Appendix A

Glossary of Terms Used In NPTS

A

Appendix A Glossary of Terms Used in NPTS

THIS glossary provides the most common terms used in the NPTS and definitions of those terms. These definitions are provided to assist the user in the interpretation of the transportation data.

Census Division

The Census Bureau divides the states into the following divisions:

- New England:
  Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
- Middle Atlantic:
  New Jersey, New York, Pennsylvania
- East North Central:
  Illinois, Indiana, Michigan, Ohio, Wisconsin
- West North Central:
  Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
- South Atlantic:
  Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia
- East South Central:
  Alabama, Kentucky, Mississippi, Tennessee
- West South Central:
  Arkansas, Louisiana, Oklahoma, Texas
- Mountain:
  Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming
- Pacific:
  Alaska, California, Hawaii, Oregon, Washington

Consolidated Metropolitan Statistical Area (CMSA)

A metropolitan complex of 1 million or more population, containing two or more component parts designated as primary metropolitan statistical areas (PMSAs).

Destination

For travel period trips, destination is the farthest point of travel from the point of origin to 75 miles or more on a one-way trip.

For travel day trips, the destination is the point at which there is a break in travel.

Driver

A driver is a person who operates a motorized vehicle. If more than one person drives on a single trip, the person who drives the most miles is classified as the principal driver.

Employed

A person is considered employed if he/she worked for pay, either full time of part time, during the week before the interview.

A person who is on call to work whenever there is a need for his/her services is not considered employed.

Education Level
The number of years of regular schooling completed in graded public, private, or parochial schools, or in colleges, universities, or professional schools, whether day school or night school. Regular schooling advances a person toward an elementary or high school diploma, or a college, university, or professional school degree.

Household
A group of persons whose usual place of residence is a specific housing unit; these persons may or may not be related to each other. The total of all U.S. households represents the total civilian non-institutionalized population.

A Household does not include group quarters (i.e., 10 or more persons living together, none of whom are related).

Household Income
Household income is the money earned by all family members in a household, including those temporarily absent. Annual income consisted of the income earned 12 months preceding the interview. Household income includes monies from all sources, such as wages and salary, commissions, tips, cash bonuses, income from a business or farm, pensions, dividends, interest, unemployment or workmen's compensation, social security, veterans' payments, rent received from owned property (minus the operating costs), public assistance payments, regular gifts of money from friends or relatives not living in the household, alimony, child support, and other kinds of periodic money income other than earnings.

Household income excludes in-kind income such as room and board, insurance payments, lump-sum inheritances, occasional gifts of money from persons not living in the same household, withdrawal of savings from banks, tax refunds, and the proceeds of the sale of one's house, car, or other personal property.

Household Members
Household members include all people, whether present or temporarily absent, whose usual place of residence is in the sample unit. Household members also include people staying in the sample unit who have no other usual place of residence elsewhere.

Household Trip
A household trip consists of one or more household members traveling together.

Household Vehicle
A household vehicle is a motorized vehicle that is owned, leased, rented or company-owned and available to be used regularly by household members during any travel period. Household vehicles are used solely for business purposes or business-owned vehicles if kept at home and used for the home to work trip, (e.g., taxicabs, police cars, etc.) which may be owned by, or assigned to, household members for their regular use. Household vehicles include all vehicles that were owned or available for use by members of the household during the travel period, even though a vehicle may have been sold before the interview.

Vehicles excluded from household vehicles are those which were not working and were not expected to be working within 60 days, and vehicles that were purchased or received after the designated travel day.

Interstate Highway, Freeway or Expressway
A divided arterial highway for through traffic with full or partial control of access and grade separations at major intersections.

Licensed Driver

A licensed driver is any person who holds a valid driver's license from any state.

Means of Transportation

A mode of travel used for going from one place (origin) to another (destination). A means of transportation includes private and public modes, as well as walking. For all travel day trips, each change of mode constitutes a separate trip. The following transportation modes, grouped by major mode, are included in the transportation data.

Private Vehicle

- Automobile
  A privately owned and/or operated licensed motorized vehicle including cars, jeeps and station wagons. Leased and rented cars are included if they are privately operated and not used for picking up passengers in return for fare.

- Van
  A privately owned and/or operated van or minivan designed to carry 5 to 13 passengers, or to haul cargo.

- Pickup Truck
  A pickup truck is a motorized vehicle, privately owned and/or operated, with an enclosed cab that usually accommodates 2-3 passengers, and an open cargo area in the rear. Pickup trucks usually have the same size of wheelbase as a full-size station wagon. This category also includes pickups with campers.

- Other Trucks
  This category consists of all trucks other than pickup trucks (i.e., dump trucks, trailer trucks, etc.).

- RV or Motor Home
  An RV or motor home includes a self-powered recreational vehicle that is operated as a unit without being towed by another vehicle (e.g., a Winnebago motor home).

- Motorcycle
  This category includes large, medium, and small motorcycles.

  Minibikes are excluded because they cannot be licensed for highway use.

Public Transportation

- Bus
  The bus category includes intercity buses, mass transit systems, and shuttle buses that are available to the general public. Also, Dial-A-Bus and Senior Citizen buses that are available to the public are included in this category.

  However, shuttle buses operated by a government agency or private industry for the convenience of employees, contracted or chartered buses, or school buses are excluded from this category.

- Commuter Train
  This category includes commuter trains and passenger trains other than elevated rail trains and subways. Commuter Train also includes local and commuter train service.

  Amtrak intercity service is excluded from this category.

- Streetcar/Trolley
  This category includes trolleys, streetcars, and cable cars.

- Elevated Rail/Subway
  This category includes elevated railways and subway trains in a city.

- Bus, Streetcar
  This category includes both the bus and streetcar/trolley categories as described above.

- Rail/Subway
  This category includes both the commuter train and elevated rail/subway categories as described above.

Other Modes

- Amtrak
  Amtrak is defined as the U.S. national passenger railroad service providing intercity train service.

  Amtrak intrecity service is excluded from the commuter train data.

- Airplane
  Airplanes include commercial airplanes and smaller planes that are available for use by the general public in exchange for a fare. Private planes and helicopters are included under "Other."

- Taxi
  Taxis include the use of a taxicab by a driver for hire, or by a passenger for fare, and airport limousines.

  The taxi category does not include rental cars if they are privately operated and not picking up passengers in return for fare.

- Bicycles
  This category includes bicycles of all speeds and sizes that do not have a motor.

- Walk
  This category includes jogging, walking, etc., provided the origin and destination are not the same.

- School Bus
  This category includes county school buses, private school buses, and buses chartered from private companies for the express purposes of carrying students to or from school and/or school-related activities.

- MOPED (Motorized Bicycle)
  This category includes motorized bicycles equipped with a small engine, typically characteristic of a two horsepower motor or less. Minibikes, dirt bikes, and trail bikes are excluded from this category. Note that a motorized bicycle may or may not be licensed for highway use.

- Other
  Includes any types of transportation not previously listed.

Metropolitan Statistical Area (MSA)

Except in the New England States, a Metropolitan Statistical Area is a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more, or "twin cities" with a combined population of at least 50,000. In addition, contiguous counties are included in an MSA if, according to certain criteria, they are socially and economically integrated with the central city. In the New England States, MSA's consist of towns and cities instead of counties.

Motorized Vehicle

Motorized vehicles are all vehicles that are licensed for highway driving. Snow mobiles and minibikes are specifically excluded.

Occupancy

Occupancy is the number of persons, including driver and passenger(s) in a vehicle. NPTS occupancy rates are generally calculated as person miles divided by vehicle miles.

Origin

Origin is the starting point of a trip.

Passenger

For a specific trip, a passenger is any occupant of a motorized vehicle, other than the driver.

Person Miles of Travel (PMT)
PMT is a measure of person travel. When one person travels one mile, one person mile of travel results. Where 2 or more persons travel together in the same vehicle, each person makes the same number of person miles as the vehicle miles. Therefore, four persons traveling 5 miles in the same vehicle, make 20 person miles (4 x 5 = 20).

Person Trip
A person trip is a trip by one or more persons in any mode of transportation. Each person is considered as making one person trip. For example, four persons traveling together in one auto makes four person trips.

Season
Season is defined as: Winter - December, January and February; Spring - March, April and May; Summer - June, July and August; and Fall - September, October and November.

Traffic Accident
A traffic accident is an accident that involves a motor vehicle which occurs on a public highway or road in the United States, and results in property damage or personal injury.

Traffic Accidents do not include accidents which occur in a parking lot, in a driveway, on a private road, or in a foreign country.

Travel Day
A travel day is a 24-hour period from 4:00 a.m. to 3:59 a.m. designated as the reference period for studying trips and travel by members of a sampled household.

Travel Period
A travel period consists of 14 days. The travel period is the 13 day period which precedes the travel day, and includes the 14th day as the travel day for a sampled household.

Travel Day Trip
A travel day trip is defined as any one-way travel from one address (place) to another by any means of transportation (e.g., private motor vehicle, public transportation, bicycle, or walking). When traveling to more than one destination, a separate trip exists each time one or both of the following criteria is satisfied:

(a) the travel time between two destinations exceeds 5 minutes, and/or

(b) the purpose for travel to one destination is different from the purpose for travel to another.

An exception to a travel day trip is travel within a shopping center or mall. It is to be considered travel to one destination, regardless of the number of stores visited.

Travel Period Trip
A travel period trip is a one-way destination which is 75 miles-or-more from home with a return home trip during the 14-day travel period. Travel to the destination is counted as one trip and travel to return home is counted as another trip. For example, a person living in Denver flies to San Francisco, stays one week, and returns to Denver during the 14-day travel period. This would be counted as two travel period trips - one outgoing and one return. The only time a travel period trip would not have a return trip collected is when the respondent moves his/her residence.

Trip Purpose

A trip purpose is the main reason that motivates a trip. For purposes of this survey, there are 11 trip reasons. For travel day trips, if there is more than one reason, and the reasons do not involve different destinations, then only the main reason is chosen. If there are two or more reasons, and they each involve different destinations, then each reason is classified as a separate trip. For travel period trips, if there is more than one reason, the primary reason is collected. The 11 trip reasons (grouped into the five major purposes) are defined as follows:

Earning a Living

- To or From Work
  Travel to a place where one reports for work; excluding work-related travel.

- Work-Related Business
  Trips related to business activities; excluding travel to the place of work.

Example: a plumber drives to a wholesale dealer to purchase supplies for his business, or a company executive travels from his office to another firm to attend a business meeting.

Business, out-of-town trips, and professional conventions are included.

Family and Personal Business

- Shopping
  Shopping includes "window-shopping" and purchases of commodities such as groceries, furniture, clothing, etc. for use or consumption elsewhere.

- Doctor/Dentist
  This category includes trips made for medical, dental, or psychiatric treatment, or other related professional services.

- Other Family or Personal Business
  This category includes the purchase of services such as cleaning garments, servicing an automobile, haircuts, banking, legal services, etc.

School or Church

- School/Church
  This category includes trips to school, college or university for class(es), or to PTA meetings, seminars, etc., or to church services or to participate in other religious activities.

  Social activities that take place at a church or school, but cannot be classified as religious or educational are not included in this category.

Social and Recreational

- Vacation
  This category is for trips reported by the respondent as "vacation."

- Visit Friends or Relatives
  Trips which are specifically designated to visit friends or relatives.

- Pleasure Driving
  Driving trips made with no other purpose listed but to "go for a drive" with no destination in mind.

- Other Social or Recreational
  Trips taken to enjoy some form of social activity involving friends or acquaintances. This category includes trips for general entertainment or recreation (both as observer or as participant).

Other

- Other
  For trips that do not fit in any of the other categories.

Urbanized Area
An approximate classification of sample households belonging or not belonging to an urbanized area. Those areas classified as an urbanized area are listed below:

1. In a central city of an MSA, or
2. In an MSA but outside the central city, and
3. Within a zip code area with a population density of at least 500 people per square mile in 1990.

Vehicle
In the 1969 survey, vehicle refers to autos and passenger vans owned or available to the household. In the 1977, 1983, and 1990 surveys, the term vehicle was expanded to include pickups and other light trucks, RV's, motorcycles and mopeds owned or available to the household. Estimates show that in 1969 there were an additional 7.5 million pickups and other light trucks that are not reflected in the 1969 NPTS data.

Vehicle Mile of Travel (VMT)
VMT is a unit to measure vehicle travel made by a private vehicle, such as an automobile, van, pickup truck, or motorcycle. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle.

Vehicle Occupancy
Vehicle Occupancy is the number of persons, including driver and passenger(s) in a vehicle; also includes persons who did not complete a whole trip. NPTS occupancy rates are generally calculated as person miles divided by vehicle miles.

Vehicle Trip
A trip by a single vehicle regardless of the number of persons in the vehicle.

Vehicle Type
For purposes of the 1990 NPTS, one of the nine vehicle types used for coding purposes in the household motorized vehicle record. The nine types are:

1. Automobile (including station wagon)
2. Passenger
3. Cargo
4. Pickup Truck (including pickup with camper)
5. Other Truck
6. RV or Motor Home
7. Motorcycle
8. Moped (Motorized Bicycle)
9. Other (Specify)

See "Means of Transportation" for definitions of these vehicle types.

Weekday
Weekday is defined as the time between 12:01 a.m. Monday and 6:00 p.m. Friday. This was done because Friday evening is considered the start of the weekend.

Weekend
Weekend is defined as the time between 6:01 p.m. Friday and midnight Sunday.

Appendix B

Differences in Geographical Boundaries Between 1983 and 1990 NPTS

B

Appendix B Differences in Geographical Boundaries Between 1983 and 1990 NPTS

BETWEEN 1983 and 1990, the definitions of two geographical boundaries changed. These changes complicate any comparisons of metropolitan area data from the 1983 and 1990 NPTS. One change is the definition of a Metropolitan Statistical Area (MSA). In 1983 all areas were divided into combinations of counties called Standard Metropolitan Statistical Areas (SMSAs), with the exception that SMSAs in New England consisted of cities and towns. Typically, metropolitan areas are redefined following each census, resulting in additions or subtractions of counties, New England towns, and central cities. Substantial changes were made following the 1980 Census because of considerable revisions in the standards used by the Office of Management and Budget to define the areas.

By 1990 the term "metropolitan statistical area" (MSA) replaced "standard metropolitan statistical area" (SMSA). An optional two-tiered metropolitan structure was introduced for MSAs of a million people or more. These MSAs could be subdivided into primary MSAs (PMSAs) if certain decentralization conditions were met and if the locality desired such subdivisions. If PMSA's were defined within an MSA, then the MSA became a consolidated MSA (CMSA). Table B.1 summarizes the metropolitan area changes since the 1980 Census.

Of the 318 preexisting SMSAs, 53 became PMSAs within 15 CMSAs, and 8 new PMSAs were established within these CMSAs. In addition, 5 preexisting SMSAs became CMSAs which were further subdivided into 10 PMSAs. As the result of these redefinitions, there were 20 CMSAs with 71 component PMSAs when the 1990 NPTS was conducted.

Among these 20 CMSAs, there were ten with a population of more than 3 million. These ten CMSAs were made up of 48 PMSAs, most of which did not by themselves have a population more than 3 million. Moreover, there was one MSA in 1990 with a population of more than 3 million.

In the 1990 NPTS, the variable MSASIZE was given a population size value based on its MSA or CMSA size. Therefore, if a household was located in an area within a PMSA of less then 3 million, but its CMSA had a population of more than 3 million, then the household was categorized as being located in an MSA of 3+ million. In 1983, however, only the SMSAs which by themselves had a population of more than 3 million were categorized as being "3+ million."

The implication of this definitional change on the NPTS data is that many more households were estimated by the 1990 data as being located within metropolitan areas with a population of more than 3 million than that estimated by the 1983 NPTS. The reason is that all of the 1990 households in the aforementioned 48 PMSAs and the one MSA were classified as being located within areas with a population of more than 3 million, although most of these 48 PMSAs did not by themselves have a population of more than 3 million. On the other hand, the 1983 NPTS classified households located within SMSAs which by themselves had a population of more than 3 million as being located in areas with a population of "3+ million."

The second geographic boundary change was the definition of a central city. Central cities are now defined as the largest city in population in the MSA plus any other cities of more than 25,000 (15,000 if one-third of the largest city's population) provided that

they meet certain standards which demonstrate their status as centers of employment. Prior to 1983 there could be up to three central cities, including the largest plus the next two largest, if their population was at least one-third of the largest city's population. The number of MSA central cities is now 525 compared with only 429 SMSA central cities prior to 1983.

TABLE B.1

SUMMARY OF METROPOLITAN AREA CHANGES SINCE THE 1980 CENSUS[1]

Of the preexisting 318 SMSAs in the 1980 Census:

- 53 SMSAs in 1983 became PMSAs within 15 CMSAs, and 8 new PMSAs were established within these CMSAs. The 8 new PMSAs were:
  - Salem-Gloucester, MA (in Boston CMSA),
  - Aurora-Elgin, Joliet, and Lake City of Illinois (in Chicago CMSA),
  - Middletown, CT (in Hartford CMSA),
  - Brazoria, TX (in Houston CMSA),
  - Pawtucket-Woonsocket-Attleboro, RI-MA (in Providence CMSA), and
  - Oakland, CA (in San Francisco CMSA).

- 7 SMSAs in 1983 became CMSAs which were further divided into a total of 15 PMSAs. They were:
  - Buffalo, NY
  - Dallas-Fort Worth, TX
  - Denver, CO
  - Kansas City, MO
  - Pittsburgh, PA
  - Portland, OR
  - St. Louis, MO

- 2 SMSAs (Kansas City and St. Louis) reverted to MSA status, eliminating their CMSAs and 5 PMSAs.

- 8 SMSAs were absorbed by adjacent areas:
  - Bay City, MI by Saginaw,
  - Meriden, CT by New Haven,
  - Newark, OH by Columbus,
  - Newport News-Hampton, VA by Norfolk,
  - Petersburg-Colonial Heights-Hopewell, VA by Richmond,
  - Rock Hill, SC and Salisburg-Concord, NC by Charlotte, and
  - Springfield, OH by Dayton.

- 85 SMSAs became MSAs with changes in composition.

- 167 SMSAs became MSAs without any changes.

New MSAs since the 1980 Census:

- 3 MSAs were added due to the new 1983 MA definition:
  - Dothan, AL
  - Fort Pierce, FL
  - Houma-Thibodaux, LA

- 9 new MSAs were established between 1984 and 1990:
  - Naples, FL (established in 1984)
  - Santa Fe, NM (established in 1984)
  - Cheyenne, WY (established in 1985)
  - Jackson, TN (established in 1985)
  - Rapid City, SD (established in 1985)
  - Merced, CA (established in 1986)
  - Decatur, AL (established in 1988)
  - Jamestown-Dunkirk, NY (established in 1988)
  - Yuma, AZ (established in 1990)

[1] Summarized by the U.S. Bureau of the Census.

Appendix C

Weighting Procedures

C

Appendix C Weighting Procedures[1]

THIS section discusses the weighting procedures for the 1990 NPTS. These weighting factors are necessary in order to obtain estimated totals for the U.S. population. The weights reflect the sample design and selection probabilities, as well as adjustments to compensate for survey nonresponse and noncoverage. The weights are multiplicative factors; that is, the estimated total is obtained by multiplying each data value by the appropriate weight and summing the results.

The weight variables are included in the proper data files as follows:

1. The Household and Vehicle Files (HOUSEHLD.DAT and VEHICLE.DAT) contain the variable WTHHFIN, which is the weight used to make estimates of household characteristics such as household income and the number of vehicles per household.

2. The Person File (PERSON.DAT) includes the variable WTPERFIN, the weight used to make person-level estimates such as the number of licensed drivers or annual miles driven.

3. The Travel Day Files (DAYTRIP.DAT and SEGTRIP.DAT) contain the variable WTTRDFIN, the weight used to compute estimates of travel characteristics collected for the travel day, such as the number of person trips and their distributions by mode and purpose. The DAYTRIP.DAT file also contains a second weight variable (WTTOHFIN), which is used only for making estimates based on the data from Question 32 of the Travel Day Section, miles driven by type of highway.

4. The Travel Period Trip File (PERTRIP.DAT) includes the variable WTTRPFIN, which is the weight used to make estimates for characteristics of the travel period trip, those of 75 miles or longer one-way.

Estimates of the number of vehicle trips or vehicle miles of travel should be based on only the data for the persons who drove the vehicles to avoid counting the trips or miles more than once. The variable DRVR_FLG in the Travel Day Files identifies those trips in which the respondent was the driver. In the Travel Period File, there are two such variables (TODRVFLG and RTDRVFLG) to indicate whether the respondent was the driver on the outgoing and return portions of the trip.

Because the sample units were telephone households, the first series of steps calculate the analysis weights to estimate household characteristics. All subsequent weights are based on the household analysis weights. Using the household weight, person-level weights were calculated adjusting for nonresponding members of the responding households. Travel-day and travel-period weights were then calculated based on the person-level weights.

One final weight calculation was required for the "miles-driven by type of highway" because these data were captured for a randomly selected trip for each person in the sample. This weight is based on the travel-day weight and also reflects the probability that the trip was selected.

The weight sums are:

- Household level 93,347,000
- Person level 222,100,829
- Travel-day level 249,562,296,784
- Travel-period level 1,536,106,728
- Randomly-selected trip level 173,376,227,059

[1] Source: U.S. Department of Transportation, Federal Highway Administration, 1990 Nationwide Personal Transportation Survey: User's Guide for the Public Use Tapes, pp. v1-v4, Washington, DC, December 1991.

The steps used in the weights calculations are summarized below.

The household weights were calculated as follows:

Step 1.
Calculate initial and sampling weights. Since the Mitofsky-Waksberg design was used in Quarter 1, the sampling weights are unknown but equal. The initial Quarter 1 weight ratios the sample households to the exogenous strata counts from Market Statistics. For Quarter 2, the initial weight ratioed the phone numbers in the 20,000 Nielsen sample to the Nielsen frame. This initial Quarter 2 weight was divided by the ratio of released numbers to the 20,000 Nielsen sample, yielding the sampling weight (which ratios the released numbers to the frame). For Quarters 3 and 4, the sampling weight was the initial weight calculated and ratioed the released numbers to the frame.

Step 2.
Poststratification of the sampling weights. The Quarters 2 through 4 sampling weights were post-stratified to the exogenous strata counts from Market Statistics.

Step 3.
Nonresponse and multiplicity adjustments. The Quarter 1 weight from Step 1 and the Quarters 2 through 4 weights from Step 2 were adjusted for nonresponse. The adjustment factor ratioed the responding households to the responding and nonresponding households. These weights were then adjusted for multiple phone numbers in a household.

Step 4.
Combining the quarters. The weights from Step 3 were prorated by the percent of the responding households in each quarter.

Step 5.
Smoothing the weights across the year. The weights from Step 4 were divided into 6 pairs based on the travel month, (i.e. January with February, etc). These weights were ratioed to 1/6 of the Market Statistics counts.

Step 6.
Poststratification to Current Population Survey estimates. The final step in calculation of the household-level weights adjusted the weights from Step 5 so that they summed to March 1990 Current Population Survey estimates for five characteristics given in Table C.1:

- Census Region
- Household size
- MSA status
- Race (black, nonblack)
- Ethnicity (Hispanic, nonhispanic).

The person weights were calculated from the final household weights that resulted from Step 6, above.

Step 7.
Person-level nonresponse adjustment. The initial person-level weight (from Step 6.) was adjusted for nonresponse. The adjustment factor ratioed the sum of the weights for all responding persons to the sum of the weights for all responding and nonresponding persons.

Step 8.
Travel day and travel period weights. The travel-day and travel-period weights were calculated from the final person-level weights from Step 7, above. The travel-day weight was calculated by multiplying the final person weight, from Step 7, by 365 to expand the person travel day to an annual

Table C.1

March 1990 Current Population Survey Household Estimates

Household Characteristic	Estimated Number of Households (CPS 3/90) (000)	
Census Region		
Northeast	19,127	*(20.5%)*
Midwest	22,760	*(24.4%)*
South	32,261	*(34.6%)*
West	19,199	*(20.6%)*
Household Size		
1 person	22,999	*(24.6%)*
2 persons	30,114	*(32.3%)*
3 persons	16,128	*(17.3%)*
4+ persons	24,106	*(25.8%)*
MSA status		
in MSA 2.5M+	29,177	*(31.3%)*
in MSA 1M - 2.5 M	16,793	*(18.0%)*
in MSA < 1M	26,361	*(28.2%)*
not in MSA	21,016	*(22.5%)*
Race of Householder		
Black	10,486	*(11.2%)*
Nonblack	82,861	*(88.8%)*
Ethnicity of Householder		
Hispanic	5,933	*(6.4%)*
Nonhispanic	87,414	*(93.6%)*
TOTAL	**93,347**	*(100.0%)*

total. The travel-period weight was calculated by dividing the travel-day weight by 14, to reflect the 14-day travel period.

Step 9.

Nonresponse adjustment. The final travel day weight from Step 8 was adjusted by ratioing the travel respondents to the travel respondents and nonrespondents.

Step 10.

Randomly selected trip and type-of-highway weights. The conditional randomly-selected-trip weight was calculated by dividing the total mileage for all eligible trips for a person by the length of the selected trip. The type-of-highway weight was calculated by multiplying the weight from Step 9 by the conditional randomly selected trip weight.

Appendix D

Estimated Standard Errors of Key Statistics

D

Appendix D Estimated Standard Errors of Key Statistics

THE final adjusted weights are used in calculating parameter estimates and their sample variances. Research Triangle Institute (RTI) uses SUDAAN for these calculations. Variance estimation for the statistics computed in the SUDAAN series of procedures for survey data analysis is based on a first-order Taylor series approximation of the deviations of estimates from their expected values. This approximation for large samples is well-known (see Kendall and Stuart, 1961, p. 231). Woodruff (1971) presented applications of this technique to sample surveys. This method yields one of the best known numerical approximations currently available in the statistical literature for ratio estimates. The general approach taken to compute variances is to first form the Taylor series linearization for a particular statistic. These linearized values are referred to as Z_i for the ith sample unit throughout this appendix. Once the linearized values are formed, they are substituted into the formula for computing the variance of a total estimate that is appropriate for the design. Estimating the total number of individuals who belong to an arbitrarily defined domain or subpopulation provides a convenient example. Denote the total in question by N_d, where d denotes the domain. Establish a domain indicator

$$I_{hijk} = \begin{cases} 1 & \text{if the } k^{th} \text{ person is in the domain} \\ 0 & \text{if the } k^{th} \text{ person is } \underline{\text{not}} \text{ in the domain} \end{cases}$$

where

h is the stratum, h=1, ..., H

i is the ith cluster, in stratum h, i=1, ..., n_h

j is the jth household in the cluster i in stratum h, j=1, ..., n_i

k is the kth person in the household; in cluster i in stratum h, k=1, ..., n_j

and w_{hijk} is the population weight for person k in household j in cluster i in stratum h.

Then, $Z_{hijk} = I_{hijk} \bullet W_{hijk}$

and the estimate of the domain total is

$$\hat{N}_d = \sum_h \sum_i \sum_j \sum_k Z_{hijk}$$

and the variance of this estimate is

$$Var(Z) = \sum_h n_h s_h^2$$

where

$$S_h^2 = \frac{\sum_i (z_{hi} - \bar{z}_h)^2}{n_k - 1}$$

, the stratum-level sum of squares,

with

$$Z_{hi} = \sum_j \sum_k Z_{hijk},$$

, the cluster-level sum,

and

$$\bar{Z}_h = \frac{\sum_i Z_{hi}}{n_h}$$

, the stratum level mean.

Other methods of obtaining the variance estimates could be used instead of the first order Taylor series linearizations. Examples include such pseudorandomization techniques as balanced repeated replications (BRR), jackknifing and bootstrapping. The Taylor series linearization is preferred by many because of its computational efficiency (generally less demanding of computer time).

Specifically, standard errors for particular statistics such as the number of person trips taken by a particular mode, or by an age group, or for a particular purpose, (as given in Tables D1- D14) can be calculated using two variables in the NPTS files. These variables are PSU_ID and VARSTRAT. VARSTRAT contains the h = 1, . . . ,H geographical stratums used while conducting the survey, while PSU_ID (i = 1, . . . ,n) identifies the ith cluster in stratum h. Thus, n_h is the number of clusters (PSU_ID) in stratum h (VARSTRAT), and z_{hi} is the weighted total value for cluster i in stratum h, where value pertains to the weighted total number of miles, trips, households, etc., depending on the statistic which is being evaluated.

Depending on the minimum number of stratum clusters, the standard error was defined as follows:

$$se = \begin{cases} se_1 & , if\ n_h > 3 \\ se_2 & , otherwise \end{cases}$$

$$se_1 = \sqrt{v_1}$$

$$se_2 = \sqrt{v_2}$$

where:

$$v_1 = \sum_{h=1}^{H} W_h - n_h$$

$$v_2 = \frac{\sum_{h=1}^{H} \sum_{i=1}^{n_h} \left[Z_{h_i} - \frac{\sum_{h=1}^{H} \sum_{i=1}^{n_h} Z_{h_i}}{\sum_{h=1}^{H}} \right]^2}{\sum_{h=1}^{H} n_h - 1}$$

n_h = number of PSU_ID's in the hth VARSTRAT

z_{hi} = sum of weighted variable[1] for i^{th} PSU_ID in the hth VARSTRAT

$$w_h = \frac{\sum_{i=1}^{n_h} \left[Z_{h_i} - \frac{\sum_{i=1}^{n_h} Z_{h_i}}{n_h} \right]^2}{n_h - 1}$$

Estimated standard errors for selected statistics are presented in Tables D1-D14.

The standard errors that are shown in Tables D1- D14 reflect the sampling error and also the variation in estimates due to some nonsampling errors. Sampling error is due to variability between estimates from all other possible samples of the same size that could have been selected using the same sample design. Estimates that were derived from any of these different samples would differ from one another. This variability, along with some nonsampling error, are measured by the stan-

[1] i.e. wthhfin, wttrdfin, trpmiles *wttrdfin

dard error. The systematic biases and some additional nonsampling errors are not found in the standard error. Some examples of nonsampling errors would include nonresponse, inaccurate response, and data entry errors. Thus, the accuracy of the estimates given is dependent on the sampling error and nonsampling errors which are measured by the standard error, and also on the biases and nonsampling errors which are not measured by the standard error.

The standard error of these estimates can be used to construct an interval around specific estimates. This interval will include, with a given amount of confidence, the average result of all possible samples. About 68 percent of the intervals, created by subtracting one standard error and adding one standard error, will include the average result of all possible samples. About 95 percent of the intervals, created by subtracting two standard errors and adding two standard errors, will include the average result of all possible samples, and about 99.99 percent of the intervals, created by subtracting and adding three standard errors, will include the average result of all possible samples. Thus, one can state, with a given percent of confidence (as stated above) that the computed interval will contain the average result of all possible samples.

An example of how these standard errors could be used is as follows. One may want to know the number of vehicle trips taken by an automobile. The estimated total number of vehicle trips taken by automobiles is 127,693,762 thousand. The standard error for this estimate, as found in Table D-12, is 1,111,866 thousand. To construct an interval that would include the average about 68 percent of the time, one would calculate: 127,693,762,000 ± (1)1,111,866,000. Therefore, a 68 percent confidence interval for the average result of all possible samples, as shown by this data, would be included in the interval 126,581,896 thousand to 128,805,628 thousand vehicle trips. An interval that would include the average about 95 percent of the time would be constructed by solving: 127,693,762,000 ± (2)1,111,866,000. Hence, a 95 percent confidence interval for the average result of all possible samples, for the total number of vehicle trips taken in automobiles, is estimated to be in the interval from 125,470,030 thousand to 129,917,494 thousand vehicle trips.

Table D.1

Standard Error for Selected Estimated Summary Statistics
1990 NPTS

	Standard Error for Summary Statistics
Total Number of Households	402,292
Total Number of Persons	1,318,004
Total Number of Licensed Drivers	906,298
Total Number of Workers	799,933
Household Vehicles	956,682
Household Vehicle Trips	1,250,013,000
Household Vehicle Miles of Travel	18,678,030,000
Person Trips	1,927,250,000
Person Miles of Travel	43,718,160,000
Travel Period Vehicle Trips	29,757,650
Travel Period Vehicle Miles of Travel	12,240,800,000
Travel Period Person Trips	50,411,100
Travel Period Person Miles of Travel	33,790,560,000
Total[1] Vehicle Miles of Travel	20,964,960,000
Total[1] Person Miles of Travel	49,414,320,000

[1] Includes both travel day miles of travel and travel period miles of travel.

TABLE D.2

STANDARD ERROR FOR ESTIMATED NUMBER OF PERSONS BY RACE
1990 NPTS

Race	Standard Error for Persons
White	1,141,124
Black	665,707
Other	569,008
ALL	**1,318,004**

Table D.3

Standard Errors for Estimated Number of Persons by Age
1990 NPTS

Age	Standard Error for Persons
5-15	478,506
16 - 19	280,742
20 - 29	573,173
30 - 39	534,884
40 - 49	325,296
50 - 59	319,800
60 - 64	190,250
65 and Over	362,950
ALL	**1,318,004**

TABLE D.4

STANDARD ERRORS FOR ESTIMATED NUMBER OF PERSONS, WORKERS, AND LICENSED DRIVERS BY SEX
1990 NPTS

Number of Persons	Standard Error
Male	712,026
Female	783,723
ALL	**1,318,004**
Number of Workers	Standard Error
Male	470,702
Female	439,921
ALL	**799,933**
Number of Licensed Drivers	Standard Error
Male	516,511
Female	535,357
ALL	**906,298**

Table D.5

Standard Errors for Estimated Number of Workers by Age
1990 NPTS

Age	Standard Error for Workers
16 - 19	154,814
20 - 29	474,331
30 - 39	456,600
40 - 49	346,467
50 - 59	234,288
60 - 64	123,874
65 and Over	82,925
ALL	**799,933**

TABLE D.6

STANDARD ERRORS FOR ESTIMATED NUMBER OF HOUSEHOLDS BY MSA SIZE
1990 NPTS

MSA Size	Standard Error for Households
Less than 250,000	282,843
250,000 - 499,999	250,932
500,000 - 999,999	255,114
1,000,000 - 2,999,999	400,413
3,000,000 or more	457,622
Not in MSA	439,012
ALL	**402,292**

Table D.7

Standard Errors for Estimated Number of Persons by MSA Size
1990 NPTS

MSA Size	Standard Error for Persons
Less than 250,000	668,063
250,000 - 499,999	629,786
500,000 - 999,999	627,825
1,000,000 - 2,999,999	1,024,451
3,000,000 or More	1,237,968
Not in MSA	1,071,904
ALL	**1,318,004**

TABLE D.8

STANDARD ERRORS FOR ESTIMATED NUMBER OF VEHICLES BY MSA SIZE
1990 NPTS

MSA Size	Standard Error for Vehicles
Less than 250,000	533,609
250,000 - 499,999	496,689
500,000 - 999,999	508,013
1,000,000 - 2,999,999	755,050
3,000,000 or more	882,691
Not in MSA	883,832
ALL	**956,682**

Table D.9

Standard Errors for Estimated Person Trips and Person Miles of Travel by MSA Size
1990 NPTS

MSA Size	Standard Error	
	Person Trips	Person Miles of Travel
Less than 250,000	997,426,600	16,560,790,000
250,000 - 499,999	854,976,400	9,124,026,000
500,000 - 999,999	897,134,100	10,954,620,000
1,000,000 - 2,999,999	1,385,446,000	23,768,680,000
3,000,000 or more	1,566,960,000	29,886,700,000
Not in MSA	1,437,063,000	20,205,500,000
ALL	**1,927,250,000**	**43,718,160,000**

TABLE D.10

STANDARD ERRORS FOR ESTIMATED VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL BY MSA SIZE
1990 NPTS

	Standard Error	
MSA Size	Vehicle Trips	Vehicle Miles of Travel
Less than 250,000	633,835,600	7,351,170,000
250,000 - 499,999	543,801,200	5,513,748,000
500,000 - 999,999	573,208,000	6,522,445,000
1,000,000 - 2,999,999	921,352,300	9,735,198,000
3,000,000 or more	972,618,200	11,761,430,000
Not in MSA	922,675,400	12,130,700,000
ALL	**1,250,013,000**	**18,678,030,000**

Table D.11

Standard Errors for Estimated Person Trips and Person Miles of Travel by Mode of Transportation
1990 NPTS

Mode	Standard Error	
	Person Trips	Person Miles of Travel
PRIVATE VEHICLE		
Auto	1,526,477,000	25,606,940,000
Passenger Van	469,521,800	10,432,040,000
Cargo Van	73,047,410	2,099,931,000
Pickup Truck	526,533,200	8,453,223,000
Other Truck	113,281,100	3,142,487,000
RV/Motor Home	46,837,990	1,644,538,000
Motorcycle	47,856,580	1,111,918,000
Moped	21,894,120	455,131,900
Other POV	29,719,960	339,988,000
PUBLIC TRANSPORTATION		
Bus	124,811,900	4,706,646,000
Amtrak	14,268,750	2,158,911,000
Commuter Train	37,097,430	1,524,714,000
Streetcar/Trolley	9,188,660	119,399,400
Elevated Rail/Subway	48,920,420	813,590,000
OTHER MODE		
Airplane	19,660,690	20,364,180,000
Taxi	38,145,620	315,254,400
Bicycle	89,960,530	364,603,700
Walk	525,762,300	429,712,900
School Bus	178,772,400	1,634,345,000
Other	39,896,910	12,364,990,000
ALL	**1,927,250,000**	**43,718,160,000**

TABLE D.12

STANDARD ERRORS FOR ESTIMATED VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL BY MODE OF TRANSPORTATION
1990 NPTS

Mode	Standard Error	
	Vehicle Trips	Vehicle Miles of Travel
Auto	1,111,866,000	16,118,840,000
Passenger Van	251,058,800	4,370,449,000
Cargo Van	63,033,060	1,609,946,000
Pickup Truck	405,292,000	6,578,588,000
Other Truck	69,519,750	2,740,346,000
RV/Motor Home	48,863,300	670,972,800
Motorcycle	45,847,390	986,791,600
Moped	16,212,150	166,125,300
Other POV	27,766,250	304,218,200
ALL	**1,250,013,000**	**18,678,030,000**

Table D.13

Standard Errors for Estimated Number of Person Trips and Person Miles of Travel by Trip Purpose
1990 NPTS

Trip Purpose	Standard Error	
	Person Trips	Person Miles of Travel
EARNING A LIVING		
To or From Work	478,799,000	8,744,114,000
Work-Related Business	122,168,200	12,993,260,000
FAMILY AND PERSONAL BUSINESS		
Shopping	525,347,900	6,650,350,000
Doctor/Dentist	93,519,850	1,827,617,000
Other Family Business	664,388,300	17,655,540,000
CIVIC, EDUCATIONAL, & RELIGIOUS		
	480,746,100	5,957,504,000
SOCIAL & RECREATIONAL		
Vacation	67,621,560	20,521,330,000
Visiting Friends	411,233,300	11,638,720,000
Pleasure Driving	56,242,260	2,156,869,000
Other Social/Recreational	623,359,700	18,112,470,000
OTHER		
	107,887,900	2,964,184,000
ALL	**1,927,250,000**	**43,718,160,000**

TABLE D.14

STANDARD ERRORS FOR ESTIMATED NUMBER OF VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL BY TRIP PURPOSE
1990 NPTS

Trip Purpose	Standard Error	
	Vehicle Trips	Vehicle Miles of Travel
EARNING A LIVING		
To or From Work	412,421,100	7,724,612,000
Work-Related Business	103,466,000	3,723,768,000
FAMILY AND PERSONAL BUSINESS		
Shopping	348,158,300	3,610,234,000
Doctor/Dentist	66,800,150	1,200,897,000
Other Family Business	472,715,100	7,958,197,000
CIVIC, EDUCATIONAL, & RELIGIOUS		
	178,321,900	2,991,542,000
SOCIAL & RECREATIONAL		
Vacation	23,328,510	3,219,005,000
Visiting Friends	245,218,400	6,236,333,000
Pleasure Driving	31,680,220	1,487,875,000
Other Social/Recreational	318,760,900	6,710,482,000
OTHER		
	76,473,870	2,216,324,000
ALL	**1,250,013,000**	**18,678,030,000**

Appendix E

Procedure To Adjust 1983 Income Categories Into 1990 Dollars

E

Appendix E Procedure to Adjust 1983 Income Categories into 1990 Dollars

TO protect the confidentiality of NPTS respondents, their household income data were categorized and available only in income categories. To assure compatibility in comparing 1983 and 1990 survey results, the 1983 income categories needed to be adjusted to reflect monetary inflation between 1983 and 1990. The adjustment is not straightforward due to the categorical nature of the data. A cumulative polynomial fitting technique is used, consisting of three steps:

(1) The basic idea of this technique is to first fit a polynomial curve to the cumulative frequency distribution (of any data element).

(2) The 1983 income is adjusted by the Consumer Price Index (CPI) to 1990 dollars.

(3) Without altering the cumulative frequency distribution, one can then "recategorize" the cumulative frequency distribution into any desired categories.

An example of how 1983 data were adjusted is given. This example redistributes 1983 households into adjusted 1983 income categories.

Table E.1 gives the 1983 income categories, and the corresponding number of households in each category. Since the cumulative polynomial fitting technique fits a polynomial curve to the cumulative distribution based on the endpoints of the income categories and since the last income category — $80,000 and up — has an indefinite range, it is impossible to determine the endpoint of this income category. To overcome this difficulty, this income category is divided into several categories with income intervals of equal size. In order to determine the number of "equally-spaced" categories that should represent the last income category, the following equation is used:

$$I = \frac{\text{Total number of households earning \$80,000 \& up}}{\text{Total number of households earning \$75,000-80,000}} = \frac{1{,}394}{404} = 3.45$$

The solution to this equation implies that the last income category should be divided into four categories ($80,000-85,000, $85,000-90,000, $90,000-95,000 and $95,000-100,000). Each of the first three categories is assumed to have the same number of households as the "$75,000-80,000" category. That is, the categories "$75,000-80,000", "$80,000-85,000", "$85,000-90,000" and "$90,000-95,000" will each have an estimated total of 404 households. To estimate the total number of households in the last income category, "$95,000-100,000", the following equation is used:

Total number of households in the "$95,000-100,000" category

= Total households in the original "$80,000 and up" category -

[(Number of new categories created - 1) x

Total households in the "$75,000-80,000" category]

= 1,394 - (3 x 404)

= 182.

The revised 1983 income categories and the corresponding number of households in each category are shown in Table E.2.

TABLE E.1

Number of Households by 1983 Household Income

1983 INCOME (THOUSANDS)	TOTAL NUMBER OF HOUSEHOLDS
Less than $5	9,475
$5-10	12,878
$10-15	12,602
$15-20	10,159
$20-25	9,708
$25-30	8,061
$30-35	6,117
$35-40	4,249
$40-45	3,504
$45-50	1,985
$50-55	1,852
$55-60	1,069
$60-65	769
$65-70	654
$70-75	499
$75-80	404
$80 and up	1,394

TABLE E.2

NUMBER OF HOUSEHOLDS AND THE ENDPOINTS OF REVISED 1983 INCOME CATEGORIES, (INCLUDING FOUR NEW INCOME CATEGORIES)

REVISED 1983 INCOME CATEGORY (THOUSANDS)	ENDPOINT OF INCOME CATEGORIES ($X_{83,i}$)	TOTAL NUMBER OF HOUSEHOLDS IN 1983 ($Y_{83,i}$)	CUMULATIVE TOTAL NUMBER OF HOUSEHOLDS IN 1983 ($W_{83,i}$)
Less than $5	$5	9,475	9,475
$5-10	$10	12,878	22,353
$10-15	$15	12,602	34,955
$15-20	$20	10,159	45,114
$20-25	$25	9,708	54,822
$25-30	$30	8,061	62,883
$30-35	$35	6,117	69,000
$35-40	$40	4,249	73,249
$40-45	$45	3,504	76,753
$45-50	$50	1,985	78,738
$50-55	$55	1,852	80,590
$55-60	$60	1,069	81,659
$60-65	$65	769	82,428
$65-70	$70	654	83,082
$70-75	$75	499	83,581
$75-80	$80	404	83,985
$80-85	$85	404	84,389
$85-90	$90	404	84,790
$90-95	$95	404	85,197
$95-100	$100	182	85,379

STEP 1. FIT A POLYNOMIAL MODEL.

The first step in the cumulative polynomial fitting technique is to fit a polynomial model based on the endpoints of the revised 1983 income categories. Based on the end points $X_{83,i}$ and their corresponding cumulative totals, $W_{83,i}$ (Table E.2), a_k=10 order polynomial fit was developed. To estimate the parameters a_k , k=1,2,...,10, the sum of the squares of the residuals, e_i^2, is minimized.

$$W_{83,i} = a_0 + (a_1 \text{ x } (X_{83,i})) + (a_2 \text{ x } (X^2_{83,i})) + \ldots + (a_k \text{ x } (X^k_{83,i})) + e_i$$

where i is the ith income category, i=1, 2, ..., (16+4); and

$X_{83,i}$ is the endpoint of i, expressed in thousands in this equation.

In fitting this curve, the following parameters for a_k were estimated:

Parameter:

a_0 = 2,293.86

a_1 = 2,967.89

a_2 = -49.3761

a_3 = 2.52795

a_4 = -0.105174

a_5 = 0.164953E-02

a_6 = 0.318930E-05

a_7 = -0.438472E-06

a_8 = 0.589443E-08

a_9 = -0.340569E-10

a_{10} = 0.754465E-13

Figure E.1 illustrates the cumulative number of households categorized by the revised 1983 income category and the fitted polynomial curve.

STEP 2. CONVERT 1983 INCOME CATEGORIES INTO 1990 DOLLARS.

Since the 1990 NPTS household income distribution is presented in 5 income categories, the question then becomes one of grouping the 1983 households into these 5 income categories and, at the same time, of taking into account the inflation factor. First, the endpoint of each 1990 income category is converted to 1983 dollars by using an inflation factor, r, which is calculated by dividing the 1990 consumer's price index (CPI) by the 1983 CPI.

$$r = \frac{CPI_{1990}}{CPI_{1983}} = 1.312$$, where CPI = consumer's price index

The rationale for this conversion is to determine the equivalent endpoints in 1983, given 1990 buying power. In other words, for households earning less than $10,000 per year in 1990, what would have been the equivalent cutoff point for this income category in 1983? With the inflation rate of 1.312, the equivalent cutoff point for the "less then $10,000" category in 1990 is "less than $7,622 (=$10,000/1.312)" in 1983. Similarly, earnings between $10,000 and $20,000 in 1990 are equivalent to earnings between $7,622 and $15,244 (=$20,000/1.312) in 1983. Table E.3 shows the revised 1983 income categories that are in 1990 dollars.

FIGURE E.1

FITTED POLYNOMIAL CURVE AND THE CUMULATIVE NUMBER OF HOUSEHOLDS BY REVISED 1983 INCOME CATEGORY

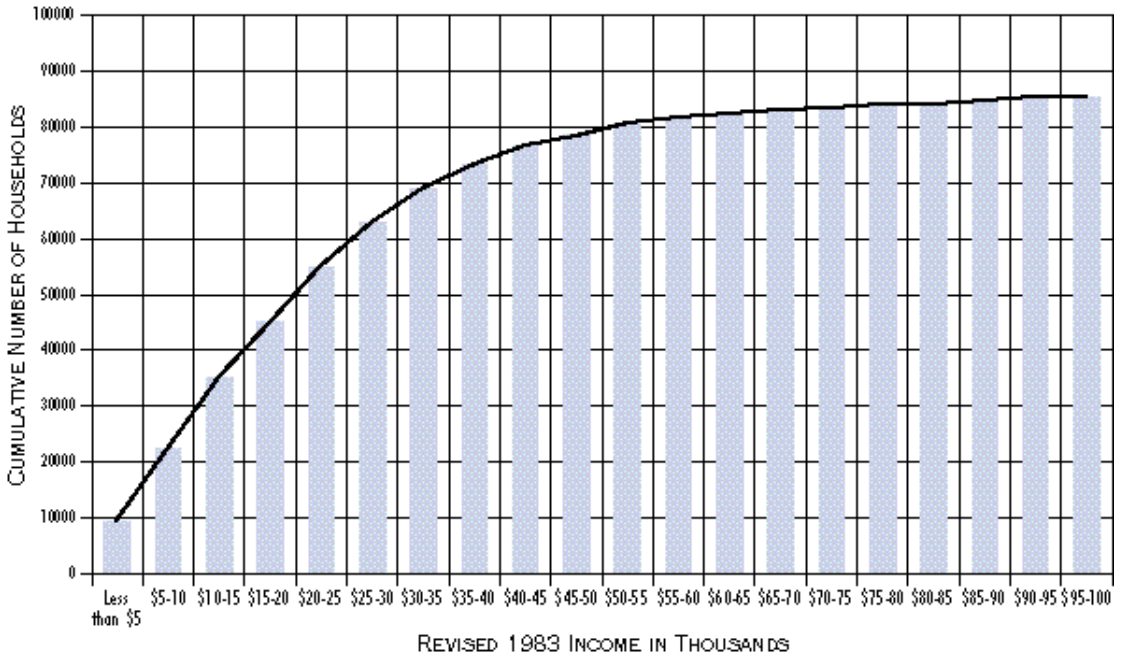

TABLE E.3

REVISED 1983 INCOME CATEGORIES

INCOME CATEGORY USED IN THE 1990 NPTS	REVISED 1983 INCOME CATEGORY IN 1990 DOLLARS
Less than $10,000	Less than $7,622
$10,000 - 20,000	$7,622 - 15,244
$20,000 - 30,000	$15,244 - 22,866
$30,000 - 40,000	$22,866 - 30,488
More than $40,000	More than $30,488

STEP 3. ESTIMATE 1983 HOUSEHOLD DISTRIBUTION USING THE REVISED INCOME CATEGORIES

To categorize the number of 1983 households in the revised 1983 income categories (Table E.3), the following equation is used:

$$W_{90,i} = a_0 + (a_1 \times (Z_{90,i})) + (a_2 \times (Z^2_{90,i})) + \ldots + (a_{10} \times (Z^{10}_{90,i}))$$

$$= 2{,}294 + 2{,}968 \times Z_{90,i} - 49.36 \times Z^2_{90,i} + 2.53 \times Z^9_{90,i} - 0.11 \times Z^4_{90,i} + 0.002 \times Z^5_{90,i}$$

where

- $W_{90,\,i}$ is the cumulative number of households in the revised 1983 income categories;
- i is the ith income category, i=1, 2, 3, 4, 5; and
- $Z_{90,i}$ = the endpoint of the revised 1983 income category i , in thousands of dollars (from Table E.3).

To calculate the number of households earning less then $7,622 per year in 1983, $Z_{90,1}$ in the above equation was replaced by 7.622:

$$W_{90,1} = 2{,}294 + 2{,}968 \times 7.622 - 49.36 \times 7.622^2 + 2.53 \times 7.622^3 - 0.11 \times 7.622^4 + 0.002 \times 7.622^5$$

$$= 18{,}016.$$

The 1983 household distribution categorized by the income categories that are in 1990 dollars is shown below.

1990 INCOME CATEGORY	REVISED 1983 INCOME CATEGORY IN 1990 DOLLARS	NUMBER OF 1983 HOUSEHOLDS (THOUSANDS)
Less than $10,000	Less than $7,622	$W_{90,1}$=18,016
$10,000 - 20,000	$7,622 - 15,244	$W_{90,2}$-$W_{90,1}$=18,437
$20,000 - 30,000	$15,244 - 22,866	$W_{90,3}$-$W_{90,2}$=15,694
$30,000 - 40,000	$22,866 - 30,488	$W_{90,4}$-$W_{90,3}$=12,065
More than $40,000	More than $30,488	$W_{90,5}$-$W_{90,4}$=21,167

Appendix F

Comparisons of Households Not Reporting Income With Those Reporting Income

F

Appendix F Comparisons of Households Not Reporting Income With Those Reporting Income

APPENDIX F provides statistics on household characteristics by whether the household reported household income or not. These tables are presented to help determine whether there are any differences between the households who reported their household income and households who did not report their household income.

TABLE F.1

NUMBER OF HOUSEHOLDS BY INCOME REPORTING STATUS AND HEAD OF THE HOUSEHOLD'S RACE
1990 NPTS

Head of the Household's Race	Income Reported	Income Not Reported	TOTAL
White	55,438	19,859	**75,297**
	(82.0%)	*(77.1%)*	*(80.7%)*
Black	7,223	3,086	**10,309**
	(10.7%)	*(12.0%)*	*(11.0%)*
Other	4,693	1,636	**6,329**
	(6.9%)	*(6.3%)*	*(6.8%)*
Unknown	230	1,181	**1,411**
	(0.3%)	*(4.6%)*	*(1.5%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

Table F.2

Number of Households by Income Reporting Status and Head of the Household's Hispanic Status
1990 NPTS

Head of the Household's Hispanic Status	Income Reported	Income Not Reported	TOTAL
Hispanic	4,382	1,451	**5,833**
	(6.5%)	*(5.6%)*	*(6.2%)*
Not Hispanic	63,069	23,292	**86,361**
	(93.3%)	*(90.4%)*	*(92.5%)*
Unknown	134	1,019	**1,153**
	(0.2%)	*(4.0%)*	*(1.2%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

Table F.3

Number of Households by Income Reporting Status and Distance to the Nearest Public Transportation
1990 NPTS

Distance to the Nearest Public Transportation	Income Reported	Income Not Reported	TOTAL
Less than 1/4 mile	23,219	9,176	**32,395**
	(34.4%)	*(35.6%)*	*(34.7%)*
1/4 to 1/2 mile	7,504	2,630	**10,134**
	(11.1%)	*(10.2%)*	*(10.9%)*
1/2 to 1 mile	3,021	990	**4,012**
	(4.5%)	*(3.8%)*	*(4.3%)*
1 mile or more	4,883	1,731	**6,614**
	(7.2%)	*(6.7%)*	*(7.1%)*
Not available	28,072	10,881	**38,954**
	(41.5%)	*(42.2%)*	*(41.7%)*
Unknown	885	354	**1,238**
	(1.3%)	*(1.4%)*	*(1.3%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

TABLE F.4

NUMBER OF HOUSEHOLDS BY INCOME REPORTING STATUS AND MSA SIZE
1990 NPTS

MSA Size	Income Reported	Income Not Reported	TOTAL
Less than 250,000	6,917	2,084	**9,001**
	(10.2%)	*(8.1%)*	*(9.6%)*
250,000-499,999	6,016	1,948	**7,964**
	(8.9%)	*(7.6%)*	*(8.5%)*
500,000-999,999	6,333	2,482	**8,815**
	(9.4%)	*(9.6%)*	*(9.4%)*
1,000,000-2,999,999	13,182	5,001	**18,183**
	(19.5%)	*(19.4%)*	*(19.5%)*
3,000,000 or More	19,485	8,484	**27,968**
	(28.8%)	*(32.9%)*	*(30.0%)*
Not in MSA	15,652	5,763	**21,415**
	(23.2%)	*(22.4%)*	*(22.9%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

Table F.5

Number of Households by Income Reporting Status and Urbanized Area Size
1990 NPTS

Urbanized Area Size	Income Reported	Income Not Reported	TOTAL
50,000-199,999	6,152	2,036	**8,188**
	(9.1%)	*(7.9%)*	*(8.8%)*
200,000-499,999	4,763	1,807	**6,570**
	(7.0%)	*(7.0%)*	*(7.0%)*
500,000-999,999	4,565	1,585	**6,150**
	(6.8%)	*(6.2%)*	*(6.6%)*
1,000,000 or more without subway/rail	13,507	4,998	**18,505**
	(20.0%)	*(19.4%)*	*(19.8%)*
1,000,000 or more with subway/rail	13,328	6,236	**19,564**
	(19.7%)	*(24.2%)*	*(21.0%)*
Not in Urbanized Area	25,270	9,100	**34,370**
	(37.4%)	*(35.3%)*	*(36.8%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

TABLE F.6

NUMBER OF HOUSEHOLDS BY INCOME REPORTING STATUS AND POPULATION DENSITY
1990 NPTS

Population Density[1]	Income Reported	Income Not Reported	**TOTAL**
Less than 1,000	34,046	12,058	**46,104**
	(50.4%)	*(46.8%)*	*(49.4%)*
1,000-4,999 within an MSA	21,408	8,332	**29,740**
	(31.7%)	*(32.3%)*	*(31.9%)*
5,000-9,999 within an MSA	7,240	3,033	**10,273**
	(10.7%)	*(11.8%)*	*(11.0%)*
10,000-49,999 within an MSA	3,896	1,938	**5,834**
	(5.8%)	*(7.5%)*	*(6.2%)*
50,000 or more within an MSA	501	183	**684**
	(0.7%)	*(0.7%)*	*(0.7%)*
1,000 or more not within an MSA	494	218	**712**
	(0.7%)	*(0.8%)*	*(0.8%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

[1] Population density is calculated as persons per square mile for the zip code in which the household is located.

TABLE F.7

NUMBER OF HOUSEHOLDS BY INCOME REPORTING STATUS AND WHETHER HOUSEHOLD IS LOCATED INSIDE OR OUTSIDE A CENTRAL CITY
1990 NPTS

Inside/Outside Central City Limits	Income Reported	Income Not Reported	TOTAL
Inside Central City	24,978	9,601	**34,579**
	(37.0%)	*(37.3%)*	*(37.0%)*
Outside Central City	26,839	10,199	**37,038**
	(39.7%)	*(39.6%)*	*(39.7%)*
Unknown	15,768	5,962	**21,730**
	(23.3%)	*(23.1%)*	*(23.3%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

Table F.8

Number of Households by Income Reporting Status and Number of Household Vehicles
1990 NPTS

Number of Household Vehicles	Income Reported	Income Not Reported	TOTAL
No Vehicles	5,460	3,113	**8,573**
	(8.1%)	*(12.1%)*	*(9.2%)*
One Vehicle	22,678	7,976	**30,654**
	(33.6%)	*(31.0%)*	*(32.8%)*
Two Vehicles	26,348	9,523	**35,872**
	(39.0%)	*(37.0%)*	*(38.4%)*
Three or More Vehicles	13,098	5,150	**18,248**
	(19.4%)	*(20.0%)*	*(19.5%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*

Table F.9

Number of Households by Income Reporting Status and Comparison of Vehicles and Drivers
1990 NPTS

Comparison of Vehicles and Drivers	Income Reported	Income Not Reported	TOTAL
# of Drivers greater than # of Vehicles	8,964	3,269	**12,232**
	(13.3%)	*(12.7%)*	*(13.1%)*
# of Drivers equal to # of Vehicles	40,812	*14,175*	**54,987**
	(60.4%)	*(55.0%)*	*(58.9%)*
# of Drivers less than # of Vehicles	17,809	8,319	**26,128**
	(26.4%)	*(32.3%)*	*(28.0%)*
TOTAL	**67,585**	**25,762**	**93,347**
	(100.0%)	*(100.0%)*	*(100.0%)*