

CHAPTER SEVEN: CHANGES IN TRIP LENGTH

Key Findings

- Average trip lengths have increased as a result of the mix of certain trip purposes increasing in average length, while other purposes remained relatively stable. An increase in tripmaking of trips that are also increasing in length, notably personal business trips, has added to the increase.
- Behavioral patterns associated with rising incomes, possession of vehicles and driver's licenses, and the increase in persons living in large metropolitan areas have boosted trip lengths.
- Work trip lengths have increased in almost all areas and demographic groups. Short work trips have actually declined in number, while trips over 30 miles in length have grown substantially.



Changes in trip length can have unexpected impacts on total travel volumes.

For example, changes in average trip length between 1983 and 1990 had greater impact on total travel demand than population growth.

One of the key factors in changes in travel demand is the very different trip length characteristics of various trip purposes. These purposes have exhibited varying levels of trip length growth in recent years. Figures 34 and 35 identify the trip length growth trends of the major trip purposes as used in the NPTS surveys of 1977, 1983, and 1990. The trip lengths shown are for vehicle trips. The trends indicate an erratic pattern. The group of purposes in Figure 34 shows a tendency toward increasing trip lengths, particularly for work and work-

related purposes. Figure 35 contains the categories that have exhibited greater stability in trip length,

particularly shopping trips, trips to visit friends and relatives, and visits to doctors and dentists.

A common characteristic of many of the more stable trip purposes is that they are made to nearby destinations. Supermarkets, convenience stores, doctors, and dentists are continually striving to minimize their distance from consumers. Surprisingly, other trip purposes that would seem to share that characteristic, notably trips to school and church and personal business trips, have shown increases in average length.

Changes in the overall average trip length are affected by the shifts in length in the component trip purposes that make up the average. The average trip length can also be affected by shifts

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FIGURE 34

**Vehicle Trip Length Trends by Purposes with Increasing Lengths
1977, 1983 & 1990**

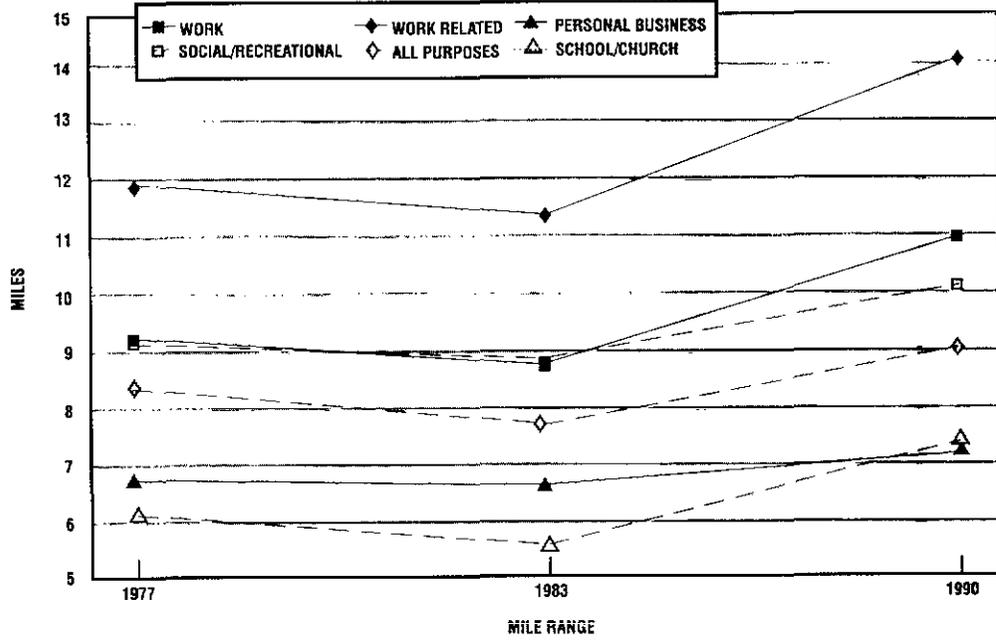


FIGURE 35

**Vehicle Trip Length Trends by Purposes with Stable Lengths
1977, 1983 & 1990**

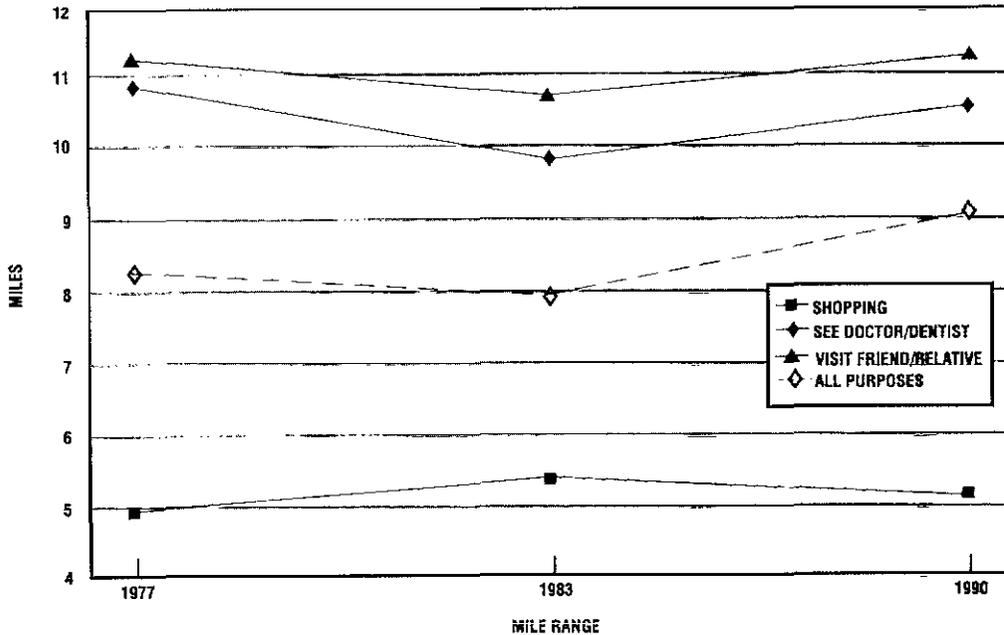
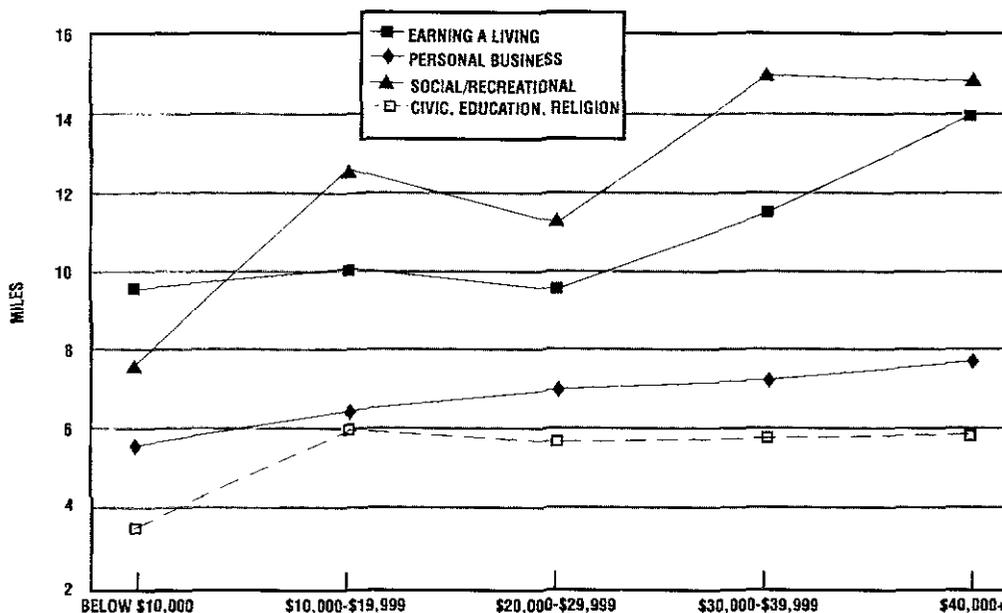


FIGURE 36

**Trip Length Trends by Income by Trip Purpose
1990**



Source: NPTS

in the relative proportions of the mix of trips by purpose. The main shift in the overall trip mix between 1983 and 1990 is the relative increase in trips for personal business purposes. This is also a trip purpose that incurred increases in trip length.

Socio-Economic Factors in Trip Length

A number of factors can affect trip lengths, including, among others, income levels, area size, and location. A number of these have been reviewed from the NPTS and the AHS data sets and examined for their potential contribution to travel demand. To better examine these factors, person trips by all modes will be used for the remainder of this chapter.

Men tend to have greater person trip lengths than women in almost every purpose category, even when the data are controlled for availability of a driver's license. Significantly, women's average trip length in each purpose category is considerably greater for women with driver's licenses. In work trips, women with licenses travel an average of 9.4 miles to work contrasted to 6.1 miles for women without licenses—a 50 percent increase. Similarly,

civic, educational, and religious trips exhibit more than a 50 percent increase. Clearly, the rapid growth in the number of women with driver's licenses has affected the trip length average for all women and the overall growth in passenger miles of travel. Since 1983, women with driver's licenses have increased by almost 11 percent, while the number of men with driver's licenses increased only 6 percent.

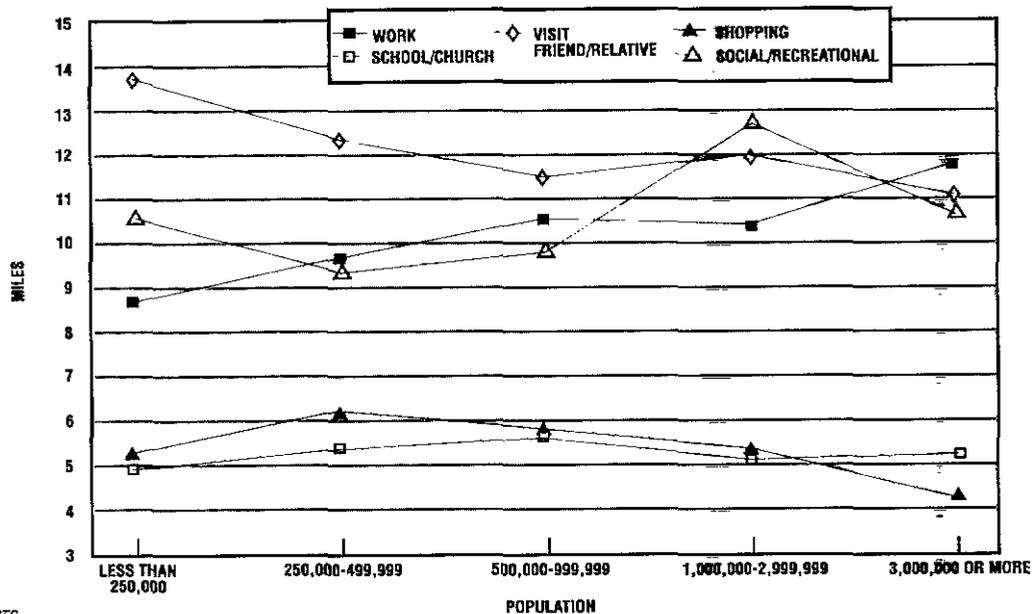
In all purpose categories, average trip lengths rise with increased incomes of households. Other factors associated with income, such as age, residence location, home ownership, and car ownership, could be significant agents of change. All modes have shown roughly similar percentage increases in average length of trips. Figure 36 shows the increases in trip length with increasing household incomes for selected trip purposes. All categories show substantial increases with increasing incomes, with the exception of trips to school and church.

Examination of the effect of area size indicates varying impacts on trip length for most trip purposes, as shown in Figure 37. Shopping, visiting friends and relatives, and social and recreational

Work trips are the major exception—increasing significantly with area size, such that shifts of the population to larger areas might become an important factor in determining work trip length trends.

FIGURE 37

**Trip Length Trends by Population of Place of Residence
NPTS Selected Purposes
1990**



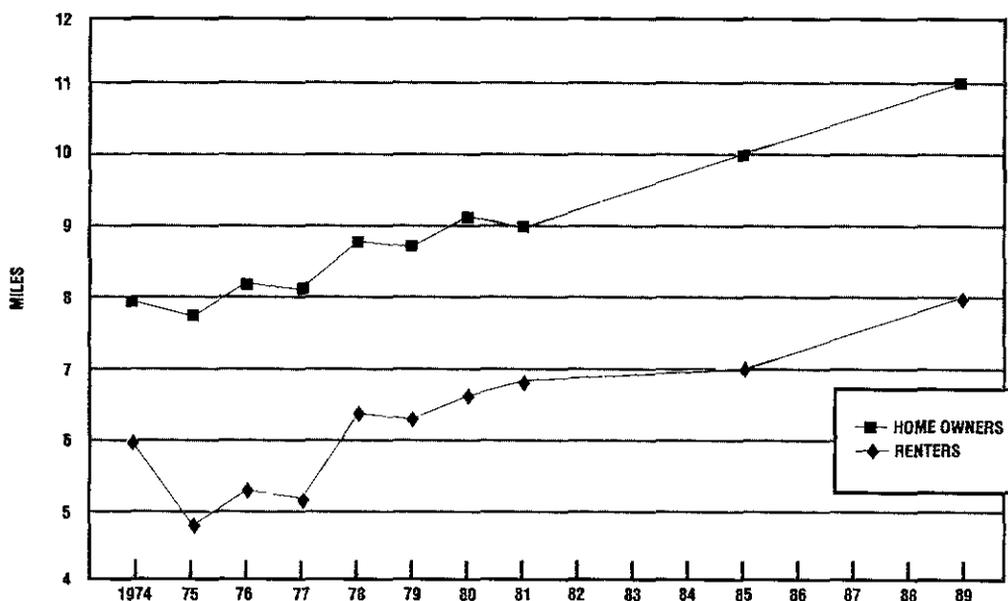
Source: NPTS

travel show little effect. In some cases, for instance shopping, trip lengths actually decrease with increasing area size. Work trips are the major exception—increasing significantly with area size, such that shifts of the population to larger areas might become an important factor in

determining work trip length trends. One factor that may be significant for further consideration is that average trip lengths seem to be shorter in the metropolitan areas over 1 million population with rail transit systems. Again, work trips are the exception to this pattern.

FIGURE 38

**Trip Length to Work
AHS Survey Trends
1974 - 1989**



Source: AHS

Work Trip Lengths

The most significant trip length growth has been in work trips and work-related business activity. Figure 38, drawn from the AHS, shows median trip length growth trends over the last 15 years separately for home owners and renters. Although growth rates can be misinterpreted from this figure because of lack of precision in the data, long-term overall growth in work trip lengths in the period is clear. A number of causal factors involved in these trends are examined here.

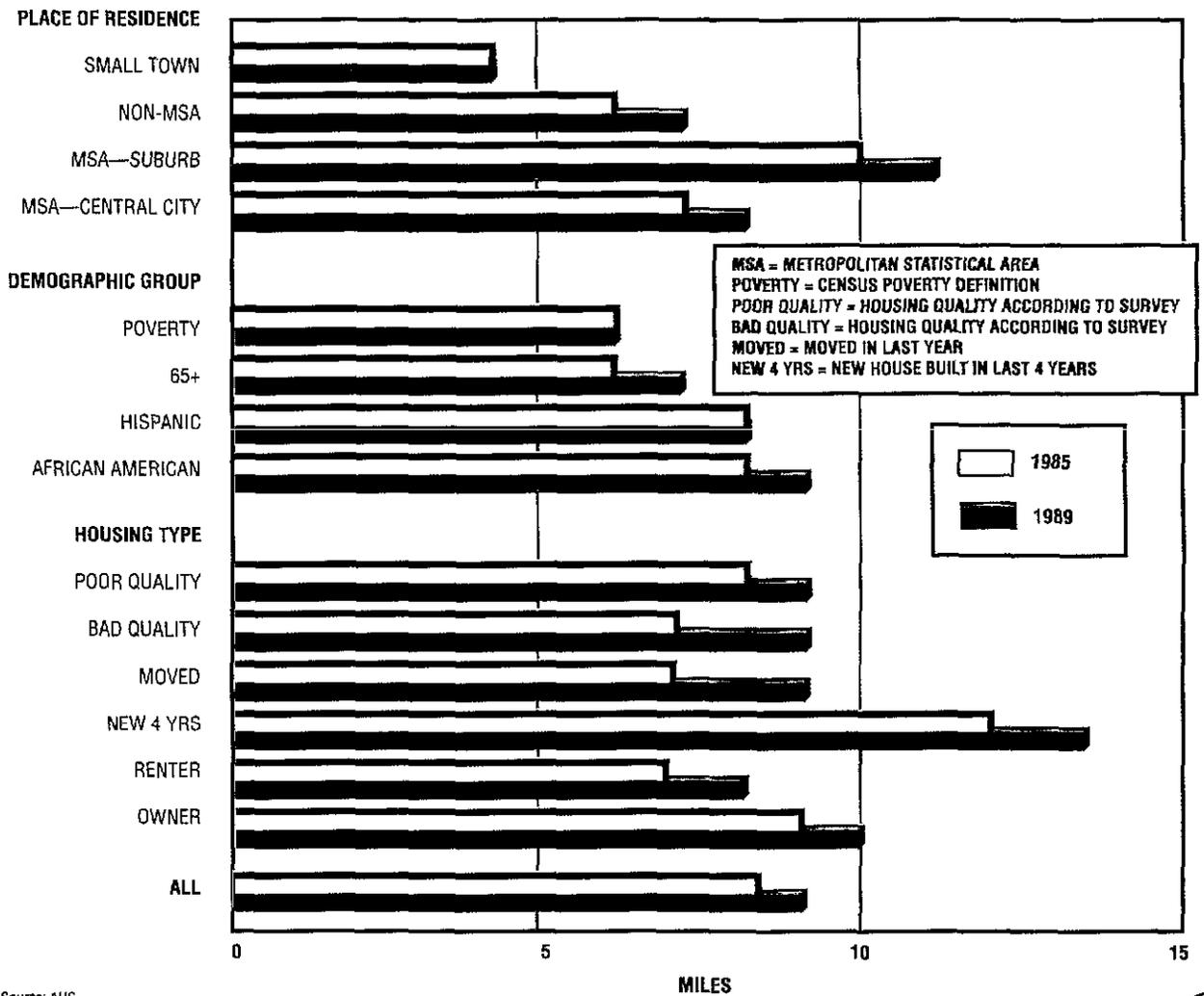
As previously noted, work trip lengths increase with increasing household incomes, with increasing area size, and with possession of a driver's license. Figure 39 shows the median trip lengths for 1985 and 1989 from the AHS for

selected demographic and housing groups. To be noted are almost uniform increases across all groups with few exceptions observed, notably small towns, the poor, and Hispanics. The use of the median, the central item in the distribution, will produce shorter trip lengths than the mean, the arithmetic average. The 1985 AHS gave a median work trip of 8 miles and had a mean (average) of 10.8 miles. Note that NPTS trip lengths are usually expressed as the mean.

Review of more detailed trip length distributions suggests that both central city and suburban trip lengths have shifted toward longer trips. Figure 40, first of all, shows the distribution for work trips by central city and suburban residents in 1989 from the AHS survey. It is clear that suburban work trip lengths are considerably longer than

FIGURE 39

**Median Work Trip Length Trends
Selected Demographic Groups
1985 & 1989**

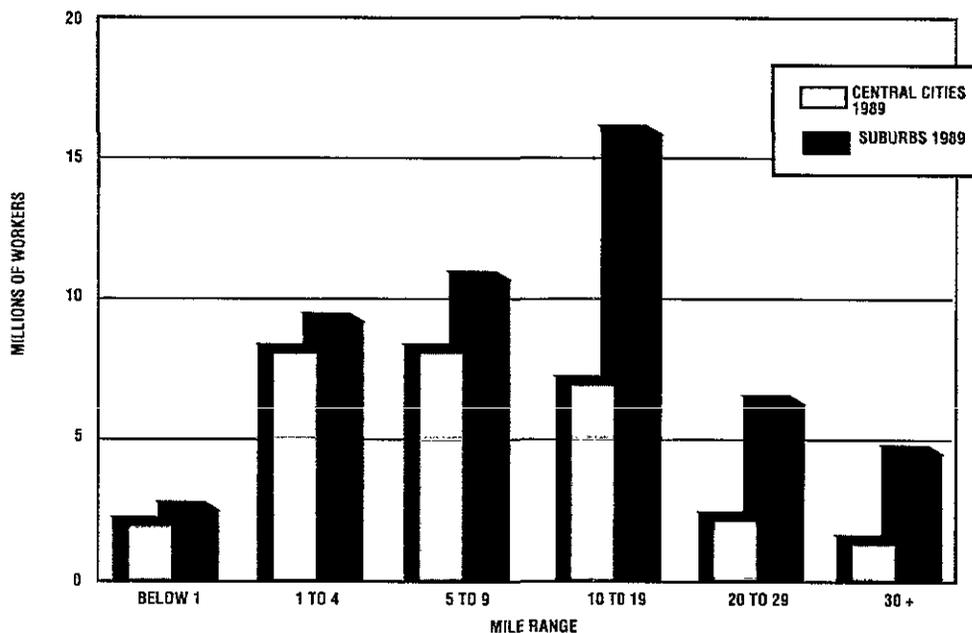


Source: AHS

Suburban trip length growth may suggest that householders are going farther out from the center to obtain lower cost housing and are commuting longer distances to central city or suburban job destinations.

FIGURE 40

**Trip Length Distribution
Central Cities and Suburbs
1989**



Source: AHS

central city trips. Note that these trips are identified by their origins only, i.e., the place of residence of the tripmaker. Figures 41 and 42 show the change in the distributions for both central city and suburban origin work trips from 1985 to 1989. A remarkable amount of change is apparent in these charts for such a short period. In both the central city and suburban cases, trips of 1 to 4 miles in length actually declined in number, trips in the category from 5 to 9 miles grew slightly, and trips of 10 miles or more grew substantially. Trips in the 20 to 30 mile range and

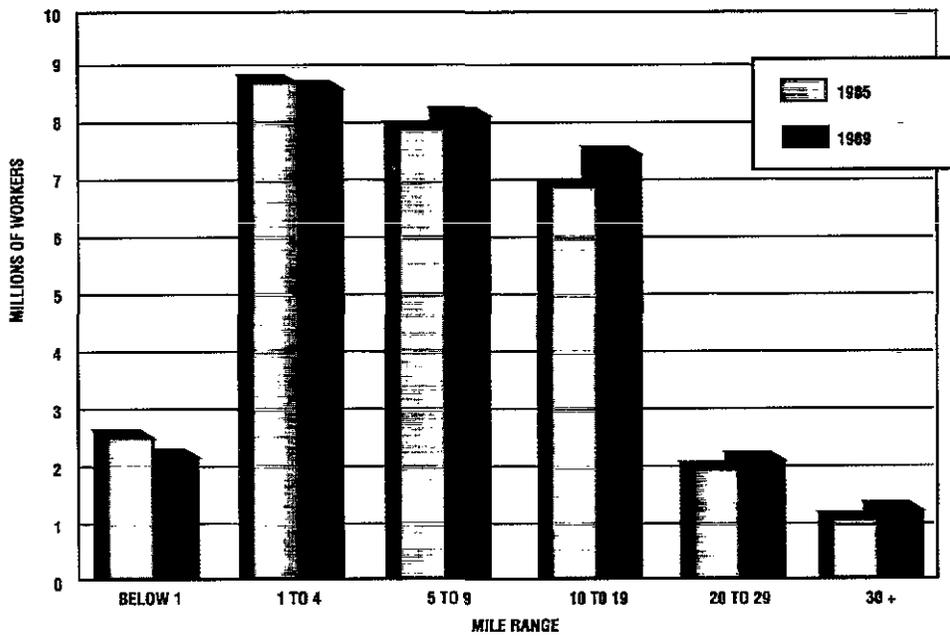
above 30 miles grew in all areas and remarkably so, especially in central cities. Trips over 30 miles in length increased by 16 percent overall and 21 percent in central cities.

The data for central cities seem to suggest a shift in travel orientation away from the city itself. Few cities have boundaries that permit trips of such length entirely within their borders. These must be trips bound for suburban job opportunities or to other adjacent metropolitan areas. Suburban trip length growth may suggest that householders are going farther out from the center to

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on transportation is trip length.*

FIGURE 41

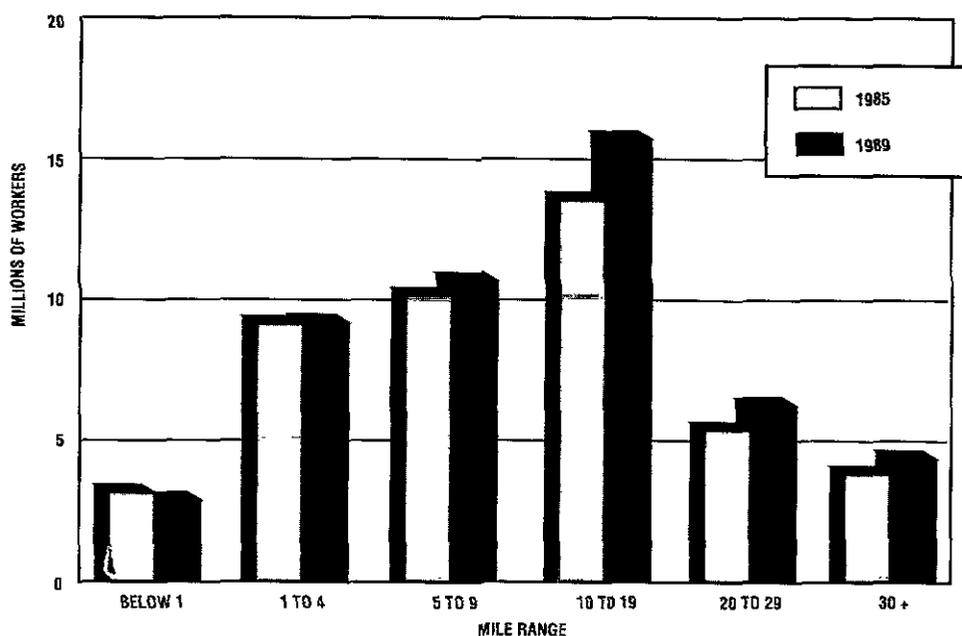
**Trip Length Distribution
Central Cities
1985 & 1989**



Source: AHS

FIGURE 42

**Trip Length Distribution
Suburbs
1985 & 1989**



Source: AHS

obtain lower cost housing and are commuting longer distances to central city or suburban job destinations. Further speculation on the reasons for these increases must await further data development on more detailed trip patterns from NPTS and the Decennial Census.

What is clear is that these data reflect the shifts over recent years of large shares of our jobs and population to the Nation's very large metropolitan areas. In 1990, more than 75 million people lived in areas of 3 million or more as compared to 60 million in 1980, an increase of 25 percent.

Further Work

The subject of trip length will be a major concern in the 1990's. The source material provided by the NPTS must be exhaustively mined to obtain a deeper understanding of trends.

Additional work can assess the effects of larger metropolitan areas, particularly on work and work-related trip lengths. The stability of nonwork trips in regard to length, as a function of destinations adjusting their locations to maintain relatively constant market areas, needs to be further evaluated. The ultimate effect of land use planning on transportation is trip length.

FACTORS IN GROWTH OF PERSONAL TRAVEL

