

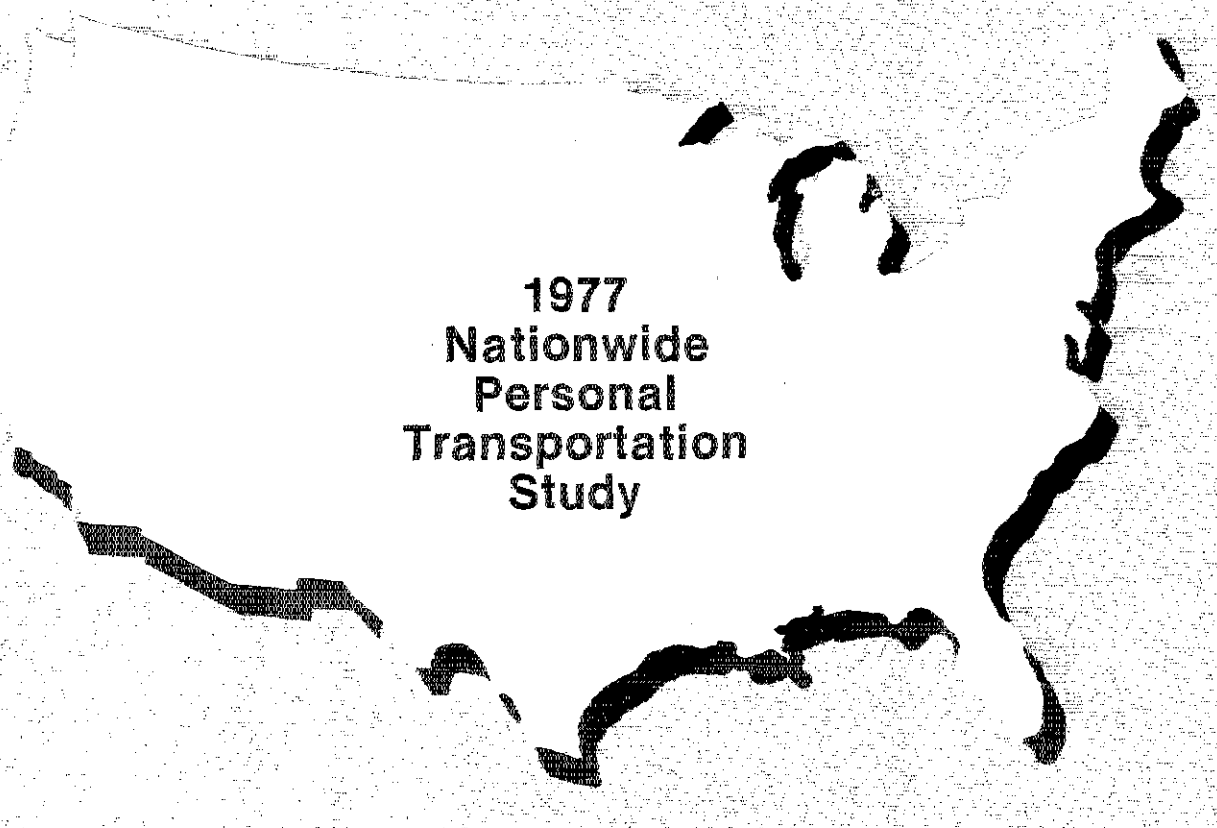


U.S. Department
of Transportation
**Federal Highway
Administration**

Household Travel

Office of Highway Planning
July 1982

Report No. 9

A map of the United States, including Alaska and Hawaii, rendered in a thick black outline. The map is centered on the page.

**1977
Nationwide
Personal
Transportation
Study**

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16. Abstract This report is one of a series prepared from the findings of the 1977 Nationwide Personal Transportation Study (NPTS). The report examines the relationship between household travel patterns and characteristics of the household. Vehicle trips and vehicle miles per household are presented relative to income, number of vehicles owned, household location and composition of the household (e.g., number of persons, workers, drivers). In some tables, rates are shown in terms of two household characteristics, such as income and number of vehicles owned. Findings from the 1977 NPTS are compared to those from the 1969 NPTS to trace changes over time in vehicle trips and travel per household.					
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1977 NATIONWIDE PERSONAL TRANSPORTATION STUDY (NPTS)

Report 9

HOUSEHOLD TRAVEL

July 1982

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

Preface

This report is a joint product of the Highway Statistics Division, Office of Highway Planning, Federal Highway Administration and the COMSIS Corporation, Wheaton, Maryland.

The report outline and data tabulations were produced by Dieter Klinger and J. Richard Kuzmyak of the COMSIS Corporation, under contract DTFH-61-80-C-00047. The report narrative was written by Susan Liss, Highway Statistics Division, Federal Highway Administration.

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I. HIGHLIGHTS

- o In 1977, the average household made 1,443 private vehicle trips and traveled 12,035 vehicle miles. This equates to daily rates of 4 vehicle trips and 33 vehicle miles. The average private vehicle trip length is 8.3 miles.
- o On the average, each household makes 402 annual vehicle trips and travels 3,657 vehicle miles for travel to work. Social and recreational activities account for 278 annual trips and 2,888 vehicle miles per household. Each household averages 466 annual trips and 2,757 annual vehicle miles for family and personal business purposes.
- o Households located inside SMSA's make 1,432 annual trips and travel 11,745 miles. Those outside SMSA's average 1,465 trips and 12,551 vehicle miles per year.
- o As household income increases, tripmaking increases from 535 annual trips for households earning less than \$5,000, to 1,514 trips for those in the \$10,000 to \$15,000 group, to 2,474 trips for those in the \$35,000 to \$50,000 income group. Travel rates per household show similar increases from 3,788 annual vehicle miles for the under \$5,000 group, to 12,608 miles for the \$10,000 to \$15,000 group, to 21,573 miles for the \$35,000 to \$50,000 group.
- o Average private vehicle trip length also increases as household income increases, from 7.2 miles for households with incomes under \$5,000 to 8.9 miles for those earning \$25,000 to \$35,000. Average trip length then declines slightly to 8.5 miles for households with incomes of \$50,000 or more.
- o In terms of household vehicle ownership, one-vehicle households make 1,059 annual vehicle trips and travel 8,070 vehicle miles. Two-vehicle households make 1,892 trips and travel 15,989 miles. Three-vehicle households make 2,509 trips and travel 22,383 miles, while households with four or more vehicles make 3,030 trips and travel 25,996 annual miles.
- o As household size increases, household travel increases from 4,422 vehicle miles for one-person households to 18,053 miles for households with five or more

persons. Tripmaking increases from 544 annual trips by one-person households to 2,244 trips by households with five or more persons.

- o Households with one worker travel an average of 12,381 annual vehicle miles. Those with two, three and four or more workers travel 18,590, 27,176 and 32,667 miles, respectively. In contrast, households with no workers average 4,181 annual vehicle miles.
- o The number of licensed drivers in the household has a significant impact on travel patterns. On the average, each driver in the household generates between 900 and 1,000 annual trips and between 7,400 and 8,000 annual vehicle miles.
- o Total auto trips increased by 26.7 percent between 1969 and 1977 and total miles of travel by auto increased by 22.5 percent. Despite the drop in average household size from 3.16 persons in 1969 to 2.83 in 1977, auto trips per household increased by 5.1 percent and auto travel per household increased by 1.5 percent over this period.

II. INTRODUCTION

A. PURPOSE OF THE REPORT

This report presents findings from the 1977 Nationwide Personal Transportation Study (NPTS) on private vehicle tripmaking and vehicle miles of travel per household. Knowledge of the relationship between household travel patterns and characteristics of the household is important in understanding travel behavior, in evaluating the use of transportation facilities and energy resources, and in assessing the impact of related policies and programs. Information on household travel habits is an essential element in planning for the transportation needs of the future.

In this report, trip and travel rates per household are presented in relationship to various socio-economic and demographic characteristics of the household. Average trip length is also included. Where the data are compatible, findings of the 1977 NPTS are compared to those of the 1969 NPTS to trace changes over time in household travel.

B. ORGANIZATION OF FINDINGS

Section III of this report presents findings from the 1977 survey on average vehicle trips and vehicle miles per household and average trip length by the following household characteristics:

- o Household location
- o Annual income
- o Number of vehicles owned
- o Number of persons
- o Number of workers
- o Number of licensed drivers
- o Household composition

In certain tables, the rates are shown in terms of two household characteristics, such as income and number of vehicles owned or number of drivers and number of vehicles.

In addition, average household trips and travel by trip purpose are presented.

Section IV of the report compares 1969 and 1977 findings for automobile trips and travel only. Section V contains a summary of the most important findings.

Appendix A contains additional tables on household trips and travel. Appendix B presents information on trip purposes in the 1969 and 1977 surveys, which is important in comparing the findings from the two surveys. Appendix C is a description of the NPTS survey procedures, including sample design, survey methodology, data processing procedures and provisions for obtaining special tabulations. Appendix D contains an order form with description and price of the NPTS public use tapes. Appendix E is a glossary of NPTS terms.

C. DESCRIPTION OF DATA

Comparisons and relationships are derived from information on the household characteristics and daily travel compiled from the 1977 NPTS survey. A nationwide probability sample of 18,000 households contacted and interviewed over the period April 1977 through March 1978 provides the information base for this survey. The sample information was expanded to approximate the characteristics and behavior of the entire U.S. population in 1977.

The NPTS survey collected information on the social and economic characteristics of each household and household member, the characteristics of each household vehicle and a description of each household trip made during a previous 24-hour period designated as the travel day. Tripmaking and travel patterns were computed based on travel day trips reported by the sample households. These trips were expanded to approximate those for all U.S. households for a full year.

Data contained in this report is for trips and travel in private vehicles only. Private vehicles include automobiles, vanbuses and other vans, minibuses, pickup and other small trucks, motorcycles and mopeds, recreational vehicles and personal-use taxis. As a proportion of trips and travel in all modes of transportation,

more than 80 percent of person trips and person miles are made in private vehicles, as shown below:

<u>Mode</u>	<u>Person Trips</u>	<u>Person Miles of Travel</u>
Private Vehicle	83.7	86.1
Public Transportation	2.7	2.7
Walk	9.3	0.3
Bicycle	0.7	0.3
Other	3.6	10.6
Total	100.0	100.0

Survey findings on the uses of other modes, e.g., public transportation, walking, bicycling, will be contained in later reports in this NPTS series.

Private vehicle trips and travel used in computing household rates were limited to those trips in which a member of the surveyed household was the driver. Trips made by household members in which a non-household member was driving were excluded. This limitation was used to eliminate statistical double-counting, which would occur if the same trip was reported by two different households.

Rates were computed by dividing vehicle trips and vehicle miles of travel by the number of households with a specific characteristic, whether the household reported travel on the designated travel day or not.

Average trip length was computed by dividing total vehicle miles for a specific group of households by their total vehicle trips. In some cases, the trip length from this computation will be slightly different from that obtained by dividing vehicle miles per household by vehicle trips per household.

D. COMPARABILITY BETWEEN THE 1969 AND 1977 SURVEYS

The 1977 NPTS is an update of the 1969 NPTS. Comparing findings from the two surveys provides valuable information on household travel behavior and demographic changes over this time. The 1969 data used in this report is based on relationships contained in the following reports from the 1969 NPTS series: Report 7, Household Travel in the United States, and Report 10, Purposes of Automobile Trips and Travel.

To better address current issues, changes were made between the 1969 and 1977 surveys. These changes affect the direct comparability of the data and the findings from the two surveys.

In the area of vehicle trips and vehicle miles of travel, an important change is the extension of the 1977 survey to include household vehicles other than automobiles. The 1969 data focused on trips and travel in automobiles, defined as passenger autos, station wagons, vanbus/minibus vehicles, and personal-use taxi vehicles. The 1977 survey has added personal trucks and vans, camper vehicles, and motorcycles and mopeds to the inventory. This change more accurately describes the vehicle base affecting household vehicle travel and the changing private vehicle stock.

For reasons of comparability, only those private vehicles defined as automobiles in both surveys are used in 1969 and 1977 comparisons. Because these differences in defining household vehicles may be confusing, the report focuses first on presentation of results from the 1977 survey, where findings are based on trips and travel in all motor vehicles owned by or available to the household. Comparisons with 1969 findings are then presented in a separate section where the 1977 data are tabulated in comparable format and definition to the 1969 data. Differences in vehicle definition are noted in the tables and discussion.

Another factor that impacts the direct comparability of 1969 and 1977 data is the type of trips used in calculating trip and travel rates. The trips used in presenting 1977 data in Section III of this report are limited to those in which a household member was the driver. However, the 1969 data contains all auto trips made by the household, including those in which the driver was not a household member. For this reason, the 1977 household trip and travel rates shown in Section IV, Trends Over Time, are based on all automobile trips reported by the household.

Because of the differences described above, the trips and vehicle miles per household shown in Section III and those in Section IV (Trends Over Time) are computed in a different manner and cannot be compared to each other. In addition, when comparing 1977 findings to those from 1969, only the 1977 data shown in the Section IV should be used.

III. ANALYSIS OF VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD

A. VEHICLE TRIP AND TRAVEL RATES BY VARIOUS HOUSEHOLD CHARACTERISTICS

Trip and Travel Rates

On the average, each household in the United States makes 1,443 private vehicle trips per year or four daily trips. The average household travels 12,035 annual vehicle miles or 33 miles per day. The average private vehicle trip length is 8.3 miles.

The derivation of household trip and travel rates from the 1977 NPTS is presented below:

Annual National Data:

Vehicle Trips (thousands)	108,826,000
Vehicle Miles of Travel (thousands)	907,603,000
Number of Households	75,412,000

Per Household Rates:

Trips per Household:

Annual	1,443
Daily	4.0

Vehicle Miles per Household:

Annual	12,035
Daily	33.0
Average Trip Length	8.3
Persons per Household	2.83

Trip Purpose*

In reviewing household travel by trip purpose, more trips and vehicle miles are made for the trip to work than any other purpose (see Table 1). On the average, each household makes 402 annual or 1.1 daily trips to work, which account for 28 percent of all household trips. The proportion of travel to work is slightly greater than the trip rate, with 3,657 annual or 10 daily vehicle miles, representing 30 percent of each household's vehicle miles.

* See Appendix E for definitions of trip purposes.

TABLE 1. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY TRIP PURPOSE

TRIP PURPOSE	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
	Annual	Daily	Annual	Daily	
EARNING A LIVING					
Home to Work	402	1.1	3,657	10.0	9.2
Work Related	74	0.2	879	2.4	11.9
Subtotal	<u>476</u>	<u>1.3</u>	<u>4,536</u>	<u>12.4</u>	<u>9.6</u>
FAMILY AND PERSONAL BUSINESS					
Shopping	245	0.7	1,204	3.3	4.9
Medical or Dental	19	0.1	205	0.6	10.8
Other	202	0.5	1,348	3.7	6.7
Subtotal	<u>466</u>	<u>1.3</u>	<u>2,757</u>	<u>7.6</u>	<u>5.9</u>
CIVIC, EDUCATIONAL AND RELIGIOUS					
	92	0.3	566	1.6	6.1
SOCIAL AND RECREATIONAL					
Visit Friends and Relatives	121	0.3	1,360	3.7	11.2
Pleasure Driving	6	0.0	96	0.3	15.7
Vacations	1	0.0	72	0.2	95.4
Other	150	0.4	1,360	3.7	9.1
Subtotal	<u>278</u>	<u>0.7</u>	<u>2,888</u>	<u>7.9</u>	<u>10.2</u>
OTHER AND UNKNOWN					
	131	0.4	1,288	3.5	9.8
ALL PURPOSES					
	1443	4.0	12,035	33.0	8.3

After travel to work, the next most significant components of household travel are other family and personal business, visiting friends and relatives and other social and recreational activities. Each of these purposes account for approximately 1,350 annual vehicle miles, or 11 percent, of each household's travel. While these three purposes comprise approximately the same amount of each household's travel, the trip rates vary from 121 trips per year for visiting friends and relatives, to 150 for other social and recreational activities, and 202 for other family and personal business.

Shopping trips are also an important part of household travel patterns. Of 1,443 total annual household trips, 245, or 17 percent, are for shopping. This equates to 0.7 daily trips. In terms of vehicle miles of travel, the average household travels 1,204 miles per year or 3.3 miles per day for shopping.

In summary, travel for work clearly dominates household trip and travel rates. While shopping, other family and personal business, visiting friends and relatives and other social and recreational activities are significant trip purposes, travel to work accounts for almost one-third of all travel done by U.S. households.

Household Location - Inside or Outside SMSA's

One factor in viewing household trip and travel rates is whether the household is located inside or outside an SMSA (Standard Metropolitan Statistical Area). Generally, households located outside SMSA's travel slightly more than those inside SMSA's, as shown in Table 2. On the average, households outside SMSA's make 1,465 annual vehicle trips and travel 12,551 miles, compared to 1,432 trips and 11,745 miles for those inside SMSA's.

Household location is further categorized for SMSA households by whether they are inside a central city or not in a central city and, for households outside an SMSA, by population under 5,000 or over 5,000. Trip and travel rates vary considerably when these four categories of household location are applied.

Households inside SMSA's, but outside the central city, make more vehicle trips (1,621 annual and 4.4 daily) and travel more vehicle miles (14,449 annual and 39.6 daily) than any other group. These households comprise slightly less than a

TABLE 2. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY HOUSEHOLD LOCATION - INSIDE OR OUTSIDE SMSA

HOUSEHOLD LOCATION	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
INSIDE SMSA						
Within Central City	34.9	1,257	3.4	9,311	25.5	7.4
Not in Central City	32.4	1,621	4.4	14,449	39.6	8.9
Average	67.3	1,432	3.9	11,745	32.2	8.2
OUTSIDE SMSA						
Under 5,000	16.7	1,409	3.9	13,837	37.9	9.8
Over 5,000	16.0	1,524	4.2	11,208	30.7	7.3
Average	32.7	1,465	4.0	12,551	34.4	8.5
ALL HOUSEHOLDS	100.0*	1,443	4.0	12,035	33.0	8.3

* Total number of households = 75,412,000

third (32.4 percent) of all households and slightly less than half (48.1 percent) of SMSA households.

Households inside SMSA's and within central cities travel less than any other category. Households within the central city account for 34.9 percent of all households and 51.9 percent of SMSA households. These households make 1,257 vehicle trips per year, which is 22.4 percent less than those outside the central city. In terms of annual vehicle miles, central city households travel 9,311 miles per year or 35.6 percent less than the rate for households outside central cities (14,449 miles). This may be due in part to the proximity of services and activities within the central city and the tendency of central city households to make more trips by modes other than the private vehicle (e.g., public transit, walking and bicycling). The average vehicle trip length for central city households is 7.4 miles, as compared to 8.9 miles for households outside the central city.

Outside SMSA's, the differences in household trip and travel rates are not as dramatic. Households in areas over 5,000 population make 1,524 vehicle trips and travel 11,208 vehicle miles per year, compared to 1,409 trips and 13,837 miles in areas under 5,000 population. Households in areas under 5,000 population have the longest average trip length, 9.8 miles, which probably reflects the greater distances required to meet the household's needs in these areas of low population density.

Household Location by SMSA Population Size Group

As shown in Table 3, trips and travel per household increase as SMSA population size increases up to 1 million, then decrease. There is a marked decline in vehicle trips and travel in SMSA's of more than 3 million. For households located in SMSA's of less than 3 million, daily private vehicle trip rates vary between 4.0 and 4.4, and daily travel ranges from 31.8 miles to 34.4 miles. In SMSA's over 3 million, daily trip rates drop to 3.2 vehicle trips and travel declines to 27.8 miles per day. These differences may be due to increases in the proportion of trips by public transportation, walking and bicycling in the largest SMSA's.

Unlike trip and travel rates, average trip length shows steady increases as SMSA size increases, from 7.6 miles in SMSA's under 250,000 to 8.8 miles in SMSA's over

TABLE 3. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER SMSA HOUSEHOLD AND AVERAGE TRIP LENGTH BY SMSA POPULATION SIZE GROUP

SMSA POPULATION SIZE GROUP	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
Under 250,000	12.3	1,545	4.2	11,617	31.8	7.6
250,000-499,999	15.4	1,534	4.2	12,076	33.1	7.9
500,000-999,999	15.6	1,593	4.4	12,548	34.4	7.9
1 million - 3 million	31.6	1,478	4.0	12,519	34.3	8.5
Over 3 million	25.1	1,156	3.2	10,130	27.8	8.8
All SMSA Households	100.0*	1,432	3.9	11,745	32.2	8.2

*Total number of SMSA households = 50,819,000

3 million. As expected, increases in average trip length would reflect the general tendency for geographic size of the area to increase as population increases.

Number of Persons in Household

Table 4 presents household trip and travel rates by the number of persons in the household. One-person households make 544 annual vehicle trips or 1.5 daily trips and travel 4,422 annual or 12.1 daily vehicle miles. Households composed of two people make 1,220 annual trips (3.3 daily trips) and travel 10,729 annual miles (29.4 daily miles). Three-person households make 1,735 annual trips (4.8 daily trips) and travel 14,748 annual miles (40.4 daily miles).

As the number of people in the household increases from one to three, each person accounts for between 540 and 610 annual trips or 1.5 and 1.7 daily trips. Travel per person ranges between 4,400 and 5,400 annual vehicle miles for households with one to three people. This equates to of 12 to 15 daily vehicle miles per person. Once household size grows beyond three people, trips and travel increase but the amount of increase per person is not as great. Four-person households make 2,022 annual trips and travel 16,270 annual vehicle miles. This represents an increase of about 290 trips and 1,520 annual miles over the rates for three-person households. Similarly, five-person households show increases of about 220 trips and about 1,780 annual miles over four-person households.

The following rates show trips and travel on a per person basis:

Number of Persons in Household	Annual Trips per Person	Annual Vehicle Miles of Travel per Person
One	544	4422
Two	610	5365
Three	578	4916
Four	506	4068
Five or More*	449	3611
All Households	510	4253

* For per person calculations, 5 was used for the five-or-more person category.

TABLE 4. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY NUMBER OF PERSONS IN HOUSEHOLD

NUMBER OF PERSONS IN HOUSEHOLD	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
One	21.5	544	1.5	4422	12.1	8.2
Two	30.4	1220	3.3	10729	29.4	8.9
Three	17.3	1735	4.8	14748	40.4	8.6
Four	16.2	2022	5.5	16270	44.6	8.1
Five or more	14.6	2244	6.1	18053	49.5	8.1
All Households	100.0*	1443	4.0	12035	33.0	8.3

TABLE 5. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY NUMBER OF EMPLOYED PERSONS IN HOUSEHOLD

NUMBER OF EMPLOYED PERSONS IN HOUSEHOLD	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
None	28.5**	557	1.5	4181	11.5	7.5
One	45.3	1440	4.0	12381	33.9	8.6
Two	22.4	2216	6.1	18590	50.9	8.4
Three	3.1	3398	9.3	27176	74.5	8.0
Four or more	0.7	4329	11.9	32667	89.5	7.6
All Households	100.0*	1443	4.0	12035	33.0	8.3

* Total number of households = 75,412,000

** Includes households with persons who are unemployed, retired, or not in the labor force.

As shown above, trips and travel per person peak in two-person households and decline steadily as the number of household members increases.

Number of Employed Persons in Household

As with the number of persons in the household, trips and travel increase significantly with increases in the number of employed persons in the household. As shown in Table 5, vehicle trips increase from 557 annual trips in households with no workers to 4329 trips in households with four or more workers. For each employed person, the number of annual trips increases by approximately 800 to 1200. One-worker households make 1440 annual vehicle trips, households with two, three and four or more workers make 2216, 3398, and 4329 trips, respectively.

Vehicle miles of travel per household show the same pattern of significant increases as number of employed persons rises. Households with no workers travel 4181 miles per year, almost 8000 miles less than the average for all households (12,035). One-worker households travel 12,381 annual miles; those with two, three and four or more workers travel 18,590, 27,176, and 32,667 miles, respectively. In looking at the amount of increase in annual travel by number of workers, one-worker households travel 8200 miles more than households with no workers. Households with two workers travel 6200 miles more than their one-worker counterparts. Three-worker households travel about 8600 miles more than those with two workers. Finally, four-or-more-worker households travel almost 5500 miles more than three-worker households.

For each additional worker in the household, annual trip rates increase by 800 to 1200 and annual miles increase between 5500 and 8600. It appears that these increases occur in all trip purposes, not just earning a living. As shown in Table 1, earning a living accounts for 476 trips and 4536 vehicle miles per year. The average household surveyed in NPTS has 1.08 employed persons. This equates to a per worker rate of about 440 trips and 4200 miles for earning a living. Therefore, for each additional employed person, vehicle trips for purposes other than earning a living increase between 360 and 760 per year and private vehicle travel increases between 1300 and 4400 annual miles. Additional workers in the household usually indicate more discretionary income, more vehicles and more licensed drivers, all of which result in higher levels of household travel, and this additional travel occurs across all trip purposes.

Number of Licensed Drivers in Household

Table 6 shows that, as expected, the number of licensed drivers in the household greatly influences the amount of trips and travel.

Households with one driver average 910 vehicle trips and 7,389 vehicle miles per year. For each additional driver in the household, the number of household vehicle trips increases by at least 900 per year and annual vehicle miles increase by at least 8000.

Household trips and travel by number of licensed drivers shows more variation than any other household attribute examined. Households with four or more drivers make 354 percent more trips and travel 352 percent more than one-driver households.

Data contained in this report on miles driven by household members will differ from that in Characteristics of 1977 Licensed Drivers and Their Travel, Report 1, 1977 NPTS. That report presents the driver's estimate of total miles driven during the past year, while this report uses an estimate based on travel day trips, expanded to an annual total. On a household basis, the driver's estimate is usually higher than the annual estimate based on expanded travel day trips.

Household Structure

The relationship between household travel and household structure is explored in Table 7. Household structure is a variable that combines the following descriptive elements of the composition of a household: the number of adults in the household, whether there are children in the household, the age of the youngest child (if there are children), and whether the household head is retired or not.

As expected, trip and travel rates vary considerably by differences in household structure. In previous discussions, the differences in travel patterns were presented relative to number of persons, employed persons and licensed drivers in the household. These variables are related to the composition of the household, specifically to the number of adults in the household and whether the household head is retired. In addition, this presentation by household structure adds the

TABLE 6. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY NUMBER OF LICENSED DRIVERS IN HOUSEHOLD

NUMBER OF LICENSED DRIVERS IN HOUSEHOLD	DISTRIBUTION OF HOUSEHOLDS*	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
One	33.6	910	2.5	7389	20.2	8.1
Two	42.8	1836	5.0	15581	42.7	8.5
Three	8.2	2926	8.0	24173	66.2	8.3
Four or more	2.7	4131	11.3	33386	91.5	8.1
Households with Drivers	87.3	1649	4.5	13736	37.6	8.3
All Households	100.0**	1443	4.0	12035	33.0	8.3

*Excludes 12.7 percent of households that do not have a licensed driver.

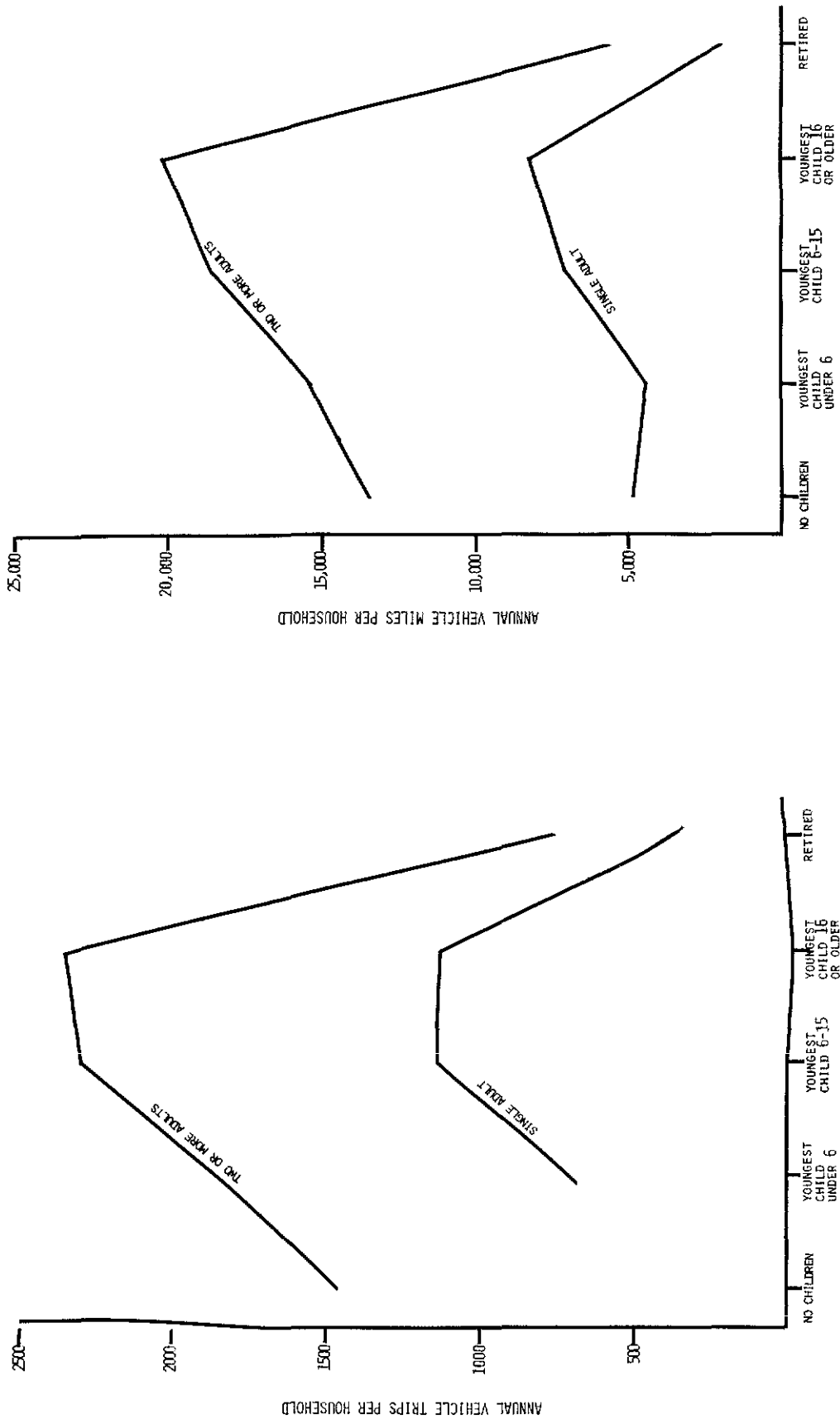
**Total number of households = 75,412,000

TABLE 7. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY HOUSEHOLD STRUCTURE

HOUSEHOLD STRUCTURE	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
Single adult, no children	18.0	585	1.6	4881	13.4	8.3
Two or more adults, no children	22.4	1469	4.0	13432	36.8	9.1
Single adult, youngest child under 6	1.9	684	1.9	4434	12.2	6.4
Two or more adults, youngest child under 6	15.5	1834	5.0	15374	42.1	8.4
Single adult, youngest child 6-15	3.7	1131	3.1	7156	19.6	6.2
Two or more adults, youngest child 6-15	18.0	2293	6.3	18588	50.9	8.1
Single adult, youngest child 16 or older	2.2	1115	3.1	8206	22.5	7.3
Two or more adults, youngest child 16 or older	6.8	2334	6.4	20194	55.3	8.6
Single adult, retired, no children	3.5	330	0.9	1928	5.3	5.8
Two or more adults, retired, no children	8.0	758	2.1	5717	15.7	7.6
All Households	100.0*	1443	4.0	12035	33.0	8.3

*Total number of households = 75,412,000

FIGURE 1. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD BY HOUSEHOLD STRUCTURE



element of travel generated by the presence of children in the household as well as the impact of the age of the youngest child.

The number of adults in the household appears to have a significant influence on trips and travel, as shown in Figure 1. When all other household characteristics (presence or absence of children, age of youngest child, and whether the household head is retired) are the same, multiple-adult households make about 1,100 trips and travel about 11,000 miles more than their single-adult counterparts. Further, when all other household characteristics are the same, the average trip length for multiple-adult households is about 1 to 2 miles longer than for comparable single-adult households.

Both the presence of children in the household and the age of the youngest child impact on household travel patterns. Within single-adult categories and within multiple-adult categories, trips and travel tend to increase with the age of the youngest child. Single-adult households with the youngest child under 6 make 684 annual trips. This increases to 1131 annual trips when the youngest child is between 6 and 15, and declines somewhat to 1115 trips when the youngest child is 16 or over. Vehicle miles of travel in single-adult households show consistent increases from 4434 miles for households with the youngest child under 6, to 7156 miles for those 6 to 15, and 8206 miles for 16 and older.

Multiple-adult households show similar trends but the amount of trips and travel is more than double the rates for single-adult households with children of the same age group. Multiple-adult households average 1834 annual vehicle trips if the youngest child is under 6, 2293 trips if the youngest child is 6 to 15, and 2334 trips if the youngest child is 16 or over. These same households also have the highest rates of travel, averaging 15,374 annual miles if the youngest child is under 6, 18,588 if the youngest child is 6 to 15, and 20,194 if the youngest child is 16 or over.

School trips may account for the rise in household travel once the youngest child reaches the age of 6. This pattern can be seen in both single-adult and multiple-adult households.

Households without children tend to travel less than those with children. Once again, these relationships must be viewed in light of the number of adults in the household. Single-adult households without children make 585 trips and travel 4881

miles per year. These rates represent fewer trips than any single-adult category with children (684 to 1131 trips) and less travel than any single-adult category other than youngest child under 6 (4434 annual miles).

Multiple-adult households without children average 1469 trips and 13,434 vehicle miles per year. These rates are lower than any multiple-adult category with children (which range from 1834 to 2334 annual trips and from 15,374 to 20,194 annual miles).

As expected, households where the household head is retired show the lowest trip and travel rates of any group within the single or multiple-adult categories. Single-adult, retired households make 330 annual trips and travel 1928 miles per year. This is considerably lower than other single-adult households, where the annual trip rate is between 585 and 1115 and travel rates are between 4434 and 8206 vehicle miles.

Multiple-adult households where the household head is retired make 758 annual trips (as compared to trip rates of 1469 to 2334 for other multiple-adult categories) and travel 5717 vehicle miles per year (as compared to rates of 13,432 to 20,194 annual miles for other multiple-adult households).

In summary, when trip and travel rates are viewed in terms of household structure categories, the number of adults in the household appears to have the strongest influence on travel rates, followed by the presence or absence of children, age of the youngest child and whether the household head is retired. Multiple-adult households with children have the highest trip and travel rates. The next highest rates occur in multiple-adult households without children, followed by single-adult households with children, multiple-adult with retired household head, single-adult without children, and then single-adult, retired household head.

B. VEHICLE TRIP AND TRAVEL RATES PER HOUSEHOLD BY HOUSEHOLD INCOME

Annual Household Income

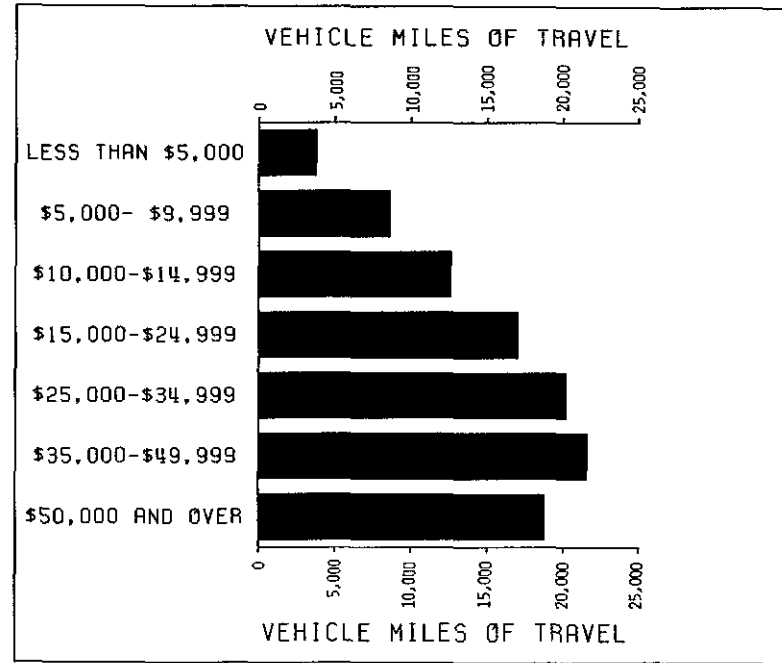
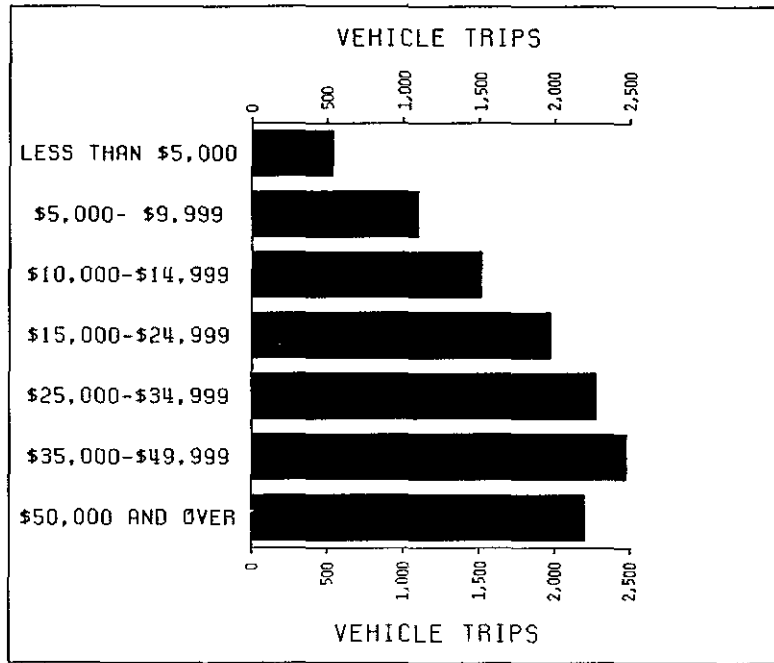
As shown in Table 8 and Figure 2, household travel varies in direct proportion to annual household income. Trips and travel per household increase as annual income

TABLE 8. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY ANNUAL HOUSEHOLD INCOME

ANNUAL HOUSEHOLD INCOME	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
Less than \$5,000	19.7	535	1.5	3788	10.4	7.2
\$5,000-\$9,999	21.8	1099	3.0	8612	23.6	7.9
\$10,000-\$14,999	21.3	1514	4.1	12608	34.5	8.3
\$15,000-\$24,999	24.8	1972	5.4	16971	46.5	8.6
\$25,000-\$34,999	7.9	2278	6.2	20221	55.4	8.9
\$35,000-\$49,999	3.0	2474	6.8	21573	59.1	8.7
\$50,000 and over	1.5	2201	6.0	18765	51.4	8.5
All Households	100.0*	1443	4.0	12035	33.0	8.3

*Total number of households = 75,214,000

FIGURE 2. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD BY HOUSEHOLD INCOME



increases up to \$50,000, then declines slightly. Average trip length declines slightly once income reaches \$35,000.

When trip and travel rates for individual income groups are compared to the average for all households, the results are as follows:

Household Income Group	Trips Relative To Average Household (percent of 1443 trips)	Vehicle Miles Relative To Average Household (percent of 12035 miles)
Under \$5,000	37	32
\$5,000-9,999	76	72
\$10,000-14,999	105	105
\$15,000-24,999	137	141
\$25,000-34,999	158	168
\$35,000-49,999	171	179
\$50,000 and over	153	156

As shown above, households in the \$10,000-15,000 income range most closely approximate the average for all households. Households in the under \$5,000 group make approximately one-third of the vehicle trips and travel of the average household. This increases to 76 percent of trips and 72 percent of travel for those in the \$5,000-10,000 range. Once household income rises above the \$15,000 level, travel increases dramatically. Households in the \$15,000-\$25,000 range make 37 percent more trips and travel 41 percent more than the average; those in the \$25,000-\$35,000 range, 58 percent more trips and 68 percent more travel, and those in the \$35,000-\$50,000 range, 71 percent more trips and 79 percent more travel. Once household income goes above \$50,000, trip and travel rates decrease somewhat, however, these households still make 53 percent more trips and 56 percent more travel than the average household.

While income is a significant factor in the amount of household trips and travel, these rates are also related to other attributes of the household such as number of vehicles, persons, and licensed drivers per household. The relationship of these household characteristics to income will be explored in later portions of this section.

Annual Household Income and Trip Purpose

Tables 9-11 present average trip and travel rates by trip purpose and household income. Rates for each major trip purpose category will be presented, followed by a discussion of the rates for all purposes.

Earning a Living. Trips for earning a living range from 230 annual trips by households with incomes under \$10,000, to 698 for those in the \$15,000-\$25,000 range, to 786 for the \$35,000-\$50,000 group, and 702 for those earning \$50,000 or more. Vehicle miles of travel for earning a living increase from 1916 miles (under \$10,000) to 6899 (\$15,000-\$25,000) to 8507 (\$35,000-\$50,000) then decline to 6582 (\$50,000 and over). Average trip length increases from 8.3 miles for households with incomes under \$10,000 to 10.8 miles for those in the \$35,000-\$50,000 range, with a decrease to 9.4 miles for households with incomes of \$50,000 and over.

Home-to-work trips and travel comprise the major portion of the broader category of earning a living. The home-to-work trip rate for all households is 402 annual or 1.1 daily trips.* The travel rate is 3,657 annual miles or 10.0 daily miles, and the average trip length is 9.2 miles. The degree to which the rates for home-to-work trips and travel by the various income groups differ from these averages are shown below:

Household Income Group	Work Trips Relative to Average Household (percent of 402 trips)	Travel to Work Relative to Average Household (percent of 3657 vehicle miles)
Under \$10,000	48	43
\$10,000-15,000	110	110
\$15,000-25,000	149	159
\$25,000-35,000	158	169
\$35,000-50,000	160	173
\$50,000 and over	136	128

*For purposes of consistency, daily rates presented in this report are computed by dividing the annual rate by 365 days. However, it should be recognized that in the case of work trips, an employed person normally has a 5-day work week, for an annual total of 260 days, minus days off for vacation, holidays and illness.

TABLE 9. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY TRIP PURPOSE AND HOUSEHOLD INCOME (UNDER \$15,000)

TRIP PURPOSE	UNDER \$10,000			\$10,000-\$14,999		
	TRIP RATE PER HOUSEHOLD	VEHICLE MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)	TRIP RATE PER HOUSEHOLD	VEHICLE MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)
EARNING A LIVING						
Home to work	194	1568	8.1	443	4009	9.0
Work related	36	348	9.8	72	1045	14.5
Subtotal	<u>230</u>	<u>1916</u>	<u>8.3</u>	<u>515</u>	<u>5054</u>	<u>9.8</u>
FAMILY AND PERSONAL BUSINESS						
Shopping	148	645	4.4	254	1197	4.7
Medical or dental	12	152	12.4	17	227	13.2
Other	<u>130</u>	<u>885</u>	<u>6.8</u>	<u>205</u>	<u>1229</u>	<u>6.0</u>
Subtotal	<u>290</u>	<u>1682</u>	<u>5.8</u>	<u>476</u>	<u>2653</u>	<u>5.6</u>
CIVIC, EDUCATIONAL AND RELIGIOUS						
	55	322	5.9	92	569	6.2
SOCIAL AND RECREATIONAL						
Visit friends and relatives	91	955	10.5	129	1374	10.6
Pleasure driving	5	51	11.0	5	76	14.6
Other*	<u>87</u>	<u>752</u>	<u>8.8</u>	<u>162</u>	<u>1588</u>	<u>9.8</u>
Subtotal	<u>183</u>	<u>1758</u>	<u>9.8</u>	<u>296</u>	<u>3038</u>	<u>10.3</u>
OTHER AND UNKNOWN						
	73	644	8.8	135	1294	9.6
ALL PURPOSES						
	831	6322	7.6	1514	12608	8.3
DISTRIBUTION OF HOUSEHOLDS**						
		41.5		21.3		

* Other social and recreational includes trips and travel for vacation, sightseeing, entertainment, eat meal, recreation and other social activities.

** Total number of households (all income groups) = 75,412,000

TABLE 10. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY TRIP PURPOSE AND HOUSEHOLD INCOME (\$15,000-\$35,000)

TRIP PURPOSE	\$15,000-\$24,999			\$25,000-\$34,999		
	TRIP RATE PER HOUSEHOLD	VEHICLE MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)	TRIP RATE PER HOUSEHOLD	VEHICLE MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)
EARNING A LIVING						
Home to work	597	5802	9.7	636	6192	9.7
Work related	101	1097	10.7	143	1836	12.8
Subtotal	698	6899	9.9	779	8028	10.3
FAMILY AND PERSONAL BUSINESS						
Shopping	325	1645	5.0	413	2291	5.6
Medical or dental	26	246	9.4	26	244	9.5
Other	266	1879	7.0	297	2056	6.9
Subtotal	617	3770	6.1	736	4591	6.2
CIVIC, EDUCATIONAL AND RELIGIOUS	125	746	5.9	157	985	6.3
SOCIAL AND RECREATIONAL						
Visit friends and relatives	149	1645	11.0	159	2345	14.7
Pleasure driving	8	125	15.0	7	123	18.9
Other*	198	1871	9.4	228	2098	9.2
Subtotal	355	3641	10.3	394	4566	11.6
OTHER AND UNKNOWN	177	1915	10.8	212	2051	9.7
ALL PURPOSES	1972	16971	8.6	2278	20221	8.9
DISTRIBUTION OF HOUSEHOLDS**		24.8				7.9

* Other social and recreational includes trips and travel for vacation, sightseeing, entertainment, eat meal, recreation and other social activities.

** Total number of households (all income groups) = 75,412,000

TABLE 11. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY TRIP PURPOSE AND HOUSEHOLD INCOME (OVER \$35,000)

TRIP PURPOSE	\$35,000-\$49,999			\$50,000 & OVER		
	TRIP RATE PER HOUSEHOLD	VEHICLE MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)	TRIP RATE PER HOUSEHOLD	VEHICLE MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)
EARNING A LIVING						
Home to work	645	6339	9.8	546	4682	8.6
Work related	141	2168	15.3	156	1900	12.2
Subtotal	<u>786</u>	<u>8507</u>	<u>10.8</u>	<u>702</u>	<u>6582</u>	<u>9.4</u>
FAMILY AND PERSONAL BUSINESS						
Shopping	408	2234	5.5	342	1820	5.3
Medical or dental	43	342	8.0	19	166	8.5
Other	324	1756	5.4	296	2562	8.7
Subtotal	<u>775</u>	<u>4332</u>	<u>5.6</u>	<u>657</u>	<u>4548</u>	<u>6.9</u>
CIVIC, EDUCATIONAL AND RELIGIOUS	178	1151	6.5	130	1020	7.9
SOCIAL AND RECREATIONAL						
Visit friends and relatives	157	1934	12.3	135	1502	11.1
Pleasure driving	7	459	63.3	18	194	10.9
Other*	300	2798	9.3	294	2155	7.3
Subtotal	<u>464</u>	<u>5191</u>	<u>11.0</u>	<u>447</u>	<u>3851</u>	<u>8.6</u>
OTHER AND UNKNOWN	271	2392	8.8	265	2764	10.4
ALL PURPOSES	2474	21573	8.7	2201	18765	8.5
DISTRIBUTION OF HOUSEHOLDS**		3.0		1.5		

* Other social and recreational includes trips and travel for vacation, sightseeing, entertainment, eat meal, recreation and other social activities.

** Total number of households (all income groups) = 75,412,000

While households with incomes under \$10,000 make less than half of the average rate for work trips and travel, those in the \$10,000 to \$15,000 range make 10 percent more than the average. The pattern does not show significant changes between \$15,000 and \$50,000, with households in those groups averaging 50 to 60 percent more work trips than the norm and about 60 to 70 percent more vehicle miles.

Average trip length for work trips by household income does not show nearly the variation seen in trip and travel rates. For households with incomes over \$10,000, the average work trip length ranges from 8.6 miles (over \$50,000 group) to 9.8 miles (\$35,000 - \$50,000 group). Workers seem to travel about the same distance to work, regardless of income. As expected, increases in home-to-work travel by higher income households is primarily due to additional workers in the household, not to longer trip lengths.

Family and Personal Business. The average household makes 466 annual trips and travels 2757 miles for family and personal business. This category includes shopping, medical or dental care and other family and personal business such as trips to the dry cleaner and gas station. Households with incomes under \$10,000 make 290 annual trips and travel only 1682 vehicle miles for this purpose, or about 60 percent of the average. Travel for this purpose in households in the \$10,000-15,000 range closely mirrors the average, with 476 trips and 2635 miles. Households with incomes of \$15,000 - \$25,000 average 3770 annual miles of travel for family and personal business. Above \$25,000, travel rates for family and personal business stay fairly constant with 4591 miles for households earning \$25,000 - \$35,000, 4332 miles for those in the \$35,000 - \$50,000 group and 4548 annual miles for those with incomes of \$50,000 or more.

Shopping trips are an important element of family and personal business. The average household makes 245 annual trips and travels 1204 miles for shopping. Both trip and travel rates for shopping peak in the \$25,000 - \$50,000 income range, then decline once income rises above \$50,000. Households with incomes of \$25,000 - \$35,000 make 69 percent more shopping trips and travel 90 percent more vehicle miles for shopping than the average household. Those in the \$35,000 -50,000 group make 67 percent more trips and travel 86 percent more than the average household for this purpose.

Civic, Educational and Religious. As with many other trip purposes, trip and travel rates for civic, educational and religious activities increase up to the \$35,000 to \$50,000 income range, then decline for households with incomes over \$50,000. Households earning under \$10,000 per year make only 55 vehicle trips and travel only 322 vehicle miles per year for this purpose. This increases to 125 trips and 746 miles for those in the \$15,000-\$25,000 range and to 178 trips and 1151 miles in the \$35,000-\$50,000 group. The rates for households in the \$35,000-\$50,000 range are about twice the rates for the average household.

Social and Recreational. Travel for social and recreational activities accounts for about one quarter of all household vehicle miles and trips for this category comprise almost one-fifth of household trips. On the average, each household makes 278 annual trips and travels 2,888 vehicle miles for social and recreational activities.

Once again, trip and travel rates increase with household income up through the \$35,000-\$50,000 group, then decline slightly. Households in the lowest income group, under \$10,000, make 183 vehicle trips and travel 1758 miles per year for social and recreational purposes. Those in the \$15,000-\$25,000 range make about twice that amount, 355 trips and 3641 vehicle miles. Households in the \$35,000-\$50,000 income group make 464 vehicle trips and travel 5,191 vehicle miles for social and recreational activities. The trip rates for this group are about 170 percent of the average for all households and travel rates are 180 percent of the average.

All Purposes. There is a direct correlation between annual income and trip-making patterns of households. Households with incomes under \$10,000 generally travel about 50 to 60 percent of the average for all households. Those in the income range of \$10,000-\$15,000 travel about 95 to 105 percent of the rate for all households; the \$15,000 - 25,000 range, about 130 to 140 percent; the \$25,000-\$35,000 range, about 160 to 170 percent; the \$35,000-\$50,000 range about 170 to 180 percent; and the over \$50,000 group, 150-155 percent. These ratios apply to all household trips, as well as the rates within each trip purpose.

Tables 9-11 presented trip rates and vehicle miles per household by trip purpose and household income. Tables 12 and 13 and Figure 3 present a similar data

TABLE 12. DISTRIBUTION OF VEHICLE TRIPS BY TRIP PURPOSE AND HOUSEHOLD INCOME

TRIP PURPOSE	ANNUAL HOUSEHOLD INCOME										TOTAL	
	UNDER \$5,000	\$5,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000 AND OVER					
EARNING A LIVING												
Home to work	4.8	15.3	23.6	37.0	12.5	4.8	2.0					100.0
Work related	6.4	14.1	20.8	34.4	15.3	5.8	3.2					100.0
Average	5.1	15.1	23.1	36.4	13.0	5.0	2.3					100.0
FAMILY AND PERSONAL BUSINESS												
Shopping	8.2	16.8	21.9	32.8	13.2	5.0	2.1					100.0
Medical or dental	9.5	17.7	19.4	34.1	10.8	6.9	1.6					100.0
Other	8.4	18.4	21.7	32.9	11.6	4.8	2.2					100.0
Average	8.3	17.6	21.7	32.8	12.5	5.0	2.1					100.0
CIVIC, EDUCATIONAL AND RELIGIOUS	10.1	14.5	20.9	33.4	13.3	5.7	2.1					100.0
SOCIAL AND RECREATIONAL												
Visit friends and relatives	10.6	20.6	22.6	30.3	10.3	3.9	1.7					100.0
Pleasure driving	7.1	24.8	18.0	34.0	8.3	3.5	4.3					100.0
Vacation	0.0	16.6	29.0	25.0	20.5	4.0	4.9					100.0
Other	7.3	16.2	22.7	32.9	12.0	6.0	2.9					100.0
Average	8.3	17.3	22.3	31.9	12.7	5.4	2.1					100.0
OTHER AND UNKNOWN	6.9	16.2	21.8	33.2	12.7	6.2	3.0					100.0
ALL PURPOSES	7.3	16.6	22.3	34.0	12.4	5.1	2.3					100.0*
DISTRIBUTION OF HOUSEHOLDS	19.7	21.8	21.3	24.8	7.9	3.0	1.5					100.0**

* Total number of vehicle trips = 108,826,000,000

** Total number of households = 75,412,000

See Appendix A, Table A-1 for distribution of vehicle trips by purpose within each income group.

TABLE 13. DISTRIBUTION OF VEHICLE MILES OF TRAVEL BY TRIP PURPOSE AND HOUSEHOLD INCOME

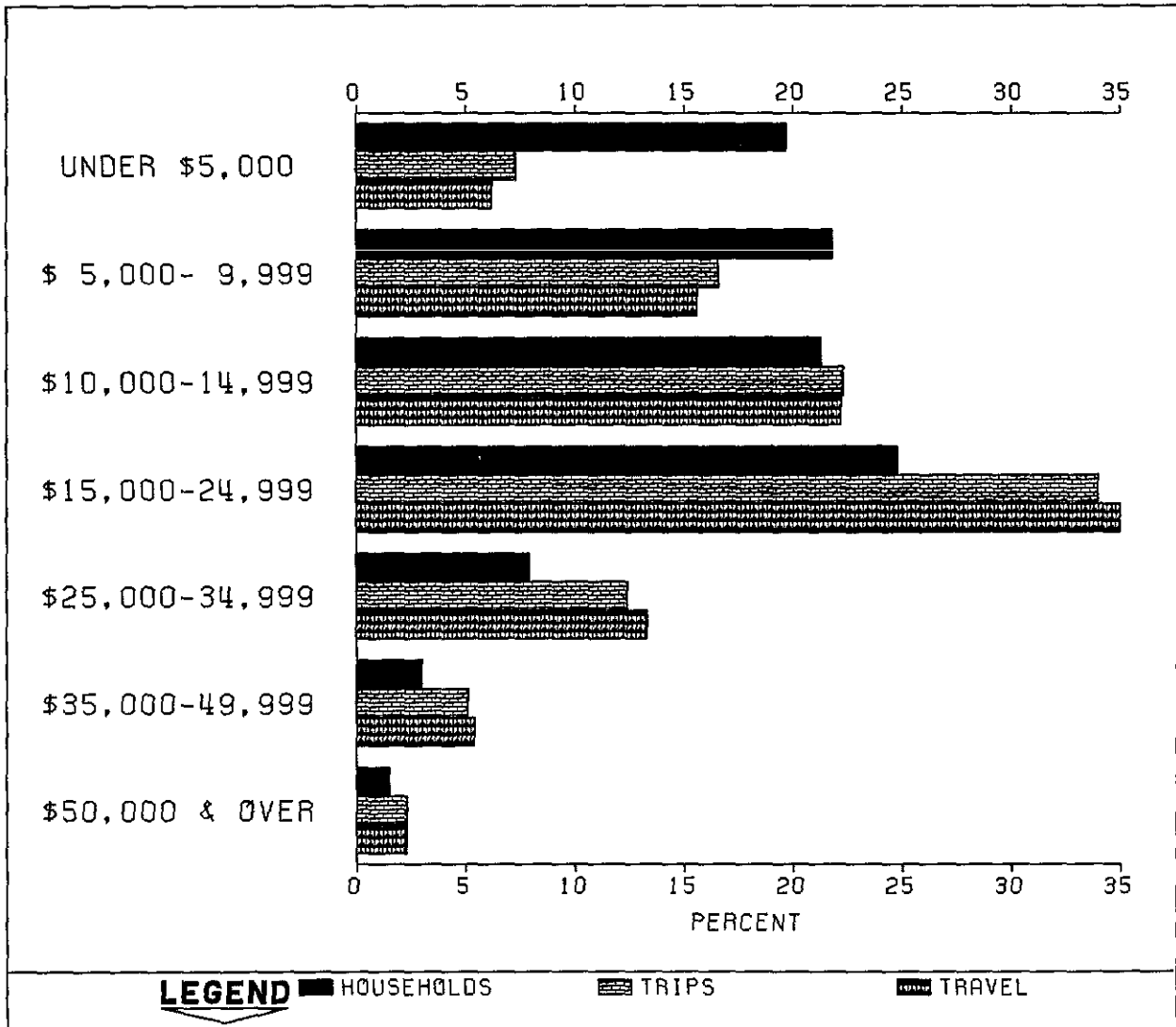
TRIP PURPOSE	UNDER \$5,000	ANNUAL HOUSEHOLD INCOME							TOTAL
		\$5,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000 AND OVER		
EARNING A LIVING									
Home to work	3.6	14.0	23.2	39.0	13.2	5.1	1.9	100.0	
Work related	6.0	10.6	25.4	30.9	16.5	7.4	3.2	100.0	
Average	4.0	13.5	23.4	37.4	14.2	5.3	2.2	100.0	
FAMILY AND PERSONAL BUSINESS									
Shopping	6.2	15.7	21.1	34.2	15.0	5.5	2.3	100.0	
Medical or dental	9.8	20.6	23.9	29.9	9.5	5.1	1.2	100.0	
Other	8.1	19.2	19.4	34.6	12.0	3.9	2.8	100.0	
Average	7.4	17.7	20.0	34.0	13.6	4.8	2.5	100.0	
CIVIC, EDUCATIONAL AND RELIGIOUS	8.4	15.1	21.4	32.6	13.7	6.1	2.7	100.0	
SOCIAL AND RECREATIONAL									
Visit friends and relatives	9.4	19.7	21.5	30.0	13.6	4.2	1.6	100.0	
Pleasure driving	5.6	18.0	16.8	32.4	10.0	14.2	3.0	100.0	
Vacations	0.0	12.8	35.5	34.1	12.2	2.5	2.9	100.0	
Other	7.7	15.0	22.9	33.8	12.1	6.1	2.4	100.0	
Average	8.1	17.5	22.6	32.0	12.3	5.2	2.3	100.0	
OTHER AND UNKNOWN	5.5	15.2	21.3	36.8	12.5	5.5	3.2	100.0	
ALL PURPOSES	6.2	15.6	22.2	35.0	13.3	5.4	2.3	100.0*	
DISTRIBUTION OF HOUSEHOLDS	19.7	21.8	21.3	24.8	7.9	3.0	1.5	100.0**	

* Total vehicle miles of travel = 907,603,000,000

** Total number of households = 75,412,000

See Appendix A, Table A-2 for distribution of vehicle miles by purpose within each income group.

FIGURE 3. DISTRIBUTION OF HOUSEHOLDS, VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL BY HOUSEHOLD INCOME



relationship using the distribution of vehicle trips and vehicle miles rather than the rates per household.

As in the previous discussion, households with incomes below \$10,000 make well below their proportional share of vehicle trips and travel. Those with incomes under \$5,000 comprise 19.7 percent of all households yet they make only 7.3 percent of all trips and travel 6.2 percent of all vehicle miles. Those in the \$5,000-\$10,000 income range account for 21.8 percent of all households and they make 16.6 percent of all trips and travel 15.6 percent of all vehicle miles.

Households in the \$10,000 to \$15,000 income group, which is the median income range, show trip-making characteristics that reflect their proportional share of the population. These households comprise 21.3 percent of all households, make 22.3 percent of all vehicle trips and travel 22.2 percent of all vehicle miles.

Once household income rises above \$15,000, the percent of trips and travel is proportionally greater than the percent of these households to the population. Households with incomes of \$15,000 or more account for 37.2 percent of all households, but make 53.8 percent of all trips and 56.0 percent of all vehicle miles of travel.

Within each income group, trips and travel by each major trip purpose show patterns similar to those for all purposes.

Increases in trips and travel by household income probably reflect both the additional need for travel in higher income households as the number of workers per household rises, as well as the capability of the household to engage in more discretionary travel for social and recreational activities and shopping.

Household Income and Vehicle Ownership*

In the previous discussions it was shown that household travel patterns varied significantly by household income. Since vehicle ownership is directly related to

*"Vehicle ownership" is defined as all motor vehicles (autos, vans, minibuses, pickups and other trucks, camper coaches, motorcycles and mopeds) owned by or available to the household on a regular basis.

household income, Table 14 presents the distribution of households by income and vehicle ownership. Of course, as household income rises, vehicle ownership increases. The number of vehicles per household increases steadily from 0.73 vehicles per household for those with incomes under \$5,000 to 2.61 vehicles for those with incomes of \$50,000 or more.

Table 15 contains household trip and travel rates by income and vehicle ownership. The average trip rate for all households is 1443 annual vehicle trips, while the average for vehicle-owning households is about 1700 vehicle trips per year.

Generally, households that own one or more vehicles make at least 1000 annual vehicle trips. (The only exception to this is households with one vehicle and incomes under \$5,000.) Households with two or more vehicles and incomes over \$15,000 make at least 2000 annual vehicle trips. For all income groups combined, households with three or more vehicles make at least 2500 annual vehicle trips.

In terms of vehicle miles per household, households with one vehicle and incomes of at least \$10,000 and all multi-vehicle households travel approximately 10,000 miles or more per year. Households with two vehicles and incomes over \$15,000 and all households with three or more vehicles travel a minimum of 17,000 annual vehicle miles.

The impact of vehicle ownership on household travel patterns can be seen by viewing trip and travel rates within three income groups: \$5,000-\$10,000, \$15,000-\$25,000, and \$35,000-\$50,000. Households with incomes of \$5,000-\$10,000 show significant increases in both trip and travel when the number of vehicles rises from one to two. Once the number of household vehicles goes above two, the amount of additional travel generated is not nearly as great as the initial jump from one to two vehicles. Households with incomes of \$15,000-\$25,000 show steadier increases as vehicle ownership goes from one to four or more vehicles. For these households, the largest increase in trip and travel rates occurs between one and two vehicles, however, consistent increases are shown between two and four or more vehicles. For households in the \$35,000-\$50,000 income group, the largest change in both trip and travel rates occurs when ownership goes from two to three vehicles.

TABLE 14. PERCENT OF HOUSEHOLDS BY HOUSEHOLD INCOME AND VEHICLE OWNERSHIP*

NUMBER OF HOUSEHOLD VEHICLES	ANNUAL HOUSEHOLD INCOME						ALL INCOME GROUPS	
	UNDER \$5,000	\$5,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999		\$50,000 AND OVER
None	46.3	17.4	6.5	2.9	1.6	3.2	2.8	15.3
One	39.5	49.3	40.1	23.5	14.9	14.3	9.9	34.6
Two	10.7	25.2	39.1	50.2	50.5	43.1	47.2	34.4
Three	2.6	5.9	10.5	16.1	21.0	22.2	21.8	10.7
Four or more	0.9	2.2	3.8	7.3	12.0	17.2	18.3	5.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0**
Average Vehicles per Household	0.73	1.27	1.67	2.06	2.37	2.49	2.61	1.59
	BY OWNERSHIP GROUP							
None	59.6	24.8	9.1	4.8	0.8	0.6	0.3	100.0
One	22.4	31.1	24.6	16.8	3.4	1.3	0.4	100.0
Two	6.1	16.0	24.2	36.1	11.7	3.8	2.1	100.0
Three	4.8	12.1	21.0	37.1	15.6	6.3	3.1	100.0
Four or more	3.4	9.6	16.0	36.3	18.9	10.3	5.5	100.0
All Households	19.7	21.8	21.3	24.8	7.9	3.0	1.5	100.0**

*Includes all motor vehicles (autos, trucks, motorcycles, mopeds) owned or available on regular basis.

** Total households = 75,412,000

Source: Household Vehicle Ownership, Report 2, 1977 NPTS.

TABLE 15. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD BY HOUSEHOLD INCOME AND VEHICLE OWNERSHIP

NUMBER OF HOUSEHOLD VEHICLES	ANNUAL HOUSEHOLD INCOME							ALL HOUSEHOLDS
	UNDER \$5,000	\$5,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000 AND OVER	
ANNUAL VEHICLE TRIPS PER HOUSEHOLD								
None	36	*	*	*	*	*	*	38
One	777	1012	1185	1259	1338	1413	*	1059
Two	1228	1661	1841	2037	2092	2194	2198	1892
Three	2263	2131	2138	2586	2961	3130	2426	2509
Four or more	*	2278	2414	3212	3337	3662	3077	3030
Vehicle-owning Households	965	1324	1616	2028	2315	2555	2254	1697
All Households	535	1099	1514	1972	2278	2474	2201	1443
ANNUAL VEHICLE MILES PER HOUSEHOLD								
None	200	*	*	*	*	*	*	315
One	5181	7124	10002	9627	12540	11013	*	8070
Two	9994	14080	14781	17823	17887	17629	17910	15989
Three	17002	18377	18936	23201	28011	28521	17921	22383
Four or more	*	17733	21666	27340	28596	35194	27471	25996
Vehicle-owning Households	6888	10332	13478	17446	20542	22271	19082	14152
All Households	3788	8612	12608	16971	20221	21573	18765	12035

*Data insufficient for presentation, but these households are included in the rates for all households.

Most households show a significant increase in both trip and travel rates when the number of vehicles rises from one to two. Generally, the higher the income, the greater the impact of additional vehicles in the household.

Another presentation of the relationship between household income, vehicle ownership and household travel is found in Tables 16 and 17 and Figure 4, using the distribution of vehicle trips and vehicle miles of travel.

As expected, households with more than one vehicle or those with incomes over \$15,000 account for a larger share of vehicle trips and travel compared to the proportion of these households to the total population. As shown in Table 16, households with two vehicles comprise 34.4 percent of all households, make 45.1 percent of all vehicle trips and travel 45.7 percent of all vehicle miles. Households with three or more vehicles account for 15.7 percent of all households, make 29.1 percent of all vehicle trips and travel 30.7 percent of all vehicle miles. As seen in Table 17, households with incomes over \$15,000 comprise 37.2 percent of all households, make 53.8 percent of all vehicle trips and travel 56.0 percent of all vehicle miles.

Household Income and Number of Persons

Annual vehicle trips and travel rates by household income and number of persons in the household is presented in Table 18. Household income has been used as a primary travel indicator by transportation planners, however, when income is considered along with household size, some important findings can be seen. First, within each income group there is considerable variation in trips and travel by the number of persons in the household. Households with five or more people and incomes of \$5,000-\$10,000 make about 900 more trips and travel about 7000 miles more than one-person households within the same income group. Five-or-more-person households with incomes of \$15,000-\$25,000 make about 1700 more trips and travel about 14,000 miles more than one-person households with the same income. Households with five or more people and incomes of \$35,000-\$50,000 make 2700 more trips and travel 22,500 miles more than one-person households in the same income group.

Second, there is a wide gap in trip and travel rates between one-person households and those with two or more people within the same income group. Households with

TABLE 16. DISTRIBUTION OF VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL
BY HOUSEHOLD INCOME AND VEHICLE OWNERSHIP (WITHIN INCOME GROUP)

NUMBER OF HOUSEHOLD VEHICLES	ANNUAL HOUSEHOLD INCOME							ALL HOUSEHOLDS	DISTRIBUTION OF HOUSEHOLDS
	UNDER \$5,000	\$5,000- 9,999	\$10,000- 14,999	\$15,000- 24,999	\$25,000- 34,999	\$35,000- 49,999	\$50,000 AND OVER		
	VEHICLE TRIPS								
None	3.1	0.5	0.2	0.1	0.0	0.1	0.5	0.4	15.3
One	57.4	45.4	31.4	15.0	8.7	8.2	2.8	25.4	34.6
Two	24.5	38.1	47.6	51.9	46.4	38.2	47.1	45.1	34.4
Three	11.0	11.4	14.8	21.1	27.3	28.1	24.0	18.6	10.7
Four or more	4.0	4.6	6.0	11.9	17.6	25.4	25.6	10.5	5.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0*	100.0
	VEHICLE MILES OF TRAVEL								
None	2.5	0.9	0.1	0.2	0.0	0.1	1.2	0.4	15.3
One	54.0	40.8	31.8	13.3	9.2	7.3	6.2	23.2	34.6
Two	28.2	41.2	45.8	52.7	44.7	35.2	45.0	45.7	34.4
Three	11.7	12.6	15.8	22.0	29.1	29.3	20.8	19.8	10.7
Four or more	3.6	4.5	6.5	11.8	17.0	28.1	26.8	10.9	5.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0**	100.0

*Total vehicle trips = 108,826,000,000

**Total vehicle miles of travel = 907,603,000,000

TABLE 17. DISTRIBUTION OF VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL BY HOUSEHOLD INCOME AND VEHICLE OWNERSHIP (WITHIN OWNERSHIP GROUP)

NUMBER OF HOUSEHOLD VEHICLES	ANNUAL HOUSEHOLD INCOME							TOTAL
	UNDER \$5,000	\$5,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000 AND OVER	
	VEHICLE TRIPS							
None	55.9	20.7	9.0	11.0	0.3	0.6	2.5	100.0
One	16.5	29.7	27.6	20.0	4.3	1.6	0.3	100.0
Two	4.0	14.0	23.5	39.0	12.8	4.3	2.4	100.0
Three	4.3	10.3	17.9	38.6	18.3	7.7	2.9	100.0
Four or more	2.8	7.2	12.9	38.4	20.8	12.4	5.5	100.0
All Households	7.3	16.6	22.3	34.0	12.4	5.1	2.3	100.0*
	VEHICLE MILES OF TRAVEL							
None	38.0	34.8	2.9	15.5	1.2	0.9	6.7	100.0
One	14.5	27.4	30.4	20.1	5.3	1.7	0.6	100.0
Two	3.9	14.1	22.3	40.3	13.0	4.1	2.3	100.0
Three	3.7	9.9	17.7	38.9	19.5	7.9	2.4	100.0
Four or more	2.1	6.5	13.4	37.8	20.7	13.8	5.7	100.0
All Households	6.2	15.6	22.2	35.0	13.3	5.4	2.3	100.0**
Distribution of Households	19.7	21.8	21.3	24.8	7.9	3.0	1.5	100.0

*Total vehicle trips = 108,826,000,000

**Total vehicle miles of travel = 907,603,000,000

**FIGURE 4. DISTRIBUTION OF VEHICLE TRIPS AND VEHICLE MILES OF TRAVEL
BY HOUSEHOLD INCOME AND VEHICLE OWNERSHIP**

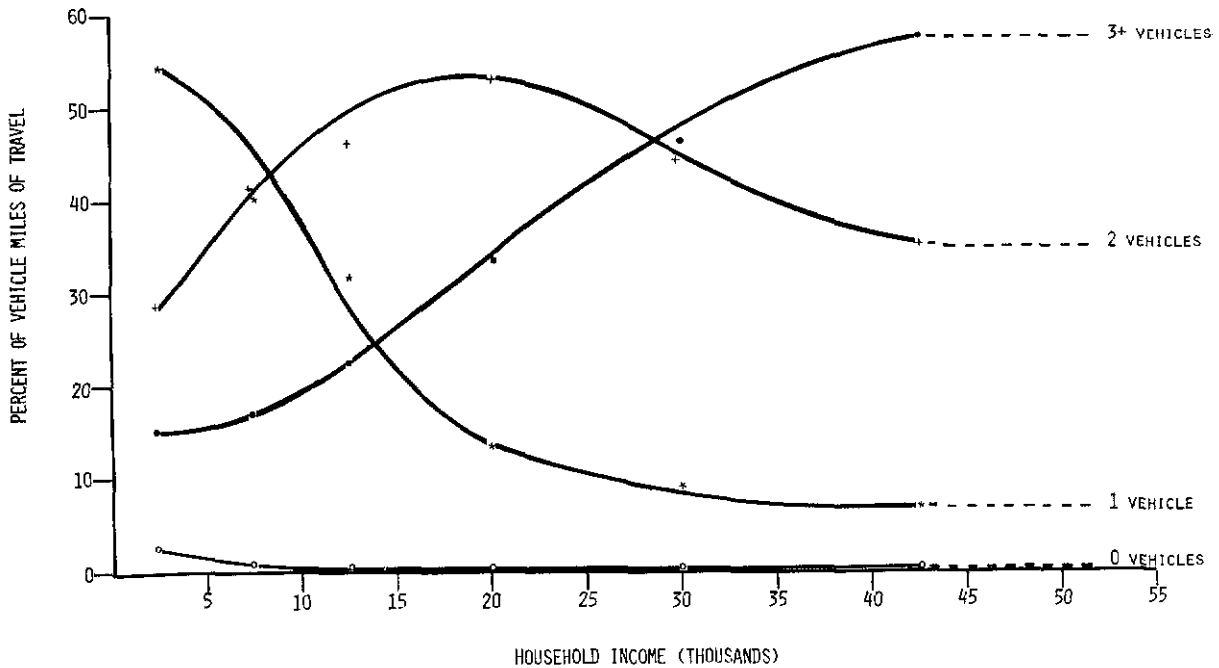
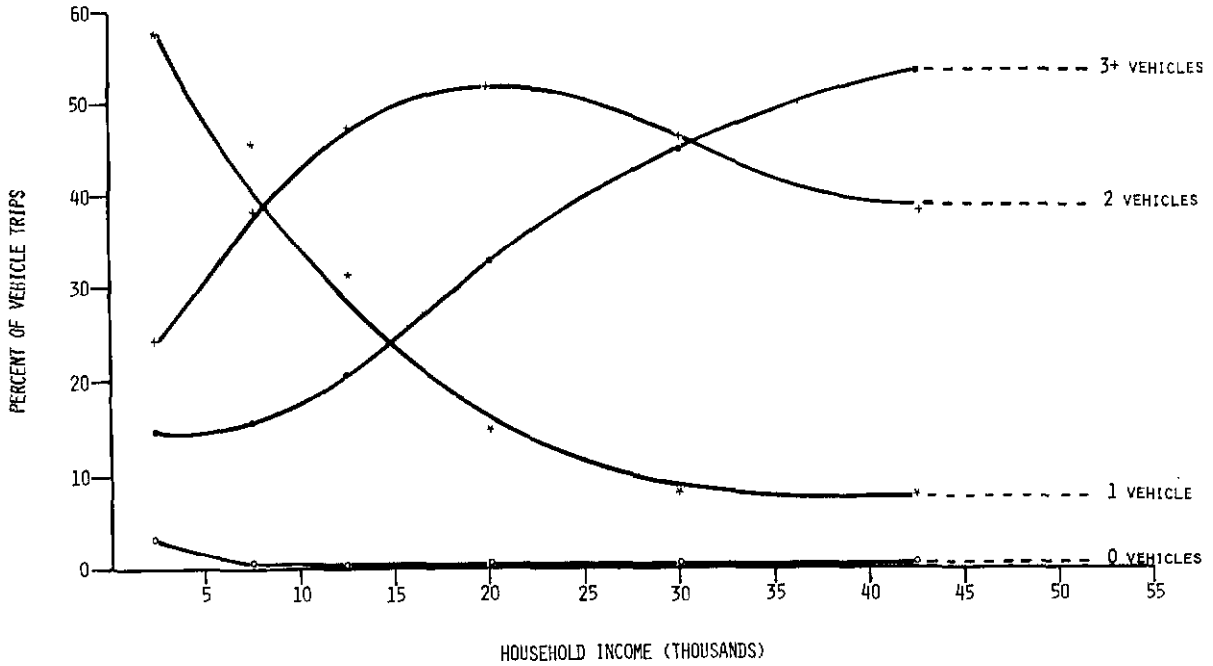


TABLE 18. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD
BY HOUSEHOLD INCOME AND NUMBER OF PERSONS IN HOUSEHOLD

NUMBER OF PERSONS IN HOUSEHOLD	Annual Household Income							ALL HOUSEHOLDS
	UNDER \$5,000	\$5,000- 9,999	\$10,000- 14,999	\$15,000- 24,999	\$25,000- 34,999	\$35,000- 49,999	\$50,000 AND OVER	
ANNUAL VEHICLE TRIPS PER HOUSEHOLD								
One	255	648	885	954	734	956	*	544
Two	660	1021	1363	1512	1703	1746	1658	1220
Three	923	1386	1689	1991	2165	2491	2481	1735
Four	1084	1536	1791	2239	2741	2512	2540	2022
Five or more	946	1542	1984	2727	2966	3655	2941	2244
All Households	535	1099	1514	1972	2278	2474	2201	1443
ANNUAL VEHICLE MILES PER HOUSEHOLD								
One	1743	4419	8400	8496	8996	8294	*	4422
Two	4871	8305	11383	14313	16993	18257	14953	10729
Three	6776	11787	14668	16398	20733	22273	18310	14748
Four	7072	12092	13498	19095	22691	18766	22359	16270
Five or more	6602	11375	16407	22483	23653	30753	24411	18053
All Households	3788	8612	12608	16971	20221	21573	18765	12035

*Data insufficient for presentation, but these households are included in the rates for all households.

incomes of \$5,000-\$10,000 make 370 additional trips and travel 3900 miles more than one-person households in the same group. For households with incomes of \$15,000-\$25,000, trip rates increase by 560 and travel increases by 5800 miles as household size goes from one to two people. The corresponding increases for households with incomes of \$35,000-\$50,000 are 790 additional trips and 9960 miles more as households size goes from one to two.

Third, as household income rises, increases in households size have greater impact on travel patterns. Households with incomes of \$15,000-\$25,000 travel about 6100 additional miles when household size goes from three to five or more people. Those with incomes of \$35,000-\$50,000 travel about 8500 miles more when household size increases from three to five or more.

Household Income and Number of Drivers

Table 19 presents annual trip and travel rates by household income and number of drivers in the household. As shown in previous tables, trip and travel rates show considerable changes by each of these variables (see Tables 6 and 8). When income and number of drivers are viewed together the changes are even more striking. As the number of drivers in the household increases, average trips and travel per household increase at greater rates than the number of drivers. Households with one driver make 910 annual vehicle trips. Those with two, three or four or more drivers have trip rates that are 2.0, 3.2 and 4.5 times the one-driver trip rate, respectively. In terms of travel, one-driver households average 7389 annual vehicle miles. Those with two, three and four or more drivers travel 2.1, 3.3 and 4.5 times the one-driver rate, respectively.

The influence of household income can be seen in looking at similar rates within three income groups. Households with incomes of \$5,000-\$10,000 with two and three drivers make 1.8 and 2.7 times the number of trips, respectively, and travel 1.9 and 2.9 times the rate of one-driver households within that income group. These rates of increase stay fairly constant as income rises to the \$15,000-\$25,000 category. For households in that income group, those with two, three and four or more drivers make 1.8, 2.8, and 3.8 times the one-driver trip rate, respectively, and travel 1.9, 2.6, and 3.7 times the one-driver travel rate. Once household income reaches \$35,000-\$50,000, there are larger differences in trip and travel

TABLE 19. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD BY HOUSEHOLD INCOME AND NUMBER OF HOUSEHOLD DRIVERS

NUMBER OF HOUSEHOLD DRIVERS	ANNUAL HOUSEHOLD INCOME							ALL HOUSEHOLDS
	UNDER \$5,000	\$5,000-9,999	\$10,000-14,999	\$15,000-24,999	\$25,000-34,999	\$35,000-49,999	\$50,000 AND OVER	
ANNUAL VEHICLE TRIPS PER HOUSEHOLD								
One	666	883	1006	1098	1103	1097	1248	910
Two	1243	1556	1829	1972	2143	2448	2090	1836
Three	2394	2399	2543	3087	3333	3049	3048	2926
Four or more	*	*	3051	4137	4396	4723	4074	4131
Households with Drivers	886	1274	1585	2010	2318	2513	2224	1649
All Households	535	1099	1514	1972	2278	2474	2201	1443
ANNUAL VEHICLE MILES PER HOUSEHOLD								
One	4370	6585	9329	9358	10522	9882	10828	7389
Two	9524	12635	14557	17414	19495	20182	17423	15581
Three	18111	19054	20269	24675	29856	27421	27767	24173
Four or more	*	*	20277	34870	33071	44690	32936	33386
Households with Drivers	6214	10063	13153	17267	20588	21915	18958	13736
All Households	3788	8612	12608	16971	20221	21573	18765	12035

*Data insufficient for presentation, but these households are included in the rates for all households.

rates as the number of household drivers increases. For households in this income group, those with two, three or four or more drivers make 2.2, 2.8, and 4.3 times the one-driver rate, respectively, and travel 2.0, 2.8, and 4.5 times the one-driver rate. As shown in this comparison, travel patterns of households within same income groups vary substantially by the number of drivers in the household. As household income rises, the impact of additional drivers in the household is reflected more in trip and travel rates.

C. VEHICLE TRIP AND TRAVEL RATES PER HOUSEHOLD BY VEHICLE OWNERSHIP

Number of Vehicles in Household

Household trip and travel rates vary considerably by the number of vehicles owned by or available on a regular basis to the household, as shown in Table 20.

On a per household trip basis, one-vehicle households make 1059 annual trips, two-vehicle households, 1892, three-vehicle households, 2509 and four-or-more-vehicle households, 3030. On a per vehicle trip basis,* this equates to 1059, 946, 836, and 638 annual trips, respectively. Looking at trips on a daily basis, each household makes between 1.7 and 2.9 daily trips in each vehicle.

In terms of annual travel rates, households with one vehicle travel 8070 miles. Two-vehicle households travel 15,989 miles, or 7995 per vehicle. Households with three vehicles average 22,383 annual miles, or 7461 per vehicle. As expected, households with four or more vehicles travel the most, 25,996 miles per household, or about 5473 per vehicle*. As more vehicles are available to the household, travel per vehicle decreases from 8070 miles (for one-vehicle households) to 5473 miles (for four-or-more-vehicle households).

A somewhat surprising finding is that households without vehicles make 38 annual trips and travel 315 miles per year. These are trips in which the driver is a member of the household that does not own a vehicle. The vehicle used could have been rented or borrowed for the trip. Excluded are trips made by household members in which the driver is not a member of a surveyed household.

*For per vehicle computation, 4.75 was used for the category of four or more vehicles.

TABLE 20. AVERAGE VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY NUMBER OF VEHICLES IN HOUSEHOLD

NUMBER OF VEHICLES IN HOUSEHOLD	DISTRIBUTION OF HOUSEHOLDS	TRIP RATE PER HOUSEHOLD		VEHICLE MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
None	15.3	38	0.1	315	0.9	8.2
One	34.6	1059	2.9	8070	22.1	7.6
Two	34.4	1892	5.2	15989	43.8	8.5
Three	10.7	2509	6.9	22383	61.3	8.9
Four or more	5.0	3030	8.3	25996	71.2	8.7
Vehicle-owning Households	84.7	1697	4.6	14152	38.8	8.3
All Households	100.0*	1443	4.0	12035	33.0	8.3

* Total number of households = 75,412,000

The travel rates presented above on a per vehicle basis will not agree with the findings in Household Vehicle Utilization, Report 5, 1977 NPTS. Data in that report was obtained from the owner's estimate of annual miles driven in each household vehicle. Data in this report is from the travel day trips expanded to annual estimates and converted to average household rates. The owner's estimate is generally higher than travel day estimates.

Vehicle Ownership and Number of Persons

Average annual vehicle trips and vehicle miles per household by vehicle ownership and number of persons in the household is presented in Table 21. For all vehicle-owning households, there is significant variation in trip and travel rates within each ownership group as household size increases.

Households with two or more vehicles make a minimum of 1000 annual vehicle trips and travel a minimum of 10,000 vehicle miles per year. Multivehicle households with three or more people generally make a minimum of 2000 annual trips and travel at least 16,000 miles per year.

Data for all households show that trips and travel rates more than double as household size increases from one to two people. A surprising exception to this is that one-vehicle households show the largest increase in trips and travel when household size goes from two to three people. Households with two vehicles follow the trend for all households, with the greatest increase in trips and travel occurring when household size goes from one to two people. In three-vehicle households, tripmaking shows consistent increases as household size goes from one to three people and travel rates jump as household size goes from one to two people. As expected, the greater the number of household vehicles, the greater the impact of additional people in the household on trip and travel rates. Households with four or more vehicles show the largest increase in tripmaking when household size goes from three or four people and the greatest increase in travel rates when household size goes from four to five or more people.

Vehicle Ownership and Number of Drivers

The relationship between household travel patterns, number of household vehicles and number of household drivers is presented in Table 22. In previous tables it was

TABLE 21. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD BY VEHICLE OWNERSHIP AND NUMBER OF PERSONS

NUMBER OF PERSONS IN HOUSEHOLD	VEHICLE OWNERSHIP					
	NONE	ONE	TWO	THREE	FOUR OR MORE	ALL HOUSEHOLDS
ANNUAL VEHICLE TRIPS PER HOUSEHOLD						
One	14	868	1075	1250	1208	544
Two	59	958	1666	1800	1800	1220
Three	*	1251	1938	2464	2306	1735
Four	*	1401	2056	2715	3366	2022
Five or more	*	1450	2267	3099	3719	2244
All Households	38	1059	1892	2509	3030	1443
ANNUAL VEHICLE MILES PER HOUSEHOLD						
One	105	6570	11981	12307	12322	4422
Two	567	7576	14429	20668	18439	10729
Three	*	9569	16170	22181	23796	14748
Four	*	9563	17308	23119	25049	16270
Five or more	*	11385	18157	24563	31329	18053
All Households	315	8070	15989	22383	25996	12035

*Data insufficient for presentation, but these households are included in the rates for all households.

TABLE 22. AVERAGE ANNUAL VEHICLE TRIPS AND VEHICLE MILES PER HOUSEHOLD BY VEHICLE OWNERSHIP AND NUMBER OF HOUSEHOLD DRIVERS

NUMBER OF HOUSEHOLD DRIVERS	VEHICLE OWNERSHIP					
	NONE	ONE	TWO	THREE	FOUR OR MORE	ALL HOUSEHOLDS
ANNUAL VEHICLE TRIPS PER HOUSEHOLD						
One	112	933	1157	1198	1259	910
Two	*	1358	1960	2136	2243	1836
Three	*	1873	2671	3251	3131	2926
Four or more	*	2489	3056	3797	4817	4131
Households with Drivers	143	1082	1900	2511	3033	1649
All Households	38	1059	1892	2509	3030	1443

ANNUAL VEHICLE MILES PER HOUSEHOLD						
One	860	7148	10781	11011	10007	7389
Two	*	10296	16486	20140	21479	15581
Three	*	14173	20919	29703	27109	24173
Four or more	*	15333	23000	32820	38057	33386
Households with Drivers	1233	8244	15989	22403	26014	13736
All Households	315	8070	15989	22383	25996	12035

*Data insufficient for presentation, but these households are included in the rates for all households.

shown that each of these variables, drivers and vehicles, has significant impact on household travel (see Tables 6 and 20). As expected, the impact is even greater when both are considered together. In viewing the extremes of the vehicle/driver/travel relationship, households with one driver and one vehicle make 933 annual vehicle trips and travel 7148 vehicle miles. Those with four or more drivers and four or more vehicles make 4817 annual vehicle trips and travel 38,057 vehicle miles. All households that have more than one driver or more than one vehicle make a minimum of 1000 vehicle trips per year and travel a minimum of 10,000 vehicle miles.

As the number of drivers and vehicles in the household increases, trips and travel increase at a proportionally greater rate than the driver/vehicle combination. In comparing households with equal numbers of drivers and vehicles, those with two drivers and two vehicles make 2.1 times the number of trips and 2.3 times the miles traveled by one-driver, one-vehicle households. Households with three drivers and three vehicles make 3.5 times the trip rate and 4.2 times the travel rate of one-vehicle, one-driver households. Households with four or more drivers and four or more vehicles make 5.2 times the number of trips and travel 5.3 times the average miles for one-driver, one-vehicle households.

IV. TRENDS OVER TIME IN HOUSEHOLD TRAVEL

A comparison of findings from the 1969 and 1977 NPTS surveys allows an analysis of changes in travel behavior over time. In addition, a summary of key indicators from both surveys (e.g., number of persons, households, autos, drivers) provides a context in which to review changes in household travel patterns. This section provides a comparison of average trips and travel per household in 1969 and 1977 by trip purpose, auto ownership, and annual income.

In comparing results of the 1977 NPTS with the 1969 findings, there are several important differences between the two surveys that must be considered. First, the 1969 data is limited to automobile trips and travel. Automobile is defined as auto, vanbus/minibus, and personal-use taxi. In the 1977 survey, the definition of household vehicle was expanded to include pickups and other privately owned trucks, recreational vehicles, motorcycles and mopeds. However, for purposes of comparing findings from the two surveys, 1977 data is limited to automobile trips and automobile travel.

Second, there is a difference in the universe of trips used in calculating household trip and travel rates in 1969 and 1977. Data published on vehicle trips and travel in the 1977 NPTS reports is, in most cases, limited to only those trips in which a household member is the driver. This is done to give a more accurate picture of trips and travel without the potential of double counting when members of two households go on the same trip.

Thus in Section III of this report, 1977 household trip and travel rates correspond to trips in which a household member was the driver. However, in this Trends Over Time section, 1977 rates are computed on the basis of all travel day trips by automobile that were reported by the household, including those in which the driver was not a household member. This was done to achieve consistency with the procedures used to calculate the 1969 trip and travel rates and to provide an accurate basis to compare results between the 1969 and 1977 surveys.

Because of these differences between the surveys, only the 1977 data as presented in this Trends Over Time Section can be compared directly to the 1969 findings.

Summary of Changes between 1969 and 1977

A review of household travel over the period 1969 to 1977 must include consideration of some changes that influence the amount of trips and travel done by U.S. households. A comparison of selected data from the 1969 and 1977 NPTS, as shown in Table 23 and Figure 5 yields some interesting findings. The most dramatic change has occurred in household size. The average number of persons per household has decreased from 3.16 in 1969 to 2.83 in 1977. The 70's mark the first decade in U.S. history that the number of persons per household fell below three. The corollary to the decrease in household size is the increase in the number of households. In the period between 1969 and 1977, the population grew by 8.1 percent, but the number of households increased by 20.7 percent. Both the drop in household size and the growth in the number of households are important phenomena in terms of travel patterns of households. If it stood alone, the drop in household size would have probably caused a significant decrease in average household travel. However, this potential decrease in travel per household was offset by increases in the number of autos owned, licensed drivers and workers over this period. It is interesting to note that, despite the drop in average household size, drivers per household and workers per household remained stable over the period 1969 to 1977 and autos per household rose slightly.

Total trips and travel increased significantly over this period, with a 26.7 percent increase shown in auto trips and a 22.5 percent increase in auto travel. In spite of the growth in the number of households and the reduction in household size, auto trips per household increased by 5.1 percent and auto travel per household rose by 1.5 percent between 1969 and 1977.

Trip Purpose

The average household made 1,396 auto trips in 1969 and 1,467 in 1977, as shown in Table 24. Auto travel rates show a slight increase from 12,423 miles per household in 1969 to 12,608 miles in 1977. Average trip length decreased from 8.9 miles in 1969 to 8.6 miles in 1977. Changes in trip length are most apparent in trips for social and recreational purposes, with the average trip length decreasing from 13.1 miles in 1969 to 10.9 miles in 1977.

TABLE 23. SUMMARY OF CHANGES IN SELECTED DEMOGRAPHIC AND TRAVEL INDICATORS BETWEEN 1969 AND 1977*

SELECTED DEMOGRAPHIC OR TRAVEL INDICATORS	1969 NPTS	1977 NPTS	PERCENT CHANGE
Persons	197,213,000	213,141,000	+8.1
Households	62,504,000	75,412,000	+20.7
Licensed Drivers	102,986,000	127,552,000	+23.9
Workers**	67,325,000	81,644,000	+21.3
Household Vehicles	- - -	120,098,000	
Household Autos***	72,500,000	98,000,000	+35.2
Auto Trips***	87,284,000,000	110,629,630,000	+26.7
Auto Travel***	775,940,000,000	950,824,842,000	+22.5
Auto Trips per Household	1,396	1,467	+5.1
Auto Travel per Household	12,423	12,608	+1.5
Persons per Household	3.16	2.83	-10.4
Drivers per Household	1.65	1.69	+2.4
Workers per Household	1.08	1.08	0.0
Autos per Household	1.16	1.30	+12.1

* Data derived from the 1969 and 1977 NPTS surveys

** Number of workers excludes those who work at home or in no fixed place and those who did not report time or distance to work.

*** Autos defined as auto, vanbus/minibus and personal-use taxi.

FIGURE 5. PERCENT CHANGE IN SELECTED DEMOGRAPHIC AND TRAVEL INDICATORS BETWEEN 1969 AND 1977

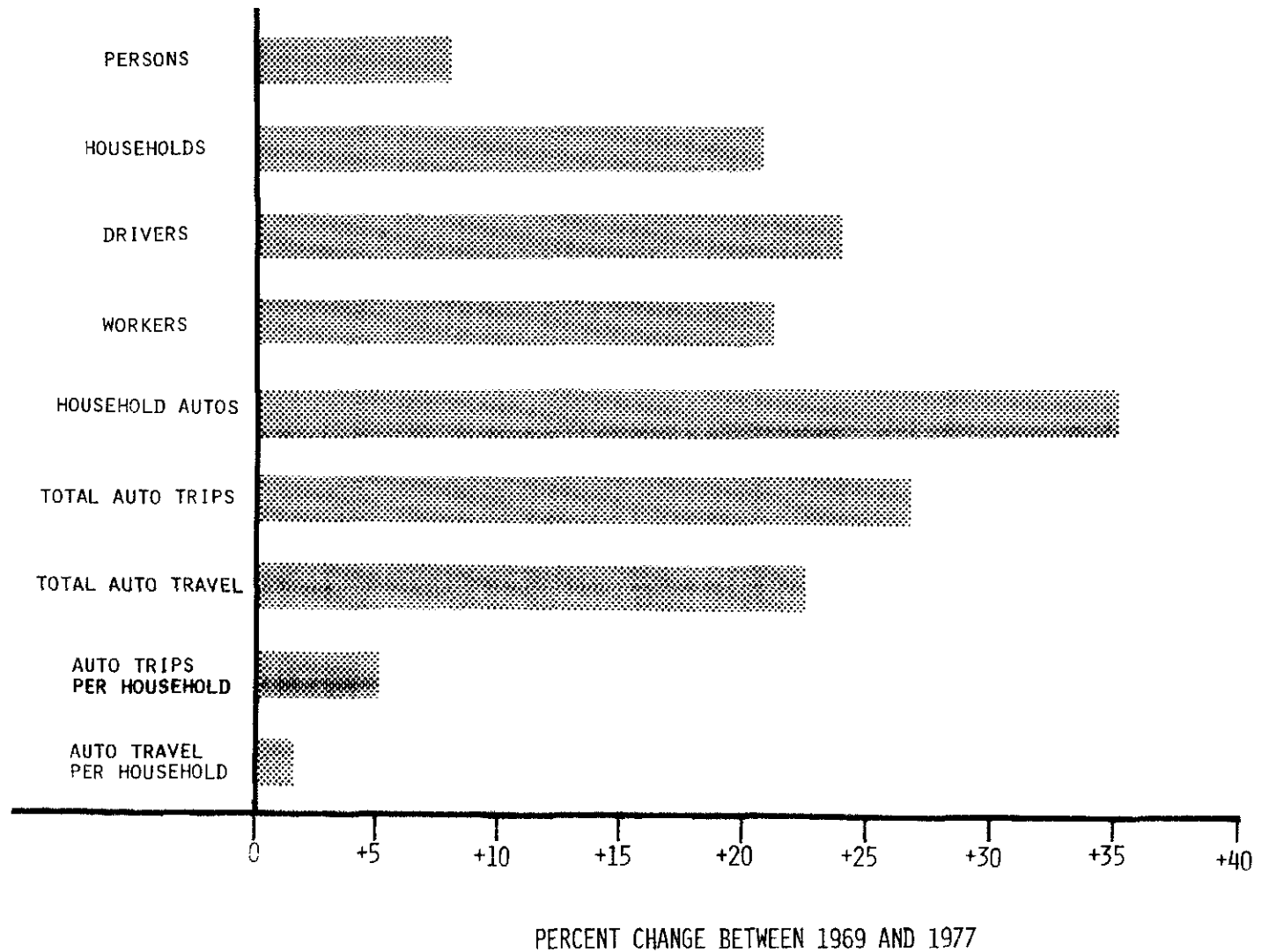


TABLE 24. AVERAGE AUTO TRIPS AND AUTO MILES OF TRAVEL PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY TRIP PURPOSE IN 1969 AND 1977

TRIP PURPOSE	AUTO TRIPS PER HOUSEHOLD		AUTO MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH				
	Annual 1969	1977	Daily 1969	1977	Annual 1969	1977	(Miles) 1969	1977	
EARNING A LIVING	445	369	1.2	1.0	4183	3418	11.5	9.4	9.3
Home to Work	61	62	0.2	0.2	983	738	2.7	2.0	16.1
Work Related	506	431	1.4	1.2	5166	4156	14.2	11.4	10.2
Subtotal									9.6
FAMILY AND PERSONAL BUSINESS	213	251	0.6	0.7	929	1288	2.6	3.5	4.4
Shopping	24	20	0.1	0.1	202	221	0.5	0.6	8.4
Medical or Dental	195	191	0.5	0.5	1270	1282	3.5	3.5	6.5
Other	432	462	1.2	1.3	2401	2791	6.6	7.6	5.6
Subtotal									6.0
CIVIC, EDUCATIONAL AND RELIGIOUS	130	110	0.4	0.3	612	654	1.7	1.8	4.7
SOCIAL AND RECREATIONAL	125	134	0.3	0.4	1497	1559	4.1	4.3	12.0
Visit Friends and Relatives	19	8	0.1	--	381	127	1.0	0.3	20.0
Pleasure Driving	168	188	0.5	0.5	2216	1910	6.1	5.2	13.2
Other *	312	330	0.8	0.9	4094	3596	11.2	9.8	13.1
Subtotal									10.9
OTHER AND UNKNOWN	16	134	-	0.4	150	1411	0.4	3.9	9.4
ALL PURPOSES	1396	1467	3.8	4.0	12423	12608	34.0	34.5	8.9
									8.6

*Other social and recreational includes trips and travel for vacations, sightseeing, eat meal, recreation and other social activities.

It is difficult to compare trips and travel over this period by individual trip purpose because of the increase in the number of trips assigned to the "other and unknown" category in 1977. This increase in trips for the "other and unknown" purpose is due to changes in the survey procedures between the two surveys and does not reflect an actual change in travel patterns. However, it does cause a corresponding decrease in 1977 trips and travel for the remaining trip purposes. For example, the decline in work trips and travel shown in Table 24 is most likely due to the number of trips assigned to "other and unknown", rather than reflecting a real decrease in the number of work trips. Appendix B contains a full discussion of the differences in trip purpose between the 1969 and 1977 NPTS and the reason for the increase in the "other" category. Additional tables containing 1969 and 1977 data by trip purpose can be found in Appendix A.

Despite the amount of trips and travel assigned to the "other" category, there were some increases by individual trip purpose. Annual shopping trips per household increased from 213 to 251 and travel for shopping rose from 929 to 1288 annual auto miles. While the average trip length for most trip purposes was shorter in 1977 than in 1969, the length of shopping trips increased from 4.4 miles in 1969 to 5.1 miles in 1977. Trip rates for visiting friends and relatives increased from 125 per year in 1969 to 134 in 1977 and travel for this purpose rose from 1,497 miles per year in 1969 to 1,559 miles in 1977.

Auto Ownership

Table 25 presents trip and travel rates by number of household autos in 1969 and 1977. Over this time period auto ownership was on the rise (see Appendix A, Table A-3). In spite of the drop in household size, the percent of households with no autos or one auto declined, while the percent with two or more autos increased. The greatest change occurred in households with three or more autos. In 1969, 4.6 percent of all households owned three or more autos, but by 1977, 8.2 percent of households were in this category.

A somewhat surprising finding is that households without autos is the only ownership category that shows relative increases in both trip and travel rates over this period. Average auto trips and travel for households with one or two autos declined from 1969 to 1977. Households with three or more autos had a 1.4 percent increase in the trip rate, but a 5.3 percent decrease in auto travel.

TABLE 25. AVERAGE AUTO TRIPS AND AUTO MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY AUTO OWNERSHIP IN 1969 AND 1977

NUMBER OF HOUSEHOLD AUTOS	DISTRIBUTION OF HOUSEHOLDS	AUTO TRIPS PER HOUSEHOLD		AUTO MILES PER HOUSEHOLD		AVERAGE TRIP LENGTH (Miles)
		Annual	Daily	Annual	Daily	
None						
1969	20.6	241	0.7	1748	4.8	7.2
1977	17.9	269	0.7	2174	6.0	8.1
One						
1969	48.4	1219	3.3	10406	28.5	8.5
1977	45.2	1204	3.3	10249	28.1	8.5
Two						
1969	26.4	2317	6.3	21405	58.6	9.2
1977	28.7	2149	5.9	18320	50.2	8.5
Three or more						
1969	4.6	3102	8.5	29974	82.1	9.6
1977	8.2	3145	8.6	28398	77.8	9.0
All Households						
1969	100.0*	1396	3.8	12423	34.0	8.9
1977	100.0**	1467	4.0	12608	34.5	8.6

* Total households in 1969 = 62,504,000

** Total households in 1977 = 75,412,000

One of the possible reasons for these findings is that by 1977, households were doing more travel in vehicles other than autos, such as pickups and other trucks. In 1977, 12.4 percent of household vehicle trips and 14.3 percent of vehicle miles of travel were in vehicles other than autos. Unfortunately, 1969 data on non-auto travel is not available. For purposes of comparability with the 1969 data, only auto trips and travel are included Table 25.

Household Income

Table 26 presents changes in travel patterns by household income between 1969 and 1977. To compare data over this period, the 1969 income levels were inflated to 1977 dollars, using the consumer price index.* Data on household income was collected by income ranges in both the 1969 and 1977 NPTS. Conversion of 1969 incomes to 1977 dollars was limited by this constraint, and therefore, care should be used in interpreting the findings shown in Table 26.

Households with incomes below \$25,000 tend to travel more in 1977 than in 1969. Those with incomes of \$25,000 or more tend to travel less. Households earning less than \$7,500 made an average of 580 auto trips in 1969 versus 790 trips in 1977, and drove 4,708 miles in 1969 compared to 6,387 miles in 1977, for a 36 percent increase in both trips and travel by auto.

Households in the \$7,500 to \$20,000 income group made 10 percent more trips in 1977 than in 1969 and traveled 8 percent more.

In the \$20,000 to \$25,000 income category, trip and travel rates also show an increase over this period. These households made about 5 percent more trips in 1977 and traveled about 8 percent more than their 1969 averages.

Households earning more than \$25,000 show a decrease of 7 percent in tripmaking and 13 percent in travel rates.

*CPI-w 1969 = 109.8; CPI-w 1977 = 181.5. Bureau of Labor Statistics, Consumer Price Index (CPI) covers wage earners and clerical works (CPI-w); U.S. city average.

TABLE 26. AVERAGE ANNUAL AUTO TRIPS AND AUTO MILES PER HOUSEHOLD AND AVERAGE TRIP LENGTH BY HOUSEHOLD INCOME IN 1969 AND 1977

ANNUAL HOUSEHOLD INCOME (1977 Dollars)	DISTRIBUTION OF HOUSEHOLDS	AUTO TRIPS PER HOUSEHOLD	AUTO MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)
UNDER \$7,500				
1969	24.6	580	4708	8.1
1977	31.7	790	6387	8.1
\$7,500-19,999				
1969	41.3	1433	12262	8.6
1977	45.9	1573	13210	8.4
\$20,000-24,999				
1969	18.1	1949	17497	9.0
1977	9.9	2037	18837	9.3
\$25,000 AND OVER				
1969	7.8	2526	24410	9.7
1977	12.5	2343	21243	9.1
INCOME NOT REPORTED				
1969 only	8.2	1351	13651	10.1
ALL HOUSEHOLDS				
1969	100.0*	1396	12423	8.9
1977	100.0**	1467	12608	8.6

* Total households in 1969 = 62,504,000

** Total households in 1977 = 75,412,000

SMSA Households

Trends in travel by SMSA households are similar to those for all households. As shown in Table 27, in the period between 1969 and 1977, average annual trips per SMSA household increased from 1,458 to 1,501 and travel increased from 12,699 miles per year to 12,721 miles.

Increases in trips and travel per household occurred in all SMSA households with incomes under \$25,000. Households with incomes of \$25,000 or more show a slight increase in trips, but a decrease in average auto travel over this period.

Households with incomes of less than \$7,500 were the only group that experienced a striking change in travel patterns, with annual trip rates increasing from 520 in 1969 to 758 in 1977. Travel by these households rose from 3,840 auto miles in 1969 to 6,045 in 1977, a 57.4 percent increase.

TABLE 27. AVERAGE ANNUAL AUTO TRIPS AND AUTO MILES PER SMSA HOUSEHOLD AND AVERAGE TRIP LENGTH BY HOUSEHOLD INCOME IN 1969 AND 1977

ANNUAL HOUSEHOLD INCOME (1977 dollars)	DISTRIBUTION OF HOUSEHOLD	AUTO TRIPS PER HOUSEHOLD	AUTO MILES PER HOUSEHOLD	AVERAGE TRIP LENGTH (Miles)
UNDER \$7,500				
1969	20.8	520	3840	7.4
1977	28.6	758	6045	8.0
\$7,500-19,999				
1969	40.6	1469	12284	8.4
1977	46.1	1546	12801	8.3
\$20,000-24,999				
1969	19.9	2008	17117	8.5
1977	10.8	2058	18488	9.0
\$25,000 AND OVER				
1969	9.5	2324	22520	9.7
1977	14.5	2412	21389	8.9
INCOME NOT REPORTED				
1969 Only	9.2	1444	14856	10.3
ALL SMSA HOUSEHOLDS				
1969	100.0*	1458	12699	8.7
1977	100.0**	1501	12721	8.5

*Total SMSA households in 1969 = 41,523,000

**Total SMSA households in 1977 = 50,819,000

V. SUMMARY

On the average, each household made 1,443 vehicle trips and traveled 12,035 vehicle miles in 1977. Travel to work accounts for about 30 percent of each household's trips and travel.

To some degree, trip and travel rates are related to the location of the household. Households within SMSA's tend to travel slightly less (11,745 annual miles) than those outside SMSA's (12,551 annual miles). For households inside SMSA's, trip and travel rates increase as population of the SMSA increases up to 1 million. There is a marked decline in vehicle trips and travel per household in SMSA's of 3 million or more.

Of course, there is a high correlation between household income and tripmaking. There are marked increases in travel as household income rises up to \$25,000. Once income reaches \$25,000 there appears to be a saturation point in travel by households in the \$25,000 to \$50,000 range. When income rises over \$50,000, trips and travel per household decline somewhat.

The relationship between income and household travel can also be expressed in terms of the distribution of trips and travel by the various income groups. Households earning less than \$5,000 a year comprise 19.7 percent of all households, yet they account for only 7.3 percent of all vehicle trips and 6.2 percent of vehicle miles of travel. The median income group, households with incomes of \$10,000 to \$15,000, represents 21.3 percent of all households and makes 22.3 percent of all vehicle trips and 22.2 percent of vehicle miles of travel. Only 3.0 percent of all households have incomes of \$35,000 to \$50,000, yet they make 5.1 percent of all vehicle trips and account for 5.4 percent of all vehicle travel.

The number of vehicles owned or available to the household also has significant impact on trip and travel rates. As number of household vehicles increases, there is a corresponding increase in the amount of trips and travel. On the average, each household makes between 1.7 and 2.9 trips each day in each vehicle. Households that own less than four vehicles travel at least 20 miles a day in each vehicle. Those with four or more vehicles average about 15 miles a day per vehicle.

The number of persons in the household is another important factor in the amount of trips and travel generated. One-person households make 544 annual trips and travel 4422 miles per year. In households with two to four people, annual trip and travel rates equate to at least 500 trips and 4,000 miles per person. Households with five or more people, average about 450 trips and 3,600 vehicle miles per person per year.

Trip and travel rates are also closely linked to the number of workers in the household. One-worker households make 1,440 annual trips and travel 12,381 vehicle miles. For each additional worker, the household averages 800 to 1,200 additional trips and 5,500 to 8,600 additional miles of travel.

Of course, household travel patterns also vary greatly by the number of licensed drivers in the household. On the average, each driver in the household generates 900 to 1,000 annual trips and travels 7,400 to 8,300 miles. Households with one driver travel 7,389 annual miles, those with two, three and four or more drivers travel 2.1, 3.3 and 4.5 times the one-driver rate, respectively.

Travel patterns of household also show considerable changes by the composition of the household, in terms of number of adults, presence of children, age of the youngest child and whether the household head is retired. Of these household characteristics, the number of adults in the household seems to have the greatest impact on travel rates. When all other household composition attributes are the same, multiple-adult households with children travel about 11,000 miles more per year than their single-adult counterparts. In households with children, as the age of the youngest child increases more travel is generated by the household. As expected, households where the household head is retired have the lowest trip and travel rates.

In the period between 1969 and 1977, slight gains were shown in trips and travel per household despite a significant decrease in household size. Drivers per household and workers per household remained stable over this period, while autos per household increased slightly.

The relationship between household travel and various household characteristics has been explored in this report. Table 28 presents a somewhat different look at these relationships in that the presentation shows four characteristics of

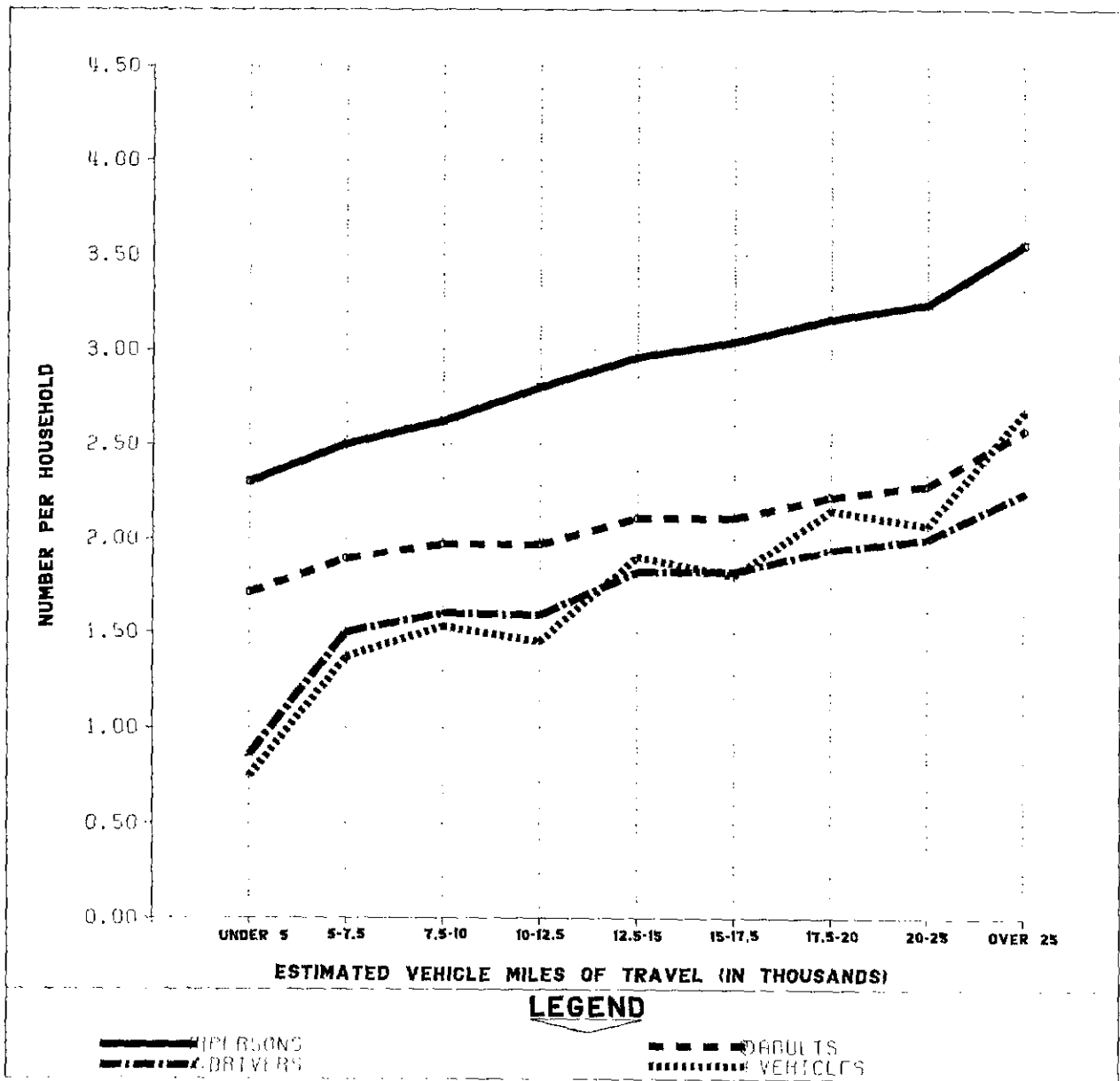
households and relates them to average annual mileage classes. The findings are, as expected, that increases in household travel show a direct correlation with increases in the number of persons, adults, drivers and vehicles in the household. The consistent pattern between increases in household travel and increases in all of the four household characteristics is presented graphically in Figure 6.

TABLE 28. SELECTED HOUSEHOLD CHARACTERISTICS BY ESTIMATED ANNUAL VEHICLE MILES OF TRAVEL PER HOUSEHOLD*

HOUSEHOLD CHARACTERISTICS	ESTIMATED ANNUAL VEHICLE MILES OF TRAVEL									
	UNDER 5,000	5,000-7,499	7,500-9,999	10,000-12,499	12,500-14,999	15,000-17,499	17,500-19,999	20,000-24,999	25,000-& OVER	ALL HOUSEHOLDS
Percent of Households	32.9	6.8	5.3	10.7	4.2	6.9	3.9	9.4	19.9	100.0
Average Persons per Household	2.30	2.50	2.62	2.80	2.96	3.04	3.16	3.24	3.55	2.83
Average Adults per Household	1.71	1.89	1.97	1.97	2.11	2.11	2.22	2.28	2.57	2.05
Average Drivers per Household	0.86	1.50	1.60	1.59	1.82	1.82	1.94	2.00	2.24	1.55
Average Vehicles per Household	0.75	1.37	1.53	1.45	1.90	1.80	2.15	2.07	2.67	1.59

*Data on annual vehicle miles for this table only is from the estimate of annual miles driven in all household vehicles, not from the travel day trip record. Averages shown are calculated for those households that reported annual estimates of mileage for all household vehicles, therefore the averages presented above may differ slightly from those for all households.

FIGURE 6. SELECTED HOUSEHOLD CHARACTERISTICS BY ANNUAL ESTIMATED VEHICLE MILES OF TRAVEL PER HOUSEHOLD



APPENDIXES

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TABLE A-1. PERCENT OF VEHICLE TRIPS BY PURPOSE
AND ANNUAL HOUSEHOLD INCOME (DISTRIBUTION BY PURPOSE)

Trip Purpose	Vehicle Trips							
	Annual Household Income							
	Less than \$5,000	\$5,000 to 9,999	\$10,000 to 14,999	\$15,000 to 24,999	\$25,000 to 34,999	\$35,000 to 49,999	\$50,000 and Over	ALL
Earning a Living								
Home to Work	18.1	25.6	29.2	30.3	27.9	26.1	24.8	24.8
Work Related	4.5	4.3	4.8	5.2	6.3	5.7	7.0	7.0
Subtotal	22.6	29.9	34.0	35.5	34.2	31.8	31.8	31.8
Family and Personal Business								
Shopping	19.0	17.3	16.8	16.5	18.1	16.6	15.5	15.5
Medical or Dental	1.7	1.4	1.1	1.3	1.1	1.7	0.9	0.9
Other	16.1	15.6	13.6	13.5	13.0	13.1	13.4	13.4
Subtotal	36.8	34.3	31.5	31.3	32.2	31.4	29.8	29.8
Civic, Educational and Religious								
	8.9	5.6	6.0	6.3	6.9	7.2	5.9	5.9
Social and Recreational								
Visiting Friends and Relatives	12.3	10.4	8.6	7.6	7.0	6.3	6.2	6.2
Pleasure Driving	0.4	0.6	0.3	0.4	0.3	0.3	0.8	0.8
Vacations	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1
Other	10.4	10.2	10.6	10.0	10.0	12.1	13.4	13.4
Subtotal	23.1	21.3	19.6	18.0	17.4	18.7	20.5	20.5
Other and Unknown								
	8.6	8.9	8.9	8.9	9.3	10.9	12.0	12.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0†

† Total number of trips = 108,826,000,000

Source: Purposes of Vehicle Trips and Travel, Report 3, 1977 NPTS (Table A-9)

TABLE A-2. PERCENT OF VEHICLE TRAVEL BY PURPOSE AND ANNUAL HOUSEHOLD INCOME
(DISTRIBUTION BY PURPOSE)

Trip Purpose	Vehicle Miles of Travel							
	Annual Household Income							
	Less than \$5,000	\$5,000 to 9,999	\$10,000 to 14,999	\$15,000 to 24,999	\$25,000 to 34,999	\$35,000 to 49,999	\$50,000 and Over	ALL
Earning a Living								
Home to Work	17.8	27.4	31.8	34.1	30.5	29.5	24.9	30.4
Work Related	7.1	4.9	8.3	6.4	9.0	10.0	10.0	7.3
Subtotal	24.9	32.3	40.1	40.5	39.5	39.5	34.9	37.7
Family and Personal Business								
Shopping	10.5	10.0	9.5	9.6	11.4	10.3	9.6	10.0
Medical or Dental	2.5	2.3	1.8	1.4	1.2	1.5	0.8	1.7
Other	14.6	13.9	9.7	11.1	10.1	8.1	13.6	11.2
Subtotal	27.6	26.2	21.0	22.1	22.7	19.9	24.0	22.9
Civic, Educational and Religious	6.3	4.5	4.5	4.3	4.8	5.3	5.4	4.7
Social and Recreational								
Visiting Friends and Relatives	17.2	14.3	10.9	9.6	11.5	8.9	7.9	11.3
Pleasure Driving	0.7	0.9	0.8	0.7	0.6	2.1	1.0	0.8
Vacations	0.0	0.4	0.9	0.8	0.5	0.3	0.7	0.8
Other	13.9	11.0	11.7	11.0	10.3	13.0	11.4	11.3
Subtotal	31.8	26.6	24.1	21.9	22.9	24.3	21.0	24.0
Other and Unknown	9.4	10.4	10.3	11.2	10.1	11.0	14.7	10.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0†

† Total vehicle miles of travel = 907,603,000,000

Source: Purposes of Vehicle Trips and Travel, Report 3, 1977 NPTS (Table A-10)

TABLE A-3. Percent of Households by Auto Ownership* and Annual Household Income for 1969** and 1977

Household Auto Ownership	By Income Group						
	Under \$5,000	\$5,000 to 9,999	\$10,000 to 11,999	\$12,000 to 14,999	\$15,000 to 24,999	\$25,000 and over	All
1969 None	63.1	25.5	9.1	4.9	2.8	1.2	20.6
1977 None	50.2	21.0	11.3	7.9	4.6	2.8	17.9
1969 One	33.6	61.2	57.9	59.2	44.0	27.4	48.4
1977 One	41.1	58.7	57.5	51.4	39.2	24.4	45.2
1969 Two	3.3	12.1	29.4	30.8	46.0	55.2	26.4
1977 Two	7.0	17.2	25.9	34.2	44.2	49.2	28.7
1969 Three or more	0.0	1.2	3.6	5.1	7.2	16.2	4.6
1977 Three or more	1.7	3.1	5.3	6.5	12.0	23.6	8.2
1969 Total†	100.0	100.0	100.0	100.0	100.0	100.0	100.0†
1977 Total†	100.0	100.0	100.0	100.0	100.0	100.0	100.0†

By Ownership Group							
1969 None	56.1	28.6	7.5	4.7	2.7	0.4	100.0
1977 None	55.1	25.5	5.8	5.3	6.4	1.9	100.0
1969 One	12.7	29.8	14.8	20.3	17.7	4.7	100.0
1977 One	17.9	28.4	11.7	13.8	21.5	6.7	100.0
1969 Two	2.5	11.4	12.5	20.0	35.4	18.2	100.0
1977 Two	4.8	13.1	8.3	14.4	38.1	21.3	100.0
1969 Three or more	0.0	7.1	10.7	16.2	33.5	32.5	100.0
1977 Three or more	4.1	8.2	5.9	9.7	36.1	36.0	100.0
1969 All†	19.2	23.7	12.4	16.7	19.6	8.4	100.0
1977 All†	19.7	21.8	9.2	12.1	24.7	12.5	100.0

* Includes only auto (standard auto, station wagon, personal use taxi) and vanbus/minibus vehicles owned or available on regular basis

** 1969 income adjusted to 1977 dollars through use of consumer price index

† Includes 62.5 million households in 1969 and 75.4 million households in 1977

Source: Household Vehicle Ownership, Report 2, 1977 NPTS (Table A-2)

TABLE A-4. AVERAGE ANNUAL AUTO TRIPS PER HOUSEHOLD BY TRIP PURPOSE AND AUTO OWNERSHIP IN 1969 AND 1977

TRIP PURPOSE	NONE		ONE		TWO		THREE OR MORE		ALL HOUSEHOLDS	
	1969	1977	1969	1977	1969	1977	1969	1977	1969	1977
	ANNUAL AUTO TRIPS PER HOUSEHOLD									
EARNING A LIVING	75	50	374	279	757	574	1055	840	445	369
HOME TO WORK	9	8	49	42	115	104	111	150	61	62
WORK RELATED	84	58	423	321	872	678	1166	990	506	431
SUBTOTAL										
FAMILY AND PERSONAL BUSINESS	33	50	201	227	348	357	363	454	213	251
SHOPPING	7	9	24	17	38	29	36	35	24	20
MEDICAL OR DENTAL	25	32	172	165	328	268	442	407	195	191
OTHER	65	91	397	409	714	654	841	896	432	462
SUBTOTAL										
CIVIC, EDUCATIONAL AND RELIGIOUS	24	28	101	80	227	162	346	264	130	110
SOCIAL AND RECREATIONAL										
VISIT FRIENDS AND RELATIVES	29	41	132	119	171	172	218	292	125	134
PLEASURE DRIVING	5	2	16	5	31	11	54	28	19	8
OTHER*	31	36	137	153	275	272	446	416	168	188
SUBTOTAL	65	79	285	277	477	455	718	736	312	330
OTHER AND UNKNOWN	3	13	13	117	27	200	31	259	16	134
ALL PURPOSES	241	269	1219	1204	2317	2149	3102	3145	1396	1467

*Other Social and Recreational Includes trips and travel for vacations, sightseeing, entertainment, eat meal, recreation and other social activities.

TABLE A-5. AVERAGE ANNUAL AUTO MILES PER HOUSEHOLD BY TRIP PURPOSE AND AUTO OWNERSHIP IN 1969 AND 1977

TRIP PURPOSE	NONE		ONE		TWO		THREE OR MORE		ALL HOUSEHOLDS	
	1969	1977	1969	1977	1969	1977	1969	1977	1969	1977
	Annual Auto Miles per Household									
EARNING A LIVING										
HOME TO WORK	505	323	3307	2477	7466	5605	11020	7700	4183	3418
WORK RELATED	101	62	736	504	1905	1233	2224	1773	983	738
SUBTOTAL	<u>606</u>	<u>385</u>	<u>4043</u>	<u>2981</u>	<u>9371</u>	<u>6838</u>	<u>13244</u>	<u>9473</u>	<u>5166</u>	<u>4156</u>
FAMILY AND PERSONAL BUSINESS										
SHOPPING	137	258	857	1152	1572	1728	1548	2738	929	1288
MEDICAL OR DENTAL	27	105	206	204	308	271	326	400	202	221
OTHER	158	206	1178	1149	2126	1722	2644	2826	1270	1282
SUBTOTAL	<u>322</u>	<u>569</u>	<u>2241</u>	<u>2505</u>	<u>4006</u>	<u>3721</u>	<u>4518</u>	<u>5964</u>	<u>2401</u>	<u>2791</u>
CIVIC, EDUCATIONAL AND RELIGIOUS	85	139	420	433	1223	956	1485	1948	612	654
SOCIAL AND RECREATIONAL										
VISIT FRIENDS AND RELATIVES	254	532	1500	1420	2288	1960	2491	3163	1497	1559
PLEASURE DRIVING	146	35	348	62	555	153	763	599	381	127
OTHER *	309	294	1743	1622	3675	2736	7142	4129	2216	1910
SUBTOTAL	<u>709</u>	<u>861</u>	<u>3591</u>	<u>3104</u>	<u>6518</u>	<u>4849</u>	<u>10396</u>	<u>7891</u>	<u>4094</u>	<u>3596</u>
OTHER AND UNKNOWN	26	220	111	1226	287	1956	331	3122	150	1411
ALL PURPOSES	1748	2174	10406	10249	21405	18320	29974	28398	12423	12608

*Other Social and Recreational includes trips and travel for vacations, sightseeing, entertainment, eat meal, recreation and other social activities.

TABLE A-6. AVERAGE AUTO TRIP LENGTH BY TRIP PURPOSE AND AUTO OWNERSHIP IN 1969 AND 1977

TRIP PURPOSE	NONE		ONE		AUTOMOBILE OWNERSHIP TWO		THREE OR MORE		ALL HOUSEHOLDS	
	1969	1977	1969	1977	1969	1977	1969	1977	1969	1977
	Average Auto Trip Length (Miles)									
EARNING A LIVING	6.7	6.5	8.8	8.8	9.9	9.8	10.4	9.2	9.4	9.3
HOME TO WORK	10.7	7.7	14.9	12.1	16.6	11.8	20.0	11.8	16.0	11.8
WORK RELATED	7.1	6.6	9.5	9.3	10.7	10.1	11.4	9.6	10.2	9.6
SUBTOTAL										
FAMILY AND PERSONAL BUSINESS	4.2	5.2	4.3	5.1	4.5	4.8	4.3	6.0	4.4	5.1
SHOPPING	4.1	11.6	8.8	12.0	8.1	9.5	9.0	11.4	8.3	10.9
MEDICAL OR DENTAL	6.1	6.3	6.8	7.0	6.5	6.4	6.0	6.9	6.5	6.7
OTHER	5.0	6.3	5.6	6.1	5.6	5.7	8.7	6.7	5.6	6.0
SUBTOTAL										
CIVIC, EDUCATIONAL AND RELIGIOUS	3.6	5.0	4.1	5.4	5.4	5.9	4.3	7.4	4.7	6.0
SOCIAL AND RECREATIONAL										
VISIT FRIENDS AND RELATIVES	8.8	13.0	11.4	12.0	13.4	11.4	11.4	10.8	12.0	11.6
PLEASURE DRIVING	26.6	14.0	21.9	12.4	18.0	14.7	14.3	21.8	19.6	16.0
VACATIONS	204.0	*	211.8	173.5	195.0	106.1	61.4	121.5	160.0	126.7
OTHER	9.2	8.3	11.0	9.4	11.1	9.6	14.6	9.3	11.5	9.4
SUBTOTAL	10.8	11.0	12.6	11.2	13.6	10.7	14.3	10.7	13.0	10.9
OTHER AND UNKNOWN	9.8	17.1	*	10.5	*	9.8	*	12.0	*	10.6
ALL PURPOSES	7.2	8.1	8.5	8.5	9.2	8.5	9.6	9.0	8.9	8.6

*Data insufficient for presentation.

TABLE A-7. AVERAGE ANNUAL AUTO TRIPS AND AUTO MILES OF TRAVEL PER SMSA HOUSEHOLD BY TRIP PURPOSE AND HOUSEHOLD INCOME IN 1969 AND 1977

TRIP PURPOSE	ANNUAL HOUSEHOLD INCOME (1977 DOLLARS)								INCOME NOT REPORTED 1969	ALL SMSA HOUSEHOLDS 1969 1977	
	UNDER \$7,500		\$7,500-19,999		\$20,000-24,999		\$25,000 AND OVER				
	1969	1977	1969	1977	1969	1977	1969	1977			
	ANNUAL AUTO TRIPS PER SMSA HOUSEHOLD										
EARNING A LIVING	141	170	558	488	745	643	846	748	533	534	451
FAMILY AND PERSONAL BUSINESS	179	253	454	465	616	653	681	728	425	448	463
CIVIC, EDUCATIONAL AND RELIGIOUS	41	66	121	106	206	147	243	178	132	134	110
SOCIAL AND RECREATIONAL	152	207	322	338	417	423	516	523	342	326	336
OTHER AND UNKNOWN	7	62	14	149	24	192	38	235	12	17	141
ALL PURPOSES	520	758	1469	1546	2008	2058	2324	2412	1444	1458	1501
	ANNUAL AUTO MILES OF TRAVEL PER SMSA HOUSEHOLD										
EARNING A LIVING	958	1356	5054	4604	7290	6810	11253	7790	6835	5400	4372
FAMILY AND PERSONAL BUSINESS	847	1277	2410	2585	3100	3389	3590	4196	2229	2318	2530
CIVIC, EDUCATIONAL AND RELIGIOUS	218	358	551	632	903	1027	1239	1035	474	610	655
SOCIAL AND RECREATIONAL	1753	2435	4159	3382	5627	5271	6159	6010	5268	4243	3694
OTHER AND UNKNOWN	64	619	110	1598	197	1991	279	2358	50	128	1470
ALL PURPOSES	3840	6045	12284	12801	17117	18488	22520	21389	14856	12699	12721
DISTRIBUTION OF SMSA HOUSEHOLDS	20.8	28.6	40.6	46.1	19.9	10.8	9.5	14.5	9.2	100.0*	100.0**

*Total SMSA Households in 1969 = 41,523,000

**Total SMSA Households in 1977 = 50,819,000

COMPARING 1969 AND 1977 NPTS TRIP PURPOSES

Source: Purposes of Vehicle Trips and Travel, Report 3, 1977 NPTS

Significant differences were made in trip purpose categories between the 1969 and 1977 NPTS. Specifically, the number of trip purposes was expanded from 11 in 1969 to 21 in 1977.

The original 11 trip purposes used in the 1969 survey are:

- o Home to work
- o Work related
- o Shopping
- o Medical or dental
- o Other family and personal business
- o Civic, educational and religious
- o Visit friends and relatives
- o Pleasure driving
- o Vacations
- o Other social and recreational
- o Other and unknown

The trip purposes added in 1977 are as follows:

- o Sightseeing
- o Eat meal
- o Entertainment
- o Recreation (participant)
- o Overnight lodging
- o Convention
- o Return home
- o Change of vehicle without change of mode
- o Change means of transportation
- o Pick up and leave off passengers

In order to compare changes between the two survey periods, recoding and/or trip linking of the 21 trip purposes used in 1977 to the 11 trip purposes used in 1969 is necessary for data comparability. As a part of the trip recoding and reclassifying process, a number of trips were classified as "other." In the 1969 survey, 1.1 percent of vehicle trips and 1.2 percent of vehicle miles of travel are in the other category. In 1977, 9.1 percent of vehicle trips and 10.7 percent of vehicle miles are classified as other. Because of the tenfold increase in the amount of trips and travel classified as "other," care must be exercised in comparing the results of the two surveys.

The remainder of this section contains a description of the recoding and trip linking procedures developed by FHWA for use in comparing the 1977 trip purposes with the 1969 trip purposes.

Table B-1 details the trip purpose recoding procedure that FHWA developed to recode the 1977 NPTS trip purposes for comparability with 1969. This procedure involves the addition of a recode field at the end of each trip record. Thus, the trip record includes the original 1977 trip purpose codes as well as the recoded 1969 trip purpose codes.

Some of the 1977 NPTS trip purposes are directly comparable to the 1969 NPTS trip purposes and no recode procedures were required; the 1977 trip purpose code was transferred to the recode field using the comparable 1969 code. These include the trip purposes shown in Group A and Group C of Table B-2.

The 1977 trip purposes included in Group B in Table B-2 were recoded to agree with the 1969 code because these 1977 trip reasons are all subgroups of the 1969 trip code. The remaining 1977 trip reasons, i.e., those in Group D, required special handling since there were no comparable 1969 trip reasons. The recoding procedure outlined in Table B-1 is concerned with this group of 1977 trip purposes and was applied in sequence (Rules 1-10).

In addition, the procedures include a method for handling work trips (Rules 11, 12, and 13), since fewer work trips were recorded in the 1969 NPTS than in the 1977 NPTS. Rules 11, 12 and 13 set forth procedures for handling the following situations:

1. The 1969 NPTS edit procedures limited the number of work trips to two: one initial trip "to work" and the other "return from work." All other trips involving work were coded as "work related." In 1977, any trip to place of employment was coded as a work trip with no restriction as to number of acceptable work trips.

2. In 1969, trips to and from lunch during the work day were coded as "personal business," since there was no eat meal category. In 1977, the trip to lunch was coded as "eat meal," and the return trip was coded as "to work."

In addition, a procedure for linking trips coded 15 (change vehicle without change of mode), 16 (change mode of transportation), and 17 (pick up or leave off passengers) was developed, since these trip purposes were never considered in 1969 and were therefore "lost." Like the recoding procedure, this procedure involves an additional field at the end of the trip record for each household member. Trip purposes codes other than 15, 16 and 17 contain a zero in this field. Trip purpose codes 15, 16 and 17 contain the number of the trip to which these are linked in this field. The trip linking procedure is as follows:

If the original trip code was 15, 16 or 17, the trip number of the next acceptable trip (or non-15, 16 and 17) was entered. If there was no acceptable trip, the trip number of the last trip processed was entered.

TABLE B-1. RECODE AND TRIP LINKING RULES TO CHANGE 1977 NPTS
TRIP PURPOSE CODES TO 1969 TRIP PURPOSE CODES

If there is more than one original trip code of 18 (return home), treat each group of trips ending with the code 18 trip as a separate entity for purposes of recoding.

1. If the original trip code was 03 (convention), then code 02 (business other than work) was added as the recode.
2. If the original trip code was 05 (eat meal) and it followed a trip recode of 01 (work), then code 04 (family or personal business) was added as the recode.
3. If the original trip code was 05 (eat meal) and it did not follow a trip recode of 01 (work), then code 10 (other social or recreational) was added as the recode.
4. If the original trip code was 11 (sightseeing), 12 (entertainment), or 13 (recreation), then code 10 (other social or recreational) was added as the recode.
5. If the original code was 19 (lodging), then code 11 (other) was added as the recode.
6. If the original trip code was 15, 16 or 17, then the recode was stored until a following trip recode was designated.
7. If the original trip code was 15, 16 or 17, and no acceptable* original trip codes followed, then code 11 (other) was added as the recode.
8. If the original trip code was 18 (return home) and there was a previous trip recode of 01 (work), then code 01 (work) was added as the recode.

* Acceptable trip codes for purposes of this procedure are the following 1977 trip codes: 01, 02, 04, 06, 07, 08, 09, 10, 14 and 21; and in addition, trip codes 05, 11, 12, 13 and 20 which were recoded to 10

9. If the original trip code was 18 (return home), and there was no previous trip recode of 01(work), but there was a preceding trip, the recode of the preceding trip was added to the record.
10. If the original trip code was 18 (return home), and there were no previous trips, then code 11 (other) was added as the recode.
11. If the original trip code was 01 (work), and there were no previous 01 (work) trips, then code 01 (work) was added as the recode.
12. If the original trip code was 01 (work) and the preceding trip was not recoded as 01 (work), then the recode of the preceding trip was added to the record.
13. If the original trip code was 01 (work), and it was followed by one or more successive 01 (work) trips, then a recode of 02 (business other than work) was added to the second as well as subsequent 01 (work) trips.

TABLE B-2. 1977-1969 NPTS TRIP PURPOSES AND CODES

	<u>CODE</u>	<u>1977 TRIP PURPOSES</u>	<u>CODE</u>	<u>1969 TRIP PURPOSES</u>
GROUP A:	01	To place of work	01	To work
	02	Work-related business	02	Business other than to work
	07	Shopping	03	Shopping
	08	Family or personal business	04	Other family or personal business
	04	Civic, educational and religious	05	To school or church
	06	Doctor or dentist	06	To doctor or dentist
	14	Vacation	07	Vacation
	09	Visit friends or relatives	08	Visit friends or relatives
	10	Pleasure driving	09	Pleasure driving
	GROUP B:	11	Sightseeing	10
05		Eat meal		
12		Entertainment		
13		Recreation		
20		Social		
GROUP C:	21	Other	11	Other
GROUP D:	03	Convention		
	15	Change vehicle without change of mode		
	16	Change means of transportation		
	17	Pick up or leave off passenger		
	18	Return home		
	19	Lodging		

SURVEY PROCEDURES AND DATA PROCESSING

Background

The 1977 NPTS was conducted by the Bureau of the Census under the joint sponsorship of the Federal Highway Administration and the National Highway Traffic Safety Administration of the Department of Transportation (DOT), as part of the expanded scope of the National Travel Program. The National Travel Program is part of the Census of Transportation, which is conducted every five years by the Bureau of the Census and includes the National Travel Survey (NTS). In 1977, the National Travel Program also included the 1977 NPTS and provided profiles of the volume and characteristics of travel by the civilian population.

Sample Design

The 1977 NPTS was based on a national probability sample of 24,466 households selected from each of the 50 States and the District of Columbia and representing the total civilian noninstitutional population of the United States. Of the 24,466 household, 3,433 units were found to be vacant, demolished, converted to nonresidential use, or otherwise ineligible for the survey. Some 3,084 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.

All of the sample units consisted of households that had previously been interviewed for the Current Population Survey (CPS). The CPS is a stratified multistage cluster sample. In the first stage, the United States was divided into 1,030 primary sampling units (PSU's) consisting of counties, groups of counties, or independent cities, which were grouped into 376 strata. Among these strata, 156 consisted of a single PSU, designated as self-representing (SR) areas, and generally contained the larger metropolitan areas. The remaining 220, contained one or more PSU's that are relatively homogeneous according to socioeconomic characteristics. From each stratum, a single PSU was selected for the sample with a probability proportionate to its 1970 census population; these PSU's are referred to as non-self-representing (NSR). The CPS portion of the NPTS was selected from these 376 PSU's (156 SR and 220 NSR).

Methodology

As indicated previously, the 1977 NPTS was conducted as part of the expanded scope of the National Travel Program which also included the National Travel Survey (NTS). The NTS/NPTS included a common sample of 13,365 households interviewed from April-November 1977 and January 1978; these households were referred to as the basic sample, and were interviewed four times for NTS data and once for NPTS data. An additional 4,584 addresses, referred to as the supplemental sample, were divided into three equal parts and were interviewed in December 1977, February 1978, and March 1978. This arrangement spread the total NPTS data collection over a 12-month period from April 1977-March 1978, with approximately 1500 households to be interviewed each month.

The households within each monthly sample were divided into 14 equal parts, with each part assigned to one of the first 14 days of the interview month. The assigned day was referred to as the designated travel day. In addition, each household was interviewed for trips of 75 miles and longer for the 14 days preceding the travel day; this was referred to as the 14-day travel period. Thus each household was interviewed for trips and travel during a 15-day period.

Data Processing

The major steps performed by the Bureau of the Census for the 1977 NPTS included clerical editing and coding of the NTS-2 Questionnaire, (Sections I-VI); the NTS-2A (Section VII) was edited and coded by the FHWA DOT personnel; full transcription of the data to magnetic tapes; computer edit of the data to ensure completeness and consistency; calculation of the weighting factors for each household; and computation of variance and calculation of statistical reliability of the data. The data was tabulated upon receipt of the edited, weighted data tapes from the Bureau of the Census.

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 are presently planned. The sequence does not necessarily indicate the order in which the reports will be prepared and published. It is offered as an indication of current plans as well as to give transportation researchers and planners a general indication of the variety and scope which the 1977 NPTS data encompasses. For those reports that have been published, the correct title, report number and publication date are shown.

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)

Survey description and tables of variance

Multioccupant vehicle travel - public and private

Person Trip Characteristics

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.

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 ()

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 urban area: An urban place of 5,000 or more population as determined by the Bureau of the Census. For Federal-aid purposes, all other areas are considered rural.

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, that 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 schoolbuses. 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 schoolbuses, private schoolbuses, 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 schoolbuses 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 whether 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 1 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 5 miles in the same vehicle, make 4 times 5 vehicle miles or 20 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 five nights away from home would result in 10 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 that 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 household: 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 that 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, trip duration is 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.)
- Change means of transportation: Trips made specifically to change from one means of transportation to another; for example, taking a taxi to an airport to catch a plane, driving a car to a fringe parking area to take a bus into town, etc.

- 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 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.

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 1 mile or less across the open end, or
- to link outlying enumeration districts of qualifying density that are not more than $1\frac{1}{2}$ 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 this study, one of the 12 vehicle types used for coding purposes in the household motorized vehicle record of the NTS-2 Questionnaire.