Personal Travel in the United States
1983-1984

VOLUME I

1983 Nationwide Personal Transportation Survey
August 1986

Part 2 of 3 of electronic PDF file

Chapters 6-8: Contains person trips and travel, workers and journey to work information, and vehicle occupancy.

6

PERSON TRIPS AND TRAVEL

INTRODUCTION

This chapter presents findings on the characteristics of person trips, which are defined as one person traveling in any mode of transportation. This is counted as one person trip. If two persons travel together, it is counted as two person trips. A person mile of travel occurs when a person travels one mile. If three persons travel 5 miles together, it is counted as 15 person miles of travel. Most of the information presented in this chapter is based on the 1983 NPTS survey, although wherever possible, equivalent data on particular characteristics have been compiled from the 1977 NPTS survey in order to show trends over time. The relationships described in this chapter are comparable to material in Report No. 11 in the 1977 NPTS report series.

This chapter analyzes trip-making characteristics such as:

- the number of person trips,
- the length of person trips,
- the distribution of person trips, and
- daily person miles of travel.

It evaluates the relationship of the above trip-making characteristics to various socio-economic characteristics of individuals, such as:

- age,
- sex, and
- possession of a driver's license,

as well as household characteristics, such as:

- household income,
- household position in the life cycle,
- place of residence, and
- size of SMSA.

In addition, the relationship of trip-making characteristics such as:

- trip type,
- means of travel,
- time of day, and
- day of week

are addressed in relation to the average number and length of trips, as well as individual and household socio-economic characteristics listed above.

SUMMARY OF NATIONAL ESTIMATES USED IN THIS CHAPTER

	1969	1977	1983
Persons	197,213	213,141	229,453
Annual Person Trips	145,146,000	211,778,000	224,385,000
Annual Person Miles of Travel (PMT)	1,404,137,000	1,879,215,000	1,946,662,000

Note: All numbers in thousands.

As Table 6-1 and Figure 6-1 show, the largest change in age groups (excluding persons under 5) between 1969 and 1983 occurred in the decreased proportion of 5 to 15 year olds (26 to 18 percent of the population), the increased number of 20-39 year olds (27 to 36 percent of the population), the baby boom generation, and the increase of the elderly population, those 60 years old or older (15 to 17 percent of the population). Other, less substantial shifts in age groups also occurred during this time period.

Sex and age seem to have had an impact, although slight, on the number and length of trips taken daily by the average individual. Although Table 6-2 shows men and women both averaged roughly three trips daily in 1983, men tended to take slightly longer trips, resulting in approximately 26 daily miles of travel compared to 21 for women as a group.

Age, rather than sex, seems to have had a greater impact on trip-making characteristics. Those 16 to 49 years old averaged more than 3 trips per day, while all other age groups made between 2 and 3 trips on the average. The one exception appears to be women over age 65, who averaged less than two trips daily.

FIGURE 6-1

CHANGES IN DISTRIBUTION OF PERSONS BY AGE

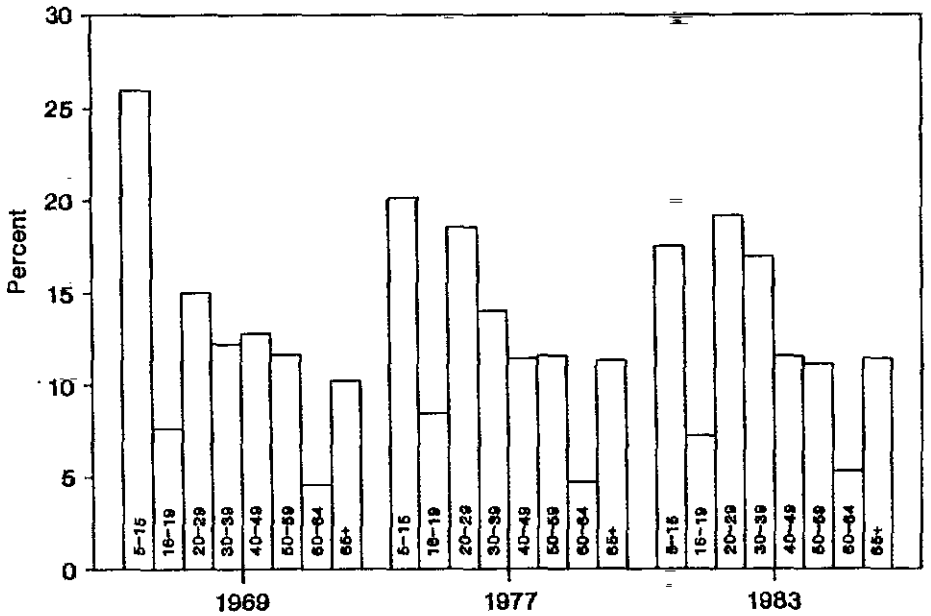


TABLE 6-1

DISTRIBUTION OF PERSONS BY AGE AND SEX

	Age									All Persons
	Under 5	5-15	16-19	20-29	30-39	40-49	50-59	60-64	65 and Over	
1969										
Male	N/A	51.0	49.9	46.0	47.3	47.6	46.7	47.9	43.2	47.9
Female	N/A	49.0	50.1	54.0	52.7	52.4	53.3	52.1	56.8	52.1
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ALL PERSONS	N/A	26.0	7.6	15.0	12.2	12.8	11.6	4.6	10.2	100.0
1977										
Male	50.4	51.0	49.7	48.5	48.4	48.1	47.1	45.7	41.3	48.1
Female	49.6	49.0	50.3	51.5	51.6	51.9	52.9	54.3	58.7	51.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ALL PERSONS	6.9	18.8	7.8	17.3	13.0	10.6	10.7	4.4	10.5	100.0
All Persons (excluding under 5)*	N/A	20.2	8.4	18.5	14.0	11.4	11.5	4.7	11.3	100.0
1983										
Male	52.8	51.1	50.3	49.9	47.8	50.2	46.5	48.0	40.3	48.6
Female	47.2	48.9	49.7	50.1	52.2	49.8	53.5	52.0	59.7	51.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ALL PERSONS	7.2	16.2	6.7	17.7	15.7	10.7	10.3	4.9	10.6	100.0
All Persons (excluding under 5)*	N/A	17.5	7.2	19.1	16.9	11.5	11.1	5.3	11.4	100.0

*Excluded for comparability with the 1969 data.

Individuals between 20 and 64 years of age typically made the longest trips at 9 to 11 miles, compared to 6 to 7 miles per trip for those over 64 and under 20. Those between 20 and 49 traveled the most, averaging over 30 miles daily, compared to those over age 64, who traveled the least each day, or less than 13 miles.

In general, more trips were made for family and personal business purposes (36 percent) than for any other reason, followed by social and recreational trips (28 percent), work and work-related trips (23 percent), and civic, educational, and religious trips (12 percent) (Table 6-3).

As shown in Tables 6-3 through 6-5, sex and age characteristics influenced the type of trips made by individuals. Men took more work and work-related trips than women (28 percent vs. 18 percent, respectively), while women made more family and personal business trips (39 percent vs. 32 percent).

TABLE 6-2

AVERAGE DAILY PERSON TRIPS, TRAVEL, AND TRIP LENGTH BY AGE AND SEX

(1983)

	Age								
	5-15	16-19	20-29	30-39	40-49	50-59	60-64	65 and Over	All
	Average Daily Trips								
Male	2.3	3.3	3.5	3.3	3.1	2.8	2.7	2.2	2.7
Female	2.3	3.4	3.4	3.6	3.2	2.8	2.1	1.6	2.7
ALL	2.3	3.3	3.4	3.4	3.1	2.8	2.4	1.8	2.7
	Average Daily Person Miles of Travel								
Male	16.8	22.0	32.4	35.1	38.4	29.9	26.6	14.6	25.5
Female	15.4	20.8	29.6	27.8	31.4	21.1	20.9	10.5	21.1
ALL	16.1	21.4	30.9	31.3	34.9	25.2	23.7	12.2	23.2
	Average Trip Length (Miles)								
Male	7.5	6.8	9.3	10.8	12.5	10.6	9.9	6.6	9.5
Female	6.6	6.1	8.8	7.7	9.8	7.6	9.8	6.8	7.9
ALL	7.0	6.4	9.0	9.1	11.1	9.0	9.8	6.7	8.7

TABLE 6-3

DISTRIBUTION OF PERSON TRIPS BY PURPOSE AND AGE

(1983 - ALL PERSONS)

	Age								
	5-15	16-19	20-29	30-39	40-49	50-59	60-64	65 and Over	All
Earning a Living									
To or From Work	1.4	13.1	26.4	26.3	28.2	26.6	21.7	6.3	20.4
Work Related Business	.4	1.1	2.3	3.3	3.2	4.1	2.1	1.5	2.4
Subtotal	1.8	14.2	28.7	29.6	31.4	30.7	23.8	7.8	22.8
Family and Personal Business									
Shopping	10.3	12.4	16.7	18.5	19.8	22.1	24.0	30.6	18.2
Doctor/Dentist	1.1	.6	.8	1.2	1.3	1.2	1.7	3.6	1.2
Other Family Business	9.8	10.2	15.5	20.5	19.2	15.8	18.4	18.1	16.1
Subtotal	21.2	23.2	33.0	40.2	40.3	39.1	44.1	52.3	35.5
Civic, Educational, and Religious	37.8	24.7	6.9	5.0	4.3	6.1	4.9	7.6	11.8
Social and Recreational									
Vacation	.4	.1	.2	.3	.3	.3	.4	.2	.3
Visiting Friends	12.2	15.7	13.8	9.0	7.6	8.5	10.4	10.4	11.0
Pleasure Driving	.5	.5	.4	.4	.5	.7	.4	1.3	.5
Other Social and Recreational	19.3	19.8	15.7	14.0	14.1	12.9	14.6	17.7	15.8
Subtotal	32.4	36.1	30.1	23.7	22.5	22.4	25.8	29.6	27.6
Other	6.8	1.8	1.3	1.5	1.5	1.7	1.4	2.7	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

This may have been the result of the greater number of women than men who stayed home to maintain the household, and therefore made fewer work trips and more of the household's personal trips. The remaining trip types, civic, educational, and religious trips, and social and recreational trips, were made fairly proportionately between both men and women.

The relationship between age and trip purposes is what one might expect. Work trips predominated, approximately 30 percent of all trips, for those between 20 and 59 years old. Civic, educational, and religious trips comprised approximately 30 percent of all trips for those less than 20 years old, and among this group, another 36 percent of the trips made by teenagers pertained to social and recreational activities.

TABLE 6-4

DISTRIBUTION OF PERSON TRIPS BY PURPOSE, AGE, AND SEX

(1983 - MALES)

	Age								
	5-15	16-19	20-29	30-39	40-49	50-59	60-64	65 and Over	All
Earning a Living									
To or From Work	1.5	16.2	31.6	33.1	33.9	31.6	26.2	6.7	24.5
Work Related Business	.4	1.6	2.5	4.7	4.4	5.6	3.2	2.1	3.1
Subtotal	1.9	17.8	34.1	37.8	38.3	37.2	29.4	8.8	27.6
Family and Personal Business									
Shopping	9.4	9.4	14.6	16.2	16.4	18.3	19.9	31.2	15.7
Doctor/Dentist	.9	.5	.6	.7	.5	.7	1.7	2.6	.9
Other Family Business	9.0	10.1	14.3	16.7	18.4	16.5	19.2	19.1	15.0
Subtotal	19.3	20.0	29.5	33.6	35.3	35.5	40.8	52.9	31.6
Civic, Educational, and Religious	39.1	24.4	5.6	3.6	3.0	4.4	4.0	5.8	11.1
Social and Recreational									
Vacation	.5	.1	.2	.3	.3	.3	.3	.0	.3
Visiting Friends	11.9	15.8	13.2	9.4	6.1	7.3	10.1	10.3	10.6
Pleasure Driving	.3	.7	.5	.4	.4	.8	.5	1.3	.6
Other Social and Recreational	20.5	19.6	15.5	13.9	15.4	12.5	14.0	18.2	16.0
Subtotal	33.2	36.2	29.4	24.0	22.2	20.9	24.9	29.8	27.5
Other	6.5	1.6	1.4	1.0	1.2	2.0	.9	2.7	2.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 6-5

DISTRIBUTION OF PERSON TRIPS BY PURPOSE, AGE, AND SEX

(1983 - FEMALES)

	Age								
	5-15	16-19	20-29	30-39	40-49	50-59	60-64	65 and Over	All
Earning a Living									
To or From Work	1.2	10.0	21.2	20.8	22.6	22.2	16.4	6.0	16.5
Work Related Business	.5	.6	2.0	2.1	2.1	2.7	.8	.9	1.7
Subtotal	1.7	10.6	23.2	22.9	24.7	24.9	17.2	6.9	18.2
Family and Personal Business									
Shopping	11.2	15.4	18.8	20.4	23.2	25.4	28.8	30.1	20.3
Doctor/Dentist	1.3	.6	1.0	1.6	2.0	1.6	1.6	4.5	1.6
Other Family Business	10.6	10.2	16.8	23.7	20.0	15.1	17.5	17.1	17.2
Subtotal	23.1	26.2	36.6	45.7	45.2	42.1	47.9	51.7	39.1
Civic, Educational, and Religious	36.6	25.1	8.1	6.1	5.5	7.6	6.0	9.2	12.5
Social and Recreational									
Vacation	.3	.2	.3	.4	.3	.4	.4	.3	.3
Visiting Friends	12.5	15.7	14.4	8.7	9.0	9.6	10.8	10.6	11.4
Pleasure Driving	.7	.5	.2	.4	.6	.6	.2	1.3	.5
Other Social and Recreational	18.1	19.9	15.9	14.0	12.9	13.4	15.5	17.3	15.6
Subtotal	31.6	36.3	30.8	23.5	22.8	24.0	26.9	29.5	27.8
Other	7.0	1.8	1.3	1.8	1.8	1.4	2.0	2.7	2.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

PERSONAL TRAVEL: AGE, MODE OF *TRANSPORTATION*

As shown in Table 6-6, approximately one-half of all trips were made by an individual driver in an auto or passenger van. The proportion of all trips made via this mode remained constant between 1977 and 1983. During the same period, those riding as a passenger in an auto or passenger van decreased by approximately 3 percentage points, from 30 to 27 percent, perhaps due to the increased vehicle ownership and hence availability. The proportion of travel via public transportation also decreased slightly during this period.

In addition to the previously mentioned correlations between sex, age, and trip purpose, there also appeared to be a relationship, although slight, between an individual's age and mode of transportation in some instances. The 30 to 49 age group were more likely to drive themselves than other age groups, with over 56 percent of their travel made by personally driving themselves. This same group made the fewest transit trips in 1977.

TABLE 6-6

DISTRIBUTION OF PERSON TRIPS BY AGE AND MODE OF TRANSPORTATION

	Age								
	5-15	16-19	20-29	30-39	40-49	50-59	60-64	65 and Over	All
1977									
Private Vehicle									
Auto, Van-Driver	.5	38.6	55.6	61.4	62.1	59.2	57.3	46.8	44.5
Auto, Van-Passenger	57.8	31.7	21.4	17.7	17.9	20.2	22.2	28.6	30.2
Pickup	4.9	5.2	9.7	11.0	11.0	9.9	8.2	5.5	8.5
Other Private Vehicle	.2	.9	1.2	.7	.7	.8	.4	.4	.7
Subtotal-Private	63.4	76.4	87.9	90.8	91.7	90.1	88.1	81.3	83.9
Public Transportation									
Bus, Streetcar	3.0	2.7	1.6	1.3	1.2	1.8	2.0	3.0	1.9
Train	.0	.1	.3	.3	.3	.3	.3	.0	.2
Subway, Elevated Rail	.1	.1	.6	.5	.3	.3	.3	.1	.3
Subtotal-Public	3.1	2.9	2.5	2.1	1.8	2.4	2.6	3.1	2.4
Other Means									
Walk	15.8	14.5	8.0	5.5	5.4	6.3	8.1	14.3	9.3
Bike	1.8	1.5	.5	.3	.1	.1	.2	.2	.6
School Bus	15.2	3.9	.2	.1	.1	.0	.0	.0	2.8
Airplane	.0	.0	.1	.1	.1	.1	.1	.1	.1
Other	.7	.8	.8	1.1	.8	1.0	.9	1.0	.9
Subtotal-Other	33.5	20.7	9.6	7.1	6.5	7.5	9.3	15.6	13.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
ALL MODES	16.1	10.2	22.8	17.1	12.5	11.0	3.8	6.5	100.0
1983									
Private Vehicle									
Auto, Van-Driver	.0	34.4	51.0	56.5	56.0	54.4	53.8	47.2	44.4
Auto, Van-Passenger	56.3	30.0	21.3	18.9	19.6	22.4	21.8	30.0	27.0
Pickup	6.1	6.8	11.2	11.7	12.6	10.7	13.3	6.5	10.1
Other Private Vehicle	.2	.8	.6	.4	.6	.3	.1	.2	.5
Subtotal-Private	62.6	72.0	84.1	87.5	88.8	87.8	89.0	83.9	82.0
Public Transportation									
Bus, Streetcar	2.8	3.0	1.7	1.3	1.0	1.2	1.5	2.3	1.7
Train	.0	.1	.3	.2	.3	.3	.1	.2	.2
Subway, Elevated Rail	.1	.2	.4	.4	.3	.3	.2	.1	.3
Subtotal-Public	2.9	3.3	2.4	1.9	1.6	1.8	1.8	2.6	2.2
Other Means									
Walk	10.5	15.6	9.9	5.9	4.6	6.8	6.4	10.4	8.5
Bike	1.8	1.6	.8	.5	.4	.1	.0	.3	.8
School Bus	15.9	4.8	.1	.0	.0	.0	.0	.0	2.6
Airplane	.0	.0	.1	.1	.1	.1	.1	.1	.1
Other	6.3	2.7	2.6	4.1	4.5	3.4	2.7	2.7	3.8
Subtotal-Other	34.5	24.7	13.5	10.6	9.6	10.4	9.2	13.5	15.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ALL MODES	13.8	8.3	22.7	20.3	12.5	10.8	4.4	7.2	100.0

PERSONAL TRAVEL: SEX, MODE OF TRANSPORTATION

Table 6-7 shows that over time women drove more themselves and traveled less as passengers. This may be due in part to the trend discussed in Chapter 4 of this report of increased vehicle ownership within households. In 1983, the proportion of trips made by both men and women by personally driving the car was essentially the same, 44 percent (Figure 6-2).

FIGURE 6-2

CHANGES IN DISTRIBUTION OF AUTO DRIVER TRIPS BY SEX

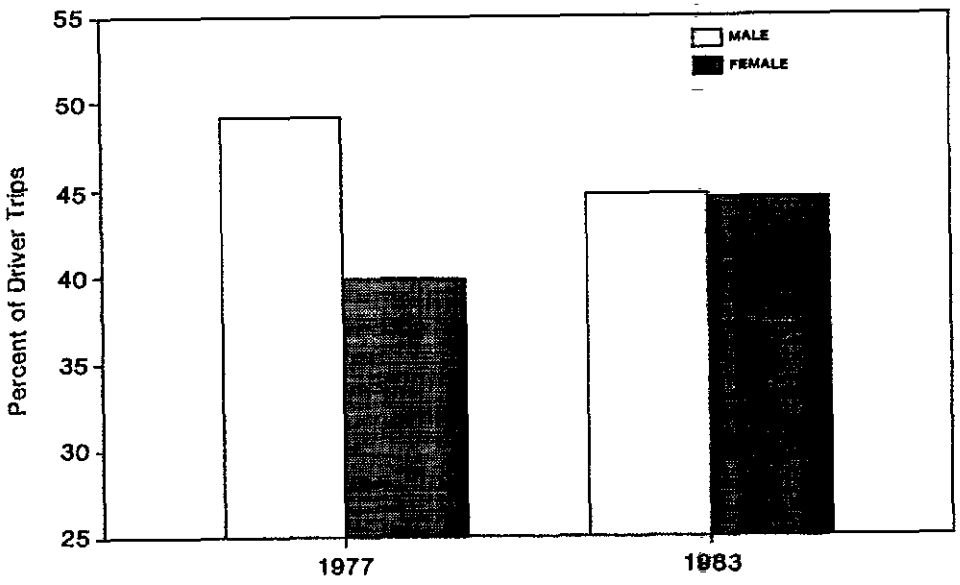


TABLE 6-7

DISTRIBUTION OF PERSON TRIPS BY SEX AND MODE OF TRANSPORTATION

	1977			1983		
	Male	Female	All	Male	Female	All
Private Vehicle						
Auto, Van-Driver	48.8	39.7	44.5	44.5	44.3	44.4
Auto, Van-Passenger	21.0	39.7	30.2	21.7	32.0	27.0
Pickup	12.6	4.3	8.5	15.3	5.1	10.1
Other Private Vehicle	1.1	.4	.7	.8	.1	.5
Subtotal-Private	83.5	84.1	83.9	82.3	81.5	82.0
Public Transportation						
Bus, Streetcar	1.7	2.2	1.9	1.5	2.0	1.7
Train	.3	.2	.2	.3	.2	.2
Subway, Elevated Rail	.4	.3	.3	.3	.3	.3
Subtotal-Public	2.4	2.7	2.4	2.1	2.5	2.2
Other Means						
Walk	9.2	9.4	9.3	7.9	9.2	8.5
Bike	.9	.3	.6	1.0	.5	.8
School Bus	2.7	2.8	2.8	2.9	2.4	2.6
Airplane	.1	.1	.1	.1	.1	.1
Other	1.2	.6	.9	3.7	3.8	3.8
Subtotal-Other	14.1	13.2	13.7	15.6	16.0	15.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

PERSONAL TRAVEL: INCOME

As shown in Table 6-8, in 1983 the number of trips made by family members and the average length of the trip were directly proportional to total household income. Figure 6-3 graphically displays this relationship. The average number of household trips ranged from 2.1 trips (average length of 6.9 miles) for households with incomes less than $10,000 to 3.0 trips (average length of 10.8 miles) for households earning $40,000 or more.

TABLE 6-8

AVERAGE DAILY TRIPS, TRAVEL AND TRIP LENGTH

BY HOUSEHOLD INCOME AND PURPOSE

(1983)

	Under $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000 and Over	All
			Average Daily Trips			
Earning a Living	.3	.6	.7	.8	.7	.6
Family and Personal Business	.8	1.0	1.0	1.0	1.0	.9
Civic, Educational, and Religious	.3	.3	.3	.3	.4	.3
Social and Recreational	.6	.7	.7	.8	.8	.7
Other	.1	.1	.1	.1	.1	.1
ALL	2.1	2.7	2.8	3.0	3.0	2.6
			Average Daily Person Miles of Travel			
Earning a Living	2.2	5.4	6.6	8.5	8.8	6.0
Family and Personal Business	4.1	6.1	5.9	6.9	7.3	5.9
Civic, Educational, and Religious	1.1	1.4	1.5	1.5	2.3	1.5
Social and Recreational	6.3	7.3	8.3	12.1	13.9	9.1
Other	.6	.4	.4	.5	.7	.5
ALL	14.3	20.6	22.7	29.5	33.0	23.0
			Average Trip Length			
Earning a Living	7.2	8.9	9.4	11.3	12.1	9.9
Family and Personal Business	5.3	6.3	6.3	6.7	7.0	6.3
Civic, Educational, and Religious	3.4	5.0	5.1	4.6	6.4	4.9
Social and Recreational	9.9	10.3	11.1	15.1	16.5	12.3
Other	10.1	7.4	5.6	7.0	10.3	8.8
ALL	6.9	7.8	8.2	9.8	10.8	8.7

Also correlated with level of household income is the likelihood of household members driving themselves by auto rather than using an alternate travel mode. As shown in Table 6-9, in 1983 over 50 percent of those with household incomes of $40,000 or more drove themselves, compared to 34 percent of those earning less than $10,000. On the other hand, the probability of being an auto passenger did not vary significantly between income categories.

FIGURE 6-3

DISTRIBUTION OF AVERAGE DAILY PERSON MILES OF TRAVEL BY HOUSEHOLD INCOME (1983)

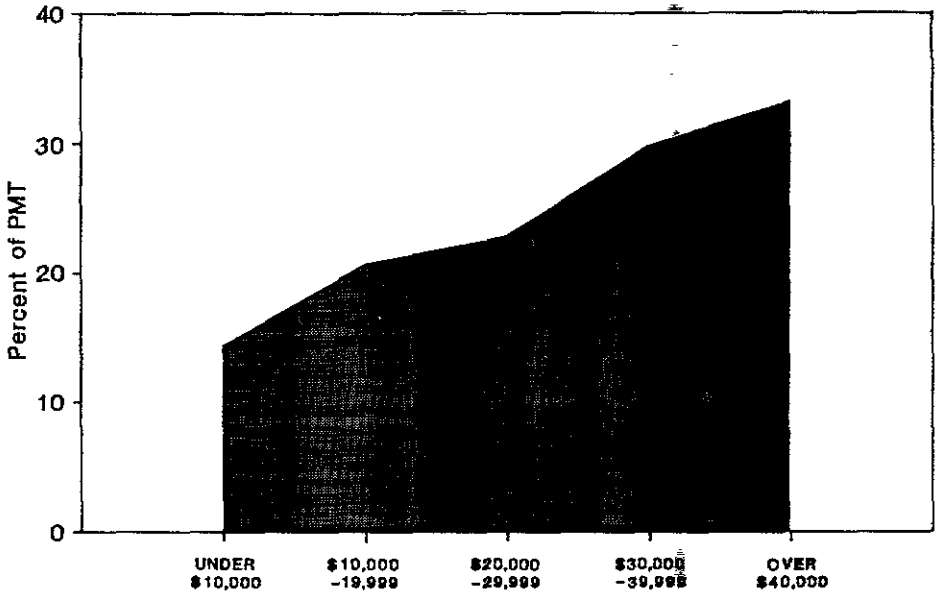


TABLE 6-9

DISTRIBUTION OF PERSON TRIPS BY HOUSEHOLD INCOME AND MODE OF TRANSPORTATION (1983)

	Under $10,000	$10,000-19,999	$20,000-29,999	$30,000-39,999	$40,000 and Over	All Incomes
Private Vehicle						
Auto, Van - Driver	34.0	42.4	46.2	46.2	51.8	44.4
Auto, Van - Passenger	26.5	26.7	27.4	27.3	26.9	27.0
Pickup	8.0	12.9	11.8	9.6	6.6	10.1
Other Private Vehicle	.4	.3	.5	.4	.7	.5
Subtotal - Private	68.9	82.3	85.9	83.5	86.0	82.0
Public Transportation						
Bus, Streetcar	3.7	1.9	1.2	1.5	.8	1.7
Train	.3	.2	.3	.1	.4	.2
Subway, Elevated Rail	.3	.5	.2	.3	.2	.3
Subtotal - Public	4.3	2.6	1.7	1.9	1.4	2.2
Other Means						
Walk	19.5	8.8	4.9	5.6	5.9	8.5
Bike	1.1	.8	.6	1.0	.7	.8
School Bus	3.2	2.4	2.9	2.1	2.4	2.6
Airplane	.1	.0	.0	.1	.2	.1
Other	2.9	3.1	4.0	5.8	3.4	3.8
Subtotal - Other	26.8	15.1	12.4	14.6	12.6	15.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

PERSONAL TRAVEL: SEX, DRIVERS
LICENSE STATUS

Table 6-10 shows that possession of a drivers license affected trip-making characteristics. In 1983, those with drivers licenses averaged almost twice as many trips as those without drivers licenses, 3.3 vs. 1.6 per day. Correspondingly, those with drivers licenses made significantly longer trips than those without licenses, 9.2 vs. 6.1 miles on the average, or approximately one-third further.

As shown previously in Table 6-2, a person's sex did not seem to significantly affect the number of trips they made, although there appeared to be a difference in average trip length, with men venturing slightly further from home. The only exception was that women without licenses tended to make slightly longer trips than men without licenses.

TABLE 6-10
AVERAGE DAILY PERSON TRIPS, TRAVEL, AND TRIP LENGTH BY SEX, DRIVERS LICENSE STATUS, AND PURPOSE
(1983)

	Male		Female		All	
	With Driver's License	Without Driver's License	With Driver's License	Without Driver's License	With Driver's License	Without Driver's License
			Average Daily Trips			
Earning a Living	1.0	.3	.7	.2	.9	.3
Family and Personal Business	1.1	.5	1.4	.7	1.2	.5
Civic, Educational, and Religious	.2	.3	.3	.3	.2	.3
Social and Recreational	.8	.6	.9	.5	.9	.5
Other	.0	.0	.1	.0	.1	.0
ALL	3.1	1.7	3.4	1.7	3.3	1.6
			Average Daily Person Miles of Travel			
Earning a Living	12.6	1.9	5.4	1.4	9.1	1.5
Family and Personal Business	7.1	2.0	8.6	3.8	7.8	3.3
Civic, Educational, and Religious	1.3	1.1	1.3	1.1	1.3	1.1
Social and Recreational	10.9	4.8	12.3	3.7	11.6	4.0
Other	.4	.1	.4	.1	.4	.1
ALL	32.3	9.9	28.0	10.1	30.2	10.0
			Average Trip Length			
Earning a Living	12.0	5.8	7.4	6.3	10.2	6.1
Family and Personal Business	6.5	4.4	6.2	5.8	6.3	5.5
Civic, Educational, and Religious	6.8	4.2	5.0	4.0	5.7	4.1
Social and Recreational	13.0	8.0	13.6	7.9	13.3	7.9
Other	7.5	5.9	7.7	4.0	7.6	4.2
ALL	10.0	5.9	8.4	6.2	9.2	6.1

It is not surprising to observe in Table 6-11 that in 1983 over half the trips made by individuals with drivers licenses were made by driving themselves, while almost half the trips taken by non-licensed persons were as auto passengers. Correspondingly, those without licenses were more likely to use public transportation, 10.8 percent of all trips compared to 1.3 percent for licensed individuals.

Sex, combined with the possession of a license, also seemed to affect the mode of traveling to one's destination. A larger percentage of women than men without licenses were auto passengers (53.7 percent vs. 38.6 percent), while men without licenses were more likely to use public transportation than women (12.5 percent vs. 10.1 percent). This may have been because women without licenses often had husbands with licenses who could drive them.

TABLE 6-11

DISTRIBUTION OF PERSON TRIPS BY SEX, DRIVERS LICENSE STATUS, AND MODE OF TRANSPORTATION

(1983)

	Male		Female		All	
	With Driver's License	Without Driver's License	With Driver's License	Without Driver's License	With Driver's License	Without Driver's License
Private Vehicle						
Auto, Van - Driver	54.7	.0	58.1	.0	56.3	.0
Auto, Van - Passenger	15.1	38.6	24.7	53.7	19.9	49.4
Pickup	17.6	5.4	5.0	4.4	11.4	4.7
Other Private Vehicle	.9	.2	.1	.1	.5	.1
Subtotal - Private	88.3	44.2	87.9	58.2	88.1	54.2
Public Transportation						
Bus, Streetcar	.8	10.7	.9	8.3	.9	9.0
Train	.3	1.0	.1	.4	.2	.6
Subway, Elevated Rail	.3	.8	.2	1.4	.2	1.2
Subtotal - Public	1.4	12.5	1.2	10.1	1.3	10.8
Other Means						
Walk	6.1	30.2	6.6	25.9	6.4	27.1
Bike	.5	4.0	.5	.8	.5	1.7
School Bus	.3	5.1	.2	2.4	.2	3.2
Airplane	.1	.0	.1	.0	.1	.0
Other	3.3	4.0	3.5	2.6	3.4	3.0
Subtotal - Other	10.3	43.3	10.9	31.7	10.6	35.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

PERSONAL TRAVEL: PLACE OF RESIDENCE

Between 1977 and 1983, the average daily person trips of 2.7 remained steady throughout the population. Despite this consistent national average, it is interesting to observe in Table 6-12 that trips made by residents of non-SMSA areas increased by 8 percent during this time frame, while those living within SMSA's did not alter their rate of trip-making.

Although the average number of person trips remained constant between 1977 and 1983, average daily person miles of travel seem to have decreased slightly during this period, from 24.1 to 23.2 miles, as shown in Table 6-13. This may be due in part to the fact that an increasing number of businesses located in the suburbs, near residential areas, rather than in more central locations. However, people living in non-SMSA locations averaged slightly higher daily miles of travel in 1983 than in 1977 (25.0 vs. 24.5 miles). Residents of central cities traveled an average of 14 percent fewer daily miles in 1983 than in 1977.

TABLE 6-12

AVERAGE DAILY TRIPS BY PLACE OF RESIDENCE AND TRIP PURPOSE

	Inside SMSA				
	Within Central City	Not in Central City	Subtotal	Outside SMSA	All
1977					
Earning a Living	.7	.7	.7	.6	.7
Family and Personal Business	.9	.9	.9	.9	.9
Civic, Educational, and Religious	.3	.4	.3	.4	.4
Social and Recreational	.7	.7	.7	.7	.7
Other	.0	.0	.0	.0	.0
TOTAL	2.6	2.7	2.6	2.6	2.7
1983					
Earning a Living	.6	.6	.6	.6	.6
Family and Personal Business	.9	1.0	.9	1.0	1.0
Civic, Educational, and Religious	.3	.3	.3	.3	.3
Social and Recreational	.7	.7	.7	.8	.7
Other	.0	.1	.1	.1	.1
TOTAL	2.5	2.7	2.6	2.8	2.7

It is also interesting to note the relationship displayed in Figure 6-4 between miles traveled for different types of trips and an area's size. Those living within SMSA's traveled further for work trips on a daily basis, and shorter distances for family and personal business trips, than their counterparts living outside SMSA's. This may be due to the amount of farm-related employment in non-SMSA areas, where people tend to live close to work, but far from most other enterprises.

FIGURE 6-4
AVERAGE DAILY PERSON MILES OF TRAVEL
BY PLACE OF RESIDENCE AND PURPOSE
(1983)

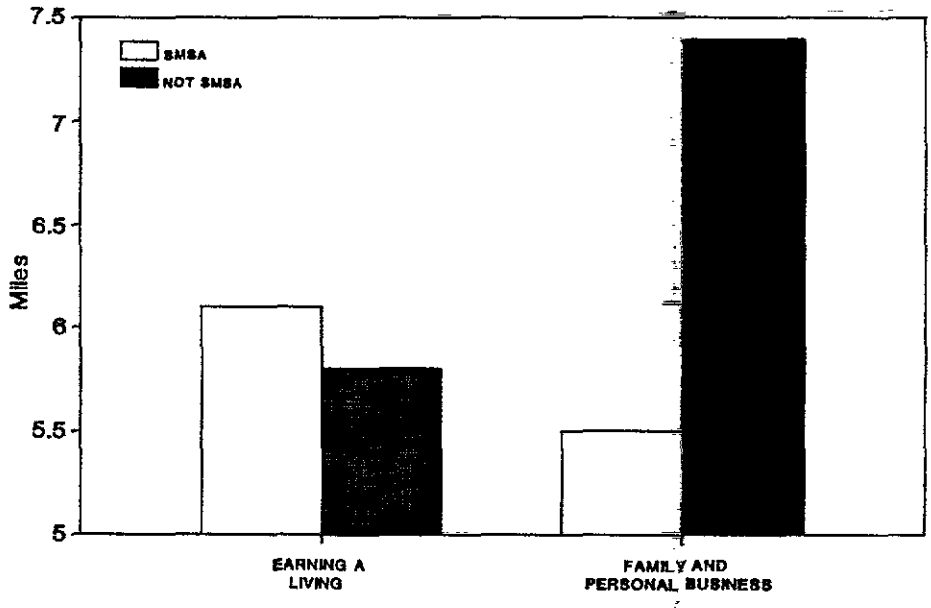


TABLE 6-13
AVERAGE DAILY PERSON MILES OF TRAVEL
BY PLACE OF RESIDENCE AND TRIP PURPOSE

	Inside SMSA				
	Within Central City	Not in Central City	Subtotal	Outside SMSA	All
1977					
Earning a Living	6.1	8.3	7.2	6.3	6.9
Family and Personal Business	4.3	6.0	5.2	6.9	5.8
Civic, Educational, and Religious	1.3	1.7	1.5	1.8	1.6
Social and Recreational	7.2	9.2	8.2	7.9	8.1
Other	2.0	1.5	1.7	1.6	1.7
ALL	20.9	26.7	23.8	24.5	24.1
1983					
Earning a Living	5.1	7.1	6.1	5.9	6.0
Family and Personal Business	4.5	6.2	5.5	7.4	6.0
Civic, Educational, and Religious	1.2	1.6	1.4	2.0	1.6
Social and Recreational	7.0	10.9	9.2	8.8	9.1
Other	.2	.5	.4	0.9	.5
ALL	18.0	26.3	22.6	25.0	23.2

Some trip-making characteristics appeared to relate to the size and type of area where one lived. Table 6-14 shows a slightly higher proportion of auto driver trips in SMSA's than in non-SMSA's, 45.8 to 40.2 percent in 1983, while trips via pickup and other trucks were the reverse, with 16.4 percent in non-SMSA's compared to 8.0 percent in SMSA's.

TABLE 6-14

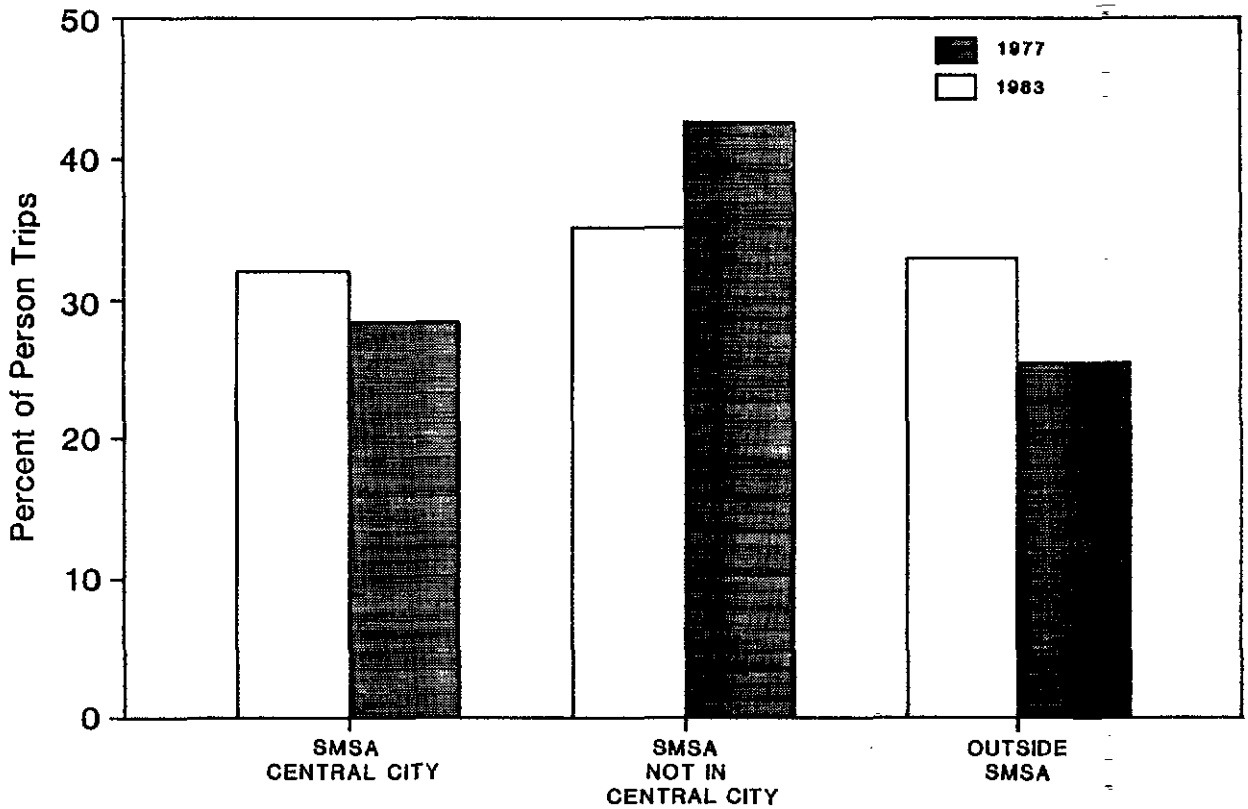
DISTRIBUTION OF PERSON TRIPS BY PLACE OF RESIDENCE AND MODE OF TRANSPORTATION

	Inside SMSA				
	Within Central City	Not in Central City	Subtotal	Outside SMSA	All
1977					
Private Vehicle					
Auto, Van - Driver	43.8	47.6	45.8	41.7	44.5
Auto, Van - Passenger	29.5	30.2	29.9	30.9	30.2
Pickup	5.4	6.6	6.0	13.6	8.5
Other Private Vehicle	.6	.8	.7	.7	.7
Subtotal - Private	79.3	85.2	82.4	86.9	83.9
Public Transportation					
Bus, Streetcar	3.8	1.4	2.5	.7	1.9
Train	.2	.4	.3	.0	.2
Subway, Elevated Rail	.7	.1	.5	.1	.3
Subtotal - Public	4.7	1.9	3.3	.8	2.4
Other Means					
Walk	12.9	8.1	10.3	7.1	9.3
Bike	.6	.7	.7	.6	.6
School Bus	1.5	3.1	2.3	3.7	2.8
Airplane	.1	.1	.1	.1	.1
Other	.9	.9	.9	.8	.9
Subtotal - Other	16.0	12.9	14.3	12.3	13.7
TOTAL	100.0	100.0	100.0	100.0	
ALL	32.1	35.0	67.1	32.9	100.0
1983					
Private Vehicle					
Auto, Van - Driver	43.7	47.0	45.8	40.2	44.3
Auto, Van - Passenger	26.5	27.1	27.0	26.8	27.0
Pickup	6.4	9.2	8.0	16.4	10.1
Other Private Vehicle	.4	.5	.5	.4	.5
Subtotal - Private	77.0	83.8	81.3	83.8	81.9
Public Transportation					
Bus, Streetcar	4.3	1.0	2.2	.4	1.8
Train	.3	.4	.3	.0	.2
Subway, Elevated Rail	.8	.2	.4	.0	.3
Subtotal - Public	5.4	1.6	2.9	.4	2.3
Other Means					
Walk	12.8	6.4	8.8	7.6	8.5
Bike	.7	.8	.8	.7	.8
School Bus	1.2	3.2	2.4	3.4	2.6
Airplane	.1	.1	.1	.1	.1
Other	2.8	4.1	3.7	4.0	3.8
Subtotal - Other	17.6	14.6	15.8	15.8	15.8
TOTAL	100.0	100.0	100.0	100.0	
ALL	28.4	42.5	74.7*	25.3	100.0

*Includes 3.8 percent unknown SMSA.

In general, the distribution between the types of trips made did not change much from 1977 to 1983. The proportion of trips that occurred within SMSA's, however, changed significantly during this period (Figure 6-5). The proportion of trips made by residents of non-central city areas in SMSA's, increased from 35.0 to 42.5 percent from 1977 to 1983, respectively, due in part to the migration of population from the other types of areas to this one. Consequently, the proportion of trips made by residents of SMSA central city and non-SMSA areas decreased between 1977 and 1983.

FIGURE 6-5
CHANGES IN DISTRIBUTION OF PERSON TRIPS
BY PLACE OF RESIDENCE



PERSONAL TRAVEL: SMSA SIZE

As shown in Table 6-15, there appeared to be a relationship between SMSA size and the number of daily trips averaged by the typical resident. Those who lived in SMSA's with a population of 3,000,000 or more averaged 2.4 trips daily, while residents of smaller-sized SMSA's averaged close to 3 trips daily (Figure 6-6). This same relationship held for trips made in both 1977 and 1983.

FIGURE 6-6

AVERAGE DAILY PERSON TRIPS BY SMSA SIZE

(1983)

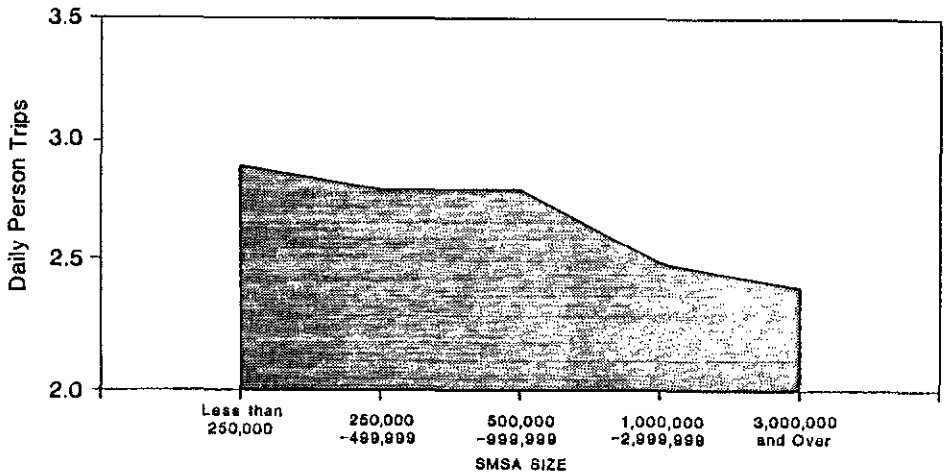


TABLE 6-15

AVERAGE DAILY PERSON TRIPS BY SMSA SIZE AND TRIP PURPOSE

(SMSA HOUSEHOLDS ONLY)

	SMSA Size					
	Less than 250,000	250,000 -499,999	500,000 -999,999	1,000,000 -2,999,999	3,000,000 and Over	Total
1977						
Earning a Living	.7	.7	.7	.7	.7	.7
Family and Personal Business	.9	.9	.9	.9	.8	.9
Civic, Educational, and Religious	.4	.3	.4	.4	.3	.4
Social and Recreational	.8	.8	.8	.8	.6	.7
Other	.0	.0	.0	.0	.0	.0
ALL	2.8	2.7	2.8	2.8	2.4	2.7
1983						
Earning a Living	.6	.7	.6	.6	.6	.6
Family and Personal Business	.9	1.0	1.1	.9	.9	1.0
Civic, Educational, and Religious	.4	.3	.3	.3	.3	.3
Social and Recreational	.9	.8	.7	.7	.6	.7
Other	.1	.1	.1	.1	.0	.1
ALL	2.9	2.9	2.8	2.6	2.4	2.7

Just as there is a relationship between SMSA size and number of average daily trips for a typical resident, there also is a relationship between SMSA size and average trip length for some trip purposes. As Table 6-16 shows, the larger the population of the SMSA, in general, the longer the distance traveled for the average earning a living trip in 1983.

Between 1977 and 1983, there was little change in the average distance traveled for all trip types combined for persons living in SMSA's. However, for specific types of trips, there were larger changes. Over time, trips for earning a living became slightly shorter, by approximately 6 percent, perhaps due in part to the increased number of businesses locating in the suburbs near residential areas. At the same time, the distance traveled for the other trip types as displayed in Figure 6-7 increased.

FIGURE 6-7

CHANGES IN AVERAGE TRIP LENGTH BY TRIP PURPOSE

(SMSA HOUSEHOLDS ONLY)

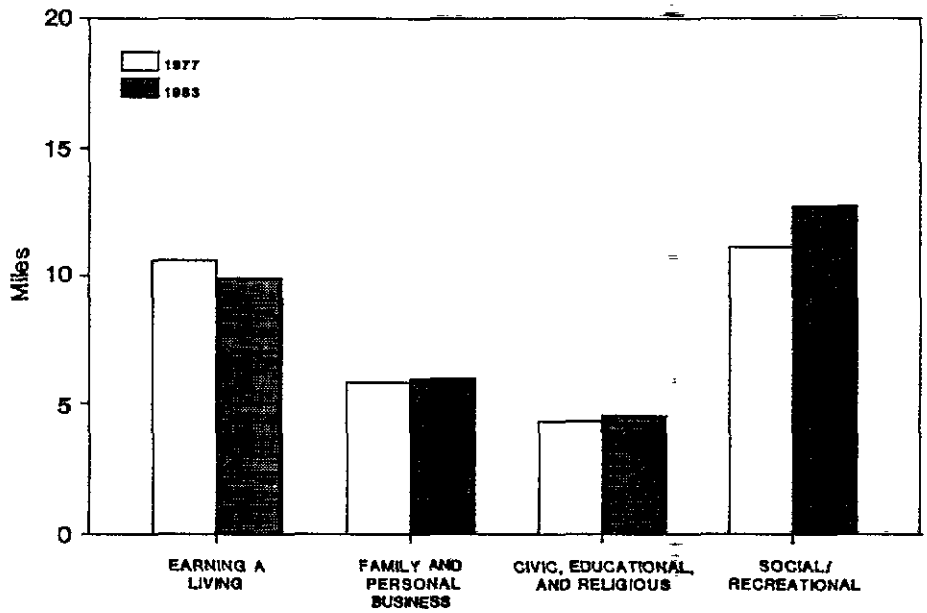


TABLE 6-16

AVERAGE TRIP LENGTH BY SMSA SIZE AND TRIP PURPOSE

	SMSA Size						
	Less than 250,000	250,000 -499,999	500,000 -999,999	1,000,000 -2,999,999	3,000,000 and Over	All SMSA's	All Places
1977							
Earning a Living	8.9	8.6	8.9	12.2	11.9	10.6	10.5
Family and Personal Business	6.2	5.6	6.8	5.6	5.2	5.8	6.4
Civic, Educational and Religious	5.4	4.6	4.2	4.4	3.4	4.3	4.6
Social and Recreational	12.5	11.2	9.8	11.5	10.7	11.1	11.2
Other	*	*	*	*	*	*	*
ALL	9.5	8.8	8.5	9.1	8.4	8.8	9.0
1983							
Earning a Living	7.4	8.9	10.2	11.1	11.5	10.0	9.9
Family and Personal Business	5.7	6.2	5.4	6.3	5.5	5.9	6.3
Civic, Educational and Religious	3.3	5.3	4.0	4.9	3.9	4.5	4.9
Social and Recreational	9.0	12.8	21.6	12.5	10.5	12.7	12.3
Other	5.8	5.2	3.9	8.5	4.4	5.9	8.0
ALL	6.7	8.6	10.5	9.1	8.0	8.5	8.7

*Sample size too small for a reliable estimate.

For most modes of transportation listed in Table 6-17, there was no evident relationship between SMSA size groups and the prevalence of a particular mode of travel. The two most common ways to travel, as an auto driver or an auto passenger, showed no correlation between SMSA size and the likelihood of traveling by auto, although persons in SMSA's of 3,000,000 population and greater made a lower percentage of trips in private vehicles than any other SMSA size group and a higher proportion of trips by public transportation. However, the proportion of trips by truck generally decreased with increased SMSA size, while use of public transit (bus, subway and train) tended to increase with SMSA size.

TABLE 6-17

DISTRIBUTION OF PERSON TRIPS BY SMSA SIZE AND MODE OF TRANSPORTATION

(SMSA HOUSEHOLDS ONLY)

	SMSA Size					
	Less than 250,000	250,000 -499,999	500,000 -999,999	1,000,000 -2,999,999	3,000,000 and Over	All SMSA's
1977						
Private Vehicles						
Auto, Van - Driver	46.2	45.8	46.2	46.6	44.1	45.8
Auto, Van - Passenger	30.5	32.9	32.4	29.9	25.2	29.9
Pickup	8.7	8.1	6.7	5.6	3.0	6.0
Other Private Vehicle	.4	.8	.9	.8	.5	.7
Subtotal	85.8	87.6	86.2	82.9	72.8	82.4
Public Transportation						
Bus, Sreetcar	1.5	1.4	1.8	2.4	4.6	2.5
Train	.0	.0	.0	.1	1.2	.3
Subway, Elevated Rail	.1	.1	.1	.2	1.6	.5
Subtotal	1.6	1.5	1.9	2.7	7.4	3.3
Other Means						
Walk	7.9	6.9	8.4	10.2	16.1	10.3
Bike	.8	.7	.6	.7	.5	.7
School Bus	2.8	2.4	2.0	2.6	2.0	2.3
Airplane	.1	.0	.1	.1	.1	.1
Other	1.0	.9	.8	.8	1.1	.9
Subtotal	12.6	10.9	11.9	14.4	19.8	14.3
TOTAL	100.0	100.0	100.0	100.0	100.0	
ALL	12.9	16.0	17.0	32.3	21.8	100.0
1983						
Private Vehicles						
Auto, Van - Driver	43.2	48.6	44.7	47.4	43.2	45.8
Auto, Van - Passenger	29.0	25.2	28.9	27.3	24.6	27.0
Pickup	9.5	10.2	10.0	7.6	4.6	8.0
Other Private Vehicle	.6	.5	.6	.4	.5	.5
Subtotal	82.3	84.5	84.2	82.7	72.9	81.3
Public Transportation						
Bus, Sreetcar	.6	.7	1.9	2.2	5.1	2.2
Train	.0	.1	.0	.4	.9	.3
Subway, Elevated Rail	.0	.0	.0	.1	1.7	.4
Subtotal	.6	.8	1.9	2.7	7.7	2.9
Other Means						
Walk	9.7	6.9	7.2	7.1	14.0	8.8
Bike	.8	.8	.7	.7	1.0	.8
School Bus	2.2	2.8	2.6	2.6	1.7	2.4
Airplane	.0	.1	.1	.1	.1	.1
Other	4.4	4.1	3.3	4.1	2.6	3.7
Subtotal	17.1	14.7	13.9	14.6	19.4	15.8
TOTAL	100.0	100.0	100.0	100.0	100.0	
ALL	16.4	14.5	13.6	27.2	21.1	100.0*

*Includes 7.2 percent unknown SMSA.

Tables 6-18 through 6-20 define relationships between family life cycle and average daily trips, average daily person miles of travel and average trip length, respectively, while Table 6-21 shows a relationship between mode of travel and family life cycle.

As would be expected, in households in which all members are over 16 years old, or of the age to qualify for a drivers license, over one-half of the trips were made by individuals driving themselves. Correspondingly, those households with children too young to drive had a higher proportion of private vehicle passenger trips, due in part to the transport of these children. For example, in households with two adults and at least one child too young to drive, approximately 36 percent of the trips were made as private vehicle passengers.

TABLE 6-18

AVERAGE DAILY PERSON TRIPS BY FAMILY LIFE CYCLE AND TRIP PURPOSE

	Single Adult, No Children	2 or More Adults, No Children	Single Adult, Youngest Child Under 6	2 or More Adults, Youngest Child Under 6	Single Adult, Youngest Child 6-15	2 or More Adults, Youngest Child 6-15
1977						
Earning a Living	.8	1.0	.3	.6	.5	.7
Family and Personal Business	.8	.9	.7	1.0	.8	.9
Civic, Educational, and Religious	.2	.2	.3	.3	.5	.5
Social and Recreational	.7	.8	.6	.7	.8	.7
Other	.0	.0	.0	.0	.0	.0
ALL	2.5	2.9	1.9	2.6	2.6	2.8
1983						
Earning a Living	.8	.9	.2	.5	.4	.6
Family and Personal Business	.9	1.1	.6	.8	.9	1.1
Civic, Educational, and Religious	.2	.2	.3	.3	.6	.5
Social and Recreational	.8	.8	.4	.6	.9	.8
Other	.0	.1	.1	.1	.1	.1
ALL	2.7	3.1	1.6	2.3	2.9	3.1

	Single Adult Youngest Child 16 or Older	2 or More Adults, Youngest Child 16 or Older	Single Adult Retired No Children	2 or More Adults, Retired No Children	All
1977					
Earning a Living	.7	.9	.0	.2	.7
Family and Personal Business	.8	.9	.1	1.0	.9
Civic, Educational, and Religious	.5	.4	.7	.2	.4
Social and Recreational	.8	.8	.6	.5	.7
Other	.0	.0	.0	.0	.0
ALL	2.8	3.0	1.4	1.9	2.7
1983					
Earning a Living	.8	.9	.0	.2	.6
Family and Personal Business	.7	.9	1.1	1.1	.9
Civic, Educational, and Religious	.4	.4	.1	.1	.3
Social and Recreational	1.0	.8	.8	.7	.7
Other	.0	.0	.0	.1	.1
ALL	2.9	3.0	2.0	2.2	2.6

TABLE 6-19

AVERAGE DAILY PERSON MILES OF TRAVEL BY FAMILY LIFE CYCLE AND TRIP PURPOSE

	Single Adult, No Children	2 or More Adults, No Children	Single Adult, Youngest Child Under 6	2 or More Adults, Youngest Child Under 6	Single Adult, Youngest Child 6-15	2 or More Adults, Youngest Child 6-15
1977						
Earning a Living	8.9	10.7	2.2	6.3	3.7	6.6
Family and Personal Business	4.1	6.4	2.8	6.2	3.4	6.0
Civic, Educational, and Religious	.8	1.1	.6	1.5	1.8	2.4
Social and Recreational	6.9	11.3	4.0	7.4	5.5	8.0
Other	2.3	3.6	.5	1.3	.4	.9
ALL	23.0	33.1	10.1	22.7	14.8	23.9
1983						
Earning a Living	7.4	8.0	1.6	6.1	2.5	5.8
Family and Personal Business	4.7	7.7	2.5	4.6	3.8	7.3
Civic, Educational, and Religious	.7	.8	.9	1.5	2.0	2.5
Social and Recreational	10.9	9.8	8.0	7.2	7.4	9.7
Other	.2	.5	.6	.5	.3	.7
ALL	23.9	26.8	13.6	19.9	16.0	26.0

	Single Adult Youngest Child 16 or Older	2 or More Adults, Youngest Child 16 or Older	Single Adult Retired No Children	2 or More Adults, Retired No Children	All
1977					
Earning a Living	6.0	9.1	.1	1.4	6.9
Family and Personal Business	4.5	6.0	2.4	5.9	5.8
Civic, Educational, and Religious	2.4	2.0	.6	.7	1.6
Social and Recreational	8.1	9.8	10.9	5.3	8.1
Other	1.0	1.7	.2	1.4	1.7
ALL	22.0	28.6	14.2	14.7	24.1
1983					
Earning a Living	4.4	8.3	.0	1.4	6.0
Family and Personal Business	5.0	6.5	4.0	5.4	6.0
Civic, Educational, and Religious	1.8	3.0	.3	.7	1.6
Social and Recreational	7.0	15.2	6.8	5.4	9.1
Other	.3	.3	.1	.2	.5
ALL	18.5	33.3	11.2	13.1	23.2

TABLE 6-20

AVERAGE TRIP LENGTH BY FAMILY LIFE CYCLE AND TRIP PURPOSE

	Single Adult, No Children	2 or More Adults, No Children	Single Adult, Youngest Child Under 6	2 or More Adults, Youngest Child Under 6	Single Adult, Youngest Child 6-15	2 or More Adults, Youngest Child 6-15
1977						
Earning a Living	10.7	11.2	7.4	10.8	7.4	10.2
Family and Personal Business	5.2	7.0	4.0	6.5	4.3	6.9
Civic, Educational, and Religious	4.9	5.4	1.8	4.6	3.5	4.5
Social and Recreational	9.5	15.0	6.7	10.2	6.7	10.7
Other	*	*	14.7	35.8	17.9	22.2
ALL	9.1	11.5	5.1	8.6	5.6	8.4
1983						
Earning a Living	9.6	9.2	7.5	12.4	6.3	9.9
Family and Personal Business	5.1	7.4	4.2	5.8	4.1	6.9
Civic, Educational, and Religious	3.9	3.8	3.7	5.1	3.5	4.9
Social and Recreational	13.8	12.1	20.1	12.2	8.7	11.8
Other	5.7	9.1	11.4	8.0	3.4	9.7
ALL	8.9	9.0	9.1	8.9	5.7	8.5

	Single Adult Youngest Child 16 or Older	2 or More Adults Youngest Child 16 or Older	Single Adult Retired No Children	2 or More Adults Retired No Children	All
1977					
Earning a Living	8.4	9.9	4.5	8.0	10.5
Family and Personal Business	5.5	6.7	3.4	6.0	6.4
Civic, Educational, and Religious	5.4	5.6	4.6	4.5	4.6
Social and Recreational	10.2	11.8	16.8	10.3	11.2
Other	25.0	*	13.0	*	48.3
ALL	7.8	9.4	9.4	8.0	9.0
1983					
Earning a Living	5.7	9.5	N/A	8.0	9.9
Family and Personal Business	7.5	7.0	3.8	4.8	6.3
Civic, Educational, and Religious	5.0	8.3	2.1	5.5	4.9
Social and Recreational	7.0	19.2	8.2	7.9	12.3
Other	11.6	6.3	6.6	3.5	8.0
ALL	6.6	11.2	5.5	6.0	8.7

*Insufficient data.

TABLE 6-21

DISTRIBUTION OF PERSON TRIPS BY FAMILY LIFE CYCLE AND MODE OF TRANSPORTATION

Family Life Cycle	Private Vehicle Driver	Private Vehicle Passenger	Public Transportation	School Bus	Other	Total
1977						
Single Adult, No Children	61.0	15.9	6.5	.0	16.6	100.0
Two or More Adults, No Children	63.3	24.2	3.2	.1	9.2	100.0
Single Adult, Youngest Child Under 6	25.9	37.0	6.4	5.1	25.6	100.0
Two or More Adults, Youngest Child Under 6	43.1	44.7	2.2	2.9	7.1	100.0
Single Adults, Youngest Child 6 to 15	35.4	36.3	5.0	5.5	17.8	100.0
Two or More Adults, Youngest Child 6 to 15	46.2	36.8	2.5	5.6	8.9	100.0
Single Adult, Youngest Child 16 or Older	57.2	28.7	3.2	1.5	9.4	100.0
Two or More Adults, Youngest Child 16 or Older	63.2	26.3	2.3	1.2	7.0	100.0
Single Adult, Retired, No Children	57.6	15.4	7.1	.0	19.9	100.0
Two or More Adults, Retired, No Children	55.4	32.9	1.7	.1	9.9	100.0
ALL	50.9	33.8	2.9	2.8	9.6	100.0
1983						
Single Adult, No Children	65.3	14.4	4.2	.0	16.1	100.0
Two or More Adults, No Children	58.7	26.0	2.3	.1	12.9	100.0
Single Adult, Youngest Child Under 6	36.8	26.3	9.9	5.4	21.6	100.0
Two or More Adults, Youngest Child Under 6	48.5	34.8	1.8	3.5	11.4	100.0
Single Adults, Youngest Child 6 to 15	35.6	34.8	4.5	7.0	18.1	100.0
Two or More Adults, Youngest Child 6 to 15	43.9	36.3	1.9	5.4	12.5	100.0
Single Adult, Youngest Child 16 or Older	49.6	24.8	3.6	3.3	18.7	100.0
Two or More Adults, Youngest Child 16 or Older	61.0	24.9	2.1	.8	11.2	100.0
Single Adult, Retired, No Children	62.5	13.7	3.0	.0	20.8	100.0
Two or More Adults, Retired, No Children	53.1	34.4	2.1	.1	10.3	100.0
ALL	51.8	30.2	2.5	2.6	12.9	100.0

Over time, there was a slight change in the distribution of travel modes for specific types of trips. Table 6-22 shows that in 1983 proportionately fewer people made trips for earning a living by driving themselves than in 1977 (32.8 percent vs. 34.7 percent), perhaps due to increased promotion and use of car and vanpooling nationwide. However, a greater percentage of people drove themselves for family and personal business in 1983 than in 1977 due in part to the trend of increased household vehicle ownership, and therefore availability. In addition, use of public transit for social and recreational trips increased from 13.7 to 18.1 percent between 1977 and 1983, perhaps due to the increased number of fixed rail systems and extensions constructed during this period.

TABLE 6-22

DISTRIBUTION OF PERSON TRIPS BY MODE OF TRANSPORTATION AND TRIP PURPOSE (WITHIN MODES)

	Private Vehicle Driver	Private Vehicle Passenger	Public Transportation	School Bus	Other*	All
1977						
Earning a Living	34.7	13.4	43.7	1.9	13.2	24.8
Family and Personal Business	35.0	36.1	17.9	1.6	31.4	33.6
Civic, Educational, and Religious	7.2	11.7	21.6	92.3	24.2	13.2
Social and Recreational	22.2	37.2	13.7	3.3	29.8	27.2
Other	.9	1.6	3.1	.9	1.4	1.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0
1983						
Earning a Living	32.8	9.5	42.0	.9	14.5	22.8
Family and Personal Business	39.4	35.7	16.2	.2	30.1	35.5
Civic, Educational, and Religious	5.3	12.7	22.7	95.6	16.6	11.8
Social and Recreational	21.4	37.7	18.1	3.0	36.1	27.6
Other	1.1	4.4	1.0	.3	2.7	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

*Includes airplane, bicycle and walk trips.

It is also interesting to observe in Table 6-22 the change over time in the distribution of specific types of household trips taking place. Trips for earning a living comprised a slightly smaller proportion of all trips in 1983 than in 1977 (22.8 percent vs. 24.8 percent), while family and business trips increased during this period from 33.6 to 35.5 percent of all household trips. This may reflect the proliferation in the number and type of services available.

While Table 6-22 reflects the distribution of the types of trips for a specific mode of transportation, Table 6-23 shows the distribution of modes for a specific type of trip.

TABLE 6-23

DISTRIBUTION OF PERSON TRIPS BY MODE OF TRANSPORTATION AND TRIP PURPOSE

(ACROSS MODES)

	Private Vehicle Driver	Private Vehicle Passenger	Public Transportation	School Bus	Other*	All
1977						
Earning a Living	71.3	18.2	5.2	.2	5.1	100.0
Family and Personal Business	53.0	36.2	1.6	.1	9.1	100.0
Civic, Educational, and Religious	27.9	30.0	4.8	19.5	17.8	100.0
Social and Recreational	41.4	46.2	1.5	.3	10.6	100.0
Other	37.6	42.7	7.5	2.1	10.1	100.0
ALL	50.9	33.8	3.0	2.8	9.5	100.0
1983						
Earning a Living	74.5	12.6	4.5	.1	8.3	100.0
Family and Personal Business	57.5	30.4	1.1	.0	11.0	100.0
Civic, Educational, and Religious	23.4	32.5	4.7	21.3	18.1	100.0
Social and Recreational	40.1	41.1	1.6	.3	16.9	100.0
Other	25.8	57.9	.8	.4	15.1	100.0
ALL	51.8	30.2	2.5	2.6	12.9	100.0

*Includes airplane, bicycle and walk trips.

Table 6-24 shows the likelihood in 1983 of using a specific mode of transportation for different trip purposes. Household members were more likely to use a private vehicle to drive to and from work (over 75 percent) than any other mode of transportation.

For family and personal business trips, 57.5 percent drove while approximately 30.4 percent were private vehicle passengers. The two remaining categories of trip purposes listed in Table 6-24, civic, educational, and religious, and social and recreational, had more people who rode as passengers than served as drivers. This was due in part to the nature of the trip, where it was common for family and friends to drive together, particularly transporting children unable to drive themselves.

TABLE 6-24

DISTRIBUTION OF PERSON TRIPS BY MODE OF TRANSPORTATION AND TRIP PURPOSE

(1983)

	Private Vehicle Driver	Private Vehicle Passenger	Public Transportation	School Bus	Other	Total
Earning A Living						
Home to Work	75.2	12.2	4.6	.1	7.9	100.0
Work Related	68.1	16.1	4.2	.0	11.6	100.0
Subtotal	74.5	12.6	4.5	.1	8.3	100.0
Family and Personal Business						
Shopping	56.1	32.1	.9	.0	10.9	100.0
Medical or Dental	46.5	44.1	4.2	.3	4.9	100.0
Other Family or Personal Business	59.8	27.4	1.2	.0	11.6	100.0
Subtotal	57.5	30.4	1.1	.0	11.0	100.0
Civic, Educational, and Religious	23.4	32.5	4.8	21.2	18.1	100.0
Social and Recreational						
Visiting Friends	45.1	37.1	1.8	.0	16.0	100.0
Pleasure Driving	34.5	62.0	.0	.0	3.5	100.0
Vacation	19.4	54.0	4.6	.0	22.0	100.0
Other	37.1	43.0	1.5	.5	17.9	100.0
Subtotal	40.1	41.1	1.6	.3	16.9	100.0
Other	25.8	57.9	.8	.4	15.1	100.0
ALL	51.8	30.2	2.5	2.6	12.9	100.0

PERSONAL TRAVEL: TIME OF DAY

As shown in Table 6-25, the most heavily concentrated period for trip-making was during the three hour period of 4 p.m. to 7 p.m., when 21 percent of all trips occurred. Of the time periods depicted in the table, the 9 a.m. to 4 p.m. period had a larger distribution of daily trips at 44 percent, but covered a 7 hour, or much larger, time frame.

Approximately one-third of all commuting to work took place between 6 a.m. and 8:59 a.m. (the morning rush hours), approximately one-quarter between 4 p.m. and 6:59 p.m. (the afternoon rush hours), and another one-quarter between 9 a.m. and 3:59 p.m. (midday).

Most family and personal business activity, 57.1 percent or an 8 percent hourly average, occurred midday between 9 a.m. and 3:59 p.m., with slightly fewer trips, averaging 7 percent per hour, made between 4 p.m. and 6:59 p.m. The highest hourly average for civic, educational, and religious trips, at 11 percent, took place between 6 a.m. and 8:59 a.m., while the most concentrated period of social and recreational trips, at an hourly average of 6 percent, occurred between 7 p.m. and 11:59 p.m.

TABLE 6-25

DISTRIBUTION OF PERSON TRIPS BY PURPOSE AND TIME OF DAY

(ACROSS TIME PERIODS)

	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 3:59 p.m.	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 11:59 p.m.	12:00 a.m. to 5:59 a.m.	Total
Earning a Living						
To or From Work	32.4	26.7	25.2	9.3	6.4	100.0
Work Related Business	11.9	59.4	15.4	9.8	3.5	100.0
Subtotal	30.2	30.1	24.2	9.4	6.1	100.0
Family and Personal Business						
Shopping	3.5	57.2	22.3	14.0	3.0	100.0
Doctor/Dentist	8.8	70.4	14.7	3.2	2.9	100.0
Other Family or Business	10.4	56.0	20.3	10.8	2.5	100.0
Subtotal	7.0	57.1	21.2	12.0	2.7	100.0
Civic, Educational, and Religious	31.5	48.1	10.0	8.6	1.8	100.0
Social and Recreational						
Vacation	15.6	53.2	15.4	13.2	2.6	100.0
Visiting Friends	3.8	39.9	24.1	28.1	4.1	100.0
Pleasure Driving	4.1	53.7	22.7	15.5	4.0	100.0
Other Social and Recreational	4.6	35.3	24.0	32.0	4.1	100.0
Subtotal	4.4	37.7	24.0	29.8	4.1	100.0
Other	11.0	49.0	20.4	16.4	3.2	100.0
ALL	14.6	44.3	21.3	16.0	3.8	100.0

During the various time periods of the day, different types of trips tended to predominate (Table 6-26). Between 6 a.m. and 9 a.m., the typical weekday morning rush-hour period, almost one-half of the trips were work-related, as would be expected. Then, from 9 a.m. to 4 p.m., the central portion of the day, between the typical morning and afternoon commute periods, almost one-half of the trips pertained to family and personal business.

During the typical afternoon rush period, between 4 p.m. and 7 p.m., no one trip type predominated. Therefore, it is interesting to note that only one-quarter of the trips during this period were made by commuters, while approximately one-third of the trips pertained to family and personal business, and another one-third to social and recreational trips. Then, during the early morning hours between 12 a.m. and 6 a.m., work trips again predominated, with one-third of the trips.

TABLE 6-26

DISTRIBUTION OF PERSON TRIPS BY PURPOSE AND TIME OF DAY

(WITHIN TIME PERIODS)

	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 3:59 p.m.	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 11:59 p.m.	12:00 a.m. to 5:59 a.m.	All
Earning a Living						
To of From Work	45.6	12.3	24.2	11.8	35.2	20.4
Work Related Business	1.9	3.2	1.7	1.4	2.2	2.4
Subtotal	47.5	15.5	25.9	13.2	37.4	22.8
Family and Personal Business						
Shopping	4.4	23.3	19.0	15.4	12.8	18.1
Doctor/Dentist	.8	2.0	.9	.3	1.0	1.2
Other Family or Business	11.5	20.2	15.3	10.8	10.7	16.1
Subtotal	16.7	45.5	35.2	26.5	24.5	35.4
Civic, Educational, and Religious	25.8	12.9	5.6	6.4	5.5	11.8
Social and Recreational						
Vacation	.3	.3	.2	.2	.2	.3
Visiting Friends	2.8	9.9	12.5	19.4	12.0	11.0
Pleasure Driving	.1	.7	.6	.5	.6	.5
Other Social and Recreational	5.0	12.7	17.9	31.5	18.0	15.9
Subtotal	8.2	23.6	31.2	51.6	30.8	27.7
Other	1.8	2.5	2.1	2.3	1.8	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

PERSONAL TRAVEL: WEEKDAY, WEEKEND

Table 6-27 shows the distribution of trip purposes for a particular day of the week, while Table 6-28 shows the distribution of trips for a particular purpose by day of the week. It is not surprising to note that less than 11 percent of all work and work-related trips occurred on the weekend, while social and recreational and family and personal business accounted for over 80 percent of all Saturday trips.

TABLE 6-27

DISTRIBUTION OF PERSON TRIPS BY PURPOSE AND DAY OF THE WEEK

(WITHIN DAY OF WEEK)

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	All
Earning a Living								
To or From Work	23.4	26.2	26.9	27.1	21.6	9.3	6.0	20.4
Work Related Business	2.5	3.5	2.7	2.6	1.8	1.9	1.3	2.4
Subtotal	25.9	29.7	29.6	29.7	23.4	11.2	7.3	22.8
Family and Personal Business								
Shopping	16.2	17.2	15.7	16.4	18.6	26.1	16.5	18.1
Doctor/Dentist	1.6	1.8	1.5	1.5	1.6	.4	.1	1.2
Other Family or Business	19.3	16.4	17.0	17.9	17.2	13.5	10.3	16.1
Subtotal	37.1	35.4	34.2	35.8	37.4	40.0	26.9	35.4
Civic, Educational, and Religious	11.1	14.2	12.2	12.1	10.1	4.2	19.3	11.8
Social and Recreational								
Vacation	.6	.2	.0	.4	.2	.4	.2	.3
Visiting Friends	9.4	7.4	7.5	7.1	10.7	15.4	21.2	11.0
Pleasure Driving	.4	.3	.4	.2	.4	.8	1.5	.5
Other Social and Recreational	12.9	10.5	14.3	12.3	15.2	25.3	21.7	15.9
Subtotal	23.3	18.4	22.2	20.0	26.5	41.9	44.6	27.7
Other	2.6	2.3	1.8	2.4	2.6	2.7	1.9	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

In general, the distribution of particular types of trips within the time periods for weekdays, displayed in Table 6-29, did not change much over time. Exceptions included the increase in the proportion of family and personal business trips between 1977 and 1983 during all time periods except 9 a.m. to 4 p.m. when it remained steady. The percentage of civic, educational, and religious trips decreased between 7 p.m. and midnight, but increased between midnight and 6 a.m.

TABLE 6-28

DISTRIBUTION OF PERSON TRIPS BY PURPOSE AND DAY OF THE WEEK

(ACROSS DAY OF WEEK)

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total
Earning a Living								
To or From Work	16.6	18.2	19.2	19.6	16.5	6.2	3.7	100.0
Work Related Business	15.9	21.3	16.8	16.0	12.0	11.1	6.9	100.0
Subtotal	16.5	18.5	19.0	19.2	16.1	6.7	4.0	100.0
Family and Personal Business								
Shopping	13.0	13.5	12.8	13.4	16.2	19.6	11.5	100.0
Doctor/Dentist	18.9	20.4	17.5	18.1	19.9	4.4	.8	100.0
Other Family or Business	17.3	14.5	15.5	16.4	16.7	11.4	8.2	100.0
Subtotal	15.2	14.2	14.2	14.9	16.5	15.3	9.7	100.0
Civic, Educational, and Religious	13.6	17.1	15.1	15.2	13.4	4.9	20.7	100.0
Social and Recreational								
Vacation	29.1	8.6	1.4	21.5	11.8	18.5	9.1	100.0
Visiting Friends	12.3	9.5	10.0	9.5	15.3	19.0	24.4	100.0
Pleasure Driving	10.9	7.1	9.3	5.9	11.4	20.0	35.4	100.0
Other Social and Recreational	11.8	9.4	13.2	11.5	15.0	21.7	17.4	100.0
Subtotal	12.2	9.4	11.7	10.7	15.0	20.5	20.5	100.0
Other	16.2	13.9	11.4	14.6	17.3	16.0	10.6	100.0
ALL	14.5	14.2	14.6	14.8	15.7	13.6	12.6	100.0

TABLE 6-29

DISTRIBUTION OF WEEKDAY PERSON TRIPS BY TIME OF DAY AND PURPOSE

(WITHIN TIME OF DAY)

	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 3:59 p.m.	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 11:59 p.m.	12:00 a.m. to 5:59 a.m.	Unknown	All
1977							
Earning a Living	55.5	19.6	37.9	17.4	53.6	28.5	30.2
Family and Personal Business	9.6	48.3	30.4	25.7	7.5	34.3	33.1
Civic, Educational, and Religious	28.9	13.8	6.6	9.9	1.7	11.4	13.8
Social and Recreational	5.0	17.1	23.8	45.6	35.2	23.2	21.6
Other	1.0	1.2	1.3	1.4	2.0	2.6	1.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1983							
Earning a Living	50.3	19.3	31.1	15.4	46.2	31.0	27.6
Family and Personal Business	15.5	48.2	36.4	28.4	23.7	46.3	36.0
Civic, Educational, and Religious	26.8	12.2	5.0	6.2	6.2	2.1	11.9
Social and Recreational	5.8	17.8	25.2	47.4	22.5	16.6	22.2
Other	1.6	2.5	2.3	2.6	1.4	4.0	2.3
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 6-30 lists weekend person trip distribution by purpose for each time period during the day.

Table 6-31 displays the distribution of weekend person trips by time of day. Over one-half of all trips were made during the middle portion of the day, the seven hour period between 9 a.m. and 3:59 p.m. Another 36 percent of the trips took place in the late afternoon through the evening, from 4 p.m. to midnight.

TABLE 6-30

DISTRIBUTION OF WEEKEND PERSON TRIPS BY TIME OF DAY AND PURPOSE

(WITHIN TIME OF DAY)

	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 3:59 p.m.	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 11:59 p.m.	12:00 a.m. to 5:59 a.m.	Unknown	All
1977							
Earning a Living	34.9	8.0	10.3	8.2	21.1	6.3	10.4
Family and Personal Business	20.3	42.9	32.8	19.8	9.0	45.7	34.5
Civic, Educational, and Religious	19.3	14.5	7.2	7.1	1.9	4.6	11.5
Social and Recreational	23.4	33.3	48.2	63.9	65.0	40.5	42.2
Other	2.1	1.3	1.5	1.0	3.0	2.9	1.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1983							
Earning a Living	28.2	7.1	9.4	7.4	14.3	6.5	9.3
Family and Personal Business	24.9	39.7	31.4	21.0	26.5	56.7	33.6
Civic, Educational, and Religious	18.7	14.3	7.4	6.7	3.7	2.6	11.5
Social and Recreational	25.6	36.3	50.1	63.1	52.6	33.4	43.2
Other	2.6	2.6	1.7	1.8	2.9	.8	2.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 6-31

DISTRIBUTION OF WEEKEND PERSON TRIPS BY TIME OF DAY AND PURPOSE

(ACROSS TIME OF DAY)

	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 3:59 p.m.	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 11:59 p.m.	12:00 a.m. to 5:59 a.m.	Unknown	All
1977							
Earning a Living	19.1	40.2	20.9	14.2	5.4	.2	100.0
Family and Personal Business	3.3	65.1	19.9	10.3	.7	.7	100.0
Civic, Educational, and Religious	9.5	65.8	13.1	11.0	.5	.1	100.0
Social and Recreational	3.1	41.2	23.9	27.2	4.1	.5	100.0
Other	8.4	49.2	22.2	13.8	5.6	.8	100.0
ALL	5.7	52.3	21.0	17.9	2.7	.4	100.0
1983							
Earning a Living	20.9	40.0	19.4	13.2	5.8	.7	100.0
Family and Personal Business	5.1	62.0	18.0	10.3	3.0	1.6	100.0
Civic, Educational, and Religious	11.2	65.3	12.4	9.6	1.2	.3	100.0
Social and Recreational	4.1	44.1	22.3	24.1	4.6	.8	100.0
Other	8.0	61.0	14.0	12.2	4.8	.0	100.0
ALL	6.9	52.6	19.2	16.5	3.8	1.0	100.0

Interestingly, this was not very different from the distribution of weekday trips shown in Table 6-32, where over 40 percent occurred midday, compared to over 50 percent during the weekend, and 38 percent took place during the late afternoon and evening, compared to 36 percent on a weekend (Figure 6-8). Nighttime trip distributions were also similar for both the weekend and weekday, approximating 4 percent of all trips. Only early morning trips seemed to vary by time of the week. Weekday morning rush hours, between 6 a.m. and 9 a.m., comprised 17 percent of the weekday's trips, compared to 7 percent of the trips during the same time period for a typical weekend.

FIGURE 6-8

DISTRIBUTION OF WEEKDAY AND WEEKEND PERSON TRIPS

(1983)

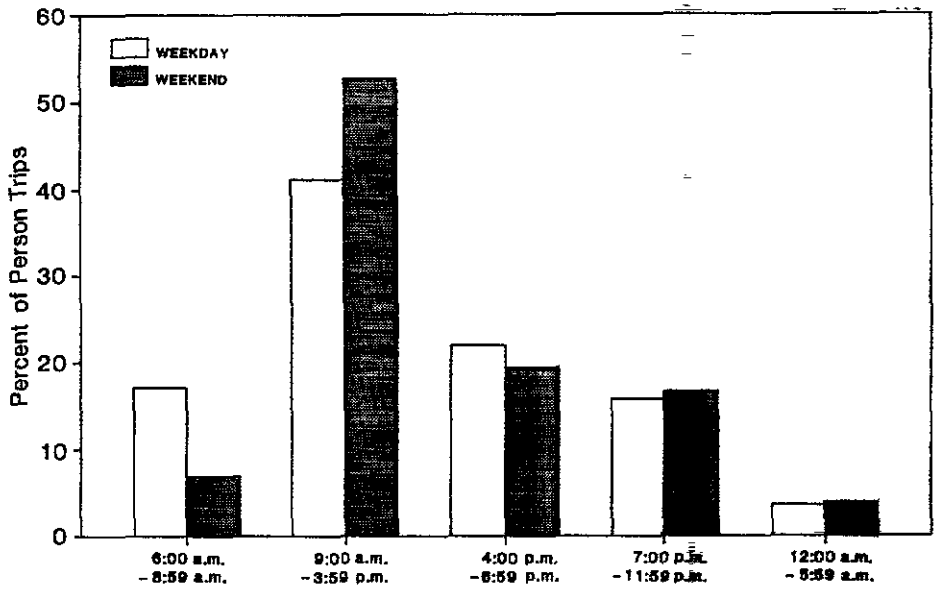


TABLE 6-32

DISTRIBUTION OF WEEKDAY PERSON TRIPS BY TIME OF DAY AND PURPOSE

(ACROSS TIME OF DAY)

	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 3:59 p.m.	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 11:59 p.m.	12:00 a.m. to 5:59 a.m.	Unknown	Total
1977							
Earning a Living	30.8	27.0	28.6	9.3	3.9	.4	100.0
Family and Personal Business	4.8	60.8	21.0	12.5	.5	.4	100.0
Civic, Educational, and Religious	35.1	41.8	10.9	11.5	.3	.4	100.0
Social and Recreational	3.9	32.9	25.2	33.9	3.6	.5	100.0
Other	14.6	38.8	23.9	18.2	3.6	.9	100.0
ALL	16.8	41.7	22.9	16.1	2.2	.3	100.0
1983							
Earning a Living	31.2	29.0	24.6	8.8	6.0	.4	100.0
Family and Personal Business	7.4	55.1	22.1	12.4	2.4	.6	100.0
Civic, Educational, and Religious	38.5	42.2	9.1	8.2	2.0	.0	100.0
Social and Recreational	4.5	33.0	24.8	33.6	3.6	.5	100.0
Other	12.0	44.6	22.5	17.7	2.4	.8	100.0
ALL	17.1	41.1	21.9	15.7	3.6	.6	100.0

7

WORKERS AND JOURNEY TO WORK

INTRODUCTION

In this chapter, information is provided on workers and their home-to-work travel. Summary tables are provided on worker characteristics such as place of residence, income, age and sex, and occupation. Information on home-to-work travel includes average trip length, average commute time, mode of travel, day of week, time of day, vehicle occupancy, and carpool size and arrangements.

Whenever possible, data on these characteristics for the 1983 NPTS are reported with data from earlier (1969 and 1977) NPTS surveys to illustrate trends. The reporting in the chapter is comparable to material presented in Report No. 4 in the 1977 NPTS report series and Report No. 8 in the 1969 series.

The chapter includes the following data:

- percentage of workers, average home-to-work trip length, and average commute time;
- mode of home-to-work travel;
- home-to-work trip occupancy; and
- carpool size and carpool arrangement.

Significant changes occurred in home-to-work travel patterns between the first NPTS in 1969 and 1983, when these data were collected. Perhaps most significant is the larger proportion of women who entered the workforce during this period (women workers increased from 36.0 percent to 43.0 percent in the 14-year period). There was a considerable shift in the percentage of population residing in SMSA's, but outside the central city (a change from 35.6% to 44.2% in the short period of time from 1977 to 1983). As the workforce shifts from a manufacturing economy to a service economy, and as the "baby boom" population matures, these changes will affect home-to-work travel and the resultant demands on the transportation system.

The NPTS survey questionnaire contains seven sections, two of which are used as sources of data for home-to-work trips and travel. Section III of the questionnaire contains a series of

questions on the respondent's occupation and characteristics of the usual home-to-work trip, such as mode, distance, and time. Section VI of the questionnaire requires specific detailed information on all trips taken by household members on a designated travel day. Information collected in Section VI includes trip purpose, mode of transportation, distance, trip time, and vehicle occupancy. It is quite possible that there may be some differences between the worker's usual work trip, as reported in Section III, and the home-to-work trip on a specific travel day (Section VI). For example, a person may report "auto" as the usual means of travel to work, however, public transportation may have been used on the designated travel day because the car was in a repair shop. Average trip length data obtained from both sources do actually vary; see Data Considerations for possible explanations.

The first section of this chapter, which discusses workers and their home-to-work travel (Tables 7-1 through 7-7), is based on Section III of the NPTS survey. The second section, which discusses mode of home-to-work travel (Tables 7-8 through 7-16), is based on Section VI of the NPTS survey. The vehicle occupancy section (Tables 7-17 through 7-21) is also based on Section VI. The last section (Tables 7-22 through 7-26), which discusses carpool size and arrangement, is based on Section III of the NPTS survey.

SUMMARY OF NATIONAL ESTIMATES USED IN THIS CHAPTER

	1969	1977	1983
Workers	75,758	93,019	103,244
Annual Person Trips To and From Work	37,638,363	43,767,000	46,493,000
Annual Vehicle Trips To and From Work	27,822,015	31,372,000	35,369,000
Annual VMT To and From Work	261,487,666	284,738,000	302,058,000

Note: All numbers in thousands.

WORKERS, HOME-TO-WORK TRAVEL: PLACE OF RESIDENCE

The most significant population shift between 1977 and 1983 was the decrease in population outside SMSA's and the increase in population inside SMSA's not in central cities. The percentage of workers living in SMSA's increased from 67.8 percent in 1977 to 76.0 percent in 1983 (Table 7-1 and Figure 7-1). Most of the growth in these areas occurred in the suburbs and other areas outside the central city. The percentage of workers living in central cities inside SMSA's decreased from 32.2 percent in 1977 to 29.0 percent in 1983.

The average trip length for all workers, regardless of where they lived, increased from 9.3 miles in 1977 to 9.9 miles in 1983. In fact, trip lengths for all categories shown in Table 7-1 increased. The longest commutes in both 1977 and 1983 were for workers living in areas outside central cities in SMSA's. The shortest trip lengths were for those residing inside central cities of SMSA's.

FIGURE 7-1

CHANGES IN DISTRIBUTION OF WORKERS BY PLACE OF RESIDENCE

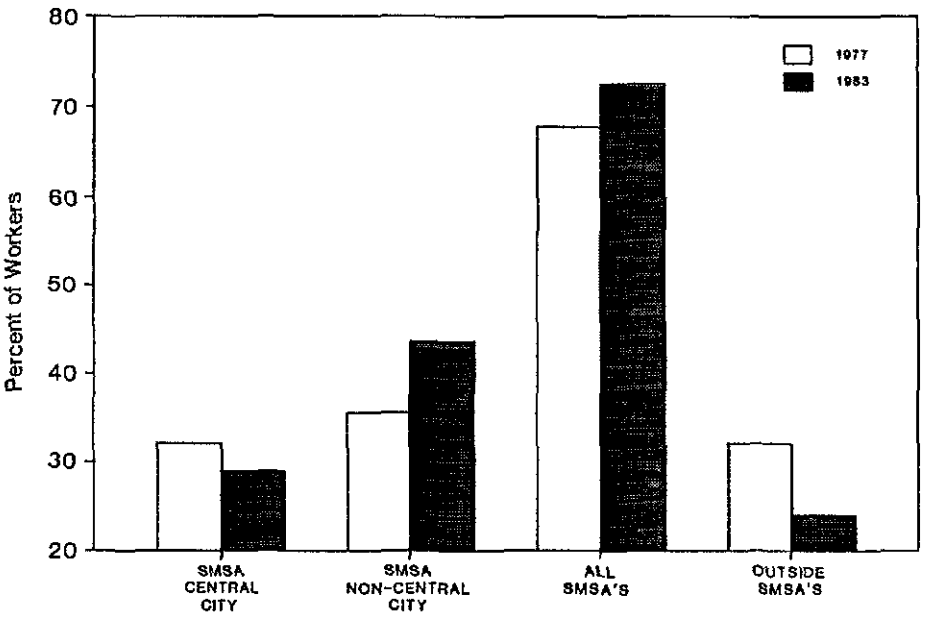


TABLE 7-1

WORKERS AND THEIR HOME-TO-WORK TRAVEL* BY PLACE OF RESIDENCE

	Inside SMSA's				
	Within Central City	Not in Central City	Subtotal	Outside SMSA's	Total
1977					
Percent of Workers (93,019,000)	32.2	35.6	67.8	32.2	100.0
Average Trip Length (Miles)	7.6	10.6	9.2	9.6	9.3
Average Commute Time (Minutes)	20.1	21.4	20.8	17.6	19.8
1983					
Percent of Workers (103,224,000)	29.0	43.6	76.0**	24.0	100.0
Average Trip Length (Miles)	8.0	11.1	9.8	10.6	9.9
Average Commute Time (Minutes)	20.5	21.5	20.9	18.4	20.4

Note: Comparable data not available for 1969.

*Average trip length and commute time is based upon the worker's "usual" home-to-work trip. See Data Considerations for an explanation of differences in "usual" and actual trip distances.

**Includes 3.4% of workers who live in SMSA's, but location in SMSA is unknown.

Figure 7-2A shows the changes in trip length between 1977 and 1983.

The average travel time to work in 1983 was 20.4 minutes. This is slightly higher than the 19.8 average in 1977. Workers who live inside SMSA's spent more time traveling to work than those living outside SMSA's.

Travel times for SMSA workers remained relatively stable during the period 1977-1983 for both central city and non-central city residents (Figure 7-2B). If a calculation of travel speed* is made from the time and distances shown, it is interesting to note that the commute speed for all SMSA workers increased from 26.5 to 28.1 miles per hour (Figure 7-2C). For workers living outside central cities, the speed increased from 29.7 to 31.0 miles per hour. For central city resident workers, the speed increased from 22.7 to 23.4 miles per hour.

For those living outside SMSA's, commute time increased from 17.6 to 18.4 minutes. The distance also increased, and the average travel speed increased from 32.7 to 34.6 miles per hour.

*Commuting Speed

$$= \frac{60 \times \text{Average Trip Length}}{\text{Average Commute Time}}$$

FIGURE 7-2A

CHANGES IN AVERAGE TRIP LENGTH OF HOME-TO-WORK TRIPS BY PLACE OF RESIDENCE

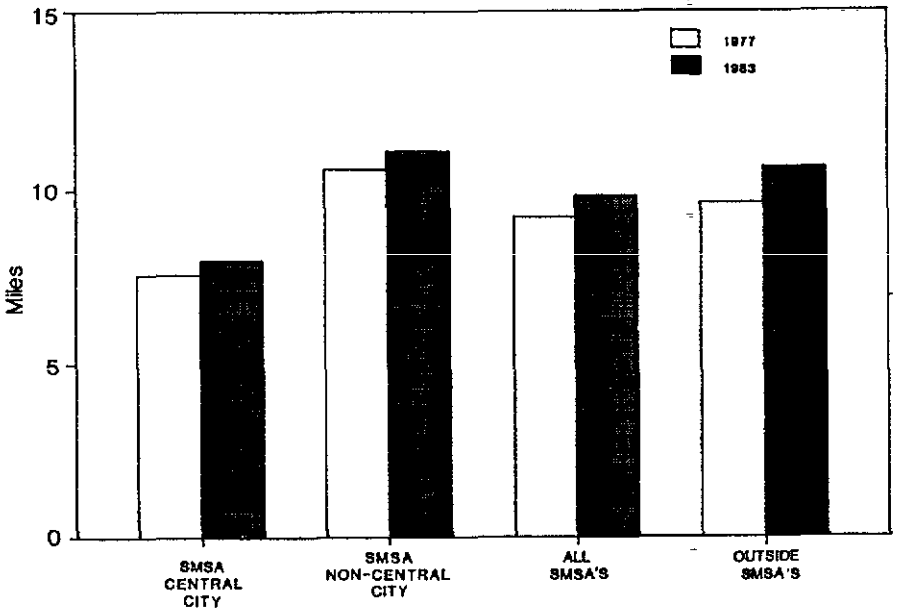
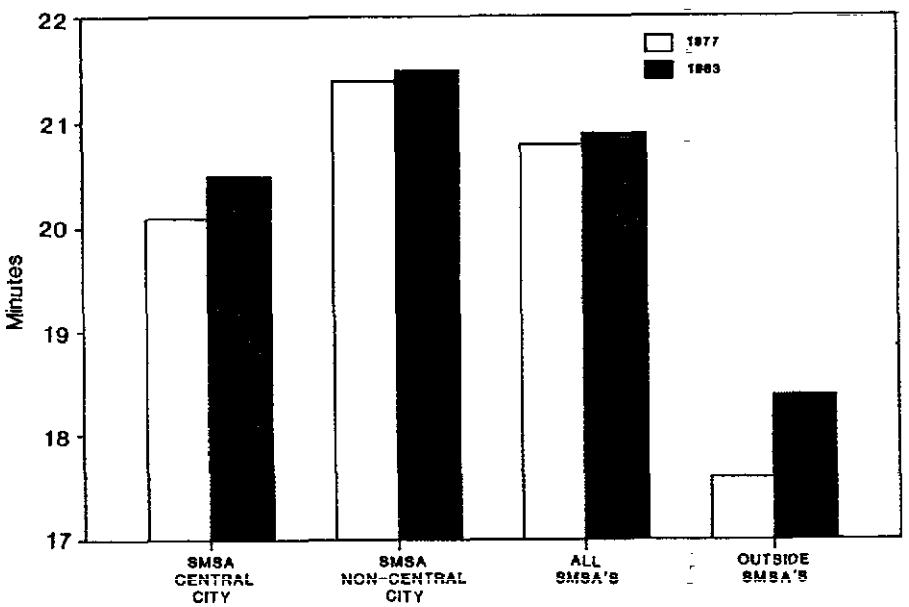


FIGURE 7-2B

CHANGES IN AVERAGE COMMUTE TIME BY PLACE OF RESIDENCE



WORKERS, HOME-TO-WORK TRAVEL: SMSA SIZE

Table 7-2 lists characteristics of SMSA work travel by SMSA size.

Commuting time increases as SMSA size increases. Using 1983 as an illustration, the commute time increased from a low of 15.3 minutes in SMSA's with less than 250,000 population to 26.8 minutes in SMSA's with 3 million or more residents. This significant difference represents about a 75 percent greater travel time in the most populated areas.

Between 1969 and 1983, commute time decreased in all SMSA size groups, except in areas where the population exceeded 3 million residents, where commute times increased slightly. On average, the commute time decreased almost 10 percent from 23.1 to 20.9 minutes in all SMSA's.

For 1983, Figure 7-3 illustrates the variation in commute time, trip length, and average speed by SMSA size.

Between 1969 and 1977, average trip length decreased for all SMSA's from 9.7 to 9.2 miles, but then increased again to 9.8 miles in 1983. It is interesting to note that the average travel speed was less for the largest SMSA's in 1983 than it was for any of the smaller SMSA's (Figure 7-3).

FIGURE 7-2C

CHANGES IN AVERAGE SPEED (MPH) OF HOME-TO-WORK TRIPS BY PLACE OF RESIDENCE

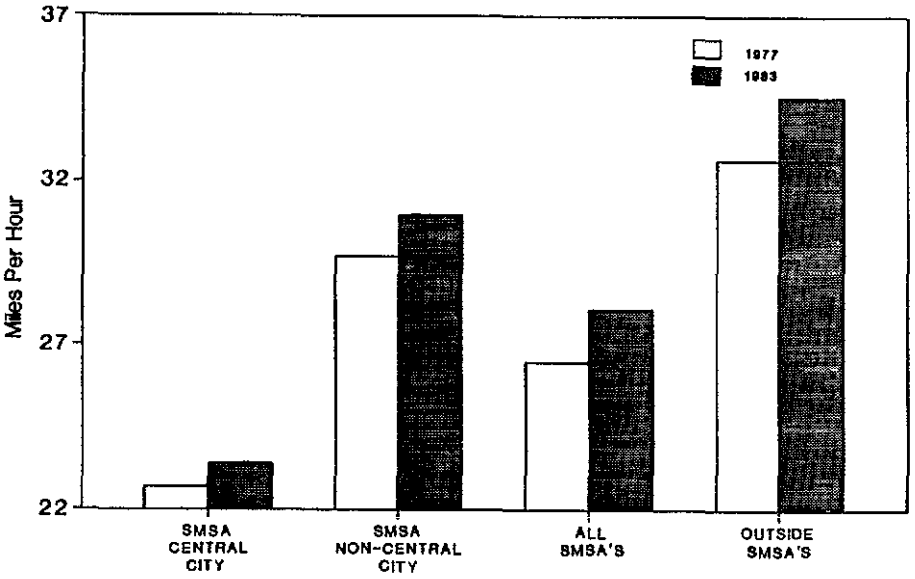


TABLE 7-2

WORKERS AND THEIR HOME-TO-WORK TRAVEL BY SMSA SIZE (SMSA'S ONLY)

	Less than 250,000	250,000-499,999	500,000-999,999	1,000,000-2,999,999	3,000,000 and Over	All SMSA's
1969						
Percent Workers (47,091,000)	15.0	13.9	15.5	29.6	26.0	100.0
Average Trip Length (Miles)	7.7	10.6	8.8	9.2	11.3	9.7
Average Commute Time (Minutes)	19.4	19.8	21.2	23.7	25.6	23.1
Average Travel Speed (mph)	23.8	32.1	24.9	23.3	26.5	25.2
1977						
Percent Workers (63,063,000)	12.5	15.2	16.3	32.4	23.6	100.0
Average Trip Length (Miles)	7.5	7.9	8.7	9.9	10.2	9.2
Average Commute Time (Minutes)	16.9	17.1	18.9	21.8	25.2	20.8
Average Travel Speed (mph)	26.6	27.7	27.6	27.2	24.3	26.5
1983						
Percent Workers (80,086,000)	14.5	13.5	12.4	29.3	23.4	100.0*
**Average Trip Length (Miles)	7.1	9.9	8.6	10.8	11.2	9.8
Average Commute Time (Minutes)	15.3	18.8	17.9	22.1	26.8	20.9
Average Travel Speed (mph)	27.8	31.6	28.8	29.3	25.1	28.1

*Includes 6.9 percent of workers living in SMSA's, but location in SMSA is unknown.
**See Data Considerations for an explanation of differences in "usual" and actual trip distances.

WORKERS, HOME-TO-WORK TRAVEL: HOUSEHOLD INCOME

People tend to live further from their work as their incomes increase. In 1983, for example, home to work trip length was 7.9 miles for people with incomes less than $10,000 (Table 7-3). People with incomes over $40,000 traveled an average of 11.5 miles from home to work. The same tendency was true in 1983 for average commute time, which increased from 18.8 minutes for the lowest income group to 22.2 minutes for the highest income groups. The same tendency was observed in 1969 and in 1977.

Between 1969 and 1977, average commute time decreased for workers in each of the income groups. The trend was reversed between 1977 and 1983 when commute time for each income group rose slightly; however, it remained below the 1969 level. Although travel time for all groups decreased between 1969 and 1983, the drop was not uniform. Travel time for workers with incomes below $10,000 dropped only 0.7 minutes from 1969 to 1983, while it dropped 2.8 minutes during the same period for those with incomes over $40,000.

As income increases so does the speed of traveling to work. For the lowest income group, the speed was 25.2 miles per hour. The speed increased for each higher income group to 27.2, 30.4 and 31.1 miles per hour, respectively. Such variation in travel time, distance, and travel speed is probably due to residential location and mode of travel used by the different income groups.

FIGURE 7-3

WORKERS AND THEIR COMMUTE CHARACTERISTICS BY SMSA SIZE (1983)

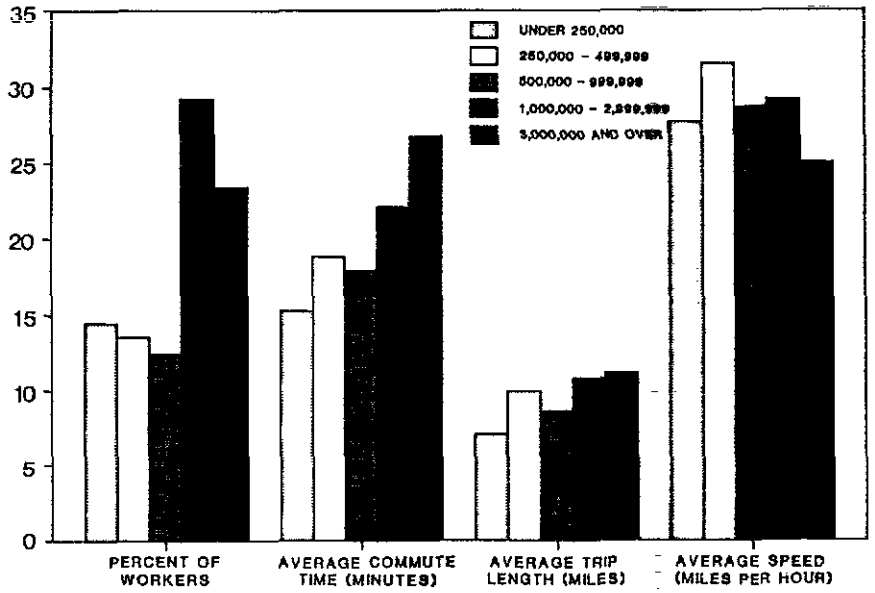


TABLE 7-3

WORKERS AND THEIR HOME-TO-WORK TRAVEL BY HOUSEHOLD INCOME

	Household Income (1983 Dollars)				
	Under $10,000	$10,000-19,999	$20,000-39,999	Over $40,000	Total
1969					
Percent of Workers (75,758,000)	12.2	27.9	47.0	12.9	100.0
Average Trip Length (Miles)	N/A	N/A	N/A	N/A	9.7
Average Commute Time (Minutes)	19.5	21.6	21.5	25.0	23.1
Average Travel Speed (MPH)	N/A	N/A	N/A	N/A	25.2
1977					
Percent of Workers (93,019,000)	10.8	23.6	47.3	18.3	100.0
Average Trip Length (Miles)	7.3	8.1	9.6	11.0	9.3
Average Commute Time (Minutes)	18.0	18.5	20.0	21.9	19.8
Average Travel Speed (MPH)	24.3	26.3	28.8	30.1	28.2
1983					
Percent of Workers (103,244,000)	11.2	24.6	42.7	21.5	100.0
*Average Trip Length (Miles)	7.9	8.7	10.4	11.5	9.9
Average Commute Time (Minutes)	18.8	19.2	20.5	22.2	20.4
Average Travel Speed (MPH)	25.2	27.2	30.4	31.1	29.1

*See Data Considerations for explanation of differences between "usual" and actual trip lengths.

WORKERS, HOME-TO-WORK TRAVEL: AGE

In general, average trip length increased with the age of workers up to about age 35 in 1977. Beginning at age 35, average trip length decreased (Table 7-4). The shortest trip lengths (4.1 and 4.8 miles, respectively) were reported for the youngest and oldest age groups.

The above tendency continued in 1983, except the age at which the drop in trip lengths occurred was about 50 years of age.

Commute time increased slightly between 1977 and 1983 from 19.8 minutes to 20.4 minutes.

In the period 1969 to 1983, the age distribution of the population shifted significantly. The shift reflects the entry of persons born during the "baby boom" years (1945 to 1965) into the workforce. In 1969 for example, 49 percent of the workers were under 40 years of age as compared to 60 percent in 1983. Likewise, in the age group of 50 years and older, there were 21.8 percent in 1983 as compared to 28.3 percent in 1969 (Figure 7-4). Basically, then, the workforce was younger in 1983 than in 1969.

FIGURE 7-4

ACCUMULATED PERCENTAGE OF WORKERS BY AGE

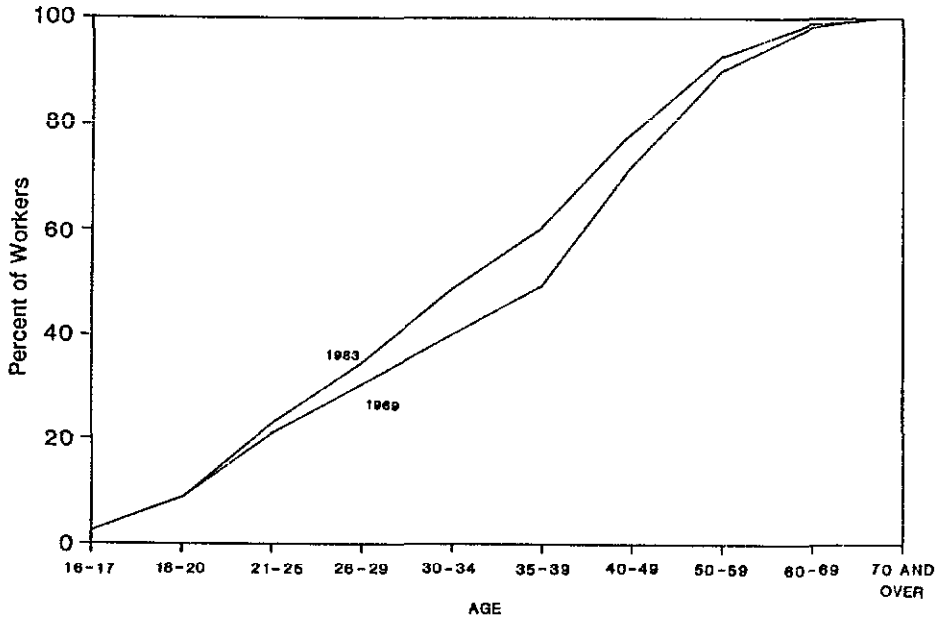


TABLE 7-4

WORKERS AND THEIR HOME-TO-WORK TRAVEL BY AGE

	16-17	18-20	21-25	26-29	30-34	35-39	40-49	50-59	60-69	70 and Older	Total
1969											
Percent of Workers (75,758,000)	2.2	6.5	12.2	8.9	9.4	9.8	22.7	18.1	8.6	1.6	100.0
1977											
Percent of Workers (93,019,000)	3.3	8.1	14.7	11.2	11.8	9.9	17.8	15.8	6.2	1.2	100.0
Average Trip Length (Miles)	4.1	7.3	9.1	9.8	11.0	10.7	10.2	9.0	7.5	4.8	9.3
Average Commute Time (Minutes)	11.9	16.4	19.3	20.8	21.5	21.0	20.8	20.5	18.7	17.1	19.8
Average Travel Speed (MPH)	20.7	26.7	28.3	28.3	30.7	30.6	29.4	26.3	24.1	16.8	28.2
1983											
Percent of Workers (103,244,000)	2.4	6.2	14.2	11.6	14.2	11.7	17.9	14.3	6.2	1.3	100.0
*Average Trip Length (Miles)	5.5	7.0	10.0	10.2	10.1	11.0	11.2	10.3	7.7	5.7	9.9
Average Commute Time (Minutes)	12.6	16.2	20.1	21.3	20.6	21.3	21.8	20.9	18.8	20.0	20.4
Average Travel Speed (MPH)	26.2	25.9	29.9	28.7	29.4	31.0	30.8	29.6	24.6	17.1	29.1

*See Data Considerations for explanation of differences between "usual" and actual trip lengths.

WORKERS, HOME-TO-WORK-TRAVEL: SEX

Table 7-5 clearly illustrates that females, as a group, traveled shorter distances and had shorter commute times than males.

What is most interesting is the large increase in the percentage of female workers from 1969 to 1983. This is shown graphically in Figure 7-5.

In 1983, females averaged 26.5 miles per hour in their travel to work, while males traveled 31.1 miles per hour (Table 7-5).

FIGURE 7-5

CHANGES IN DISTRIBUTION OF WORKERS BY SEX

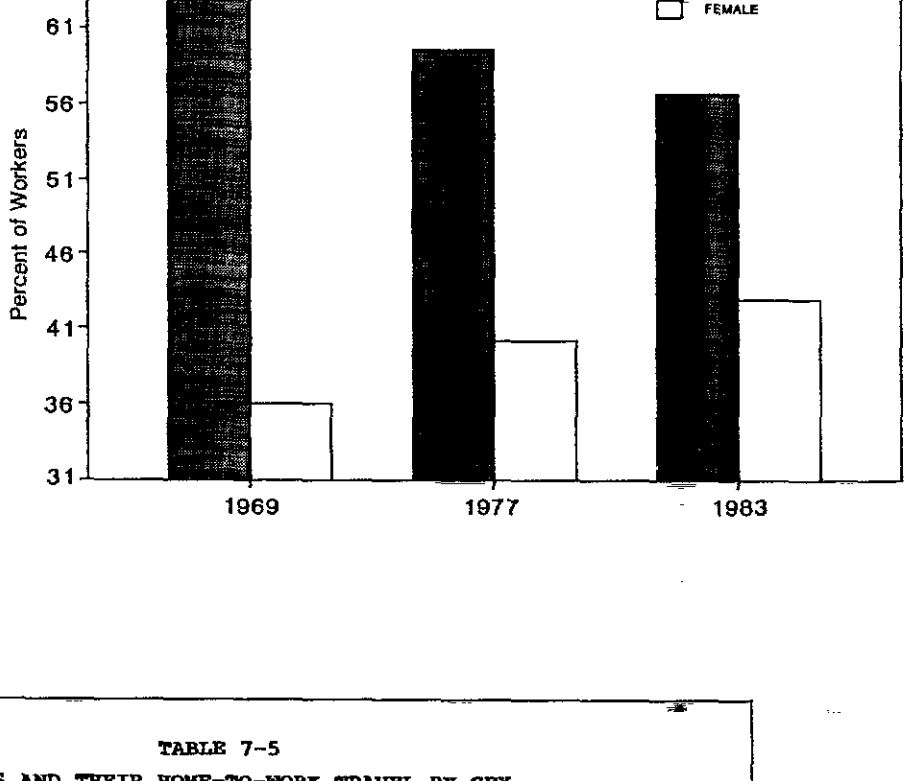


TABLE 7-5

WORKERS AND THEIR HOME-TO-WORK TRAVEL BY SEX

	Male	Female	Total
1969			
Percent of Workers (75,758,000)	64.0	36.0	100.0
1977			
Percent of Workers (93,019,000)	59.8	40.2	100.0
Average Trip Length (Miles)	10.7	7.4	9.3
Average Commute Time (Minutes)	21.4	17.6	19.8
Average Speeds (mph)	30.0	25.2	28.2
1983			
Percent of Workers (103,244,000)	57.0	43.0	100.0
*Average Trip Length (Miles)	11.2	8.3	9.9
Average Commute Time (Minutes)	21.6	18.8	20.4
Average Speeds (mph)	31.1	26.5	29.1

*See Data Considerations for explanation of differences between "usual" and actual trip lengths.

WORKERS, HOME-TO-WORK TRAVEL: MODE

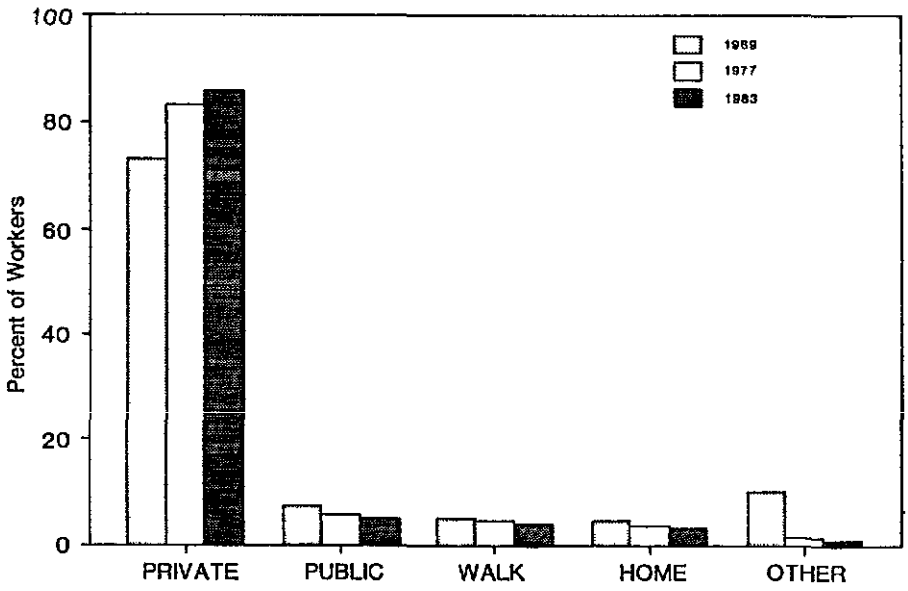
The proportion of workers who used private vehicle travel increased significantly from 1969 to 1983, from 73.1 percent to 86.2 percent (Figure 7-6). Of this, the "truck, van, and other private transportation" group increased most significantly from 5.8 to 15.6 percent of the total (Table 7-6).

Over the 14-year period, the public transportation share decreased from 7.3 percent in 1969 to 5.3 percent in 1983. The proportion of workers who walk to work and those who work at home also decreased.

Between 1977 and 1983, the average trip length increased for each mode except for "other," which includes bicycle, school bus, etc. Although this increase was relatively small for the private modes, it was quite large for public transportation, where average trip length went from 11.1 miles to 15.1 miles. This increase was probably due to the number of new rail systems which opened during this time period across the country. In 1977 the trip length for public transportation (mostly bus travel) was in the same range as for private vehicle travel. In 1983, the trip length for public transportation was about 50 percent higher than for private vehicle travel, which reflects greater use of rail facilities.

FIGURE 7-6

CHANGES IN DISTRIBUTION OF WORKERS BY MODE OF TRAVEL TO WORK



Note: Modes used in this figure are defined as follows:

Private - passenger cars, trucks, vans, and other private vehicles.
Public - bus, train, streetcar, subway, airplane, commercial taxi, and other public vehicles.
Other - all modes not accounted for the first four categories such as bicycles, school bus, etc.

TABLE 7-6

WORKERS AND THEIR HOME-TO-WORK TRAVEL BY MODE

	Passenger Car	Truck, Van, and Other Private Transportation	Public Transportation	Walk	Work at Home	Other	Total
1969							
Percent of Workers (75,758,000)	67.3	5.8	7.3	5.1	4.5	10.0	100.0
1977							
Percent of Workers (93,019,000)	72.1	11.5	5.7	4.7	3.7	1.4	100.0*
Average Trip Length (Miles)	9.5	11.2	11.1	0.3	-	6.7	9.3
Average Commute Time (Minutes)	19.0	19.9	38.8	8.8	-	16.7	19.8
Average Travel Speed (MPH)	30.0	33.8	17.2	2.0	-	24.1	28.2
1983							
Percent of Workers (103,244,000)	70.6	15.6	5.3	4.1	3.5	0.9	100.0
**Average Trip Length (Miles)	9.9	11.3	15.1	0.4	-	5.6	9.9
Average Commute Time (Minutes)	19.1	20.1	46.1	8.9	-	29.9	20.4
Average Travel Speed (MPH)	31.1	33.7	19.7	2.7	-	11.2	29.1

*Includes 0.9 percent unknown.
**See Data Considerations for explanation of differences between "usual" and actual trip lengths.

The average commute time for workers who used private vehicle travel to work remained relatively stable for the period 1977 to 1983 (Table 7-6). Travel time by public transportation increased significantly from 38.8 minutes to 46.1 minutes. Again, it is presumed that this increase is based upon a higher utilization of rail transit as compared to bus and the movement of workers out of the central city. This is further borne out by the speed of travel by public transportation, which increased from 17.2 to 19.7 miles per hour in the period 1977 to 1983.

WORKERS, HOME-TO-WORK TRAVEL: OCCUPATION

The percentage of workers by occupation shifted significantly during the period 1969 to 1983 (Table 7-7). The proportion of professional workers decreased during the period. Clerical workers' proportions increased significantly, and service workers' and managers' proportions also increased. The changes in these three groups represent a general shift in the United States toward a service oriented economy. Interestingly, workers classified as farmers increased from 2.7 percent in 1969 to 4.1 percent in 1983.

The average trip length of 9.9 miles in 1983 was exceeded by all workers except professionals, clerks, and service workers.

The average commute time was relatively constant for all workers in 1983, varying from a low of 16.1 to a high of 24.2 minutes. Between 1977 and 1983, the travel time by category remained relatively stable except for managers, which increased from 20.7 to 24.2 minutes, and for farmers.

TABLE 7-7

WORKERS AND THEIR HOME-TO-WORK TRAVEL BY OCCUPATION*

	Professional	Farmers	Managers	Clerks
1969				
Percent of Workers (75,758,000)	15.4	2.7	8.6	21.9
1977				
Percent of Workers (93,019,000)	15.5	2.9	10.7	23.8
Average Trip Length (Miles)	10.7	6.2	10.1	8.1
Average Commute Time (Minutes)	21.8	12.6	20.7	19.0
1983				
Percent of Workers (103,244,000)	12.9	4.1	10.7	30.6
**Average Trip Length (Miles)	9.8	12.0	12.5	9.1
Average Commute Time (Minutes)	20.0	21.5	24.2	19.8

	Laborers	Unskilled	Services	Other	Total
1969					
Percent of Workers (75,758,000)	13.8	23.4	11.9	1.3	100.0
1977					
Percent of Workers (93,019,000)	13.7	19.2	12.5	1.3	100.0***
Average Trip Length (Miles)	11.5	10.0	6.5	5.2	9.3
Average Commute Time (Minutes)	21.8	20.3	16.1	15.3	19.8
1983					
Percent of Workers (103,244,000)	11.9	16.3	13.5	0.0	100.0
**Average Trip Length (Miles)	11.8	11.0	6.7	-	9.9
Average Commute Time (Minutes)	22.8	21.4	16.1	-	20.4

*As defined by the 1980 Census of Population Occupational Classification System. Included in the 1983 NPTS Users Guide for the Public Use Tapes.
**See Data Considerations for explanation of differences between "usual" and actual trip lengths.
***Includes 0.4 percent unknown.

MODE OF HOME-TO-WORK TRAVEL: PLACE OF RESIDENCE

As can be seen in Table 7-8, the percentage of private vehicle driver trips for all workers increased from 71.4 to 75.2 between 1977 and 1983. However, the percentage of private vehicle passenger trips decreased from 18.3 to 12.2, reflecting a lower vehicle occupancy. The total passenger vehicle travel remained relatively stable, decreasing from 89.7 percent to 87.4 percent. The proportion of public transit use decreased from 5.2 percent to 4.6 percent.

The largest decreases in public transportation use occurred in areas outside SMSA's where the proportion of worker trips by public transportation dropped by two-thirds from 1.0 to 0.3 percent. In areas inside SMSA's, transit use dropped from 7 percent to 6.2 percent. Within the central cities transit use increased from 9.7 percent to 10.7 percent; outside the central cities usage dropped from 4.6 to 3.3 percent.

Outside of the SMSA's, 93.8 percent of the trips were by personal vehicle in 1977. This dropped to 90.0 percent by 1983. Within SMSA's, 88 percent of the trips were by private vehicle in 1977. This decreased slightly to 86.2 percent in 1983.

In 1983, the percentage of private vehicle travel by workers outside central cities was considerably higher than for those residing in central cities. Travel by public transportation reflected a much higher user frequency for those residing in central cities (Table 7-8).

TABLE 7-8

DISTRIBUTION OF HOME-TO-WORK TRIPS BY PLACE OF RESIDENCE AND MODE

	Inside SMSA's				
	Within Central City	Not in Central City	Subtotal	Outside SMSA's	All Places
1977					
Private Vehicle Driver	67.3	73.6	70.7	73.2	71.4
Private Vehicle Passenger	17.5	17.2	17.3	20.6	18.3
Public Transportation	9.7	4.6	7.0	1.0	5.2
Other	5.5	4.6	5.0	5.2	5.1
TOTAL	100.0	100.0	100.0	100.0	-
ALL MODES	33.2	35.7	68.9	31.1	100.0
1983					
Private Vehicle Driver	70.8	77.0	74.5	76.3	75.2
Private Vehicle Passenger	10.9	12.1	11.7	13.7	12.2
Public Transportation	10.7	3.3	6.2	0.3	4.6
Other	7.6	7.6	7.6	9.7	8.0
TOTAL	100.0	100.0	100.0	100.0	-
ALL MODES	28.4	44.5	76.4*	23.6	100.0

*Includes 3.5 percent of workers who live in SMSA's, but location in SMSA is unknown.

Private vehicle includes: Automobile, station wagon, passenger van, other van, pickup truck, pickup with camper, other truck, motorized camper coach, motorcycle, motorized bicycle, moped, other P.O.V.

Public transportation includes: Bus, train, streetcar, elevated rail or subway, taxi (commercial use).

Other includes: Airplane, bicycle, walk, school bus, other.

MODE OF HOME-TO-WORK TRAVEL: SMSA SIZE

Between 1969 and 1983 the percentage of private vehicle driver trips increased in all but the largest SMSA's (Table 7-9). The percent of vehicle passenger trips decreased in all SMSA's, reflecting a decrease in vehicle occupancy.

As might be expected, a direct relationship exists between public transportation use and the population of an SMSA. In 1983, 0.5 percent of work trips were made by public transportation in SMSA's with less than 250,000 population. In the largest SMSA's more than 15 percent of work trips were made by public transit. The proportion of public transportation use decreased from 1969 to 1983 in all SMSA population groups. But the largest SMSA's are the only ones in which a greater percentage of work trips were made by workers who use public transportation than by those who ride as passengers in private vehicles (Figure 7-7). As might be expected, the relative decrease was the lowest in the largest SMSA's, probably reflecting the number of rail systems built in the larger SMSA's and the greater emphasis placed on public transportation in these SMSA's relative to SMSA's with smaller populations.

FIGURE 7-7

DISTRIBUTION OF WORK TRIPS BY MODE AND SMSA SIZE (1983)

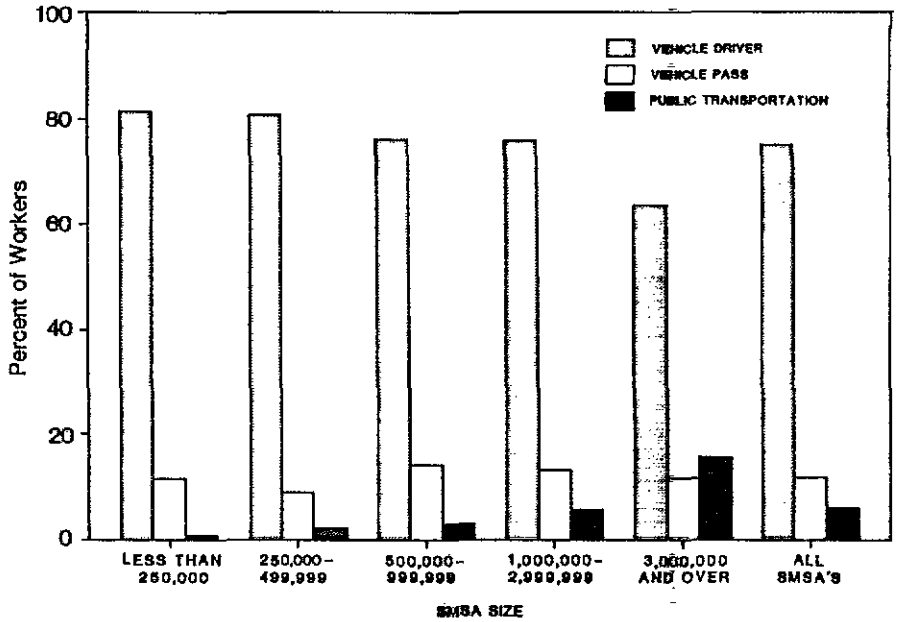


TABLE 7-9

DISTRIBUTION OF HOME-TO-WORK TRIPS BY SMSA SIZE AND MODE

(IN SMSA ONLY)

	Less than 250,000	250,000-499,999	500,000-999,999	1,000,000-2,999,999	3,000,000 and Over	All SMSA's
1969						
Private Vehicle Driver	75.7	73.5	69.3	68.5	66.1	69.9
Private Vehicle Passenger	20.8	21.6	22.7	19.1	14.1	18.9
Public Transportation	3.3	4.6	7.8	11.4	18.9	10.6
Other	0.2	0.3	0.2	1.0	0.9	0.6
TOTAL	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	15.0	13.9	15.4	29.8	25.9	100.0
1977						
Private Vehicle Driver	73.0	75.9	74.6	70.2	63.7	70.7
Private Vehicle Passenger	19.9	18.3	18.5	18.5	12.9	17.3
Public Transportation	3.0	2.6	4.0	5.5	16.3	7.0
Other	4.1	3.2	2.9	5.8	7.1	5.0
TOTAL	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	12.6	14.7	16.6	32.9	23.2	100.0
1983						
Private Vehicle Driver	81.4	80.7	75.8	75.5	63.3	74.5
Private Vehicle Passenger	11.7	8.8	13.9	12.9	11.7	11.7
Public Transportation	0.5	1.9	2.7	5.5	15.4	6.2
Other	6.4	8.6	7.6	6.1	9.6	7.6
TOTAL	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	14.4	14.9	12.2	28.7	22.7	100.0*

*Includes 7.1 percent unknown SMSA size.

See Table 7-8 for definitions of modes.

MODE OF HOME-TO-WORK TRAVEL: ANNUAL HOUSEHOLD INCOME (1983 DOLLARS)

Income level has a substantial influence on the mode of transportation that people use to travel to work. In 1983, the frequency of public transit trips by workers earning less than $10,000 was more than twice that of those workers earning more than $40,000 (Table 7-10). However, regardless of income, most workers used private vehicles to get to work. Workers with higher incomes tended to use private vehicles more often than those with lower incomes (Figure 7-8). Workers with lower incomes tended to use public transportation and other means more often than those with higher incomes.

In all income groups, the percentage of trips made in a private vehicle as a driver increased in the period 1977 to 1983. The percentage of trips made in a private vehicle as a passenger decreased as did the proportion of those trips made by public transportation.

FIGURE 7-8
DISTRIBUTION OF HOME-TO-WORK TRIPS
BY MODE AND ANNUAL HOUSEHOLD INCOME
(1983)

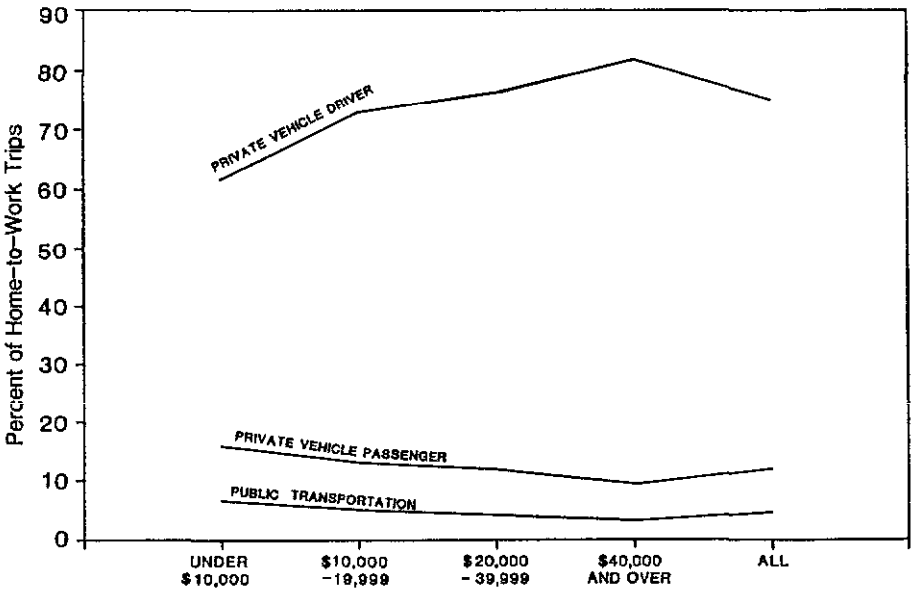


TABLE 7-10
DISTRIBUTION OF HOME-TO-WORK TRIPS
BY ANNUAL HOUSEHOLD INCOME AND MODE

	Under $10,000	$10,000-19,999	$20,000-39,999	$40,000 and Over	All Income Groups
1977					
Private Vehicle Driver	57.2	67.7	74.5	74.9	71.4
Private Vehicle Passenger	23.2	20.5	17.4	15.8	18.3
Public Transportation	8.0	6.3	4.1	5.1	5.2
Other	11.6	5.5	4.0	4.2	5.1
TOTAL	100.0	100.0	100.0	100.0	-
ALL MODES	9.3	23.5	48.7	18.5	100.0
1983					
Private Vehicle Driver	61.7	72.9	76.4	82.0	75.2
Private Vehicle Passenger	15.9	13.3	12.1	9.5	12.2
Public Transportation	6.9	5.2	4.4	3.1	4.6
Other	15.5	8.6	7.1	5.4	8.0
TOTAL	100.0	100.0	100.0	100.0	-
ALL MODES	10.1	25.1	44.1	20.7	100.0

See Table 7-8 for definitions of modes.

MODE OF HOME-TO-WORK TRAVEL: AGE

In 1983, there was a moderate increase in the percentage of private vehicle driver trips made by workers as age increased, until about age 50. Above age 50, the percentage of trips made by workers who drove to work leveled off (Table 7-11). Younger workers were more likely than older workers to be passengers in private vehicles. Public transit use was relatively consistent from one age group to another.

The percentage of trips made by vehicle drivers increased between 1969 and 1983 in all age groups, with the most dramatic increases among older drivers. Between 1969 and 1983, the proportion of trips made by workers over 70 who drove to work more than doubled, from 31.3 percent to 78.4 percent. The frequency of trips made by workers who traveled as passengers dropped in all age groups, as did the rate of public transportation travel.

TABLE 7-11

DISTRIBUTION OF HOME-TO-WORK TRIPS BY WORKER AGE AND MODE

	16-17	18-20	21-25	26-29	30-34	35-39	40-49	50-59	60-69	70 and Older	All Ages
1969											
Private Vehicle Driver	31.8	50.0	49.6	57.3	61.8	61.1	58.0	48.3	41.2	31.3	52.8
Private Vehicle Passenger	31.8	24.2	26.4	22.5	17.0	16.8	17.7	21.7	18.8	12.5	20.6
Public Transportation	9.1	9.1	8.8	6.7	5.3	5.3	6.6	6.7	9.4	12.5	7.2
Other	27.3	16.7	15.2	13.5	15.9	16.8	17.7	23.3	30.6	43.7	19.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	2.2	6.5	12.2	8.9	9.4	9.8	22.7	18.1	8.6	1.6	100.0
1977											
Private Vehicle Driver	48.7	67.2	70.6	78.6	80.2	79.3	78.3	76.6	70.0	70.1	71.4
Private Vehicle Passenger	29.7	20.1	17.3	10.8	11.2	11.3	11.1	11.9	13.5	8.2	18.3
Public Transportation	4.6	3.8	6.3	5.5	5.1	5.1	4.7	5.7	7.9	7.9	5.2
Other	17.0	8.9	5.8	5.1	3.5	4.3	5.9	5.8	8.6	13.8	5.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	3.0	8.1	15.4	11.5	12.4	10.2	17.6	15.4	5.5	0.9	100.0
1983											
Private Vehicle Driver	48.8	71.9	74.3	74.8	76.4	75.5	81.9	75.2	78.5	78.4	75.2
Private Vehicle Passenger	24.9	15.7	13.2	11.9	10.1	12.2	9.6	12.4	9.7	6.1	12.2
Public Transportation	3.4	5.5	4.3	5.6	4.6	4.4	3.4	5.1	5.4	5.4	4.6
Other	22.9	6.9	8.2	7.7	8.9	7.9	5.1	7.3	6.4	10.1	8.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	1.8	6.1	14.9	12.1	15.1	11.4	17.5	14.2	6.1	0.8	100.0

See Table 7-8 for definitions of modes.

MODE OF HOME-TO-WORK TRAVEL: SEX

Females tend to make more work trips as private vehicle passengers than do male workers. They also use public transportation more than their male counterparts. However, the relative increase in driving for females was considerably greater than that for males between 1977 and 1983. The percent of trips made by male drivers increased only slightly from 76.2 to 78.5 percent during this 6 year period, while the percentage of trips made by female drivers increased significantly from 62.2 to 70.7 percent (Table 7-12). The percentage of trips made by females using public transit also increased slightly during the period, while male ridership on public transportation decreased.

TABLE 7-12

DISTRIBUTION OF HOME-TO-WORK TRIPS BY SEX AND MODE

	Male	Female	All Workers
1977			
Private Vehicle Driver	76.2	62.2	71.4
Private Vehicle Passenger	11.9	22.6	18.3
Public Transportation	4.8	5.7	5.2
Other	7.1	9.5	5.1
TOTAL	100.0	100.0	-
ALL MODES	59.1	40.9	100.0
1983			
Private Vehicle Driver	78.5	70.7	75.2
Private Vehicle Passenger	9.9	15.7	12.2
Public Transportation	3.4	6.0	4.6
Other	8.2	7.6	8.0
TOTAL	100.0	100.0	-
ALL MODES	58.7	41.3	100.0

See Table 7-8 for definitions of modes.

MODE OF HOME-TO-WORK TRAVEL: TRIP LENGTH

More than half of all workers' home-to-work trips in all three survey years were five miles or less (Table 7-13). Over three-quarters of all workers drove their own vehicles to work in 1983. People who traveled less than five miles to work used "other" modes (walk, bicycle, etc.) more frequently than did people who commuted greater distances. People who traveled more than 20 miles tended to drive less frequently and were passengers much more often than those who lived closer to work, perhaps indicating an inclination of those workers to carpool to work. The highest proportion of transit use in 1983 also occurred among workers who commuted more than 20 miles to work.

TABLE 7-13

DISTRIBUTION OF HOME-TO-WORK TRIPS BY TRIP LENGTH AND MODE

	Trip Length (Miles)						
	5 or Less	6-10	11-15	16-20	21-30	31 and Over	All Trips
1969							
ALL MODES	52.2	20.4	11.1	6.8	5.8	3.7	100.0
1977							
Private Vehicle Driver	66.4	74.6	77.8	76.4	77.6	64.7	71.4
Private Vehicle Passenger	16.9	15.4	13.7	15.7	14.5	23.3	18.3
Public Transportation	4.5	6.5	4.8	5.2	4.3	9.2	5.2
Other	12.2	3.5	3.7	2.7	3.6	2.8	5.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	53.2	20.4	11.1	6.1	5.4	3.8	100.0
1983							
Private Vehicle Driver	72.8	79.8	78.9	80.6	73.4	69.5	75.2
Private Vehicle Passenger	11.1	11.5	13.5	13.8	16.9	19.2	12.2
Public Transportation	3.2	6.1	6.1	4.5	7.7	7.2	4.6
Other	12.9	2.6	1.5	1.1	2.0	4.1	8.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	54.1	20.3	10.7	6.1	5.2	3.6	100.0

See Table 7-8 for definitions of modes.
See Data Considerations for a discussion of home-to-work trip length.

MODE OF HOME-TO-WORK TRAVEL:
DAY OF THE WEEK

The mode of transportation to work varies very little by day of the week. In 1983, about three-quarters of all work trips were made by private vehicle drivers on any given day of the week (Table 7-14). That proportion increased on Fridays and was accompanied by a decline in the use of public transportation. In 1983, workers tended to make more trips by public transportation during the first days of the week than on Friday, Saturday, and Sunday.

Few changes in day of the week travel patterns occurred between 1977 and 1983. The most significant changes occurred on Sundays. Frequency of private vehicle passenger trips dropped by almost half while the proportion of trips made on Sundays by workers who use public transportation doubled. For all days of the week, 1983 private vehicle driver trips varied from a 74.6 percent low on Mondays to a 78.2 percent high on Fridays. Private vehicle passenger trips varied from a low of 10.8 percent on Wednesdays to a high of 14.9 percent on Saturdays.

TABLE 7-14

DISTRIBUTION OF HOME-TO-WORK TRIPS BY DAY OF THE WEEK AND MODE

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	All Days
1969								
ALL MODES	16.6	17.9	19.4	17.9	17.6	7.8	2.8	100.0
1977								
Private Vehicle Driver	71.1	71.6	69.6	72.7	71.3	75.3	67.0	71.4
Private Vehicle Passenger	18.4	16.5	19.8	17.8	18.7	16.9	25.4	18.3
Public Transportation	5.8	6.1	5.2	5.5	4.8	3.2	1.5	5.2
Other	4.7	5.8	5.4	4.0	5.2	4.6	6.1	5.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	14.9	18.3	19.2	18.2	18.6	7.5	3.3	100.0
1983								
Private Vehicle Driver	74.6	75.3	76.1	75.9	78.2	76.0	76.6	75.2
Private Vehicle Passenger	11.2	12.7	10.8	11.4	11.7	14.9	12.4	12.2
Public Transportation	6.2	4.8	4.4	5.2	3.4	2.9	3.1	4.6
Other	8.0	7.2	8.7	7.5	6.7	6.2	7.9	8.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	16.8	18.0	19.2	19.6	16.6	6.1	3.7	100.0

See Table 7-8 for definitions of modes.

MODE OF HOME-TO-WORK TRAVEL: TIME OF DAY

In 1983, the highest proportion (32.1 percent) of daily work trips occurred in the 3-hour period from 6:00-8:59 a.m. (Table 7-15). This was down slightly from 34.3 percent in 1969. Between 1969 and 1983, workers gradually spread their work travel to hours outside the peak period (Figure 7-9). The percentage of worker travel increased on either side of 6:00-8:59 a.m.

In the afternoon peak period (4:00-6:59 p.m.), the percentage of work trips decreased from 29.3 percent in 1977 to 25.0 percent in 1983.

The proportional distribution of worker trips by mode varies by time period. The highest percentage of trips made using transit in 1983 occurred during the peak periods: 5.6 percent in both the 6:00-8:59 a.m. period and the 4:00-6:59 p.m. period. Between 1977 and 1983, the percentage of workers who traveled by transit decreased during both the morning peak and the afternoon peak.

The percentage of trips made in a private vehicle as a driver or passenger was relatively constant across the time periods in both 1977 and 1983, with the smallest percentage of passenger trips in both survey years occurring during the 9:00 a.m.-12:59 p.m. time period.

FIGURE 7-9

DISTRIBUTION OF HOME-TO-WORK TRIPS BY TIME OF DAY

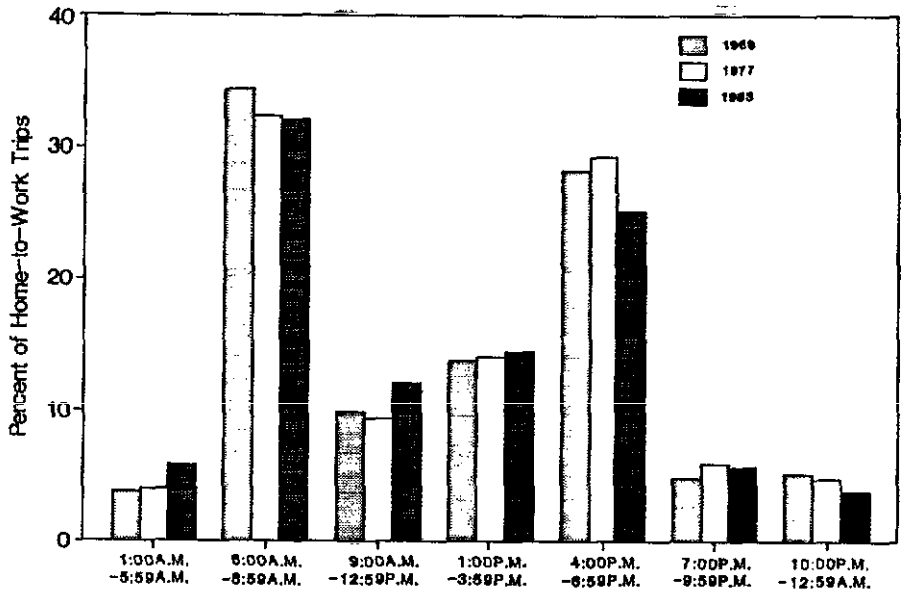


TABLE 7-15

DISTRIBUTION OF HOME-TO-WORK TRIPS BY TIME OF DAY AND MODE

	1:00 a.m. to 5:59 a.m.	6:00 a.m. to 8:59 a.m.	9:00 a.m. to 12:59 p.m.	1:00 p.m. to 3:59 p.m.
1969				
ALL MODES	3.9	34.3	9.9	13.6
1977				
Private Vehicle Driver	73.4	72.0	72.5	70.6
Private Vehicle Passenger	19.4	18.3	16.1	19.3
Public Transportation	4.1	6.0	3.7	3.7
Other	3.1	3.7	7.7	6.4
TOTAL	100.0	100.0	100.0	100.0
ALL MODES	4.0	32.4	9.4	14.1
1983				
Private Vehicle Driver	73.9	76.7	75.9	75.1
Private Vehicle Passenger	13.7	11.8	9.9	12.3
Public Transportation	4.5	5.6	2.7	3.3
Other	7.9	5.9	11.5	9.3
TOTAL	100.0	100.0	100.0	100.0
ALL MODES	5.8	32.1	12.1	14.4

See Table 7-8 for definitions of modes.

	4:00 p.m. to 6:59 p.m.	7:00 p.m. to 9:59 p.m.	10:00 p.m. to 12:59 a.m.	All Time Periods
1969				
ALL MODES	28.1	4.9	5.3	100.0
1977				
Private Vehicle Driver	70.6	69.9	73.9	71.4
Private Vehicle Passenger	17.8	20.9	19.5	18.3
Public Transportation	6.2	3.6	2.3	5.2
Other	5.4	5.6	4.3	5.1
TOTAL	100.0	100.0	100.0	-
ALL MODES	29.3	6.0	4.8	100.0
1983				
Private Vehicle Driver	73.3	74.2	77.5	75.2
Private Vehicle Passenger	12.9	14.3	11.8	12.2
Public Transportation	5.6	3.0	2.6	4.6
Other	8.2	8.5	8.1	8.0
TOTAL	100.0	100.0	100.0	-
ALL MODES	25.0	5.8	3.9	100.0*

*Includes 0.9 percent unknown.

See Table 7-8 for definitions of modes.

MODE OF HOME-TO-WORK TRAVEL: PUBLIC TRANSIT AVAILABILITY

As might be expected, the percentage of workers who use public transit is highest for those who live closest to available transit. The use of public transit drops dramatically when workers live more than 1/4 mile from transit. For 1983, 10.3 percent of the workers living closer than 1/4 mile made trips by public transit (Table 7-16). This decreased to 4.2 percent for those who lived 1/4 to 1/2 mile from public transit and to 2.4 percent for those living distances of 1/2 to 1 mile. A similar relationship existed in 1977.

VEHICLE OCCUPANCY

Average vehicle occupancy has been calculated in two ways, which causes slight differences in the results. One way is to weight the data based on trips:

$$\frac{\text{Total Private Vehicle Person Trips}}{\text{Total Private Vehicle Driver Trips}}$$

The second approach is to weight this occupancy by miles driven per trip:

$$\frac{\text{Person-Miles of Travel}}{\text{Vehicle-Miles of Travel}}$$

This will be referred to as "vehicle miles of travel" (VMT) weighted occupancy.

TABLE 7-16

DISTRIBUTION OF HOME-TO-WORK TRIPS BY PUBLIC TRANSIT AVAILABILITY AND MODE

	Distance to Nearest Public Transit						
	Less Than 1/4 Mile	1/4 - 1/2 Mile	1/2 - 1 Mile	1 - 2 Miles	More Than 2	No Answer	All Work Trips
1977							
Private Vehicle Driver	65.4	73.4	73.1	75.4	74.8	76.7	71.4
Private Vehicle Passenger	16.2	18.3	19.3	18.5	20.5	17.1	18.3
Public Transportation	10.7	5.4	3.3	3.4	0.9	1.9	5.2
Other	7.7	2.9	4.3	2.7	3.8	4.3	5.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	34.8	12.5	5.3	3.7	37.3	6.4	100.0
1983							
Private Vehicle Driver	68.6	77.3	77.1	79.5	79.1	81.6	75.2
Private Vehicle Passenger	12.0	12.5	13.8	10.3	12.2	13.1	12.2
Public Transportation	10.3	4.2	2.4	4.4	0.3	0.5	4.6
Other	9.1	6.0	6.7	5.8	8.4	4.8	8.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	-
ALL MODES	34.8	13.7	5.3	4.3	37.6	4.3	100.0

See Table 7-8 for definitions of modes.

VEHICLE OCCUPANCY: TRIP LENGTH

Table 7-17 presents vehicle occupancy for different trip lengths, weighted by trips. Table 7-18 presents the same data, weighted by vehicle miles of travel.

On a trip weighted basis, the vehicle occupancy decreased overall from 1.4 to 1.2 during the period 1969-1983. This general tendency toward a reduction was found at all trip lengths except for those greater than 30 miles. For trip lengths greater than 30 miles, the average occupancy increased from 1.6 to 1.7, this may have been due to the fact that workers realized the greatest cost savings for these long trips by carpooling.

On a VMT basis, overall vehicle occupancy remained constant at 1.3 between 1977 and 1983 (Table 7-18). This, again, was probably due to the increase in occupancy for trips over 30 miles, which heavily weighted the calculation of the total occupancy. At all other distances, the occupancy stayed the same or decreased over the six year period.

TABLE 7-17

DISTRIBUTION OF HOME-TO-WORK TRIP OCCUPANCY BY TRIP LENGTH

(TRIP WEIGHTED)

	Trip Length (Miles)						
	5 or Less	6-10	11-15	16-20	21-30	31 and Over	All Trips
1969	1.3	-	1.4*	1.5	1.7	1.6	1.4
1977	1.3	1.3	1.3	1.3	1.3	1.5	1.3
1983	1.2	1.1	1.2	1.2	1.3	1.7	1.2

*In 1969, the data is for 5-15 miles.

TABLE 7-18

HOME-TO-WORK TRIP OCCUPANCY BY TRIP LENGTH

(VMT WEIGHTED)

	Home-to-Work Trip Length (Miles)						
	5 or Less	6-10	11-15	16-20	21-30	31 and Over	All Trips
1977	1.2	1.3	1.3	1.3	1.3	1.6	1.3
1983	1.2	1.1	1.1	1.2	1.3	1.8	1.3

VEHICLE OCCUPANCY: SMSA SIZE

Tables 7-19 and 7-20 present SMSA occupancy data by SMSA size weighted by trips and VMT, respectively.

For all SMSA's combined, there was a drop in vehicle occupancy from 1.3 in 1977, to 1.2 in 1983 on a trip-weighted basis (Table 7-19). This decrease in occupancy was evidenced in SMSA's of all sizes. There does not appear to be any particular relationship between vehicle occupancy and SMSA size. In 1983, for example, the variation was from 1.1 to 1.2, in no particular relationship to SMSA size.

The VMT weighted occupancy values in Table 7-20 are very similar to those in Table 7-19. In 1983, the occupancy rate was 1.2 as compared to 1.3 in 1977. The variation between areas was slightly greater, from 1.2 to 1.4, with the highest value found in the largest SMSA's.

TABLE 7-19

HOME-TO-WORK TRIP OCCUPANCY BY SMSA SIZE

(SMSA'S ONLY)

(TRIP WEIGHTED)

	Less than 250,000	250,000-499,999	500,000-999,999	1,000,000-2,999,999	3,000,000 and Over	All SMSA's
1969	1.4	1.4	1.4	1.4	1.3	1.4
1977	1.3	1.3	1.3	1.3	1.2	1.3
1983	1.2	1.2	1.1	1.1	1.2	1.2

TABLE 7-20

HOME-TO-WORK TRIP OCCUPANCY BY SMSA SIZE

(SMSA'S ONLY)

(VMT WEIGHTED)

	Less than 250,000	250,000-499,999	500,000-999,999	1,000,000-2,999,999	3,000,000 and Over	All SMSA's
1977	1.4	1.4	1.2	1.3	1.3	1.3
1983	1.2	1.3	1.2	1.2	1.4	1.2

VEHICLE OCCUPANCY: HOUSEHOLD INCOME

Table 7-21 relates vehicle occupancy to household income for 1977 and 1983. There was very little variation in occupancy by income and little change between 1977 and 1983. There was some tendency toward a slightly lower occupancy for the highest income group in 1983, in which the occupancy of 1.2 can be compared to the 1.3 occupancy for all other income groups.

CARPOOL SIZE AND ARRANGEMENT

During the last decade, interest in the formation of carpools as a major travel mode has increased. The initial impetus was due to the gasoline shortages of the 1970's and the greatly increased price of fuel. In recent years, the economic situation with regard to the construction of new highway facilities has again focused attention on the formation of carpools as a means of achieving greater person carrying capacity on our streets and highways.

WORKERS WHO CARPOOL: NUMBER IN CARPOOL

Most carpool arrangements consist of two persons (Table 7-22). In 1977, 69.3 percent of workers who carpool reported being in carpool arrangements consisting of two persons; in 1983 this increased to 73.2 percent.

In 1977, 4.6 percent of the carpoolers were in five or six person carpools; this decreased to 3.1 percent by 1983. However, the proportion of workers in carpools of seven or more persons doubled from 1.1 to 2.2, perhaps reflecting a growth in vanpool arrangements.

TABLE 7-21
HOME-TO-WORK TRIP OCCUPANCY BY HOUSEHOLD INCOME
(VMT WEIGHTED)

	Under $10,000	$10,000-19,999	$20,000-39,999	$40,000 and Over	All Income Groups
1977	1.4	1.4	1.3	1.3	1.3
1983	1.3	1.3	1.3	1.2	1.3

TABLE 7-22
DISTRIBUTION OF WORKERS WHO CARPOOL
BY NUMBER OF PERSONS IN CARPOOL

Number of Persons	1977	1983
Two	69.3	73.2
Three	18.2	15.7
Four	6.8	5.8
Five	3.4	1.8
Six	1.2	1.3
Seven or More	1.1	2.2
TOTAL	100.0	100.0
Total Number of Carpoolers	13,739,000	16,059,000

WORKERS WHO CARPOOL: DRIVING ARRANGEMENT

Essentially no change occurred between 1977 and 1983 in the distribution of carpoolers by driving arrangement. Table 7-23 shows that in 1977, 37.7 percent of workers who carpool shared the driving responsibility. This decreased very slightly to 37.3 percent in 1983. The percentage of carpoolers who only drove increased slightly from 23.6 to 24.6 percent. The percentage of carpoolers who rode only increased slightly (Table 7-23).

WORKERS WHO CARPOOL: PLACE OF RESIDENCE

Workers tend to carpool more frequently in the larger SMSA's than in smaller SMSA's. This is probably attributable more to the density of the population and the geographic size of the areas than to the popularity of carpooling (Table 7-24). In 1983, 73.3 percent of workers who carpooled resided within an SMSA and 26.7 percent outside an SMSA. This should be compared with the 76.0 percent of all workers who resided in SMSA's and 24.0 percent outside.

TABLE 7-23

DISTRIBUTION OF WORKERS WHO CARPOOL BY DRIVING ARRANGEMENT

	1977	1983
Share Driving	37.7	37.3
Drive Others Only	23.6	24.6
Ride Only	37.3	37.7
No Answer	1.4	0.4
TOTAL	100.0	100.0
Total Number of Carpoolers	13,039,000	16,059,000

TABLE 7-24

DISTRIBUTION OF CARPOOLERS BY PLACE OF RESIDENCE

	1977		1983	
	Carpoolers	All Workers	Carpoolers	All Workers
Inside SMSA's				
Within Central City	28.7	32.2	27.0	29.0
Not in Central City	36.6	35.6	43.0	43.6
Subtotal	65.3	67.8	73.3*	76.0**
Outside SMSA's	34.7	32.2	26.7	24.0
TOTAL	100.0	100.0	100.0	100.0

*Includes 3.3 percent of carpoolers who live in SMSA's, location unknown.

**Includes 3.4 percent of workers who live in SMSA's, location unknown.

WORKERS WHO CARPOOL: SMSA SIZE

Table 7-25 presents the distribution of workers who carpool and reside within SMSA's by SMSA size.

In 1977, SMSA's with 3 million and over population accounted for 16.7 percent of the carpoolers, but had 23.6 percent of the workers. In 1983, the percentages for the same population group were 22.0 and 23.4, respectively. In most other population size groups for the two years, the percentage of carpoolers was greater than the percentage of workers.

WORKERS WHO CARPOOL: AVERAGE TRIP LENGTH

Most workers who carpool are involved in trips to work that are relatively short. This would be expected since the majority of trips to work are short. Table 7-26 shows the distribution of carpoolers by length of trip. In 1983, 34.7 percent of carpoolers traveled less than 5 miles to work. However, 54.1 percent of all workers traveled less than 5 miles to work.

TABLE 7-25

DISTRIBUTION OF WORKERS WHO CARPOOL BY SMSA SIZE

(SMSA'S ONLY)

	1977		1983	
	Carpoolers	All Workers	Carpoolers	All Workers
Less than 250,000	13.2	12.5	16.2	14.5
250,000 to 499,999	15.8	15.2	12.5	13.5
500,000 to 999,999	18.2	16.3	12.5	12.4
1,000,000 to 2,999,999	36.1	32.4	29.9	29.3
3,000,000 and Over	16.7	23.6	22.0	23.4
TOTAL	100.0	100.0	100.0*	100.0**

*Includes 6.9 percent of carpoolers who live in SMSA's, size unknown.
**Includes 6.9 percent of workers who live in SMSA's, size unknown.

TABLE 7-26

DISTRIBUTION OF WORKERS WHO CARPOOL BY AVERAGE TRIP LENGTH

Trip Length (Miles)	1977		1983	
	Carpoolers	All Workers	Carpoolers	All Workers
Under 5	36.9	53.2	34.7	54.1
6 to 10	19.9	20.4	19.4	20.3
11 to 15	16.1	11.1	14.8	10.7
16 to 20	9.5	6.1	8.5	6.1
21 to 30	9.0	5.4	14.1	5.2
Over 30	8.6	3.8	8.5	3.6
TOTAL	100.0	100.0	100.0	100.0

Figures 7-10 and 7-11 allow comparison of carpool trip length distributions with those of all workers for 1977 and 1983. The trip lengths of workers who carpooled tended to be longer than those of all workers. Less than 26 percent of all workers commuted more than 10 miles in 1983, whereas, of those who carpooled, more than 45 percent traveled more than 10 miles.

FIGURE 7-10

DISTRIBUTION OF WORKERS WHO CARPOOL AND ALL WORKERS BY AVERAGE TRIP LENGTH (1977)

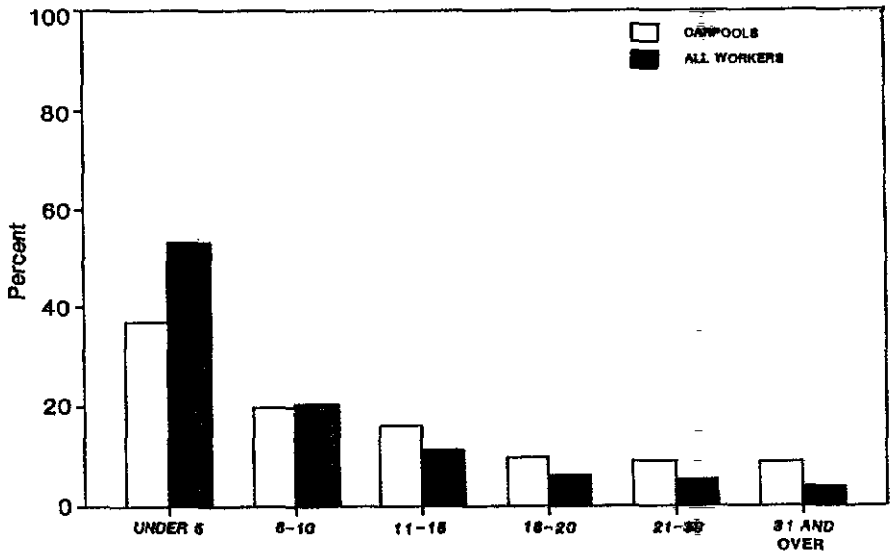
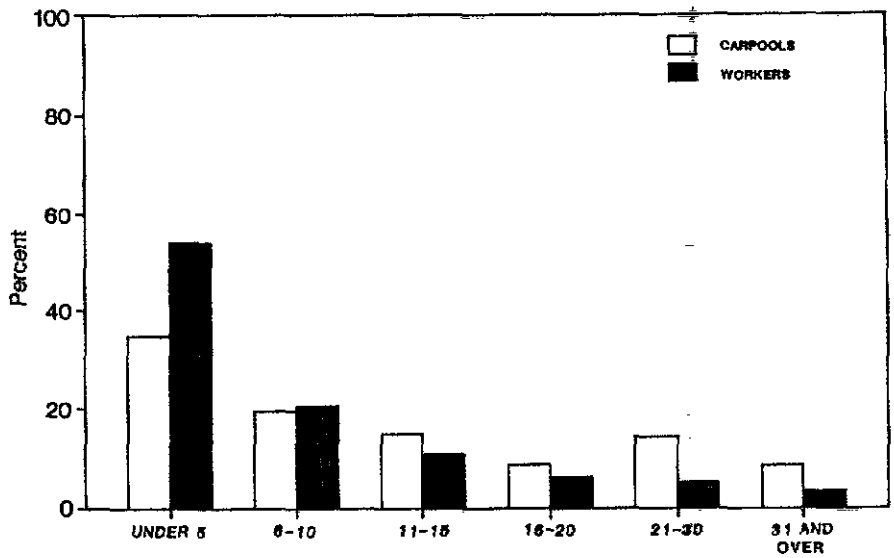


FIGURE 7-11

DISTRIBUTION OF WORKERS WHO CARPOOL AND ALL WORKERS BY AVERAGE TRIP LENGTH (1983)



8

VEHICLE OCCUPANCY

INTRODUCTION

This chapter presents information on trends in vehicle occupancy. Like the previous chapters, it highlights this important travel characteristic in terms of the key demographic, economic, and travel-related forces which affect it. Also, trends are depicted over time, focusing mainly on the changes between 1977 and 1983, but also including some comparison with 1969.

Vehicle occupancy is an important travel characteristic. It represents efficiency in travel and, hence, has major implications for transportation resources requirements, energy needs, and the environment.

At least two different ways exist to portray vehicle occupancy. One common method is to define occupancy as persons per vehicle trip. This report presents some data using this definition, but relies more heavily on the measure of persons per vehicle mile of travel (VMT). The latter is a more telling measure from a policy or planning point of view because the distance involved in the travel is taken into consideration. The report on vehicle occupancy (Report No. 6) from the 1977 NPTS also emphasized the VMT-based measure of occupancy.

This chapter presents tables and displays that look at vehicle occupancy as related to:

- purpose of travel,
- household residence location by SMSA size,
- number of household licensed drivers,
- number of vehicles owned by the household,
- household life cycle,
- household income,
- trip lengths,
- hour of day, and
- weekday vs. weekend.

Finally, an effort is made to compare data from the recent 1983 and 1977 NPTS surveys with data from the 1969 NPTS survey. The 1969 trip data, it will be recalled, were obtained for travel by autos and vans only. Also, trips were not restricted, as in 1977 and 1983, to those in which a household member was the driver. These two criteria tend to inflate the estimate of occupancy. Since it is not possible to refactor the 1969 data, the 1977 and 1983 data were reconfigured to be consistent with the 1969 data for comparison in one table.

SUMMARY OF NATIONAL ESTIMATES USED IN THIS CHAPTER

	1969	1977	1983
Annual Vehicle Trips	87,284,000	108,826,000	126,874,000
Annual VMT	775,940,000	907,603,000	1,002,139,000

Note: All numbers in thousands.

VEHICLE OCCUPANCY: PURPOSE

Vehicle occupancy varies with the purpose of travel. Historically, travel to work or for work-related purposes has had the lowest rate of occupancy of all household travel. Travel for discretionary purposes typically involves more family members and a greater number of occupants per trip.

Average number of occupants per vehicle mile of travel fell by about 10 percent between 1977 and 1983, from 1.9 to 1.7 occupants (Table 8-1). The biggest changes were in social and recreational travel, where average occupancy fell from 2.4 to 2.1 between 1977 and 1983, and family and personal business, which fell from 2.0 to 1.8. Average occupancy for earning a living remained the same, at 1.3 occupants per mile of travel. The largest declines in occupancy for specific trip purposes were for pleasure driving, which fell 18 percent from 2.8 to 2.3, and travel for medical/dental purposes, which fell 23 percent, from 2.2 to 1.7 occupants. Work-related travel increased the most with an increase of 14 percent, from 1.4 to 1.6 average occupants.

Figures 8-1 and 8-2 show the proportions of 1977 and 1983 travel and trips, respectively, attributable to the various trip purposes.

FIGURE 8-1

CHANGE IN TRAVEL DISTRIBUTION BY TRIP PURPOSE

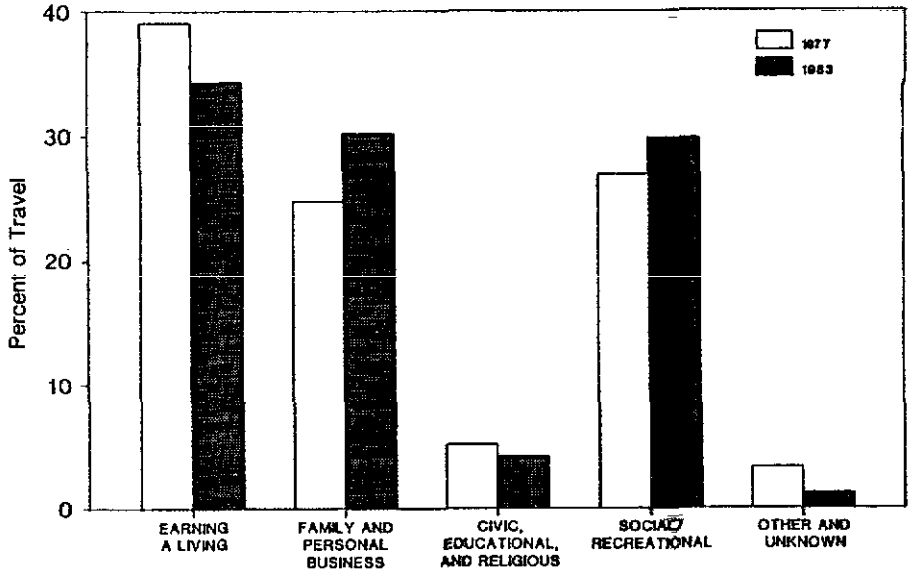


TABLE 8-1

AVERAGE OCCUPANCY BY TRIP PURPOSE

(PERSONS PER VEHICLE-MILE)

Trip Purpose	1977 Average Occupancy	1977 Percent of VMT	1983 Average Occupancy	1983 Percent of VMT
Earning a Living				
To Work	1.3	31.7	1.3	30.2
Work Related	1.4	7.6	1.6	4.2
All	1.3	39.3	1.3	34.3
Family and Personal Business				
Shopping	2.1	11.1	1.8	13.3
Medical/Dental	2.2	1.8	1.7	1.5
Other	2.0	12.0	1.8	15.5
All	2.0	24.9	1.8	30.4
Civic, Educational, and Religious	2.0	5.2	2.1	4.1
Social and Recreational				
Visiting Friends	2.3	12.1	2.0	13.5
Pleasure Driving	2.8	.9	2.3	1.1
Vacation	2.7	.6	2.5	2.1
Other	2.6	13.7	2.1	13.3
All	2.4	27.3	2.1	30.0
Other and Unknown	2.2	3.3	1.9	1.2
ALL PURPOSES	1.9	100.0	1.7	100.0

Table 8-1 depicts travel occupancy on a person per vehicle mile of travel (VMT) basis. For comparative purposes, Table 8-2 illustrates the same breakdown, but with vehicle occupancy computed on a person per vehicle trip basis. Occupancy per vehicle trip is generally lower overall (1.6 in 1983) than the per mile measure (1.7 in 1983). Also, the changes from 1977 to 1983 are smaller.

Overall trends, however, are similar. Average occupants per trip declined overall and for each major trip purpose. The same trend was true for occupancy per vehicle mile except for civic, educational, and religious travel, which increased on the person per mile basis.

Interestingly, travel to work showed no decline on a person per mile basis. Average occupancy declined from 1.3 to 1.2 on a per trip basis. Average occupancy for pleasure driving dropped from 2.8 to 2.3 between 1977 and 1983 on a per vehicle-mile basis, but increased on a per-trip basis (2.4 vs. 2.5).

FIGURE 8-2

CHANGE IN TRIP DISTRIBUTION BY PURPOSE

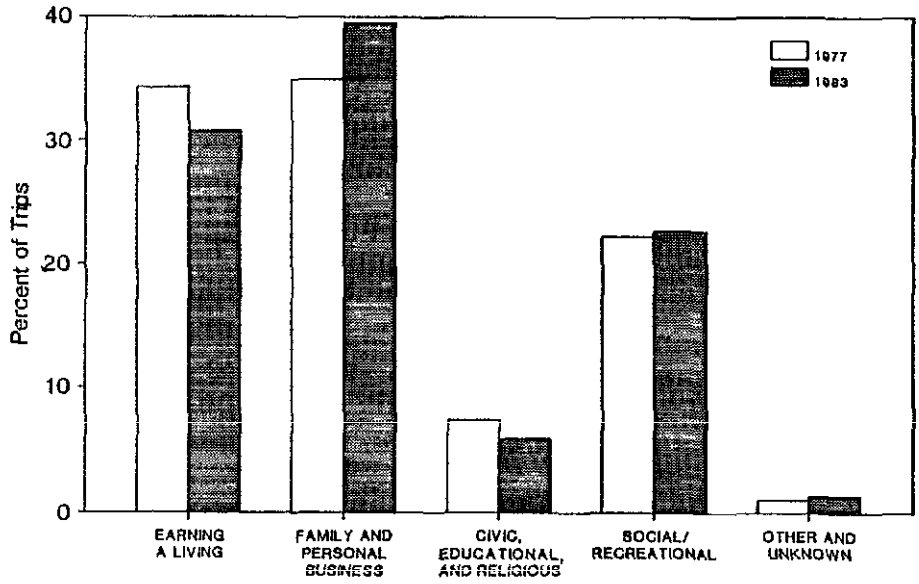


TABLE 8-2

AVERAGE OCCUPANCY BY TRIP PURPOSE

(PERSONS PER VEHICLE TRIP)

Trip Purpose	1977 Average Occupancy	1977 Percent of Trips	1983 Average Occupancy	1983 Percent of Trips
Earning a Living				
To Work	1.3	29.3	1.2	27.8
Work Related	1.3	5.3	1.3	2.9
All	1.3	34.6	1.2	30.7
Family and Personal Business				
Shopping	1.8	18.6	1.6	20.0
Medical/Dental	1.9	1.5	1.6	1.2
Other	1.7	14.9	1.6	18.3
All	1.8	35.0	1.6	39.5
Civic, Educational, and Religious	2.0	7.3	1.9	5.9
Social and Recreational				
Visiting Friends	1.9	9.3	1.8	9.9
Pleasure Driving	2.4	.5	2.5	.4
Vacation	2.6	.1	2.5	.2
Other	2.2	12.3	2.0	12.1
All	2.1	22.2	1.9	22.6
Other and Unknown	1.8	.9	1.7	1.3
ALL PURPOSES	1.7	100.0	1.6	100.0

Tables 8-3 and 8-4 display information similar to that in Tables 8-1 and 8-2, but in terms of the actual frequency of types of travel at each occupancy level. The results provide additional insight into the downturn in occupancy between 1977 and 1983.

The reduction in travel and trip occupancy is reflected in a shifting of the percentage of trips and travel into the lower occupancy levels. Table 8-3 shows that the percentage of trips occurring in single-occupant vehicles increased from 59.6 percent in 1977 to 65.7 percent in 1983 for all trip purposes combined, a 10.2 percent increase. This increase in share of single-occupant trips is evident in all major trip purposes shown (Figure 8-3).

Table 8-4 shows the same trends in occupancy on a travel basis. Overall, the share of VMT made in single-occupant vehicles increased from 51.7 percent to 57.4 percent, or 11.0 percent, for all trip purposes combined (Figure 8-4).

FIGURE 8-3

PERCENT OF ONE-OCCUPANT TRIPS BY TRIP PURPOSE

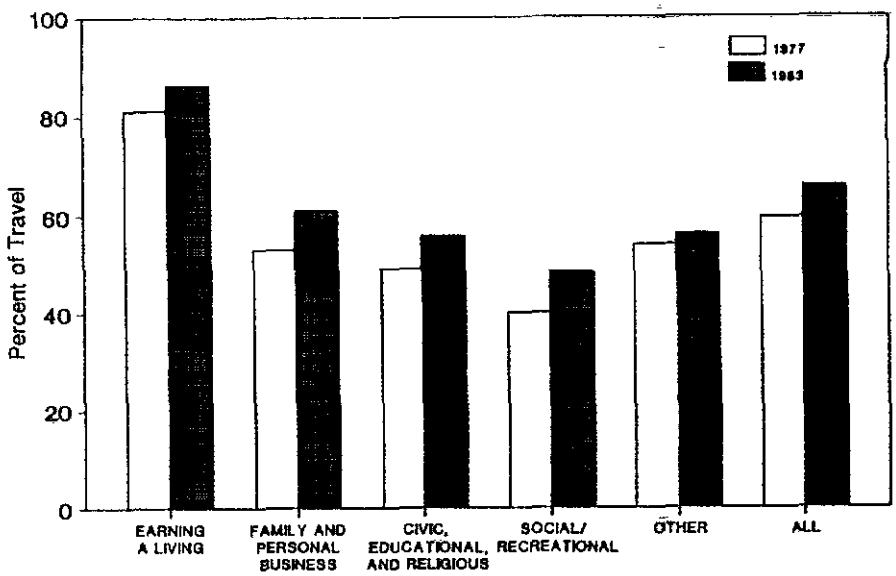


TABLE 8-3

DISTRIBUTION OF VEHICLE TRIPS BY NUMBER OF OCCUPANTS AND TRIP PURPOSE

Number of Occupants	Trip Purpose: Earning a Living		Family Business		Civic, Educational, and Religious		Social and Recreational		Other		All Purposes	
	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983
One	81.2	86.4	53.1	61.0	48.9	55.9	40.1	48.3	54.1	56.1	59.6	65.7
Two	13.4	9.8	29.4	25.3	27.9	23.5	33.8	29.9	24.8	23.5	24.7	21.5
Three	3.4	2.6	10.0	8.6	11.0	10.5	12.3	11.2	11.4	9.0	8.3	7.4
Four	1.2	.7	4.6	3.1	6.7	6.3	8.4	6.7	6.2	3.7	4.4	3.4
Five	.4	.2	1.9	1.3	3.0	1.8	3.2	2.4	1.5	.3	1.8	1.2
Six	.2	.2	.5	.5	1.5	1.1	1.3	.9	.7	1.0	.7	.5
Seven	.1	.0	.3	.1	.4	.2	.4	.3	.3	.0	.3	.1
Eight	.0	.0	.1	.1	.3	.2	.3	.2	.6	.4	.1	.1
Nine or More	.1	.1	.1	.0	.3	.5	.2	.1	.4	.0	.1	.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The data in Tables 8-3 and 8-4 show an increase in travel by single-occupant vehicles across all major trip purposes. In no case has the share of single-occupant travel declined. The most striking change for a known trip purpose was in social and recreational travel, where the percent of travel (VMT) made in single-occupant vehicles increased by 41 percent (from 26.8 percent to 37.8 percent), while percent of trips increased by 20.4 percent (from 40.1 percent to 48.3 percent). The most stable relationship was in earning a living, where the share of single-occupant travel increased by only 2.5 percent and the share of single-occupant trips by 6.4 percent. This information suggests that an increasing share of shorter trips are being made by single-occupant vehicles.

FIGURE 8-4

PERCENT OF ONE-OCCUPANT TRAVEL BY TRIP PURPOSE

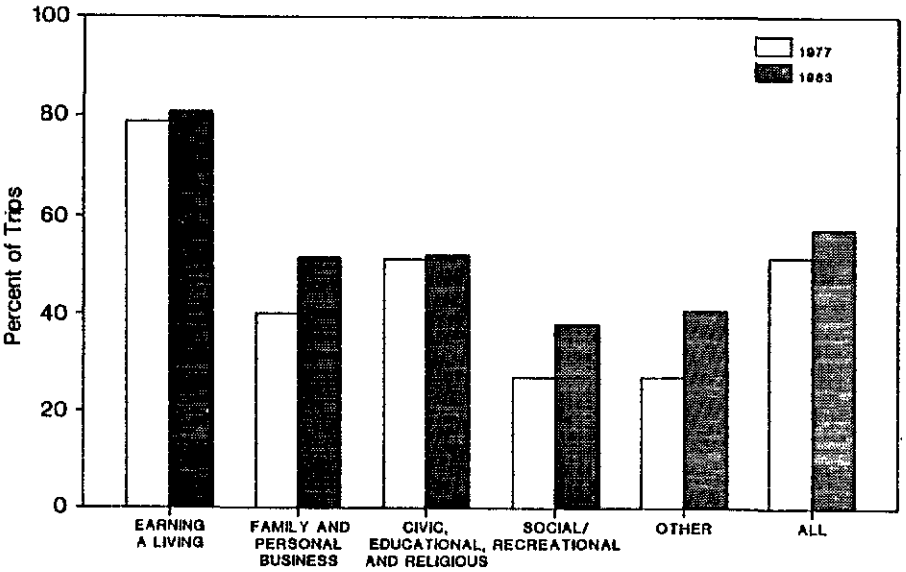


TABLE 8-4

DISTRIBUTION OF VEHICLE MILES OF TRAVEL BY NUMBER OF OCCUPANTS AND TRIP PURPOSE

Number of Occupants	Trip Purpose: Earning a Living		Family Business		Civic, Educational, and Religious		Social and Recreational		Other		All Purposes	
	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983
One	78.8	80.8	40.0	51.6	51.3	52.0	26.8	37.8	26.8	40.6	51.7	57.4
Two	14.3	13.0	35.2	29.9	25.1	25.7	38.2	35.5	49.7	40.3	27.7	25.7
Three	3.8	3.9	13.3	10.9	9.7	7.1	15.1	10.8	7.1	10.9	9.7	8.3
Four	1.9	1.2	6.9	4.4	7.1	7.3	10.8	10.2	11.6	5.3	6.2	5.2
Five	.7	.2	3.1	1.6	3.9	4.1	5.3	4.5	3.6	.1	2.8	2.1
Six	.2	.4	.8	.9	1.6	2.0	2.5	.8	.1	2.7	1.1	.8
Seven	.1	.0	.5	.3	.4	.0	.8	.2	.7	.0	.4	.1
Eight	.1	.1	.1	.4	.4	.2	.3	.1	.0	.1	.2	.2
Nine or More	.1	.4	.1	.0	.5	1.6	.2	.1	.4	.0	.2	.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

An important underlying question is provoked by the data in Tables 8-3 and 8-4, namely, is occupancy decreasing on short or long trips? Table 8-5 addresses this question by displaying the distribution of single and multi-occupant vehicle miles of travel (VMT) by trip length category.

Table 8-5 shows that the overall share of vehicle miles involving single-occupant vehicles increased significantly between 1977 and 1983 (52.0 percent versus 57.4 percent, respectively). Highest increases in the proportion of single-occupant vehicle travel between 1977 and 1983 occurred in each of the categories under 11 miles long. Despite the fact that the proportions of total travel remained the same or declined between the two years in trip length categories of 11 miles or greater, proportions of total travel made by single occupants increased in each of these same categories except for those of length 21 to 30 miles. Thus, the shift between 1977 and 1983 from multi-occupant vehicle travel to single-occupant vehicle travel, while existing to some degree for all trips, is particularly predominent for trips of shorter length.

TABLE 8-5

DISTRIBUTION OF VEHICLE MILES OF TRAVEL

BY TRIP LENGTH AND OCCUPANCY

	Single Occupant			Multi-Occupant			All		
Trip Length (miles)	1977	1983	Percent Change	1977	1983	Percent Change	1977	1983	Percent Change
1-4	7.0	8.3	+18.6	4.5	4.2	- 6.7	11.5	12.5	+ 8.7
5-7	6.4	7.8	+21.9	4.3	4.1	- 4.7	10.7	11.9	+11.2
8-10	6.5	7.9	+21.5	4.5	4.5	0.0	11.0	12.4	+12.7
11-15	8.0	8.9	+11.3	5.1	4.2	-17.6	13.1	13.1	0.0
16-20	6.1	6.3	+ 3.3	4.2	3.8	- 9.5	10.3	10.1	- 1.9
21-30	7.5	6.5	-13.3	5.1	4.4	-13.7	12.6	10.9	-13.5
31 or more	10.5	11.7	+11.4	20.3	17.4	-14.3	30.8	29.1	- 5.5
TOTAL	52.0	57.4	+10.4	48.0	42.6	-11.3	100.0	100.0	--

VEHICLE OCCUPANCY: TRIP PURPOSE, PLACE OF RESIDENCE

As seen in Table 8-6, occupancy levels were generally greater for travel by persons in households outside SMSA's--in 1983 about 1.9 persons per mile outside SMSA's vs. 1.7 inside SMSA's. Travel by persons in households inside SMSA's and outside central cities tended to have higher rates of occupancy than those inside central cities (1.7 vs. 1.6 persons per mile). Between 1977 and 1983, occupancy levels dropped for all residence groups inside SMSA's.

Occupancy rates for those in households outside SMSA's in 1977 and 1983 were generally higher for all major trip purposes than for those in SMSA households, with the exception of social and recreational travel. In fact, the only occupancy increases between 1977 and 1983 occurred in non-SMSA household travel. For this group, occupancy for work travel actually *increased (from* 1.4 to 1.5) between 1977 and 1983, as well as for civic, educational, and religious travel (2.1 to 2.9).

Travel by persons in households inside SMSA's but outside central cities showed reductions in occupancy in all major trip purposes.

TABLE 8-6

AVERAGE OCCUPANCY BY TRIP PURPOSE AND PLACE OF RESIDENCE

(PERSONS PER VEHICLE-MILE)

	Trip Purpose							
	Earning a Living		Family Business		Civic, Educational, and Religious		Social and Recreational	
	1977	1983	1977	1983	1977	1983	1977	1983
In SMSA Central City	1.3	1.3	2.0	1.8	1.9	1.9	2.4	2.0
Non-Central City	1.3	1.2	2.0	1.7	2.0	1.6	2.4	2.3
Subtotal	1.3	1.3	2.0	1.7	1.9	1.7	2.4	2.1
Non-SMSA	1.4	1.5	2.1	2.0	2.1	2.9	2.4	2.0
ALL PLACES	1.3	1.3	2.0	1.8	2.0	2.1	2.4	2.1
Percent of VMT	39.3	34.3	24.9	30.4	5.2	4.1	27.3	30.0

	Trip Purpose					
	Other		All Purposes		Percent of VMT	
	1977	1983	1977	1983	1977	1983
In SMSA Central City	2.3	1.6	1.8	1.6	27.0	22.2
Non-Central City	2.0	2.0	1.8	1.7	38.8	46.1
Subtotal	2.1	1.9	1.8	1.7	65.8	72.2
Non-SMSA	2.3	1.9	2.0	1.9	34.2	27.8
ALL PLACES	2.2	1.9	1.9	1.7	100.0	100.0
Percent of VMT	3.3	1.2	100.0	100.0		

VEHICLE OCCUPANCY: TRIP PURPOSE, SMSA SIZE

Travel occupancy rates varied by type of trip across the different SMSA size groups as seen in Table 8-7, but there appears to be no systematic difference which can be explained by SMSA size.

Average occupancy fell for all trip purposes across all SMSA groups between 1977 and 1983, with the exception of minor increases in occupancy for work travel in the largest SMSA group (3 million or more), and in "other" travel in SMSA's under 250,000 and those of 1 to 3 million.

In 1983, the rate for SMSA's between 250,000 and 500,000 fell more in line with other SMSA's, in contrast to 1977 when it was about 11 percent higher. The biggest changes leading to its leveling were sizable reductions in average occupancy for family and personal business and social and recreational travel.

TABLE 8-7

AVERAGE OCCUPANCY BY TRIP PURPOSE AND SMSA SIZE

(PERSONS PER VEHICLE-MILE)

SMSA Size	Earning a Living		Family and Personal Business		Civic, Educational, and Religious		Social and Recreational	
	1977	1983	1977	1983	1977	1983	1977	1983
Less than 250,000	1.4	1.2	2.0	1.9	2.0	1.9	2.2	1.9
250,000-499,999	1.4	1.3	2.1	1.7	1.9	1.8	2.7	2.1
500,000-999,999	1.2	1.2	2.2	2.0	1.9	1.4	2.3	2.0
1,000,000-2,999,999	1.3	1.2	1.9	1.7	2.0	1.7	2.4	2.3
3,000,000 or More	1.3	1.4	1.9	1.7	1.7	1.7	2.4	2.1
ALL SMSA's	1.3	1.3	2.0	1.7	1.9	1.7	2.4	2.1
Percent of VMT (SMSA's)	40.4	35.6	23.3	29.1	5.3	3.9	27.7	30.4

SMSA Size	Other		All		Percent of VMT	
	1977	1983	1977	1983	1977	1983
Less than 250,000	1.9	2.7	1.8	1.7	12.4	14.0
250,000-499,999	2.4	1.6	2.0	1.7	15.8	14.4
500,000-999,999	2.1	1.9	1.8	1.6	16.5	13.6
1,000,000-2,999,999	2.0	2.1	1.8	1.7	33.7	29.4
3,000,000 or More	2.3	1.7	1.8	1.7	21.6	20.9
ALL SMSA's	2.1	1.9	1.8	1.7		
Percent of VMT (SMSA's)	3.3	1.0			100.0	100.0*

*Includes 7.7 percent unknown SMSA.

VEHICLE OCCUPANCY: TRIP PURPOSE, NUMBER OF LICENSED DRIVERS

The following set of tables looks first, individually, at the relationship between drivers and occupancy and vehicle ownership and occupancy, and then highlights the combined effect of both variables.

Table 8-8 indicates that no obvious relationship exists between occupancy levels and number of licensed drivers in the household. If anything, there appears to be a tendency for higher occupancy rates in households with two drivers than in those with one driver or with three or more drivers. In fact, the two-driver strata is one of the few that showed occupancy increases between 1977 and 1983. Travel for earning a living and civic, educational, and religious purposes showed increased occupancy rates during this period. However, rates for family and personal business travel and social and recreational travel fell significantly for the two-driver strata during the same period.

TABLE 8-8

AVERAGE OCCUPANCY BY TRIP PURPOSE AND NUMBER OF HOUSEHOLD DRIVERS

(PERSONS PER VEHICLE-MILE)

Number of Licensed Drivers	Earning a Living		Family and Personal Business		Civic, Educational, and Religious		Social and Recreational	
	1977	1983	1977	1983	1977	1983	1977	1983
One	1.3	1.2	2.0	1.8	1.9	1.5	2.2	1.7
Two	1.3	1.4	2.1	1.9	2.1	2.7	2.6	2.3
Three or More	1.4	1.2	1.9	1.7	1.9	1.5	2.3	2.0
ALL	1.3	1.3	2.0	1.8	2.0	2.1	2.4	2.1
Percent of VMT	39.3	34.3	24.9	30.4	5.2	4.1	27.3	30.0

Number of Licensed Drivers	Other		All		Percent of VMT	
	1977	1983	1977	1983	1977	1983
One	2.1	1.4	1.8	1.6	20.7	19.0
Two	2.2	2.1	1.9	1.9	55.5	56.0
Three or More	2.3	1.7	1.8	1.6	23.8	25.0
ALL	2.2	1.9	1.9	1.7	100.0	100.0
Percent of VMT	3.3	1.2	100.0	100.0		

Note: Data on households with no drivers insufficient for analysis; however, these households are included in "all."

Somewhat more of a relationship occurred between level of vehicle ownership and average occupancy (Table 8-9). For all travel purposes combined in 1983, average occupancy declined from 1.8 persons per vehicle mile in one-vehicle households to 1.6 persons per vehicle mile in households with four or more vehicles. This represents a uniform decline in occupancy levels for all ownership groups between 1977 and 1983. Consistent with earlier relationships, the most pronounced declines in occupancy were for social and recreational travel.

TABLE 8-9

AVERAGE OCCUPANCY BY TRIP PURPOSE AND NUMBER OF HOUSEHOLD VEHICLES (PERSONS PER VEHICLE-MILE)

Number of Vehicles	Trip Purpose: Earning a Living		Family Business		Civic, Educational, and Religious		Social and Recreational		Other		All Purposes		Percent of VMT	
	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983	1977	1983
One	1.4	1.4	2.0	1.8	2.2	2.1	2.4	2.0	1.9	1.8	1.9	1.8	23.4	23.4
Two	1.3	1.3	2.1	1.9	2.0	2.2	2.5	2.3	2.2	2.1	1.9	1.8	46.0	42.2
Three	1.3	1.3	1.9	1.7	2.0	1.5	2.3	2.1	2.2	1.5	1.8	1.7	20.0	20.6
Four or More	1.4	1.3	1.9	1.8	1.7	1.4	2.3	1.9	3.0	1.6	1.8	1.6	10.6	13.8
ALL	1.3	1.3	2.0	1.8	2.0	2.1	2.4	2.1	2.2	1.9	1.9	1.7	100.0	100.0
Percent of VMT	39.3	34.3	24.9	30.4	5.2	4.1	27.3	30.0	3.3	1.2	100.0	100.0		

Note: Data on households with no vehicles insufficient for analysis.

Table 8-10 illustrates, by trip purpose, how occupancy levels vary under the combined effect of number of household drivers and number of vehicles owned. The data in this table are from 1983 only.

The strongest trends were found in the jump from one to two drivers; this usually caused a significant rise in occupancy. However, the increase from two to three or more drivers showed a leveling or decline in occupancy in most cases; this may suggest more short trips with fewer occupants.

TABLE 8-10

AVERAGE OCCUPANCY BY NUMBER OF HOUSEHOLD DRIVERS AND NUMBER OF HOUSEHOLD VEHICLES BY TRIP PURPOSE 1983*

(PERSONS PER VEHICLE-MILE)

Number of Vehicles	Number of Drivers: One	Two	Three or More	All
Earning a Living				
One	1.2	1.7	1.4	1.4
Two	1.2	1.4	1.3	1.3
Three	1.1	1.3	1.2	1.3
Four or More	1.0	1.6	1.3	1.3
All	1.2	1.4	1.2	1.3
Family and Personal Business				
One	1.6	2.0	2.0	1.8
Two	2.2	1.9	1.5	1.9
Three	1.6	1.7	1.7	1.7
Four or More	1.6	1.7	1.8	1.8
All	1.8	1.9	1.7	1.8
Civic, Educational, and Religious				
One	1.5	2.9	1.8	2.1
Two	1.4	2.3	1.7	2.2
Three	1.0	3.4	1.5	2.5
Four or More	**	2.1	1.3	1.3
All	1.5	2.7	1.5	2.1
Social and Recreational				
One	1.7	2.7	1.5	2.0
Two	1.9	2.3	2.6	2.3
Three	1.4	2.3	1.9	2.1
Four or More	1.7	2.1	1.8	1.9
All	1.7	2.3	2.0	2.1
All Purposes				
One	1.5	2.1	1.7	1.8
Two	1.7	1.8	1.8	1.8
Three	1.4	1.8	1.5	1.6
Four or More	1.4	1.8	1.5	1.6
All	1.6	1.9	1.6	1.7

*Data in this table comparable to Table 15 in Report 6, Vehicle Occupancy, 1977 NPTS.

**Insufficient data.

VEHICLE OCCUPANCY: TRIP PURPOSE, LIFE CYCLE

There appears to be a relationship between where a household is in its life cycle of development and its travel behavior, including trip occupancy. Table 8-11 lists ten different conditions relative to presence and status of adults and presence and age of children in the household. Unique travel needs and economic resources are implied with each of the categories.

Households without children are likely to have fewer restrictions on their travel than those with children. Table 8-11 shows this to be so, with childless households having uniformly lower rates of vehicle occupancy. The lowest occupancy rates among childless households were found in those of retired households, which also showed one of the largest declines in occupancy since 1977.

Among households with children, the highest rates of occupancy were found in households with young children (youngest child under 6 years). Average occupancy then fell as the household matured, as measured by the age of the youngest child. These differences largely prevailed across individual trip purposes.

TABLE 8-11

AVERAGE OCCUPANCY BY TRIP PURPOSE AND FAMILY LIFE CYCLE

(PERSONS PER VEHICLE-MILE)

	Trip Purpose							
	Earning a Living		Family Business		Civic, Educational, and Religious		Social and Recreational	
Family Life Cycle	1977	1983	1977	1983	1977	1983	1977	1983
Single Adult, No Children	1.2	1.1	1.4	1.3	1.3	1.3	1.8	1.5
Two or More Adults, No Children	1.3	1.3	1.7	1.6	1.5	1.4	2.0	1.8
Single Adult, Youngest Child Under 6	1.8	1.3	2.4	2.0	2.2	1.3	3.1	1.5
Two or More Adults, Youngest Child Under 6	1.4	1.5	2.6	2.4	2.5	3.4	3.1	2.8
Single Adult, Youngest Child 6 to 15	1.4	1.2	1.9	1.6	2.5	1.6	2.4	1.8
Two or More Adults, Youngest Child 6 to 15	1.3	1.4	2.2	1.9	2.2	2.4	2.9	2.6
Single Adult, Youngest Child 16 or Older	1.4	1.0	1.4	1.4	1.7	1.2	1.5	1.6
Two or More Adults, Youngest Child 16 or Older	1.4	1.2	1.7	1.7	1.7	1.4	2.0	2.0
Single Adult, Retired, No Children	1.0	.0	1.6	1.3	1.3	1.1	1.8	1.2
Two or More Adults, Retired, No Children	1.2	1.1	1.7	1.4	2.0	1.8	2.0	1.9
ALL	1.3	1.3	2.0	1.8	2.0	2.1	2.4	2.1
Percent of VMT	39.3	34.3	24.9	30.4	5.2	4.1	27.3	30.0

	Trip Purpose					
	Other		All Purposes		Percent of VMT	
Family Life Cycle	1977	1983	1977	1983	1977	1983
Single Adult, No Children	1.5	1.2	1.4	1.3	7.3	9.5
Two or More Adults, No Children	1.8	1.8	1.6	1.5	26.2	30.0
Single Adult, Youngest Child Under 6	2.3	2.0	2.3	1.6	.8	1.0
Two or More Adults, Youngest Child Under 6	3.6	3.2	2.3	2.2	21.8	21.3
Single Adult, Youngest Child 6 to 15	2.0	1.3	1.9	1.6	2.0	2.2
Two or More Adults, Youngest Child 6 to 15	2.5	1.8	2.0	1.9	25.3	21.3
Single Adult, Youngest Child 16 or Older	1.8	2.0	1.5	1.4	.9	.9
Two or More Adults, Youngest Child 16 or Older	1.8	1.9	1.6	1.6	10.2	9.3
Single Adult, Retired, No Children	1.0	1.0	1.7	1.2	.6	.5
Two or More Adults, Retired, No Children	1.9	1.1	1.8	1.5	4.9	4.0
ALL	2.2	1.9	1.9	1.7	100.0	100.0
Percent of VMT	3.3	1.2	100.0	100.0		

VEHICLE OCCUPANCY: HOUSEHOLD INCOME, TRIP PURPOSE

It might be expected that as household income increases, the restrictions on travel would be less, and vehicle occupancy would decline. Table 8-12 indicates that this is only partly true.

Household incomes are associated with changing life cycle function and other important compositional elements that affect travel. As a result, we find that the highest rates of occupancy occurred in households in the middle of the income spectrum ($10,000 to $20,000 and $20,000 to $40,000), with a general decline in occupancy for households with incomes of $40,000 or more.

While occupancy almost uniformly declined between 1977 and 1983, the middle income strata ($20,000 to $40,000) showed some increases in occupancy--for travel for earning a living, and civic, educational, and religious travel.

TABLE 8-12

AVERAGE OCCUPANCY BY TRIP PURPOSE AND INCOME

(PERSONS PER VEHICLE-MILE)

	Trip Purpose							
	Earning a Living		Family and Personal Business		Civic, Educational, and Religious		Social and Recreational	
Income	1977	1983	1977	1983	1977	1983	1977	1983
Under $10,000	1.3	1.3	2.0	1.8	1.9	1.4	2.2	1.9
$10,000 to $19,999	1.4	1.3	2.1	1.9	2.1	2.4	2.4	1.9
$20,000 to $39,999	1.3	1.4	2.1	1.8	2.0	2.4	2.5	2.3
$40,000 and Over	1.3	1.3	1.9	1.7	1.9	1.7	2.5	2.1
ALL	1.3	1.3	2.0	1.8	2.0	2.1	2.4	2.1
Percent of VMT	39.3	34.3	24.9	30.4	5.2	4.1	27.3	30.0

	Trip Purpose					
	Other		All		Percent of VMT	
Income	1977	1983	1977	1983	1977	1983
Under $10,000	1.8	1.9	1.9	1.7	9.3	10.4
$10,000 to $19,999	2.1	1.9	1.9	1.7	21.9	24.1
$20,000 to $39,999	2.4	1.8	1.9	1.8	47.7	42.8
$40,000 and Over	1.9	2.3	1.8	1.7	21.1	22.7
ALL	2.2	1.9	1.9	1.7	100.0	100.0
Percent of VMT	3.3	1.2	100.0	100.0		

VEHICLE OCCUPANCY: TRIP PURPOSE, TRIP LENGTH

Table 8-13 presents data which explore the relationship between occupancy and the length of the trip.

Several trends are shown by the data. First, trip length did not appear to have a major influence on occupancy levels. Occupancies in 1977 and 1983 were relatively invariant with trip length, until trip length reached 30 miles or more, after which occupancy increased.

TABLE 8-13

AVERAGE OCCUPANCY BY TRIP PURPOSE AND ONE WAY TRIP LENGTH

(PERSONS PER VEHICLE-MILE)

	Trip Purpose							
	Earning a Living		Family and Personal Business		Civic, Educational, and Religious		Social and Recreational	
Trip Length (Miles)	1977	1983	1977	1983	1977	1983	1977	1983
1	1.3	1.2	1.6	1.5	2.0	1.8	1.9	1.6
2	1.3	1.2	1.7	1.5	2.0	1.7	1.9	1.8
3	1.3	1.2	1.7	1.6	1.9	1.9	2.0	2.0
4	1.2	1.2	1.8	1.6	1.9	1.8	2.0	1.8
5	1.2	1.2	1.9	2.5	1.9	1.7	2.1	1.9
6	1.3	1.1	1.8	1.6	2.0	2.5	2.1	1.9
7	1.2	1.1	1.9	1.6	1.6	1.6	2.0	2.1
8-10	1.2	1.2	2.0	1.7	2.1	1.7	2.2	2.0
11-15	1.3	1.2	1.9	1.7	2.1	1.9	2.2	2.0
16-20	1.3	1.2	2.0	1.9	1.9	1.6	2.3	2.0
21-30	1.3	1.4	2.1	1.9	1.7	4.4	2.4	2.3
31-40	1.4	1.5	2.3	2.2	2.3	2.1	2.7	2.1
41 and Over	1.6	1.9	2.5	2.1	2.2	2.9	2.8	2.3
ALL	1.3	1.3	2.0	1.8	2.0	2.1	2.4	2.1
Percent of VMT	39.3	34.3	24.9	30.4	5.2	4.1	27.3	30.0

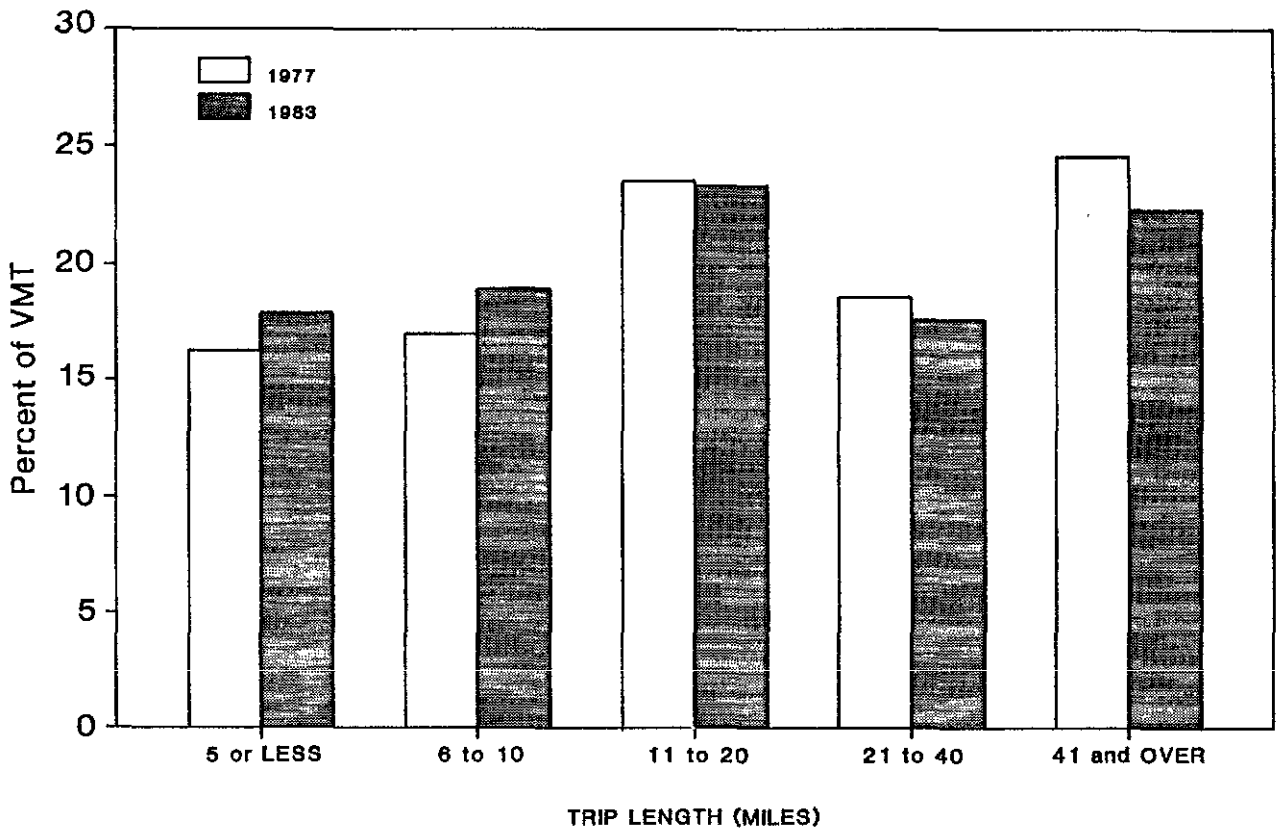
	Trip Purpose					
	Other		All		Percent of VMT	
Trip Length (Miles)	1977	1983	1977	1983	1977	1983
1	2.3	1.6	1.6	1.5	1.7	1.7
2	1.4	1.6	1.6	1.5	3.2	3.6
3	1.9	1.4	1.7	1.6	3.7	3.9
4	1.9	1.8	1.7	1.5	3.0	3.3
5	1.9	1.4	1.7	1.6	4.7	5.4
6	1.6	2.0	1.7	1.6	2.9	3.1
7	1.8	2.0	1.6	1.5	3.1	3.4
8-10	1.7	1.7	1.7	1.6	11.0	12.4
11-15	1.7	2.1	1.7	1.5	13.2	13.2
16-20	1.3	2.2	1.7	1.6	10.3	10.1
21-30	1.5	2.0	1.7	1.8	12.5	10.8
31-40	2.0	2.8	2.0	1.9	6.1	6.8
41 and Over	2.3	1.9	2.3	2.2	24.6	22.3
ALL	2.2	1.9	1.9	1.7	100.0	100.0
Percent of VMT	3.3	1.2	100.0	100.0		

Second, trips in general are getting shorter. The proportion of travel (VMT) accounted for by short trips increased, as shown in the downward shift in the distribution of VMT vs. trip length: 17.9 percent of all VMT was accounted for by trips 5 miles or less in 1983, compared to 16.3 percent in 1977. Similarly, 36.8 percent of all trips were 10 miles in length or less in 1983, compared to only 33.3 percent in 1977. Figure 8-5 illustrates the distribution of travel by trip length in both 1977 and 1983.

Third, trip occupancy declined rather uniformly between 1977 and 1983 at all trip distances. Occupancy levels seemed the least affected in only the longest trips, i.e., those over 20 miles in length. In fact, the few increases in occupancy that occurred between 1977 and 1983 were for travel for earning a living on trips greater than 20 miles and civic, educational, and religious travel for trips between 20 and 30 miles and those over 40 miles. Correspondingly, however, some of the biggest individual declines were in the longest trip lengths, specifically for social and recreational travel over 30 miles, and, to a lesser extent, family and personal business trips over 40 miles.

FIGURE 8-5

PERCENT OF TRAVEL BY TRIP LENGTH



VEHICLE OCCUPANCY: TRIP PURPOSE, TIME OF DAY

As might be expected, travel occupancy varied with the time when travel occurs, largely as a reflection of the variation in the concentration of particular trip purposes of different times of day or week. However, as Tables 8-14 and 8-15 show, occupancy rates within individual trip purposes were also somewhat affected by trip timing.

Comparing Tables 8-14 and 8-15 shows, first, a generally higher 1983 level of occupancy on

TABLE 8-14

AVERAGE WEEKDAY TRIP OCCUPANCY BY PURPOSE AND TIME OF DAY

(PERSONS PER VEHICLE-MILE)

Time	Earning a Living		Family and Personal Business		Civic, Educational, and Religious		Social and Recreational	
	1977	1983	1977	1983	1977	1983	1977	1983
10 p.m. - 6 a.m.	1.3	1.4	2.5	1.6	1.5	1.3	2.3	1.8
6 a.m. - 9 a.m.	1.4	1.3	1.9	2.1	1.9	1.7	2.6	2.3
9 a.m. - 4 p.m.	1.3	1.4	1.9	1.6	1.7	1.4	2.2	2.0
4 p.m. - 7 p.m.	1.3	1.3	1.9	1.7	1.8	1.4	2.3	2.0
7 p.m. - 10 p.m.	1.4	1.3	2.3	2.2	2.0	1.5	2.3	2.0
Unknown	1.1	1.0	1.5	1.7	1.3	2.0	2.1	2.0
ALL	1.3	1.3	1.9	1.7	1.8	1.5	2.3	2.0
Percent of VMT	48.7	42.1	23.7	30.8	5.1	3.3	19.7	22.5

Time	Other		All		Percent of VMT	
	1977	1983	1977	1983	1977	1983
10 p.m. - 6 a.m.	1.5	1.4	1.7	1.5	8.5	9.0
6 a.m. - 9 a.m.	2.2	1.8	1.6	1.5	20.8	19.2
9 a.m. - 4 p.m.	2.1	1.8	1.7	1.6	37.0	37.9
4 p.m. - 7 p.m.	2.2	1.7	1.7	1.6	23.8	22.9
7 p.m. - 10 p.m.	1.6	2.2	2.0	1.9	9.6	10.5
Unknown	1.2	6.0	1.3	1.7	.3	.5
ALL	2.1	1.9	1.7	1.6	100.0	100.0
Percent of VMT	2.8	1.3	100.0	100.0		

TABLE 8-15

AVERAGE WEEKEND TRIP OCCUPANCY BY TRIP PURPOSE AND TIME OF DAY

(PERSONS PER VEHICLE-MILE)

Time	Earning a Living		Family and Personal Business		Civic, Educational, and Religious		Social and Recreational	
	1977	1983	1977	1983	1977	1983	1977	1983
10 p.m. - 6 a.m.	1.5	1.1	2.3	2.2	2.1	1.2	2.4	2.6
6 a.m. - 9 a.m.	1.4	1.3	2.2	1.7	2.4	2.5	2.5	1.8
9 a.m. - 4 p.m.	1.6	1.4	2.2	1.9	2.5	3.1	2.5	2.4
4 p.m. - 7 p.m.	1.4	1.4	2.4	2.2	2.4	2.7	2.7	2.3
7 p.m. - 10 p.m.	1.4	1.3	2.5	2.1	2.5	3.6	2.7	2.1
Unknown	1.6	1.0	1.5	3.0	2.0	2.0	3.5	1.7
ALL	1.5	1.3	2.3	2.0	2.5	2.9	2.6	2.3
Percent of VMT	15.3	12.9	28.4	28.6	5.5	6.4	46.1	50.9

Time	Other		All		Percent of VMT	
	1977	1983	1977	1983	1977	1983
10 p.m. - 6 a.m.	2.6	1.2	2.2	2.3	8.2	8.4
6 a.m. - 9 a.m.	1.8	1.9	2.0	1.7	10.5	11.7
9 a.m. - 4 p.m.	2.5	2.4	2.3	2.2	49.9	47.9
4 p.m. - 7 p.m.	2.7	1.5	2.4	2.2	20.5	19.9
7 p.m. - 10 p.m.	2.2	2.8	2.5	2.1	10.5	11.5
Unknown	1.0	--	2.8	1.9	.4	.6
ALL	2.4	2.0	2.3	2.1	100.0	100.0
Percent of VMT	4.7	1.2	100.0	100.0		

weekends--2.1 persons per vehicle mile overall on weekends vs. 1.6 on weekdays, or about 30 percent higher. These differences held for all trip purposes except on travel for earning a living. The biggest differences were for civic, educational, and religious travel (2.9 vs. 1.5 persons per mile) and social and recreational travel (2.3 vs. 2.0 persons per mile). All purposes except weekday work and weekend civic, educational, and religious showed declines in occupancy between 1977 and 1983, both on weekdays and weekends. Declines do not appear to have been any greater proportionally on weekends than on weekdays.

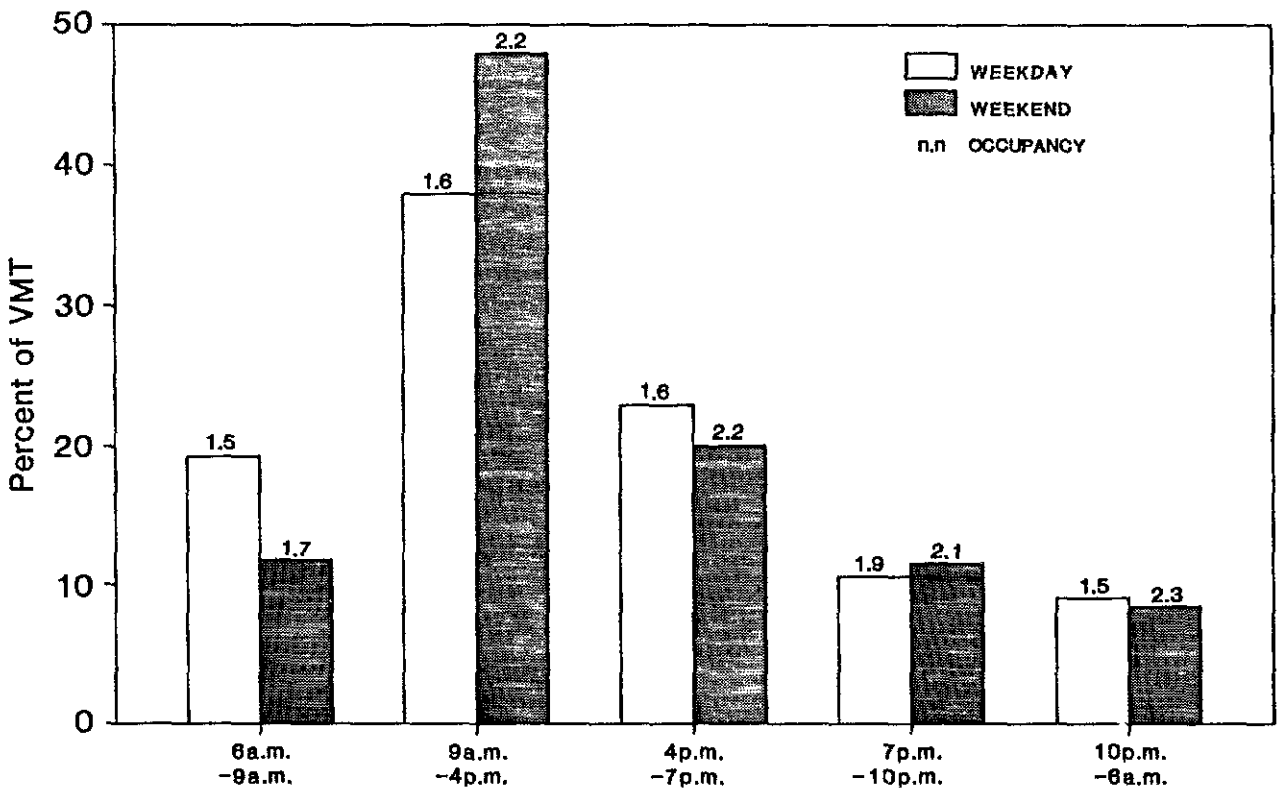
Weekday occupancy seemed to be greatest between 7 and 10 p.m., when family and personal business and social and recreational travel is more common. Work travel occupancy seemed to be relatively invariant throughout the day, whereas family and personal business occupancy reached its peak between 7 and 10 p.m. Civic, educational, and religious and social and recreational occupancies each reached their peak between 6 and 9 a.m.

Weekend travel did not seem to have any definitive occupancy peak by time of day. The lowest rates of occupancy occurred between 6 and 9 a.m. Figure 8-6 depicts proportions of 1983 weekend and weekday travel by time of day together with the average vehicle occupancy for each time period.

FIGURE 8-6

PERCENT OF 1983 TRAVEL BY TIME OF DAY AND DAY OF WEEK

(UNKNOWN = 0.5%)



AUTO OCCUPANCY: TRIP PURPOSE

As mentioned in the introduction, the reason data on occupancy from the 1969 NPTS survey is not presented for comparison with the 1977 and 1983 survey data is that the travel corresponds to a different travel universe. In 1969 trips were limited to autos and passenger vans only and were not restricted to household drivers. Table 8-16 places the 1977 and 1983 data on the same basis as the 1969 data, so that comparisons can be made.

In general, defining the trip data in 1969 terms has the effect of increasing occupancy levels. The 1983 average occupancy per vehicle-mile calculated at 2.1, compared to 1.7 in Table 8-1; similarly, 1983 occupancy per vehicle trip using 1969 rules was 1.8, compared to 1.6 in Table 8-2. Figure 8-7 compares auto occupancy rates (persons per vehicle trip) by purpose for 1969, 1977, and 1983 while Figure 8-8 looks at occupancy rates in terms of persons per vehicle-mile.

Overall, trends over time in Table 8-16 tend to be in the same direction as those in Tables 8-1 and 8-2. Average occupancy for all travel (all purposes combined) has declined between 1969 and 1983. The biggest declines have been in social and recreational travel, both in a per mile and a per trip basis. Only civic, educational, and religious travel showed an increase, and only on a per mile basis.

TABLE 8-16

COMPARISON OF AUTO* OCCUPANCY RATES BY TRIP PURPOSE

	Persons per Vehicle Trip			Persons per Vehicle-Mile		
	1969	1977	1983	1969	1977	1983
Earning a Living						
To Work	1.4	1.4	1.3	1.6	1.5	1.6
Work Related	1.6	1.4	1.5	1.7	1.6	1.8
All	1.4	1.4	1.4	1.6	1.5	1.6
Family and Personal Business						
Shopping	2.0	1.9	1.7	2.2	2.2	2.0
Medical/Dental	2.1	2.0	1.8	2.6	2.3	1.9
Other	1.9	1.8	1.8	2.2	2.2	2.0
All	2.0	1.9	1.7	2.3	2.2	2.0
Civic, Educational, and Religious	2.5	2.3	2.3	2.5	2.3	2.6
Social and Recreational						
Visit Friends/Relatives	2.3	2.1	2.0	2.7	2.5	2.3
Pleasure Driving	2.7	2.5	2.8	3.0	2.8	2.8
Vacation	3.3	2.9	2.7	3.3	2.8	2.6
Other	2.6	2.6	2.4	3.0	2.9	2.7
All	2.5	2.4	2.2	2.9	2.7	2.5
Other	--	2.2	2.0	--	2.5	2.2
ALL PURPOSES	1.9	1.9	1.8	2.2	2.2	2.1

*Includes auto, station wagon, and passenger vans.

FIGURE 8-7

AUTO OCCUPANCY RATES (PERSONS PER VEHICLE TRIP) BY PURPOSE

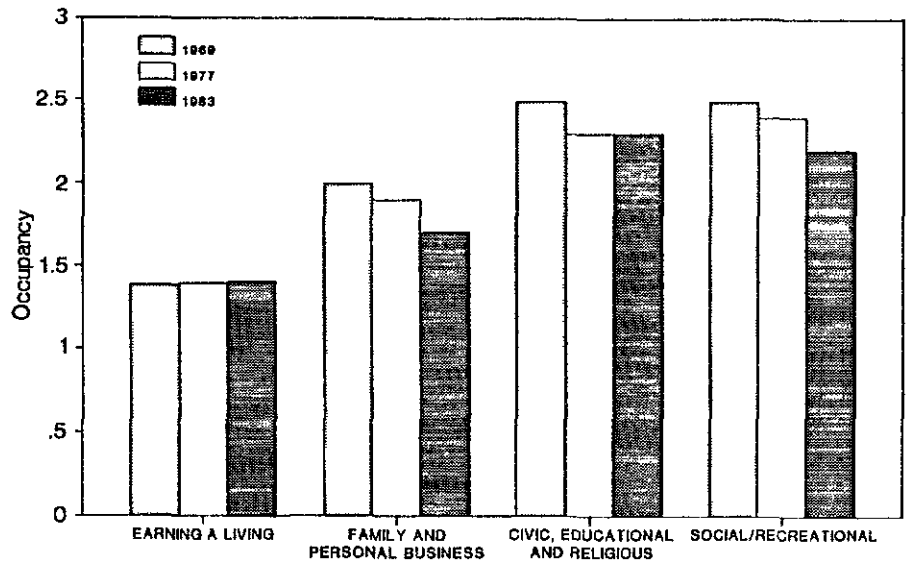


FIGURE 8-8

AUTO OCCUPANCY RATES (PERSONS PER VEHICLE-MILE) BY PURPOSE