Summary of Travel Trends 1995 Nationwide Personal Transportation Survey

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of Transportation

Federal Highway
Administration

ABBREVIATIONS AND COMMON TERMS USED IN THIS PUBLICATION:

CMSA	Consolidated Metropolitan Statistical Area
DOT	Department of Transportation
FHWA	Federal Highway Administration
MSA	Metropolitan Statistical Area
NPTS	Nationwide Personal Transportation Survey
PMT	Person Miles Traveled
POV	Privately Owned Vehicle/Personally Operated Vehicle
SMSA	Standard Metropolitan Statistical Areas
VMT	Vehicle Miles Traveled

FOR MORE INFORMATION ON NPTS:

web site: http://www-cta.ornl.gov/npts/
email: ogatekee@fhwa.dot.gov

FOR ONLINE ANALYSIS OF NPTS, VISIT

web site: http://www-cta.ornl.gov/npts/1995/

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Prepared for
U.S. Department of Transportation
Federal Highway Administration

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SUMMARY OF TRAVEL TRENDS

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Summary of Travel Trends

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INTRODUCTION

> "*The national objectives of general welfare, economic growth and stability, and security of the United States require the development of transportation policies and programs that contribute to providing fast, safe, efficient, and convenient transportation at the lowest cost consistent with those and other national objectives, including the efficient use and conservation of the resources of the United States*."
>
> - U.S. DOT Strategic Plan for Fiscal Years 1997-2002

To reach these objectives, five specific performance goals are identified: safety, mobility, economic growth and trade, human and natural environment, and national security. To develop transportation policies and programs that reach these goals, it is imperative to fully understand how travel behavior changes over time.

To further our understanding of travel behavior, the U.S. Department of Transportation (US DOT) conducts the Nationwide Personal Transportation Survey (NPTS) to obtain information on personal travel of U.S. households with respect to why, how, when, where from, where to, how frequently, how long, and with whom. The NPTS also provides information by subgroups of the population, e.g., by age, gender, race, zero-vehicle households, which allows important policy analyses of how transportation serves these groups. The NPTS has been conducted in 1969, 1977, 1983, 1990, and 1995.

PROFILE OF THE 1995 NPTS

Coverage. The NPTS is a survey of travel by the civilian, non-institutionalized population of the United States age five and older. As such, it does not include: (1) military personnel living on base or overseas, and (2) residents of group quarters, such as nursing homes or assisted-living facilities, college dormitories, long-term medical institutions, and prisons. However, military personnel are included if they live in civilian housing. College students are included if they live in apartments or other off-campus housing, or if they are contacted when home for the summer.

Sample Size. The sample size for the 1995 NPTS was 42,033 households comprised of:

- a national sample of 21,020 completed households, and
- 21,013 additional households collected for the use of and funded by five add-on areas:

  New York State,
  Commonwealth of Massachusetts,
  Oklahoma City, Oklahoma,
  Tulsa, Oklahoma, and
  Seattle, Washington.

The 42,033 households in the NPTS sample contained 103,466 persons eligible for the survey, of which 95,360 were interviewed.

Contents. The NPTS serves as the nation's inventory of daily personal travel. It collects data on the daily trips including, but not limited to:

- purpose of the trip (work, shopping, etc.)
- means of transportation used (car, bus, subway, walk, etc.)
- how long the trip took , i.e., travel time
- time of day the trip took place

- day of week the trip took place
- number of people in the vehicle , i.e., vehicle occupancy
- driver characteristics (age, gender, worker status, education level, etc.)
- vehicle attributes (make, model, model year, amount of miles driven in a year).

These data are collected for:

- all personal trips
- all modes
- all purposes
- all trip lengths
- all areas of the country, urban and rural
- all days of the week
- all months of the year.

For more information on the 1995 survey methodology and procedures, please consult: "*User's Guide for the Public Use Data Files 1995 Nationwide Personal Transportation Survey*" available at:

www-cta.ornl.gov/npts/

In addition to being an information resource, this web site allows you to conduct ad hoc analysis. Note that new users are required to complete a simple registration before using the analysis tools.

IMPROVEMENTS IN THE 1995 NPTS SURVEY METHOD

The US DOT continues to research and embrace improved methodologies to collect more accurate and more complete travel data, and to increase response rates. Among the changes in the NPTS, two are especially significant. First, a written *diary* was used to help respondents to better remember their travel on their designated travel day. Second, a *household roster* of trips was used to assist respondents to

recall trips made with other household members. A comparison between the 1990 and 1995 survey methods is summarized in Appendix 1.

While improvements to the survey process are encouraged, changes in the 1995 survey method brought about significant data compatibility issues. To address these issues, the 1990 survey data were adjusted to allow comparison to the 1995 survey (see Implications and Adjustment box). Since the survey improvements helped the reporting of trips that might have been forgotten, the adjustment only applies to trip frequency and not to trip attributes (e.g., trip length) nor to household, driver and vehicle characteristics. In this report, both the original 1990 data and the adjusted 1990 data are reported to facilitate trends analysis. The reader is advised to compare the 1969-1983 survey results to the **unadjusted** 1990 data, and the 1995 survey results to the **adjusted** 1990 data.

REPORT ORGANIZATION

This report highlights important travel trends in tabular and graphic format. Statistics are categorized by topic. The report begins with a summary of travel and demographic changes. Next, travel changes are examined from an individual household perspective, then from an individual person perspective. This report concludes with trip-making statistics of sub-populations such as women, households without vehicles, low-income households, and the elderly. No attempt is made in this report to present all of the data or to analyze and discuss the data in any depth. Standard error estimates for key statistics are presented in Appendix 5.

Implications of Improved Survey Method and Adjustments of 1990 Data

As depicted in Appendix 1, there were a number of changes in the 1995 survey. Changes that presumably caused the greatest impacts on trip reporting were the use of a written *travel diary* and *household rosters* of trips. The 1990 survey data have been adjusted, to the extent possible, to account for the potential impacts on travel trends due to these changes.

Three assumptions were used to adjust the 1990 survey data shown in this report. First, it was assumed that had the improved survey method been used in the 1990 survey, more discretionary trips would have been reported. Second, it was assumed that the improved survey method would not have helped the reporting of non-discretionary trips (e.g., work and school trips). Finally, it was assumed that the adjustment procedure only affects the statistics on the number of trips but not on the attributes of individual trips (e.g., trip length). For example, it was estimated that an additional forty-one percent of trips taken for family and personal business, other than shopping, would have been recorded in the 1990 survey if the improved method had been used.

Based on the adjusted 1990 data, the NPTS survey suggests that Americans increased their travel by 4.5 percent between 1990 and 1995. This 4.5 percent estimate could be over-estimated because the impacts of survey changes other than *travel diary* and *trip rostering* have not been accounted for. This implies that almost all of the travel changes observed between the 1990 (even after adjustment) and 1995 surveys could be slightly over-estimated.

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Table 1
Summary Statistics on Demographic Characteristics and Total Travel
1969, 1977, 1983, 1990, and 1995 NPTS

	1969	1977	1983	1990	1990 Adj.	1995	Percent Change 69-90 Comp* Annual	69-90 %Change Rate	90 (adj.)-95 Comp* Annual	90 (adj.)-95 %Change Rate
Households (000)										
All	62,504	75,412	85,371	93,347	-	98,990	*1.9%*	*49%*	*1.2%*	*6%*
1 person	10,980	16,214	19,354	22,999	-	24,732	*3.6%*	*109%*	*1.5%*	*8%*
2 persons	18,448	22,925	27,169	30,114	-	31,834	*2.4%*	*63%*	*1.1%*	*6%*
3 persons	10,746	13,046	14,756	16,128	-	16,827	*2.0%*	*50%*	*0.9%*	*4%*
4+ persons	22,330	23,227	24,092	24,106	-	25,597	*0.4%*	*8%*	*1.2%*	*6%*
Persons (000)										
All	197,213	213,141	229,453	239,416	-	259,994	*0.9%*	*21%*	*1.7%*	*9%*
Under 16	60,100	54,958	53,682	54,303	-	61,411	*-0.5%*	*-10%*	*2.5%*	*13%*
16-19	14,598	16,552	15,268	13,851	-	14,074	*-0.2%*	*-5%*	*0.3%*	*2%*
20-34	40,060	52,252	60,788	59,517	-	59,494	*1.9%*	*49%*	*0.0%*	*0%*
35-64	62,982	66,988	75,353	82,480	-	93,766	*1.3%*	*31%*	*2.6%*	*14%*
65+	19,473	22,391	24,362	26,955	-	31,249	*1.6%*	*38%*	*3.0%*	*16%*
All 16+	137,113	158,183	175,771	182,803		198,583	*1.4%*	*33%*	*1.7%*	*9%*
All Male	94,465	102,521	111,514	114,441	-	126,553	*0.8%*	*21%*	*2.0%*	*11%*
All Male - 16+	66,652	74,542	83,645	86,432	-	95,627	*1.1%*	*30%*	*2.0%*	*11%*
All Female	102,748	110,620	117,939	124,975	-	133,441	*0.8%*	*22%*	*1.3%*	*7%*
All Female - 16+	73,526	83,721	92,080	96,371	-	102,956	*1.1%*	*31%*	*1.3%*	*7%*
All - 5+	NA	198,434	212,932	222,101	-	241,675	*0.9%*	*12%*	*1.7%*	*9%*
Licensed Drivers (000)										
All	102,986	127,552	147,015	163,025	-	176,330	*2.2%*	*58%*	*1.6%*	*8%*
Male	57,981	66,199	75,639	80,289	-	88,480	*1.6%*	*38%*	*2.0%*	*10%*
Female	45,005	61,353	71,376	82,707	-	87,851	*2.9%*	*84%*	*1.2%*	*6%*
Workers (000)										
All	75,758	93,019	103,244	118,343	-	131,697	*2.1%*	*56%*	*2.2%*	*11%*
Male	48,487	55,625	58,849	63,996	-	71,105	*1.3%*	*32%*	*2.1%*	*11%*
Female	27,271	37,394	44,395	54,334	-	60,593	*3.3%*	*99%*	*2.2%*	*12%*
Household Vehicles (000)										
	72,500	120,098	143,714	165,221	-	176,067	*4.0%*	*128%*	*1.3%*	*7%*
Household Vehicle Trips (000,000)										
	87,284	108,826	126,874	158,927	193,916	229,745	*2.9%*	*82%*	*3.4%*	*18%*
Household VMT (000,000)										
	775,940	907,603	1,002,139	1,409,600	1,695,290	2,068,368	*2.9%*	*82%*	*8.0%*	*22%*
Person Trips (000,000)										
	145,146	211,778	224,385	249,562	304,471	378,930	*2.6%*	*72%*	*8.7%*	*24%*
Person Miles of Travel (000,000)										
	1,404,137	1,879,215	1,946,662	2,315,300	2,829,936	3,411,122	*2.4%*	*65%*	*8.1%*	*21%*

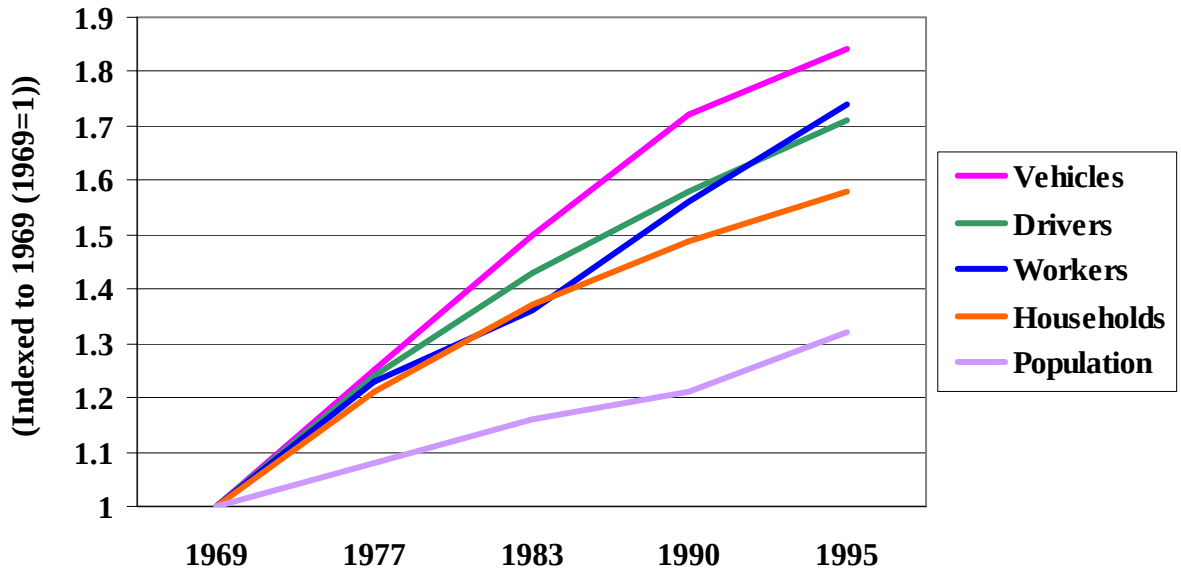
Note:

- All tables reporting totals could include some unreported characteristics.
- In expanding (weighting) the sample to the total population, slightly different approaches were used in 1990 and 1995. Thus, the growth in the under 16 age group is probably overstated. Other age groups track closer to Census data.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).
- The 1969 survey included only automobiles, station wagons, vans, and minibuses as household vehicles.

* "Comp Annual" = Compounded Annual Rate of Percent Change.

During the past two decades, the number of vehicles increased at a steeper rate than any other demographic indicators. In fact, the number of vehicles has increased at an annual rate of almost one and one-half times that of the total population.

Figure 1
Changes in Summary Demographics
1969, 1977, 1983, 1990, and 1995 NPTS



Note:

- The 1969 NPTS survey did not include trucks as household vehicles. For comparability across surveys, the number of household vehicles in 1969 was estimated based on statistics reported in *Highway Statistics*. It was assumed that fifty percent of all 2-axle 4-tire vehicles in 1969 were used for personal purposes, resulting in a total estimate 95,876,000 household vehicles [=89,173,502 + 50% × 13,405,772].

On an individual household basis, vehicle ownership seems to have reached a saturation point. By 1990, household vehicle ownership had reached one vehicle for every licensed driver. In terms of travel, Americans continue to make more vehicle trips and drive more miles.

Table 2
Summary Demographic and Travel Trends
1969, 1977, 1983, 1990, and 1995 NPTS

	1969	1977	1983	1990	1990 Adjusted	1995
Persons per household	3.16	2.83	2.69	2.56	-	2.63
Vehicles per household	1.16	1.59	1.68	1.77	-	1.78
Licensed drivers per household	1.65	1.69	1.72	1.75	-	1.78
Vehicles per licensed driver	0.70	0.94	0.98	1.01	-	1.00
Workers per household	1.21	1.23	1.21	1.27	-	1.33
Vehicles per worker	0.96	1.29	1.39	1.40	-	1.34
Daily vehicle trips per household	3.83	3.95	4.07	4.66	5.69	6.36
Daily VMT per driver	20.64	19.49	18.68	23.69	28.49	32.14
Average vehicle trip length (miles)	8.89	8.34	7.90	8.98	8.85	9.06

Note:
- Average vehicle trip length for 1990 and 1995 is calculated using only those records with trip mileage information present.
- The 1969 survey does not include pickups and other light trucks as household vehicles.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Table 3 compares data from the NPTS and those from other data sources. Given its project-specific goals, each data source has its own scope in terms of data collection method, target population, and data validation and estimation procedures. Therefore, comparison of NPTS data to data from other sources is at best informative but not conclusive.

Data on population and on the total number of households are estimated by the Bureau of Census of the U.S. Department of Commerce as reported in the *Statistical Abstract of the United States* (1997 edition and previous editions, from Census Bureau Web page, http://www.census.gov). While the NPTS estimates household population, the Bureau of Census measures resident and civilian population. The Bureau of Census' estimates are for July 1 of each year.

Data on the number of licensed drivers are reported by the Federal Highway Administration (FHWA) of the US DOT in its annual *Highway Statistics* (Summary to 1995, Table DL-220, p-III-10). Note that *Highway Statistics* shows the **cumulative** number of driver's licenses issued, while the NPTS estimates the number of people who hold a driver's license. (The Highway Statistics series can be found at: www.fhwa.dot.gov/ohim/ohimstat.htm.)

The NPTS's estimate on vehicles includes all household-based vehicles but excludes most fleet vehicles, whereas *Highway Statistics* (Summary to 1995, Table VM-201A, p-V-17-V-18) reports all vehicles (personal and commercial) categorized by vehicle type (e.g., automobiles, 2-axle, 4-tire trucks, etc.). To estimate comparable "household-based" vehicles from *Highway Statistics*, all of the automobiles, motorcycles, and a percentage of the 2-axle 4-tire trucks are assumed to be household-based vehicles. The percent 2-axle 4-tire trucks used for personal purposes is estimated from the Truck Inventory and Use Surveys (TIUS) and varies by year:

1977: 63.21 percent trucks, from 1977 TIUS
1983: 64.20 percent trucks, from 1982 TIUS
1990: 72.38 percent trucks, from 1990 TIUS
1995: 73.90 percent trucks, from 1992 TIUS

Table 3
Comparison of Survey Variables with Other Sources
(thousands)

	Households	Population	Licensed Drivers	Vehicles
		1969		
Other Sources	61,806	199,145	108,306	89,174
NPTS	62,504	197,213	102,986	72,500
		1977		
Other Sources	74,142	218,106	138,121	132,155
NPTS	75,412	213,141	127,552	120,098
		1983		
Other Sources	83,918	232,086	154,389	152,070
NPTS	85,371	229,453	147,015	143,714
		1990		
Other Sources	91,947	247,826	167,015	172,902
NPTS	93,347	239,416	163,025	165,221
		1995		
Other Sources	97,386	261,538	176,628	180,735
NPTS	98,990	259,994	176,330	176,067

Note:
- See Page 10 for details on other sources.
- The 1969 NPTS survey includes only automobiles, station wagons, and van buses/minibuses as household vehicles.

The average household size remained relatively stable, about 2.6 persons per household, from 1990 to 1995 (Table 2). However, a typical household traveled about 4,000 miles more in 1995 than in 1990. This increase took the form of more, but shorter trips for most trip purposes. The notable exceptions were trips to work and shopping trips, which increased in length. Social and recreational trips increased in number, but not in miles.

Table 4
Average Annual PMT, Person Trips and Trip Length by Trip Purpose
1983, 1990, and 1995 NPTS

Trip Purpose	1983	1990	1990 Adjusted	1995
Average Annual PMT per Household				
All Purposes	**22,802**	**24,803**	**30,316**	**34,459**
To/From Work	4,586	5,637	5,637	7,740
Work Related Business	1,354	1,043	1,043	1,987
Shopping	2,567	2,674	3,343	4,659
All Other Fam/Per Business	3,311	5,083	7,167	7,381
School/Church	1,522	1,599	1,599	1,973
Social and Recreational	8,964	8,567	11,308	10,571
Other	500	195	214	131
Average Annual Person Trips per Household				
All Purposes	**2,628**	**2,673**	**3,262**	**3,828**
To/From Work	537	539	539	676
Work Related Business	62	38	38	100
Shopping	474	504	630	775
All Other Fam/Per Business	456	606	854	981
School/Church	310	304	304	337
Social and Recreational	728	662	874	953
Other	61	20	22	6
Average Person Trip Length (miles)				
All Purposes	**8.68**	**9.45**	**9.47**	**9.13**
To/From Work	8.54	10.65	10.65	11.63
Work Related Business	21.77	28.20	28.20	20.28
Shopping	5.41	5.38	5.38	6.08
All Other Fam/Per Business	7.27	8.55	8.55	7.63
School/Church	4.90	5.39	5.39	5.98
Social and Recreational	12.31	13.19	13.19	11.27
Other	8.22	10.30	10.30	22.83

Note:
- Average person trip length for 1990 and 1995 is calculated using only those records with trip mileage information present.
- All tables reporting totals could include some unreported characteristics.
- Standard Errors for 1995 data in Table 4 are presented in Appendix 5.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

In 1995, commuting had the largest share of vehicle travel for all purposes. In the past, social and recreational trips had the longest average driving distance among all trips. However, this pattern changed in 1995, with commuting trips becoming the longest. Note also that the increase in the number of work trips is likely due to the increase in the number of workers in the household (Table 2).

Table 5
Average Annual VMT, Vehicle Trips and Trip Length by Selected Trip Purposes
1969, 1977, 1983, 1990, and 1995 NPTS

Trip Purpose	1969	1977	1983	1990	1990 Adjusted	1995
Average Annual VMT per Household						
All Purposes	**12,423**	**12,036**	**11,739**	**15,100**	**18,161**	**20,895**
To or From Work	4,183	3,815	3,538	4,853	4,853	6,492
Shopping	929	1,336	1,567	1,743	2,178	2,807
Other Fam & Personal Business	1,270	1,444	1,816	3,014	4,250	4,307
Social and Recreational	4,094	3,286	3,534	4,060	5,359	4,764
Average Annual Vehicle Trips per Household						
All Purposes	**1,396**	**1,442**	**1,486**	**1,702**	**2,077**	**2,321**
To or From Work	445	423	414	448	448	553
Shopping	213	268	297	345	431	501
Other Fam. & Personal Business	195	215	272	411	579	626
Social and Recreational	312	320	335	349	460	427
Average Vehicle Trip Length (miles)						
All Purposes	**8.90**	**8.35**	**7.90**	**8.98**	**8.85**	**9.06**
To or From Work	9.40	9.02	8.55	10.97	10.97	11.80
Shopping	4.36	4.99	5.28	5.10	5.10	5.64
Other Fam. & Personal Business	6.51	6.72	6.68	7.43	7.43	6.93
Social and Recreational	13.12	10.27	10.55	11.80	11.80	11.24

Note:
- Average vehicle trip length for 1990 and 1995 is calculated using only those records with trip mileage information present.
- All purposes includes other purposes not shown above, such as trips to school, church, doctor, dentist, and work-related business trips.
- All tables reporting totals could include some unreported characteristics.
- Standard Errors for 1995 data in Table 5 are presented in Appendix 5.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

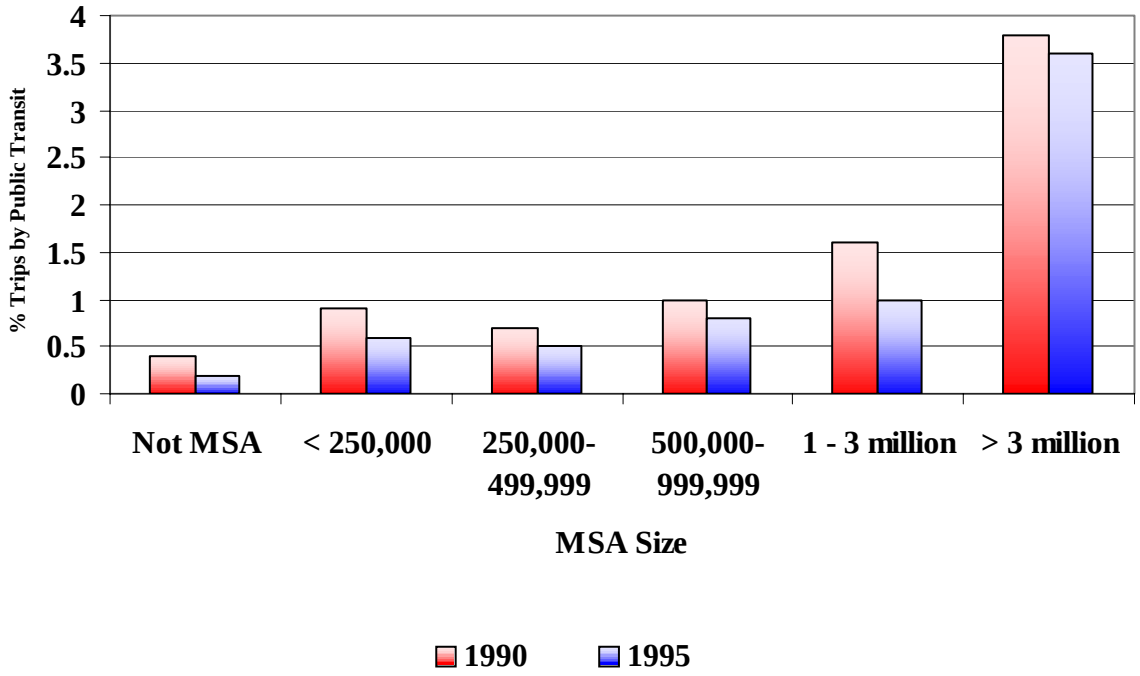
Table 6
Average Annual Person Trips per Household
by Mode of Transportation and MSA Size
1977, 1983, 1990, and 1995 NPTS

Mode of Transportation					
SMSA or MSA Size	1977	1983	1990	1990 Adjusted	1995
Private					
ALL	**2,351**	**2,152**	**2,329**	**2,861**	**3,307**
Not in (S)MSA	2,436	2,322	2,306	2,837	3,492
Less than 250,000	2,517	2,375	2,508	3,090	3,503
250,000 - 499,999	2,574	2,443	2,461	3,014	3,472
500,000 - 999,999	2,628	2,140	2,413	2,957	3,509
1,000,000 - 2,999,999	2,366	2,031	2,430	2,986	3,354
3,000,000 and above	1,785	1,691	2,160	2,649	3,075
PublicTransit					
ALL	**73**	**60**	**52**	**58**	**67**
Not in (S)MSA	22	11	13	14	9
Less than 250,000	47	17	27	30	23
250,000 - 499,999	44	23	19	22	18
500,000 - 999,999	58	48	28	33	33
1,000,000 - 2,999,999	86	67	46	52	37
3,000,000 and above	189	181	112	124	137
Walk					
ALL	**261**	**226**	**193**	**234**	**205**
Not in (S)MSA	199	211	146	175	134
Less than 250,000	241	280	172	212	138
250,000 - 499,999	206	199	165	203	152
500,000 - 999,999	256	184	132	161	138
1,000,000 - 2,999,999	295	179	170	207	162
3,000,000 and above	396	330	278	337	301
ALL MODES					
ALL	**2,808**	**2,628**	**2,673**	**3,262**	**3,828**
Not in (S)MSA	2,800	2,766	2,580	3,151	3,878
Less than 250,000	2,944	2,889	2,816	3,450	3,926
250,000 - 499,999	2,945	2,891	2,741	3,340	3,894
500,000 - 999,999	3,049	2,542	2,667	3,252	3,916
1,000,000 - 2,999,999	2,861	2,463	2,737	3,344	3,795
3,000,000 and above	2,459	2,326	2,641	3,213	3,765

Note:
- The population size groups for 1977 - 1983 NPTS are SMSA Size Groups and 1990 - 1995 are MSA Size Groups (see Appendix 4).
- All modes includes other modes not specified such as bike, school bus, taxi and other.
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

The propensity of American households to travel more was evident regardless of where people lived (Table 6). However, where people lived did influence *how* people traveled. Not surprisingly, people in large metropolitan areas used public transit more often than those in medium and small areas. Nonetheless, the proportion of trips taken by public transportation decreased across all areas since 1990.

Figure 2
Percent Trips by Public Transportation per Household by MSA Size
Adjusted 1990 and 1995 NPTS



Since the sample excluded households without telephones, care should be taken in interpreting results of characteristics that are known to be related to telephone ownership, such as family income and age. For example, estimates of survey data grouped by family income could underestimate the impact of low-income households and, therefore, not adequately represent the population as a whole. Although average household travel increased about three percent per year between 1990 and 1995, this trend did not hold for every household. Only households with income between $10,000 and $50,000 had this increase, while travel for households at either end of the income spectrum increased at a more moderate rate, around one percent per year. Low income households showed a lower growth rate presumably because of budgetary constraints. On the other hand, more affluent households may have reached a saturation point in travel.

Table 7
Person Trips per Household by Household Income
1983, 1990, and 1995 NPTS

Income	1983	1990	1990 Adjusted	1995	Annual Compounded Rate 1990-1995
ALL	**2,628**	**2,673**	**3,262**	**3,828**	***3.3%***
< $10,000	1,479	1,717	2,106	2,231	*1.2%*
$10 to $20,000	2,019	2,079	2,548	2,976	*3.2%*
$20 to $30,000	2,522	2,613	3,201	3,727	*3.1%*
$30 to $40,000	2,936	3,008	3,681	4,176	*2.6%*
$40 to $50,000	3,251	3,319	4,052	4,670	*2.9%*
$50 to $60,000	3,465	3,566	4,344	4,583	*1.1%*
$60 to $70,000	3,584	3,751	4,560	4,902	*1.5%*
$70 to $80,000	3,630	3,846	4,676	4,765	*0.4%*
$80,000+	3,573	3,760	4,592	4,842	*1.1%*
Unreported		2,090	2,536	3,424	*6.2%*

Note:
- Incomes for 1983, 1990, and adjusted 1990 have been adjusted to 1995 dollars.
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

While the predominance of private vehicle travel continued, the survey also shows the continued use of public transit for trips to work or school.

Table 8
Total Person Trips by Mode of Transportation and Trip Purpose
Adjusted 1990 and 1995 NPTS
(millions)

	Private		Public Transit		Other		TOTAL	
	1990 Adj	1995	1990 Adj	1995	1990 Adj	1995	1990 Adj	1995
Total	**267,029**	**327,400**	**5,460**	**6,638**	**31,746**	**32,424**	**304,471**	**378,930**
	(87.7%)	***(86.4%)***	***(1.8%)***	***(1.8%)***	***(10.4%)***	***(8.6%)***	***(100%)***	***(100%)***
To or From Work	45,856	60,740	1,992	2,328	2,427	2,397	50,314	66,901
	(91.1%)	*(90.8%)*	*(4.0%)*	*(3.5%)*	*(4.8%)*	*(3.6%)*	*(100%)*	*(100%)*
Work Related Business	3,178	8,835	92	123	249	658	3,529	9,860
	(90.1%)	*(89.6%)*	*(2.6%)*	*(1.2%)*	*(7.1%)*	*(6.7%)*	*(100%)*	*(100%)*
Family and Personal Business	128,368	156,065	1,318	2,000	8,809	10,524	138,559	173,764
	(92.6%)	*(89.8%)*	*(1.0%)*	*(1.2%)*	*(6.4%)*	*(6.1%)*	*(100%)*	*(100%)*
School/Church	17,545	22,436	1,076	826	9,735	8,960	28,397	33,355
	(61.8%)	*(67.3%)*	*(3.8%)*	*(2.5%)*	*(34.3%)*	*(26.9%)*	*(100%)*	*(100%)*
Social and Recreational	70,382	78,809	946	1,350	10,188	9,799	81,575	94,362
	(86.3%)	*(83.5%)*	*(1.2%)*	*(1.4%)*	*(12.5%)*	*(10.4%)*	*(100%)*	*(100%)*
Other	1,629	470	35	11	338	84	2,014	623
	(80.9%)	*(75.4%)*	*(1.7%)*	*(1.8%)*	*(16.8%)*	*(13.5%)*	*(100%)*	*(100%)*

Note:
- All tables reporting totals could include some unreported characteristics.
- Standard Errors for 1995 data in Table 8 are presented in Appendix 5.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Both men and women took more trips in 1995 than in 1990. In 1995, men made more trips per person than women. Nonetheless, women continued to make more trips than men for family and personal business. Increases for commuting and for work-related business reflected an increase of 13 million workers from 1990 to 1995 (Table 1).

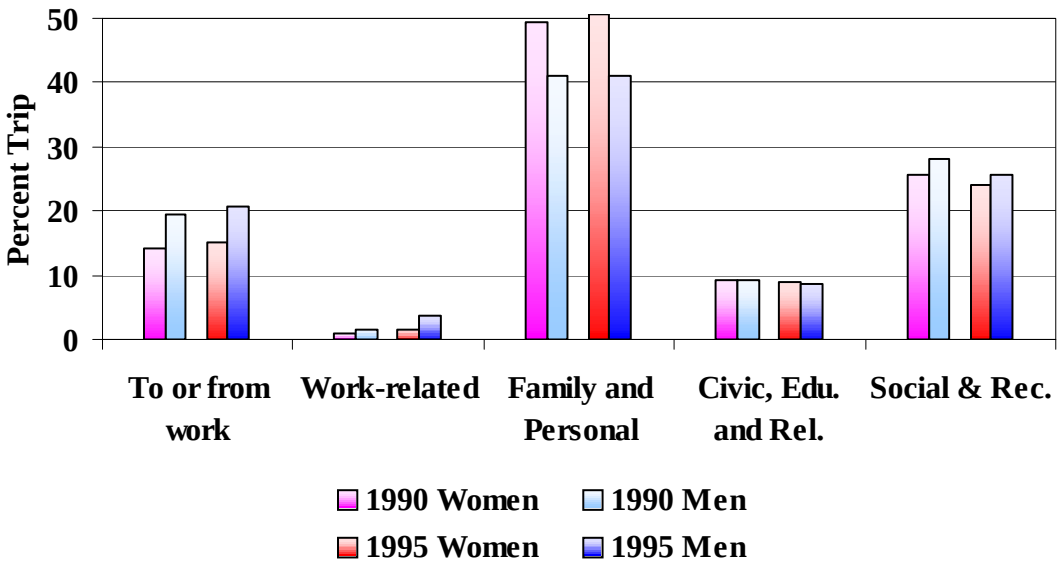
Table 9
Person Trips per Person by Trip Purpose and Gender
Adjusted 1990 and 1995 NPTS

	Women		Men	
	1990 Adj	1995	1990 Adj	1995
Total	**1,401** ***(100%)***	**1,558** ***(100%)***	**1,339** ***(100%)***	**1,579** ***(100%)***
To or From Work	197 *(14.1%)*	229 *(14.7%)*	259 *(19.3%)*	327 *(20.7%)*
Work Related Business	11 *(0.8%)*	23 *(1.5%)*	21 *(1.6%)*	60 *(3.8%)*
Family and Personal Business	693 *(49.4%)*	786 *(50.5%)*	549 *(41.0%)*	648 *(41.1%)*
School/Church	132 *(9.4%)*	141 *(9.1%)*	123 *(9.2%)*	134 *(8.5%)*
Social and Recreational	358 *(25.6%)*	375 *(24.1%)*	377 *(28.2%)*	406 *(25.7%)*
Other	9 *(0.6%)*	3 *(0.2%)*	9 *(0.7%)*	2 *(0.1%)*

Note:
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).
- All tables reporting totals could include some unreported characteristics.

The most striking gender difference in travel is non-work travel. More than half of women's travel is for family and personal business (e.g., groceries shopping, taking children to school or organized sports). The comparable rate for men is about 40 percent.

Figure 3
Distribution of Person Trips per Person by Gender and Trip Purpose
Adjusted 1990 and 1995 NPTS



There is a continuing trend for the typical American household to make more trips per day. On average, a person five years or older took more than four trips a day, which represents a 14 percent increase in the past five years (Table 10). Almost one-half of these trips were for family and personal business. Consistent with the trend on trip frequency, total daily miles of travel also increased. About one-third of these miles were private vehicle trips for family and personal business (Table 11). The amount of travel increased for all trip purposes.

Table 10
Daily Trip Rates per Person by Trip Purpose
1977, 1983, 1990, and 1995 NPTS

	1977	1983	1990	Adjusted 1990	1995
Person Trips per Day					
Total	**2.92**	**2.89**	**3.08**	**3.76**	**4.30**
To or From Work	0.57	0.59	0.62	0.62	0.76
Family/Personal Business	0.91	1.02	1.28	1.71	1.97
School/Church	0.35	0.34	0.35	0.35	0.38
Social and Recreational	0.71	0.80	0.76	1.01	1.07
Other	0.38	0.14	0.06	0.06	0.12
Person Miles of Travel per Day					
Total	**25.95**	**25.05**	**28.56**	**34.91**	**38.67**
To or From Work	5.16	5.04	6.49	6.49	8.69
Family/Personal Business	5.68	6.46	8.93	12.10	13.51
School/Church	1.61	1.67	1.84	1.84	2.21
Social and Recreational	7.81	9.85	9.86	13.02	11.86
Other	5.68	2.04	1.43	1.46	2.39

Note:
- All tables reporting totals could include some unreported characteristics.
- "Other" trip purpose includes trips for work-related business.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

In 1995, an individual traveled on average almost four miles more per day than in 1990. Significant increases in daily travel for work and for family and personal business were offset somewhat by a decrease in miles traveled for social and recreational purposes.

Table 11
Distribution of Daily Person Miles of Travel per Person
by Mode of Transportation and Trip Purpose
Adjusted 1990 and 1995 NPTS

	Private		Public Transit		Other		TOTAL	
	Adjusted 1990	1995	Adjusted 1990	1995	Adjusted 1990	1995	Adjusted 1990	1995
TOTAL	**30.85** ***(88.4%)***	**35.26** ***(92.1%)***	**0.74** ***(2.1%)***	**0.82** ***(2.1%)***	**3.31** ***(9.5%)***	**2.20** ***(5.7%)***	**34.91** ***(100%)***	**38.67** ***(100%)***
To or From Work	6.15 *(17.6%)*	8.09 *(20.9%)*	0.27 *(0.8%)*	0.30 *(0.8%)*	0.06 *(0.2%)*	0.22 *(0.6%)*	6.49 *(18.6%)*	8.69 *(22.5%)*
Work Related Business	0.63 *(1.8%)*	1.85 *(4.8%)*	0.01 *(0.0%)*	0.02 *(0.1%)*	0.56 *(1.6%)*	0.34 *(0.9%)*	1.20 *(3.4%)*	2.23 *(5.8%)*
Family/Personal Business	11.39 *(32.6%)*	12.70 *(32.8%)*	0.14 *(0.4%)*	0.19 *(0.5%)*	0.57 *(1.6%)*	0.49 *(1.3%)*	12.10 *(34.7%)*	13.51 *(34.9%)*
School/Church	1.32 *(3.8%)*	1.68 *(4.3%)*	0.12 *(0.3%)*	0.07 *(0.2%)*	0.40 *(1.1%)*	0.44 *(1.1%)*	1.84 *(5.3%)*	2.21 *(5.7%)*
Social and Recreational	11.12 *(31.9%)*	10.83 *(28.0%)*	0.18 *(0.5%)*	0.24 *(0.6%)*	1.71 *(4.9%)*	0.66 *(1.7%)*	13.02 *(37.3%)*	11.86 *(30.7%)*
Other	0.23 *(0.7%)*	0.10 *(0.3%)*	0.01 *(0.0%)*	0.00 *(0.0%)*	0.01 *(0.0%)*	0.05 *(0.1%)*	0.25 *(0.7%)*	0.15 *(0.4%)*

Note:
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).
- Numbers in parenthesis are a percentage of total daily person miles of travel.

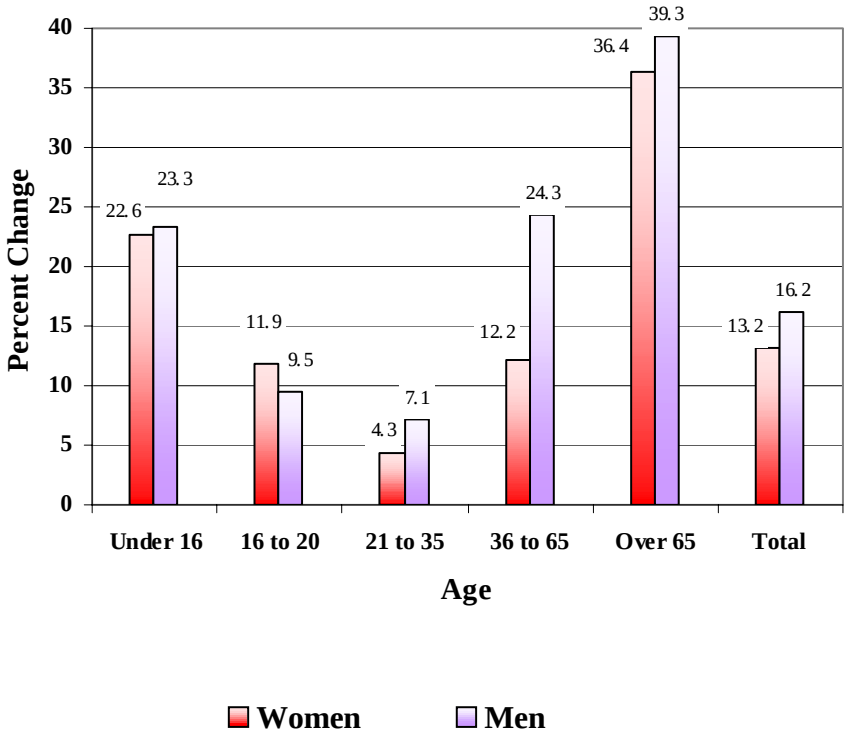
Table 12
Average Daily Person Trips per Person by Age and Gender
1983, 1990, and 1995 NPTS

Age	TOTAL				Men				Women			
	1983	1990	1990 Adj	1995	1983	1990	1990 Adj	1995	1983	1990	1990 Adj	1995
Total	**2.9**	**3.1**	**3.8**	**4.3**	**2.9**	**3.0**	**3.7**	**4.3**	**2.9**	**3.1**	**3.8**	**4.3**
Under 16	2.3	2.6	3.1	3.7	2.3	2.6	3.0	3.7	2.3	2.6	3.1	3.8
16 to 20	3.3	3.5	4.2	4.6	3.2	3.5	4.2	4.6	3.4	3.5	4.2	4.7
21 to 35	3.5	3.6	4.4	4.6	3.4	3.5	4.2	4.5	3.5	3.7	4.6	4.8
36 to 65	2.9	3.2	3.9	4.6	2.9	3.1	3.7	4.6	3.0	3.3	4.1	4.6
Over 65	1.8	1.9	2.4	3.4	2.2	2.2	2.8	3.9	1.5	1.7	2.2	3.0

Note:
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

As a group, both men and women increased their travel from five years ago and, by 1995, took about an equal number of trips per day (Table 12). Interestingly, different age groups demonstrated different levels of travel increase. These age-dependent changes were also gender-dependent. For example, while males between the ages of 36 and 64 increased their travel by 24 percent during the past five years, their female counterparts only increased their travel by 12 percent. The most striking observation is the travel increases by individuals over 65 years of age. Regardless of gender, an average elderly person increased her/his travel by almost 40 percent from 1990.

Figure 4
Percent Change per Person in Personal Travel by Age and Gender
From Adjusted 1990 to 1995



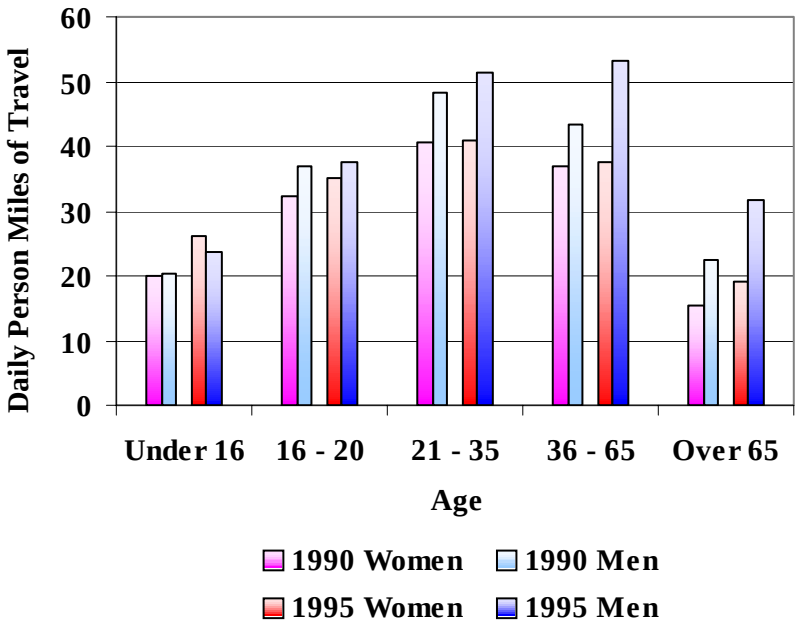
On average, an individual travels 39 miles per day (Table 11), which represents an increase of 4 miles per day since 1990. These data point to the fact that we probably have not reached a saturation point in travel. But, as evident in Table 13, there is a great difference between the travel of men and women. The difference in miles traveled is particularly telling given the fact that men and women take about an equal number of trips per day. Obviously women's trips are notably shorter than men's trips. Again, the greatest increases in miles traveled per person are by both men and women over 65 years of age.

Table 13
Average Daily Person Miles of Travel per Person by Age and Gender
1983, 1990, and 1995 NPTS

Age	TOTAL				Men				Women			
	1983	1990	1990 Adj	1995	1983	1990	1990 Adj	1995	1983	1990	1990 Adj	1995
Total	**25.1**	**28.6**	**34.9**	**38.7**	**27.7**	**31.6**	**38.0**	**43.9**	**22.6**	**25.8**	**32.1**	**33.8**
Under 16	16.2	16.2	20.1	25.0	16.8	16.3	20.3	23.7	15.4	16.1	19.9	26.2
16 to 20	22.2	28.1	34.4	36.4	23.0	30.1	36.9	37.6	21.5	26.2	32.2	35.0
21 to 35	31.1	36.5	44.3	46.0	32.8	40.4	48.2	51.3	29.5	32.9	40.7	40.8
36 to 65	29.2	33.0	40.1	45.1	33.6	36.5	43.4	53.2	25.2	29.7	37.0	37.5
Over 65	12.0	14.2	18.4	24.4	14.8	17.4	22.5	31.7	10.2	11.8	15.3	19.2

Note:
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Figure 5
Average Daily Person Miles of Travel per Person by Gender
Adjusted 1990 and 1995



In the 1990 NPTS Summary of Travel Trends report, average time spent driving a private vehicle excluded any drivers who did not drive on the designated travel day. In the 1995 report, average time spent driving a private vehicle was calculated using two different methods: (1) by including all drivers, even those who did not drive a private vehicle on the designated travel day, and (2) by excluding any drivers who did not drive on the designated travel day. Note the 1990 data reported here are different from those published in the *1990 Nationwide Personal Transportation Survey Databook, Volume II* (Tables 5-66 to 5-68), due to the fact that the 1990 adjusted data are used. In 1995, a driver spent on average about one hour behind a wheel, an increase of seven minutes from 1990. People living in smaller cities generally spent slightly less time driving than those living in large areas.

Table 14
Average Time Spent Driving a Private Vehicle in a Typical Day by MSA Size
Adjusted 1990 and 1995 NPTS
(in Minutes)

	All Drivers		Only Persons Who Drove on Their Travel Day	
MSA Size	1990 Adj	1995	1990 Adj	1995
ALL	**49.35**	**56.20**	**71.88**	**73.07**
Not in MSA	48.85	56.36	69.20	69.14
< 250,000	48.36	53.86	67.94	71.49
250,000 to 499,999	47.82	55.81	71.66	73.12
500,000 to 999,999	50.20	56.76	72.42	72.13
1 to 2.9 million	50.61	56.48	74.38	74.86
3+ million	49.38	56.43	71.08	72.75

Note:
- Average time spent driving does not include any driving done in a segmented trip (see Appendix 6 for the definition of a segmented trip). Also excludes driving done as an "essential part of work."
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

The average vehicle occupancy, measured as person miles per vehicle mile, has decreased consistently over time. This trend is related to the increase in vehicle ownership, and decreases in household size.

Table 15
Average Vehicle Occupancy for Selected Trip Purposes
1977, 1983, 1990, and 1995 NPTS
(person miles per vehicle mile)

Trip Purpose	1977	1983	1990	1995	Percent Change (77-95) Total Change
To or From Work	1.3	1.29	1.14	1.14	*-15.38%*
Shopping	2.1	1.79	1.71	1.74	*-19.05%*
Other Family or Personal Business	2.0	1.81	1.84	1.78	*-10.00%*
Social and Recreational	2.4	2.12	2.08	2.04	*-16.67%*
All Purposes	**1.9**	**1.75**	**1.64**	**1.59**	***-15.79%***

Note:
- All Purposes includes other trip purposes not shown, such as trips to school, church, doctor, dentist, and work-related business trips.
- Standard Errors for 1995 data in Table 15 are presented in Appendix 5.
- All tables reporting totals could include some unreported characteristics.

The number and percentage of households without a vehicle continue to decrease over time. However, there is still concern about the mobility of households without vehicles. The next few tables will focus on this group. The norm in the United States is that each household is a multi-vehicle household, with nearly 60 percent of all households having two or more vehicles in 1995.

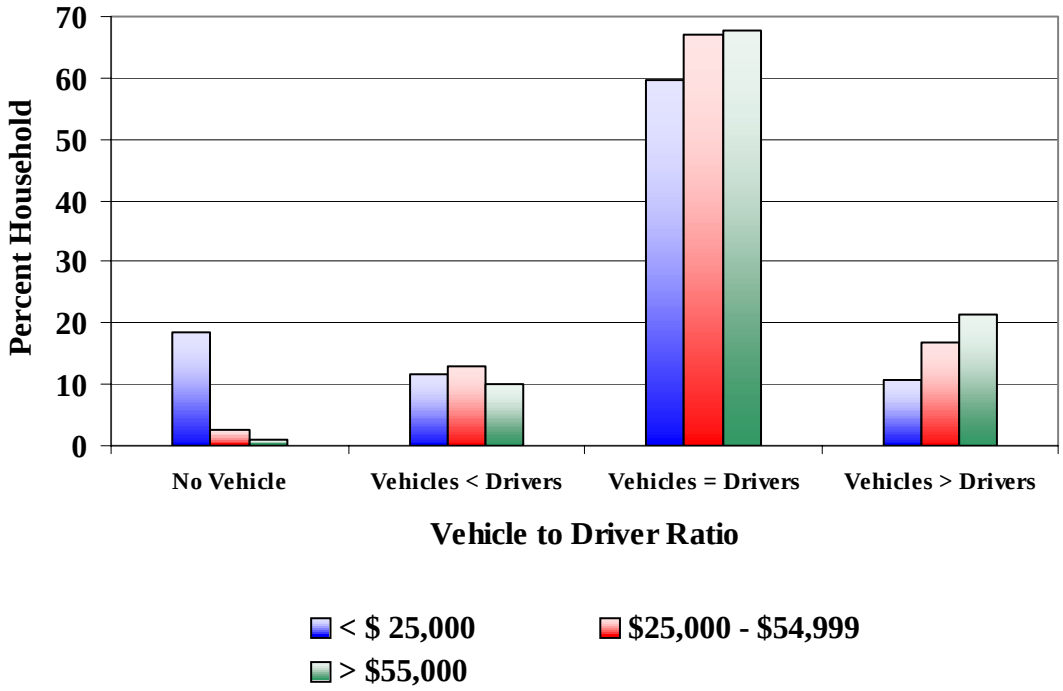
Table 16
Availability of Household Vehicles
1969, 1977, 1983, 1990, and 1995 NPTS
(thousands)

Households with --	1969	1977	1983	1990	1995
No Vehicle	12,876 *(20.6%)*	11,538 *(15.3%)*	11,548 *(13.5%)*	8,573 *(9.2%)*	7,989 *(8.1%)*
One Vehicle	30,252 *(48.4%)*	26,092 *(34.6%)*	28,780 *(33.7%)*	30,654 *(32.8%)*	32,064 *(32.4%)*
Two Vehicles	16,501 *(26.4%)*	25,942 *(34.4%)*	28,632 *(33.5%)*	35,872 *(38.4%)*	40,024 *(40.4%)*
Three or More Vehicles	2,875 *(4.6%)*	11,840 *(15.7%)*	16,411 *(19.2%)*	18,248 *(19.6%)*	18,914 *(19.1%)*
ALL	**62,504** ***(100.0%)***	**75,412** ***(100.0%)***	**85,371** ***(100.0%)***	**93,347** ***(100.0%)***	**98,990** ***(100.0%)***
Vehicles Per Household	**1.16**	**1.59**	**1.68**	**1.77**	**1.78**

Note:
- Standard Errors for 1995 data in Table 16 are presented in Appendix 5.
- The 1969 survey does not include pickups or other light trucks as household vehicles.

Eighty percent of households in 1995 had at least one vehicle for each of their drivers, representing a slight decrease from 1990. Most American households continue to have one vehicle for each of its drivers. It is clear that income affects vehicle ownership and availability. While about one-fifth of low income households do not own a vehicle, the comparable percentage in higher income households is merely one percent.

Figure 6
Household Distribution by Household Income and Vehicle to Driver Ratio
1995 NPTS



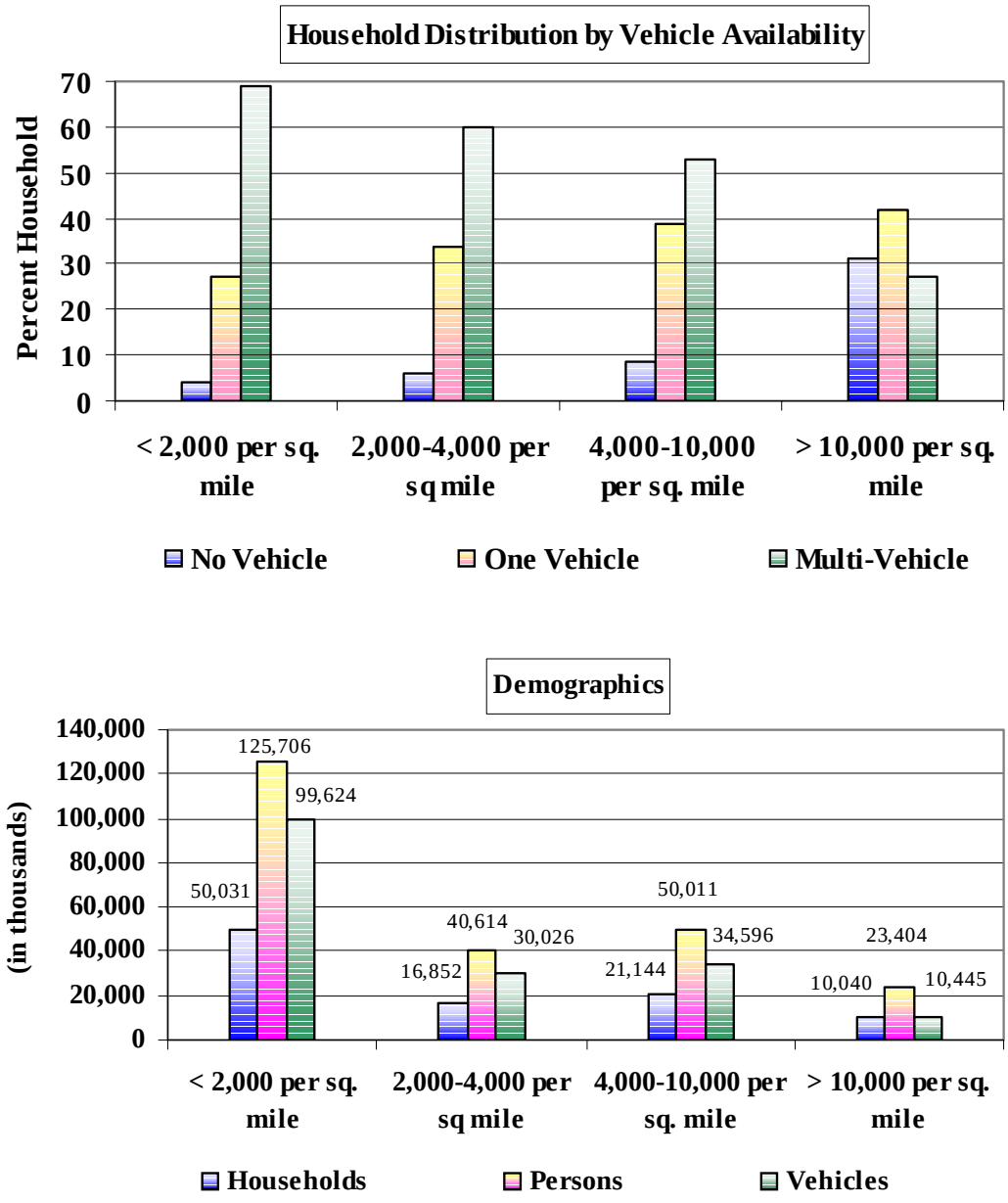
The geographic dispersion of households without a vehicle becomes polarized from the perspective of population density. Almost one-third of households in areas with a population density more than 10,000 per square mile do not own a vehicle. On the other hand, almost 70 percent of households in the least densely populated areas own more than two vehicles. The percent households in these areas without a vehicle declined by almost 40 percent from 1990 to 1995.

Table 17
Distribution of Households by Household Vehicle Availability and Population Density
1990 and 1995 NPTS

Household Vehicle Availability	Population Density (Persons per Square Mile)							
	Less than 2,000		2,000 to 4,000		4,000 to 10,000		10,000 or more	
	1990	1995	1990	1995	1990	1995	1990	1995
ALL	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***	***100%***
No Vehicle	*6.1%*	*3.9%*	*7.6%*	*6.2%*	*10.9%*	*8.5%*	*35.1%*	*31.0%*
One Vehicle	*30.4%*	*27.3%*	*33.4%*	*33.8%*	*38.2%*	*38.6%*	*40.0%*	*41.7%*
Two Vehicles	*41.0%*	*44.5%*	*41.5%*	*42.3%*	*34.9%*	*38.6%*	*18.4%*	*21.3%*
Three or More Vehicles	*22.5%*	*24.3%*	*17.5%*	*17.7%*	*16.0%*	*14.4%*	*6.5%*	*6.0%*

Note:
- Population Density for 1990 is based on household zipcode areas, whereas 1995 is based on census tract.

Figure 7
Vehicle Ownership and Demographic Statistics by Population Density
1995 NPTS



The percent households not owning a vehicle increased with increasing area size. In 1995, households without a vehicle can be grouped into three broad categories depending on population. About 5 percent of households are without a vehicle in non-MSA areas or in small cities (< 250,000), whereas more than 10 percent of households in areas with more than 3 million people are without a vehicle. In large cities, such as New York, some zero-vehicle households are by choice due to the high cost and the inconvenience of owning a vehicle, and the availability of other modes. About six to seven percent of the households in medium size cities (with 250,000 to 3 million people) do not have a vehicle.

Table 18
Percent of Households Without a Vehicle Within MSA Size Group
1977, 1983, 1990 and 1995 NPTS

MSA Size	% Households Within An Area Without a Vehicle				
	1977	1983	1990	1995	% Change 1977-1995
Not in (S)MSA	*12.2*	*10.5*	*7.7*	*5.3*	*-57%*
< 250,000	*13.7*	*10.1*	*8.6*	*4.8*	*-65%*
250,000 to 499,999	*12.2*	*8.1*	*5.7*	*7.3*	*-40%*
500,000 to 999,999	*14.0*	*14.3*	*8.4*	*6.3*	*-55%*
1 to 2.9 million	*14.2*	*12.1*	*8.2*	*6.9*	*-51%*
3+ million	*26.1*	*25.4*	*12.4*	*11.2*	*-57%*
ALL	***15.3***	***13.5***	***9.2***	***8.1***	***-47%***

Note:
- The population size groups for 1977 - 1983 NPTS are SMSA Size Groups and 1990 - 1995 are MSA Size Groups (see Appendix 4).
- All tables reporting totals could include some unreported characteristics.

Automobiles continue to lose their market share of private vehicles, from 80 percent in 1977 to 65 percent in 1995. In the meantime, minivans and sport utility vehicles (SUVs) claimed a larger market share. Regardless of vehicle type, all vehicles were in operation longer in 1995 than in the past.

Table 19
Vehicle Distribution and Average Vehicle Age by Vehicle Type
1977, 1983, 1990, and 1995 NPTS

	1977	1983	1990	1995
Distribution of Vehicles				
TOTAL	***100.0***	***100.0***	***100.0***	***100.0***
Auto	*79.6*	*75.9*	*74.7*	*64.3*
Van	*2.8*	*3.6*	*5.5*	*7.8*
Sport Utility	*NA*	*NA*	*NA*	*6.9*
Pickup	*12.8*	*15.2*	*17.2*	*17.7*
Other Truck	*1.3*	*1.5*	*0.6*	*0.4*
RV/Motor Home	*0.4*	*0.5*	*0.5*	*0.5*
Motorcycle	*2.7*	*2.5*	*1.3*	*0.9*
Moped	*0.2*	*0.6*	*0.1*	*NA*
Other	*0.2*	*0.2*	*0.1*	*0.1*
Average Vehicle Age				
TOTAL	**6.6**	**7.60**	**7.71**	**8.33**
Auto	6.4	7.20	7.61	8.24
Van	5.5	8.45	5.88	6.68
Sport Utility	NA	NA	NA	6.56
Pickup	7.3	8.54	8.43	9.65
Other Truck	11.6	12.39	14.48	14.93
RV/Motor Home	4.5	10.69	10.44	13.21

Note:

- The 1977, 1983, and 1990 surveys do not include a separate category for sports utility vehicles, while the 1995 survey does. In 1990 survey, most SUVs were classified as automobiles. The 1995 survey does not include a separate category for mopeds.
- Motorcycle, moped, and other pov are excluded from the calculation of vehicle age.
- All tables reporting totals could include some unreported characteristics.
- Standard Errors for 1995 data in Table 19 are presented in Appendix 5.

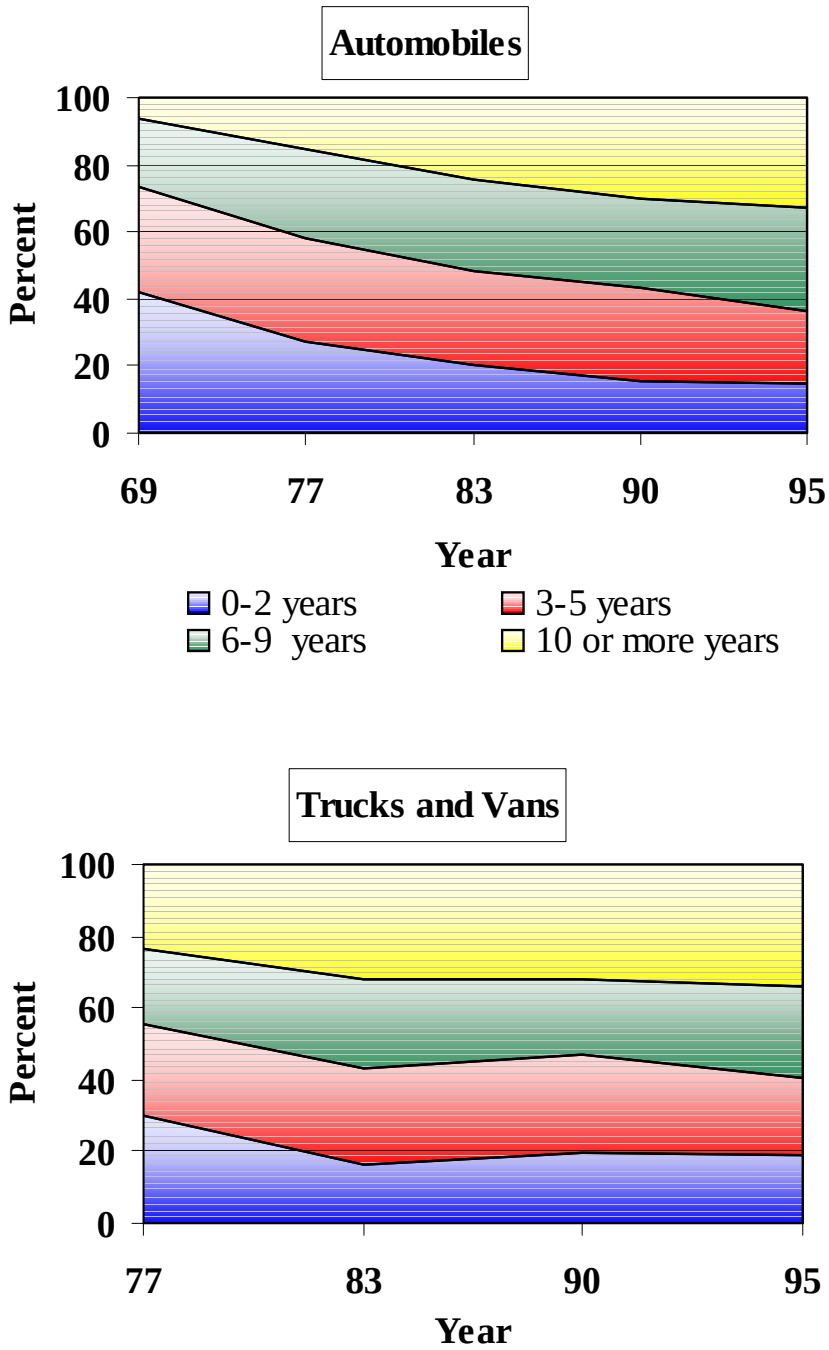
In 1995, household vehicles remained in operation significantly longer than those in 1969. This observation is confirmed by both the average vehicle age and by vehicle age distribution. The 1969 automobiles averaged 5.1 years of age while the 1995 automobiles average 8.2 years of age—a 3-year or 60 percent increase. In 1995, one-third of vehicles were at least ten years or older compared to only six percent in 1969. In the past, trucks and vans tended to be in operation longer than their automobile counterparts. However, this was no longer true by 1995.

Table 20
Distribution of Vehicles by Vehicle Age and Vehicle Type
1969, 1977, 1983, 1990, and 1995 NPTS
(percentage)

	1969	1977			1983			1990			1995		
Vehicle Age	Auto	Auto	Truck/ Van	All	Auto	Truck/ Van	All	Auto	Truck/ Van	All	Auto	Truck/ Van	All
0 to 2 years	*41.8*	*27.3*	*29.9*	*27.8*	*20.0*	*16.6*	*19.2*	*15.6*	*19.7*	*16.6*	*14.9*	*19.2*	*16.2*
3 to 5 years	*31.9*	*30.4*	*25.6*	*29.6*	*28.0*	*26.6*	*27.6*	*27.7*	*27.2*	*27.5*	*21.7*	*21.6*	*21.5*
6 to 9 years	*20.1*	*26.7*	*21.1*	*25.7*	*27.4*	*25.0*	*26.9*	*26.8*	*20.9*	*25.3*	*30.3*	*25.5*	*28.5*
10 or more years	*6.2*	*15.6*	*23.4*	*16.9*	*24.6*	*31.8*	*26.3*	*29.9*	*32.2*	*30.6*	*33.1*	*33.7*	*33.8*
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***	***100.0***
Average Age	5.1	5.5	6.4	5.6	6.7	7.8	6.9	7.6	8.0	7.7	8.2	8.3	8.3

Note:
- The 1969 survey does not include pickups and other light trucks as household vehicles.
- Totals do not include any unreported vehicle ages, but do include vehicle types such as motorcycle, RV, etc. that are not shown.

Figure 8
Distribution of Vehicles by Vehicle Age
1969, 1977, 1983, 1990 and 1995 NPTS



Based on the owner's estimates, an average vehicle was driven 12,000 miles a year, similar to the 1990 level. There were not only more old vehicles in 1995 than in the past, they were also driven more. Although vehicles are becoming "cleaner" due to more stringent emissions standards, the environmental benefits could be somewhat delayed because of the continued use of older vehicles and increased use of almost all vehicles.

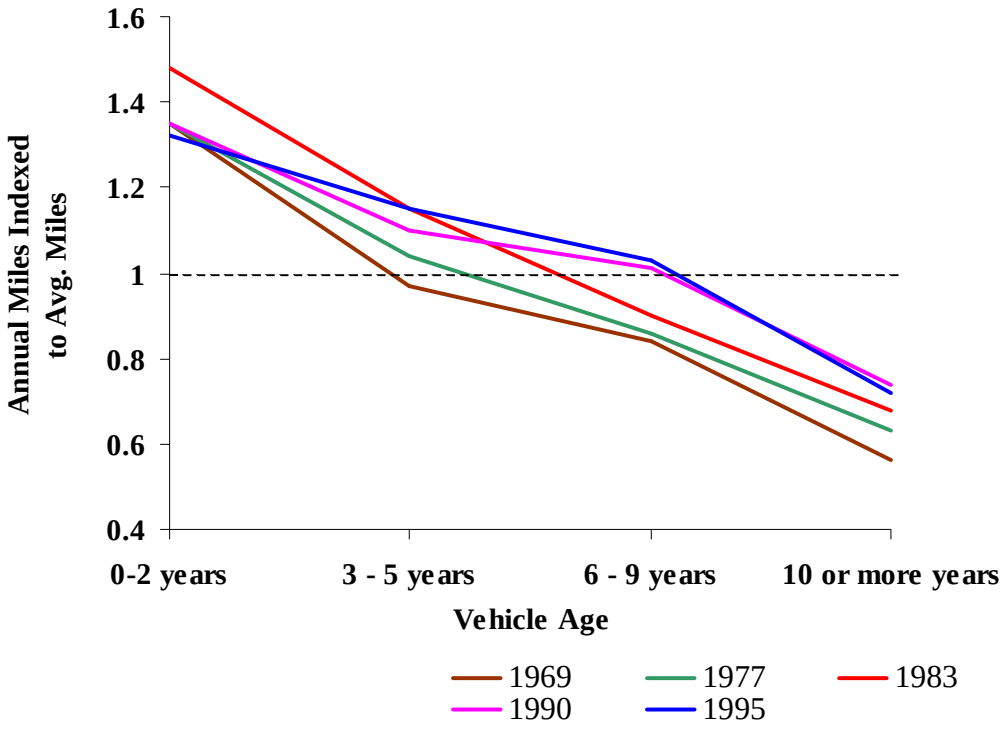
Table 21
Average Annual Miles per Vehicle by Vehicle Age
(Vehicle Owner's Estimate)
1969, 1977, 1983, 1990, and 1995 NPTS

						Percent Change	
						Compounded Annual Rate	Total Change
Vehicle Age	1969	1977	1983	1990	1995	69-95	69-95
0 to 2 years	15,700	14,460	15,292	16,811	16,092	*0.09%*	*2.50%*
3 to 5 years	11,200	11,074	11,902	13,706	14,004	*0.86%*	*25.04%*
6 to 9 years	9,700	9,199	9,253	12,554	12,608	*1.01%*	*29.98%*
10 or more years	6,500	6,755	7,023	9,176	8,758	*1.15%*	*34.74%*
ALL	**11,600**	**10,679**	**10,315**	**12,458**	**12,226**	***0.20%***	***5.39%***

Note:
- The 1969 survey does not include pickups and other light trucks as household vehicles.
- All tables reporting totals could include some unreported characteristics.
- Standard Errors for 1995 data in Table 21 are presented in Appendix 5.

There is a trend of older vehicles being driven more than before. In 1969, a 3-5 year old vehicle was driven, on average, the same number of miles as the average for all vehicles. In 1995, this pattern had changed to 6-9 year old vehicles (note that the graphs in Figure 9 shift to the right). Also, consistent with this pattern, vehicles ten or more years old are being driven more, relative to the average among all vehicles.

Figure 9
Annual Miles Driven Per Vehicle, Indexed to the Annual Average
1969, 1977, 1983, 1990 and 1995 NPTS



Based on 1990 and 1995 NPTS data, the overall estimate of annual miles driven per licensed driver increased. In 1995, elderly men drove on average 1,000 miles more than those in 1990. However, this increase in driving was not true for all age groups. Teenage drivers reduced their driving from the 1990 level. However, the differences in teen driving between 1990 and 1995 are not statistically significant.

Table 22
Average Annual Miles per Licensed Driver by Driver Age and Gender
(Self Estimate)
1969, 1977, 1983, 1990, and 1995 NPTS

Driver Age	1969	1977	1983	1990	1995	Percent Change	
						Annual Rate	Total Change
						69-95	69-95
ALL							
16 to 19	4,633	5,662	4,986	8,485	7,624	*1.93%*	*64.56%*
20 to 34	9,348	11,063	11,531	14,776	15,098	*1.86%*	*61.51%*
35 to 54	9,771	11,539	12,627	14,836	15,291	*1.74%*	*56.49%*
55 to 64	8,611	9,196	9,611	11,436	11,972	*1.28%*	*39.03%*
65+	5,171	5,475	5,386	7,084	7,646	*1.52%*	*47.86%*
ALL	**8,685**	**10,006**	**10,536**	**13,125**	**13,476**	***1.70%***	***55.16%***
Men							
16 to 19	5,461	7,045	5,908	9,543	8,206	*1.58%*	*50.27%*
20 to 34	13,133	15,222	15,844	18,310	17,976	*1.21%*	*36.88%*
35 to 54	12,841	16,097	17,808	18,871	18,858	*1.49%*	*46.86%*
55 to 64	10,696	12,455	13,431	15,224	15,859	*1.53%*	*48.27%*
65+	5,919	6,795	7,198	9,162	10,304	*2.16%*	*74.08%*
ALL	**11,352**	**13,397**	**13,962**	**16,536**	**16,550**	***1.46%***	***45.79%***
Women							
16 to 19	3,586	4,036	3,874	7,387	6,873	*2.53%*	*91.66%*
20 to 34	5,512	6,571	7,121	11,174	12,004	*3.04%*	*117.78%*
35 to 54	6,003	6,534	7,347	10,539	11,464	*2.52%*	*90.97%*
55 to 64	5,375	5,097	5,432	7,211	7,780	*1.43%*	*44.74%*
65+	3,664	3,572	3,308	4,750	4,785	*1.03%*	*30.59%*
ALL	**5,411**	**5,940**	**6,382**	**9,528**	**10,142**	***2.45%***	***87.43%***

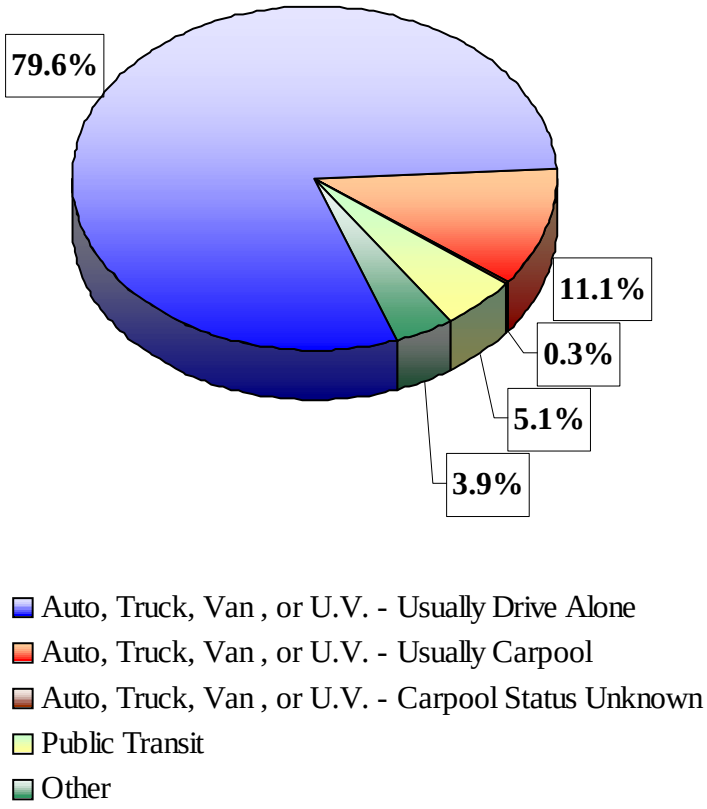
Note:
- All tables reporting totals could include some unreported characteristics.
- In 1995, some drivers indicating that they drove 'no miles' for their average annual miles were changed to 'miles not reported.' **(See Appendix 7 for details on data revision.)**
- Standard Errors for 1995 data in Table 22 are presented in Appendix 5.

Table 23
Commute VMT and Total VMT By Year
1969, 1977, 1983, 1990, and 1995 NPTS

	1969	1977	1983	1990	1990 adj	1995
Commute Vehicle Trips (000,000)	27,844	31,886	35,271	41,792	41,792	54,782
Commute VMT (000,000)	260,716	287,710	301,644	453,042	453,042	642,610
Total VMT (000,000)	775,940	907,603	1,002,139	1,409,600	1,695,290	2,068,368
% Commute VMT of Total VMT	33.60%	31.70%	30.10%	32.14%	26.72%	31.07%
Workers (000)	75,758	93,019	103,244	118,343	118,343	131,697

Note:
- Caution should be used when comparing the number of workers or the number of commute trips between the 1990 and 1995 NPTS. Slightly different approaches were used in defining workers and commute trips between the 1990 and 1995 NPTS (see Appendix 3).

Figure 10
Distribution of Workers by Usual Mode
1995 NPTS
(percentage)



Workers in the United States predominately traveled to work in privately-owned vehicles. About five percent of the commuters reported public transit as their usual mode to work, which represents the same level as in 1990.

Table 24
Distribution of Workers by Usual Mode
1969, 1977, 1983, 1990, and 1995 NPTS
(percentage)

Mode of Transportation	1969	1977	1983	1990	1995
All Modes	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***
Auto, Truck, Van, or Utility Vehicle	*90.8*	*93.0*	*92.4*	*87.8*	*91.0*
Public Transit	*8.4*	*4.7*	*5.8*	*5.3*	*5.1*
Other	*0.8*	*2.3*	*1.8*	*6.9*	*3.9*

Note:
- Usual mode is defined as the means of transportation usually used to go to work during the week before the interview. Data in this table are derived from the person file.
- The 1969 survey excludes walk trips.
- All modes does not include workers who worked at home or any unreported modes.
- Other includes other modes not shown above such as RV, motorcycle, other POV, Amtrak, airplane, taxi, bike, walk, school bus, and other.
- Standard Errors for 1995 data in Table 24 are presented in Appendix 5.

The average commute was one mile longer in 1995 than in 1990. However, with somewhat improved commute speeds, the average commute time increased only slightly. Although having only slightly longer commute distances, those who used public transit spent twice as long on their commute as those who drove or rode in privately-owned vehicles (Figure 11).

Table 25
General Commute Patterns by Mode of Transportation
1983, 1990, and 1995 NPTS

1983	1990	1995	1983	1990	1995	1983	1990	1995	1983	1990	1995
ALL MODES			Private			Public Transit			Other		
Average Commute Trip Length (miles)											
8.54	10.65	11.63	8.86	11.02	11.84	11.81	12.75	12.88	1.35	2.15	8.15
Average Commute Travel Time (minutes)											
18.20	19.60	20.65	17.62	19.05	20.10	39.77	41.10	41.95	10.58	12.41	18.82
Average Commute Speed (miles per hour)											
28.17	33.33	33.80	30.18	34.74	35.36	17.82	18.23	19.29	7.63	7.61	25.89

Note:
- All trip miles and travel times were calculated using actual trips to and from work as reported in the travel day file.
- Average commute trip length for 1990 and 1995 is calculated using only those records with trip mileage information present.
- Average commute travel time does not include time spent waiting for transportation.
- Average commute speed for 1990 and 1995 NPTS does not include any segmented trips because a change in the mode of transportation during the trip would cause the calculation of average commute speed to be meaningless. (see Appendix 6 for the definition of a segmented trip).
- All tables reporting totals could include some unreported characteristics.

Figure 11
Average Travel Time for Commuting by Selected Travel Mode and MSA Size
1995 NPTS

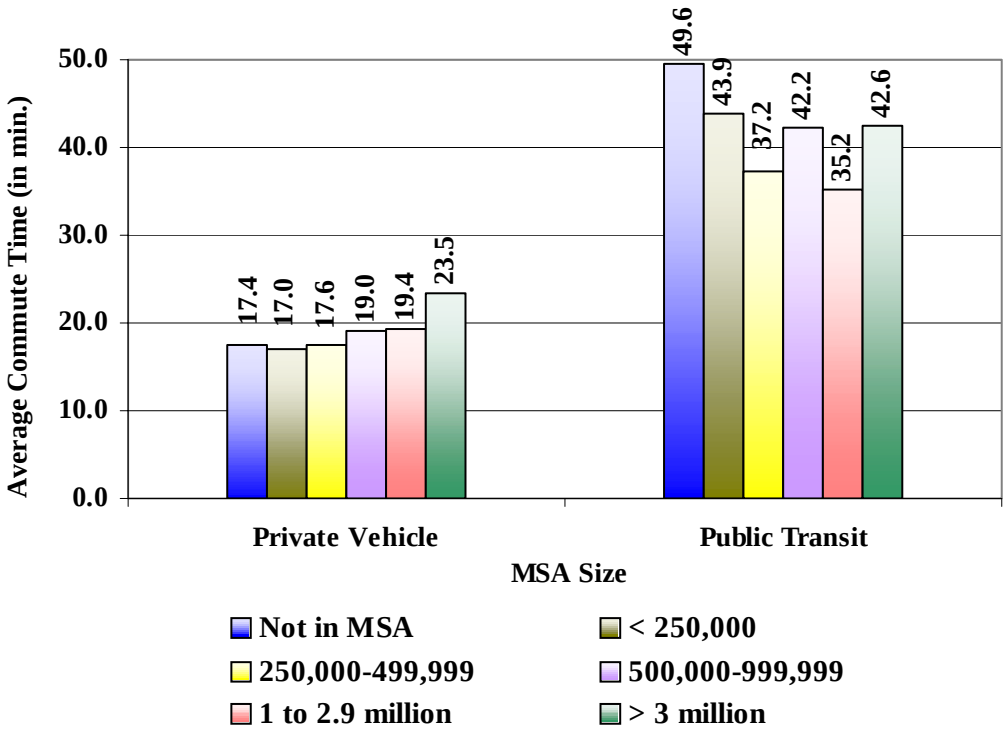


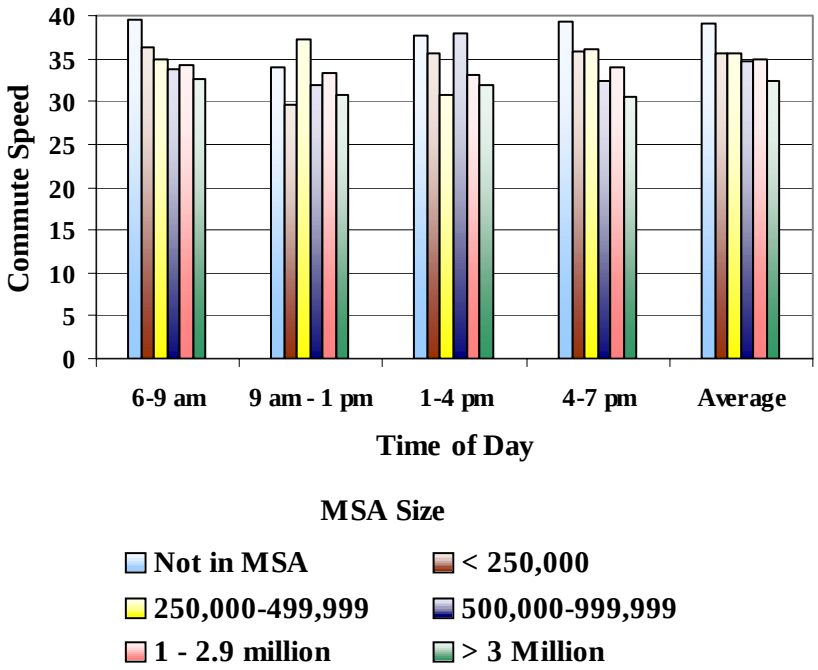
Table 26
Average Commute Speed by MSA Size
1983, 1990, and 1995 NPTS
(miles per hour)

	MSA Size					
	Not in MSA	Less than 250,000	250,000 to 499,999	500,000 to 999,999	1 to 2.9 million	3 million and over
1983	31.97	27.20	30.09	28.52	28.11	24.32
1990	38.34	32.85	34.22	34.84	31.89	30.99
1995	39.11	35.67	35.72	34.76	34.89	32.29

Note:
- All trip miles and travel times were calculated using actual trips to and from work as reported in the travel day file.
- Average commute speed for 1990 and 1995 NPTS does not include any segmented trips because a change in the mode of transportation during the trip would cause the calculation of average commute speed to be meaningless. (see Appendix 6 for the definition of a segmented trip).
- The population size groups for 1977 - 1983 NPTS are SMSA Size Groups and 1990 - 1995 are MSA Size Groups (see Appendix 4).

Generally, as the population of an area increases, commute speeds decrease. Depending on the time of day and location, average commute speeds ranged from 29 to 47 miles per hour in 1995. In almost all areas, commute speeds improved from 1983. In larger areas, the lowest speeds tended to occur in the late afternoon and early evening, while in areas with less than 250,000 people the lowest speeds occurred between 9 am and 1 pm.

Figure 12
Average Commute Speed for **Selected** Time of Day by MSA Size
1995 NPTS
(miles per hour)



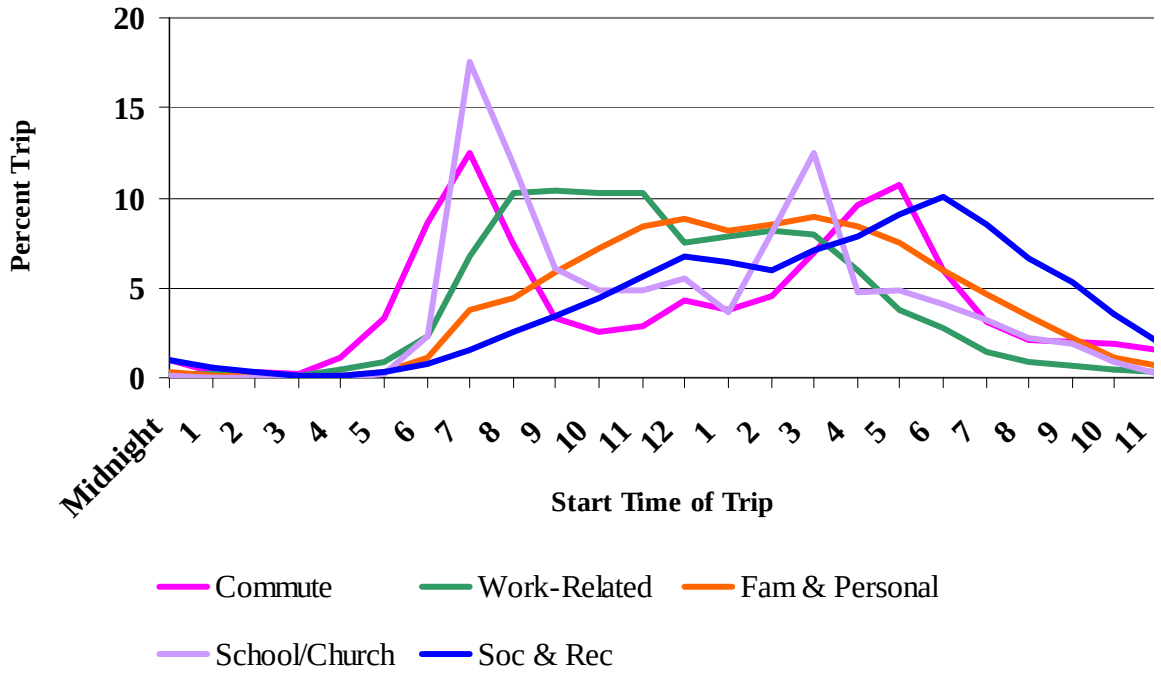
The temporal distribution of personal trips remained the same during the past decade—more than two-fifths of the trips started between 9 o'clock in the morning and 4 o'clock in the afternoon. However, this distribution varies somewhat by trip purpose (see Figure 13). As expected, commuting to and from work began predominately between 6 and 9 o'clock in the morning and between 4 and 7 o'clock in the afternoon while more than half of work-related trips started between 9 am and 4 pm.

Table 27
Distribution of Person Trips by Start Time of Trip
1983, 1990, and 1995 NPTS

Time of Day	1983	1990	1990 Adj	1995
10 pm - 1 am	*4.0*	*4.0*	*4.1*	*3.5*
1 - 6 am	*3.3*	*1.9*	*1.8*	*1.7*
6 - 9 am	*14.4*	*13.9*	*12.5*	*13.8*
9 am - 1 pm	*23.4*	*20.1*	*20.6*	*24.2*
1 - 4 pm	*20.8*	*20.4*	*20.7*	*22.1*
4 - 7 pm	*21.2*	*22.8*	*22.9*	*23.0*
7 - 10 pm	*12.3*	*12.8*	*13.2*	*11.8*
ALL	***100.0***	***100.0***	***100.0***	***100.0***

Note:
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Figure 13
Distribution of Person Trips by Trip Purpose and Start Time of Trip
1995 NPTS



Although travel was less *frequent* on weekends than on weekdays, weekend trips were on average *longer* than weekday trips. This is true for both 1990 and 1995. In 1995, the average daily time spent driving was ten minutes longer on weekdays than on weekends.

Table 28
Daily Travel Statistics by Weekday vs Weekend
Adjusted 1990 and 1995 NPTS

Daily Travel Statistics	1990 Adjusted		1995	
	Weekday	Weekend	Weekday	Weekend
Vehicle Trips per Driver	3.41	2.89	3.81	2.99
% work trips	*27.8%*	*9.7%*	*31.9%*	*12.5%*
% non-work trips	*72.2%*	*90.3%*	*68.1%*	*87.5%*
VMT per Driver	28.54	28.36	33.46	28.87
Average Vehicle Trip Length	8.47	9.96	8.85	9.73
Average Time Spent Driving (in minutes)	50.68	46.07	59.48	48.05
Person Trips per Person	3.82	3.60	4.43	3.96
PMT per Person	32.6	40.64	37.68	41.14
Average Person Trip Length	9.47	11.51	8.63	10.53

Note:
- Average time spent driving includes all drivers, even those who did not drive a private vehicle on the day in which the household was interviewed. It does not include any driving done in a segmented trip (see Appendix 6 for the definition of a segmented trip). Also excludes driving done as an "essential part of work."
- Average trip length is calculated using only those records with trip mileage information present.
- Standard Errors for 1995 data in Table 28 are presented in Appendix 5.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Travel statistics indicated that the population 65 and older was more mobile in 1995 than its corresponding cohort in 1990. On a daily basis, older drivers drove an average of 32 percent more miles, took 38 percent more trips, and spent 12 more minutes driving daily in 1995 than in 1990.

Table 29
Daily Travel Statistics of People 65 and Older
1983, 1990, and 1995 NPTS

Daily Travel Statistics	1983	1990	1990 Adjusted	1995
Vehicle Trips per Driver	1.66	1.78	2.27	2.94
% work trips	*10.2%*	*6.2%*	*4.8%*	*8.5%*
% non-work trips	*89.8%*	*93.8%*	*95.2%*	*91.5%*
VMT per Driver	9.80	11.50	14.83	19.56
Average Vehicle Trip Length	5.92	6.55	6.61	6.69
Average Time Spent Driving (in minutes)	na	24.02	30.83	42.89
Person Trips per Person	1.82	1.95	2.49	3.43
PMT per Person	12.21	15.33	19.85	25.24
Average Person Trip Length	6.70	7.99	8.12	7.46

Note:
- Average time spent driving includes all drivers, even those who did not drive a private vehicle on the day in which the household was interviewed. It does not include any driving done in a segmented trip (see Appendix 6 for the definition of a segmented trip). Also excludes driving done as an "essential part of work."
- Average trip length is calculated using only those records with trip mileage information present.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Regardless of household composition, women took more trips in 1995 than in 1990. Women with children between the ages 6 and 15, whether a single parent or in a 2-adult household, averaged more than 5 trips per day. The proportion of the trips women took to and from work increased from 1990 to 1995.

Table 30
Daily Person Trips of Adult Women by Household Composition
1983, 1990, and 1995 NPTS

Household Composition	1983		1990		Adjusted 1990		1995	
	All	*% work trips*	All	*% work trips*	All	*% work trips*	All	*% work trips*
ALL	**2.95**	***17.56%***	**3.23**	***17.65%***	**4.00**	***14.25%***	**4.36**	***15.83%***
Single Adult, No Child	2.60	*23.52%*	3.32	*23.80%*	4.07	*19.41%*	4.19	*25.78%*
2 or > Adult, No Child	2.85	*25.56%*	3.29	*25.84%*	4.01	*21.20%*	4.19	*25.06%*
Single Adult, Child<6	2.65	*11.02%*	3.59	*12.53%*	4.48	*10.04%*	4.80	*12.71%*
2 or > Adult, Child<6	3.32	*10.18%*	3.51	*13.68%*	4.41	*10.88%*	4.74	*12.03%*
Single Adult, Child 6-15	3.73	*14.12%*	4.17	*13.43%*	5.17	*10.83%*	5.35	*11.59%*
2 or > Adult, Child 6-15	3.59	*13.94%*	3.85	*12.99%*	4.78	*10.46%*	5.24	*11.64%*
Single Adult, Child 16-21	2.59	*28.80%*	3.41	*20.53%*	4.17	*16.79%*	4.56	*22.37%*
2 or > Adult, Child 16-21	2.84	*28.88%*	3.40	*24.71%*	4.13	*20.34%*	4.54	*20.93%*
Single Adult, Retired*	1.49	*0.00%*	1.79	*1.68%*	2.30	*1.30%*	3.06	*0.65%*
2 or > Adult, Retired*	1.97	*12.76%*	2.17	*9.68%*	2.75	*7.64%*	3.48	*8.33%*

Note:
- All tables reporting totals could include some unreported characteristics.
- In 1983, adult women were defined as all females 16 or older. In 1990 and 1995, adult women were defined as females 18 or older.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).
- *Many "retired" people continue to work which is why they report trips to and from work.

Individuals in low income households took, on average, about four trips a day in 1995, continuing an upward trend. As expected, a smaller portion of trips in low income households were for work or work-related activities.

Table 31
Daily Person Trips per Person for Low Income Households by Trip Purpose
1983, 1990, and 1995 NPTS

Trip Purpose	Low-Income Households (Less than $25,000 of 1995 dollars)				Other Households
	1983	1990	Adjusted 1990	1995	1995
ALL	**2.50** ***(100.0%)***	**2.82** ***(100.0%)***	**3.45** ***(100.0%)***	**3.87** ***(100.0%)***	**4.59** ***(100.0%)***
To/From Work	0.47 *(18.7%)*	0.49 *(17.5%)*	0.49 *(14.3%)*	0.58 *(15.1%)*	0.86 *(18.7%)*
Work Related Business	0.06 *(2.4%)*	0.03 *(0.9%)*	0.03 *(0.8%)*	0.06 *(1.6%)*	0.14 *(3.0%)*
Family/Personal Business	0.91 *(36.3%)*	1.22 *(43.3%)*	1.63 *(47.1%)*	1.88 *(48.5%)*	2.06 *(44.8%)*
School/Church	0.30 *(12.0%)*	0.36 *(12.6%)*	0.36 *(10.3%)*	0.36 *(9.3%)*	0.39 *(8.5%)*
Social & Recreational	0.70 *(28.2%)*	0.70 *(24.9%)*	0.93 *(26.8%)*	0.98 *(25.3%)*	1.14 *(24.7%)*
Other	0.06 *(2.4%)*	0.02 *(0.8%)*	0.02 *(0.7%)*	0.00 *(0.1%)*	0.01 *(0.2%)*

Note:
- Incomes for 1983 and 1990 have been adjusted to 1995 dollars.
- Low income households are defined as a household earning $25,000 or less in a year.
- All tables reporting totals could include some unreported characteristics.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

In 1995, people in households without a vehicle averaged 1.3 fewer trips per day than those in households with vehicles. The impact of owning a vehicle on mobility was the greatest for those who lived in areas with less than one quarter of a million people.

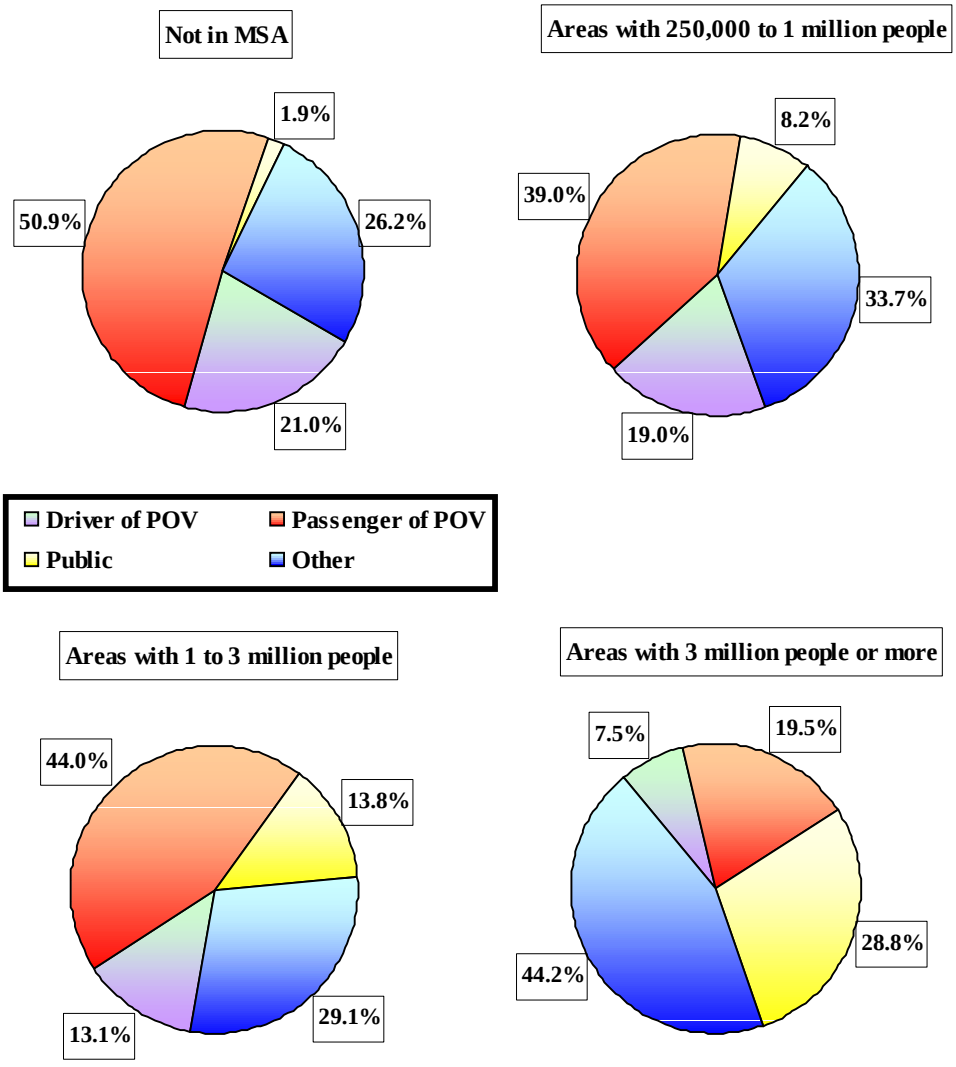
Table 32
Daily Person Trips per Person
by Vehicle Ownership Status and MSA Size
Adjusted 1990 and 1995 NPTS

MSA Size	1990 Adjusted		1995	
	Without Vehicle	With Vehicles	Without Vehicle	With Vehicles
ALL	**2.28**	**3.86**	**3.04**	**4.38**
Not in MSA	1.81	3.80	2.92	4.43
< 250,000	2.87	4.11	2.43	4.54
250,000 to 499,999	1.92	3.95	3.17	4.47
500,000 to 999,999	1.80	3.98	2.69	4.45
1 to 2.9 million	2.23	3.91	3.00	4.41
3 million +	2.50	3.72	3.13	4.26

Note:
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Figure 14 focuses on households without a vehicle. Those without access to a privately-owned vehicle met many of their transportation needs by riding as a passenger in a privately-owned vehicle, or by walking or bicycling. Of those who lived in large metropolitan areas with three million or more people, almost three-quarters of the trips were by walk, bike or public transit.

Figure 14
Mode Distribution of Person Trips Taken by Zero-Vehicle Households
1995 NPTS



Note:

- Other includes other modes not shown above such as RV, motorcycle, other POV, Amtrak, airplane, taxi, bike, walk, school bus, and other.

REFERENCES

1. PlanTrans, Draft report on NPTS Pretest Methods, Spring 1997

TRAVEL CONCEPTS AND GLOSSARY OF TERMS

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TRAVEL CONCEPTS

PERSON TRIP

DEFINITION - A trip by one person in any mode of transportation. This is the most basic and universal measure of personal travel. Each record in the Travel Day and Travel Period files in the NPTS data set represents one person trip.

EXAMPLES - Two people traveling together in one car are counted as two person trips. Three people walking to the store together are counted as three person trips.

PERSON MILES OF TRAVEL (PMT)

DEFINITION - The number of miles traveled by each person on a trip.

EXAMPLES - If two people traveling together take a six-mile subway trip to the airport, that trip results in 12 person miles of travel. A four-mile van trip with a driver and three passengers counts as 16 person miles of travel.

VEHICLE TRIPS

DEFINITION - A trip by a single privately operated vehicle (POV) regardless of the number of persons in the vehicle.

EXAMPLES - Two people traveling together in a car would be counted as one vehicle trip. Four people going to a restaurant in a van is considered one vehicle trip.

NPTS MODE RESTRICTIONS - To be considered a vehicle trip in NPTS, the trip must have been made in a privately operated vehicle, namely a household-based car, van, sport utility vehicle, pickup truck, other truck, recreational vehicle, motorcycle or other POV. The vehicle does not need to belong to the household.

Trips made in other highway vehicles, such as buses, streetcars, taxis, and school buses are collected in the NPTS, but these are shown as person trips by those modes. The design of the NPTS is such that it does not serve as a source for vehicle trips in modes such as buses, because there is no way to trace the movement of the bus fleet throughout the day. Those interested in vehicle trips by buses, taxis, etc. need to use a data source

that relies on reports from the fleet operators of those vehicles. The National Transit database (www.fta.dot.gov/ntl/index.html) provided by the Federal Transit Administration is one such source.

VEHICLE MILES OF TRAVEL (VMT)

DEFINITION - One vehicle mile of travel is the movement of one privately operated vehicle (POV) for one mile, regardless of the number of people inthe vehicle.

EXAMPLES- When one person drives her car 12 miles to work, 12 vehicle miles of travel have been made. If two people travel three miles by pickup, three vehicle miles of travel have been made.

SAME MODE RESTRICTIONS - For NPTS data, vehicle miles are restricted to the same privately-operated vehicles as vehicle trips (see above), that is a household-based car, van, sport utility vehicle, pickup truck, other truck, recreational vehicle, or other POV.

VEHICLE OCCUPANCY

DEFINITION - For NPTS data, vehicle occupancy is generally computed as person miles of travel per vehicle mile (referred to as the travel method). Note that the other commonly-used definition of vehicle occupancy is persons per vehicle trip (referred to as the trip method).

COMMENTS - Because longer trips often have higher occupancies, the travel method generally yields a higher rate (1.59 for the 1995 NPTS) than the trip method (1.50). The calculation of the travel method requires that trip miles be reported, thus it is calculated on a slightly smaller number of trips than the trip method.

GLOSSARY OF TERMS

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

Adult For NPTS, this is defined as a person 18 years or older.

Consolidated Metropolitan Statistical Area (CMSA) A large metropolitan complex of one million or more population, containing two or more identifiable component parts designated as primary metropolitan statistical areas (PMSAs). For example, the Boston CMSA is composed of six PMSAs.

Destination For travel day trips, the destination is the point at which there is a break in travel, except if the break is only to change vehicles or means of transport.

For travel period trips, the destination is the farthest point of travel.

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

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

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

Household A group of persons whose usual place of residence is a specific housing unit; these persons may or may not be related to each other. The total of all U.S. households represents the total civilian non-institutionalized population. A household does not include group quarters (i.e., ten or more persons living together, none of whom are related).

Household Income

Household income is the money earned by all family members in a household, including those temporarily absent. Annual income consisted of the income earned 12 months preceding the interview. Household income includes monies from all sources, such as wages and salary, commissions, tips, cash bonuses, income from a business or farm, pensions, dividends, interest, unemployment or workmen's compensation, social security, veterans' payments, rent received from owned property (minus the operating costs), public assistance payments, regular gifts of money from friends or relatives not living in the household, alimony, child support, and other kinds of periodic money income other than earnings. Household income excludes in-kind income such as room and board, insurance payments, lump-sum inheritances, occasional gifts of money from persons not living in the same household, withdrawal of savings from banks, tax refunds, and the proceeds of the sale of one's house, car, or other personal property.

Household Members

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

Household Vehicle

A household vehicle is a motorized vehicle that is owned, leased, rented or company-owned and available to be used regularly by household members during the two-week travel period. Household vehicles include vehicles used solely for business purposes or business-owned vehicles, so long as they are driven home and can be used for the home to work trip, (e.g., taxicabs, police cars, etc.). Household vehicles include all vehicles that were owned or available for use by members of the household during the travel period, even though a vehicle may have been sold before the interview. Vehicles excluded from household vehicles are those which were not working and were not expected to be working within 60 days, and vehicles that were purchased or received after the designated travel day.

Licensed Driver

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

Means of Transportation

A mode of travel used for going from one place (origin) to another (destination). A means of transportation includes private and public

modes, as well as walking. For all travel day trips, each change of mode constitutes a separate trip. The following transportation modes, grouped by major mode, are included in the NPTS data.

Private Vehicle

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

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

Sport Utility Vehicle. A privately owned and/or operated vehicle that is a hybrid of design elements from a van, a pickup truck and a station wagon. Examples include a Chevrolet Blazer, Ford Bronco, Jeep Cherokee, or Nissan Pathfinder.

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

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

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

Motorcycle. This category includes large, medium, and small motorcycles. Minibikes are excluded because they cannot be licensed for highway use.

Other POV. A vehicle that cannot be classified into one of the categories above.

Public Transportation

Bus. The bus category includes intercity buses, mass transit systems, and shuttle buses that are available to the general public. Also, Dial-A-Bus and Senior Citizen buses that are available to the public are included in this category. However, shuttle buses operated by a government agency or private industry for the convenience of employees, contracted or chartered buses, or school buses are excluded from this category.

Commuter Train. This category includes commuter trains and passenger trains other than elevated rail trains and subways. Commuter Train also includes local and commuter train service. Amtrak intercity service is excluded from this category.

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

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

Other Modes

Amtrak. Amtrak is defined as the U.S. national passenger railroad service providing intercity train service. Amtrak intercity service is excluded from the commuter train data.

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

Taxi. Taxis include the use of a taxicab by a driver for hire, or by a passenger for fare, and airport limousines. The taxi category does not include rental cars if they are privately operated and not picking up passengers in return for fare.

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

Walk. This category includes walking and jogging.

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

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

Other. Includes any type of transportation not previously listed, e.g. ferry boat.

Metropolitan Statistical Area (MSA)

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

Motorized Vehicle

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

Occupancy

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

Passenger

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

Person Miles of Travel (PMT)

PMT is a primary measure of person travel. When one person travels one mile, one person mile of travel results. Where two or more persons travel together in the same vehicle, each person makes the same number of

person miles as the vehicle miles. Therefore, 4 persons traveling 5 miles in the same vehicle results in 20 person miles (4 x 5 = 20).

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

POV A privately-owned vehicle or privately-operated vehicle. Either way, the intent here is that this is not a vehicle available to the public for a fee, such as a bus, subway, taxi, etc.

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

Travel Day Trip A travel day trip is defined as any time the respondent went from one address to another by private motor vehicle, public transportation, bicycle, walking, or other means. However, a separate trip is not counted in two instances:

1. When the sole purpose for the trip is to get to another vehicle or mode of transportation in order to continue to the destination.
2. Travel within a shopping center, mall or shopping areas of 4-5 blocks is to be considered as travel to one destination.

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

To or From Work Travel between home and a place where one reports for work.

Work-Related Trips for the respondent's job or business, other than to or from the workplace. Examples: a plumber drives to a wholesale dealer to purchase supplies for his business, or a company executive travels from his office to another firm to attend a business meeting. Out-of-town business trips and professional conventions are included in this category.

FAMILY AND PERSONAL BUSINESS:

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

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

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

SCHOOL OR CHURCH:

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

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

SOCIAL AND RECREATIONAL:

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

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

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

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

OTHER:

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

Urbanized Area

An urbanized area consists of the built up area surrounding a central core (or central city), with a population density of at least 1,000 persons per square mile. Urbanized areas do not follow jurisdictional boundaries, thus it is common for the urbanized area boundary to divide a county.

For the 1995 NPTS, an approximate classification of sample households was based upon the population density of the Census block group containing the household. Households in block groups estimated to have at least 1,000 persons per square mile were classed as urban; those in block groups with less than 1,000 persons per square miles were classed as not urban.

Vehicle

In the 1995 NPTS, the term vehicle includes autos, passenger vans, sport utility vehicles, pickups and other light trucks, RV's, motorcycles and mopeds owned or available to the household. Note that in the 1969 NPTS, the term vehicle was limited to cars or passenger vans. Estimates show that in 1969 there were an additional 7.5 million pickups and other light trucks that are not reflected in the 1969 NPTS data.

Vehicle Miles of Travel (VMT)

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

Vehicle Occupancy

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

Vehicle Trip

A trip by a single privately-operated vehicle (POV) regardless of the number of persons in the vehicle.

Vehicle Type

For purposes of the 1995 NPTS, one of the following:

1. Automobile (including station wagon)
2. Van
3. Sport Utility Vehicle
4. Pickup Truck (including pickup with camper)
5. Other Truck
6. RV or Motor Home
7. Motorcycle
8. Other

See "Means of Transportation" for definitions of these vehicle types. For NPTS, vehicle types are limited to privately operated vehicles (POV) because other vehicles that the respondent may have rode in (e.g., bus) were not tracked throughout the day, as was the case with household vehicles.

Weekday

Weekday is defined as the time between 12:01 a.m. Monday and midnight Friday.

Weekend

Weekend is defined as the time between 12:01 a.m. Saturday and midnight Sunday.

Worker

See "Employed"

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APPENDIX 1

CHANGES IN THE 1995 NPTS SURVEY METHODOLOGY AND THEIR PROBABLE IMPACTS

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APPENDIX 1
CHANGES IN THE 1995 NPTS SURVEY METHODOLOGY AND THEIR PROBABLE IMPACTS

Change	From 1990	To 1995	Probable Impacts
Respondent Contact	No advance letters	Advance letters	Improved response. Legitimizes the survey with respondents.
	No incentive	Incentive ($2/person)	Improved respondent cooperation rates, may have increased trip reporting.
Trip Reporting	Recall	Travel Diary	More trips reported, especially incidental trips and trips for family & personal business and social & recreational purposes.
	All trips for individual person are collected independently	Household rostering of trips	Include trips that may have been forgotten. More consistent trip data. Lower respondent burden. More coherent picture of household trip making.
	Did not specifically confirm zero trips	Specifically confirmed zero trips	More accurate count of persons who made no trips on their assigned travel day.
	Proxy from memory	Proxy from diary	More trips reported. More accurate reporting of trip characteristics.
	Trip definition	Clearer trip definition	Easier for respondent to report trips. Interviewers more attuned to pick up incidental trips.
	On-line edits	Additional on-line edits	More coherent trip reporting. Improved data quality.
Completed household definition	At least one person completed the travel-day interview	At least 50% of the adults completed the travel-day interview	A more accurate representation of travel by the household unit.

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APPENDIX 2
ADJUSTMENT OF 1990 TRAVEL DATA

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APPENDIX 2
ADJUSTMENT OF 1990 TRAVEL DATA

The 1995 Nationwide Personal Transportation Survey (NPTS) was a significant improvement over previous surveys in the NPTS series. Different methods were used to ensure that more complete trip reporting was obtained. Specifically,

- a travel diary was used by respondents in the 1995 survey, in lieu of memory recalling; and
- "household rostering" was used to capture some trips that may otherwise have been overlooked.

Although these improvements enhance the completeness and accuracy of trip reporting, they prevent any direct comparisons between the 1990 and 1995 travel data. Any travel changes observed between the 1990 and 1995 surveys now reflect not only actual changes in travel during the period but also artifacts of differences in survey methodology. That is, any changes observed between the 1990 and 1995 travel data are presumably attributable to: (1) actual changes in travel behavior, (2) use of travel diaries, (3) use of household rostering, and (4) other improvements in the 1995 survey method such as a better coding scheme to decipher trip purposes. The latter is expected to have a smaller effect than the first three factors. Since no data are available to quantify the impact of these "other" improvements, their impacts are not evaluated in this exercise.

However, the improved coding scheme in 1995 had an effect on trip recording. In 1990, 1.9 billion trips were coded as "other" trip purpose. In 1995, this number was 700 million, a decline of 64 percent. These "other" trips are those that can not be classified into any of the existing trip purpose categories. Two reasons contribute to this substantial decrease in "other" trips. First, the information was collected in the 1995 survey on "from" where the trip was originated and "to" where the trip was

destined. This type of "to" and "from" information enabled the trip purposes to be determined more accurately. As a result, the number of trips with unspecified trip purposes decreased. Second, better schemes to code trip purposes were used both during and after the data collection phase, significantly reducing the ambiguity in trip purposes.

The reduction in trips with unspecified trip purposes presumably increases the number of trips categorized into the proper trip purpose categories. Ideally, one should remove *all* artifacts that result from an improved method. However, data to address the effects of each of the individual improvements are extremely limited. Our approach was developed to remove as many artifacts that the data allow. Specifically, our approach quantified and removed the effect of the travel diary and household trip rostering on the amount and type of trips in the 1995 NPTS.

Adjustment Approach

To more accurately reflect travel trends, the 1990 travel data were adjusted to account for two *major* changes in survey methodology: (1) travel diary, and (2) household rostering. In essence, the 1990 travel data were adjusted in such a way as if a travel diary and household rostering were used in the 1990 survey. The theory is that more trips would have been recorded in the 1990 survey if travel diaries were used. This theory is supported by data collected in the 1995 NPTS pre-test. Data from the 1995 NPTS pre-test showed that travel diaries led to more complete reporting, particularly for incidental trips, such as stopping at a convenience store, which are often forgotten and, therefore, difficult to capture in a household travel survey. Household rostering is also expected to capture more complete trip reporting by helping remind respondents of forgotten trips. Since data from the 1995 NPTS pre-test suggest that the impact of travel diary varies for different trip purposes, separate adjustment factors were developed for different purposes.

Although more detailed trip purpose information was collected in the 1995 survey, for this analysis trip purposes were grouped into four broad categories: (1) work and school, (2) shopping, (3) family and personal business other than shopping, and (4) social and recreational. Separating shopping

trips from trips taken for other family and personal businesses is based on the belief that travel diaries and household rostering influence reporting on these trips differently. This appendix describes the approach used to quantify impacts of travel diary and household rostering on the number of person trips recorded by these purposes.

Rather than adjust travel data in all previous surveys (e.g., 1969, 1983 NPTS), only 1990 travel data were adjusted. Both original and adjusted 1990 statistics are presented in this report. The user is warned not to compare 1995 results to those from previous NPTS. For trend analysis, the 1995 results should only be compared to the adjusted 1990 statistics.

Impact of Travel Diary on Trip Reporting

A methodological experiment was designed as part of the 1995 NPTS pre-test to test three different survey methods: memory recall (n=875), memory jogger (n=729), and travel diary (n=708). Although the pre-test sample sizes are not particularly large, these pretest data provide the only platform to quantify the impact of travel diaries on trip reporting. On an individual basis, using a travel diary indeed captures more trips than recalling the day's trips from the memory (Table A2.1). It was found that the diary method averaged 0.5 trips more per person per day than the recall, or retrospective method [1]. In addition, travel diary use has greater impact on reporting non-work or non-school related trips than on work or school trips. Its impact is the greatest for non-shopping types of family and personal travel, such as visiting a doctor's office, dropping off or picking up someone: 37 percent more such trips were reported by using travel diaries than by recalling from memory.

The ratio of travel rates between those collected by travel diaries and those by recall approximates the additional trips that would have been reported if travel diaries were used in the 1990 survey. Contrary to our assumption that travel diaries will not increase the number of work and school trips reported, there were fewer work and school trips reported in the 1995 NPTS pre-test when travel diaries were used rather than recall. For trip purposes other than work and school, travel diaries capture

more trips than recall (Table A2.1). Since travel diaries are not believed to improve the reporting of non-incidental trips such as commute or school trips and since there is no other evidence supporting a decrease in commute or school trips from 1990 to 1995, the impact of travel diaries on reporting these trips is considered null, and no adjustment was made to the 1990 data.

Table A2.1 Annual Person Trips per Person by Survey Methods
Based on 1995 NPTS *Pre-test* Data

	Travel Diary (1)	Recall (2)	% Different = [(1)-(2)]/(2)
Work and school	312.50	341.64	-8.5%
Shopping	273.09	226.20	20.7%
Other family and personal	317.47	231.36	37.2%
Social and recreational	293.82	244.39	20.2%
Other	8.29	7.58	9.4%
ALL	**1,205.17**	**1,051.17**	**14.7%**

Impact of Household Rostering on Trip Reports

In "household rostering," the interviewer has the benefit of trip data from all household members who had already been interviewed. For example, suppose person #1 took a trip and reported that persons #2 and #3 were on the trip with him. When persons #2 and #3 were interviewed, they were asked to confirm that they were on the trip with person #1. If they were, the trip characteristics were "copied" from person #1's record to those of person #2 and person #3. If person #2 or person #3 indicated that they were not on the trip with person #1, this response was accepted. One benefit of household rostering is that it aids the memory of the respondent and improves trip reporting.

If household rostering had been used in the 1990 NPTS, how many more trips would have been reported? Unfortunately, this question can not be answered directly due to the lack of data. Instead, an indirect approach was developed. The basic idea behind this approach is simple: It is assumed that household rostering does not increase trip reporting from 1990 to 1995 for trips where only one household member is on the trip. Therefore, the travel trends observed between 1990 and 1995 in the "non-accompany" trips are basically due to (1) changes in travel behavior, (2) use of travel diaries, and (3) other improvements in the 1995 survey method (these effects being relatively inconsequential). It should be emphasized that the "non-accompany" trips are not necessarily all single-occupant trips. Rather, they are trips where only one household member is on the trip, with or without being accompanied by non-household members. These trips are referred hereafter as "non-accompany trips."

After adjusting these "non-accompany" trips in 1990 for the impact of travel diaries, the remaining difference between the 1990 and 1995 "non-accompany" trip rates is presumably attributable to the change in travel during the period. Now, adjusting **all** of the 1990 trips to reflect the impact of trip diary and the change in travel during the five year period, the remaining difference between the 1995 survey data and the adjusted 1990 data presumably reflects the impact of household rostering.

Table A2.2 illustrates the steps taken to estimate the real changes in trip rates observed in the "non-accompany" trips from 1990 to 1995. The total numbers of "non-accompany" trips reported in the 1990 NPTS are in Column 1. The impact of using travel diaries on reporting trips are listed in Column 2. Adjusting 1990 data for diary impact, Column 3 reports the estimated number of trips by purpose that would have been collected in 1990 had travel diaries been used. Comparing the adjusted 1990 figures (Column 3) to comparable 1995 data (Column 4), one can calculate the percentage change in travel from 1990 to 1995 by trip purpose. The overall increase is nearly 30 percent, approximately 4.5 percent per year for the five year period.

Table A2.2 Estimated Travel Changes from 1990 to 1995
Based on trips without other household members "accompanied"

Purpose	(1)	(2)	(3)=(1)x[(=1+(2)]	(4)	(5)= [(4)-(3)]/(3)
	1990 1-hhm[1] trips (000)	Diary Impact[2] (%)	1990 1-hhm trips adjusted for diary impact	1995 1-hhm trips (000)	change in travel (%)
Work, School	62,973,929	0	62,973,929	84,974,961	34.9
Shopping	27,983,544	20.7	33,860,088	45,996,625	35.8
Other Fam/Per	33,237,593	37.2	45,535,502	58,602,172	28.7
Soc/Rec	33,166,604	20.2	39,799,925	46,509,286	16.9
Other	1,233,007	9.4	1,343,978	356,444	-73.5
TOTAL	**158,594,677**		**182,383,879**	**236,439,488**	

[1] 1-household-member (1-hhm) trips = Trips where no other household members "accompanied."
[2] From Table 1.

This approach suggests that Americans as a whole took approximately 35 percent more commute and school trips from 1990 to 1995. A number of factors could contribute to this increase in the total number of work and school trips. For example, the number of workers increased by 11 percent during this period. Note that the number of "other" trips decreased by 74 percent due to a better trip purpose coding scheme. The lack of appropriate and sufficient data prohibits an evaluation of the impact of this improved coding scheme. Thus, no adjustments are made to 1990 trips categorized as "other" trip purpose. These trips are a very small proportion of all trips.

With these calculations, the revised estimates of 1990 trips now reflect adjustments for (1) trip diary and (2) change in travel. Presumably, the remaining difference between the 1995 survey data and the adjusted 1990 data reflects the impact of household rostering. Table A2.3 demonstrates the steps to estimate this effect. First, the number of trips collected in the 1990 survey was adjusted for the diary impact (e.g., 21 percent for shopping trips) and for the change in travel between 1990 and 1995 (e.g., 36 percent for shopping trips). It can be reasonably assumed that after this adjustment the 1990 data

are almost comparable to the 1995 data except for the impact of household rostering. The percentage difference between this adjusted 1990 data and the observed 1995 data is used to estimate the impact of household rostering (Table A2.3). Based on this somewhat convoluted approach, we estimated that approximately four percent more shopping trips would have been reported in the 1990 survey if household rostering had been used. Again, the number of "other" trips decreased by 74 percent due to a better trip purpose coding scheme. The lack of appropriate and sufficient data prohibits an evaluation of the impact of this improved coding scheme. Thus, no adjustment is done to 1990 trips categorized with the "other" trip purpose.

Table A2.3 Estimated Impacts of Household Rostering by Trip Purpose

Purpose	(1) 1990 Total Trips (000)	(2) Diary Impact (%)	(3) change in travel (%)	(4)= (1) x [(2)+(3)]/100 1990 trips adjusted for diary impact and % change in travel	(5) 1995 Total Trips (000)	(6)= [(5)-(4)]/(4) impact of trip rostering (%)
Work, School	82,240,011	0	34.9	110,941,885	110,115,282	-0.7
Shopping	47,056,740	20.7	35.8	73,643,798	76,688,225	4.1
Other Fam/Per	56,551,552	37.2	28.7	93,819,025	97,075,588	3.5
Soc/Rec	61,799,215	20.2	16.9	84,726,724	94,361,999	11.4
Other	1,914,779	9.4	-73.5	687,406	689,270	0.3

Adjustment Factors for 1990 Travel Data

By combining the impact of travel diary (Column 2 of Table A2.3) and the impact of household rostering (Column 6 of Table A2.3), the factors used to adjust 1990 travel data range from no adjustment for work and school trips to a 41 percent increase for trips taken for other family and personal business (i.e., non-shopping trips) (Table A2.4). These adjustment factors suggest that between 1990 and 1995 the total number of person trips increased about 4.5 percent per year, compared to a rate of 2.6 percent between 1969 and 1990. However, after taken into account the population increases over the years, these adjustment factors suggest that a typical American increased his/her trips by 2.7 percent per year

(Table A2.5). This rate is comparable to the 2 percent increase observed between the 1969 and 1990 surveys.

Table A2.4 1990 Travel Data Adjustment
(Person trips in thousands)

Purpose	1990 Trips (1)	Adjustment Factor (2)	Adjusted 1990 Trips (1) × (2)	1995 Trips	Average Annual % Change
Work, School	82,240,011	1.00	82,240,011	110,115,282	6.01
Shopping	47,056,740	1.25	58,820,925	76,688,225	5.45
Other Fam/Per Bus	56,551,552	1.41	79,737,688	97,075,588	4.01
Social/Recreational	61,799,215	1.32	81,574,964	94,361,999	2.96
Other	1,914,779	1.00	1,914,779	689,270	-
TOTAL	**249,562,297**		**304,288,367**	**378,930,363**	**4.49**

Table A2.5 Daily Person Trips per Person
Adjusted 1990 and 1995 NPTS

Purpose	1990 Trip Rate	Adjustment Factor Diary+Rostering Trip Rate	Adjusted 1990	1995 Trip Rate	Average Annual Change Rate (%)
Work, School	1.015	1.00	1.015	1.248	4.22
Shopping	0.580	1.25	0.725	0.869	3.70
Other Fam/Per Bus	0.698	1.41	0.984	1.100	2.26
Social/Recreational	0.762	1.32	1.006	1.070	1.24
Other	0.024	1.00	0.024	0.008	--
TOTAL	**3.079**	-	**3.754**	**4.296**	**2.73**

The fundamental assumption in this approach is that the changes observed in the "non-accompany" trips reflect the changes observed in all trips. The validity of this assumption is checked by first examining how representative the "non-accompany" trips are in both 1990 and 1995. "Non-accompany" trips in both 1990 and 1995 account for no less than 50 percent of the total person trips (Table A2.6), suggesting that using "non-accompany" trips to estimate the magnitude of travel changes

in all trips appears to be reasonable. The validity of this assumption is further verified by checking whether the "non-accompany" rate has changed from 1990 to 1995. More than three quarters of work trips and school trips are not accompanied by other household members. This percentage remains relatively stable from 1990 to 1995 (Table A2.6). Note that dropping off and picking up children from schools are not considered "school trips" they are categorized under "Other family and personal business." Almost all trips remain somewhat stable for the non-accompany rate between 1990 and 1995 except social and recreational trips. There is a smaller percentage of social and recreational trips in 1995 that went "unaccompanied by other households" than in 1990: 49 percent vs. 54 percent. That data seem to support the idea that using only "non-accompany" trips to estimate travel changes between 1990 and 1995 is reasonable.

Table A2.6 One-Household-Member Person Trips, Total Person Trips, and Non-Accompany Rate by Trip Purpose
1990 and 1995 NPTS
(Person Trips in thousands)

Purpose	1990 NPTS			1995 NPTS		
	HH Non-Accompany Person Trips	Total Person Trips	Non-Accompany Rate	HH Non-Accompany Person Trips	Total Person Trips	Non-Accompany Rate
Work, School	62,973,929	82,240,011	76.57%	84,974,961	110,115,282	77.17%
Shopping	27,983,544	47,056,740	59.47%	45,996,625	76,688,225	59.98%
Other Fam/Per Bus	33,237,593	56,551,552	58.77%	58,602,172	97,075,588	60.37%
Social/Recreational	33,166,604	61,799,215	53.67%	46,509,286	94,361,999	49.29%
Other	1,233,007	1,914,779	64.39%	356,444	689,270	51.71%
TOTAL	**158,594,677**	**249,562,297**	**63.55%**	**236,439,488**	**378,930,363**	**62.40%**

This analysis was conducted using simple methods with the data available. These calculations might raise as many questions as they have answered. Notwithstanding, this is the first attempt to

explain the differences on travel that can be attributed to the improvements in the survey methods. Hopefully more research on the effects of different survey methods will follow.

APPENDIX 3

DIFFERENCES IN WORKERS AND COMMUTE TRIPS BETWEEN 1990 AND 1995 NPTS

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APPENDIX 3

DIFFERENCES IN WORKERS AND COMMUTE TRIPS BETWEEN 1990 AND 1995 NPTS

Data from the NPTS indicate that overall personal travel increased at a surprising rate of 52 percent from 1990 to 1995. This rate implies an average annual increase of 8.7 percent—which is unprecedented when compared to an average annual rate of 1.5 percent between 1983 and 1990 and 0.8 percent between 1977 and 1983. This unprecedented increase is attributable to two factors: the real increase in travel, and "statistical artifacts" stemming from the different survey methods and definitions used in 1990 and 1995. Appendix 2 details these two factors and describes how the 1990 survey data are adjusted to ensure valid comparisons between the 1990 and 1995 survey data. However, this adjustment was not made to **commute** and **school** trips because improved survey methods (use of travel diaries and households rostering) are not believed to improve the reporting of non-incidental trips such as commute or school trips.

This unprecedented increase is also observed in *work trips*, which include both journeys to work and work-related trips. While the number of workers increased by an average of 2.2 percent each year between 1990 and 1995, travel related to earning a living increased at an annual rate of 5.6 percent for the total number of journey-to-work (JTW) vehicle trips, or 7.2 percent for the total JTW VMT (Table A3.1). The changes in work-related trips are significantly more pronounced than those in JTW (Table A3.1). This appendix identifies two sources potentially contributing to these increases in commutes and work-related travel.

The first potential source is the recording of commercial driving. In 1990, commercial drivers were instructed *not* to report trips as part of work. However, in 1995, trips as part of work (i.e., commercial driving) were recorded in the Travel Day file **as long as** the number of such trips taken is 10 or fewer. This difference between the two surveys in reporting commercial driving largely explains

the annual increase of 60 percent in work-related trips among commercial drivers from 1990 to 1995 (Table A3.2).

Table A3.1 Statistics on Commutes and Work-Related Trips
1983, 1990, and 1995 NPTS

	1983	1990	1995	Compounded Annual Change	
				83-90	90-95
Workers (10^3)	103,244	118,343	131,697	2.0%	2.2%
Journey-to-work Trips					
Person Trips (10^6)	46,493	50,314	66,901	1.1%	5.9%
Vehicle Trips (10^6)	35,271	41,792	54,737	2.5%	5.6%
VMT (10^6)	301,644	453,042	642,610	6.0%	7.2%
Work-related Trips					
Person Trips (10^6)	5,283	3,529	9,860	-5.6%	22.8%
Vehicle Trips (10^6)	3,679	2,845	7,921	-3.6%	22.7%
VMT (10^6)	42,090	42,336	137,867	0.01%	26.6%

Table A3.2. Annual Person Trips per Person
1990 and 1995 NPTS

Trip Purpose	Commercial Drivers			Non-Commercial Drivers		
	1990 NPTS	1995 NPTS	Annual % Difference	1990 NPTS	1995 NPTS	Annual % Difference
To/From Work	399.58	840.12	16.02%	431.51	468.16	1.64%
Work-Related	32.23	343.19	60.49%	29.22	42.81	7.94%

Note: The number of commercial drivers and non-commercial drivers include only those workers age 16 or older.

However, some of these "work-related" trips were mis-coded as "to or from work," or commute trips. Two examples of such mis-coding are listed in Table A3.3. It is obvious from these examples that all of the trips coded as "to and from work," except the trips that were either to, or from, home, should in fact have been coded as "work-related." To gauge the magnitude of this mis-coding among all commercial drivers would involve manually checking individual trips, which can be very tedious. Thus, the exact impact of this mis-coding on the increase in commutes between 1990 and 1995 is unknown at this time. However, a preliminary analysis was conducted on workers who took unusually large numbers of commute trips in a day. Specifically, the analysis focused on the workers who took four or more commute trips in a day (3.5 percent of all workers). Rather than assuming that anyone who reported more than four commute trips had their 5th and 6th commutes mis-coded, a set of additional ad-hoc criteria were used. A commute trip was considered mis-coded if it was the 5th or greater commute trip taken in a day (e.g., the 6th or the 7th, etc.), **and** it used an unusual mode such as school bus, airplane, and a truck other than a pickup truck, **and** the mode used was different from the one used in the previous commute trip. By limiting the trips to those that meet the above criteria, we believe that between 70 percent and 80 percent of those trips are mis-coded. However, since only less than one percent of all trips meet the above criteria, the impact of potentially mis-coding is inconsequential. If the number of daily commute trips per person is limited to four, then commute trips are estimated to increase between 1990 and 1995 at an average annual rate of 5.8 percent, rather than the 5.9 percent as reported in Table A3.1.

In addition to this difference in data recording, two definitional differences potentially bias any comparisons between 1990 and 1995 on workers and commutes. They are: the definition of workers, and the definition of commute trips. Unfortunately, lack of benchmark data prohibits any adjustments to the 1990 data to account for the definitional differences.

Table A3.3. Example of Two Persons Taking Trips That Were Classified as Commute Trips
1995 NPTS

HOUSE ID	PERSON ID	95 Trip Purpose	WHY TO	WHY FROM	Mode of Transportation	Start Time of Trip
1059377	1	To work	To work	Home	Pickup	6:15
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**6:40**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**7:20**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**7:55**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**8:20**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**9:00**
1059377	1	Home	Home	To work	Pickup	9:15
1059377	1	To work	To work	Home	Auto	13:45
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**14:20**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**15:05**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**15:30**
1059377	**1**	**To work**	**To work**	**To work**	**School Bus**	**15:50**
1059377	1	Home	Home	To work	Auto	16:45

Obviously, this driver is a school bus driver. He drove his pickup truck to work at 6:15 am; began his school-bus route at 6:40 am; finished his morning run at 9:00 am; went home in his pickup truck at 9:15 am. In the afternoon, he drove his car to the bus yard at 1:45 pm; began his afternoon bus route at 2:20 pm; finished his run at 3:50 pm; went home in his own car at 4:45 pm. Trips highlighted should have been coded as "work-related."

HOUSE ID	PERSON ID	95 Trip Purpose	WHY TO	WHY FROM	Mode of Transportation	Start Time of Trip
1142363	1	To work	To work	Home	Pickup	8:00
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**9:15**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**10:05**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**10:50**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**11:30**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**12:15**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**13:00**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**13:40**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**14:00**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**14:15**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**15:00**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**15:15**
1142363	**1**	**To work**	**To work**	**To work**	**Other trk**	**15:35**
1142363	1	Home	Home	To work	Pickup	16:30

Similar to the school-bus driver, this driver drove to work in his own pickup truck at 8 am. From 9:15 am to 3:35 pm, all driving should have been coded as "work-related," rather than "to work." At 4:30 pm, he went home in his pickup truck. Instead of 14 journeys-to-work, only 2 trips were JTW.

Definition of Workers

In the 1990 NPTS, a respondent was defined as a worker if:

- the respondent was working most of the previous week (a one-week period prior to the interview),
- the respondent was with a job but not at work most of the previous week, or
- the respondent was doing something else most of the previous week (e.g. looking for work, keeping house, going to school, etc.), but responded "Yes" to:
  - (a) "Did you do any work last week, not counting work around the house?", or
  - (b) "Did you have a job or business from which you were temporarily absent last week?"

In the 1995 survey, a worker was defined based on the response to a single question, "Do you have a full or part-time job working for pay or profit?" Because of the difference in the definition of a worker between the two surveys, any comparisons of the difference in the number of workers between the 1990 and 1995 NPTS should be made with caution. Different estimates of the number of workers are presented in Table A3.4. Apparently, the more stringent criteria used in 1990 yield an estimate of the total number of workers that is considerably closer to that estimated by the Bureau of Labor Statistics.

Table A3.4 Number of Workers (in '000)
1983, 1990, and 1995 NPTS and BLS Data

	NPTS	BLS[1] Data	% Different
1983	103,244	100,834	2.4%
1990	118,343	118,793	-0.4%
1995	131,697	124,900	5.4%

[1] U.S. Bureau of Labor Statistics, Bulletin 2306; and Employment and Earnings, monthly, January issues. BLS data beginning 1994, not directly comparable with earlier years. See text, section 13, and February 1994 issue of Employment and Earnings.

Definition of Commute Trips

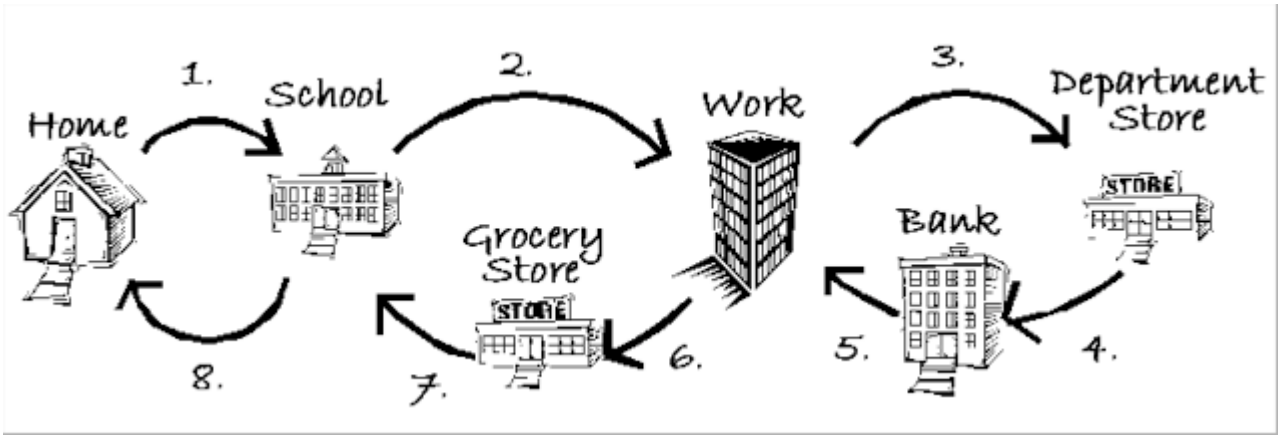
Commute trips include trips from home to work and trips from work to home. In the 1990 NPTS, trip purposes were "activity-based" and were determined using a *round-trip* scheme. Using this scheme, trips to and from work were both coded as "to and from work" and a commute trip was defined as a trip taken with a purpose categorized as "to or from work." This was mainly done to assign both parts of the round-trip to the reason the travel was made, thus avoiding the use of "return home" or "return to work." By 1995, the basis for determining trip purpose was significantly different from that used in the 1990 NPTS. The 1995 NPTS was "destination-based" and defined trip purposes as to why the *one-way* trip was made. Therefore, each trip purpose was defined based on the destination of that one-way trip. The reasons for this coding scheme are: (1) to obtain better data on trip chaining, (2) to have a coding scheme that was more direct and precise, and (3) to have a coding scheme that was easier for the interviewer to apply.

To apply the 1990 trip-purpose coding scheme to the 1995 NPTS data, a considerable number of intermediate steps are required. For example, in the 1990 trip-purpose coding scheme, if there was

more than one trip before the return-home trip, then the *destination* where the longest time was spent was the "purpose" of that trip. Thus, the steps in the recoding process are to: (1) first create trip chains, (2) measure time spent at each destination, and, finally, (3) determine the main purpose of the trip. These steps can be illustrated by an example (Figure A3.1). In this example, the traveler stops on the way to work to drop off a child at school; continues on to work; runs some errands during lunch by shopping at a store and banking at a bank. On her way home, she stops at the grocery store to shop, then to school to pick up her child, and finally returns home. All her trips during this day are enumerated in a tabular format, under both the 1990 and 1995 definitions. Under the 1990 trip-purpose coding scheme, Trip No. 5 will be for "shopping" if more time is spent at the store than at the bank. However, if more time is spent at the bank than at the store, then the trip purpose for Trip No. 5 will be "other family and personal business" according to the 1990 trip-purpose definition. The same logic applies to Trip No. 8. Because it is most common to spend the longest time at work, rather than at the store (Trip No. 6) or at school (Trip No. 7), the purpose for Trip No. 8 is "to or from work." Appendix M of the 1995 NPTS User's Guide provides more detailed information on the coding of the 1995 and 1990 trip purposes.

Although significantly improving the way trips are characterized with respect to why travel takes place, this re-coding scheme introduces discrepancies between the two surveys. Re-coding the 1995 trip purposes is a complicated process. Table A3.5 illustrates an example of how 1995 data could be coded incorrectly. Incidentally, all trips in Table A3.5 qualify as commute trips because their purposes, based on the 1990 definition, are "to and from work." To investigate the likelihood of mis-coding trip purposes, information on the "to" and "from" purposes is used. In 1995, additional information was collected on individual trips with respect to the destination "*to*" which travel takes place and the destination "*from*" which travel returns. All of these commute person trips (with a 1990 trip purpose of "to and from work") have the "*to*" part of the trip as "return to work" (Column 2). The primary purpose for the trip can then be ascertained by the information on the "*from*" portion of the trip. For example, there are 102 trips that were "return to work" "from work"—which is highly illogical. One reasonable interpretation of these 102 trips would be "return to work" from "work-

Figure A3.1 An Example to Illustrate Trip-Purpose Coding Schemes



Trip Number	Description	Trip Purpose	
		1990 Definition	1995 Definition
1.	from home to child's school	Other family/personal business	Take someone somwhere
2.	from child's school to work	To or from work	To work
3.	from work to store	Shopping	Shopping
4.	from store to bank	Other family/personal business	Other family/personal business
5.	from bank back to work	Shopping*	Return to work
6.	from work to store	Shopping	Shopping
7.	from store to child's school	Other family/personal business	Pick up someone
8.	from child's school to home	To or from work	Home

* If more time is spent at the store than at the bank.

Table A3.5 Example of Presumably Incorrectly-Coded 1995 Commute Trips
(With the 1990 trip purpose of "To and From Work")

1995 Trip-Purpose Definition		1990 Trip-Purpose Definition	
"**from**" part of the trip	"**to**" part of the trip = "return to work"	Currently coded trip purpose	Presumably correct 1990 trip purpose
To work	102	To and from work	Work-related business
Work related business	1,490	„	Work-related business
Return to work	35	„	Work-related business
Shopping	58	„	Shopping
School	3	„	School
Religious activity	2	„	Religious activity
Medical or dental	6	„	Medical or dental
Other family/personal business	64	„	Other family/per bus
Take someone somewhere	20	„	Other family/per bus
Pick up someone	0	„	Other family/per bus
Vacation	0	„	Vacation
Visit friends or relatives	13	„	Visit friends or relatives
Went out to eat	24	„	Other soc/rec
Other social/recreational	12	„	Other soc/rec
Home	1,091	„	Other family/per bus
Not ascertained	19	„	Not ascertained
ALL	**2,938**	**„**	**ALL**

related business." If these trips' purposes are coded correctly, then they would not count as commute trips. Another example are the 58 trips which "return to work" from "shopping." If these trips are correctly coded, then they should be "shopping" trips rather than "to and from work" trips which qualify them as commute trips. The third column of Table A3.5 gives the trip purposes that are probable correct. Should all the trips reported in Table A3.5 be coded correctly, they would be disqualified as commute trips, partially explaining the unprecedented increase in commutes from 1990 to 1995. Unfortunately, the magnitude of the mis-coding of 1995 trips can not be readily quantified.

Another possible explanation of the apparently great increase in work trips is the large percentage of non-workers who reportedly commuted to work on their designated travel day. This percentage is almost always higher in 1995 than in 1990 for every age group (Table A3.6). However, the difference between 1990 and 1995 increases substantially for age categories older than 55 years. The reasons for these differences are unclear. One plausible explanation is that more people 55 years old and over volunteered for work without pay in 1995 than in 1990. Persons who perform unpaid volunteer work might not consider themselves a "worker" but consider daily travel to their unpaid volunteer work as "going to work." Unfortunately, this possible explanation can not be substantiated. Although three surveys on voluntarism have been conducted through the Current Population Survey in 1965, 1974 and 1989, each of these surveys differs in terms of questions, concepts and coverage. Consequently, their usefulness for identifying changes in volunteer behavior over time is very limited.

In summary, any comparisons on statistics related to workers and commutes between 1990 and 1995 should include a caveat indicating that part of the differences between the two surveys are due to (1) different definitions of workers and trip purposes in the two surveys, and (2) the way commercial driving was recorded, and not due to actual changes in travel or in social economy.

Table A3.6 Percent of Non-Workers Commute to Work
1990 and 1995 NPTS

Age of Worker	1990 NPTS	1995 NPTS
16 to 19	4.78%	4.74%
20 to 24	1.51%	2.71%
25 to 29	0.93%	0.94%
30 to 34	0.87%	1.12%
35 to 39	0.91%	1.12%
40 to 44	1.02%	0.83%
45 to 49	0.70%	1.03%
50 to 54	1.39%	1.51%
55 to 59	1.41%	4.05%
60 to 64	2.62%	6.64%
65 to 69	7.24%	15.12%
70 to 74	6.56%	27.23%
75 to 79	15.23%	33.66%
80 to 84	24.39%	58.95%
85+	53.99%	64.02%

APPENDIX 4

DIFFERENCES IN METROPOLITAN AREA DEFINITIONS BETWEEN 1983 AND 1990 NPTS

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APPENDIX 4

DIFFERENCES IN METROPOLITAN AREA DEFINITIONS BETWEEN 1983 AND 1990 NPTS

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

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

Of the 318 preexisting SMSAs, 53 became PMSAs within 15 CMSAs, and 8 new PMSAs were established within these CMSAs. In addition, five preexisting SMSAs became CMSAs which were further subdivided into ten PMSAs. As the result of these redefinitions, there were 20 CMSAs with 71 component PMSAs when the 1990 NPTS was conducted. Among these 20 CMSAs, there were ten with a population of more than three million. These ten CMSAs were made up of 48 PMSAs, most of which did **not** by themselves have a population more than three million. Moreover, there was one MSA in 1990 with a population of more than three million.

In the 1990 and 1995 NPTS, the variable MSASIZE was given a population size value based on its **MSA** or **CMSA** size. Therefore, if a household was located in an area within a PMSA of less than three million, but its CMSA had a population of more than three million, then the household was categorized as being located in an MSA of three+ million. In 1983 and all previous NPTS surveys, however, only the SMSAs which **by themselves** had a population of more than three million were categorized as being "3+ million." The implication of this definitional change on the NPTS data is that **many more** households were estimated by the 1990 and 1995 data as being located within metropolitan areas with a population of more than three million than that estimated by the previous NPTS surveys.

APPENDIX 5

STANDARD ERROR TABLES

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APPENDIX 5

STANDARD ERROR TABLES

The final adjusted weights are used in calculating parameter estimates and their sample variance. The standard error estimates shown in the following tables were obtained using the *ultimate cluster* variance formula. Further information on calculating standard errors using this method can be found in Appendix F and Appendix G of the *CENVAR, Variance Calculation System User's Guide* (U.S. Department of Commerce, Bureau of the Census, International Systems Team, Washington, DC, January, 1995.)

The standard errors that are shown in the following tables reflect the sampling error and also the variation in estimates due to some nonsampling errors. Sampling error is due to variability between estimates from all other possible samples of the same size that could have been selected using the same sample design (e.g. variation that occurred by chance because a sample was surveyed rather than the entire household population). Estimates that were derived from any of these different samples would differ from one another. This variability, along with some nonsampling error, are measured by the standard error. Nonsampling error can be attributed to several sources including the following:

- The inability to obtain information about all cases in the sample unit and item (nonresponse)
- The inability to obtain correct information from respondents
- Errors made in data collection such as recording and coding errors
- Errors made in data processing
- Failure to represent all units with the sample (noncoverage)

Sampling errors shown in this report are primarily measures of sampling variability although they may include some nonsampling error. Thus, the accuracy of the estimates given is dependent on

the sampling error and nonsampling errors which are measured by the standard error, and also on the biases and nonsampling errors which are not measured by the standard error.

The standard error of these estimates can be used to construct an interval around specific estimates. This interval will include, with a given amount of confidence, the true population value. About 68 percent of the intervals, created by subtracting one standard error and adding one standard error, will include the true population value. About 95 percent of the intervals, created by subtracting two standard errors and adding two standard errors, will include the true population value, and about 99.75 percent of the intervals, created by subtracting and adding three standard errors, will include the true population value. Thus, one can state, with a given percent of confidence (as stated above) that the computed interval will contain the true population value.

An example of how these standard errors could be used is as follows. One may want to know the annual person miles traveled per household for social and recreational purposes. The estimate of the total number of annual person miles of travel per household for social and recreational purposes in 1995 is 10,571. The standard error for this estimate, as found in Standard Errors for Table 5, is 283.76. To construct an interval that would include the true population value about 68 percent of the time, one would calculate: $10{,}571 \pm (1)283.76$. Therefore, a 68 percent confidence interval for the true person miles traveled per household, as shown by this data, would be included in the interval 10,287 to 10,855 person miles of travel per person. An interval that would include the true person miles per household about 95 percent of the time would be constructed by solving: $10{,}571 \pm (2)283.76$. Hence, a 95 percent confidence interval for the true number of person miles of travel per household for social and recreational purposes is in the interval from 10,003 to 11,139 person miles per household.

Standard Errors for Table 1
Summary Statistics on Demographic Characteristics and Total Travel,
1995 NPTS

Standard Errors for:	
HOUSEHOLDS (000)	
All	330
1 person	386
2 persons	330
3 persons	280
4+ persons	341
PERSONS (000)	
All Persons 5 or older	1,281
Under 16	675
16-19	330
20-34	738
35-64	693
65+	460
All Males 5 or older	808
All Females 5 or older	778
LICENSED DRIVERS (000)	
All	846
Men	596
Women	525
WORKERS (000)	
All	864
Men	589
Women	524
HOUSEHOLD VEHICLES (000)	
	880
HOUSEHOLD VEHICLE TRIPS (000,000)	
	1,600
HOUSEHOLD VMT (000,000)	
	23,782
PERSON TRIPS (000,000)	
	2,645
PERSON MILES OF TRAVEL (000,000)	
	49,131

Standard Errors for Table 4
Average Annual PMT, Person Trips and Trip Length by Trip Purpose
1995 NPTS

Stderr for Avg Annual PMT per HH	
All Purposes	496.32
To/From Work	122.92
Work Related Business	113.88
Shopping	126.00
All Other Fam/Per Business	272.25
School/Church	69.83
Social and Recreational	283.76
Other	49.89
Stderr for Avg Annual Person Trips per HH	
All Purposes	26.72
To/From Work	6.53
Work Related Business	2.86
Shopping	8.50
All Other Fam/Per Business	10.10
School/Church	5.81
Social and Recreational	10.83
Other	0.57
Stderr for Avg Person Trip Length	
All Purposes	0.12
To/From Work	0.15
Work Related Business	1.08
Shopping	0.15
All Other Fam/Per Business	0.27
School/Church	0.18
Social and Recreational	0.28
Other	8.32

Standard Errors for Table 5
Average Annual VMT, Vehicle Trips, and Trip Length
by Selected Trip Purposes
1995 NPTS

Stderr for Avg Annual VMT per HH	
All Purposes	240.25
To or From Work	106.32
Shopping	61.52
Other Fam & Personal Business	95.27
Social and Recreational	114.44
Stderr for Avg Annual Vehicle Trips per HH	
All Purposes	16.17
To or From Work	5.71
Shopping	5.49
Other Fam. & Personal Business	7.01
Social and Recreational	4.97
Stderr for Avg Vehicle Trip Length	
All Purposes	0.09
To or From Work	0.16
Shopping	0.11
Other Fam. & Personal Business	0.14
Social and Recreational	0.25

Standard Errors for Table 8
Total Person Trips by Mode of Transportation and Trip Purpose
1995 NPTS
(millions)

Standard Errors				
	Private	Public Transit	Other	Total
Total	**2,390**	**223**	**633**	**2,645**
To or From Work	611	101	124	647
Work Related Business	267	27	67	283
Family and Personal Business	1,509	106	285	1,594
School/Church	467	62	271	576
Social and Recreational	1,007	93	336	1,165
Other	50	5	18	56

Standard Errors for Table 15
Average Vehicle Occupancy for Selected Trip Purposes
(person miles per vehicle mile)

Standard Errors	
To or From Work	0.008
Shopping	0.028
Other Family or Personal Business	0.030
Social and Recreational	0.032
All Purposes	0.013

Standard Errors for Table 16
Households by Availability of Household Vehicle
1995 NPTS
(thousands)

Standard Errors for Households with -	
No Vehicle	213
One Vehicle	400
Two Vehicles	370
Three or More Vehicles	286
ALL	**330**
Vehicles Per Household	.0089

Standard Errors for Table 19
Number of Household Vehicles and Average Vehicle Age by Vehicle Type
1995 NPTS

Standard Errors for Vehicles (000)	
Total	880
Auto	687
Van	273
Sport Utility	258
Pickup	407
Other Truck	75
RV/Motor Home	76
Motorcycle	112
Other	25
Standard Errors for Avg Vehicle Age	
Total	0.042
Auto	0.048
Van	0.109
Sport Utility	0.122
Pickup	0.108
Other Truck	0.945
RV/Motor Home	0.553

Note:

- Standard errors are generated for number of household vehicles and average vehicle age, not on percentage of household vehicles and vehicle age.

Standard Errors for Table 21
Average Annual Miles per Vehicle by Vehicle Age
(Vehicle Owner's Estimate)
1995 NPTS

Standard Errors for Vehicles	
0 to 2 years	224.24
3 to 5 years	153.95
6 to 9 years	155.52
10 or more years	126.54
ALL	**85.83**

Standard Errors for Table 22
Average Annual Miles per Licensed Driver by Driver Age and Gender
(Self Estimate)
1995 NPTS

Driver Age	
Stderr for ALL	
16 to 19	392
20 to 34	213
35 to 54	156
55 to 64	239
65+	158
ALL	**103**
Stderr for Men	
16 to 19	568
20 to 34	335
35 to 54	250
55 to 64	414
65+	268
ALL	**161**
Stderr for Women	
16 to 19	509
20 to 34	208
35 to 54	150
55 to 64	192
65+	122
ALL	**99**

Standard Errors for Table 24
Number of Workers by Usual Mode
1995 NPTS
(thousands)

Mode of Transportation	Stderr
All Modes	**864**
Auto, Truck, Van, or Utility Vehicle	801
Public Transit	204
Other	171

Note:
- Standard errors are generated for number of workers by usual mode, not on percentage of workers by usual mode.

Standard Errors for Table 28
Daily Travel Statistics by Weekday vs Weekend
1995 NPTS

Standard Errors for Daily Travel Statistics	Weekday	Weekend
Vehicle Trips per Driver	0.023	0.031
Daily Work Trips	0.009	0.011
Daily Non-Work Trips	0.013	0.018
VMT per Driver	0.392	0.633
Average Vehicle Trip Length	0.101	0.207
Average Time Spent Driving (in minutes)	0.492	0.780
Person Trips per Person	0.035	0.056
PMT per Person	0.597	1.252
Average Person Trip Length	0.127	0.294

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APPENDIX 6

SEGMENTED TRIPS IN NPTS

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APPENDIX 6

SEGMENTED TRIPS IN NPTS

WHAT

In the 1990 and 1995 NPTS, certain trips were given "segmented" treatment, that is, they were broken into component parts. A trip was given segmented treatment if both of the following conditions occurred:

- there was a change of vehicle or a change of mode on the trip, AND
- one of the modes used was a public transportation mode (bus, subway, elevated rail, commuter train, streetcar or trolley).

WHY

Transportation planners and researchers have a high degree of interest in multi-modal trips, and the data from segmented trips can help in answering questions such as "What access modes are used to get to the bus, subway and commuter train?" or "How does travel time of segmented trips compare with non-segmented?" Certain trips were given segmented treatment in order to get more complete data on multi-modal trips and on the use of public transportation. In earlier NPTS surveys, if more than one mode was used on a trip, the entire trip was considered to be made on the mode that was used for the longest distance. However, this procedure had the effect of undercounting the use of transit. For example, if you walked to the bus stop, took the bus to a subway station, and took the subway to work, the entire trip would have been considered a subway trip (assuming this was the longest segment) and the walk and bus portions would have been ignored.

HOW

If a trip met the two conditions above, it would be given segmented treatment. First, characteristics of the trip as a whole would be collected, such as purpose, number of people on the trip, starting time of the trip, whether it was a home-based trip, etc. Second, each time there was a change of mode (e.g. auto to commuter train) or a change of vehicle (e.g. one bus to another), it would be considered a segment.

Certain information was collected on each segment, namely, the mode used, the starting time of the segment, the length of the segment in minutes and, if the segment was on transit, the waiting time and whether the respondent sat or stood on the segment.

APPENDIX 7

REVISED AVERAGE ANNUAL MILES DRIVEN PER DRIVER

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APPENDIX 7

REVISED AVERAGE ANNUAL MILES DRIVEN PER DRIVER

Why the revision?

Numerous data users had questioned the earlier annual average miles driven because there were per driver declines between 1990 and 1995 in virtually all age/gender categories other than men 65 or older. This seemed incongruous, given the overall strong increase in travel during this time. Upon checking the reasons for the declines in average annual miles per driver, it was discovered that in 1990 only two percent of the drivers reported driving no miles during the year, while this rose to nine percent in 1995. Further, many of the nine percent of 1995 drivers indicated that they actually did drive, either on their assigned Travel Day or as the primary driver of one of the household vehicles which reported mileage. Those drivers that reported not driving but also showed up as having driven, were moved from 'no miles' to 'miles not reported.' After this change was made, only about one and a half percent of all drivers remained in the "no miles category".

What the revised data means

The revised data show modest increases of generally less than ten percent for most age/gender groups. The big exception is the 16-19 year-old group, where miles declined between 1990 and 1995. This may be due to delayed licensing laws and/or higher auto insurance premiums. However, a number of reviewers questioned this decline in teenage driving. The driving reported by this group on their assigned travel day was reviewed and also showed a slight decline. But there was still concern that this decline was a survey affect, not a real decline. A number of other survey attributes were analyzed, including the degree of proxy reporting by teenagers in 1990 and 1995 and whether they were a primary driver of a household vehicle. Nothing conclusive was found. Thus, use the data on 16-19 year-olds with caution.

For men, the most dramatic increases in travel were for those 65 and older. Younger men, namely those 20-54 may finally be reaching saturation in their travel. Women's travel shows a very different pattern, with declines in the youngest group (16-19), consistent increases of 7 to 8 percent for those 20 through 64, and no change in average travel for those 65 and older. Given what we know about older women, it is somewhat surprising that their average driving did not grow. However, perhaps the fact of their increased health and financial status is offset by the more women in this group staying alive longer, keeping their driver's licenses, but not necessarily still driving.

Revised Annual Miles Driven per Driver
by Driver's Age and Gender

	Male			Female		
Age	1990	1995	%change	1990	1995	%change
16-19	9,543	8,206	-14.0%	7,387	6,873	-7.0%
20-34	18,310	17,976	-1.8%	11,174	12,004	+7.4%
35-54	18,871	18,858	0.0%	10,539	11,464	+8.8%
55-64	15,224	15,859	+4.2%	7,211	7,780	+7.9%
65+	9,162	10,304	+12.5%	4,750	4,785	+0.8%
ALL	**16,536**	**16,550**	**0.0%**	**9,528**	**10,142**	**+6.5%**

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