

## MOBILITY IN AMERICAN LIFE

A Report to Congress

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A mobile society is an open society, where seamless access to diverse economic, social, and cultural marketplaces fosters the opportunities, competition, and choices that fuel the economy and enrich the daily lives of millions. Transportation investment choices contribute to such an open society by increasing access to new activity centers, reducing bottlenecks in existing facilities, and extending mobility to the least advantaged members of society.

By most measures, the United States is the most mobile nation, accommodating over 4 trillion miles of passenger travel and 3.7 trillion ton-miles of freight in the late 1990s. A vast system of transportation infrastructure makes this possible: 4 million miles of road, 580,000 bridges, 350 commercial ports, 5,500 airports. Every day, the U.S. maintains, patrols, and moves goods the length of enough commercially navigable waterways, 25,000 miles if stretched end-to-end, to span the globe.

The United States transportation systems are constantly in flux, adapting to the changing frontiers of the U.S. economy. Once principally geographic and geological, the frontiers of transportation have become increasingly technological, operational, economic, and geo-political. Exhibit 1-1 illustrates some of the many forces that impact US travel patterns.

However, evidence has accumulated that not all segments of U.S. society share in the high quality mobility that most Americans have come to expect. Significant barriers to mobility persist for people with disabilities, elderly people, low-income households, recent immigrants and people of color. The system for distributing goods and services fails to reach into some places where millions of Americans live and work. Without a concentrated effort to address the mobility problems of these groups, and their access to goods and services, the participation and success of these groups in the larger economy will continue to be limited.

As an introduction to the report, the focus of this chapter is to raise the profile of unmet transportation needs in the midst of transportation "plenty." The superlative qualities of the U.S. surface transportation systems are reported throughout the succeeding chapters. While reviewing this it is helpful to keep in mind the groups that have perennially found themselves left behind.

The most commonly discussed problem is the failure of transportation systems to connect under-employed workers who reside in central cities to growing entry level suburban jobs. Also, as a matter of civil rights, transportation is the key for people with disabilities who are denied the same access to opportunities as is available to the majority of Americans. Single-parent households with children have unique logistical challenges for which flexible and sensible transportation options are simply not extended.

Mobility can help cure isolation. All the disadvantaged groups experience a multifaceted isolation from American life. But this isolation is most severe, debilitating, and progressive for senior citizens. As the proportion of Americans who are elderly begins to increase sharply in about 2010, and as expected medical advances increase their longevity along with their capabilities, the senior population is expected to make new demands on the transportation infrastructure. They will prolong their involvement in the mainstream of society and, what is

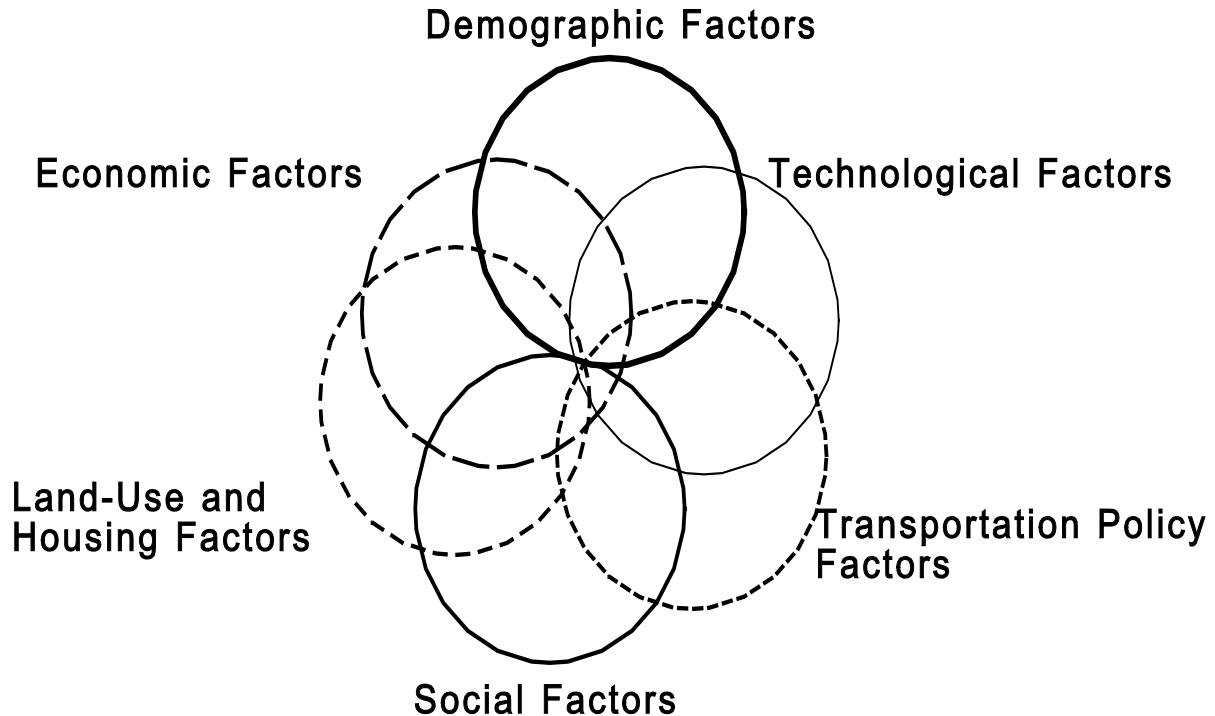
more, they will have the economic power and votes enforce their demands in the infrastructure.

Today's transportation decisions will create the infrastructure for decades to come. In response to new challenges, the Transportation Efficiency Act for the 21<sup>st</sup> Century (TEA-21) calls for new approaches to shaping the U.S. transportation infrastructure to the economy. There is increased emphasis on market principles. For example, local decision-makers will increasingly generate highway financing on the bond markets and manage congestion with High Occupancy Toll (HOT) lanes.

The remainder of this section attempts to describe some of the impacts of economic, social and demographic influences on personal travel behavior. The 1995 Nationwide Personal Transportation Survey (NPTS) is the source of the data for this chapter. This survey provides data to view differences in transportation patterns by income, age, gender and race.

**Exhibit 1-1**

**Factors Affecting U.S. Travel Patterns: Economic, Social, Technological, Land Use and Housing, Demographic, Transportation Policy**



**Measuring Mobility**

Americans are among the most mobile people in the world. The quarter of a century between 1969 and 1995 shows very large increases in travel indicators relative to modest increases in households and population.

Between 1969 and 1995:

- person trips grew by 161 %
- vehicle miles of travel grew by 167%
- household vehicles grew by 143%
- the number of households grew by 58%
- the population grew by 32%.

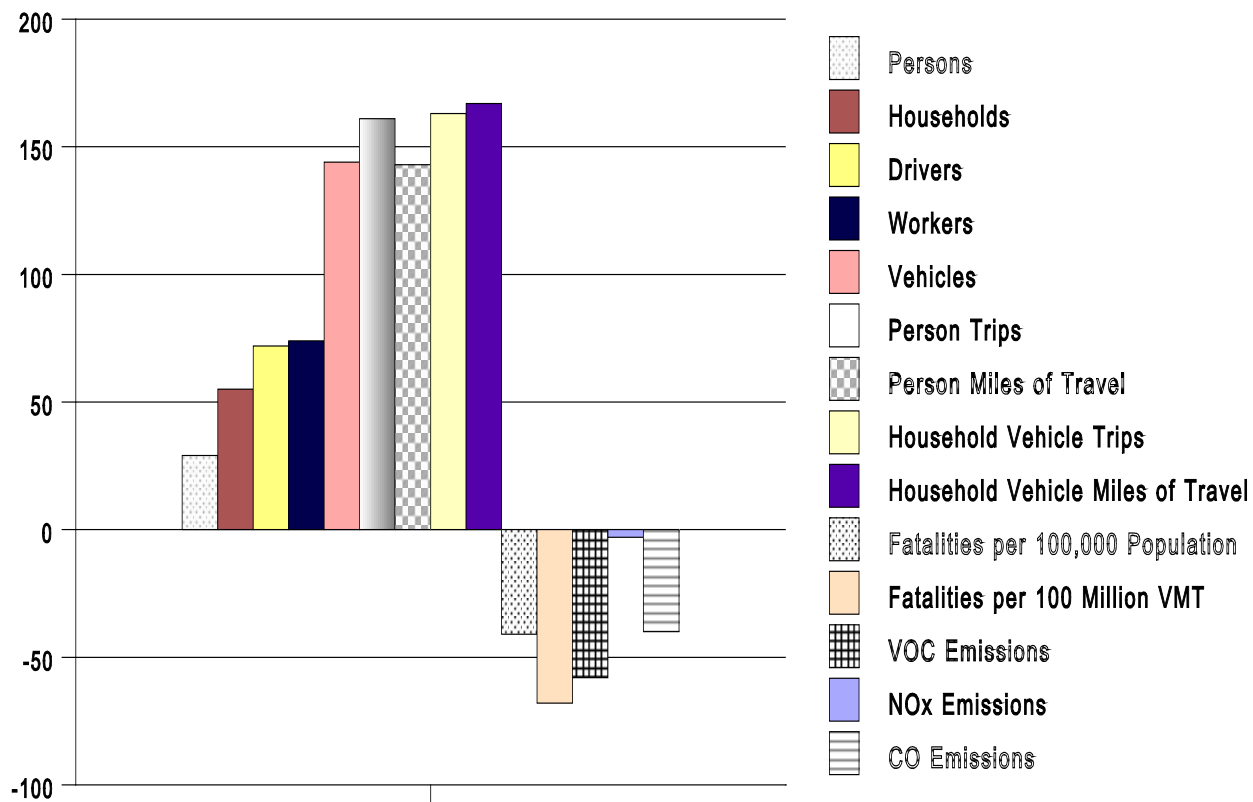
Converting these aggregate trends to the impact on individuals and households, as shown below, reveals a much greater increase in number of daily trips than in miles travelled. This most likely reflects the changes in our society over that time and our need or capacity to get more activities accomplished in any given day.

**Exhibit 1-2  
Measures of Mobility, 1969 and 1995**

	1969	1995
<b>Percent Aged 16+ Licensed to Drive</b>	<b>75%</b>	<b>89%</b>
<b>Percent Living in Households Without a Vehicle</b>	<b>79%</b>	<b>92%</b>
<b>Mean Person Trips per Day</b>	<b>2.2</b>	<b>3.9</b>
<b>Mean Person Miles per Day</b>	<b>21.3</b>	<b>29.3</b>
<b>Mean Vehicle Trips per Day</b>	<b>1.3</b>	<b>2.4</b>
<b>Mean Vehicle Miles per Day</b>	<b>11.8</b>	<b>19.3</b>

Public behavior, governmental policies, and technological advances have accomplished much over the 1969 to 1995 period. Exhibit 1-3 displays key 1995 demographic, travel, safety and air quality indicators indexed to 1969. There were substantial increases in personal travel over this time, yet there were significant decreases in highway fatalities and the most crucial emissions indicators.

**Demographics, Personal Travel, Safety and Air Quality Indexed to 1969**



The increased travel shown above has impacted all economic and demographic groups, however there are still significant differences in the amount of travel performed by various subgroups. The NPTS data tells us that on an average day:

- Women travel 33 percent less than men
- African-Americans travel 24 percent less than Whites
- Hispanics travel 17 percent less than Whites, but 8 percent more than African Americans
- People over 75 travel 64 percent less than people 30-49
- People in households with income under \$25,000 travel 40 percent less than people in households with incomes of \$50,000 or more.

**Exhibit 1-4**

**Average Daily Person Miles by Selected Social and Demographic Characteristics**

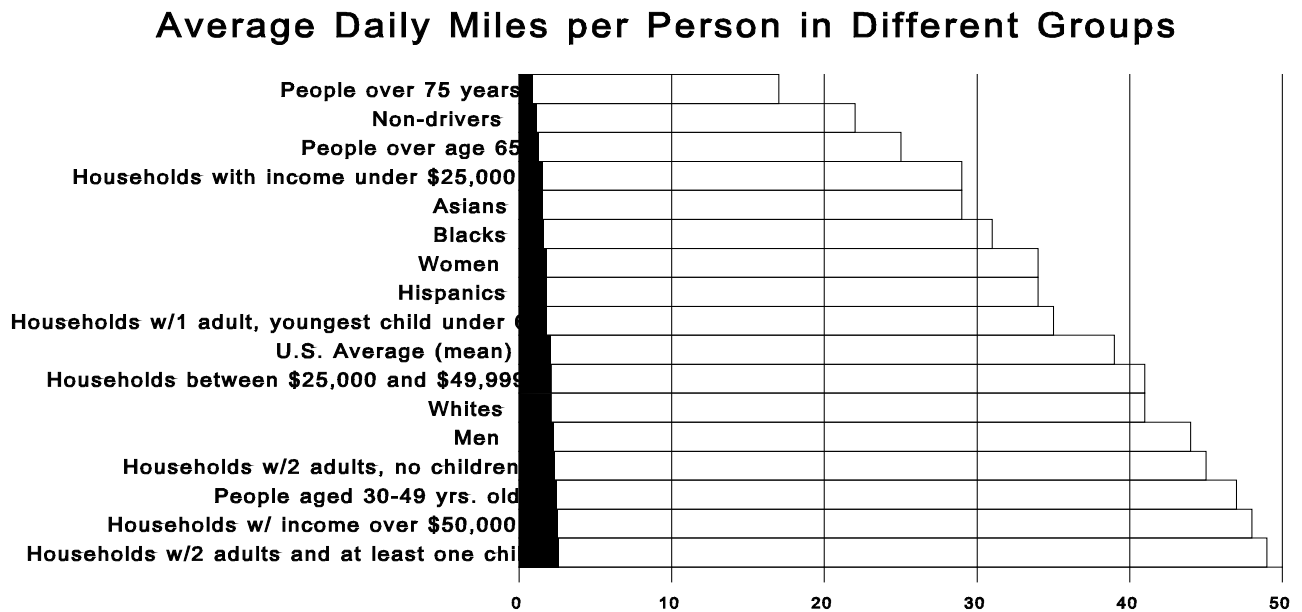


Exhibit 1-4 raises a key question regarding mobility, “Are the differences in average daily person miles a result of choice or lack of transportation options?” Real-world complexities confound the answer to this question. For example, densely developed neighborhoods may have shopping and employment opportunities within short distances of residential areas lowering a person’s daily travel miles. The remainder of this chapter attempts to filter through some of today’s complexities relative to their influence on travel patterns.

## The Role of Income

While serious mobility restrictions exist for many groups, household income appears to be the single, most significant determinant of mobility. All aspects of travel can be linked with income – number of trips, person miles, vehicle miles, and vehicle ownership. Some of the major mobility issues of low-income households include the limitations on their access area, their lower auto ownership and relatively larger share of trips by walk and public transit.

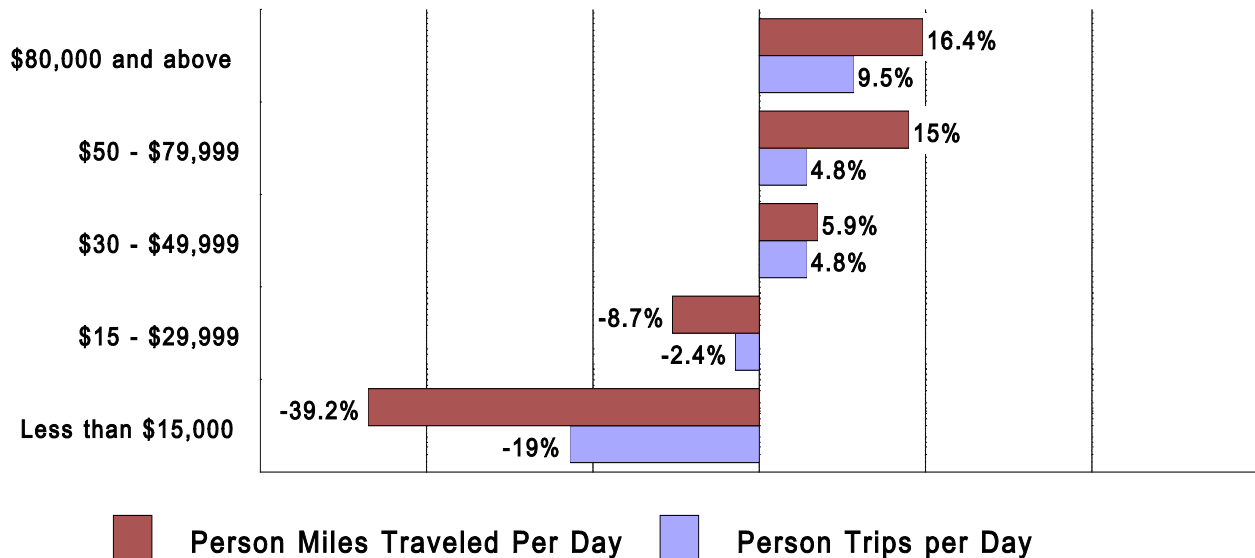
According to 1995 data, individuals in low-income households compared to all other households make 20 percent fewer trips annually (1,340 compared to 1,648) and travel 40 percent fewer miles annually (9,060 compared to 14,924). Income differences are even more dramatic on the household level. VMT per household in low-income households is approximately half that in other households (11,594 miles compared to 23,427).

Exhibit 1-5 provides more details on the income differences based on average daily trips and travel. Households with less than \$15,000 income make 1.2 fewer trips (26 percent lower) than households with incomes of \$80,000 or more. The difference in person miles traveled is even more striking. Low-income households travel 15.9 fewer miles (48 percent less) than high-income households. One reason for these differences, especially the disparity of person miles traveled, is the lower vehicle ownership rates in low-income households.

### Exhibit 1-5

#### Daily Travel per Capita by Household Income Class

## Per Capita Trips and Miles by Income As Percent of U.S. Average



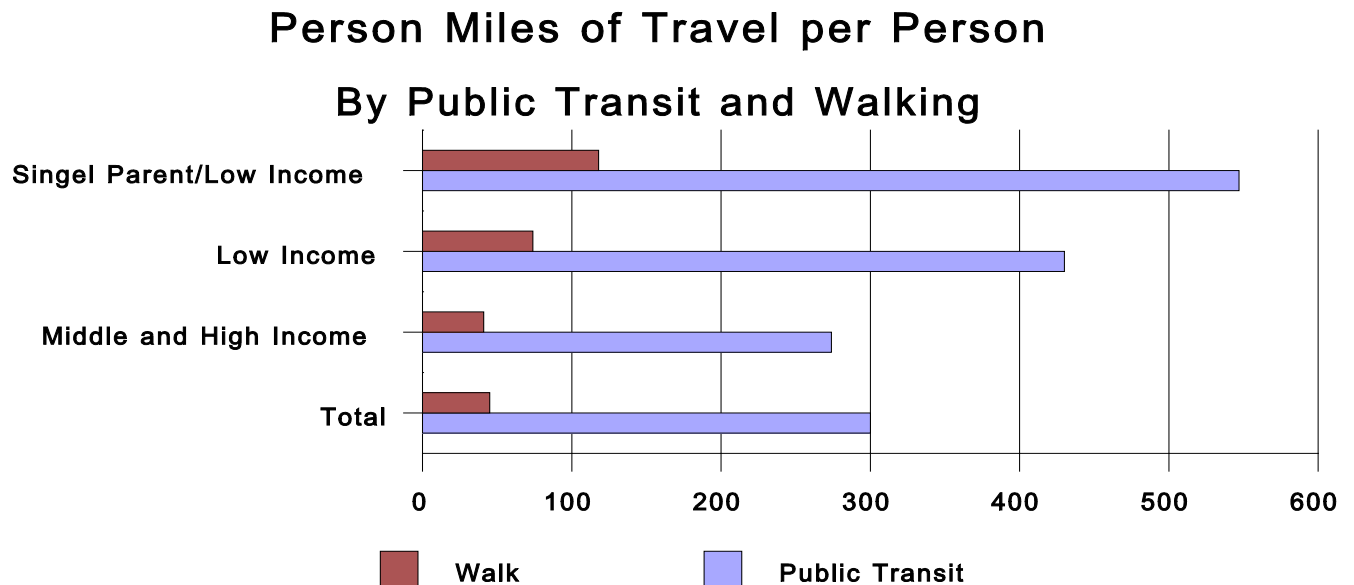
A personal vehicle enables a driver to choose departure time and route. In other words, ownership of a vehicle results in a degree of mobility. However, the high cost of acquiring, registering, insuring and maintaining a vehicle places vehicle ownership out of range for many low-income households. Exhibit 1-6 shows that 26 percent of low-income households do not have a car, compared to 4 percent of other households. Single parent low-income households are even more likely to not own a car (36 percent). In terms of vehicle availability, 0.7 vehicles are available per adult in low-income households compared to over 1 vehicle per adult in other households.

INSERT - Exhibit 1-6 (figure 1 on page 74 of Searching for Solutions)

Without a vehicle many low-income households obtain a level of mobility through trips in vehicles owned by others, walking and mass transit. Approximately 8 percent of trips in low-income households are made in vehicles owned by others compared to 1 percent in other income groups. The incidence of walk trips by low-income households is even more striking. People in low-income households are more than twice as likely to make a walk trip as those in other income groups. Regarding transit use, households with income less than \$15,000 represent 11.7 percent of the population, yet make 27 percent of all transit trips. The 8 percent of households without a vehicle account for 47 percent of all transit trips.

Exhibit 1-7 helps illustrate the link between income and mode choice. The difference in use of walk and transit is especially clear between single parent low-income households compared to middle and high-income households.

**Exhibit 1-7**



Due to the fact that a larger share of trips made in cars owned by others, walking, and public transit, the area in which low-income people travel is geographically confined. For all other households, about 50 percent of their trips are within three miles of home. For low-income, this rises to 60 percent, and for low-income single-parent households, it reaches 66 percent. The difference in the travel radius, or area that one can access, expands geometrically. A 3-mile radius gives you access to 28 square miles, while a 10-mile radius allows access to 300 square miles. The ability to travel more than 3 miles from home opens opportunities for employment and services. For example, when a supermarket closes in a lower-income neighborhood, residents are left with fewer options for basic needs.

Transportation limitations are especially critical for work trips. Even though low-income households are more likely to be without a car, their travel by private vehicles to work is high, 84 percent of work trips compared to 90 percent in other households. Average vehicle occupancy is somewhat higher for workers in low-income households (1.20 vs. 1.14 person miles per vehicle mile).

The growth in employment opportunities in the past two decades has largely been in the suburbs of major metropolitan areas. This points to the “spatial mismatch” of having large groups of low-skilled workers in the inner city or close-in suburbs, while the service jobs they could fill are located in geographically diverse areas of the suburbs or exurbs. In addition, many shifts fall outside of typical 9 to 5 work hours. In summary, transit services and walking may not be able to meet the work trip needs of some low-income households.

## **Role of Age**

The American society is aging rapidly. The median age of America’s population rose from 28 to 34 between 1970 and 1995. One reason for this increase is the proportion of those age 75 and older is increasing. By 2030 the proportion of the population over the age of 75 is projected to rise from 6 percent to 9 percent. The fastest growing segment of the elderly, the population aged 85, over is expected to double (to 7 million) by 2020. Different mobility issues face the elderly because they typically drive less, live in suburban locations, have lower incomes, have health problems and may require special services and facilities.

Exhibit 1-8 shows how annual miles driven decreases as age increases. In addition, the exhibit reveals that annual miles driven by the elderly has steadily increased since 1969. These increases can be linked to the growing number of elderly with driver’s licenses. According to 1995 NPTS data, 55 percent of women and 84 percent of men aged 75 and over have licenses. More importantly, almost 100 percent of men and 90 percent of women who will be over the age of 70 in 2012 are currently licensed drivers. As a result the elderly will be driving more than this cohort did two decades ago.

The increases and projected increases in driving by the elderly pose some serious highway safety issues. Currently, the elderly are second only to teens in their crash involvement rate and have the highest fatality rate of any group on the road. An increasingly mobile elderly population will be sharing the road with non-elderly drivers who will likely be increasingly aggressive in their driving. Intelligent transportation systems technology may offer some solutions to making this

mix of drivers work.

**Exhibit 1-8**  
**Average Annual Miles by Driver Age, 1969- 1995**

	1969	1977	1983	1990	1995
All Ages	8,685	10,006	10,588	13,181	13476
60-64	8,112	8,002	8,568	10,314	11354
65-69	5,850	6,277	6,804	8,347	9054
70+	4,644	4,828	4,348	6,138	6779

Another reason for the increase in annual miles driven by the elderly is the majority older people live in areas where it is necessary to drive for basic daily needs. Those elderly who live in urban centers are more likely to be members of ethnic or racial minorities, and are also more likely to be women living alone and to be poor. In short, the majority of older people age in the places they lived while working. Increasingly these are suburban or rural communities where it is difficult to access services or facilities without a car, and where it has generally been difficult to provide transit services.

Among the elderly, women outnumber men by three to two and are overrepresented among the very old. Given the differences in life expectancies between men and women, it is reasonable to expect that older women are more likely to be widowed and living alone. Between 1970 and 1996, the proportion of elderly women living alone grew from 37 percent to 53 percent. In addition, 25 percent of older women live in households without vehicles compared to 6 percent of older men. As the baby boom ages, the percentage of men with licensed is predicted to remain constant while the percentage of women is predicted to increase, but how this impacts the mobility of elderly women living alone remains to be seen.

Women 75 years and older average only 1.1 vehicle trips a day, compared to 2.2 for men of the same age. The difference in average daily vehicle miles of travel is even more striking, with women 75 years and older driving 5 miles per day, compared to 14 miles per day for men of the same age.

One of the constants of travel behavior is that increased income correlates directly with increased travel. Household income is considered the best predictor of the amount of travel. However, women age 75 and older are the striking exception to the rule. Exhibit 1-9 shows the influence of age, gender and income on daily average person miles traveled. The average person miles per day for men 75+ does increase with income, this relationship does not hold for women.

**Exhibit 1-9**  
**Average Number of Person Miles Traveled per Day**  
**by Age, Sex, and Household Income**

Age	Men			Women		
	Household Income			Household Income		
	<\$15,000	\$15 - \$59,999	\$60,000 +	<\$15,000	\$15 - \$59,999	\$60,000 +
16 - 29	25.6	37.4	37.8	23.6	32.3	36.7
30 - 39	26.4	39.7	42.2	25.4	33.6	37.0
40 - 49	28.9	39.5	43.0	23.9	32.2	37.1
50 - 64	22.3	36.0	39.0	16.6	25.7	28.5
65 - 74	18.5	28.3	30.2	15.2	22.2	26.3
75+	15.4	20.4	21.6	8.8	14.4	11.9
Column Mean	23.7	37.7	40.0	18.8	29.7	34.6
For Entire Population			31.4			

Finally, the cultural composition of the elderly is changing. In 1995, approximately 87 percent of the elderly were white. By the middle of the next century, the Census Bureau predicts that 20 percent of older Americans will be African American and 19 percent will be of races other than African American or White. Over 15 percent will be of Hispanic origin. Travel patterns vary considerably by race and Hispanic status. On average, African Americans and Hispanics make a greater percent of their trips by public transit and walk than their White and non-Hispanic counterparts. These differences are likely due to differences in income, vehicle ownership, and housing location, which will be highlighted later in this chapter.

Meeting the mobility needs of elderly is especially complicated because many may not be able to drive. A 1990 study found that almost one in five men and one in three women older than age 75 required assistance to conduct some of their daily activities, such as bathing, dressing or eating. Between 80 and 90 percent of this kind of personal care, as well as help with household tasks – including transportation – are provided to the elderly by family members, often daughters and daughters-in-law. With the high levels of women working, there is a growing need for elderly service providers, including special transportation services designed to meet their unique needs.

How our multimodal transportation system will meet the mobility needs of our expanding elderly population is a question of growing importance.

### **Role of Gender**

Women's roles have and are continuing to change in all aspects of their lives -- at home, at work, and in society at large. These changes represent the most significant influence on changes in travel behavior over the past quarter century. .

Working mothers make more trips, more often in a car, and covering more miles than at any time in the past 25 years. Dual career households buy services, such as day care, that were formerly conducted in the home. Mothers still serve as the primary 'taxi' service for their children, and as they increase the number of hours worked, women link more and more stops on to the trip to and from work. This phenomenon is called 'trip chaining'. Trip chaining limits the ability to shift commute trips to transit or carpools.

Whereas travel by single adults of both sexes, and by men and women in households without children is rather similar, travel by men and women in households with smaller children is starkly different. Women have always made trips for sustaining the household such as shopping trips and family errands--the increase in women's participation in the labor force has pushed these trips into the non-work time periods. In addition, many employed women with children drop children at school or day-care on the way to work. Therefore, non-work related trips are being chained together between home and work. This trip-chaining behavior is especially prevalent by women in households with children under 5 years of age.

Both men's and women's lives are becoming more complex as we try to balance work and family responsibilities. Women have made great strides and accomplishments in the last twenty years, but remain primarily responsible for family and shopping trips. These responsibilities stem from our attitudes toward how family needs are met. As Martin Wachs stated "travel patterns are among the most clearly 'gendered' aspects of American life." Perhaps with more women completing college, and entering more varied occupations, differences in jobs and salaries between men and women will translate into child care patterns and family responsibilities which are more evenly divided and the gap between men's and women's travel will close somewhat. .

### **Role of Race and Hispanic Status**

African Americans average 1,421 annual trips per person, or 3.9 trips a day, compared to 1,602 annual and 4.4 daily trips for Whites. As compared to Whites, African Americans make six times the number of annual transit trips (95 vs.15) and almost twice the number of annual walk trips (72 vs.131). African Americans make 76 percent of their trips by private vehicle as compared to 88 percent by Whites.

Similar patterns are shown in the comparison of travel by Hispanics and non-Hispanics. Hispanics are twice as likely to use transit as non-Hispanics (48 annual trips vs. 25), and Hispanics make fifty percent more walking trips than non-Hispanics (126 vs. 80). The differences in private vehicle use are slight, with Hispanics making 82 percent of their trips by private vehicle, versus 87 percent for non-Hispanics.

The incidence of households without a vehicle is lower for Hispanics than non-Hispanics, and much lower for African-Americans than the general population. While 14.9 percent of all low-income households (below \$15,000) do not own a vehicle, this increases to 30.4 percent of low-income Hispanic households and 46.5 percent of low-income African-American households.

**Percent of Households without a Vehicle**

All U.S. households without a vehicle .....	8.1 percent
Households with income below \$15,000 .....	14.9 percent
Hispanic households without a vehicle .....	12.2 percent
Hispanic households with income below \$15,000.....	30.4 percent
African-American households without a vehicle.....	24.1 percent
African-American households with income below \$15,000.....	46.5 percent

In terms of travel mode, 44 percent of transit trips are made by African-Americans, although they represent only 12.4 percent of the population.

Differences in travel behavior by race are often ascribed to income differences among racial and ethnic groups. However, even when controlling for income, differences in race reflect differences in travel behavior. Clearly, race, income, and household location are intertwined to form a pattern of travel and mode use. Further research and data analysis may yield information that would allow for more effectively addressing the mobility needs of low-income and minority populations.

**Summary**

Although all elements of the population have increased their mobility over time, many challenges still exist. A transportation system that provides accessibility, efficiency and flexibility must meet mobility challenges through traditional and innovative means.

Transit

There is clearly a larger market for transit that has not yet been tapped. Currently, 84 percent of transit riders are frequent users, i.e., people who use transit two or more times a week. Demand-responsive programs to transport people to subways, trolleys and bus transfer points may increase the scope of people who consider transit as an option. Given the projected growth in the elderly population, customer oriented para-transit designed to meet the needs of older Americans may play a significant role in allowing this group to maintain their mobility.

Land Use and Sustainable Communities

There are a number of initiatives to promote the development of neo-traditional neighborhoods,

which includes a return to higher density and mixed land use neighborhoods in which transit and walking would be viable options. The benefits of such development are found in improved air quality, residents having a full range of viable mode choices, improved health of those who walk and bike, and a greater sense of community.

### Technology

Older Americans need responses that may come from new technology to insure their continued mobility and resolve some of the serious safety issues they present to themselves and others. Highway and vehicle technology can play an integral role in increasing travel times and mitigating the impact of highway congestion.

Some researchers suggest that greater use of telecommunications, such as telecommuting, may decrease work travel, while other researchers claim that Internet use will expand the need for mobility. It is fairly certain that technology has and will continue to change travel patterns, and may result in more home-based trips and more deliveries to the home. More research is needed to help identify the major trends and assess their impact in the changing world of transportation, telecommunications and personal travel.

### Vehicle Ownership

Having an private vehicle increases the range of goods and services available to the traveler by simply expanding the area accessible. In some areas where transit is not available, programs that provide autos may help make work viable for women on welfare. For some urban dwellers, however, an auto may be more of a liability than an asset.