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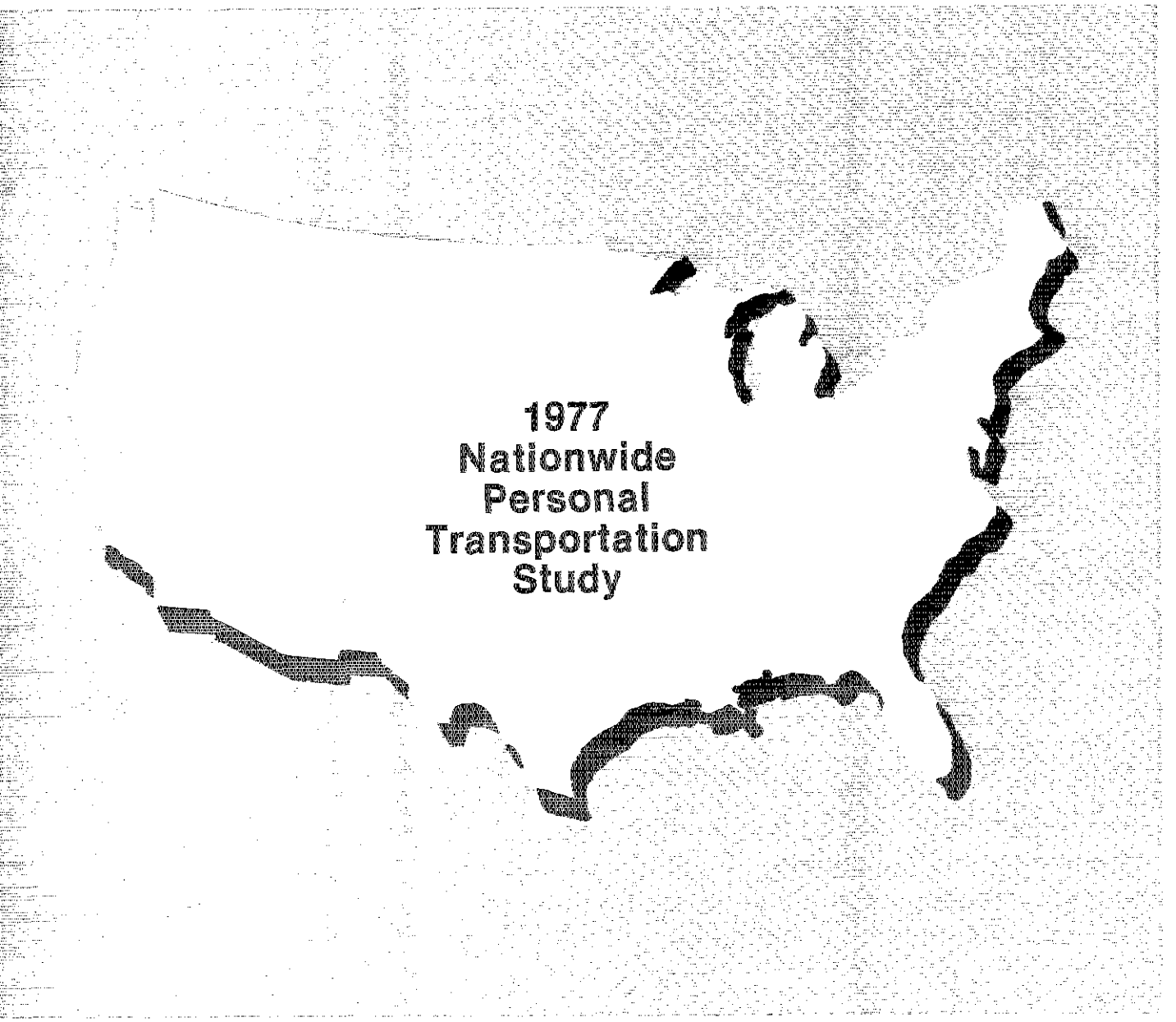

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16. Abstract

This report is part of a series that presents data relating to the 1977 Nationwide Personal Transportation Study.(NPTS). This report presents in tabular form, estimates of variability referred to as standard errors based on information obtained from a probability sample of households interviewed for NPTS. The tables contain standard errors for estimates of vehicle trips, person trips, and person miles, and household demographic characteristics. Estimates of standard errors of percentages have been prepared for vehicle trips, vehicle miles, person trips, and person miles for different trip purposes. In addition, standard errors of means are presented for average annual vehicle trips, vehicle miles, person trips, trip duration and trip distance.

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Report 10

ESTIMATES OF VARIANCES

December 1982

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
WASHINGTON, D.C. 20590

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I. INTRODUCTION

A. PURPOSE OF REPORT

This report presents estimates of variability referred to as standard errors, based on information obtained from a probability sample of households interviewed for the 1977 Nationwide Personal Transportation Study (NPTS). Estimates of variability are important in measuring the precision with which an estimate from a sample approximates the true value.

The procedures used to develop these estimates were produced by the Bureau of the Census, Department of Commerce, Washington, D.C. Any questions should be referred to Dennis Schwanz, Bureau of the Census.

These estimates were provided to the Federal Highway Administration, Department of Transportation, by the Bureau of the Census. Because of confidentiality requirements by the Bureau of the Census, the Federal Highway Administration was unable to verify any of the estimates produced.

B. ORGANIZATION OF THE REPORT

The tables in this report are organized into three major parts relating variability estimates to data application. All variability estimates were computed for data at the national level only.

The approximations to the standard errors for the NPTS estimates can be found in Tables A-1 through A-10. Tables A-1 through A-6 contain estimates of standard errors for travel day estimates, including vehicle trips, person trips, person miles, vehicle miles, and for household demographic characteristics. Tables A-7 through A-9 contain standard errors for travel period estimates, and include vehicle trips, person trips, and vehicle. Table A-10 contains standard errors for estimates of person demographic characteristics.

Estimates of standard errors of percentages can be found in Tables B-1 through B-20 for vehicle trips and vehicle miles and person trips and person miles for different trip purposes. Tables B-1 through B-14 contain estimates of standard errors for the travel day and Tables B-15 through B-20 contain estimates for the travel period. Tables B-21 and B-22 contain estimates of standard errors of percentages for estimates of person demographic characteristics. The standard error of means can be found in Tables C-1 through C-5.

C. SAMPLE DESIGN

The 1977 Nationwide Personal Transportation Study (NPTS) data was collected from interviews conducted in April 1977 through March 1978 by the Bureau of the Census, acting as collection agent for the Department of Transportation. The sample for this survey was spread over 376 sample areas (called primary sampling units), with coverage in each of the 50 States and the District of Columbia.

Approximately 21,100 sample households were eligible for interview in the 1977 NPTS. In addition, 3,400 units were found to be vacant, demolished, converted to nonresidential use, or otherwise ineligible for the survey. Of the households eligible for interviewing, 3,100 households were not interviewed because the occupants were not at home after repeated calls, refused to participate in the survey, or were unavailable for some other reason.

The NPTS sample was divided into 12 equal monthly samples, and the sample units within each monthly sample were divided into 14 equal parts, with each part being assigned to one of the first 14 days of the month. This assigned day was referred to as the travel day. If at all possible, interviewers visited the sample units the day following the travel day to complete the NPTS interview. If this was not possible, NPTS interviews were conducted within 4 days of the travel day. During the NPTS interview, information was collected for all trips taken by household members during travel day as well as for trips of 75 miles and longer during the 14-day period immediately preceding travel day. This 14-day period was referred to as travel period.

For 9 of the 12 months (April through November of 1977 and January of 1978) the NPTS sample units were also interviewed for the National Travel Survey (NTS), which is part of the Census Bureau's Quinquennial Census of Transportation. These sample units are referred to as the NPTS basic sample and were interviewed a total of 4 or 5 times for NTS and once for NPTS.

Approximately 80 percent of the NPTS basic sample units comprised a representative national probability sample. The remaining 20 percent also comprised a probability sample; however, they were selected in specific areas of the country to increase the reliability of NTS trip data for certain States.

For the remaining 3 months (December of 1977, and February and March of 1978), the NPTS sample units were only interviewed for NPTS. These sample units are referred to as the NPTS supplemental sample.

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

The CPS is a stratified multistage cluster sample. In the first stage, the United States was divided into primary sampling units (PSUs) consisting of counties, groups of counties, or independent cities. Approximately 1,930 PSUs 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, designated self-representing (SR) areas, generally contained the larger metropolitan areas. The remaining 220 were formed by combining PSUs that possessed similar characteristics, such as geographic region, population density, population growth rate, and proportion of Black and other races population. From each stratum, one PSU was selected for the sample with a probability proportionate to its 1970 Census population. These PSUs are referred to as non-self representing (NSR). The NPTS sample was selected from these 376 PSUs (156 SR + 220 NSR).

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

The next step was to select an expected cluster of about four neighboring housing units within each sample ED. (Note that for NPTS, all of the units within each of these clusters were assigned the same travel day and travel period). Most clusters were selected from the list of addresses for the ED compiled in the 1970 Census. However, in those EDs where addresses were incomplete or inadequate (mostly rural areas), the selection process was accomplished using area sampling methods. These EDs were divided into small land areas with well-defined boundaries, having an expected size of four, or a multiple of four, housing units. Those segments with an expected size of a multiple of four were further

subsampled at the time of enumeration so that an expected four housing units were chosen for interview.

In addition, a sample of new construction units was selected from building permits issued since January 1970. Within each sample PSU, the building permits were chronologically ordered by month issued, and compact clusters of approximately four housing units were created. These clusters were then sampled using the appropriate sampling rate. Housing units constructed since the 1970 Census in areas which do not issue building permits were brought into the sample as a result of the area sample described above.

Since the NPTS sample consists of households previously interviewed for CPS, additional updating was done to represent units built since the time of the CPS. However, this updating was only done in permit-issuing areas. New construction from nonpermit-issuing areas was not represented for about 2½ to 3 years for the units chosen to increase reliability of NTS trip data for certain States and for 1½ years for the remaining CPS sample. (See section on nonsampling error.)

D. ESTIMATING PROCEDURES

The 1977 NPTS estimation procedure consists of two major components: the basic weighting process, consisting of the application of weighting factors to account for various aspects of the NPTS sample design and for the noninterviews encountered in NPTS; and the final weighting process which consists of the application of weighting factors needed to make estimates of NPTS characteristics for different time periods from both travel day and travel period data. The factors used in the basic weighting process are described in detail in this section and consist of the following:

1. Basic Weight
2. Household Noninterview Factor
3. Within Household Noninterview Factor
4. First-Stage Ratio Estimate Factor
5. Second-Stage Ratio Estimate Factor
6. Third-Stage Ratio Estimate Factor

The specifications for the final weighting process are included in Appendix A of this report and differ slightly from those included in the NPTS Users Guide. Revised procedures for computing travel period trips, vehicle miles, person trips, and person miles based on the day the trip ended, rather than the day the trip began (as previously indicated) are discussed in this report along with the new Pi factors to be used.

Basic weight--This factor is equal to the inverse of the probability of selection associated with the sample units assigned to a specific travel day. The basic weight for the NPTS basic sample units assigned to a specific travel day is equal to about 750,000 for the units which comprise the national probability sample and between 200,000 and 400,000 for the units which were added to improve the reliability of NTS State data. The basic weight for the NPTS supplemental sample units assigned to a specific travel day is equal to about 560,000. The weights used for the units were chosen to increase the reliability of the State estimates and did not change the expected level of the estimates.

Household noninterview factor--This factor is used to account for the 3,100 households that were eligible to be interviewed for NPTS but were not. The factor was computed separately for different household characteristics (i.e., race of head at the time of the NPTS interview and education of head at the time of the last CPS interview), and also for each of the 14 travel days for a given month. The factor is equal to:

$$\frac{\text{Weighted estimates of interviewed households} + \text{Weighted estimate of noninterviewed households}}{\text{Weighted estimate of interviewed households}}$$

The household noninterview factor is applied to all characteristics from interviewed households.

Within household noninterview factor--This factor is used to account for those persons, who were not interviewed for NPTS, from households in which at least one person was interviewed. This factor is computed separately for different person characteristics (i.e., race and family income categories based on the NPTS interview) and also for each of the 14 travel days for a given month. The factor is equal to:

$$\frac{\text{Weighted estimate of interviewed persons} + \text{Weighted estimate of noninterviewed persons in households in which at least one person was interviewed}}{\text{Weighted estimate of interviewed persons}}$$

It was assumed that trips involving more than one person would have been included even if there were noninterviews in an interviewed household. Trips involving one person would be missed if that person was a noninterview. Therefore, this factor is applied only to person characteristics and to characteristics of trips involving one person.

Ratio estimation--Ordinarily, the distribution of a sample differs somewhat from the distribution of the total population from which the sample is drawn in terms of such characteristics as age, race, sex, residence, etc. Because of this, various stages of ratio estimate factors are applied to bring the distribution of the sample into closer agreement with the total population, thereby reducing the variability of the sample estimates. Some of these ratio estimate factors are also applied to correct for known deficiencies in the NPTS sample with regard to household coverage and within household coverage of persons. (See section on nonsampling error.)

First-stage ratio estimate factor--This factor is used to reduce the sampling variability resulting from the sampling of PSUs. The factor takes into account the differences that existed at the time of the 1970 Census between the distribution of the sample non-self representing (NSR) PSUs and all the NSR PSU's within race-residence categories in a Census region of the country.

The factor is equal to:

$$\frac{\text{1970 Census race-residence population counts for all NSR PSUs in a region}}{\text{Estimate of the race-residence population using 1970 census counts for the sample NSR PSUs in a region}}$$

The numerator is calculated by taking the 1970 Census counts for each race-residence category and summing them across all NSR PSUs in a region. The denominator is calculated by taking the 1970 Census counts for each race-residence category for each sample NSR PSU, weighting these counts by the inverse of the probability of selecting that PSU, and summing these weighted counts across the sample NSR PSUs in a region. The first-stage ratio estimate factor is applied to all characteristics for sample units in NSR PSUs only.

Second-stage ratio estimate factor--This factor is used to reduce sampling variability and to correct for household coverage problems. The factor is computed separately for different race of head-, sex of head-residence categories for each month and is equal to:

$$\frac{\text{Independent estimate of households for a specific race of head-, sex of head-residence category for a specific month}}{\text{Weighted sample estimate of households for a specific race of head-, sex of head-residence category for a specific month}}$$

These independent estimates are derived from CPS data and the resulting second-stage ratio estimate factors are 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 is used to reduce sampling variability and to correct for both household and within-household coverage problems. The factor is computed separately for different age, race, and sex categories for each month and is equal to:

$$\frac{\text{Independent estimate of persons in a specific age, race, sex category for a specific month}}{\text{Weighted sample estimate of persons in a specific age, race, sex category for a specific month}}$$

The third-stage ratio estimate factor is calculated using independent estimates of the civilian noninstitutional population of the United States by age, race, and sex. These independent estimates are based on statistics from the 1970 Census: statistics on births, deaths, immigration and emigration; and statistics on the strength of the armed forces. These factors are applied to person characteristics, vehicle trip characteristics for trips involving only one person from a household, and person-trip characteristics. Vehicle trips for trips involving only one person from a household receive a third-stage factor instead of a second-stage factor because these characteristics are affected by both household and within-household coverage problems.

II. RELIABILITY OF THE ESTIMATES

A. SAMPLING ERRORS

The particular sample used for this survey is one of a large number of possible samples of the same size that could have been selected using the same sample design. Estimates derived from the different samples would differ from each other. The variability between estimates from all possible samples is defined as the sampling error. A common measure of this sampling error is the standard error which measures the precision with which an estimate from a sample approximates the average results of all possible samples.

The standard error estimate also partially reflects the variation in the estimates due to some nonsampling errors but it does not measure any systematic biases. Therefore, the accuracy of the estimates depends on both the sampling and nonsampling errors measured by the standard error biases and some additional nonsampling errors not measured by the standard error.

The sample estimate and its estimated standard error enable one to construct interval estimates with prescribed confidence that the interval included the average result of all possible samples. If all possible samples were selected and surveyed under essentially the same conditions, and an estimate and its estimated standard error were calculated from each sample, then:

1. About 68 percent of the intervals from one standard error below the estimate, to one standard error above the estimate, would include the average result of all possible samples.

2. About 90 percent of the intervals from 1.6 standard errors below the estimate to 1.6 standard errors above the estimate, would include the average result of all possible samples.

3. About 95 percent of the intervals from two standard errors below the estimate to two standard errors above the estimate, would include the average result of all possible samples.

The average of all possible samples either is or is not contained in any specific computed interval. However, for a specific sample one can say with specified confidence that the average of all possible samples is included in the computed interval.

The figures presented in the tables are approximations to the standard errors of various estimates shown in this report. To derive standard errors that would be applicable to a wide variety of items and also could be prepared at a moderate cost, a number of approximations were required. Thus, the standard error tables provide an indication of the order of magnitude of the standard errors rather than the precise standard error for any specific item.

In general, the approximation to the actual standard errors is more precise for vehicle and person characteristics, including vehicle trips and person trips and miles, than for vehicle miles. Among the vehicle and person categories, the approximation to the standard errors pertaining to public transportation are not as precise as they are for other categories. The quality of the standard error approximations was much better for travel day estimates than it was for travel period estimates. It should also be noted that the approximations to the standard errors are, in general, much better for annual data than they are for quarterly data.

The reliability of an estimated percentage depends upon the size of the percentage and the size of the total upon which the percentage is based. Estimated percentages are relatively more reliable than the corresponding estimates of the numerators of the percentages, particularly if the percentages are 50 percent or more. An approximation to the standard error of a percentage may be obtained by using the standard error of percent tables included in this report or the following formula:

Let x = numerator

y = denominator

σx = standard error of numerator

σy = standard error of denominator

The standard error of the percentage (i.e., $100\frac{x}{y}$) is approximately equal to:

$$\sigma\left(100\frac{x}{y}\right) = 100\left(\frac{x}{y}\right)\sqrt{\left(\frac{\sigma x}{y}\right)^2 - \left(\frac{\sigma x}{y}\right)^2}$$

The standard errors of x and y can be obtained from the standard error tables included in this text. In using the standard error of percentages in this report, two-way interpolation should be used to determine standard errors for percentages not specifically shown in these tables.

The reliability of an estimated mean depends on the size of the mean and the size of the total upon which the mean is based (the denominator). Two-way interpolation should be used to determine standard errors for estimated means not specifically shown in these tables.

For the means, it was much the same case as for the rest of the data. The approximation to standard errors for average trip distance and trip duration and the average number of vehicle and person trips was more reliable than the approximation to the standard errors for average number of vehicle miles. Standard errors for means were only calculated for travel day data.

Included in these tables are estimates of standard errors for estimates of zero and zero percent. These estimates are considered to be overestimates of the true standard errors and should be used primarily for construction of confidence intervals for characteristics when an estimate of zero is obtained.

1. Illustrations in the Use of Standard Error Tables

The examples used here are not actual data figures. They are numbers fabricated solely for the purpose of showing how to use the standard error tables.

a. Tables A-1 through A-10:

Suppose there were 149,000,000,000 total vehicle travel day trips taken between April 1977 and March 1978. Interpolation in Table A-1 shows that

after rounding, the standard error on an estimate of this size is approximately 1,614,000,000. This is computed as follows:

The base estimate of 149 billion travel day trips is between 100 billion and 150 billion. If we subtract the lower limit base estimate of 100 billion from the 149 billion and from the upper base estimate of 150 billion, we know that 149 billion is 49/50 percent between the 100 and 150 billion. The same procedure is followed for interpreting the standard error. We know that the standard error for 149 billion is 49/50 percent between the standard error for 100 billion (S.E.: 1,354,943,200) and 150 billion (S.E.: 1,619,774,400). The difference between the two standard errors is 264,831,200 x 49/50 or 259,534,576.

If we add 259,534,576 to the standard error for the lower limit base estimate, it gives us a standard error of approximately 1,614,000,000 (rounded). Consequently, the 68 percent confidence interval shown by this data is from 147,386,000,000 (149,000,000,000-1,614,000,000) to 150,614,000,000 (149,000,000,000+1,614,000,000) travel day trips. Therefore, a conclusion that the average estimate derived from all possible samples of total travel day vehicle trips between April 1977 and March 1978 lies within a range computed in this way would be correct for roughly 68 percent of all possible samples. Similarly, we could conclude that the average estimate derived from all possible samples lies within the interval of 146,418,000,000 to 151,582,000,000 travel day vehicle trips with 90 percent confidence and that the average estimate derived from all possible samples lies within the interval from 145,772,000,000 to 152,228,000,000 travel day vehicle trips with 95 percent confidence.

b. Tables B-1 through B-22:

Suppose there were 13,000,000,000 travel day vehicle trips taken by persons aged 18-24 and 2,000,000,000 or 15.4 percent of the trips, were to the person's place of work. Two-way interpolation in Table B-3 shows that the standard error of 15.4 percent for a base of 13,000,000,000 is approximately 0.6 percentage points. This is arrived by using the following two-way interpolation procedure:

(1) First interpolate between 10 percent and 25 percent for bases of 10,000,000,000 and 15,000,000,000:

Bases	Standard Errors		
	10%	25%	15.4%
10,000,000,000	.6	.8	0.7
15,000,000,000	.5	.7	0.6

Following the same procedure as in (a) above, the standard error for 15.4 percent, base of 10 billion equals .67 or .7. the standard error for 15.4 percent base of 15 billion equals .6.

(2) Then interpolate between 10 billion and 15 billion for 15.4 percent on a base of 13,000,000. Using the same procedures as above, the standard error for 15.4 percent is .6.

Bases	Standard Errors
10,000,000,000	.7
13,000,000,000	.6
15,000,000,000	.6

Consequently, the 68 percent confidence interval as shown by this data is from 15.4 ± .6 or 14.8 to 16 percent; the 90 percent confidence interval is from 14.4 to 16.4 percent; and the 95 percent confidence interval is from 14.2 to 16.6 percent.

c. Tables C-1 through C-5:

Standard errors for a specific mean having a specific base can be found using two-way interpolation in Table C-1. The same steps that were used for finding the standard error of a percent should be applied for finding the standard error of a mean.

For example, suppose that there were 3,800,000 travel day vehicle trips made by 2,000 households for an average of approximately 1900 trips per year. Using Table C-1 interpolate between the estimated means of 1500 and 2100 for bases of 3,000,000 and 4,000,000.

Bases of Means	Estimates Means		
	1500	1900	2100
3,000,000	71.6	77.7	80.8
4,000,000	63.3	68.6	71.3

$\frac{1900-1500}{2100-1500} = \frac{2}{3}$ × 9.2 (difference between 80.8-71.6) = 6.1

71.6 + 6.1 = 77.7

For 4,000,000 Base:

$\frac{1900-1500}{2100-1500} = \frac{2}{3}$ × 8.0 (difference between 71.3-63.3) = 5.3

63.3 + 5.3 = 68.56

Then interpolate between 3,000,000 and 4,000,000 for 1900.

3,000,000 = 77.7
3,800,000 = 70.4
4,000,000 = 68.6

$\frac{3.8-3.0}{4.0-3.0} = \frac{.8}{1.0} \times 9.2 = 7.4$

Therefore, the 68 percent confidence level interval as shown by this data is 1900 ± 70.4 or from 1829.6 to 1970.4. The 90 percent confidence interval is from 1787.4 to to 2112.6. The 95 percent confidence level is from 1759.2 to 2040.8.

2. Differences in Standard Errors Between Two Sample Estimates

The standard errors shown are not directly applicable to differences between two sample estimates. The standard error of a difference between estimates is approximately equal to the square root of the sum of the squares of the standard errors of each estimate considered separately. In formula notation:

$$\sigma_{x-y} = \sqrt{\sigma^2_x + \sigma^2_y}$$

This formula is quite accurate for differences between estimates of the same characteristics in two different areas or the differences between separate and uncorrelated characteristics in the same area. If, however, there is a high positive correlation between the two characteristics, the formula will overestimate the true error. Also, if there is a high negative correlation the formula will underestimate the true error.

Suppose there were 400,000,000 travel day vehicle trips taken by persons aged 18-24 in the United States between April 1977 and March 1978 for social or entertainment reasons. The difference between social or entertainment trips and trips to work for persons aged 18-24 is 1,600,000,000 trips. Table A-2 shows by interpolation that the standard error on an estimate of 2,000,000,000 is approximately 87,600,000 and the standard error on an estimate of 400,000,000 is approximately 37,100,000 after rounding. Therefore, the standard error of the estimates differences of 1,600,000,000 is approximately:

$$95{,}100{,}000 = \sqrt{(87{,}600{,}000)^2 + (37{,}100{,}000)^2}$$

Consequently, the 68 percent confidence interval for the 1,600,000,000 difference is from 1,504,900,000 to 1,695,100,000 travel day vehicle trips. Therefore, a conclusion that the average estimates difference, derived from all possible samples, lies within a range computed this way would be correct for roughly 68 percent of all possible samples. Similarly, a 95 percent confidence interval would be from 1,409,800,000 to 1,790,200,000. Since zero is not included in this 95 percent confidence interval, we can conclude that the number of travel day vehicle trips for social or entertainment purposes is significantly different from the number of travel day vehicle trips to work by persons aged 18-24. The same method should be used for finding the standard error of a difference between percentages and the difference between means.

3. Medians

For medians, the estimated sampling error depends on the size of the base and the distribution upon which the median is based. An approximate method for measuring the reliability of the estimated median is to determine an interval about the estimated median such that there is a stated degree of confidence that the average median from all possible samples lies within the interval. The following procedure may be used to estimate confidence limits of a median based on sample data:

1. From Tables B-1 through B-22, determine the standard error of a 50 percent characteristic on the base of the median.

2. Add to and subtract from 50 percent, the standard error determined in step 1. This will give you a lower percentage limit (50 percent - standard error of 50 percent) and an upper percentage limit (50 percent + standard error of 50 percent).

3. Using the distribution of the characteristics, determine the confidence interval corresponding to the two points determined in step 2. To find the lower endpoint of the confidence interval, it is necessary to know which interval corresponds to the lower percentage limit. Similarly, to find the upper endpoint of the confidence interval, it is necessary to know which interval corresponds to the upper pecentage limit. Note that these two intervals could be different, although this will not happen very often.

Illustration in the computation of a 95-percent confidence interval for a median

Suppose the median income of a household taking a trip was $13,000 and the distribution of households with respect to income was as follows:

Income Group	Households	Percent of Households
$0-$9,999	28,500,000	38.0
$10,000-$14,999	15,000,000	20.0
$15,000+	31,500,000	42.0

The base of the distribution from which this median was determined is 75,000,000 households.

1. From standard error Table B-18, the estimated standard error of a 50 percent characteristic on a base of 75,000,000 is approximately 0.4 percentage points.

2. To obtain a two-standard error confidence interval on the estimated median, add to and subtract from 50-percent twice the estimated standard error determined in step 1. This yields percentage limits of 49.2 (50.0-2(.4)) and 50.8 (50.0+2(.4)).

3. From the distribution of households by income categories shown above, the $10,000-$14,999 interval corresponds to 49.2 percent; i.e., 28,500,000 households, or 38 percent, fall below this interval and 15,000,000 households, or 20 percent, fall within this interval. By linear interpolation, the lower endpoint of the 95-percent confidence interval is found to be approximately:

   Similarly, the $10,000-$14,999 interval corresponds to 50.8 percent. Since this is the same interval as above, the same percentages apply and the endpoint of the 95-percent confidence interval is found to be aproximately:

$$\$10,000 + (\$15,000 - \$10,000 \frac{(50.8 - 38)}{20}) = \$13,200$$

   Thus the 95 percent confidence interval ranges from $12,800 to $13,200.

B. NONSAMPLING ERRORS

In addition to sampling errors, the NPTS estimates are subject to nonsampling errors. In general, nonsampling errors can be attributed to many sources: inability to obtain information about all cases, definitional difficulties, differences in the interpretation of questions, inability or unwillingness to provide correct information on the part of respondents, mistakes in recording or coding the data, and other errors of collection, response, processing, coverage, and estimation for missing data.

These can be narrowed down into four major categories encompassing all types of nonsampling error; coverage error, response error, errors due to noninterview, and errors in the processing of the data.

1. Coverage Errors

a. Interview Period

The first coverage problem is related to the interview period. Only the first 14 days of each month are covered for travel day because it was assumed the rest of the month would be accurately reflected in these 14 days. For travel period this was not quite as serious although there are still some days in each month that are not actually covered by the interview.

b. Completeness of Sample Frame

The second coverage problem has to do with the completeness of the sample frame. The NPTS new construction sample has deficiencies with regard to the representation of both conventional new construction and new construction mobile homes in permit-issuing areas. During the sampling of building permits, only those issued since January 1, 1970, were eligible to be sampled to represent conventional new construction in permit-issuing areas. It had been assumed that units with permits issued prior to 1970 would have been completed by the time of the 1970 census (i.e., April 1970), and therefore would have been represented in the sample selected from 1970 census units. However, it has been estimated that the 1977 NPTS sampled missed about 5 percent (i.e., about 600,000 units) of all conventional new construction (i.e., all conventional housing units built after April 1970, in both permit-issuing and nonpermit-issuing areas) because the permits for these missed units were issued before 1970. In addition, the new construction updating of the NPTS sample from CPS only included permits issued through September 1976. As a result, it is estimated that the 1977 NPTS sample missed about 3 percent (about 300,000) of all conventional new construction because the permits for these units, which were built before April 1977, were issued after September 1976.[1/]

Unlike the procedure for conventional new construction, there is no sampling procedure specifically for new construction mobile homes. However, new mobile homes in segments where area sampling methods are used do come into the NPTS sample. In addition, new mobile homes in segments sampled from the 1970 census list also come into the sample if the mobile homes are located in mobile home parks, identified as such in the 1970 census. However, new mobile homes in those segments that are located in mobile home parks not in existence at the time of the 1970 census and for which area sampling methods are not used, have no chance

[1/] These problems are present in other sample surveys utilizing the same frame.

of coming into the NPTS sample. It has been estimated that the 1977 NPTS sample missed at least 170,000 new mobile homes.[1/]

As previously mentioned (in the section on sample design) no updating was done for new construction in nonpermit-issuing area segments. Even though the number of units that would be picked up by updating in area segments was estimated to be quite small, this still introduces another source of error in the data with respect to coverage.

It is also felt that deficiencies exist in EDs (enumeration districts) where area sampling methods are used. It has been assumed that all units located inside these EDs would be represented in the sample. However, it has been estimated that the 1977 NPTS sample missed as much as 2 percent (i.e., as much as 400,000 units) of all housing units in EDs where area sampling methods were used because these units were not listed during the canvassing.[1/]

The second-and third-stage ratio estimates were employed to reduce the effect of these household coverage deficiencies, although some bias in the NPTS sample estimates may still exist.

c. Within Household Coverage of Persons

The third coverage problem has to do with the within household coverage of persons. This occurred whenever the household respondent failed to account for all persons residing in the household at the time of interview. The third-stage ratio estimate was employed to reduce the effect of this deficiency, although some bias in the NPTS sample may still exist.

2. Response Errors

The second major category is response error. A major source of response error results from the inability of the respondents to accurately recall all of the trips or all of the details about the trips they had taken on their travel day or within their travel period. As was mentioned in the sample design, interviews were attempted to be conducted the day after the household's travel day to increase the accuracy of their recall. This was not always possible and the more days that elapsed between the travel day and the actual day of interview, the greater the chances of recall problems.

Another type of response error is known as "telescoping." For NPTS, the term telescoping refers to the inclusion of trips that should be excluded. The respondent may incorrectly include a travel period trip that was actually taken before their travel period.

Response error also occurs in the estimation of trip mileage. For both travel day and travel period trips, the respondent was asked the length of the trip and his/her response was used as the estimate. These distances were probably close to the actual distance for travel day trips since most of these trips were probably taken quite often. Travel period trips, however, are generally trips that are not taken too often, and the distances are usually not known, making the respondent's mileage estimate farther from the true distance.

1/ These problems are present in other sample surveys utilizing the same frame.

Another possible source of response error could be the effect of other surveys on NPTS. The NPTS basic sample households were interviewed for NTS (National Travel Survey) at that same time, making the interview quite long. As a result, the length of the interview could have had an effect on the respondent's answers. In addition, almost all of the NPTS sample units had previously been interviewed for the Current Population Survey (CPS) which could have affected the respondent's answers as well.

3. Noninterviews

The third major type of error is error that occurs due to the noninterviews encountered in NPTS. In adjusting for noninterviews in the NPTS weighting procedure, it is assumed that noninterviewed households and persons would have answered questions similarly to interviewed households within the same noninterview adjustment category. The extent to which this is not true will fail to eliminate the bias present due to those noninterviews.

Additional nonsampling errors arise for noninterviewed persons in interviewed households. In adjusting for these persons, it was assumed that trips involving more than one person from a household would have been reported even if they involved a noninterviewed person within an interviewed household. As a result, for estimates of household trips the within-household noninterview factors were only applied to trips involving one member of a household. Thus, household trips involving two-or-more people who were both noninterviews in an interviewed household would not be represented as trips involving two or more persons if their trips did not include other interviewed persons in the household.

4. Data Processing

The fourth, and last major type of error occurs in the processing of the data. One type of processing error is that which occurs in the keying and coding of the data. The rounding of estimates is another source of processing error, the severity of which depends on the statistic being measured. The effect of rounding is significant relative to the sampling error only for small percentages. This means that confidence intervals formed from the standard errors may be distorted, and this should be taken into account when considering the results of this survey.

III. VARIANCES FOR THE 1977 NPTS

A. Standard Error Tables

B. Standard Errors of Percentages

C. Standard Errors of Mean for Travel Day

A. Standard Error Tables

TABLE A-1. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF VEHICLE TRIPS* (TRAVEL DAY)

Estimated Total (000 000)	Estimated Standard Error (1 sigma)
0	20,093,310
20	20,093,310
25	22,412,730
50	31,696,050
75	38,819,160
100	44,824,020
150	54,896,800
200	63,388,000
250	70,868,410
500	100,212,240
750	122,721,180
1,000	141,690,900
1,500	173,497,710
2,000	200,294,590
2,500	223,887,740
5,000	316,282,420
7,500	386,945,150
10,000	446,320,130
15,000	545,436,780
20,000	628,437,290
25,000	701,069,240
50,000	980,463,820
75,000	1,187,195,700
100,000	1,354,943,200
150,000	1,619,779,400

*This table does not include standard errors for any characteristics associated with a specific purpose of trip except for "purpose of trip" cross-tabulated with "SMSAs of size 100,000-499,999." For standard errors associated with a specific purpose of trip use Table A-2.

TABLE A-2. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF VEHICLE TRIPS FOR A SPECIFIC PURPOSE OF TRIP
(Travel Day)

Estimated Total (000,000)	Estimated Sigma Error (1 Sigma)	
	Other Purpose	All Purposes, Except Other Purposes
0	10,339,560	3,459,850
2.5	10,339,560	3,459,850
5	10,339,560	4,159,410
7.5	10,339,560	5,094,560
10	10,339,560	5,883,090
15	12,453,740	7,206,250
20	14,380,460	8,322,190
25	16,077,970	9,305,750
50	22,738,580	13,169,200
75	27,850,060	16,139,780
100	32,159,760	18,649,160
150	39,390,630	22,871,170
200	45,487,990	26,444,760
250	50,861,150	29,605,670
500	71,957,050	42,147,160
750	88,163,940	51,958,280
1,000	101,843,250	60,384,880
1,500	124,830,660	74,898,950
2,000	144,255,860	87,561,050
2,500	161,410,120	99,083,760
5,000	229,165,460	148,237,560
7,500	281,763,640	190,972,110
10,000	326,611,460	230,879,860
15,000	403,081,500	306,583,440
20,000	468,951,790	379,523,470
25,000	528,202,890	451,042,670
50,000	773,971,690	-
75,000	979,847,780	-
100,000	1,167,136,200	-

*This includes the following purposes: to work, civic, education, shopping, social, entertainment, recreation, visit friends or relatives, and family or personal business.

TABLE A-3. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF PERSON TRIPS
(Travel Day)

Estimated of Total (000,000)	Estimated Standard Error (1 Sigma) Household Clustering Items[1]	Non-Household Clustering Items[2]	Public Transportation
0	19,312,110	11,840,790	4,412,380
10	19,312,110	11,840,790	6,655,850
15	19,312,110	13,327,250	8,166,240
20	19,653,160	15,389,240	9,446,300
25	21,973,880	17,205,970	10,579,970
50	31,082,640	24,334,930	15,093,750
75	38,076,740	29,806,540	18,645,540
100	43,976,960	34,420,480	21,712,690
150	53.884,380	42,163,260	27,034,420
200	62,247,830	48,693,980	31,718,710
250	69,625,920	54,450,510	36,015,170
500	98,682,960	77,068,150	54,673,130
750	121,126,690	94,466,530	71,247,290
1,000	140,170,660	109,170,210	86,937,720
1,500	172,419,420	133,925,000	117,077,110
2,000	199,950,640	154,896,130	146,409,680
2,500	224,506,610	173,461,390	175,346,820
5,000	324,168,760	247,297,570	317,782,050
7,500	405,026,540	305,289,550	-
10,000	476,745,800	355,282,590	-
15,000	605,477,940	441,824,410	-
20,000	723,212,490	517,789,130	-
25,000	834,616,600	587,295,340	-
50,000	1,349,468,300	887,507,770	-
75,000	1,836,692,500	1,152,502,800	-
100,000	2,313,808,300	1,402,388,600	-
250,000	5,120,656,013	2,802,121,518	-

[1] Household clustering items refers to characteristics for which there is more than one observation per household. This causes a clustering of similar observations within the household. Examples of household clustering items would be number of trips for total persons, household income, race of traveler, and residence of traveler. In general, this causes an increase in the variance of an estimate for that characteristic. However, this was not always true for all person trips characteristics. This household clustering effect was found to occur for only total person trips and privately owned automobiles. Thus, for all other means of transportation, standard errors for non-household clustering items should be used. In addition, non-household clustering standard errors should be used for total persons and race of traveler, since this clustering effect was not found to exist for these characteristics either. Sex and age are not considered household clustering items for travel day even though there may be more than one observation per household because, in general, the entire household does not take a trip together.

[2] Non-household clustering items refers to all characteristics except those defined under household clustering items and any form of public transportation.

TABLE A-4-1. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF PERSON MILES: OTHER PUBLIC TRANSPORTATION
(Travel Day)

Estimated Total (000 000)	Other Public[1/] Transportation Annual (000)	Household Clustering Items[2/] Annual (000)	Remainder[3/] (000)
0	2,313,432	747,572	226,383
150	2,313,432	747,572	226,383
200	2,313,432	747,572	226,383
250	2,313,432	747,572	237,905
500	2,313,432	747,572	336,539
750	2,313,432	748,785	412,285
1,000	2,313,432	864,595	476,194
1,500	2,313,432	1,058,842	583,531
2,000	2,313,432	1,222,568	674,165
2,500	2,409,389	1,366,787	754,145
5,000	3,491,212	1,932,320	1,069,379
7,500	4,376,097	2,365,855	1,313,208
10,000	5,166,250	2,730,994	1,520,382
15,000	6,595,811	3,342,663	1,871,888
20,000	7,914,059	3,857,339	2,172,737
25,000	9,169,129	4,309,912	2,441,725
50,000	15,032,336	6,075,834	3,540,403
75,000	20,632,368	7,417,631	4,440,725
100,000	26,138,924	8,537,671	5,245,047
150,000	37,038,042	10,388,849	6,702,851
200,000	-	11,917,419	8,049,070
250,000	-	13,235,628	9,332,120
500,000	-	18,079,584	15,336,801
750,000	-	21,332,336	21,080,488
1,000,000	-	23,659,531	23,659,531
1,500,000	-	26,433,049	-
2,000,000	-	27,270,303	-

1/ Other public transportation includes all forms of public transportation except bus or train and elevated rail or subway.

2/ Household clustering items are defined the same way as in Table A-3. For person miles, there are no exceptions - the standard errors should be used for all household clustering items. See the note on how to calculate standard errors of totals.

Totals - To find the standard error of the total person miles for any demographic characteristic, the following steps should be followed:

1. Split up the total person miles into person miles traveled by other public transportation and person miles traveled by all other modes of transportation.
2. Find the standard error corresponding to each estimate in part (1) using the appropriate table for all other modes of transportation. Use either the household clustering table or the remainder table.
3. The standard error of the total can be found using the following formula:

$$\text{Standard error of total} = \sqrt{\left(\begin{array}{c}\text{Standard error for}\\ \text{other public}\\ \text{transportation}\end{array}\right)^2 + \left(\begin{array}{c}\text{Standard error for}\\ \text{all other modes}\\ \text{of transportation}\end{array}\right)^2}$$

3/ Remainder refers to all characteristics except those pertaining to other public transportation, elevated rail and subway, and household clustering items. See the note on how to calculate standard errors of totals.

TABLE A-4-2. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF PERSON MILES: ELEVATED RAIL AND SUBWAY
(Travel Day)

Estimated Total (000 000)	Estimated Standard Error (1 Sigma)
	Elevated Rail and Subway (000)
0	24,875
20	24,875
25	24,941
50	36,326
75	45,745
100	54,231
150	69,744
200	84,198
250	98,062
500	163,639
750	226,903
1,000	289,375
1,500	413,376
2,000	536,846
2,500	660,083
5,000	1,275,135
7,500	1,889,651

TABLE A-5. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF VEHICLE MILES: SHOPPING, CIVIC, RELIGIOUS, EDUCATION; RECREATION, SOCIAL, ENTERTAINMENT

Estimated Total (000 000)	Estimated Standard Error (1 Sigma)	
	Shopping, Civic, Religious, Education (000)	Recreation, Social Entertainment (000)
0	38,263	51,655
25	38,263	51,655
50	43,744	51,655
75	53,586	62,333
100	61,889	72,088
150	75,829	88,563
200	87,597	102,578
250	97,977	115,037
500	138,847	165,146
750	170,403	205,230
1,000	197,168	240,357
1,500	242,468	302,481
2,000	281,114	358,390
2,500	315,559	410,629
5,000	455,102	616,419
7,500	567,097	864,711
10,000	667,897	1,076,205
15,000	846,704	1,490,327
20,000	-	1,899,061
25,000	-	-
50,000	-	-
75,000	-	-
100,000	-	-
150,000	-	-
200,000	-	-
250,000	-	-
500,000	-	-
750,000	-	-

TABLE A-6. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS
(Travel Day)

Estimated Total (000 000)	Estimated Standard Error (1 Sigma)
0	5,720
.5	53,310
1	75,130
1.5	91,690
2	105,510
5	163,260
7.5	196,250
10	222,240
15	261,170
20	288,300
25	306,760
50	300,480
75	5,720
100	5,720

TABLE A-7. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF VEHICLE TRIPS
(Travel Day)

Estimated Total (000)	Estimated Standard Error (1 Sigma)
0	317,430
500	398,480
1,000	563,880
1,500	691,020
2,000	798,410
2,500	875,750
5,000	1,262,450
7,500	1,556,320
10,000	1,802,420
15,000	2,220,510
20,000	2,578,960
25,000	2,897,970
50,000	4,216,600
75,000	5,301,870
100,000	6,276,930
150,000	8,053,600
200,000	9,703,680
250,000	11,282,850
500,000	18,724,720
750,000	25,883,160
1,000,000	32,943,440

TABLE A-8. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF PERSON TRIPS
(Travel Day)

Estimated Total (000)	Household Clustering Items[1/]	Remainder[2/]
0	951,000	415,540
500	951,000	455,850
1,000	975,210	644,940
1,500	1,194,640	790,220
2,000	1,379,740	912,850
2,500	1,542,920	1,021,020
5,000	2,184,330	1,446,950
7,500	2,678,070	1,775,820
10,000	3,095,630	2,054,780
15,000	3,799,310	2,526,920
20,000	4,396,240	2,929,730
25,000	4,925,380	3,288,780
50,000	7,037,470	4,743,590
75,000	8,706,300	5,290,860
100,000	10,152,860	6,962,840
150,000	12,675,320	8,828,270
200,000	14,908,910	-
250,000	16,869,090	-
500,000	26,010,540	-
750,000	34,145,230	-
1,000,000	41,904,190	-
1,500,000	56,905,520	-

1/ Household clustering items are defined the same as in Table A-3. Here again only total person trips and trips by privately owned automobiles will have a clustering effect. For travel period trips, age, and sex items would be included as household clustering items because travel period trips are, in general, trips taken by the entire family so there will be more than one person of the same age and sex from a household.

2/ Remainder includes all items except those defined in 1/ above, under household clustering items. All forms of public transportation are included in the remainder.

TABLE A-9. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF VEHICLE MILES: WORK RELATED, VACATION, FAMILY OR PERSONAL BUSINESS, VISIT FRIENDS OR RELATIVES, SOCIAL, RECREATION
(Travel Day)

Estimated Total (000 000)	Estimated Standard Errors (1 Sigma)		
	Work-Related, Vacation, Family or Personal Business, Visit Friends or Relatives	Social, Recreation	Remainder[1/]
0	60,304,680	18,623,930	39,013,860
15	60,304,680	18,623,930	39,013,860
20	60,304,680	19,314,810	39,013,860
25	60,304,680	21,655,860	39,013,860
50	60,304,680	31,055,440	44,237,500
75	67,322,980	38,553,760	54,376,570
100	77,876,840	45,109,130	63,015,230
150	95,718,740	56,667,260	77,729,590
200	110,917,080	67,033,400	90,387,310
250	124,444,240	76,692,420	101,758,780
500	179,036,140	120,051,110	148,777,920
750	222,941,050	159,973,830	187,989,520
1,000	261,596,430	198,544,190	223,540,650
1,500	330,357,770	273,902,500	288,975,190
2,000	392,638,040	348,167,520	350,347,800
2,500	451,129,500	421,916,950	409,488,940
5,000	717,743,660	-	691,288,280
7,500	966,909,730	-	964,673,480
10,000	1,209,459,900	-	1,235,243,900
15,000	1,686,093,600	-	1,773,088,800
20,000	-	-	2,309,097,000
25,000	-	-	2,844,306,900
50,000	-	-	5,516,509,300
75,000	-	-	8,186,903,000

[1/] Remainder in this table includes all purposes except work related, vacation, family or personal business, visit friends or relatives, social/recreation.

TABLE A-10. ESTIMATED STANDARD ERRORS FOR ESTIMATES OF PERSON DEMOGRAPHIC CHARACTERISTICS

Estimated Total (000)	Estimated Standard Errors (1 Sigma)	
	Household Clustering Items[1/]	Remainder[2/]
0	15,040	6,870
100	38,800	26,210
150	47,540	32,090
200	54,910	37,060
250	61,410	41,430
500	86,990	58,560
750	106,720	71,690
1,000	123,440	82,740
1,500	151,680	101,240
2,000	175,720	116,790
2,500	197,100	130,450
5,000	283,240	183,600
7,500	352,310	223,790
10,000	412,970	257,160
15,000	520,540	311,860
20,000	617,640	356,500
25,000	708,590	394,520
50,000	1,120,990	528,220
75,000	1,504,520	608,370
100,000	-	654,940
150,000	-	670,680
200,000	-	-
250,000	-	-

1/ Household clustering item refers to characteristics for which there is more than one observation per household. This causes a clustering of similar observations within the household. Examples of household clustering items would be household income, race of person, and residence of person. In general, this causes an increase in the variance of an estimate for that characteristic; however, certain person demographic characteristics were exceptions. With respect to race, this household clustering effect was found to exist only for white persons who traveled during travel period and black persons who traveled during travel period. Thus, for other race items, use the "Remainder" column.

2/ Remainder refers to all characteristics except those indicated in household clustering items. Use the remainder portion of the table for total white persons and total black persons as these characteristics correspond to ratio estimate cells and the household clustering effect is nonapplicable. Also use the remainder portion of the table for white persons traveling on travel day, white persons not traveling on travel day, black persons traveling on travel day, and black persons not traveling on travel day.

B. STANDARD ERRORS OF PERCENTAGES·

TABLE B-1. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE TRIPS*
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
25,000	44.6	44.6	44.6	44.6	44.6	44.8
50,000	28.7	28.7	28.7	28.7	28.7	31.7
75,000	21.1	21.1	21.1	21.1	22.4	25.9
100,000	16.7	16.7	16.7	16.7	19.4	22.4
150,000	11.8	11.8	11.8	11.8	15.8	18.3
200,000	9.1	9.1	9.1	9.5	13.7	15.8
250,000	7.4	7.4	7.4	8.5	12.3	14.2
500,000	3.9	3.9	4.4	6.0	8.7	10.0
750,000	2.6	2.6	3.6	4.9	7.1	8.2
1,000,000	2.0	2.0	3.1	4.3	6.1	7.1
1,500,000	1.3	1.3	2.5	3.5	5.0	5.8
2,000,000	1.0	1.0	2.2	3.0	4.3	5.0
2,500,000	0.8	0.9	2.0	2.7	3.9	4.5
5,000,000	0.4	0.6	1.4	1.9	2.7	3.2
7,500,000	0.3	0.5	1.1	1.6	2.2	2.6
10,000,000	0.2	0.4	1.0	1.3	1.9	2.2
15,000,000	0.13	0.4	0.8	1.1	1.6	1.8
20,000,000	0.10	0.3	0.7	1.0	1.4	1.6
25,000,000	0.08	0.3	0.6	0.9	1.2	1.4
50,000,000	0.04	0.2	0.4	0.6	0.9	1.0
75,000,000	0.03	0.2	0.4	0.5	0.7	0.9
100,000,000	0.02	0.14	0.3	0.4	0.6	0.7
150,000,000	0.01	0.12	0.3	0.4	0.5	0.6

* This table does not include standard errors for any characteristics associated with a specific purpose of trip except for "purpose of trip" cross-tabulated with "SMSAs of size 100,000-499,999." For standard errors associated with a specific purpose of trip use table B-2.

TABLE B-2. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE TRIPS FOR A SPECIFIC PURPOSE OF TRIP*

(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
15,000	40.8	40.8	40.8	40.8	40.8	41.5
20,000	34.1	34.1	34.1	34.1	34.1	35.9
25,000	29.3	29.3	29.3	29.3	29.3	32.2
50,000	17.1	17.1	17.1	17.1	19.7	22.7
75,000	12.1	12.1	12.1	12.1	16.1	18.6
100,000	9.4	9.4	9.4	9.6	13.9	16.1
150,000	6.4	6.4	6.4	7.9	11.4	13.1
200,000	4.9	4.9	5.0	6.8	9.8	11.4
500,000	4.0	4.0	4.4	6.1	8.8	10.2
750,000	2.0	2.0	3.1	4.3	6.2	7.2
1,000,000	1.4	1.4	2.6	3.5	5.1	5.9
1,500,000	1.0	1.0	2.2	3.1	4.4	5.1
2,000,000	0.7	0.8	1.8	2.5	3.6	4.2
2,500,000	0.5	0.7	1.6	2.2	3.1	3.6
5,000,000	0.4	0.6	1.4	1.9	2.8	3.2
7,500,000	0.2	0.5	1.0	1.4	2.0	2.3
10,000,000	0.14	0.4	0.8	1.1	1.6	1.9
15,000,000	0.10	0.3	0.7	1.0	1.4	1.6
20,000,000	0.07	0.3	0.6	0.8	1.1	1.3
25,000,000	0.05	0.2	0.5	0.7	1.0	1.1
50,000,000	0.04	0.2	0.4	0.6	0.9	1.0
75,000,000	0.02	0.14	0.3	0.4	0.6	0.7
100,000,000	0.02	0.12	0.3	0.4	0.5	0.6
150,000,000	0.01	0.10	0.2	0.3	0.4	0.5

* Where the specific purpose is other than: to work, civic, religious, education, shopping, social, entertainment, recreation, visit friends or relatives, and family or personal business.

TABLE B-3. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE TRIPS FOR A SPECIFIC PURPOSE OF TRIP*
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
5,000	41.2	41.2	41.2	41.2	41.2	41.8
7,500	31.8	31.8	31.8	31.8	31.8	34.2
10,000	25.9	25.9	25.9	25.9	25.9	29.6
15,000	18.9	18.9	18.9	18.9	20.9	24.1
20,000	14.9	14.9	14.9	14.9	18.1	20.9
25,000	12.3	12.3	12.3	12.3	16.2	18.7
50,000	6.5	6.5	6.5	7.9	11.5	13.2
75,000	4.5	4.5	4.7	6.5	9.4	10.8
100,000	3.4	3.4	4.1	5.6	8.1	9.4
150,000	2.3	2.3	3.3	4.6	6.6	7.6
200,000	1.7	1.7	2.9	4.0	5.7	6.6
250,000	1.4	1.4	2.6	3.5	5.1	5.9
500,000	0.7	0.8	1.8	2.5	3.6	4.2
750,000	0.5	0.7	1.5	2.0	3.0	3.4
1,000,000	0.3	0.6	1.3	1.8	2.6	3.0
1,500,000	0.2	0.5	1.1	1.4	2.1	2.4
2,000,000	0.2	0.4	0.9	1.3	1.8	2.1
2,500,000	0.14	0.4	0.8	1.1	1.6	1.9
5,000,000	0.07	0.3	0.6	0.8	1.1	1.3
7,500,000	0.05	0.2	0.5	0.6	0.9	1.1
10,000,000	0.03	0.2	0.4	0.6	0.8	0.9
15,000,000	0.02	0.15	0.3	0.5	0.7	0.8
20,000,000	0.02	0.13	0.3	0.4	0.6	0.7
25,000,000	0.01	0.12	0.3	0.4	0.5	0.6
50,000,000	0.01	0.08	0.2	0.3	0.4	0.4

* This includes the following purposes: to work, civic, religious, education, shopping, social, entertainment, recreation, visit friends or relatives, and family or personal business.

TABLE B-4. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON TRIPS: HOUSEHOLD CLUSTERING ITEMS[1/]
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
20,000	49.1	49.1	49.1	49.1	49.1	49.1
25,000	43.6	43.6	43.6	43.6	43.6	43.9
50,000	27.9	27.9	27.9	27.9	27.9	31.1
75,000	20.5	20.5	20.5	20.5	22.0	25.4
100,000	16.2	16.2	16.2	16.2	19.0	22.0
150,000	11.4	11.4	11.4	11.4	15.5	17.9
200,000	8.8	8.8	8.8	9.3	13.5	15.5
250,000	7.2	7.2	7.2	8.3	12.0	13.9
500,000	3.7	3.7	4.3	5.9	8.5	9.8
750,000	2.5	2.5	3.5	4.8	6.9	8.0
1,000,000	1.9	1.9	3.0	4.2	6.0	6.9
1,500,000	1.3	1.3	2.5	3.4	4.9	5.7
2,000,000	1.0	1.0	2.1	2.9	4.3	4.9
2,500,000	0.8	0.9	1.9	2.6	3.8	4.4
5,000,000	0.4	0.6	1.4	1.9	2.7	3.1
7,500,000	0.3	0.5	1.1	1.5	2.2	2.5
10,000,000	0.2	0.4	1.0	1.3	1.9	2.2
15,000,000	0.13	0.4	0.8	1.1	1.6	1.8
20,000,000	0.10	0.3	0.7	0.9	1.3	1.6
22,500,000	0.08	0.3	0.6	0.8	1.2	1.4
50,000,000	0.04	0.2	0.4	0.6	0.9	1.0
75,000,000	0.03	0.2	0.3	0.5	0.7	0.8
100,000,000	0.02	0.14	0.3	0.4	0.6	0.7
250,000,000	0.01	0.11	0.2	0.3	0.5	0.6

1/ Household clustering items refers to characteristics for which there is more than one observation per household. This causes a clustering of similar observations within the household. Examples of household clustering items would be number of trips for total persons, household income, race of traveler and residence of traveler. In general, this causes an increase in the variance of an estimate for that characteristic. However, this was not always true for all person trips characteristics. This household clustering effect was found to occur for only total person trips and privately owned automobiles. Thus, for all other means of transportation, standard errors for non-household clustering items should be used. In addition, non-household clustering standard errors should be used for total persons and race of traveler, since this clustering effect was not found to exist for these characteristics either. Sex and age are not considered household clustering items for travel day even though there may be more than one observation per household because, in general, the entire household does not take a trip together.

TABLE B-5. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON TRIPS: NON-HOUSEHOLD CLUSTERING ITEMS[1/]
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
15,000	44.1	44.1	44.1	44.1	44.1	44.4
20,000	37.2	37.2	37.2	37.2	37.2	38.5
25,000	32.1	32.1	32.1	32.1	32.1	34.4
50,000	19.1	19.1	19.1	19.1	21.1	24.3
75,000	13.6	13.6	13.6	13.6	17.2	19.9
100,000	10.6	10.6	10.6	10.6	14.9	17.2
150,000	7.3	7.3	7.3	8.4	12.2	14.0
200,000	5.6	5.6	5.6	7.3	10.5	12.2
250,000	4.5	4.5	4.7	6.5	9.4	10.9
500,000	2.3	2.3	3.4	4.6	6.7	7.7
750,000	1.6	1.6	2.7	3.8	5.4	6.3
1,000,000	1.2	1.2	2.4	3.3	4.7	5.4
1,500,000	0.8	0.9	1.9	2.7	3.8	4.4
2,000,000	0.6	0.8	1.7	2.3	3.3	3.8
2,500,000	0.5	0.7	1.5	2.1	3.0	3.4
5,000,000	0.2	0.5	1.1	1.5	2.1	2.4
7,500,000	0.2	0.4	0.9	1.2	1.7	2.0
10,000,000	0.12	0.3	0.7	1.0	1.5	1.7
15,000,000	0.08	0.3	0.6	0.8	1.2	1.4
20,000,000	0.06	0.2	0.5	0.7	1.1	1.2
25,000,000	0.05	0.2	0.5	0.7	0.9	1.1
50,000,000	0.02	0.15	0.3	0.5	0.7	0.8
75,000,000	0.02	0.13	0.3	0.4	0.5	0.6
100,000,000	0.01	0.11	0.2	0.3	0.5	0.5
250,000,000	0.01	0.08	0.15	0.2	0.4	0.4

1/ Non-household clustering items refers to all characteristics except those defined under household clustering items (see Table B-4) and any form of public transportation.

TABLE B-6. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON TRIPS: PUBLIC TRANSPORTATION
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
5,000	46.8	46.8	46.8	46.8	46.8	46.9
7,500	37.0	37.0	37.0	37.0	37.0	38.3
10,000	30.5	30.5	30.5	30.5	30.5	33.2
15,000	22.7	22.7	22.7	22.7	23.4	27.1
20,000	18.0	18.0	18.0	18.0	20.3	23.4
25,000	15.0	15.0	15.0	15.0	18.2	21.0
50,000	8.1	8.1	8.1	8.9	12.8	14.8
75,000	5.5	5.5	5.5	7.3	10.5	12.1
100,000	4.2	4.2	4.6	6.3	9.1	10.5
150,000	2.8	2.8	3.7	5.1	7.4	8.6
200,000	2.2	2.2	3.2	4.4	6.4	7.4
250,000	1.7	1.7	2.9	4.0	5.7	6.6
500,000	0.9	0.9	2.0	2.8	4.1	4.7
750,000	0.6	0.8	1.7	2.3	3.3	3.8
1,000,000	0.4	0.7	1.4	2.0	2.9	3.3
1,500,000	0.3	0.5	1.2	1.6	2.3	2.7
2,000,000	0.2	0.5	1.0	1.4	2.0	2.3
2,500,000	0.2	0.4	0.9	1.3	1.8	2.1
5,000,000	0.09	0.3	0.6	0.9	1.3	1.5
7,500,000	0.06	0.2	0.5	0.7	1.0	1.2
10,000,000	0.04	0.2	0.5	0.6	0.9	1.0
15,000,000	0.03	0.2	0.4	0.5	0.7	0.9
20,000,000	0.02	0.15	0.3	0.4	0.6	0.7
25,000,000	0.02	0.13	0.3	0.4	0.6	0.7
50,000,000	0.01	0.09	0.2	0.3	0.4	0.5
75,000,000	0.01	0.08	0.2	0.2	0.3	0.4

TABLE B-7. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON MILES: OTHER PUBLIC TRANSPORTATION[1/]
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
2,500,000	46.9	46.9	46.9	46.9	46.9	47.0
5,000,000	30.6	30.6	30.6	30.6	30.6	33.2
7,500,000	22.7	22.7	22.7	22.7	23.5	27.1
10,000,000	18.1	18.1	18.1	18.1	20.3	23.5
15,000,000	12.8	12.8	12.8	12.8	16.6	19.2
20,000,000	9.9	9.9	9.9	10.0	14.4	16.6
25,000,000	8.1	8.1	8.1	8.9	12.9	14.9
50,000,000	4.2	4.2	4.6	6.3	9.1	10.5
75,000,000	2.9	2.9	3.7	5.1	7.4	8.6
100,000,000	2.2	2.2	3.2	4.5	6.4	7.4
150,000,000	1.4	1.4	2.6	3.6	5.3	6.1

1/ Other public transportation includes all forms of public transportation except bus or train and elevated rail or subway.

TABLE B-8. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON MILES: HOUSEHOLD CLUSTERING ITEMS[1/]
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
750,000	49.9	49.9	49.9	49.9	49.9	49.9
1,000,000	42.8	42.8	42.8	42.8	42.8	43.2
1,500,000	33.3	33.3	33.3	33.3	33.3	35.3
2,000,000	27.2	27.2	27.2	27.2	27.2	30.6
2,500,000	23.0	23.0	23.0	23.0	23.7	27.3
5,000,000	13.0	13.0	13.0	13.0	16.7	19.3
7,500,000	9.1	9.1	9.1	9.5	13.7	15.8
10,000,000	7.0	7.0	7.0	8.2	11.8	13.7
15,000,000	4.7	4.7	4.9	6.7	9.7	11.2
20,000,000	3.6	3.6	4.2	5.8	8.4	9.7
25,000,000	2.9	2.9	3.8	5.2	7.5	8.6
50,000,000	1.5	1.5	2.7	3.7	5.3	6.1
75,000,000	1.0	1.0	2.2	3.0	4.3	5.0
100,000,000	0.7	0.9	1.9	2.6	3.7	4.3
150,000,000	0.5	0.7	1.5	2.1	3.1	3.5
200,000,000	0.4	0.6	1.3	1.8	2.6	3.1
250,000,000	0.3	0.5	1.2	1.6	2.4	2.7
500,000,000	0.15	0.4	0.8	1.2	1.7	1.9
750,000,000	0.10	0.3	0.7	0.9	1.4	1.6
1,000,000,000	0.07	0.3	0.6	0.8	1.2	1.4
1,500,000,000	0.05	0.2	0.5	0.7	1.0	1.1
2,000,000,000	0.04	0.2	0.4	0.6	0.8	1.0

1/ Household clustering items are defined the same as in table A-3. For person miles there are no exceptions - the standard errors should be used for all household clustering items. For totals, standard errors should be calculated the same way that is described in table A-4.

TABLE B-9. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON MILES: ELEVATED RAIL AND SUBWAY
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
25,000	48.3	48.3	48.3	48.3	48.3	48.3
50,000	31.9	31.9	31.9	31.9	31.9	34.2
75,000	23.8	23.8	23.8	23.8	24.2	27.9
100,000	18.9	18.9	18.9	18.9	20.9	24.2
150,000	13.5	13.5	13.5	13.5	17.1	19.7
200,000	10.5	10.5	10.5	10.5	14.8	17.1
250,000	8.6	8.6	8.6	9.2	13.2	15.3
500,000	4.5	4.5	4.7	6.5	9.4	10.8
750,000	3.0	3.0	3.8	5.3	7.6	8.8
1,000,000	2.3	2.3	3.3	4.6	6.6	7.6
1,500,000	1.5	1.5	2.7	3.7	5.4	6.2
2,000,000	1.2	1.2	2.4	3.2	4.7	5.4
2,500,000	0.9	1.0	2.1	2.9	4.2	4.8
5,000,000	0.5	0.7	1.5	2.1	3.0	3.4
7,500,000	0.3	0.6	1.2	1.7	2.4	2.8

TABLE B-10. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON MILES: REMAINDER[1/]
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
250,000	47.5	47.5	47.5	47.5	47.5	47.6
500,000	31.2	31.2	31.2	31.2	31.2	33.6
750,000	23.2	23.2	23.2	23.2	23.8	27.5
1,000,000	18.5	18.5	18.5	18.5	20.6	23.8
1,500,000	13.1	13.1	13.1	13.1	16.8	19.4
2,000,000	10.2	10.2	10.2	10.2	14.6	16.8
2,500,000	8.3	8.3	8.3	9.0	13.0	15.0
5,000,000	4.3	4.3	4.6	6.4	9.2	10.6
7,500,000	2.9	2.9	3.8	5.2	7.5	8.7
10,000,000	2.2	2.2	3.3	4.5	6.5	7.5
15,000,000	1.5	1.5	2.7	3.7	5.3	6.1
20,000,000	1.1	1.1	2.3	3.2	4.6	5.3
25,000,000	0.9	0.9	2.1	2.9	4.1	4.8
50,000,000	0.5	0.7	1.5	2.0	2.9	3.4
75,000,000	0.3	0.5	1.2	1.6	2.4	2.7
100,000,000	0.2	0.5	1.0	1.4	2.1	2.4
150,000,000	0.15	0.4	0.8	1.2	1.7	1.9
200,000,000	0.11	0.3	0.7	1.0	1.5	1.7
250,000,000	0.09	0.3	0.7	0.9	1.3	1.5
500,000,000	0.05	0.2	0.5	0.6	0.9	1.1
750,000,000	0.03	0.2	0.4	0.5	0.8	0.9
1,000,000,000	0.02	0.1	0.3	0.5	0.7	0.8

[1/] Remainder refers to all characteristics except those pertaining to other public transportation, (Table B-7) elevated rail and subway (Table B-8) and household clustering items (Table B-9). For totals, standard errors should be calculated the same way that is described in Table A-4.

TABLE B-11. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE MILES: SHOPPING, CIVIC, RELIGIOUS, EDUCATION (Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
50,000	43.3	43.3	43.3	43.3	43.3	43.7
75,000	33.8	33.8	33.8	33.8	33.8	35.7
100,000	27.7	27.7	27.7	27.7	27.7	30.9
150,000	20.3	20.3	20.3	20.3	21.9	25.2
200,000	16.1	16.1	16.1	16.1	18.9	21.9
250,000	13.3	13.3	13.3	13.3	16.9	19.6
500,000	7.1	7.1	7.1	8.3	12.0	13.8
750,000	4.9	4.9	4.9	6.8	9.8	11.3
1,000,000	3.7	3.7	4.3	5.9	8.5	9.8
1,500,000	2.5	2.5	3.5	4.8	6.9	8.0
2,000,000	1.9	1.9	3.0	4.1	6.0	6.9
2,500,000	1.5	1.5	2.7	3.7	5.4	6.2
5,000,000	0.8	0.9	1.9	2.6	3.8	4.4
7,500,000	0.5	0.7	1.6	2.1	3.1	3.6
10,000,000	0.4	0.6	1.3	1.9	2.7	3.1
15,000,000	0.3	0.5	1.1	1.5	2.2	2.5

TABLE B-12. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE MILES: RECREATION, SOCIAL, ENTERTAINMENT (Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
75,000	40.6	40.6	40.6	40.6	40.6	41.4
100,000	33.9	33.9	33.9	33.9	33.9	35.8
150,000	25.5	25.5	25.5	25.5	25.5	29.2
200,000	20.4	20.4	20.4	20.4	21.9	25.3
250,000	17.0	17.0	17.0	17.0	19.6	22.7
500,000	9.3	9.3	9.3	9.6	13.9	16.0
750,000	6.4	6.4	6.4	7.8	11.3	13.1
1,000,000	4.9	4.9	4.9	6.8	9.8	11.3
1,500,000	3.3	3.3	4.0	5.5	8.0	9.2
2,000,000	2.5	2.5	3.5	4.8	6.9	8.0
2,500,000	2.0	2.0	3.1	4.3	6.2	7.2
5,000,000	1.0	1.0	2.2	3.0	4.4	5.1
7,500,000	0.7	0.8	1.8	2.5	3.6	4.1
10,000,000	0.5	0.7	1.6	2.1	3.1	3.6
15,000,000	0.3	0.6	1.3	1.8	2.5	2.9
20,000,000	0.3	0.5	1.1	1.5	2.2	2.5

TABLE B-13. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE MILES: REMAINDER[1/]
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
150,000	49.4	49.4	49.4	49.4	49.4	49.4
200,000	42.3	42.3	42.3	42.3	42.3	42.8
250,000	37.0	37.0	37.0	37.0	37.0	38.3
500,000	22.7	22.7	22.7	22.7	23.4	27.1
750,000	16.3	16.3	16.3	16.3	19.1	22.1
1,000,000	12.8	12.8	12.8	12.8	16.6	19.1
1,500,000	8.9	8.9	8.9	9.4	13.5	15.6
2,000,000	6.8	6.8	6.8	8.1	11.7	13.5
2,500,000	5.5	5.5	5.5	7.3	10.5	12.1
5,000,000	2.8	2.8	3.7	5.1	7.4	8.6
7,500,000	1.9	1.9	3.0	4.2	6.1	7.0
10,000,000	1.4	1.4	2.6	3.6	5.2	6.1
15,000,000	1.0	1.0	2.2	3.0	4.3	4.9
20,000,000	0.7	0.9	1.9	2.6	3.7	4.3
25,000,000	0.6	0.8	1.7	2.3	3.3	3.8
50,000,000	0.3	0.5	1.2	1.6	2.3	2.7
75,000,000	0.2	0.4	1.0	1.3	1.9	2.2
100,000,000	0.15	0.4	0.8	1.1	1.7	1.9
150,000,000	0.10	0.3	0.7	0.9	1.4	1.6
200,000,000	0.07	0.3	0.6	0.8	1.2	1.4
250,000,000	0.06	0.2	0.5	0.7	1.0	1.2
500,000,000	0.03	0.2	0.4	0.5	0.7	0.9
750,000,000	0.02	0.14	0.3	0.4	0.6	0.7

1/ Remainder includes all trips except those for the following purposes: shopping, civic, religious, education, recreation, social, or entertainment.

Standard errors for percentages of annual vehicle miles for shopping, civic, religious and education are found in Table B-11. Standard errors for percentages of annual vehicle miles for social or entertainment are found in Table B-12.

TABLE B-14. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS
(Travel Day)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
500	1.1	1.1	2.3	3.2	4.6	5.3
1,000	0.6	0.8	1.6	2.3	3.3	3.8
1,500	0.4	0.6	1.3	1.9	2.7	3.1
2,000	0.3	0.5	1.2	1.6	2.3	2.7
5,000	0.11	0.3	0.7	1.0	1.5	1.7
7,500	0.08	0.3	0.6	0.8	1.2	1.4
10,000	0.06	0.2	0.5	0.7	1.0	1.2
15,000	0.04	0.2	0.4	0.6	0.8	1.0
20,000	0.03	0.2	0.4	0.5	0.7	0.8
25,000	0.02	0.15	0.3	0.5	0.7	0.8
50,000	0.01	0.11	0.2	0.3	0.5	0.5
75,000	0.01	0.09	0.2	0.3	0.4	0.4
100,000	0.01	0.08	0.2	0.2	0.3	0.4

TABLE B-15. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE TRIPS
(Travel Period)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
500	38.8	38.8	38.8	38.8	38.8	39.8
1,000	24.1	24.1	24.1	24.1	24.4	28.2
1,500	17.5	17.5	17.5	17.5	19.9	23.0
2,000	13.7	13.7	13.7	13.7	17.2	19.9
5,000	6.0	6.0	6.0	7.6	10.9	12.6
7,500	4.1	4.1	4.5	6.2	8.9	10.3
10,000	3.1	3.1	3.9	5.3	7.7	8.9
15,000	2.1	2.1	3.2	4.4	6.3	7.3
20,000	1.6	1.6	2.7	3.8	5.5	6.3
25,000	1.3	1.3	2.5	3.4	4.9	5.6
50,000	0.6	0.8	1.7	2.4	3.4	4.0
75,000	0.4	0.6	1.4	2.0	2.8	3.3
100,000	0.3	0.6	1.2	1.7	2.4	2.8
150,000	0.2	0.5	1.0	1.4	2.0	2.3
200,000	0.2	0.4	0.9	1.2	1.7	2.0
250,000	0.13	0.4	0.8	1.1	1.5	1.8
500,000	0.06	0.3	0.5	0.8	1.1	1.3
750,000	0.04	0.2	0.4	0.6	0.9	1.0
1,000,000	0.03	0.2	0.4	0.5	0.8	0.9

TABLE B-16. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON TRIPS: HOUSEHOLD CLUSTERING ITEMS[1/]
(Travel Period)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
1,000	48.7	48.7	48.7	48.7	48.7	48.7
1,500	38.8	38.8	38.8	38.8	38.8	39.8
2,000	32.2	32.2	32.2	32.2	32.2	34.5
2,500	27.5	27.5	27.5	27.5	27.5	30.8
5,000	16.0	16.0	16.0	16.0	18.9	21.8
7,500	11.2	11.2	11.2	11.2	15.4	17.8
10,000	8.7	8.7	8.7	9.2	13.3	15.4
15,000	6.0	6.0	6.0	7.6	10.9	12.6
20,000	4.5	4.5	4.8	6.5	9.4	10.9
25,000	3.7	3.7	4.2	5.8	8.4	9.7
50,000	1.9	1.9	3.0	4.1	6.0	6.9
75,000	1.3	1.3	2.5	3.4	4.9	5.6
100,000	0.9	1.0	2.1	2.9	4.2	4.9
150,000	0.6	0.8	1.7	2.4	3.4	4.0
200,000	0.5	0.7	1.5	2.1	3.0	3.4
250,000	0.4	0.6	1.3	1.8	2.7	3.1
500,000	0.2	0.4	1.0	1.3	1.9	2.2
750,000	0.13	0.4	0.8	1.1	1.5	1.8
1,000,000	0.09	0.3	0.7	0.9	1.3	1.5
1,500,000	0.06	0.3	0.5	0.8	1.1	1.3

1/ Household clustering items defined the same as in table A-3. Here again only total person trips and trips by privately owned automobiles will have a clustering effect. For travel period trips, age and sex items would be included as household clustering items because travel period trips are, in general, trips taken by the entire family so there will be more than one person of the same age and sex from a household.

TABLE B-17. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL PERSON TRIPS: REMAINDER[1]/
(Travel Period)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
500	45.4	45.4	45.4	45.4	45.4	45.6
1,000	29.3	29.3	29.3	29.3	29.3	32.2
1,500	21.7	21.7	21.7	21.7	22.8	26.3
2,000	17.2	17.2	17.2	17.2	19.7	22.8
2,500	14.2	14.2	14.2	14.2	17.6	20.4
5,000	7.7	7.7	7.7	8.6	12.5	14.4
7,500	5.2	5.2	5.2	7.1	10.2	11.8
10,000	4.0	4.0	4.4	6.1	8.8	10.2
15,000	2.7	2.7	3.6	5.0	7.2	8.3
20,000	2.0	2.0	3.1	4.3	6.2	7.2
25,000	1.6	1.6	2.8	3.9	5.6	6.4
50,000	0.8	0.9	2.0	2.7	3.9	4.6
75,000	0.6	0.7	1.6	2.2	3.2	3.7
100,000	0.4	0.6	1.4	1.9	2.8	3.2
150,000	0.3	0.5	1.1	1.6	2.3	2.6

1/ Remainder includes all items except those defined under household clustering items (see Table B-16). All forms of public transportation are included in the remainder.

TABLE B-18. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE MILES: WORK RELATED, VACATION, VISIT FRIENDS OR RELATIVES, FAMILY OR PERSONAL BUSINESS (Travel Period)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
75,000	44.4	44.4	44.4	44.4	44.4	44.6
100,000	37.4	37.4	37.4	37.4	37.4	38.7
150,000	28.5	28.5	28.5	28.5	28.5	31.6
200,000	23.0	23.0	23.0	23.0	23.7	27.3
250,000	19.3	19.3	19.3	19.3	21.2	24.5
500,000	10.7	10.7	10.7	10.7	15.0	17.3
750,000	7.4	7.4	7.4	8.5	12.2	14.1
1,000,000	5.6	5.6	5.6	7.3	10.6	12.2
1,500,000	3.8	3.8	4.4	6.0	8.6	10.0
2,000,000	2.9	2.9	3.8	5.2	7.5	8.6
2,500,000	2.3	2.3	3.4	4.6	6.7	7.7
5,000,000	1.2	1.2	2.4	3.3	4.7	5.5
7,500,000	0.8	0.9	1.9	2.7	3.9	4.5
10,000,000	0.6	0.8	1.7	2.3	3.3	3.9
15,000,000	0.4	0.6	1.4	1.9	2.7	3.2

TABLE B-19. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE MILES: SOCIAL, RECREATION
(Travel Period)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
20,000	47.7	47.7	47.7	47.7	47.7	47.7
50,000	26.7	26.7	26.7	26.7	26.7	30.2
75,000	19.6	19.6	19.6	19.6	21.3	24.7
100,000	15.4	15.4	15.4	15.4	18.5	21.3
150,000	10.8	10.8	10.8	10.8	15.1	17.4
200,000	8.4	8.4	8.4	9.1	13.1	15.1
250,000	6.8	6.8	6.8	8.1	11.7	13.5
500,000	3.5	3.5	4.2	5.7	8.3	9.5
750,000	2.4	2.4	3.4	4.7	6.8	7.8
1,000,000	1.8	1.8	2.9	4.1	5.8	6.8
1,500,000	1.2	1.2	2.4	3.3	4.8	5.5
2,000,000	0.9	0.9	2.1	2.9	4.1	4.8
2,500,000	0.7	0.8	1.9	2.6	3.7	4.3

TABLE B-20. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF ANNUAL VEHICLE MILES: REMAINDER[1/]

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
50,000	43.5	43.5	43.5	43.5	43.5	43.9
75,000	34.0	34.0	34.0	34.0	34.0	35.9
100,000	27.8	27.8	27.8	27.8	27.8	31.1
150,000	20.5	20.5	20.5	20.5	22.0	25.4
200,000	16.2	16.2	16.2	16.2	19.0	22.0
250,000	13.4	13.4	13.4	13.4	17.0	19.6
500,000	7.2	7.2	7.2	8.3	12.0	13.9
750,000	4.9	4.9	4.9	6.8	9.8	11.3
1,000,000	3.7	3.7	4.3	5.9	8.5	9.8
1,500,000	2.5	2.5	3.5	4.8	6.9	8.0
2,000,000	1.9	1.9	3.0	4.2	6.0	6.9
2,500,000	1.5	1.5	2.7	3.7	5.4	6.2
5,000,000	0.8	0.9	1.9	2.6	3.8	4.4
7,500,000	0.5	0.7	1.6	2.2	3.1	3.6
10,000,000	0.4	0.6	1.4	1.9	2.7	3.1
15,000,000	0.3	0.5	1.1	1.5	2.2	2.5
20,000,000	0.2	0.4	1.0	1.3	1.9	2.2
25,000,000	0.15	0.4	0.9	1.2	1.7	2.0
50,000,000	0.08	0.3	0.6	0.8	1.2	1.4
75,000,000	0.05	0.2	0.5	0.7	1.0	1.1

1/ Includes all purposes as defined for "Remainder" in Table A-9, i.e., work related, vacation, family or personal business, visit friends or relatives; social and recreation.

TABLE B-21. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF PERSON DEMOGRAPHIC CHARACTERISTICS: HOUSEHOLD CLUSTERING ITEMS*
(Travel Period)

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
150	9.1	9.1	9.1	9.5	13.7	15.8
200	7.0	7.0	7.0	8.2	11.9	13.7
250	5.7	5.7	5.7	7.4	10.6	12.3
500	2.9	2.9	3.8	5.2	7.5	8.7
750	2.0	2.0	3.1	4.2	6.1	7.1
1,000	1.5	1.5	2.7	3.7	5.3	6.1
1,500	1.0	1.0	2.2	3.0	4.3	5.0
2,000	0.7	0.9	1.9	2.6	3.8	4.3
2,500	0.6	0.8	1.7	2.3	3.4	3.9
5,000	0.3	0.5	1.2	1.6	2.4	2.7
7,500	0.2	0.4	1.0	1.3	1.9	2.2
10,000	0.2	0.4	0.8	1.2	1.7	1.9
15,000	0.1	0.3	0.7	0.9	1.4	1.6
20,000	0.08	0.3	0.6	0.8	1.2	1.4
25,000	0.06	0.2	0.5	0.7	1.1	1.2
50,000	0.03	0.2	0.4	0.5	0.8	0.9
75,000	0.02	0.1	0.3	0.4	0.6	0.7

* See Table A-10 for the description of household clustering items for person demographic characteristics.

TABLE B-22. ESTIMATED STANDARD ERRORS FOR PERCENTAGES OF PERSON DEMOGRAPHIC CHARACTERISTICS: REMAINDER*

(68 chances out of 100)

Base of Percentage (000)	Estimated Percentage					
	0 or 100	1 or 99	5 or 95	10 or 90	25 or 75	50
150	4.4	4.4	4.7	6.4	9.3	10.7
200	3.3	3.3	4.0	5.6	8.0	9.3
250	2.7	2.7	3.6	5.0	7.2	8.3
500	1.4	1.4	2.6	3.5	5.1	5.9
750	0.9	1.0	2.1	2.9	4.1	4.8
1,000	0.7	0.8	1.8	2.5	3.6	4.1
1,500	0.5	0.7	1.5	2.0	2.9	3.4
2,000	0.3	0.6	1.3	1.8	2.5	2.9
2,500	0.3	0.5	1.1	1.6	2.3	2.6
5,000	0.1	0.4	0.8	1.1	1.6	1.9
7,500	0.09	0.3	0.7	0.9	1.3	1.5
10,000	0.07	0.3	0.6	0.8	1.1	1.3
15,000	0.05	0.2	0.5	0.6	0.9	1.1
20,000	0.03	0.2	0.4	0.6	0.8	0.9
25,000	0.03	0.2	0.4	0.5	0.7	0.8
50,000	0.01	0.1	0.3	0.4	0.5	0.6
75,000	0.01	0.1	0.2	0.3	0.4	0.5
100,000	0.01	0.08	0.2	0.2	0.4	0.4
150,000	0.01	0.07	0.1	0.2	0.3	0.3

* See Table A-10 for the description of the remainder category for person demographic characteristics.

C. STANDARD ERRORS OF MEANS FOR TRAVEL DAY

TABLE C-1. STANDARD ERRORS FOR AVERAGE NUMBER OF VEHICLE TRIPS

Base of Means (000)	Estimated Means 890	1000	1500	2100	2700	3400	4100
2,000	78.5	79.6	86.0	96.8	111.4	133.1	191.8
3,000	65.5	66.4	71.6	80.8	92.9	110.9	158.8
4,000	57.9	58.7	63.3	71.3	82.0	97.8	139.4
5,000	52.8	53.5	57.7	65.0	74.7	89.1	126.3
6,000	49.1	49.8	53.7	60.4	69.4	82.8	116.8
7,000	46.2	46.8	50.5	56.9	65.4	78.0	109.5
7,500	45.0	45.6	49.2	55.4	63.6	75.9	106.4
8,000	44.0	44.3	45.8	48.6	52.2	74.1	103.6
8,500	43.0	43.3	44.8	47.6	51.2	72.5	101.2
9,000	42.1	42.4	43.9	46.6	50.2	71.0	98.9
9,500	41.3	41.6	43.1	45.8	49.4	69.7	96.8
10,000	40.5	40.8	42.3	45.0	48.6	68.4	94.9
15,000	35.2	35.5	37.0	39.6	43.3	59.9	81.8
20,000	32.0	32.3	33.9	36.6	40.3	55.2	74.4
25,000	29.7	29.8	30.1	31.5	38.5	52.2	69.6
30,000	28.0	28.1	28.9	30.3	37.2	50.1	66.2
40,000	24.9	25.1	25.6	28.7	35.5	47.3	61.7
50,000	22.7	23.0	24.1	27.7	34.5	45.5	58.8
60,000	21.1	21.4	23.0	27.0	33.8	44.3	56.8
70,000	19.9	20.3	22.2	26.5	33.2	43.5	55.3

TABLE C-2. STANDARD ERRORS FOR AVERAGE ANNUAL VEHICLE MILES
(Travel Day)

Base of Means (000)	Estimated Means 4300	8000	10000	13000	15000	18000	22000
2,000	493.3	774.9	875.5	970.9	999.4	999.4	999.4
3,000	406.1	640.0	724.8	808.0	835.7	835.7	835.7
4,000	354.5	560.4	636.3	712.7	740.4	746.5	746.5
5,000	319.6	506.8	576.7	648.9	676.8	688.4	688.4
6,000	294.0	467.6	533.3	602.5	630.8	646.8	646.8
7,000	274.3	437.4	499.9	567.1	595.8	615.3	615.3
7,500	266.0	424.8	486.0	552.3	581.2	602.3	586.4
8,000	258.5	413.4	473.4	539.1	568.2	590.6	579.2
8,500	251.8	403.1	462.0	527.1	556.4	580.1	572.8
9,000	245.6	393.7	451.7	516.2	545.7	570.7	567.0
9,500	239.9	385.1	442.2	506.2	535.9	562.1	561.8
10,000	234.7	377.2	433.5	497.1	527.0	554.2	557.1
15,000	198.5	322.6	373.8	434.9	466.5	501.5	526.1
20,000	177.6	291.5	340.1	400.2	433.1	473.0	509.9
25,000	163.8	271.2	318.1	377.9	411.8	455.1	499.9
30,000	153.9	256.7	302.5	362.2	396.9	442.7	493.2
35,000	146.5	245.9	290.9	350.6	386.0	433.6	488.3
40,000	140.6	237.4	281.9	341.6	377.5	426.7	484.6
50,000	132.0	225.0	268.8	328.6	365.4	416.8	479.4
60,000	125.9	216.4	259.7	319.7	357.1	410.1	475.9
70,000	121.4	210.0	253.0	313.1	351.0	405.2	473.4

Table C-3. Standard Errors for Average Number of Person Trips

Base of Means (000)	Estimated Means 100	500	800	1300	1800	2400	3400	4400
700	53.8	80.4	81.6	82.7	97.5	135.8	227.7	336.1
800	50.3	75.3	76.4	77.5	91.5	127.4	213.5	315.0
900	47.4	71.0	72.1	73.3	86.5	120.5	201.7	297.5
1,000	45.0	67.4	68.5	69.7	82.4	114.6	191.8	282.7
2,000	31.8	47.8	48.9	50.4	60.1	83.5	138.5	203.2
3,000	26.0	39.2	40.3	42.1	50.6	70.1	115.5	168.6
4,000	22.5	34.1	35.2	37.3	45.1	62.3	102.0	148.3
5,000	20.2	30.6	31.8	34.0	41.4	57.2	92.9	134.6
6,000	18.4	28.0	29.2	31.7	38.8	53.4	86.4	124.7
7,000	17.0	26.0	27.3	29.9	36.8	50.6	81.4	117.1
7,500	16.5	25.2	26.5	29.2	36.0	49.4	79.3	113.9
8,000	15.9	24.5	25.8	28.5	35.2	48.4	77.5	111.1
8,500	15.5	23.8	25.1	27.9	34.6	47.4	75.8	108.5
9,000	15.0	23.1	24.5	27.3	34.0	46.6	74.2	106.1
9,500	14.6	22.6	23.9	26.8	33.4	45.8	72.8	104.0
10,000	14.3	22.0	23.4	26.4	32.9	45.1	71.6	102.0
15,000	11.7	18.3	19.9	23.3	29.5	40.3	62.8	88.5
20,000	10.1	16.1	17.9	21.6	27.7	37.6	58.0	80.9
25,000	9.1	14.7	16.5	20.5	26.5	36.0	54.9	76.0
30,000	8.3	13.6	15.6	19.7	25.7	34.8	52.7	72.5
35,000	7.7	12.8	14.8	19.1	25.1	33.9	51.1	69.9
40,000	7.2	12.1	14.3	18.7	24.7	33.3	49.8	67.9
50,000	6.5	11.2	13.4	18.1	24.0	32.3	48.0	65.0
60,000	5.9	10.5	12.9	17.6	23.6	31.7	46.8	63.0
70,000	5.5	10.0	12.4	17.3	23.2	31.2	45.9	61.6
80,000	5.2	9.5	12.1	17.1	23.0	30.9	45.2	60.4
90,000	4.9	9.2	11.8	16.9	22.8	30.6	44.7	59.5
100,000	4.7	8.9	11.6	16.8	22.6	30.4	44.2	58.8
150,000	3.9	8.0	10.9	16.3	22.2	29.7	42.9	56.6
200,000	3.4	7.6	10.6	16.0	21.9	29.3	42.2	55.4

TABLE C-4. STANDARD ERRORS FOR AVERAGE TRIP DURATION (MINUTES)

Base of Means (000 000)	Estimated Means							
	10	12	13	15	16	17	19	23
60	1.1	1.9	2.4	3.3	3.8	4.3	5.3	7.5
70	1.0	1.8	2.2	3.1	3.5	4.0	4.9	6.9
80	1.0	1.7	2.1	2.9	3.3	3.7	4.6	6.5
90	0.9	1.6	2.0	2.7	3.1	3.5	4.4	6.1
100	0.9	1.5	1.9	2.6	3.0	3.3	4.1	5.8
200	0.6	1.1	1.3	1.8	2.1	2.4	2.9	4.1
300	0.5	0.9	1.1	1.5	1.7	1.9	2.4	3.4
400	0.5	0.8	0.9	1.3	1.5	1.7	2.1	2.9
500	0.4	0.7	0.8	1.2	1.3	1.5	1.9	2.6
600	0.4	0.6	0.8	1.1	1.2	1.4	1.7	2.4
700	0.3	0.6	0.7	1.0	1.1	1.3	1.6	2.2
800	0.3	0.5	0.7	0.9	1.1	1.2	1.5	2.1
900	0.3	0.5	0.6	0.9	1.0	1.1	1.4	1.9
1,000	0.3	0.5	0.6	0.8	1.0	1.1	1.3	1.8
1,500	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.5
2,000	0.2	0.4	0.4	0.6	0.7	0.8	1.0	1.3
2,500	0.2	0.3	0.4	0.5	0.6	0.7	0.9	1.2
3,000	0.2	0.3	0.4	0.5	0.6	0.6	0.8	1.1
4,000	0.2	0.3	0.3	0.4	0.5	0.6	0.7	1.0
5,000	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.9
6,000	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.8
7,000	0.2	0.2	0.3	0.4	0.4	0.4	0.5	0.7
8,000	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.7
9,000	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.7
10,000	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6
15,000	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.5
20,000	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.5
25,000	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.5
30,000	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
40,000	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4
50,000	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4
60,000	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.4
70,000	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
80,000	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
90,000	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
100,000	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
150,000	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3

TABLE C-5. STANDARD ERRORS FOR AVERAGE TRIP DISTANCE (MILES)

Base of Means (000 000)	Estimated Means 3	5	7	9	11	15	20	25
40	1.7	1.8	2.7	4.0	5.6	9.0	13.6	18.4
50	1.5	1.6	2.4	3.6	5.0	8.0	12.1	16.5
60	1.4	1.5	2.2	3.3	4.5	7.3	11.1	15.0
70	1.3	1.4	2.0	3.0	4.2	6.8	10.3	13.9
80	1.2	1.3	1.9	2.9	3.9	6.4	9.6	13.0
90	1.1	1.2	1.8	2.7	3.7	6.0	9.1	12.3
100	1.0	1.2	1.7	2.6	3.5	5.7	8.6	11.7
200	0.7	0.8	1.2	1.8	2.5	4.0	6.1	8.3
300	0.6	0.7	1.0	1.5	2.1	3.3	5.0	6.8
400	0.5	0.6	0.9	1.3	1.8	2.9	4.4	5.9
500	0.5	0.5	0.8	1.2	1.6	2.6	3.9	5.3
600	0.4	0.5	0.7	1.1	1.5	2.4	3.6	4.9
700	0.4	0.5	0.7	1.0	1.4	2.2	3.3	4.5
800	0.4	0.5	0.7	1.0	1.3	2.1	3.1	4.2
900	0.4	0.4	0.6	0.9	1.3	2.0	3.0	4.0
1,000	0.4	0.4	0.6	0.9	1.2	1.9	2.8	3.8
2,000	0.3	0.3	0.5	0.7	0.9	1.4	2.1	2.8
3,000	0.2	0.3	0.4	0.6	0.8	1.2	1.8	2.4
4,000	0.2	0.3	0.4	0.5	0.7	1.1	1.6	2.1
5,000	0.2	0.3	0.4	0.5	0.7	1.0	1.5	1.9
6,000	0.2	0.3	0.4	0.5	0.6	1.0	1.4	1.8
7,000	0.2	0.2	0.4	0.5	0.6	0.9	1.3	1.7
8,000	0.2	0.2	0.3	0.5	0.6	0.9	1.3	1.7
9,000	0.2	0.2	0.3	0.5	0.6	0.9	1.2	1.6
10,000	0.2	0.2	0.3	0.4	0.6	0.8	1.2	1.6
15,000	0.2	0.2	0.3	0.4	0.5	0.8	1.1	1.4
20,000	0.1	0.2	0.3	0.4	0.5	0.7	1.0	1.3
25,000	0.1	0.2	0.3	0.4	0.5	0.7	1.0	1.3
30,000	0.1	0.2	0.3	0.4	0.5	0.7	1.0	1.2
40,000	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2
50,000	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.2
60,000	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.1
70,000	0.1	0.2	0.3	0.4	0.5	0.7	0.9	1.1
80,000	0.1	0.2	0.3	0.4	0.5	0.6	0.9	1.1
90,000	0.1	0.2	0.3	0.4	0.5	0.6	0.9	1.1
100,000	0.1	0.2	0.3	0.4	0.5	0.6	0.9	1.1
150,000	0.1	0.2	0.3	0.4	0.5	0.6	0.9	1.1

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APPENDIX A

FINAL WEIGHTING SPECIFICATIONS FOR DATA FROM THE 1977 NPTS

Introduction

This section contains the instructions for the application of the weighting specifications to 1977 NPTS data from April 1977 through March 1978. The weighting factors described in the weighting specifications are needed to make estimates of NPTS characteristics for different time periods. Separate instructions are given for weighting the data from the travel day and the 14-day travel period. It is important to note that estimates from the travel day and travel period are not additive since both are independent estimates of total national travel.

For the travel day and the 14-day travel period, directions are given for the user who wants to obtain an estimate of vehicle trips, vehicle miles of travel, person trips and person miles of travel for day(s), month(s), quarter(s) or a year. In addition, instructions for expansion of the household/person characteristics are provided; these allow the user to obtain characteristics of traveling and non-traveling households/persons for a specified time period. Special formulae are provided for obtaining weighted estimates of household/person characteristics in those cases where the time period being considered requires combining data from the basic and supplemental samples.

Each household, person and trip reported for NPTS was assigned a weight known as W_o, which differs depending upon the attributes of the household, person or trip. In addition, each household was assigned a BW (PSU) weight, based on the Primary Sampling Unit (PSU) in which the household is located, so that all households in the same PSU have the *same BW (PSU) weight. The BW (PSU) weight is used only when making an estimate of* households/persons from the combined basic and supplemental samples.

For each quarter of NPTS data, application of the weighting procedures will yield estimates of the total number of households in the United States, total number of persons in the United States, and total travel occurring during that quarter. If all four quarters are being analyzed, the "weighted" data for persons and households must be summed and *divided by four; the weighted data for trips and travel need only to be summed for all four* quarters to obtain annual estimates.

Definitions of the Key Terms Used in the Estimating Procedure

Basic sample--The basic sample consists of those households interviewed from April-November 1977 and January 1978.

BW(PSU) weight--The BW(PSU) weight is the weight assigned to each household based on the probability of selection; it varies by the PSU of the household. The BW(PSU) weight is used only when obtaining estimates of households or persons from the combined basic and supplemental samples.

Covered day--A covered day is a day that has been reported for by NPTS households. This *applies to a designated travel day or the days from the 14-day travel period.*

Household--The household is the basic sampling and reporting unit for collecting trips and travel and other information in the survey.

Household trip--A household trip is each time one or more household members go on a trip. For example: if three household members go on the same trip, it is counted as one

household trip; however, if three household members each go on a separate trip, it is counted as three household trips.

Person Miles--Person miles are the sum of miles traveled by each person on a trip. Thus, the number of person miles for a given household trip is equal to the weighted number of person trips for the trip multiplied by the one-way trip distance for the trip. The number of person miles for a given person trip is the number of one-way trip miles traveled by that one person on the trip.

P_i--P_i is a factor to be applied to travel period trips, depending on the day of the month the trip took place. This factor allows for differences in sample size reporting travel period trips for any given day.

Supplemental sample--The supplemental sample consists of those households interviewed during December 1977, and February and March 1978.

Time inflation factors--Time inflation factors are used to expand estimates of trip characteristics from covered days to form monthly, quarterly, or annual estimates. Different factors are used to expand travel day and travel period trips.

Travel day--Travel day is a designated 24-hour period during the first 14 days in a month assigned to a household for reporting trips and travel.

Travel period--The travel period is the 14 days preceding the travel day assigned to household for reporting trips and travel of 75 miles and longer (one-way).

W_o--W_o represents the weight for a specific travel day trip, person, or household estimate. These weights vary depending on the attributes of the variable.

Procedures for estimating household trips, vehicle miles, person trips, and person miles--Segment 5 of the NPTS data tape contains W_o household trip weight (columns 376-387) which should be used for estimating household trips and vehicle miles for travel day trips, and a separate W_o person trip weight (columns 220-375) for each person trip associated with a travel day trip, which should be used for estimating person trips and person miles for travel day trips.

1. Covered travel days. To form any household trip estimate from travel day trips, the W_o household trip weights should be summed for all travel day trips being considered. The same procedure should be followed for person trips except that the W_o person trip weights should be summed for each travel day person trip being considered. In order to form a vehicle miles travel day trip estimate, the vehicle miles associated with each travel day trip must be multiplied by the W_o household trip weight. Similarly, a person mile travel day trip estimate can be formed by multiplying the person miles associated with each person trip by the W_o person trip weight.

2. Monthly, quarterly, or annual estimates. To form a household trip estimate from travel day trips for a given month, apply the travel day time inflation factors shown in Table 1 on page 62 to the W_o household trip weights for each travel day trip in that month. For example, to create an estimate of travel day trips for the month of May, the W_o's for travel day trips for the 4, 5, 6, 7, 11, 12, 13, and 14 of May should receive a factor of 2 and those of the 1, 2, 3, 8, 9, and 10 of May should receive a factor of 5/2.

The same procedure should be followed for a monthly estimate of person trips, vehicle miles, or person miles from travel day trips. To create quarterly or annual estimates, obtain an estimate for each month separately, using the procedure described above, and sum monthly estimates for months under consideration.

TABLE I. Travel Day Time Inflation Factors

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

Note that these factors should be applied to the W_o trip weight factors.

Procedures for estimating household or person characteristics--Segment 1 of the NPTS data tape contains the W_o household weight (columns 115-126) and the BW(PSU) weight (columns 103-114).

Segment 2 of the NPTS data tape contains the W_o person weight (columns 57-68) and the BW(PSU) weight (columns 45-56).

1. Covered travel day(s). To form an estimate of household (or person) characteristics of traveling and nontraveling households (persons) for a specific travel day, the W_o weights for each household (person) assigned the specific travel day should be summed. For example, to estimate the total number of traveling households on June 1, the W_o weights should be summed for all households with a June 1 travel day that made a trip.

   To estimate the total number of nontraveling households on June 1, the W_o weights should be summed for all households with a June 1 travel day that did not make any trips.

2. Monthly or quarterly or annual estimates for households or persons from the basic or supplemental sample. To estimate monthly, quarterly, or annual household (person) characteristics from the basic or supplemental sample, a factor of $\frac{1}{d}$ (where d=number of covered travel days in the month(s)) should be applied to the W_o weights.

   For example: To estimate the total number of households that made one or more travel day trips during April, May, and June (all months from the basic sample), a factor of 1/42 should be applied to the W_o household weights (Segment 1, columns 115-126) for all households reporting trip(s) in April, May, and June.

   To estimate the total number of households that made one or more travel day trips during December only, (a month from the supplemental sample), a factor of 1/14 should applied to the W_o household weights for all households reporting trips during December.

3. Monthly, quarterly, or annual estimates for households or persons from the basic and supplemental sample. To estimate household (person) characteristics of traveling and nontraveling households (persons) for more than one month covered by both the basic and supplemental samples, different factors are applied to the households (or persons) depending on whether they are from the basic or supplemental sample.

Households (persons) assigned travel days covered by the basic NPTS sample should receive a factor equal to:

$$(W_o) \left[\frac{562{,}803.7842}{(d_1 \times 562{,}803.7842) + (d_2 \times BW(PSU))} \right]$$

Where: d_1 = number of days covered by basic sample
d_2 = number of days covered by supplemental sample

BW(PSU) = basic weight shown in Segments 1, 2, 5, and 6 and assigned to the households (or persons) from the basic sample.

Households (persons) assigned travel days covered by supplemental samples should receive a factor equal to:

$$W_o \left[\frac{BW(PSU)}{(d_1 \times 562{,}803.7842) + (d_2 \times BW(PSU))} \right]$$

Where d_1 and d_2 are same as defined above and BW(PSU) is the basic weight assigned to households from the supplemental sample.

For example: To estimate the number of households which took travel day trips during October, November, and December, the following procedure should be followed:

Households from the basic sample (October and November) which took travel day trips in October and November should have the following factors applied:

$$W_o \left[\frac{562{,}803.7842}{((2 \times 14) \times 562{,}803.7842) + ((1 \times 14) \times BW(PSU))} \right]$$

Households from the supplemental sample (December) which took travel day trip(s) in December should have the following factors applied:

$$W_o \left[\frac{BW(PSU)}{((2 \times 14) \times 562{,}803.7842) + ((1 \times 14) \times BW(PSU))} \right]$$

B. Travel Week* Trip Estimates

Revised Procedures for Estimating Household Trips, Vehicle Miles, Person Trips and Person Miles.

Segment 6 of the NPTS data tape contains the W_o household trip weight for each travel week trip, which should be used for estimating vehicle trips and vehicle miles for travel week trips, and a separate W_o person trip weight for each person trip associated with a travel week trip, which should be used for estimating person trips, person nights, and person miles for travel week trips. In addition, this segment indicates the day in which a travel period trip occurred. Forming vehicle trip, vehicle mile, person trip, person mile, and person night estimates from travel week trips is more complicated than forming these estimates from travel day trips. Since the sample size reporting travel week trips varies by the day in a month, different factors, depending on the day of the month the trip ended, must be applied to travel week trips to account for this. These factors, known as P_i, are defined as follows:

$$P_i = \frac{1}{14-i} \quad \text{for } 1<i<13 \text{ where } i = \text{the number of the day of the month being considered}$$

$$\frac{1}{14-n+1} \quad \text{for } n-13<i<n \text{ where } n = \text{the number of days in the month}$$

Thus, the W_o weight for each travel week trip should be multiplied by a P_i factor that depends on the day the trip ended. The P_i factors are shown in Table 2 on pages 66 and 67.

For example, if an estimate of household trips from travel week trips is needed for June 1 a factor of 1/14-1 = 1/13 must be applied to the W_o household trip weights for each travel week trip reported as ending on June 1. If an estimate of household trips from travel

*Travel week and travel period will be used interchangeably throughout this section.

week trips reported as ending in June (i.e., the first 13 days in June and the last 14 days in June) is needed, the factors given in Table 2 should be applied to the W_O household trip weights based on the day the travel week trip ended.

Since travel week trips are only reported for the first 13 days in a month and the last 14 days in a month, time inflation factors are also needed for travel week trip estimates for the full month. These time inflation factors, which are also based on the day the travel week trip is reported to have occurred, are given on page 68. For example, if an estimate of travel week trips is needed for the full month of June (not just the first 13 days and the last 14 days), the time inflation factors given in Table 2 would have to be applied to the W_O household trip weights and P_i factors for these trips. If an estimate of travel week trips is needed for more than one month, the procedure is essentially the same. Each travel week day will need to be considered separately in order to determine the P_i and time inflation factors. Only now the P_i and time inflation factors must be computed for days from more than one month.

Specifically, the formula would be:

$(W_O)(P_i)$(inflation factor)

For the following dates in June the P_i and the inflation factors would be:

	P_i	Inflation Factor
June 1	$\frac{1}{13}$	$\frac{5}{4}$
June 2	$\frac{1}{12}$	$\frac{5}{4}$
June 3	$\frac{1}{11}$	1
June 28	$\frac{1}{12}$	$\frac{4}{3}$
June 29	$\frac{1}{13}$	$\frac{5}{4}$
June 30	$\frac{1}{14}$	$\frac{5}{4}$

Since the date the trip ended is not now on the Segment 6 tape, it can best be derived from the following sources, using data from the outgoing and incoming trip.

a. To the month (cols. 106-107) and day of the month (cols. 108-109) the trip began, add the sum of the nights spent enroute to the destination (cols. 66-68) and nights spent at destination (cols. 70-71) to arrive at the date the trip ended.

b. If the above data are not available for a particular trip, use an alternate source. Specifically, to the month (cols. 106-107) and day of the month (cols. 108-109) the trip began, add the sum of the data contained in cols. 81-83, 85-87, 89-91, 93-95, 97-99, and 101-103 (nights spent at different types of lodging) to arrive at the date the trip ended.

TABLE 2. Revised P_i Factors to be Applied to W_o Household
(based on the Day the Travel Period Trip Ended)

Day of the Month the Trip Ended	P_i Factors: April, June, September, November	January, March, May, July, August, October, December	February
1	$\frac{1}{T3}$	$\frac{1}{T3}$	$\frac{1}{T3}$
2	$\frac{1}{T2}$	$\frac{1}{T2}$	$\frac{1}{T2}$
3	$\frac{1}{T1}$	$\frac{1}{T1}$	$\frac{1}{T1}$
4	$\frac{1}{T0}$	$\frac{1}{T0}$	$\frac{1}{T0}$
5	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$
6	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
7	$\frac{1}{7}$	$\frac{1}{7}$	$\frac{1}{7}$
8	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
9	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
10	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
11	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
12	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
13	1	1	1
15	-	-	1

TABLE 2. P_i Factors to be Applied to W_o
Travel Period Trip Weights
(Con't)

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

TABLE 3. Travel Period Time Inflation Factors

Dates	Factors
3,10,18,25 of March	$\frac{9}{8}$
1,2,8,9,22,23,29,30 of April 3,10,24,31 of May 1,2,8,9,22,23,29,30 of June 1,8,22,29 of July 1,2,3,8,9,10,22,23,24,29,30,31 of August 1,2,8,9,22,23,29,30 of September 1,2,8,9,22,23,29,30 of November 1,2,8,9,22,23,29,30 of December 3,10,24,31 of January 1,2,8,9,23,24,30,31 of March	$\frac{5}{4}$
7,21,28 of April 1,2,8,9,22,23 of May 7,21,28 of June 7,9,10,21,23,24,28,30,31 of July 7,21,28 of August 7,21,28 of September 7,21,28 of October 7,21,28 of November 7,21,28 of December 7,8,9,21,22,23,28,29,30 of January 7,21,28 of February	$\frac{4}{3}$
7,21 of May 1,2,3,29,30,31 of October 3,10 of December 7,22,29 of March	$\frac{3}{2}$
3,4,5,6,10,11,12,13,17,18,19,20,24,25,26,27 of April 4,5,6,11,12,13,18,19,20,25,26,27,28,29,30 of May 3,4,5,6,10,11,12,13,17,18,19,20,24,25,26,27 of June 2,3,4,5,6,11,12,13,18,19,20,25,26,27 of July 4,5,6,11,12,13,18,19,20,25,26,27 of August 3,4,5,6,10,11,12,13,17,18,19,20,24,25,26,27 of September 4,5,6,8,9,10,11,12,13,18,19,20,22,23,24,25,26,27 of October 3,4,5,6,10,11,12,13,17,18,19,20,24,25,26,27 of November 4,5,6,11,12,13,18,19,20,24,25,26,27,31 of December 1,2,4,5,6,11,12,13,18,19,20,25,26,27 of January 1,2,3,4,5,6,8,9,10,11,12,13,15,16,17,18,19,20,22,23,24,25, 26,27 of February 4,5,6,11,12,13,19,20,21,26,27,28 of March	1

Note that these factors should be applied after W_o trip weight and P_i factors have been applied.

Procedure for estimating household or person characteristics--

1. Specific travel period. To obtain an estimate of traveling or nontraveling household (person) characteristics for a specific 14-day travel period, the W_0 weights for each household (Segment 1, columns 115-126) or person (Segment 2, columns 57-68) being considered in the estimate for the specific 14-day travel period should be summed.

   For example: To estimate the number of traveling households for the travel period from May 19 - June 1, sum the W_0 weights for all households making a travel period trip during that 2-week period from those households interviewed on June 2.

2. Monthly or quarterly estimate for households (persons) from the basic or supplemental sample (but not both). To obtain a factor of $\frac{1}{d}$ (d=number of covered days) is applied to the W_0 weights of households with a travel day in the month of interest. The traveling or nontraveling status of the household will be based on the 14-day travel period of the household, but the travel day determines the month of interest.

   For example: To estimate the number of households which made travel period trips during July, August, and September, the W_0 weights should be summed and divided by 3 x 14 or 42 for all households with a travel day in July, August, and September and reporting one or more travel period trips.

3. Monthly, quarterly or annual estimates for households or persons from the basic and supplemental sample combined. To obtain an estimate of travel period household (person) characteristics for more than 1 month covered by both the basic and supplemental sample, follow the same estimating procedure as for travel day household (person) characteristics covered by both the basic and supplemental sample. Different factors are applied to the household (persons) depending on whether they are from the basic or supplemental sample. For travel period estimates, the households upon which these estimates should be based are those households with a travel day in the months under consideration: the traveling or nontraveling status is based on the 14-day travel period for the households.

   For example: To estimate the number of households which took a travel period trip during the NPTS travel year (April 1977 - March 1978):

   For all households with a travel day in April-November and January (basic sample) which made one or more trips during the 14-day travel period, should receive a factor equal to:

$$(W_o)\left[\frac{562,803.7842}{(d_1 \times 562,803.7842) + (d_2 \times BW(PSU))}\right]$$

d_1 or 9x14 ; d_2 or 3x14

For all households with a travel day in December, February and March (supplemental sample) which made one or more trips during the 14-day period, should receive a factor equal to:

$$(W_o)\left[\frac{BW(PSU)}{(d_1 \times 562{,}803.7842) + (d_2 \times BW(PSU))}\right]$$

d_1 or 9x14 $\qquad$ d_2 or 3x14

APPENDIX B

GLOSSARY OF TERMS USED IN NPTS

This glossary is provided to assist the user in the interpretation of the data.

Airport: A commercial facility that services regularly scheduled airlines.

Carpool: A regularly scheduled traveling arrangement whereby two or more persons ride together in the same vehicle, sharing the driving and/or the cost of the trip, or simply riding together regularly with one or more persons doing the driving. If two or more household members regularly ride to work in the same vehicle, it is also considered a carpool.

Central City: A city of 50,000 inhabitants or more in the 1970 Census or twin cities i.e., cities with contiguous boundaries and constituting, for general social and economic purposes, a single community with a combined population of at least 50,000, and with the smaller of the twin cities having a population of at least 15,000.

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

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

Driver: 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. If one or more household members share the driving, the percent of driving done by each household member is recorded separately. If nonhousehold members share the driving, the total percent of driving done by all nonhousehold members is recorded.

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 is that which advances a person toward an elementary or high school diploma, or a college, university or professional school degree.

Employed: A person is considered employed if there is a definite arrangement for regular full-time or part-time work for pay every week or every month. A formal, definite arrangement with one or more employers to work a specified number of hours a week, or days a month, but on an irregular schedule during the work month is also considered employment. A person who is on call to work whenever there is a need for his (her) services, is not considered employed.

Family Income: The money income of all persons in a household, including those temporarily absent. Includes wages and salary (before deductions), commissions, tips, cash bonuses; net income from a person's own (unincorporated) business, professional practice, or farm (gross receipts minus business expenses); 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. Excludes income in kind, such as room and board, insurance payments, lump-sum inheritances, occasional gifts of money from persons

not living in the same household, money received from selling one's house, car, or other personal property, withdrawal of savings from banks, and tax refunds.

Federal-aid rural area: Any area outside of federal-aid urban areas.

Federal-aid urban area: An urban place of 5,000 or more population as determined by the Bureau of the Census.

Freeway, tollway, or expressway: A divided arterial highway for through traffic with full or partial control of access and grade separations at major intersections.

Head of household: The one person who is regarded as the head by the members of the household. In most cases the husband is the head, if living in the household. In some cases, the head may be a parent of the chief wage earner or the only adult member of the household. An Armed Forces member is considered as the head only if he lives at home and is a household member. Only one head is designated for each household.

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 noninstitutionalized population.

Household trip: One or more household members traveling together.

Household vehicle: A motorized vehicle that is owned, leased, rented or company owned and left at home to be regularly used by household members during the reference period. Includes vehicles used solely for business purposes if kept at home, e.g., taxicabs, police cars, etc., which may be owned by, or assigned to, household members for their regular use. Includes vehicles brought home by a car sales person or auto mechanic, only if the vehicle was available for use by him (her) during the entire reference period. Includes all vehicles that were owned or available for use by members of the household during the reference period even though a vehicle may have been sold before the interview. Excludes vehicles that were not working and not expected to be working within 60 days, and vehicles that were purchased or received after the designated travel day.

Licensed driver: Any person who holds a valid driver's license from any State.

Means of transportation: A personal mode used for going from one place (origin) to another (destination). Includes private and public motorized modes, as well as walking. For all travel day trips, each change of mode constitutes a separate trip. The following personal transportation modes are included:

-- Automobile: A privately owned and/or operated licensed motorized vehicle including cars, jeeps, dune buggies, and stationwagons. Also includes leased and rented cars if they are privately operated and not picking up passengers in return for fare.

-- Vanbus/Minibus: Privately owned and/or operated vans and buses designed to carry from 5-13 passengers.

-- Pickup truck/other van: A small open-body motorized vehicle, privately owned and/or operated, with four to six tires, built on a chassis comparable to that of a

passenger car. Accommodates fewer than five passengers. Includes travel trucks (service trucks) when they are not being used for commercial purposes.

-- Other truck (personal use): The private use, either as a passenger or driver, of all other types of trucks, i.e., dump trucks, trailer trucks, etc., when they are not being used for commercial purposes.

-- Motorcycle: Includes large, medium and small motorcycles. Does not include minibikes, etc., which can not be licensed for highway use.

-- Self-contained recreational vehicle: Includes recreational vehicles that are operated as a self-contained unit without being hitched to another vehicle: for example, a motor home.

-- Taxi (personal use): The use of a passenger vehicle either by a driver or a passenger, which does not involve the duties of a professional driver for the payment of a fare by a passenger.

-- Bus: Includes intercity buses, etc.; mass transit systems and shuttle buses that are available to the general public. Also includes senior citizen buses or similar bus services that are available to the public. Does not include shuttle buses operated by a government agency or private industry for the convenience of employees, contracted or chartered buses or school buses. These latter types are included in "other."

-- Train: Includes commuter trains and passenger trains other than elevated trains and subways.

-- Streetcar: Includes trolleys, streetcars, and cable cars.

-- Elevated rail or subway: Includes elevated train and subway trains.

-- Airplane: Includes 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 (commercial use): The use of a taxicab by a driver for hire or by a passenger for fare. Also includes airport limousines. Does not include rental cars if they are privately operated and not picking up passengers in return for fare.

-- Truck (commercial use): Includes the commercial use, either as a driver or a passenger, of pickups, dump trucks and trailer trucks being operated for business-related purposes.

-- Bicycles: Includes bicycles of all speeds and sizes and minibikes.

-- Walk: Includes jogging, walking etc., provided the origin and destination are not the same.

-- Schoolbus: Includes county school buses, private school buses, and buses chartered from private companies for the express purpose of carrying students to or from school and/or school-related activities. Does not include school buses

chartered or reserved for other trips, such as church outings; these are included under "other."

-- Motorized bicycle/(often called a Moped): Includes bicycles equipped with both pedals and a small engine, typically a horsepower or less.

-- Other: Includes any types of transportation not included above.

Motorized vehicle: Includes all vehicles that are licensed for highway driving. Specifically excluded are snowmobiles, minibikes, etc.

Origin: Starting point of a trip.

Owned vehicle: Includes all vehicles that one or more household members have purchased for private use regardless if paid for in full, or a gift or legacy to a household member for private use.

Passenger: For a specific trip, any occupant of a motorized vehicle other than the driver.

Person (household member): All people, whether present or temporarily absent, whose usual place of residence is the sample unit, or people staying in the sample unit who have no other usual place of residence elsewhere.

Person miles: A measure of person travel. When one person travels one mile, one person mile of travel results. Where two 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 five miles in the same vehicle, make 4 times 5 vehicle miles or twenty person miles.

Person nights: The number of nights spent by each person away from home on a travel period trip. For example, two persons on a trip spending 5 nights away from home would result in ten person nights.

Person trip: A unit of person travel. When two or more persons travel together in the same vehicle, each person is counted as making one person trip.

Rural area: Any area outside of an urban place.

Standard Metropolitan Statistical Area (SMSA): Except in the New England States, a standard 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 SMSA if, according to certain criteria, they are socially and economically integrated with the central city. In the New England States, SMSA's consist of towns and cities instead of counties.

Station wagon: A passenger vehicle, having an enclosed body of paneled design with two or more seats, where the rear seats can be removed or folded down to create larger luggage or freight compartments.

Stop: For travel period trips, a break in travel other than for gasoline, rest, and food. For travel day trips, each stop is treated as a separate trip.

Train station: A depot where regularly scheduled trains may be boarded for travel to cities at least 30 miles away.

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

Travel period: The 14 days immediately preceding the travel day of a household.

Traveler: A person reporting a travel day and/or travel period trip(s).

Traveling houshold: A household reporting at least one travel day and/or travel period trip.

Trip(travel day): A travel day trip is defined as any one-way travel from one address (place) to another by private motor vehicle, public transportation, bicycle, or walking. Jogging and walking for exercise are excluded. When travel is to more than one destination, a separate trip exists each time one or both of the following criteria is satisfied:

a. The traveltime between two destinations exceeds 5 minutes.

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

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

Trip(travel period): A travel period trip is one-way to a destination which is 75 miles or more from place of origin.

Trip duration: For travel period trips, the number of nights spent away from home on a single trip, including time (nights) spent enroute and at the destination. For travel day trips, usually measured in minutes.

Trip purpose: The main reason that motivated the trip. For purposes of this survey, there are 21 trip reasons. If there are more reasons than one, 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. The 21 trip reasons are defined as follows:

-- To place of work: Includes travel to a place where one reports for work. It does not include any other work-related travel.

-- Work-related business: Trips related to business activities except to the place of work; for example, a plumber drives to a wholesale dealer to purchase supplies for his business.

-- Convention: Trips made to attend business, professional, special interest, and other types of conventions.

-- Civic/Education/Religious: Trips to political rallies, legislative hearings, voting places, etc.; to school, college, or university for class(es), PTA meetings,

seminars, etc.; to church services or to participate in other religious activities. Social activities that take place at a church or school are not classified as religious or educational.

-- Eat meal: Trips taken to eat a meal in a public place. Trips taken to a friend's house for dinner are classified "visit friends or relatives."

-- Doctor or dentist: Trips made for medical, dental or psychiatric treatment, or other related professional services.

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

-- Family or personal business: Trips taken to attend organized functions of the family or friends, such as weddings, graduations, reunions, etc. Includes purchase of services such as cleaning garments, beauty parlor treatments, servicing of an auto, etc.

-- Visit friends or relatives: Trips made to visit friends or relatives but not prompted by organized family affairs or an emergency.

-- Pleasure driving: Includes driving trips made with no other purpose listed here but to "go for a drive" with no destination in mind: for example, a Sunday drive in the country.

-- Sightseeing: Trips taken to sightsee or tour with a particular place planned to visit. This distinguishes "sightseeing" from "pleasure driving."

-- Entertainment: Trips taken to go to a movie, the theatre, opera, concert, discotheque, cabaret, spectator sports, such as a ball game, races, track meet, or an amusement park.

-- Recreation (participant): Trips taken to participate in sporting or outdoor activities, such as fishing, hunting, golf, swimming, picnicking, skiing, skating, bowling, basketball, etc.

-- Vacation: Trips reported by the respondent as "vacation."

-- Change of vehicle: Trips made specifically to change from one vehicle to another within the same "means of transportation" category. (For example, transferring from one bus to another, one plane to another, or from one passenger car to another.)

-- Pick up or leave off passenger: Trips that are made to serve a passenger. For example, a trip by Mrs. Columbo to pick up her mother and drive her to the store on travel day would be reported as two trips: the trip to her mother's home for the purpose of picking up a passenger and the trip to the store for the purpose of shopping. If Mr. Hersholt drives from Washington to Chicago during the 14-day travel period and stops in Baltimore to pick up his son, the purpose of his first stop on his trip to Chicago will be reported in Part B of Section VI as "picking up a passenger."

-- Return home: The trip made to the residence of the respondent at the time of the trip. In the case of a college student who lives on campus and is interviewed at school, trips to the dormitory or other living quarters on campus are considered "return home."

-- Lodging: Trips made for the purpose of taking overnight accommodations. This category is also used in lieu of "return home" when return trips are to this lodging.

-- Social: Trips taken to enjoy some form of social activity involving friends or acquaintances, such as a party, playing cards, dancing, etc.

-- Other: Any purpose for a trip that does not fit into one of the above categories.

Type Z noninterview: A person in an interviewed household for which trip information is incomplete but certain demographic information is available.

Urban place: Defined by the Bureau of the Census as follows:

a. A place of 2,500 inhabitants or more incorporated as a city, borough, village, or town, (except towns in New England, New York, and Wisconsin);

b. The densely settled fringe, whether incorporated or not, of urbanized areas;

c. Towns in New England and townships in New Jersey and Pennsylvania that contain no incorporated municipalities as subdivisions and have either 25,000 inhabitants or more, or a population of 2,500 to 25,000 and a density of 1,500 persons or more per square mile;

d. Counties in States other than the New England States, New Jersey, and Pennsylvania that have no incorporated municipalities within their boundaries and have a density of 1,500 persons or more per square mile; or

e. Unincorporated places of 2,500 inhabitants or more.

Urbanized area: Defined by the Bureau of the Census as:

1. Any area made up of:

a. A central city of 50,000 inhabitants or more in 1960, or in a special census conducted by the Census Bureau since 1960, or in the 1970 census; or

b. Twin cities, i.e. cities with contiguous boundaries and consistuting for general social, and economic purposes, a single community with a combined population of at least 50,000 and with the smaller of the twin cities having a population of at least 15,000.

2. Surrounding closely settled territory, including the following (but excluding the rural portions of extended cities):

a. Incorporated places of 2,500 inhabitants or more.

b. Incorporated places with fewer than 2,500 inhabitants provided that each has a closely settled area of 100 housing units or more.

c. Small parcels of land, normally less than one square mile in area, having a population density of 1,000 inhabitants or more per square mile. The areas of large nonresidential tracts devoted to such urban land uses as railroad yards, airports, factories, parks, golf courses, and cemeteries are excluded in computing the population density.

d. Other similar small areas in unincorporated territory with lower population density provided that they serve

- to eliminate enclaves, or
- to close indentations in the urbanized areas of one mile or less across the open end, or
- to link outlying enumeration districts of qualifying density that are not more than 1½ miles from the main body of the urbanized area.

Vehicle mile: A unit to measure vehicle travel made by a household vehicle: automobile, vanbus/minibus, pickup truck/other van, other truck (personal use), motorcycle, self-contained recreational vehicle, and taxi (personal use).

Vehicle occupancy: The number of persons, including driver and passenger(s) in a vehicle; also includes persons who did not complete a whole trip.

Vehicle trip: For purposes of this study, a vehicle trip is a trip made in a private vehicle regardless of the number of persons in the vehicle.

Vehicle type: For purposes of the study, one of the 12 vehicle types used for coding purposes in the household motorized vehicle record of the NTS-2 Questionnaire.

APPENDIX C

SPECIAL TABULATIONS, SUBJECT AREA REPORTS AND SURVEY QUESTIONNAIRE

Special Tabulations

There are some applications that require the use of data items on the Census file, such as those related to place of residence of individual respondents, that cannot be included on the public use tape without possible disclosure of the individual respondents. If disclosure can be avoided, the Bureau of the Census will undertake special tabulations in accordance with its policy that "Special tabulation or transcriptions of data in the files of the Bureau of the Census will be undertaken on a cost basis, insofar as Bureau facilities are available. Those requesting special tabulations should understand that the data are based on surveys paid for by public funds and, therefore, are public property. The purpose for which such tabulations are obtained must not be contrary to the public interest, or be used to give unfair commercial or other advantage to any person or group."

Requests for special tabulations should be addressed to: Chief, Demographic Surveys Division, Bureau of the Census, Washington, D.C. 20233.

Subject Areas Planned for 1977 NPTS Reports

The following is a list of subject areas for which 1977 NPTS reports have been published/being prepared. This will give transportation researchers and planners a general indication of the variety and scope which the 1977 NPTS data encompasses. Report number 11 should be available in a few months.

CHARACTERISTICS OF 1977 LICENSED DRIVERS AND THEIR TRAVEL
(Report 1, October 1980)
HOUSEHOLD VEHICLE OWNERSHIP
(Report 2, December 1980)
PURPOSES OF VEHICLE TRIPS AND TRAVEL
(Report 3, December 1980)
HOME-TO-WORK TRIPS AND TRAVEL
(Report 4, December 1980)
HOUSEHOLD VEHICLE UTILIZATION
(Report 5, April 1981)
VEHICLE OCCUPANCY
(Report 6, April 1981)
A LIFE CYCLE OF TRAVEL BY THE AMERICAN FAMILY
(Report 7, July 1981)
URBAN/RURAL SPLIT OF TRAVEL
(Report 8, June 1982)
HOUSEHOLD TRAVEL
(Report 9, July 1982)
ESTIMATES OF VARIANCES
(Report 10, December 1982)
PERSON TRIP CHARACTERISTICS AND USE OF PUBLIC TRANSPORTATION
(Report 11, December 1982)

Survey Questionnaire

Copies of the NPTS Survey Questionnaire are available upon written request from the Office of Highway Planning (HHP-44), Federal Highway Administration, Washington, D.C. 20590. A copy of the NTS-2A, Section VII: Mapping of Private Motor Vehicle Trips is enclosed.

APPENDIX D

NPTS PUBLIC USE TAPE REQUEST

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

For governmental agencies and educational institutions, there 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 attached form and should clearly indicate:

1. Which (or all) of the four (4) quarters of data that are desired.
2. Name and/or title of the individual or organization making the request.
3. Number of tapes, if any, included with the request (or being shipped separately).
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, SW
Washington, D.C. 20590

NPTS Public Use Tape Request

1. Data desired

   Tape 1 - First Quarter ( )
   Tape 2 - Second Quarter ( )
   Tape 3 - Third Quarter ( )
   Tape 4 - Fourth Quarter ( )
   Tapes 1-4 - All Quarters ( )

2. Number of tapes submitted

   None (tape payment included) ( ); 1 tape ( ); 2 tapes ( ); 3 tapes ( ); 4 tapes ( )

3. Method of tape submittal

   With order ( )
   Under separate cover ( )

4. Type of tape labeling desire

   Standard IBM labels ( )
   No labels ( )

5. Recording density (9-track)

   800 BPI ( )
   1600 BPI ( )

6. Type of organization, Name and Address

   Educational ( ) Government ( )
   Private Organization ( ) Private Individual ( )
   Other (specify) ( )

Name _____
Title _____
Organization _____
Address _____
City, State, Zip _____

7. Total fee enclosed

   Tape copy on user furnished tape(s),_____quarters @ $36 per quarter $_____

   Tape copy on FHWA furnished tape(s),_____quarters @ $61 per quarter $_____

8. Payment enclosed as

   Money order ( )

   Check ( )