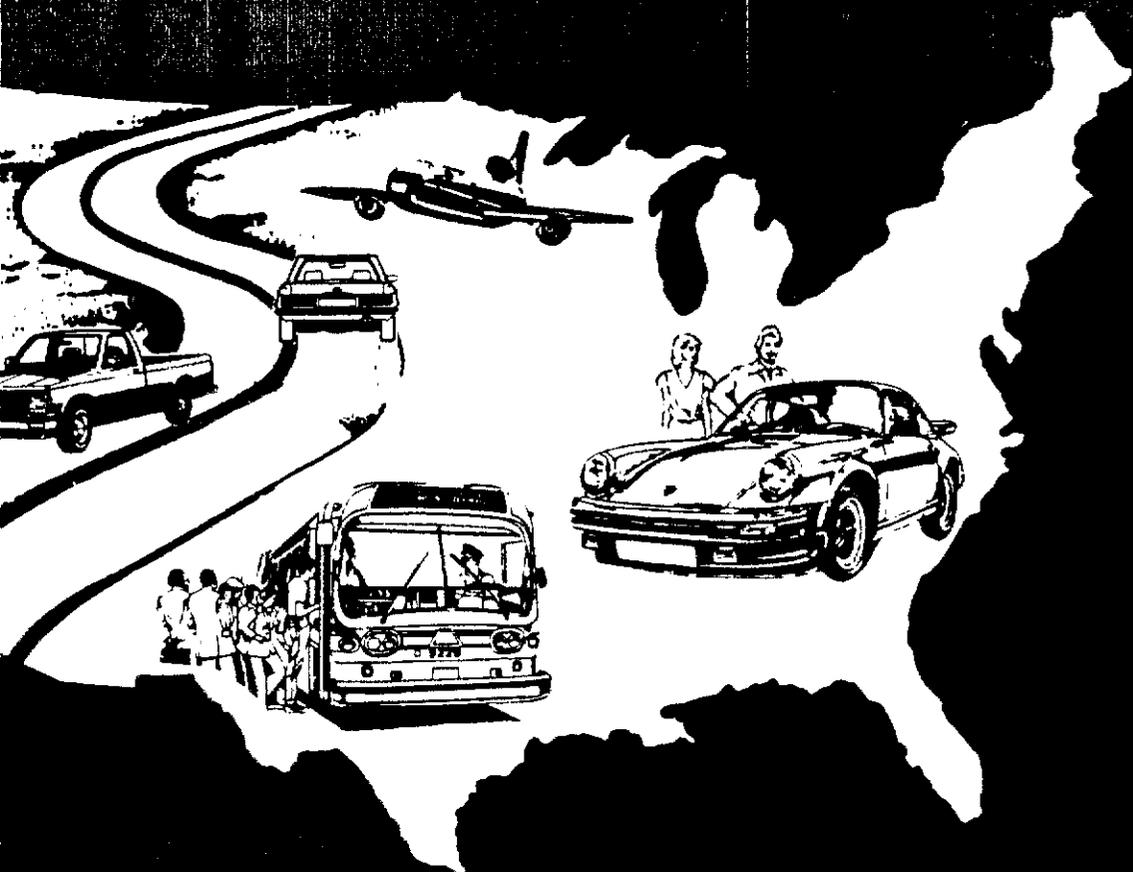


USER'S GUIDE FOR THE PUBLIC USE TAPES



**1983 - 1984
NATIONWIDE PERSONAL
TRANSPORTATION STUDY**

November 1985

**Office of the Secretary
Federal Highway Administration
National Highway Traffic Safety Administration
Urban Mass Transportation Administration**

Prepared by COMSIS Corporation, Wheaton, Maryland for the
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Office of the Secretary
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USER'S GUIDE FOR THE PUBLIC USE TAPES

1983-1984 Nationwide Personal Transportation Study

Part 1:

Contains:

Table of Contents
Introduction
Survey Procedures and Methodology
Questionnaire Information
NPTS Public Use Information
Weighting Procedures
Comparison of 1983 with 1969 and 1977 NPTS
Appendix A: Sample Tables

November 1985

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16. Abstract This report is part of a series that presents findings from the 1983-1984 Nationwide Personal Transportation Study (NPTS). This report explains the 1983 NPTS data collection, coding, and tabulation procedures. It includes a section that compares the 1983 Study with the 1969 and 1977 studies and procedures for achieving comparability among the three studies.					
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I. INTRODUCTION

This Users Guide provides details of the 1983 Nationwide Personal Transportation Study (NPTS). It explains 1983 NPTS data collection coding and tabulation procedures to assist transportation planners and others who need comprehensive data on travel and transportation patterns in the United States. The 1983 NPTS updates information gathered during similar studies in 1969 and 1977.

Publicly available tapes with data from the 1983 study feature several refinements:

- o The data are arranged in five hierarchical files to facilitate analysis;
- o The five data sets are available individually or as a collection
- o The data are available in the Statistical Analysis System (SAS), the Department of Labor's Table Producing Language (TPL) or standard EBCDIC format.

The Users Guide includes a section that compares the 1983 study with the 1969 and 1977 studies. It discusses revisions of the latest NPTS and coding procedures for achieving comparability among the three studies. Appendix C is a Glossary of terms that define terminology used in the report. The 1983 NPTS questionnaire is reprinted in Appendix D. Appendix G is an order form for 1983 NPTS data tapes.

Sponsorship

The Bureau of the Census conducted the 1983 NPTS under the sponsorship of several agencies of the U.S. Department of Transportation (DOT). The study was sponsored by the Federal Highway Administration, the National Highway Traffic Safety Administration, the Urban Mass Transportation Administration and the Office of the Secretary.

Purpose

The National Personal Transportation Study compiles national data on the nature and characteristics of travel. It addresses a broad range of travel in the United States, providing data on all personal trips by all purposes and all modes of transportation. When the 1983 study is used in conjunction with previous NPTS

studies, it is possible to track, over time, both travel and the characteristics that contribute to that travel for the entire nation. NPTS data may be used to describe current travel patterns and, given projections of demographic change, it is a valuable trend analysis tool to forecast future travel demand.

The 1983 NPTS essentially follows the data collection design used for previous studies. Information from a sample was collected about all trips taken during a designated 24-hour period (Travel Day). Additional detail was collected about trips of 75 miles or further (one-way) that were taken during the preceding 14-day period (Travel Period) including the 24-hour travel day. The information consists of trips and travel by purpose, mode, trip length, day-of-week, time-of-day, vehicle used, and vehicle occupancy. Data about long trips include the date on which the trip started and ended.

Scope

The 1983 NPTS includes:

1. Household data that consist of codes for 20 different ethnic origins; 9 codes for varieties of relationships; educational levels through graduate school; income categories; availability and type of the nearest public transportation; and other demographic information.
2. Motor vehicle data including make, model and type of fuel and other vehicle related information.
3. Data on occupations and the travel-to-work patterns including the usual trip mode, the time and distance of the work trip, ridesharing information, recent changes in the means of transportation to work, and reasons for the change.
4. Data about drivers including their driving experience and their work travel.
5. Data describing trips taken during a 14-day period (travel period), where the farthest point of the trip was at least 75 miles from home, including the date and time the trip started and ended, the day of the week, trip means, distance, number in travel party, and the purpose of the trip.
6. Data about trips of any length that were taken during a designated 24-hour period (travel day) including the time when the trip began, length of the trip, composition of the travel party, trip means, purpose of the trip and vehicle used.
7. Data about accident history and the use of safety devices in household vehicles including frequency and reasons for seat belt and motorcycle helmet use.

II. SURVEY PROCEDURES AND METHODOLOGY

Data for the 1983 NPTS were gathered between February 1983 and January 1984. The sample consists of approximately 6,500 households, drawn from expired Current Population Survey (CPS) units and a small number of housing units built since January 1980. People in the selected households were interviewed only once. Each month, for a year, people in a different group of households were interviewed. Each household in the sample was assigned a specific 24-hour "travel day" for which detailed information on all travel was collected. "Travel days" always occurred during the first 14 days in each month. People in the sample households were interviewed on the day following the designated travel day. The data include information about all people who were members of the sample household **on the date of interview.**

Interviewing Procedures

Bureau of the Census employees personally visited the people in each sample household to obtain NPTS data. The visits were preceded by a letter from the Director of the Bureau of the Census to inform each household about the Nationwide Personal Transportation Study and to solicit their cooperation. Members of the sample households were interviewed within four days of their designated "travel day." Household members who were absent at the time of the interview were contacted by telephone. Each person over the age of 14 was asked to report all trips they had taken during the designated 24 hour "travel day", as well as trips of 75 miles and longer (one-way distance from home to farthest point on the trip) taken during the 14-day "travel period" ending on the "travel day." A knowledgeable household member, age 14 or over, was asked to report all trips (excluding bicycling and walking trips) taken by household members between the ages of 5 and 13 years.

Data Collection

Collection of the 1983 NPTS data was undertaken by the Bureau of the Census' permanent professional field staff, located in 12 Regional Offices throughout the United States.

Each staff member was thoroughly trained prior to beginning work on the survey. Interviewers received about three days of classroom training plus self-training materials. Additional home

study materials and classroom training were planned throughout the interviewing period. Formal training was supplemented by on-the-job training sufficient to insure job performance at the level of established standards. Quality control measures, such as editing returns, observing interviews and reinterviewing selected sample households, were employed throughout the survey.

Data Processing

The major steps performed by the Bureau of the Census for the 1983 NPTS included clerical editing and coding of the NPTS-1 Questionnaire (Sections I through VII plus Household Information), full transcription of the data to magnetic tape; computer edit of the data to ensure completeness and consistency; calculation of the weighting factors for each household; and computation of variance and calculation of statistical reliability of the data. The FHWA tabulated the edited and weighted data upon receipt of the tapes, from the Bureau of the Census.

Data Editing

The Bureau of the Census, in cooperation with FHWA, developed specifications for editing the raw 1983 NPTS data. In this section, a brief description is given of each type of edit-related procedure performed, and examples are included. In some cases, detailed descriptions are presented.

1. Data Sets

The NPTS data file was initially sorted by Panel, PSU, and NPTS serial number. Each household was sorted internally so that, within a household, the data is in sequence by:

- a) General household data (items 1-25c). Household roster data (items 11-21 for each person) were placed in sequence by relationship code (item 12b) and line number (item 11).
- b) Data for each trip within the 14-day travel period. Data for each trip in the travel day, and data from Section VII (Use of Safety Devices in Household Vehicles).

2. Blanks and NA (Not Ascertained) Codes

Procedures have been followed to be certain that every data field on the edited data tapes is filled with characters. To accomplish this the character(s) "9" (representing "not ascertained") was placed in every unfilled field except for item 12b (relationship) and item 24e (make/model code) prior to the edit. Where applicable, the "9"s were replaced with good entries during

the edit. Following the edit, any blank data fields were filled with "8"s (representing blanks).

3. Military Time

Following the accomplishment of the edit procedure for a household, each time entry (coded in a.m. or p.m.) was converted to "military" time (that is, time expressed between 0001 (12:01 a.m.) and 2400 (12:00 midnight)).

4. Completeness and Duplicate Records Check

Edit checks were made to assure that, in cases of a non-interview, an appropriate status (item 9) has been coded. Conversely, where the data obviously shows that an interview has been made, item 9, Noninterview Status, has been blanked when coded.

Duplicate records were considered to be those having the same NPTS control number and extra unit designation, if any. Where these were found, the first record containing the configuration has been accepted and the others dropped. Counts of the dropped records have been provided to FHWA.

5. Range Edits

All items that showed codes outside the specified code range for those items where range limits have been established have been recoded as "not ascertained" (generally, filled with "9"(s)).

Example: An entry of "00" in the month or day position of date the interview was completed has been changed to "99". The rest of the date has been accepted as coded, provided it is within the specified range(s).

6. Completeness and Consistency Edits

A series of edits were developed to assure that entries in selected fields throughout the data appear logical in view of entries in other data fields. Checks for completeness were derived from the fact that certain fields must contain entries if other fields are coded. Where data is obviously missing, rules for coding the missing data have been developed. Miscodings, such as data for different household members, both coded with the same line number, are included in the edits.

Example: In the above-mentioned case where there is a line number duplication, the line number having the most data associated with it was accepted, and the data was blanked for the remaining line number(s). Should all the duplicate line numbers

have the same amount of data, the first line number sequentially was accepted, and the remaining line numbers were blanked.

Example: The year and the date a household vehicle was purchased or acquired is earlier than the model year for the vehicle. In such cases, the year of the acquisition data is set to the model year.

7. "Not Ascertained" (N/A) Edits

Review of the entries in certain data fields makes it obvious that certain other data fields should contain an entry of "not ascertained." Where other data appear edit procedures assure that the more appropriate N/A entry was substituted.

Example: A code indicates that the nearest public transportation stop is within two miles of the interviewed household, but the code for type of transportation available is not a valid one. The edit will substitute a N/A entry in the type of transportation available field.

8. Blanking Edits

This type of edit is designed to check for no data responses in areas where questions should not have been asked because of a specific response to a previous question. Where data is found in such areas, "8"(s) (representing blanks) were substituted in the field(s) that should have been skipped.

Example: Where the type of vehicle (item 24c) is a motorcycle or a motorized bicycle, items 24d through 24j should be blanks, as the questions do not apply.

Sample Design - How Sample was Selected

The 1983 NPTS was based on a national probability sample of approximately 7,900 households selected from each of the 50 states and the District of Columbia, and representing the total civilian noninstitutional population of the United States. However, 1,000 of these household units were found to be vacant, demolished, converted to nonresidential use, or otherwise ineligible for the survey. Of the 6,900 households eligible for interviewing, approximately 450 were not interviewed because the occupants were not home after repeated calls, refused to participate in the survey or because they were unavailable for some other reason(s). This resulted in a net of 6,438 sample households.

Almost all of the NPTS sample units had previously been interviewed for the Current Population Survey (CPS), which is conducted monthly by the Bureau of the Census for the Bureau of Labor Statistics. The CPS is designed to measure the change in

the rate of unemployment using a stratified multi-stage cluster sample. Exhibit II-1 displays the steps taken in obtaining the sample. In the first stage, the country was divided into primary sampling units (PSU's) consisting of counties, groups of counties, or independent cities. Approximately 1,930 PSU's were formed and grouped into 376 strata. Among these strata, 156 consisted of a single PSU and thus came into the sample with certainty. These strata generally contained the larger metropolitan areas. The remaining 220 PSU strata were formed by combining PSU's that possessed similar characteristics (i.e., geographic region, population density, population growth rate and proportion of each race within the population).

From each multi-PSU stratum, one PSU (termed nonself-representing [NSR]) was selected for the sample with a probability proportionate to its 1970 Census population. In addition, 54 of the smaller single-PSU strata were made nonself-representing PSU's for NPTS, and these and the 220 NSR PSU's were paired based on their 1970 Census population and other geographic considerations. One PSU from each pair was selected for NPTS, and the largest 102 single-PSU's were selected for the sample.

Within the sample PSU's, a sample of housing units enumerated in the 1970 Census of Population was selected for the CPS in several stages. The first stage was the selection of a sample of census enumeration districts (ED's) - administrative units used in the 1970 Census. The probability of selection of an ED was proportionate to its population.

In the second step, clusters of about four neighboring housing units (termed segments) were selected within each sample ED. Most segments were selected from the list of addresses for the ED compiled in the 1970 Census. However, in the ED's where addresses were incomplete or inadequate (mainly rural areas), the selection process was accomplished using area sampling methods. These ED's were divided into small land areas with well-defined boundaries, having an expected size of four, or a multiple of four, housing units. Those with more than four housing units were further subsampled at enumeration time so that only four housing units were chosen for interview.

In order for the sample to include housing units built since 1970, building permits issued since January of that year were used. These permits were chronologically arrayed by month issued, and compact clusters of approximately four housing units were created and sampled using the appropriate sampling rate. In areas where building permits were not issued, housing units constructed since 1970 were sampled using the area sampling method described above.

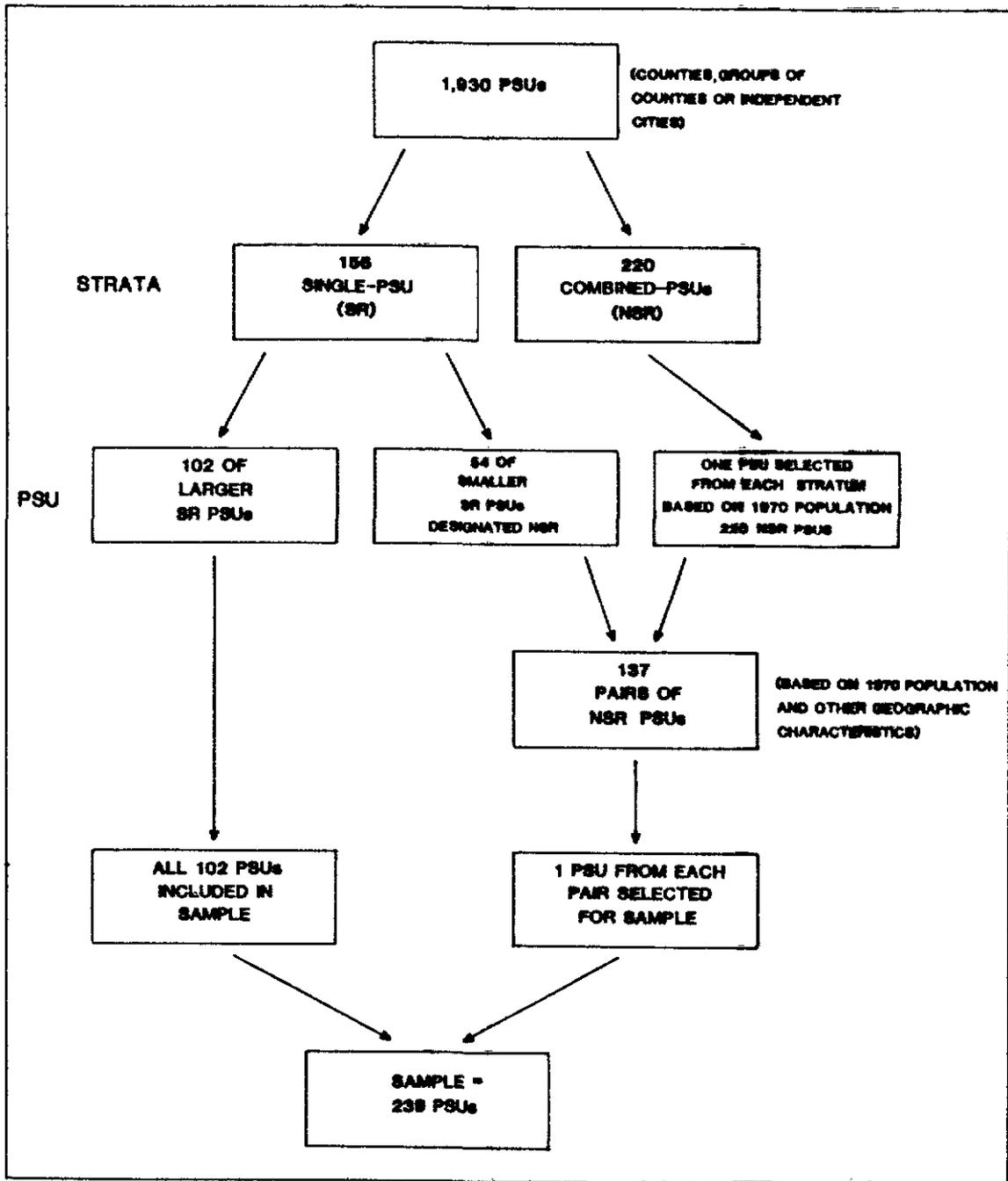


Exhibit II-1 - Development of NPTS Sample Primary Sampling Units (PSUs)

Note:

NSR = Nonself - representing

SR = Self - representing

Each segment (except for special places) was subsampled at a rate of approximately 1 in 3.5 to further reduce the sample size. Therefore, perhaps one, or sometimes two, housing units of each segment were selected for NPTS interview.

Because the above-described sample selection process resulted in the inclusion of only those households previously interviewed for CPS, updating of the selected sample was necessary to include housing units built since the time of the CPS. However, this was accomplished only in permit-issuing areas. The NPTS sample did not include any housing units constructed in non-permit-issuing areas for 2 to 3 1/2 years following the CPS sample.

III. 1983 NPTS QUESTIONNAIRE

The 1983 NPTS questionnaire (Form NPTS-1) consists of seven numbered sections plus a section for household information. A brief description of each section is given below, and a copy of the NPTS-1 is included in Appendix D to provide necessary detail for the data user.

Household Information

This section contains information on type of structure of the home, together with tenure and land use, and demographic data for each household member including birth date, age, sex, race, marital status, ethnic origin or descent, armed forces status, and education. Family income during the past 12 months is also included by range categories. Appendix H also shows which U.S. cities were part of the survey and whether or not the city had a rail system.

Section I: Motorized Vehicle Record

Included in this section is information on each of the motor vehicles available for use by members of the household during the 14-day travel period covered by the survey. Type of vehicle, model year, type of transmission, number of cylinders, air conditioning, seating capacity, safety equipment, vehicle ownership, status (new or used) at acquisition, miles driven during the past year (or from date of purchase if less than 12 months previous), type of fuel used, and whether or not the vehicle was used at least four times a month to go to work are the items coded for each vehicle.

Section II: Availability of Public Transportation

This section contains information regarding the proximity and type of public transportation (bus, train, streetcar, and subway or elevated rail) available to the household.

Section III: Occupation and Travel to Work

For each household member 16 years of age or older, questions on occupation during the previous week, including employer or self employment information, kind of work, principal means of

transportation to work, driving arrangements (i.e., carpool or vanpool), change (if any) in principal means of transportation to work within the last year (including reasons for the change), parking arrangements at work, and time and distance from home to work.

Section IV: Driver Information

In this section vehicle drivers in the household who are at least 16 years of age are asked to report: information on miles driven during the past year and on work-related driving mileage on the average work day, the travel day, and during the 14-day travel period is also gathered. The type of vehicle used in work-related driving is also requested.

Section V: 14-Day Travel Period

Trips of at least 75 miles in length (from home to farthest point on the trip) with a return to home, taken during the 14-day period ending on the travel day are gathered in this section. For each trip, each household member 14 years of age and over is asked to supply information regarding the destination, the date and time the trip began, the other household members on the trip, the number of persons in the travel party, means of transportation, household vehicle used, the reasons and main purpose for the trip, household date and time of arrival at the destination, and the total distance of the trip (including any side trips taken along the way). Information for household members between the ages of 5 and 13 is obtained from older members of the household. Similar information is obtained for both the outgoing and return portions of each qualifying trip. Provision is included for determining whether or not the same trip has been reported by another member of the household in order to avoid duplication.

Section VI: Travel Day

All travel undertaken on the designated travel day, regardless of trip length, is addressed in this portion of the questionnaire. As in the previous section, all household members 14 years old and over are asked for trip and travel information. Information for household members between the ages of 5 and 13 is obtained from older household members. The travel day is considered to begin at 4:00 a.m. on the designated day and end at 3:59 a.m. on the following day. Walking and bicycling trips for household members under the age of 14 are not included.

For each trip made during the travel day, the main purpose of the trip, reason for each household member being on the trip, time the trip began, trip length (trip duration), the number of people in the travel party, and the main means of transportation for the trip were requested. If the trip was made by private

vehicle, additional information on that vehicle is obtained. Availability of public transportation within one-half mile of the trips beginning and end points is checked, together with the reasons for using or not using public transportation. As in Section V, checks are included to determine whether other household members may have reported the same trip.

Section VII: Use of Safety Devices in Household Vehicles

This section is divided into two parts: Part A, for household members age 5 and above; and Part B, for household members who are 4 years of age and younger.

Part A

Questions concerning each household member's practices concerning the wearing of seat belts are presented in this part. The use of seat belts on long trips, on short trips, in inclement weather, when driving a vehicle (if 16 years of age or older), when a front seat passenger and when a back seat passenger is investigated. Reasons for wearing or for not wearing seat belts are delineated, together with reasons for discontinuing seat belt use, if applicable.

If one of the household vehicles is a motorcycle, information on helmet use is obtained for each household member driving the motorcycle. Finally, for those household members who are licensed drivers, accident experience during the previous year is obtained together with number of injuries sustained in a household vehicle(s).

Part B

Information is obtained on the use by the household of child safety seat(s), the position of the seat, if used, whether or not the seat has a built-in belt or internal harness, if used, whether the vehicle's seat belt is fastened around the child's seat and whether the child has ever been injured (and/or treated in a hospital) as a result of a traffic accident of emergency stop while not in the child safety seat.

IV. NPTS PUBLIC USE DATA STRUCTURE AND DATA REQUEST

1983 NPTS Public Use Data Formats

The 1983 Public Use Data Tapes are being offered in three formats: SAS, TPL, and EBCDIC. All formats originate from the basic Census format which followed the questionnaire and contain all enhancements and computed weights. The data is being offered in the three formats to assist analysts in using the data. Below is a description of each of the three data formats:

1) SAS - The Statistical Analysis System is one of the most widely used statistical software packages. It allows complex data manipulation and descriptive data presentation. SAS is relatively easy to use and well documented. One of its most powerful features is its ability to handle hierarchical files. This allows data files to be small and to share information with related files. SAS also has the capability of producing report quality tabulations and graphics. A SAS PROC CONTENTS will accompany this public use tape.

2) TPL - The Table Producing Language was created by the Department of Labor for the purpose of producing report quality tabulations. TPL has the advantage of having one file containing the different hierarchies, this reduces the amount of file handling necessary. The disadvantages are a limit to data manipulation and presentation. A TPL CODEBOOK will accompany this public use tape.

3) EBCDIC - EBCDIC is the standard IBM data file format. These files can be read into (or used by) any software package or programming language. A file layout will be accompany this public use tape.

The remainder of this User Guide will use SAS variable names and reference the SAS version of the data sets. However, all data is identical in the three versions of the data sets.

1983 NPTS Public Use Data Structure

The original Census tapes were reformatted into the following set of hierarchical files:

- Household file
- Person file
- Vehicle file
- Travel Day Trip file
- Travel Period Trip file

The Household file contains the data elements from Section II and the Household Information section of the Questionnaire. The person file contained the elements from Sections III and IV, and also from Sections VII A&B (the safety information). The vehicle file contained the information from Section I. The travel day trip and the travel period trip files contains the data from Sections VI and V, respectively.

These files were updated with the computation of new variables and completion of the trip records. Descriptions of the new variables and assumptions made in creating them are listed below. Also, the process involved determining whether a trip was a household trip or not is described.

Household File

The following 18 variables were created and added to the SAS household data set. The variable names as they appear on the file, a brief description, and the method of calculation, if needed, are given.

- 1) UND_16: Represents the number of persons 15 years old and younger in each household.
- 2) OVER_16: Represents the number of persons 16 years old and older in each household.
- 3) NUM_LIC: Represents the number of licensed drivers in each household.
- 4) NUM_WORK: Represents the number of employed persons in each household.
- 5) TYPE1: Represents the number of vehicle type 1 (auto) available to each household.
- 6) TYPE2: Represents the number of vehicle type 2 (station wagon) available to each household.
- 7) TYPE3: Represents the number of vehicle type 3 (passenger van) available to each household.
- 8) TYPE4: Represents the number of vehicle type 4 (other van) available to each household.

- 9) TYPE5: Represents the number of vehicle type 5 (pickup truck) available to each household.
- 10) TYPE6: Represents the number of vehicle type 6 (pickup with camper) available to each household.
- 11) TYPE7: Represents the number of vehicle 7 (other truck) available to each family.
- 12) TYPE8: Represents the number of vehicle type 8 (motorized camper coach) available to each household.
- 13) TYPE9: Represents the number of vehicle type 9 (motor-cycle) available to each household.
- 14) TYPE10: Represents the number of vehicle type 10 (motorized bicycle/moped) available to each household.
- 15) TYPE11: Represents the number of vehicle type 11 (other privately owned vehicle) available to each household.
- 16) LIF_CYC: Represents the life cycle of the household. The different cycles are:

- 1: Single adult, no children
- 2: Two or more adults, no children
- 3: Single adult, youngest child under age 6
- 4: Two or more adults, youngest child under age 6
- 5: Single adult, youngest child age 6 to 15
- 6: Two or more adults, youngest child age 6 to 15
- 7: Single adult, youngest child age 16 or older
- 8: Two or more adults, youngest child age 16 or older
- 9: Single adult, retired, no children
- 10: Two or more adults, retired, no children.

Three assumptions were made when calculating LIF_CYC variable. For cycle 10, only one adult in the household had to be retired to qualify for this category. Persons age 16 to 21 were considered children if they were listed as children of the responding person in the household roster, otherwise they were considered adults. Persons over 21 who were listed as children of the responding person were considered adults.

17) HH_DTRP: Represents the number of travel day trips taken by each household. Each trip taken by the household is counted only once. For example, if three household members go on the same trip, it is counted as only one trip.

18) HH_PTRP: Represents the number of travel period trips by each household. Period trips are defined similarly as travel day trips.

Vehicle File

The following variable was added to the SAS vehicle data set. The variable names as they appear on the data set and a description of each are given.

1) ANNMILES - The mileages of some vehicles were annualized because of the length of ownership of the vehicle. If the vehicle had been owned by a household for less than a year, the mileage reported from the survey was annualized. This was done by dividing the reported vehicle mileage by the number of months owned and multiplying by twelve to obtain a yearly estimate of miles driven. For vehicles that were owned by a household for a year or more, the annualized miles variable is equal to the reported mileage.

Two assumptions were made in the annualization process. First, if a vehicle was less than a year old and its reported mileage was over 40,000 miles, then the annualized mileage was set equal to the reported mileage. Second, if a vehicle was less than a year old and its reported mileage was less than 40,000 miles, but its annualized mileage was greater than 40,000 miles, the annualized mileage was set equal to 40,000 miles.

Person File

The following two variables were added to the the SAS person data set. Given below are the variable names as they appear on the data set and a brief description of each.

1) PER_DTRP: Represents the number of travel day trips taken by each member of the household. Each household member on a trip counts the trip. For example, if three household members go on a trip together, it is counted as three person trips.

2) PER_PTRP: Represents the number of travel period trips taken by each member of the household. The variable is defined similarly as PER_DTRP.

Travel Period Trip File

The following six variables were added to the SAS travel period trip data set. The variable names as they appear on the data set and an explanation of each are given below.

1) O_HHTRIP: The variable is equal to one if the household member was the one who originally reported the outgoing trip, otherwise the variable is equal to zero.

2) R_HHTRIP: The variable is equal to one if the household member was the one who originally reported the return trip, otherwise the variable is equal to zero. O_HHTRIP and

R_HHTRIP were used to copy information from the record of the household member who originally reported the trip to the records of other household members on the trip.

3) O_DAYS: Represents the number of days from December 31, 1982 to the beginning date of the outgoing trip.

4) O_ENDAYS: Represents the number of days from December 31, 1982 to the end date of the outgoing trip.

5) R_DAYS: Represents the number of days from December 31, 1982 to the beginning date of the return trip.

6) R_ENDAYS: Represents the number of days from December 31, 1982 to the end date of the return trip.

For items 3-6 above, trips that ended between January 1 and January 14 were assumed to have taken place in 1984. Trips that ended between January 15 and January 31 were assumed to have taken place in 1983.

Travel Day Trip File

The following three variables were added to the SAS travel day trip data set. The variable names as they appear on the data set and a description of each are given.

1) HH_TRIP: The variable is equal to one if the household member was the person who originally reported the travel day trip, otherwise it is equal to zero. HH_TRIP was used to copy information from the record of the household member who originally reported the trip to the record of other household members on the trip.

2) DRIV: The variable is set equal to one if the person was the principal driver on the travel day trip, otherwise it is equal to zero.

3) OD_PURP: The origin-destination trip purpose variable (OD_PURP) was calculated for each trip in the travel day file by using the originally reported trip purpose and the previous trip end. There are four responses for the origin-destination purpose: home based work (HBW), home based shopping (HBS), home based other (HBO), and non-home based (NHB). If the trip purpose was to work or work-related (trip purpose one or two), the trip was HBW, no matter where the previous trip ended. If the trip purpose was shopping (trip purpose three) and the trip either began or ended at home, the trip was considered HBS. If the trip began or ended at home, but the purpose was not work or work related or shopping (trip purposes four to eleven), the trip was considered HBO. If a trip did not begin or end at home and was not work or work related or for shopping, then the trip was NHB.

Public Use Tape Request

Single copies of the tapes are available through the Federal Highway Administration (FHWA).

For governmental agencies and educational institutions, there is no charge for tape copying. If no tapes are furnished with the request, there is a \$25 charge for each tape provided by FHWA.

For private individuals and all nongovernment or noneducation organizations, there is a \$36 charge per tape copied. In addition, if no tapes are forwarded with the request, there is an added charge of \$25 for each tape provided by FHWA.

All tapes provided to FHWA should be 9-track.

Appropriate user documentation will be provided with each request.

All orders should be documented on the form found in Appendix G and should clearly indicate:

1. Which version of the data is desired (SAS, TPL, EBCDIC);
2. Name and/or title of the individual or organization making the request;
3. Number of tapes, if any, included with the request;
4. Amount of payment enclosed if applicable.

All checks or money orders should be made payable to:

Federal Highway Administration

Request and payment should be forwarded to:

Federal Highway Administration
Highway Statistics Division
HHP-44 (NPTS)
400 Seventh Street, S.W.
Washington, D.C. 20590

V. WEIGHTING PROCEDURES FOR DATA FROM THE 1983 NPTS

V. WEIGHTING PROCEDURES FOR DATA FROM THE 1983 NPTS

Introduction

This chapter will discuss the weighting procedures to be applied to the 1983 NPTS. These weighting factors are necessary to obtain national estimates of NPTS characteristics. Details are included for obtaining a national estimate of vehicle trips, vehicle-miles of travel, person trips, and person-miles of travel. Instructions are also outlined for expansion of household/person characteristics.

Although the travel day occurs within the 14-day travel period, the estimates of total national travel obtained from weighting the data from each are independent of each other and should not be added together.

First, the procedures for each weighting type will be described and demonstrated with examples. Then, the indepth process used to develop the weights will be presented.

Proper Applications of Weights

Weighting the 1983 NPTS data sets will be demonstrated with SAS procedures. The weight variable is usually factored down by one-thousand or one-million to ensure that the numeric display will fit in the table produced. The weight is then applied in a PROC FREQ or PROC TABULATE step. Examples are given to show the application of the weights in each data set for all cases used in data analysis.

1. Household File: The weight variable used in the household file is HHFIWGT. The variable is divided by one thousand in the data step and then applied in the table producing step.

```
DATA TEMP1 ; SET HH.HH ;  
    HHFIWGT=HHFIWGT/1000 ;
```

```
PROC FREQ ;  
    TABLES FAM INC ;  
    WEIGHT HHFIWGT ;  
    TITLE1 'HOUSEHOLDS BY FAMILY INCOME' ;  
    TITLE2 '(WEIGHTED IN THOUSANDS)' ;
```

2. Vehicle File: The weight variable used in the vehicle file is also HHFIWGT. The variable is divided by one thousand in the data step before being applied in the table producing step.

```
DATA TEMP2 ; SET VEH.VEH ;
  HHFIWGT=HHFIWGT/1000 ;
PROC FREQ ;
  TABLES MOD YEAR ;
  WEIGHT HHFIWGT ;
  TITLE1 'VEHICLES BY MODEL YEAR' ;
  TITLE2 '(WEIGHTED IN THOUSANDS)' ;
```

3. Person File: The person file contains two weight variables, PE1FIWGT and PE2FIWGT. The first weight is used when weighting demographic characteristics, such as sex or age. The second weight is used when weighting non-demographic characteristics, such as employment status. The weight variable is divided by one thousand and applied in the table producing step.

```
DATA TEMP3 ; SET PER.PER ;
  PE1FIWGT=PE1FIWGT/1000 ;
  PE2FIWGT=PE2FIWGT/1000 ;

PROC FREQ ;
  TABLES SEX ;
  WEIGHT PE1FIWGT ;
  TITLE1 'PERSONS BY SEX' ;
  TITLE2 '(WEIGHTED IN THOUSANDS)' ;
PROC FREQ ;
  TABLES STATUS ;
  WEIGHT PE2FIWGT ;
  TITLE1 'PERSONS BY EMPLOYMENT STATUS' ;
  TITLE2 '(WEIGHTED IN THOUSANDS)' ;
```

4. Travel Day File: There are two weight variables in the travel day file, DAHFIWGT and DAPFIWGT. DAHFIWGT is used for estimating household vehicle trips and household vehicle miles traveled (VMT) and DAPFIWGT is used for estimating person trips and person miles traveled (PMT). A household vehicle trip is a trip where the driver is a household member and the vehicle used is a privately owned vehicle. Each household trip is only counted once. For example, if three household members are on the same trip together, it is considered three person trips, but only one household trip. The statements that are used to select the household trips are shown in the example data steps.

To calculate VMT and PMT, a temporary variable is created in the data step. The new variable is the product of multiplying the trip distance times the appropriate weight. Whenever trip distances are being used, the unknowns must be removed. The weight variables are divided by one million before being applied in the table producing step.

a. Household Vehicle Trips and VMT:

```
DATA TEMP4 ; SET DTRP.DTRP ;
  IF HH TRIP=1 ;
  IF DRIV NO NE 0 ;
  IF 1<=MEANS<=11 ;
  IF DISTANCE<999999 ;
  DAHFIWGT=DAHFIWGT/1000000 ;
  HDISTWGT=DAHFIWGT*DISTANCE ;

PROC FREQ ;
  TABLES PURPOSE ;
  WEIGHT DAHFIWGT ;
  TITLE1 'HOUSEHOLD VEHICLE TRIPS BY PURPOSE' ;
  TITLE2 '(TRAVEL DAY TRIPS - WEIGHTED IN MILLIONS)' ;

PROC FREQ ;
  TABLES PURPOSE ;
  WEIGHT HDISTWGT ;
  TITLE1 'HOUSEHOLD VMT BY PURPOSE' ;
  TITLE2 '(TRAVEL DAY TRIPS - WEIGHTED IN MILLIONS)' ;
```

b. Person Trips and PMT:

```
DATA TEMP5 ; SET DTRP.DTRP ;
  IF DISTANCE<999999 ;
  DAPFIWGT=DAPFIWGT/1000000 ;
  PDISTWGT=DAPFIWGT*DISTANCE ;

PROC FREQ ;
  TABLES PURPOSE ;
  WEIGHT DAPFIWGT ;
  TITLE1 'PERSON TRIPS BY PURPOSE' ;
  TITLE2 '(TRAVEL DAY TRIPS - WEIGHTED IN MILLIONS)' ;

PROC FREQ ;
  TABLES PURPOSE ;
  WEIGHT PDISTWGT ;
  TITLE1 'PMT BY PURPOSE' ;
  TITLE2 '(TRAVEL DAY TRIPS - WEIGHTED IN MILLIONS)' ;
```

5. Travel Period File: The travel period file is organized the same way as the travel day file, with a weight variable for each type of trip. PRHFIWGT is used when weighting household vehicle trips and household VMT. PRPFIWGT is used when weighting person trips and PMT. Household vehicle trips and person trips are defined the same as in the travel day file. The statements used to select household vehicle trips are illustrated in the example data steps.

When calculating VMT and PMT in the travel period file, both the outgoing trip distance and the return trip distance are used. The temporary variable used for weighting, therefore, is the product of multiplying the appropriate weight by the sum of the outgoing and return trip distances. The weight variables are divided by one million in the data step before being applied in the table producing step.

a. Household Vehicle Trips and VMT:

```
DATA TEMP6 ; SET PTRP.PTRP ;
  IF O_HHTRIP=1 ;
  IF O_DRIVE NE 0 ;
  IF 1<=0 MEANS<=11 ;
  IF O_DIST<888888 ;
  IF R_DIST<888888 ;
  PRHFIWGT=PRHFIWGT/1000000 ;
  HDISTWGT=PRHFIWGT*(O_DIST+R_DIST) ;

PROC FREQ ;
  TABLES O_PURP ;
  WEIGHT PRHFIWGT ;
  TITLE1 'HOUSEHOLD VEHICLE TRIPS BY PURPOSE' ;
  TITLE2 '(TRAVEL PERIOD TRIPS - WEIGHTED IN MILLIONS)' ;

PROC FREQ ;
  TABLES O_PURP ;
  WEIGHT HDISTWGT ;
  TITLE1 'HOUSEHOLD VMT BY PURPOSE' ;
  TITLE2 '(TRAVEL PERIOD TRIPS - WEIGHTED IN MILLIONS)' ;
```

b. Person Trips and PMT:

```
DATA TEMP7 ; SET PTRP.PTRP ;
  IF O_DIST<888888 ;
  IF R_DIST<888888 ;
  PRPFIWGT=PRPFIWGT/1000000 ;
  PDISTWGT=PRPFIWGT*(O_DIST+R_DIST) ;

PROC FREQ ;
  TABLES O_PURP ;
  WEIGHT PRPFIWGT ;
  TITLE1 'PERSON TRIPS BY PURPOSE' ;
  TITLE2 '(TRAVEL PERIOD TRIPS - WEIGHTED IN MILLIONS)' ;

PROC FREQ ;
  TABLE O_PURP ;
  WEIGHT PDISTWGT ;
  TITLE1 'PMT BY BY PURPOSE' ;
  TITLE2 '(TRAVEL PERIOD TRIPS - WEIGHTED IN MILLIONS)' ;
```

Control Totals

Listed below are control numbers for various variables to help the user in determining if the correct weighting procedure has been used.

1983 NPTS CONTROL NUMBERS

VARIABLE	1977	1983	CHANGE
Total Households	75,412	85,371	13 %
Total Vehicles	120,098	143,714	20 %
Total Persons	213,141	229,453	8 %
Total Licensed Drivers	127,552	147,015	15 %
Day trip file			
Annual Household* Vehicle Trips	108,826,000	126,874,000	17 %
Annual Household* VMT	907,603,000	1,002,139,000	10 %
Annual Person Trips	211,778,000	224,385,000	6 %
Annual Person Miles of Travel	1,879,215,000	1,946,662,000	3 %
Period trip file			
Annual Household* Vehicle Trips	n/a	455,000	
Annual Household* VMT	n/a	171,827,000**	
Annual Person Trips	n/a	1,056,000	
Annual Person Miles of Travel	n/a	639,347,000**	

Note: All numbers in thousands

* Household member driving, means of transportation is a private vehicle, and trip distance is known.

** Total trip distance is used (outgoing distance + return distance)

Development of Weighting Factors

The following sections will cover the building blocks used in creating the final weights that are applied to the data. These building blocks can be found on the data files along with the final weights which have already been calculated for you. This should simplify the process of weighting the data significantly. Please refer to the section on **Proper Application of Weights** for specific usage of the final weights.

Each household, person, and trip included in the NPTS data has been assigned a weight using some or all of the following components:

Basic Weight

This weight is assigned to each travel day sample to provide national estimates for a particular travel day. It is found by multiplying the base weight from the CPS sample by 7.194, because of the CPS subsampling scheme, then by 12 (12 months per year), and then by 14 (14 travel days per month). Basic weights for special places and households in updated new construction were obtained in much the same manner as for other housing units. The resultant Basic Weighting Factors are as follows:

- o Special places and updated new construction households in PSU's that are nonself-representing - 2,095,248.5568
- o Special places and updated new construction households in PSU's that are self-representing - 1,571,436.4176
- o Other NPTS housing units - 1,884,204.6459

Duplication Control Factor

Some households need to have a duplication control factor applied in addition to a basic weight. These factors have been applied on an individual basis from CPS Duplication Control Files developed for the CPS samples.

Household Noninterview Factors

A household noninterview factor, accounting for the households that were eligible to be interviewed, but were never interviewed, was computed quarterly for each cell in Table V-1, for each day of the week of travel day (Sunday, Monday, Tuesday, etc.). The factor is computed from the following formula:

$$\frac{E_c + NE_c}{E_c}$$

Where:

E_c = Weighted estimate of interviewed households in a Table V-1 cell for the quarter. (Note: A household is considered interviewed if at least one person is interviewed.)

NE_c = Weighted estimate of noninterviewed households in the same Table V-1 cell for the same quarter.

TABLE V-1

HOUSEHOLD NON-INTERVIEW CELLS: HOUSEHOLDS BY SIZE, RESIDENCE AND DAY OF THE WEEK

RESIDENCE	By Day of the Week of Travel Day		
	SIZE OF HOUSEHOLD		
	1	2	3 or More
SMSA:			
Central City	1	31	51
Balance	4	34	54
Non-SMSA:	5	35	55

Each cell's count and computer factor are tested against the following criteria:

- o The unweighted count of interviewed cases for a cell or set of cells must be at least 15
- o The noninterview adjustment factor for a cell or set of cells must be less than 2

If a specific cell fails to meet these criteria, counts for the cell are combined in accordance with specified rules with those from other cell(s), and the data for the set of cells are retested against the criteria.

The following data has been printed out for each cell and provided to FHWA. Included are counts for both before and after the combining of cells.

- o Weighted count of interviewed households
- o Unweighted count of interviewed households
- o Weighted count of noninterviewed households
- o Unweighted count of noninterviewed households
- o Household noninterview factors

Within Household Noninterview (Type Z) Factors

About 6 percent of persons in the households in which interviews took place were not interviewed. The within-household noninterview factors were used to account for those persons not interviewed for NPTS from households in which at least one person was interviewed. These factors were computed separately for different person and household characteristics (i.e., sex and age categories, family income, and household vehicle ownership categories based on the NPTS interview) and also for day of the week of Travel Day. The factor was computed from the following formula:

$$\frac{A + B}{A}$$

Where:

A = Weighted estimate of interviewed persons and

B = Weighted estimate of noninterviewed persons in households in which at least one person was interviewed

It was assumed that trips involving more than one person were included, despite the noninterviews in a household, because others in the household would have included the trip. Trips involving one person would be missed if that person was a non-interview for the Travel Day or Travel Period section of the questionnaire. Therefore, the within household noninterview factor(s) was applied only to person characteristics and to characteristics of trips involving only one person. Three separate factors were derived to apply to: a) estimates related to travel day information; b) estimates related to travel period (household trips from one-person trips, person-trips, miles and nights from one-person trips, vehicle-trips from one-person trips and vehicle-miles of travel from one-person trips); and c) estimates of persons, use of safety devices, workers, and drivers.

The following three tables (V-2a, V-2b, V-2c) define the cells used to calculate the various factors.

TABLE V-2a

**WITHIN HOUSEHOLD NONINTERVIEW CELLS FOR FACTOR "a":
PERSONS BY HOUSEHOLD VEHICLE OWNERSHIP, AGE, SEX,
AND DAY OF THE WEEK**

HH Vehicle Ownership	Sex/Age					
	Male			Female		
	Under 20	20-64	65+	Under 20	20-64	65+
0	2	3	5	12	13	15
1	52	53	55	62	63	65
2 or unknown	92	93	95	102	103	105
3 or more	122	123	125	132	133	135

Note: These Characteristics should be obtained from the NPTS questionnaire.

TABLE V-2b

**WITHIN HOUSEHOLD NONINTERVIEW CELLS FOR FACTOR "b":
PERSONS BY HOUSEHOLD VEHICLE OWNERSHIP, AGE, SEX,
AND HOUSEHOLD INCOME**

By Income Categories: \$9,999 or less, \$10,000-\$14,999, \$15,000-\$24,999,
\$25,000-\$34,999, and \$35,000 or more.

HH Vehicle Ownership	Sex/Age					
	Male			Female		
	Under 20	20-64	65+	Under 20	20-64	65+
0	2	3	5	12	13	15
1	52	53	55	62	63	65
2 or unknown	92	93	95	102	103	105
3 or more	122	123	125	132	133	135

Note: These Characteristics should be obtained from the NPTS questionnaire.

TABLE V-2c

**WITHIN HOUSEHOLD NONINTERVIEW CELLS FOR FACTOR "c":
PERSONS BY HOUSEHOLD LOCATION, AGE, SEX,
AND HOUSEHOLD INCOME**

By Income Categories: \$9,999 or less, \$10,000-\$14,999, \$15,000-\$24,999,
\$25,000-\$34,999, and \$35,000 or more.

Residence	Sex/Age					
	Male			Female		
	Under 20	20-64	65+	Under 20	20-64	65+
Inside SMSA						
Central City:	2	3	5	72	73	75
Outside						
Central City:	22	23	25	92	93	95
Outside SMSA:	32	33	35	102	103	105

Note: These Characteristics should be obtained from the NPTS questionnaire or the sample file.

As was the case for the Household Noninterview Factor, criteria have been established to determine whether a particular cell will be utilized alone or be combined with other cell(s) for factor-determination purposes. The following data has been printed out for each cell and supplied to FHWA. Included are counts for before and after the cell-collapsing process:

- o Weighted count of interviewed persons
- o Unweighted count of interviewed persons
- o Weighted count of noninterviewed persons
- o Unweighted count of noninterviewed persons
- o The within household noninterview factors

Ratio Estimation Factors

The distribution of a sample usually differs somewhat from the distribution of the total population from which the sample was drawn, in terms of such characteristics as age, race, sex, residence, etc. To compensate for this, various stages of ratio estimate factors were applied to bring the sample distribution into closer agreement with the total population, resulting in reduction of sample estimate variability. In addition, some ratio estimate factors were applied to correct for known NPTS sample deficiencies with regard to household coverage and within household coverage of persons.

First Stage Ratio Estimate Factor - This factor was used to reduce the sampling variability resulting from the sampling of PSU's. It took into account the differences that existed at the time of the 1980 Census between the distribution of the sample nonself representing PSU's and all the nonself representing PSU's within employment status-sex-residence categories within each Census region of the country. Table V-3 outlines the adjustment cell categories. The factor was equal to:

$$\frac{C}{D}$$

Where:

C = 1980 Census employment status-sex-residence population counts for all nonself-representing PSU's in a region, and

D = Estimate of the employment status-sex-residence population using 1980 Census counts for the sample nonself-representing PSU's in a region.

TABLE V-3

NPTS FIRST STAGE ADJUSTMENT CELLS

Employment Status/Sex

Region Residence	Under 16		Employed		Not Employed or Not in Labor Force	
	Male	Female	Male	Female	Male	Female
Northeast						
SMSA	x	x	x	x	x	x
Non-SMSA	x	x	x	x	x	x
North Central						
SMSA	x	x	x	x	x	x
Non-SMSA	x	x	x	x	x	x
South						
SMSA	x	x	x	x	x	x
Non-SMSA	x	x	x	x	x	x
West						
SMSA	x	x	x	x	x	x
Non-SMSA	x	x	x	x	x	x

The numerator, C, was calculated by taking the 1980 Census counts for each employment status-sex-residence category and summing them across all nonself-representing PSU's in a region. The denominator, D, was calculated by taking the 1980 Census counts for each employment status-sex-residence category for each sample nonself-representing PSU, and weighting these counts.

Second Stage Ratio Estimate Factor - This factor was used to reduce sampling variability and to correct for household coverage problems. It was computed separately for different reference person characteristics, sex-residence-employment-education, for each quarter. It was calculated with the formula:

$$\frac{E}{F}$$

Where:

E = Independent estimate of households for a specific sex-residence-employment-education category for a specific quarter, and

F = Weighted sample estimate of households for a specific sex-residence-employment-education category for a specific quarter.

The cells formed by the various combinations of categories are shown in Table V-4. The aforementioned independent estimates were derived from Current Population Survey (CPS) data. The resulting second stage ratio estimate factors were applied to household characteristics and to household trip characteristics for trips involving more than one person from a household.

Third Stage Ratio Estimate Factor - This factor was used to reduce sampling variability and to correct for both household and within household coverage problems. The factor was computed separately for the cells formed by various combinations of age-race-sex categories (See Table V-5). The factor was calculated through use of the formula:

$$\frac{G}{H}$$

Where:

G = Independent estimate of persons in a specific age-race-sex category for a specific quarter, and

H = Weighted sample estimate of persons in a specific age-race-sex category for a specific quarter.

Independent estimates of the civilian noninstitutional U.S. population based on the 1980 Census as well as on statistics for births, deaths, immigration, and Armed Forces strength by age, race and sex were used in calculating the third stage ratio estimate factor(s). The factors were applied to person characteristics, household trip characteristics for trips involving only one person from a household, and person-trip characteristics. The third stage factor, rather than a second-stage factor, was applied to household-trips for those trips involving only one person because the characteristics would be affected by both household and within household coverage problems. Separate factors were derived which apply to one-person travel day information, one-person travel period information, individual worker and driver information, and all other person information.

TABLE V-4

SECOND STAGE RATIO ESTIMATE CELLS

Residence Employment & Education2 of Reference Person	Married Couple	Other male reference person	Other female reference person
Inside SMSA3: In Central City			
Employed1:			
Grade School	2	1002	302
High School	5	1005	305
College	9	1009	309
Not Employed, Not in Labor Force	14	1014	314
Inside SMSA: Not in Central City			
Employed:			
Grade School	62	1062	362
High School	65	1065	365
College	69	1069	369
Not Employed, Not in Labor Force	74	1074	374
Outside SMSA:			
Employed:			
Grade School	92	1092	392
High School	95	1095	395
College	99	1099	399
Not Employed, Not in Labor Force	104	1104	404

Employed includes all persons working for pay or profit, or without pay on a family farm or business. It also includes those who were temporarily absent from work. This can be obtained from responses 1 and 2 in source code 302, or a "Yes" response in source codes 303 or 304.

Education refers to the highest grade completed. Grade school refers to all grades through 8, or no school. High school refers to grades 9 through 12.

Note, these tabulations are based on 1970 SMSA definitions.

TABLE V-5
THIRD STAGE RATIO ESTIMATE CELLS

Age	Sex/Race			
	Male		Female	
	Black	Non-Black	Black	Non-Black
5-15	2	3	202	203
16-19	15	16	215	216
20-24	31	32	231	232
25-34	42	43	242	243
35-44	47	48	247	248
45-54	50	51	250	251
55-64	60	61	260	261
65+	80	81	280	281

Estimates for Travel Day Trips

To obtain travel day trip characteristics additional factors must be applied to the Initial Person Weight or to the initial household weight. Trips which were reported only for travel days were taken only during the first 14 days in each month. Factors to expand the travel day to the full 89 or 92 days of trips in a quarter must be applied. These time inflation factors for travel day are listed in Table V-6.

For each travel day, weighted quarterly estimates for each of the relevant subgroups are developed by multiplying the weighted subgroup total for each travel day in a given quarter by the appropriate Travel Day Time Inflation Factor from Table V-6. Annual estimates of trips can be made by adding the estimates for the quarters in the year together.

TABLE V-6

TIME INFLATION FACTORS FOR TRAVEL DAY

<u>Dates</u>		<u>Factors</u>
1,2,3,4,5,8,9,10,11,12	of February	
1,2,3,4,5,8,9,10,11,12	of March	
1,2,5,6,7,8,9,12,13,14	of April	
3,4,5,6,10,11,12,13	of May	
1,2,3,7,8,9,10,14	of June	
1,5,6,7,8,12,13,14	of July	$\frac{13}{6}$
2,3,4,5,9,10,11,12	of August	
1,2,6,7,8,9,13,14	of September	
4,5,6,7,11,12,13,14	of October	
2,5,9,12	of November	
3,7,10,14	of December	
4,7,11,14	of January	
1,8	of May	
5,12	of June	
10	of July	
6,7,13,14	of August	
10,11	of September	
1,2,8,9	of October	
4	of November	
2,9	of December	$\frac{12}{5}$
6,13	of January	
1,8	of November	$\frac{14}{6}$
6,13	of December	
3,10	of January	
3	of April	1
3,4,5	of September	
10	of October	
11	of November	
7,14	of February	
7,14	of March	
4,11	of April	2
2,3,4	of July	
3,10	of November	
1,8	of December	
5,12	of January	
6,13	of February	
6,13	of March	
10	of April	
2,7,9,14	of May	$\frac{11}{5}$
4,6,11,13	of June	

TABLE V-6 TIME INFLATION FACTORS FOR TRAVEL DAY (Continued)

<u>Dates</u>		<u>Factors</u>
9,11	of July	$\frac{11}{5}$
6,7,13,14	of November	
4,5,11,12	of December	
8,9	of January	
1,2	of January	$\frac{5}{2}$
1,8	of August	
12	of September	3
3	of October	

Of course, should a trip estimate for a specific travel day be desired, the initial person or household weight can be used without applying the Travel Day Time Inflation Factor. To estimate travel day trips for more than a single travel day (for example, the first five days in April), the estimate of trips for each of the days should be developed, and these estimates should be summed. Again, no use of the Travel Day Time Inflation Factor is made.

Estimates for Travel Period Trips

To obtain a weighted subgroup total for a travel period trip characteristic where:

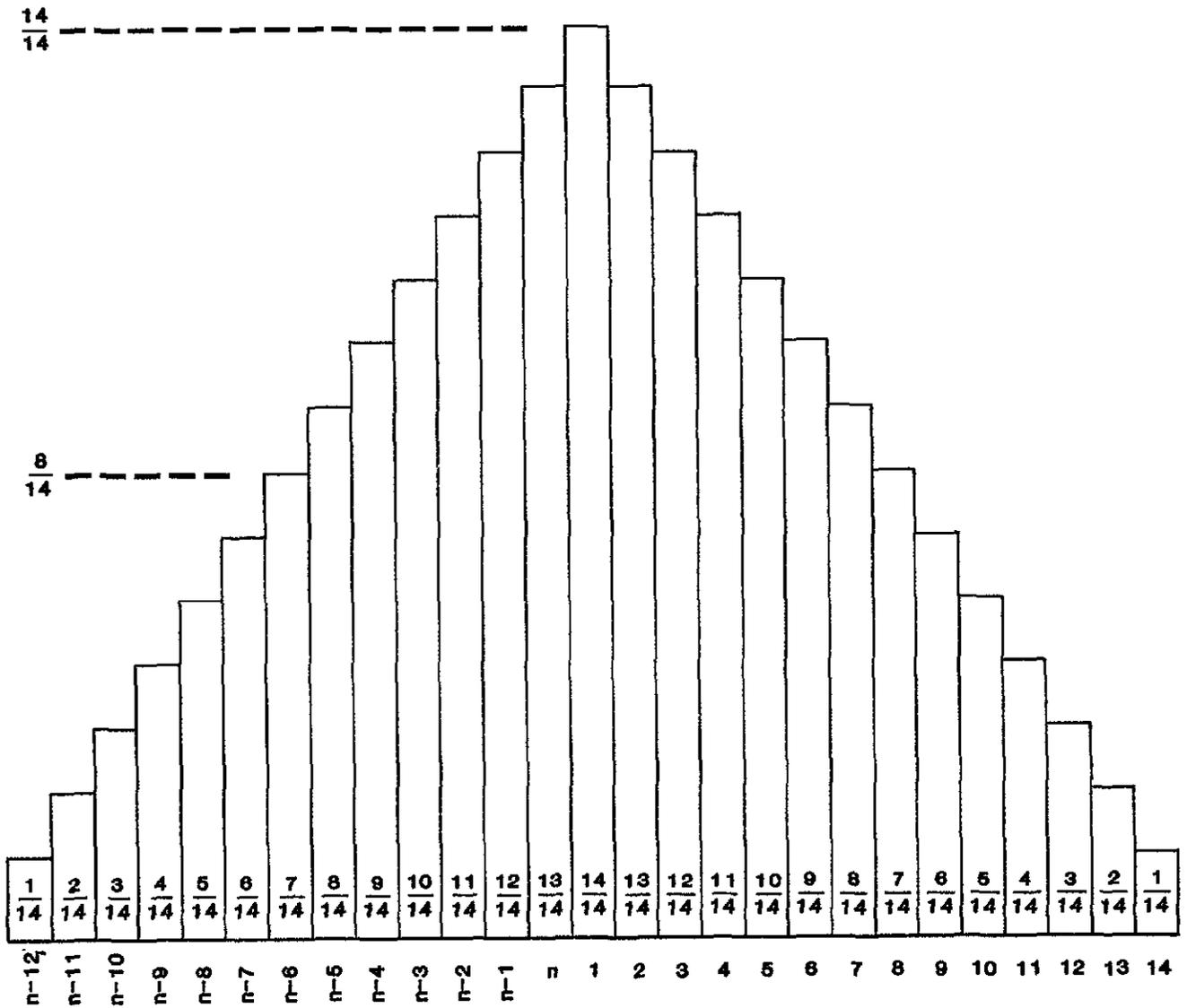
n = the number of days in month

i = the number of the day of the month for which trips were being reported (where a trip was reported on the day it ended)

Since the 14-day travel period ends on the "travel day" and since the travel day must be one of the first 14 days of the month, i (during the 14-day travel period) must be between 1 and 14, or between $n-12$ and n . The probability, P_i , that the i^{th} day is covered is $(15-i)/14$, if i is between 1 and 14, and $(13-n+i)/14$, if i is between $n-12$ and n . Diagram V-1 provides a schematic representation of the proportion of households that could report travel period trips for a given day of the month.

DIAGRAM V-1

Schematic representation of the proportion of the 667 households assigned to month of interview in NPTS that could report travel period trips for a given day.



n=the number of days in a month

To obtain a weighted estimate of any characteristics (trips, persons, or household characteristics) pertaining to the i^{th} day of a particular month, a factor of $(1/14) \times (1/P_i)$ must be applied to the initial person or household weight. Thus, using the first day of the month as an example,

$$P_i = \frac{15-i}{14} = \frac{15-1}{14} = \frac{14}{14} = 1$$

and the factor

$$= \frac{1}{14} \times \frac{1}{P_i} = \frac{1}{14} \times \frac{1}{1} = \frac{1}{14}$$

This factor, the Travel Period Covered Day Factor, should be applied to all travel period trips ending on the first day of the month.

To estimate trips for more than 1 day, the weighted estimate of trips for each day under consideration should be developed as discussed above and summed to form the final estimate. Thus, the estimate of travel period trips ending during the first five days in April is obtained by calculating the weighted estimate of trips for each of the five days (using the Traveled Period Covered Day Factor for each day) and then summing the estimates for each of the five days.

Since trips reported for the 14-day travel periods cover 27 days in a month, it is necessary to use the appropriate Time Inflation Factor for Travel Period (Table V-7) to obtain a quarterly estimate of trips from trips reported for the 14-day travel periods.

TABLE V-7

TIME INFLATION FACTORS FOR TRAVEL PERIOD

<u>Dates</u>		<u>Factors</u>
2,3,5,9,10,12,16,17,19,23,24,26	of February	
2,3,5,9,10,12,19,23,24,26,30,31	of March	
2,6,7,9,13,14,20,21,23,27,28,30	of April	
3,5,10,12,19,24,26,31	of May	$\frac{13}{12}$
2,7,9,14,21,23,28,30	of June	
5,7,12,14,19,21,26,28	of July	
3,5,10,12,19,24,26,31	of August	
2,7,9,14,21,23,28,30	of September	
5,7,12,14,19,21,26,28	of October	
2,9,23,30	of November	
7,14,21,28	of December	
4,11,19,26	of January	
1,4,8,11,18,22,25	of February	
1,4,8,11,22,25,29	of March	
1,5,8,12,19,22,26,29	of April	
4,6,11,13,20,25,27	of May	
1,3,8,10,22,24,29	of June	
1,6,8,13,20,22,27,29	of July	$\frac{13}{11}$
2,4,9,11,23,25,30	of August	
1,6,8,13,20,22,27,29	of September	
4,6,11,13,20,25,27	of October	
1,8,22,29	of November	
6,13,20,27	of December	$\frac{14}{11}$
3,10,25	of January	
2,9,23	of May	
6,13,20,27	of June	$\frac{11}{9}$
11,25	of July	
6,13,20	of November	$\frac{10}{8}$
4,11	of December	
8,23,30	of January	
7,14,21,28	of February	
7,14,21,28	of March	
3,4,11,18,25	of April	
28,29,30	of May	
2,3,4	of July	
3,4,5	of September	1
10	of October	
11,24,25,26,27	of November	
24,25,26,31	of December	
1,2	of January	

TABLE V-7 TIME INFLATION FACTORS FOR TRAVEL PERIOD (Continued)

<u>Dates</u>		<u>Factors</u>
7,14,21,28	of August	
11,18,25	of September	$\frac{12}{11}$
2,9,23,30	of October	$\frac{12}{11}$
5,12,19	of November	
3,10	of December	$\frac{10}{9}$
7,14,22,29	of January	$\frac{10}{9}$
6,13,20,27	of February	
6,13,20,27	of March	
10,24	of April	$\frac{11}{10}$
7,14,21	of May	$\frac{11}{10}$
4,11,18,25	of June	
9,23,30	of July	
4,7,14,18,21,28	of November	
2,5,9,12,19,23,30	of December	
6,9,13,21,24,28,31	of January	
1,8,22	of May	
5,12,19,26	of June	
10,24,31	of July	
1,6,8,13,20,22,27,29	of August	
10,12,19,24,26	of September	
1,3,8,22,24,29,31	of October	$\frac{12}{10}$
3,10	of November	$\frac{12}{10}$
1,8,22,29	of December	$\frac{12}{10}$
5,12,20,27	of January	$\frac{12}{10}$

Annual trip estimates may be obtained by using the subgroup estimates for each day (using all of the appropriate described factors), and summing these for all days in the 14-day travel periods in the year.

A further adjustment needs to be made when a combination of travel day and travel period information is to be used to find trip and travel estimates. Travel period trips ending on the last day of the travel period are, of course, reported on the travel day as well. In addition, trips of 75 miles or more beginning on or before the travel day and ending after it are represented in a different travel period. The overlap between travel period and travel day trips can be eliminated by checking the item on the questionnaire (source code 638) which flags those trips in Section VI, Travel Day, which are also included in Section V-14, Day Travel Period. Any travel period trips identified in this procedure should be processed by applying the appropriate weighting factors (just as any other travel period trip would be processed), and then subtracting them from the weighted total trips. Next, the long trips ending after the travel day (some portion of which have been reported for the travel day) are subtracted after identification by means of source code 640. Distances in all travel day trips taken after the last return home for the day are summed and this figure is added to the number of miles traveled on the last trip before returning home (source code 640). If this figure is at least 150 miles, then all the trips which have been added together overlap. Where the total is less than 150 miles and the first trip for the travel day did not begin at home (source code 604), judgment has been used to determine whether or not there is overlap. If the first trip for the day began at home and the total distance for all trips taken after the last return home for the day (including the distance entered in source code 640) was less than 150 miles, no overlap was considered to have occurred.

If overlap was found, it was counted as one trip. Estimates of total trips and total mileage have been obtained by adding travel period and travel day weighted estimates and subtracting the weighted overlap.

Commercial Driving

Estimates for travel day, travel period, and total commercial driving mileage can be produced by dividing the mileage in "miles driven as an essential part of work in the 14-day travel period" (source code 406) by 14 to obtain an average daily estimate for each day within the travel period. Each day is then treated as a one-person travel period trip, with probabilities (P_{is}) and time inflation factors being applied. These estimates of commercial driving can be added to the combined estimates of travel period and travel day, since there is no overlap.

Initial Weights

The NPTS data tape contains both an initial household weight and an initial person weight. These have been calculated as follows:

Initial Household Weight = HHBAWGT =

(Basic Weight) x
(Duplication Control Factor) x
(Household Noninterview Factor)

Initial Person Weight = PEBAWGT =

(Basic Weight) x
(Duplication Control Factor) x
(Household Noninterview Factor) x
(Within Household Noninterview Factor) x

Final Weights

The following are the procedures we used for calculating the final weights.

Household level:

$$\text{HHFIWGT} = \frac{\text{HHBAWGT} * \text{1st Stage Factor} * \text{2nd Stage Factor}}{12 * 14}$$

Where: HHFIWGT is the final household weight
HHBAWGT is base weight on the final Census tape

Person level:

for demographic variables

$$\text{PE1FIWGT} = \frac{\text{HHBAWGT} * \text{1st Stage Factor} * \text{3rd Stage Factor (d)}}{12 * 14}$$

for non-demographic variables

$$\text{PE2FIWGT} = \frac{\text{PEBAWGT(c)} * \text{1st Stage} * \text{3rd Stage (c)}}{12 * 14}$$

Where: PE1FIWGT is final person weight for demographic variables
 PE2FIWGT is final person weight for non-demographic variables
 HHBAWGT is basic weight from Census tape
 PEBAWGT(c) is basic person weight for characteristics

Vehicle level:

HHFIWGT same as household level

Household Trips:

day trips

one person on trip

$$\text{DAHFIWGT} = \text{PEBAWGT}(a) * \text{1st Stage factor} * \text{3rd Stage factor}(a) * \text{Trip inflation factor}$$

two or more persons on trip

$$\text{DAHFIWGT} = \text{HHBAWGT} * \text{1st Stage factor} * \text{2nd Stage factor} * \text{Trip inflation factor}$$

period trips

one person on trip

$$\text{PRHFIWGT} = \text{PEBAWGT}(b) * \text{1st Stage factor} * \text{3rd Stage factor}(b) * \text{Trip inflation factor} * \frac{1}{\text{PI}} * \frac{1}{14}$$

two or more persons on trip

$$\text{PRHFIWGT} = \text{HHBAWGT} * \text{1st Stage factor} * \text{2nd Stage factor} * \text{Trip inflation factor} * \frac{1}{\text{PI}} * \frac{1}{14}$$

Where: DAHFIWGT is final household day trip weight
 PRHFIWGT is final household period trip weight
 HHBAWGT is basic weight from Census tape
 PEBAWGT(a) is basic person weight for day trips
 PEBAWGT(b) is basic person weight for period trips

Person Trips:

day trips

one person on trip

$$\text{DAPFIWGT} = \text{PEBAWGT}(a) * \text{1st Stage} * \text{3rd Stage} (a) \\ * \text{Travel Day Trip inflation factor}$$

two or more persons on trip

$$\text{DAPFIWGT} = \text{HHBAWGT} * \text{1st Stage} * \text{3rd Stage} (d) \\ * \text{Travel Day Trip inflation factor}$$

period trips

one person on trip

$$\text{PRPFIWGT} = \text{PEBAWGT}(b) * \text{1st Stage} * \text{3rd Stage} (b) \\ * \text{Travel Period Trip inflation factor} * \frac{1}{\text{PI}} * \frac{1}{14}$$

two or more persons on trip

$$\text{PRPFIWGT} = \text{HHBAWGT} * \text{1st Stage} * \text{3rd Stage} (d) \\ * \text{Travel Period Trip inflation factor} * \frac{1}{\text{PI}} * \frac{1}{14}$$

Where: DAPFIWGT is final person day trip weight
PRPFIWGT is final person period trip weight
HHBAWGT is basic weight from Census tape
PEBAWGT(a) is basic person weight for day trips
PEBAWGT(b) is basic person weight for period trips

VI. COMPARISON OF 1983 NPTS WITH 1969 AND 1977 NPTS

Based on the results from and uses made of the 1969 and 1977 NPTS, modifications to the data codes used in 1977 were made to provide for more efficient data collection in 1983. Detailed below are the significant differences apparent when the 1983 NPTS data formats and codes are compared to the 1977 and 1969 NPTS.

Differences between 1983 NPTS and 1977 and 1969 NPTS

Trip Purposes

The number of trip purposes went from 11 in 1969 to 21 in 1977 and back to 11 in 1983. As Table VI-1 illustrates, the 1983 trip purposes closely parallel those found in the 1969 survey. Conventions, sightseeing, entertainment, recreation (participant), overnight lodging, social, change vehicle without change mode, change means of transportation, and pick-up or leave-off passengers are the 1977 NPTS trip purposes that have been eliminated in formulating the 1983 NPTS trip purposes. The "return home" trip purpose (code "18") in the 1977 NPTS has been incorporated outside the basic codes for trip purpose in the coding schemes for trips both in the 14-day travel period and on the travel day in the 1983 data.

Vehicle Type

In vehicle type coding for 1983 personal use taxi, a separate code in 1977 was combined into the "auto" category. Vans, coded as "vanbus/minibus" or "pickup truck/other van" in 1977 were coded as "passenger van" or "other van" in 1983. "Pickup truck" was made a separate code in 1983, as was "pickup with camper." The 1977 category for "self-contained recreational vehicle" was modified to "motorized camper coach," or "pickup with camper." A category for "other privately-owned vehicle" was added in 1983. While the 1977 truck categories "truck (other than pickup) (personal use)" and "truck (commercial use)" were combined into the single category, "other truck" for 1983. In 1983 a separate vehicle category, "station wagon," was coded in addition to "auto." Several vehicle characteristics were added including: the vehicle's seating capacity, the type of fuel it uses, and the type of passenger restraint, if any, with which the vehicle is equipped.

Income

Income categories were revised from 15 in number in 1977 to 17 for the 1983 NPTS. The minimum income group category was raised from "under \$2,000" to "under \$5,000," while the maximum category dropped from "\$100,000 and over" to "\$80,000 and more."

TABLE VI-1

1983, 1977 AND 1969

NPTS TRIPS PURPOSES AND CODES

Code 1969 Trip Purposes	Code 1977 Trip Purposes	Code 1983 Trip Purposes
01 To work	01 To place of work	01 To or from work
02 Business other than to work	02 Work-related business	02 Work-related business
03 Shopping	07 Shopping	03 Shopping
04 Other family or personal business	08 Family or personal business	04 Other family or personal business
05 To school or church	04 Civic, educational or religious	05 School/Church
06 To doctor or dentist	06 Doctor or dentist	06 Doctor/Dentist
07 Vacation	14 Vacation	07 Vacation
08 Visit friends or relatives	09 Visit friends or relatives	08 Visit friends or relatives
09 Pleasure driving	10 Pleasure driving	09 Pleasure driving
10 Other social recreational	11 Sightseeing	10 Other social or recreational
	5 Eat meal	
	12 Entertainment	
	13 Recreation (participant)	
	20 Social	
11 Other	21 Other	11 Other
	03 Convention	
	15 Change vehicle without change of mode	
	16 Change means (mode) of transportation	
	17 Pick-up or leave-off passenger	
	18 Return home	
	19 Lodging	

Rural/Urban Split of Travel

The detail in the 1977 study interviews regarding trip tracing on an area map to determine the proportion of each trip in rural and in urban areas has been eliminated from the 1983 data. Therefore, as was true in the 1969 NPTS, travel was related to the place of residence of the tripmaker.

Non-Family Income

A separate question regarding non-family income has been added in the 1983 NPTS. In 1977, only family income category was present.

Non-family income represents the income of all persons under one roof that are not related. Family income represents the income of all related individuals.

Public Transportation Data

Questions in the 1977 study regarding distance from home to the nearest inter-city bus terminal, train station and airport have been dropped from the 1983 NPTS. The 1983 NPTS, similar to the 1977 study contains question on the type and proximity of the nearest public transportation facility.

Carpool Data

The 1977 NPTS question which asked if persons in a carpool are members of the same household has been eliminated in 1983. Data on carpool arrangements prior to any change in the principal means of transportation to work within the previous year were also dropped in 1983.

Parking Data

Questions on availability of employer-provided parking at work and whether the employee pays to park at work have been added to the 1983 NPTS questionnaire.

Travel Day

Details in the 1977 NPTS on the place and cost of parking and period covered by that cost have been reduced in the 1983 study to simply whether parking was involved on the trip and, if so, whether there was a parking cost. In addition to the main purpose of the trip, a trip purpose is also asked of each household member on the trip.

Trips of 75 Miles-or-More (One-Way)

In 1969, long trips were defined as "overnight travel." In 1977 and 1983 long trips were defined as trips of 75 miles or more one-way from home.

Questions on type of lodging and number of nights spent in each lodging type have been eliminated in the 1983 study. 1977 NPTS detail on household members' percentage of driving have been simplified to include only an inquiry as to whether anyone, other than the principal driver on the trip, shared the driving. Detail on each portion of these trips has been eliminated in favor of reporting the trip as a single entity including side trips taken on the way to the final trip destination. Provision, however, has now been made for including all reasons for the trip in addition to the main trip purpose.

Safety Devices

A section in the 1983 questionnaire has been added to obtain detailed information on use of safety devices in household vehicles, including such information as reasons for wearing/not wearing seat belts, frequency of seat belt use, motorcycle helmet use, and whether or not the household member had any accidents as a driver during the previous 12 months where an injury occurred. Information on child safety devices is also included.

APPENDIX A

SAMPLE TABLES

TABLE I
ANNUAL HOUSEHOLD VEHICLE VMT BY PURPOSE AND INCOME
(TRAVEL DAY TRIPS-WEIGHTED in millions)

TABLE OF PURPOSE BY FAM_INC

PURPOSE FREQUENCY PERCENT ROW PCT COL PCT	FAM_INC Family Income							TOTAL
	Under 10,000	10,000- 19,999	20,000- 29,999	30,000- 39,999	40,000 and Over			
To or From Work	22917 2.29 7.58 22.04	63538 6.34 21.03 26.32	83674 8.35 27.69 33.63	57249 5.71 18.95 31.69	74807 7.46 24.76 32.86			302185 30.14
Work Related Bus	3136 0.31 7.43 3.02	12258 1.22 29.03 5.08	10159 1.01 24.06 4.08	8621 0.86 20.42 4.77	8049 0.80 19.06 3.54			42223 4.21
Shopping	14508 1.45 10.84 13.95	35553 3.55 26.57 14.73	33105 3.30 24.74 13.31	20683 2.06 15.46 11.45	29973 2.99 22.40 13.17			133823 13.35
Other Family or	16440 1.64 10.60 15.81	43430 4.33 28.00 17.99	33119 3.30 21.35 13.31	28659 2.86 18.47 15.86	33482 3.34 21.58 14.71			155131 15.47
School/Church	4617 0.46 11.26 4.44	8746 0.87 21.34 3.62	9290 0.93 22.66 3.73	5965 0.60 14.55 3.30	12372 1.23 30.18 5.44			40990 4.09
Doctor/Dentist	1964 0.20 13.39 1.89	3302 0.33 22.51 1.37	3946 0.39 26.90 1.59	2423 0.24 16.52 1.34	3035 0.30 20.69 1.33			14669 1.46
TOTAL	103998 10.37	241384 24.08	248782 24.82	180666 18.02	227636 22.71			1002467 100.00

CONTINUED

TABLE 1 (CONTINUED)
 ANNUAL HOUSEHOLD VEHICLE VMT BY PURPOSE AND INCOME
 (TRAVEL DAY TRIPS-WEIGHTED IN MILLIONS)

TABLE OF PURPOSE BY FAM_INC

PURPOSE	Main purpose FAM_INC	Family Income					TOTAL
		Under 10,000	10,000- 19,999	20,000- 29,999	30,000- 39,999	40,000 and Over	
FREQUENCY PERCENT ROW PCT COL PCT							
Vacation		3106 0.31 14.57 2.99	2276 0.23 10.68 0.94	5438 0.54 25.51 2.19	7014 0.70 32.90 3.88	3483 0.35 16.34 1.53	21317 2.13
Visit Friends or		17945 1.79 13.21 17.26	38899 3.88 28.64 16.11	31529 3.15 23.22 12.67	23315 2.33 17.17 12.91	24112 2.41 17.76 10.59	135801 13.55
Pleasure Driving		641 0.06 5.70 0.62	3165 0.32 28.12 1.31	1592 0.16 14.15 0.64	1311 0.13 11.65 0.73	4545 0.45 40.38 2.00	11253 1.12
Other Social or		16112 1.61 12.08 15.49	27858 2.78 20.88 11.54	34510 3.44 25.87 13.87	23428 2.34 17.56 12.97	31509 3.14 23.62 13.84	133417 13.31
Other		2612 0.26 22.45 2.51	2338 0.23 20.09 0.97	2418 0.24 20.78 0.97	1998 0.20 17.17 1.11	2270 0.23 19.51 1.00	11636 1.16
		0 0.00 0.00 0.00	21 0.00 100.00 0.01	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	21 0.00
TOTAL		103998 10.37	241384 24.08	248782 24.82	180666 18.02	227636 22.71	1002467 100.00

ANNUAL HOUSEHOLD VEHICLE VMT BY PURPOSE AND INCOME
HOUSEHOLD VEHICLES ONLY
(TRAVEL DAY TRIPS-WEIGHTED in millions)

TABLE OF PURPOSE BY FAM_INC

PURPOSE FREQUENCY PERCENT ROW PCT COL PCT	Main purpose	FAM_INC Family Income						TOTAL
		Under 10,000	10,000- 19,999	20,000- 29,999	30,000- 39,999	40,000 and Over		
	To or From Work	19981 2.10 6.93 20.45	61550 6.48 21.36 26.46	78867 8.30 27.37 33.61	55570 5.85 19.28 33.28	72229 7.61 25.06 33.16		288197 30.35
	Work Related Bus	2899 0.31 7.58 2.97	11252 1.18 29.42 4.84	9189 0.97 24.03 3.92	7838 0.83 20.49 4.69	7066 0.74 18.48 3.24		38244 4.03
	Shopping	14155 1.49 10.99 14.48	34126 3.59 26.49 14.67	32656 3.44 25.35 13.92	18581 1.96 14.42 11.13	29309 3.09 22.75 13.45		128826 13.56
	Other Family or	15211 1.60 10.51 15.57	40037 4.22 27.65 17.21	30817 3.24 21.29 13.13	27630 2.91 19.08 16.55	31088 3.27 21.47 14.27		144784 15.24
	School/Church	4688 0.49 11.93 4.80	8414 0.89 21.41 3.62	8500 0.89 21.63 3.62	5105 0.54 12.99 3.06	12586 1.33 32.03 5.78		39293 4.14
	Doctor/Dentist	1883 0.20 13.14 1.93	3074 0.32 21.45 1.32	3979 0.42 27.76 1.70	2423 0.26 16.90 1.45	2975 0.31 20.75 1.37		14334 1.51
	TOTAL	97725 10.29	232576 24.49	234622 24.70	166971 17.58	217833 22.94		949726 100.00

CONTINUED

TABLE 2 (CONTINUED)
 ANNUAL HOUSEHOLD VEHICLE VMT BY PURPOSE AND INCOME
 HOUSEHOLD VEHICLES ONLY
 (TRAVEL DAY TRIPS-WEIGHTED in millions)

TABLE OF PURPOSE BY FAM_INC

PURPOSE FREQUENCY PERCENT ROW PCT COL PCT	FAM_INC Family Income						TOTAL
	Under 10,000	10,000- 19,999	20,000- 29,999	30,000- 39,999	40,000 and Over		
Vacation	3353 0.35 25.35 3.43	2276 0.24 17.21 0.98	2749 0.29 20.79 1.17	1969 0.21 14.89 1.18	2877 0.30 21.76 1.32		13225 1.39
Visit Friends or	17229 1.81 13.16 17.63	38518 4.06 29.43 16.56	30209 3.18 23.08 12.88	22712 2.39 17.35 13.60	22208 2.34 16.97 10.19		130875 13.78
Pleasure Driving	600 0.06 5.28 0.61	3395 0.36 29.92 1.46	1497 0.16 13.20 0.64	1311 0.14 11.55 0.78	4545 0.48 40.05 2.09		11348 1.19
Other Social or	15165 1.60 11.70 15.52	27602 2.91 21.30 11.87	33836 3.56 26.11 14.42	22202 2.34 17.13 13.30	30805 3.24 23.77 14.14		129610 13.65
Other	2561 0.27 23.35 2.62	2310 0.24 21.06 0.99	2322 0.24 21.17 0.99	1630 0.17 14.86 0.98	2146 0.23 19.56 0.99		10970 1.16
	0 0.00 0.00 0.00	21 0.00 100.00 0.01	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00		21 0.00
TOTAL	97725 10.29	232576 24.49	234622 24.70	166971 17.58	217833 22.94		949726 100.00

TABLE 3
 PERCENT OF TRIPS BY MODE AND TIME OF DAY
 TRAVEL PERIOD TRIPS EXCLUDED
 (DAY TRIPS - WEIGHTED IN MILLIONS)
 TABLE OF START_T BY MEANS

START_T FREQUENCY PERCENT ROW PCT COL PCT	Time trip began	MEANS											TOTAL
		Auto (In cludes P	Station Mag	Passenger Van	Other Van in	Pickup ruck	Pickup with Compl	Other Tr Compl	Motorize d Camp	Motorcyc le	Motorize d Bicycl	Other (P OV)	
	1 a.m. to 6 a.m.	4886 2.11 65.18 3.40	451 0.20 6.28 2.82	143 0.06 1.99 3.06	66 0.03 0.91 4.40	705 0.32 9.80 3.91	46 0.02 0.64 3.10	30 0.01 0.42 2.59	4 0.00 0.06 10.32	15 0.01 0.21 2.38	5 0.00 0.08 3.41	0 0.00 0.00 0.00	7189 3.24
	6 a.m. to 9 a.m.	17893 8.07 55.87 12.98	2118 0.96 6.61 13.25	687 0.31 2.15 14.67	187 0.08 12.50	3095 1.40 9.67 17.18	216 0.10 0.68 14.45	165 0.07 0.52 14.89	16 0.01 0.06 47.13	97 0.04 0.38 15.04	28 0.01 0.06 12.42	26 0.01 0.08 22.01	32025 14.44
	9 a.m. to 1 p.m.	33122 14.93 63.81 24.03	3962 1.79 7.63	952 0.43 20.32	390 0.18 26.11	4484 2.02 8.64 24.90	259 0.12 0.50 17.30	280 0.13 0.54 23.82	7 0.00 0.01 18.31	171 0.08 0.33 26.63	47 0.02 0.09 29.12	22 0.01 0.04 18.71	51912 23.48
	1 p.m. to 4 p.m.	27300 12.31 59.30 19.80	3087 1.39 6.71 19.31	910 0.41 3.98 19.43	228 0.10 0.49 15.26	3575 1.61 7.77 19.85	410 0.18 0.89 27.39	206 0.09 0.45 17.57	5 0.00 0.01 11.76	117 0.05 0.25 18.25	38 0.02 0.08 23.91	66 0.02 0.10 36.98	46035 20.75
	4 p.m. to 7 p.m.	30246 13.64 64.16 21.94	3513 1.58 7.45	1086 0.49 2.30 23.19	416 0.19 0.88 27.88	3674 1.66 7.79 20.40	332 0.15 0.70 22.15	239 0.11 0.51 20.40	5 0.00 0.01 12.48	154 0.07 0.33 23.93	28 0.01 0.06 17.72	23 0.01 0.05 19.11	47142 21.25
	7 p.m. to 10 p.m.	17658 7.96 64.50 12.81	2288 1.03 8.36 14.31	663 0.30 2.42 16.16	168 0.08 0.62 11.28	1847 0.83 6.75 10.25	163 0.07 0.60 10.89	182 0.08 0.66 15.49	0 0.00 0.00 0.00	67 0.23 0.25 10.44	14 0.01 0.05 8.46	4 0.00 0.01 3.18	27375 12.34
	10 p.m. to 1 a.m.	6218 2.80 69.33 4.51	563 0.25 3.52	199 0.09 2.22 4.24	6 0.00 0.07 0.43	525 0.24 5.85 2.91	34 0.02 0.38 2.27	71 0.03 0.79 6.04	0 0.00 0.00 0.00	21 0.01 0.24 3.33	4 0.00 0.05 2.64	0 0.00 0.00 0.00	8969 4.04
	Unknown	732 0.33 62.59 0.53	6 0.00 0.37 0.03	44 0.02 3.74 0.93	32 0.01 2.74 2.14	108 0.05 9.26 0.60	37 0.02 3.14 2.45	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	4 0.00 0.32 2.33	0 0.00 0.00 0.00	1170 0.53
	TOTAL	137855 62.15	15987 7.21	5685 2.11	1493 0.67	18013 8.12	1498 0.68	1174 0.53	39 0.02	643 0.29	161 0.07	118 0.05	221816 100.00

CONTINUED

TABLE 3 (CONTINUED)
 PERCENT OF TRIPS BY MODE AND TIME OF DAY
 TRAVEL PERIOD TRIPS EXCLUDED
 (DAY TRIPS -- WEIGHTED IN MILLIONS)

TABLE OF START_T BY MEANS

START_T FREQUENCY PERCENT ROM PCT COL PCT	Time trip began											TOTAL
	Bus	Train	Streetscar	Elevated Rail or R	Airplane	Taxi (Co mercial)	Bicycle	Walk	School us	Other		
1 a.m. to 6 a.m.	99 0.04 1.37 2.63	5 0.00 0.06 0.98	0 0.00 0.00 0.00	43 0.02 0.60 6.51	0 0.00 0.00 0.00	27 0.01 0.38 7.32	26 0.01 0.36 1.55	463 6.54 2.42	70 0.03 0.98 1.18	16 0.01 0.22 2.47	288 0.13 4.00 3.92	7189 3.24
6 a.m. to 9 a.m.	1066 0.48 3.33 28.49	154 0.07 0.48 32.85	19 0.01 0.06 45.21	204 0.09 0.64 38.70	5 0.00 0.01 5.92	18 0.01 0.06 4.82	202 0.09 0.63 11.94	2461 1.11 7.69 12.87	2733 1.23 8.53 45.78	81 0.04 0.25 12.81	559 0.25 1.75 7.61	32025 14.44
9 a.m. to 1 p.m.	692 0.31 1.33 18.58	40 0.02 0.08 8.43	0 0.00 0.00 0.00	73 0.03 0.14 10.97	12 0.01 0.02 15.37	71 0.03 0.14 19.28	388 0.17 0.75 22.87	5660 2.55 10.98 29.59	354 0.15 0.64 5.58	179 0.08 0.35 28.39	767 0.35 1.48 18.43	51912 23.40
1 p.m. to 4 p.m.	947 0.43 2.86 25.32	56 0.12 0.12 12.01	8 0.00 0.03 19.80	85 0.04 0.19 12.82	27 0.01 0.06 34.14	32 0.02 0.11 13.94	336 0.15 0.73 19.81	4832 2.18 10.58 25.26	2568 1.16 5.58 42.94	168 0.08 0.36 26.53	1054 0.47 2.25 14.18	46035 20.75
4 p.m. to 7 p.m.	680 0.31 1.44 18.17	186 0.08 0.40 39.74	15 0.01 0.03 34.99	164 0.07 0.55 24.61	10 0.00 0.02 12.57	94 0.04 0.20 25.51	445 0.20 0.94 26.26	3288 1.48 6.97 17.19	178 0.08 0.38 2.98	132 0.06 0.28 20.88	2233 1.01 4.74 30.39	47142 21.25
7 p.m. to 10 p.m.	161 0.07 0.59 4.31	28 0.01 0.07 4.31	0 0.00 0.00 0.00	45 0.02 0.16 6.79	15 0.01 0.05 18.65	52 0.02 0.19 14.99	227 0.10 0.83 13.39	1773 0.80 6.48 9.27	68 0.03 0.22 1.01	35 0.02 0.13 5.59	1933 0.87 7.06 26.30	27375 12.34
10 p.m. to 1 a.m.	75 0.03 0.84 2.82	8 0.00 0.09 1.68	0 0.00 0.00 0.00	27 0.01 0.38 4.88	11 0.00 0.12 13.36	56 0.03 0.62 15.12	52 0.02 0.38 3.08	535 0.24 5.96 2.79	24 0.01 0.23 0.48	21 0.01 0.23 3.34	519 0.23 5.78 7.86	8969 4.84
Unknown	22 0.01 1.84 0.58	0 0.00 0.00 0.00	0 0.00 0.00 0.00	24 0.01 2.05 3.61	0 0.00 0.00 0.00	0 0.00 0.00 0.00	18 0.01 1.58 1.09	118 0.05 10.06 8.61	12 0.01 1.07 0.21	0 0.00 0.00 0.08	15 0.01 0.25 1.28	1178 0.53
TOTAL	3742 1.69	469 0.21	42 0.02	665 0.38	79 0.04	370 0.17	1695 0.76	19129 8.62	5980 2.70	631 0.28	7349 3.31	221816 100.00

AVERAGE ANNUAL PERSON MILES OF TRAVEL PER PERSON
 BY PURPOSE AND INCOME
 (TRAVEL PERIOD TRIPS-Weighted)

Purpose of out trip	Family Income					Total
	Under 10,000	10,000-19,999	20,000-29,999	30,000-39,999	40,000 and Over	
To or From Work	4.5	32.7	54.2	6.2	84.5	37.1
Work Related Business	50.7	184.5	159.1	687.1	1247.6	404.3
Family or Personal Business	153.2	295.9	668.1	378.6	779.8	446.7
Social or Recreational	951.9	1085.7	1531.5	2272.1	2781.3	1617.7
Other	243.8	124.1	121.7	78.7	147.3	145.6
Total	1404.0	1723.0	2534.7	3422.8	5040.5	2651.5

TABLE 5
 ANN. MILES/HOUSEHOLD BY INCOME AND URBAN AREA SIZE
 (HOUSEHOLDS - WEIGHTED)

Family Income	Urbanized Area Size							Total	
	50,000 to 199,999	200,000 to 749,999	750,000 to 1,249,999	No Rail, 1,250,- 000+	Rail, 1,250,- 000+	Unknown size	Not Urb Under 5000		
Under \$10,000	5723	6735	4366	5640	2905	11274	6260	8839	6212
\$10,000-19,999	12169	12997	11191	13535	8949	10955	15310	18507	13898
\$20,000-29,999	16314	19773	16751	18895	14691	19706	21541	24980	19781
\$30,000-39,999	20125	22044	20857	20642	19519	30853	24126	27864	22842
\$40,000 or more	24387	24451	25316	29466	22430	43792	25848	34035	27325
Total	13291	15471	13343	16720	12706	19006	15556	20540	16153

HOUSEHOLDS BY NUMBER OF VEHICLES AND INCOME
(HOUSEHOLD - WEIGHTED)TABLE OF FAM_INC BY VEHICLES
Number of Household Vehicles

FAM_INC	Family Income	None	One	Two	Three	Four or more	TOTAL
FREQUENCY							
PERCENT							
ROW PCT							
COL PCT							
Under \$10,000		8838099	9555565	3032685	683742	241160	22351251
		10.35	11.19	3.55	0.80	0.28	26.18
		39.54	42.75	13.57	3.06	1.08	
		76.53	33.20	10.59	6.25	4.40	
\$10,000-19,999		2013354	10507481	17188929	2323189	727836	22760789
		2.36	12.31	8.42	2.72	0.85	26.66
		8.85	46.16	31.58	10.21	3.20	
		17.43	36.51	25.11	21.25	13.29	
\$20,000-29,999		410294	5398290	7952600	2702550	1303863	17767597
		0.48	6.32	9.31	3.17	1.53	20.81
		2.31	30.38	44.76	15.21	7.34	
		3.55	18.76	27.77	24.72	23.81	
\$30,000-39,999		151993	1838879	5150966	2128286	1096054	10366178
		0.18	2.15	6.03	2.49	1.28	12.14
		1.67	17.74	49.69	20.53	10.57	
		1.32	6.39	17.99	19.46	20.01	
\$40,000 or more		134790	1481385	5308505	3096835	2107641	12129156
		0.16	1.74	6.22	3.63	2.47	14.21
		1.11	12.21	43.77	25.53	17.38	
		1.17	5.15	18.54	28.32	38.48	
TOTAL		11548529	28781600	28633685	10934602	5476554	85374971
		13.53	33.71	33.54	12.81	6.41	100.00

TABLE 7

WORKERS BY PRINCIPLE MODE TO WORK
AND DISTANCE TO WORK
(WEIGHTED in thousands)

TABLE OF MEANS_W BY WORKDIST

MEANS_W	Principal Means of Trans. to Work	WORKDIST	Distance to Work	TOTAL			
FREQUENCY PERCENT ROW PCT COL PCT	0-5	6-10	11-20	21-75	176+	Unknown	
Auto (Includes P	29660 28.73 44.28 66.23	14918 14.45 22.27 71.54	12804 12.40 19.11 71.32	6696 6.49 10.00 67.55	134 0.13 0.20 38.95	2773 2.69 4.14 29.50	66985 64.88
Station Wagon	1574 1.52 41.60 3.51	924 0.89 24.42 4.43	661 0.64 17.47 3.68	336 0.33 8.88 3.39	14 0.01 0.37 4.07	275 0.27 7.27 2.93	3784 3.67
Passenger Van	749 0.73 36.22 1.67	355 0.34 17.17 1.70	326 0.32 15.76 1.82	431 0.42 20.84 4.35	0 0.00 0.00 0.00	207 0.20 10.01 2.20	2068 2.00
Other Van	448 0.43 37.74 1.00	123 0.12 10.36 0.59	208 0.20 17.52 1.16	106 0.10 8.93 1.07	0 0.00 0.00 0.00	302 0.29 25.44 3.21	1187 1.15
Pickup Truck	4800 4.65 38.29 10.72	2554 2.47 20.37 12.25	2390 2.31 19.07 13.31	1347 1.30 10.75 13.59	111 0.11 0.89 32.27	1333 1.29 10.63 14.18	12535 12.14
Pickup With Camp	287 0.28 39.48 0.64	162 0.16 22.28 0.78	89 0.09 12.24 0.50	85 0.08 11.69 0.86	11 0.01 1.51 3.20	93 0.09 12.79 0.99	727 0.70
Other Truck	295 0.29 36.74 0.66	116 0.11 14.45 0.56	39 0.04 4.86 0.22	46 0.04 5.73 0.46	24 0.02 2.99 6.98	283 0.27 35.24 3.01	803 0.78
Motorized Camper	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	23 0.02 100.00 0.24	23 0.02
TOTAL	44780 43.37	20853 20.20	17954 17.39	9912 9.60	344 0.33	9401 9.11	103244 100.00

CONTINUED

WORKERS BY PRINCIPLE MODE TO WORK
AND DISTANCE TO WORK
(WEIGHTED in thousands)

TABLE OF MEANS_M BY WORKDIST

MEANS_M	Principal Means of Trans. to Work						WORKDIST	Distance to Work	TOTAL
FREQUENCY PERCENT ROW PCT COL PCT	0-5	6-10	11-20	21-75	76+	Unknown			
Motorcycle	153 0.15 31.22 0.34	190 0.18 38.78 0.91	94 0.09 19.18 0.52	53 0.05 10.82 0.53	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	490 0.47	
Motorized Bicycl	55 0.05 100.00 0.12	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	55 0.05	
Other (POV)	103 0.10 50.49 0.23	23 0.02 11.27 0.11	28 0.03 13.73 0.16	37 0.04 18.14 0.37	0 0.00 0.00 0.00	13 0.01 6.37 0.14	0 0.00 0.00 0.00	204 0.20	
Bus	1486 1.44 46.35 3.32	878 0.85 27.39 4.21	575 0.56 17.94 3.20	179 0.17 5.58 1.81	0 0.00 0.00 0.00	88 0.09 2.74 0.94	0 0.00 0.00 0.00	3206 3.11	
Train	16 0.02 1.70 0.04	164 0.16 17.39 0.79	337 0.33 35.74 1.88	390 0.38 41.36 3.93	12 0.01 1.27 3.49	24 0.02 2.55 0.26	0 0.00 0.00 0.00	943 0.91	
Streetcar	28 0.03 52.83 0.06	12 0.01 22.64 0.06	13 0.01 24.53 0.07	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	53 0.05	
Elevated Rail or	223 0.22 21.16 0.50	364 0.35 34.54 1.75	320 0.31 30.36 1.78	147 0.14 13.95 1.48	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	1054 1.02	
Airplane	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	38 0.04 45.78 11.05	45 0.04 54.22 0.48	0 0.00 0.00 0.00	83 0.08	
TOTAL	44780 43.37	20853 20.20	17954 17.39	9912 9.60	344 0.33	9401 9.11	103244 100.00		

CONTINUED

TABLE 7 (CONTINUED)
 WORKERS BY PRINCIPLE MODE TO WORK
 AND DISTANCE TO WORK
 (WEIGHTED in thousands)

TABLE OF MEANS_M BY WORKDIST

MEANS_M FREQUENCY PERCENT ROW PCT COL PCT	Principal Means of Trans. to Work							Distance to Work Unknown	TOTAL
	0-5	6-10	11-20	21-75	76+				
Taxi (Commercial)	40 0.04 75.47 0.09	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	13 0.01 24.53 0.14	53 0.05
Bicycle	458 0.44 88.93 1.02	29 0.03 5.63 0.14	0 0.00 0.00 0.00	16 0.02 3.11 0.16	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	12 0.01 2.33 0.13	515 0.50
Walk	4156 4.03 97.67 9.28	16 0.02 0.38 0.08	16 0.02 0.38 0.09	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	67 0.06 1.57 0.71	4255 4.12
School Bus	99 0.10 60.37 0.22	11 0.01 6.71 0.05	14 0.01 8.54 0.08	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	40 0.04 24.39 0.43	164 0.16
Other	88 0.09 43.56 0.20	14 0.01 6.93 0.07	26 0.03 12.87 0.14	29 0.03 14.36 0.29	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	45 0.04 22.28 0.48	202 0.20
Work at Home	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	3640 3.53 100.00 38.72	3640 3.53
	62 0.06 28.84 0.14	0 0.00 0.00 0.00	14 0.01 6.51 0.08	14 0.01 6.51 0.14	0 0.00 0.00 0.00	0 0.00 0.00 0.00	0 0.00 0.00 0.00	125 0.12 58.14 1.33	215 0.21
TOTAL	44780 43.37	20853 20.20	17956 17.39	9912 9.60	344 0.33	9401 9.11	103244 100.00		

TABLE 8
DRIVERS BY AGE AND SEX
(WEIGHTED IN THOUSANDS)

SEX	FREQUENCY PERCENT ROW PCT COL PCT	Age												TOTAL
		16 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	Over 70	
Male	5378	9561	9419	9034	7356	6255	5177	4814	5508	5162	3513	4583	75734 51.65	
	3.65	6.58	6.48	6.14	5.88	4.54	3.52	3.27	3.74	3.51	2.39	3.11		
	7.89	12.62	12.44	11.93	9.71	8.25	6.84	6.36	7.26	6.82	4.44	6.05		
Female	4478	9108	8651	9457	7488	5834	4933	4846	5339	4431	3003	4118	71464 48.55	
	3.04	6.18	5.74	6.43	5.89	3.96	3.35	3.29	3.65	3.81	2.04	2.79		
	6.25	12.73	11.83	13.23	18.48	8.16	6.98	6.78	7.47	6.28	4.20	5.75		
TOTAL	9856	18669	17870	18492	14844	12079	10111	9660	10839	9593	6515	8693	147197 100.00	
	6.48	12.68	12.14	12.56	10.08	8.21	6.87	6.56	7.36	6.52	4.43	5.91		

TABLE 9 (CONTINUED)
PERSONS BY HOW OFTEN THEY WEAR SEAT BELTS
BY AGE AND SEX
(WEIGHTED in thousands)

TABLE OF AGESEX BY WEAR_BLT

AGESEX FREQUENCY PERCENT ROW PCT COL PCT	WEAR_BLT	How often wear Seat Belts					TOTAL
		Always	Most of the Time ^s	Sometime ^s	Never		
21 to 35, Female	.	3469	5182	2660	7407	11865	13
	.	.	2.81	1.44	4.02	6.44	0.01
	.	.	19.05	9.78	27.23	43.62	0.05
36 to 65, Male	.	3387	5759	3015	7827	15426	28
	.	.	3.13	1.64	4.25	8.38	0.02
	.	.	17.90	9.37	24.32	47.94	0.09
36 to 65, Female	.	4089	5647	3211	9040	16028	11
	.	.	3.07	1.74	4.91	8.70	0.01
	.	.	16.57	9.42	26.53	47.03	0.03
Over 65, Male	.	1442	1291	912	1748	3529	13
	.	.	0.70	0.50	0.95	1.92	0.01
	.	.	17.17	12.13	23.25	46.94	0.17
Over 65, Female	.	4406	1617	1018	1980	4352	0
	.	.	0.88	0.55	1.08	2.36	0.00
	.	.	17.92	11.28	21.95	48.24	0.00
TOTAL	.	.	31656	17800	48184	85876	111
	.	.	17.19	9.67	26.17	46.64	0.06
	.	.					
							27202
							14.77
							32180
							17.48
							34080
							18.51
							7518
							4.08
							9022
							4.90
							184139
							100.00

TABLE 10
 AVERAGE DAILY VMT PER HOUSEHOLD
 BY PURPOSE AND INCOME
 (TRAVEL DAY TRIPS-WEIGHTED)

Origin Destination Purpose	Family Income					Total
	Under \$10,000	\$10,000- 19,999	\$20,000- 29,999	\$30,000- 39,999	\$40,000- and over	
Home Based Work	3.2	9.1	14.5	17.4	18.7	11.1
Home Based Shopping	1.2	2.5	3.2	3.2	4.4	2.6
Home Based Other	5.8	10.8	13.8	18.5	19.0	12.2
Non-Home Based	2.6	6.7	6.9	8.6	9.3	6.3
Total	12.7	29.1	38.4	47.7	51.4	32.2