
Section 1

TRENDS AND PROSPECTS

In the next 30 years, the proportion of the population that is elderly will increase dramatically. This rapid growth of the elderly population has brought attention to the increasing need for better transportation choices, especially for elderly people of the future. Most elderly people of the future are projected to be more highly educated, healthier, and enjoying higher incomes than elderly persons of the year 2000.

Tomorrow's older persons are projected to have aged in place in their current suburban or rural communities (which seldom have good public transit service). They are likely to be highly active and to travel more frequently to a wider range of destinations than elderly people of today are. Most older persons will have been automobile drivers all their lives and can be expected to demand high levels of mobility and high-quality transportation services from all travel modes that they use.

At the same time, more older individuals may have unmet travel needs. By the year 2030, there may be a greater number of older persons who have mobility or income limitations than is true today. There may be substantial numbers of frail and poor older women living alone at a low level of independence. Decreasing family ties may lead to a greater focus on non-family sources of travel assistance. Transportation services will need to consider much larger numbers of elderly people from a greater diversity of backgrounds and cultures.

Automobiles currently play a very large part in the travel patterns of older persons; public transit is used for only about 3 percent of trips by seniors. Transit usage among the elderly is closely related to residential location, with older center city residents using transit much more frequently than those residing elsewhere. Transit currently

has problems serving older persons who are in the oldest age groups, have multiple travel options, live outside of central cities, and/or have multiple impairments. The large number of older persons who do not drive and do not use public transportation should be considered potential riders for new or improved transit services; such services could help older persons continue

to live independently in their own homes for longer periods of time, thus benefiting both the older persons and society as well.

The combination of these factors is expected to pose substantial challenges for public transportation providers who wish to capture a significant proportion of the trips of tomorrow's older persons.

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DEMOGRAPHIC PROJECTIONS REGARDING OLDER PERSONS

Although the “graying of America” is an accepted phenomenon, some of the causes, repercussions, and characteristics of this trend are less well known. The number of people who are “elderly,” “older,” or “seniors”—all taken to mean 65 years of age or older in this report—is larger than ever before and is still growing. Older persons are living longer than previously. At the same time, birth rates are declining, leading to overall increases in the average age of the U.S. population and in the proportion of the population that is elderly. Characteristics of the older population such as numerical and geographic distributions, income distribution, health status, activity patterns, family structure, and retirement status are all changing.

All these characteristics need to be understood for a clear picture of the probable mobility needs of older persons in the future.

Public transit operators must understand these probable mobility needs if they wish to serve a significant portion of the future travel needs of older persons. This chapter discusses the key characteristics of the older population; the next two chapters discuss current and future travel trends.

POPULATION CHANGES AMONG THE ELDERLY¹

Number of Older Persons

The number of older persons is projected to grow dramatically, as shown in Table 1.

¹ Readers interested in up-to-date information should consult the statistics Web page of the Administration on Aging at www.aoa.dhhs.gov/aoa/STATS/profile.

Table 1
Population Projections for People
Age 65 and Older

	1995		2030	
	<i>Number of People</i>	<i>Percent of Population</i>	<i>Number of People</i>	<i>Percent of Population</i>
65+ years	33.7 million	12.8%	70.2 million	20.4%
75+ years	14.7 million	6.4%	32.2 million	12.2%
85+ years	3.6 million	1.6%	8.8 million	2.5%

Source: U.S. Bureau of the Census, 1996.

According to the Census Bureau, 34.4 million people 65 years of age and older constituted 12.7 percent of the total U.S. population in 1998. People 65 years of age and older made up 13 percent of the population in the year 2000, a figure that will rise to 18 percent by 2020 (U.S. Bureau of the Census, 2000a). By 2030, seniors are projected to constitute 70 million out of a total population of 350 million people, or 20 percent (AoA, 2001). By 2050, people age 65 and older are projected to be 80 million out of 392 million people (20.4 percent). (Thus, although the elderly population is projected to be larger numerically in 2050, it will constitute about the same percentage of the total population in 2050 as it did in 2030.)

Although one in five persons will be age 65 and older in the United States in 2030, one in four persons will be at least that old in most European countries and Japan. In 2050, more than one-third of the population of many European countries will be age 65 and older (OECD, 2001).

Age Distribution

The number of people age 75 and older is projected to increase from 14.7 million people in 1995 to 32.2 million in 2030, and those age 85 and older are projected to increase from 3.6 million in 1995 to

8.8 million in the year 2030. The largest increases in the number of people who are over the ages of 75 and 85 will come after 2030 and before 2050. The 14.7 million people age 75 and older in 1995 are projected to increase to 45.5 million in 2050, and the 3.6 million people age 85 and older in 1995 are projected to increase to 18.9 million in 2050. By 2050, nearly 20 percent of the population will be 75 years of age or older. (The official year 2000 Census reported that there were 51,310 people in the United States 100 years old or older [U.S. Bureau of the Census, 2001a].)

In terms of numbers, the fastest-growing demographic group in the United States is people 85 years of age and older; this group's numbers are expected to double between 2000 and 2005. The 75-and-over age group will show the greatest increase in terms of its proportion of the overall U.S. population. Between 1995 and 2050, the number of people age 65 and over is projected to more than double, the number of people age 75 and over is projected to triple, and the number of people age 85 and over is projected to quintuple.

Proportion of the Population That Is Older

There will also be a dramatic increase in the percentages of the total population

that these older age groups constitute. The overall aging of our society will be seen in much higher proportions of older persons: those over age 65 will increase in number from about 13 percent in 1995 to more than 20 percent of the total population in 2030 (U.S. Bureau of the Census, 1996; AoA, 1999). From 1995 to 2050, the proportion of people age 65 and older will increase by 60 percent, the proportion of people age 75 and older will almost triple, and the proportion of those age 85 and over will triple. The most significant increase is expected between 2010 and 2030, when the “baby boom” generation reaches age 65.

The anticipated population changes are summarized in Table 1. Similar changes or even greater changes are expected in Europe and in other parts of the world. (For example, see Metz, 2000, p. 149.)

Changes over Time

The elderly population will increase only gradually until 2010, after which it will rise substantially as the baby boom generation begins to reach age 65. Until then, increases will be tempered by the relatively small number of children born during the Depression years of the 1930s. This interim period provides an important opportunity to begin developing policies and programs to serve the needs of this expanding population. In the meantime, the fastest growing age cohort will continue to be the small but increasing number of people age 85 and above. This has important policy and program implications because both driving and the use of regular public transit fall dramatically at or above age 85, and the prevalence of disabilities increases substantially for this group. This points strongly to the need for another mobility option for those people age 85 and over,

an option that differs from driving and from current public mass transit services.

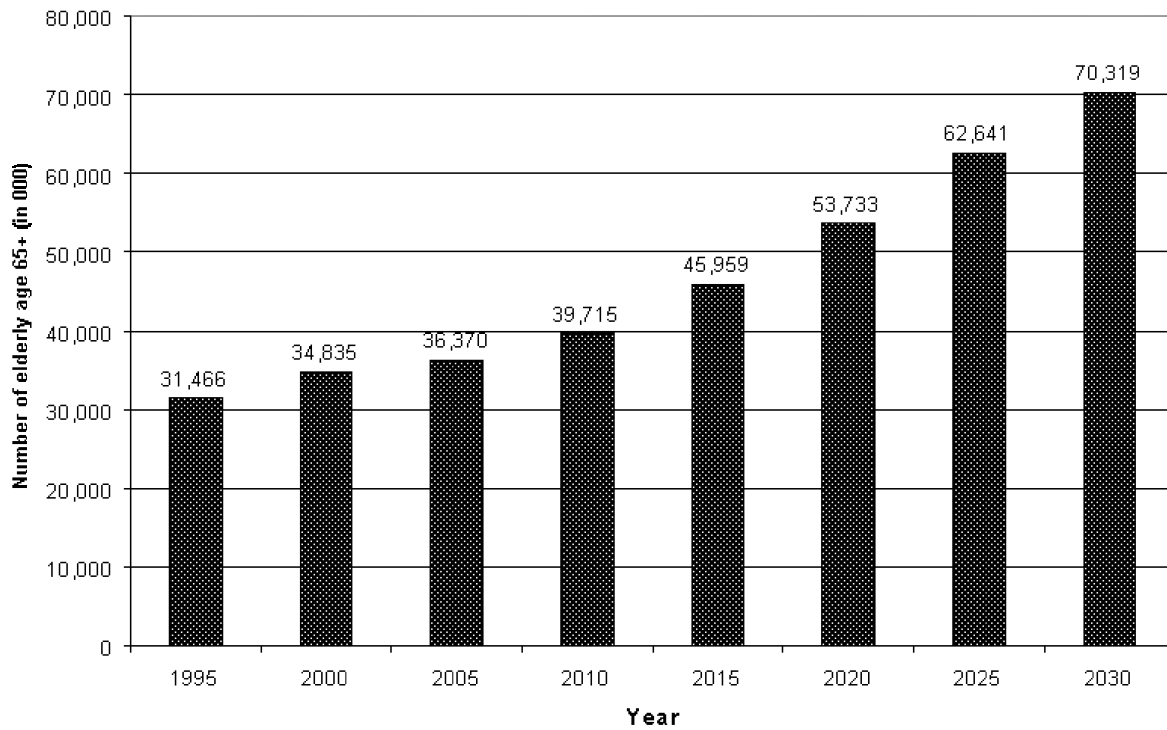
From 2000 to 2020, the U.S. population age 65 and above will increase by more than 54 percent, rising from nearly 35 million people in the year 2000 to almost 54 million in 2020, as the leading edge of the baby boom enters the ranks of the elderly. Figure 1 shows that this pattern will only accelerate in later years, with the elderly population increasing to more than 70 million by the year 2030.

Gender Differences

Women tend to live longer than men, and they make up almost 60 percent of all persons 65 and older. There are approximately 143 elderly women to every 100 elderly men. In the group of elderly 85 years and older, the ratio swells to 241 women to every 100 men. Almost half of all older women in 1998 were widows (45%), with four times as many widows (8.4 million) as widowers (2.0 million). Older women have a higher poverty rate than older men, 12.8 percent versus 7.2 percent in 1998. The U.S. Census Bureau projects that these patterns will continue, at least in the near term.

Older women are more likely than older men to be living alone, to be frail, and to have low incomes (AoA, 2001). Whereas men age 65 and older can expect to spend an average of two-thirds of their remaining years independently, the proportion is much lower for women (Katz et al., 1983). All these factors have transportation implications. Seniors who live with a spouse or significant other are much more likely to be independently providing their own transportation; older men are much more likely to be married than are older women, who are more likely to be living alone.

Figure 1
Growth in the Number of People Age 65+, 2000–2030



Source: U.S. Bureau of the Census, 2000a.

Life Expectancy

Average life expectancy has been increasing for more than 100 years. For the year 2000, life expectancy at birth is 74.1 years for men and 79.5 years for women (Minino and Smith, 2001). In about 50 years, males will be expected to live 77.2 years and females about 82.7 years (Old Age and Survivors Board, 1997).

GEOGRAPHIC DISTRIBUTION OF CHANGES

Regional Differences

In 1999, just over one-half (52 percent) of all persons age 65 and older lived in nine

states. California led the list with 3.6 million older persons; Florida, New York, and Texas had more than 2 million seniors apiece, and Pennsylvania had nearly 2 million seniors. Other states with more than 1 million seniors included Illinois, Michigan, New Jersey, and Ohio. The distribution of the population is shown in Table 2.

Changes in the percentage of the population that is elderly between 1995 and the year 2020 also will vary considerably from one part of the country to another. Figure 2 shows that increases will be greatest in the West and South and lowest in the Northeast and Midwest. Individual states within these regions show considerable variation as well in the size of their elderly populations now and will continue to do so in the future. In the year 2000, Alaska,

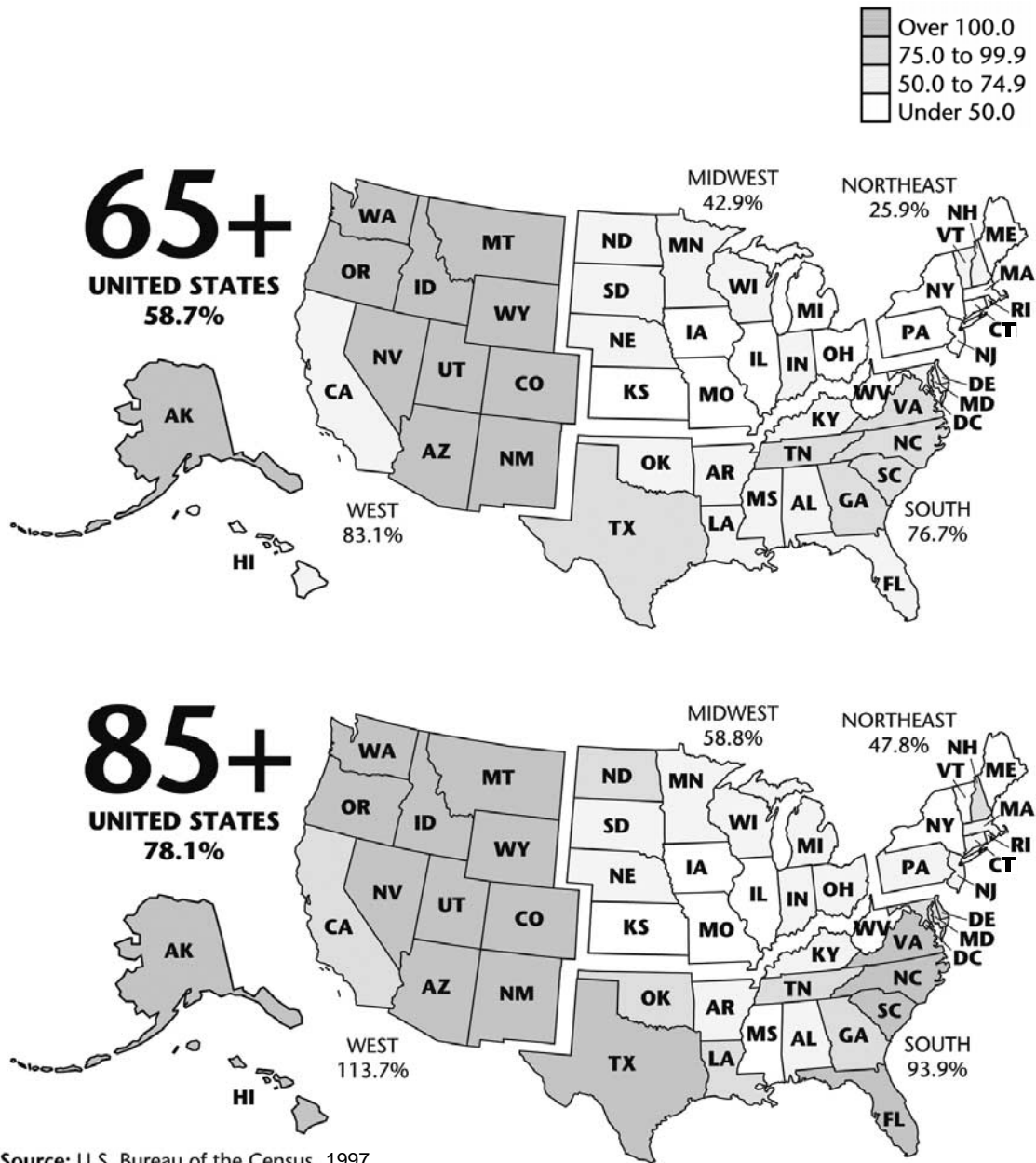
Table 2
Resident Population Age 65 and Older, by State, 2000

<i>Alphabetically</i>	<i>Number of People</i>	<i>Percent</i>	<i>Ranked by Percentage</i>	<i>Percent</i>
UNITED STATES	34,540,025	12.7		
ALABAMA	567,952	13.1	FLORIDA	18.1
ALASKA	34,750	5.6	PENNSYLVANIA	15.8
ARIZONA	628,633	13.2	WEST VIRGINIA	15.1
ARKANSAS	361,342	14.2	IOWA	14.9
CALIFORNIA	3,647,532	11.0	NORTH DAKOTA	14.6
COLORADO	407,773	10.1	RHODE ISLAND	14.6
CONNECTICUT	468,576	14.3	SOUTH DAKOTA	14.4
DELAWARE	98,135	13.0	CONNECTICUT	14.3
DISTRICT OF COLUMBIA	72,102	13.9	ARKANSAS	14.2
FLORIDA	2,741,849	18.1	MAINE	14.0
GEORGIA	761,143	9.8	DISTRICT OF COLUMBIA	13.9
HAWAII	161,889	13.7	MASSACHUSETTS	13.9
IDAHO	142,029	11.3	HAWAII	13.7
ILLINOIS	1,496,177	12.3	NEBRASKA	13.7
INDIANA	743,020	12.5	MISSOURI	13.6
IOWA	428,487	14.9	NEW JERSEY	13.6
KANSAS	354,079	13.3	NEW YORK	13.4
KENTUCKY	493,154	12.5	OKLAHOMA	13.4
LOUISIANA	501,458	11.5	KANSAS	13.3
MAINE	175,357	14.0	MONTANA	13.3
MARYLAND	596,961	11.5	OHIO	13.3
MASSACHUSETTS	859,731	13.9	ARIZONA	13.2
MICHIGAN	1,223,560	12.4	WISCONSIN	13.2
MINNESOTA	585,394	12.3	ALABAMA	13.1
MISSISSIPPI	335,492	12.1	OREGON	13.1
MISSOURI	745,684	13.6	DELAWARE	13.0
MONTANA	117,239	13.3	INDIANA	12.5
NEBRASKA	228,286	13.7	KENTUCKY	12.5
NEVADA	207,412	11.5	NORTH CAROLINA	12.5
NEW HAMPSHIRE	144,585	12.0	MICHIGAN	12.4
NEW JERSEY	1,108,257	13.6	TENNESSEE	12.4
NEW MEXICO	199,974	11.5	ILLINOIS	12.3
NEW YORK	2,429,632	13.4	MINNESOTA	12.3
NORTH CAROLINA	954,866	12.5	VERMONT	12.3
NORTH DAKOTA	92,383	14.6	SOUTH CAROLINA	12.2
OHIO	1,501,136	13.3	MISSISSIPPI	12.1
OKLAHOMA	448,698	13.4	NEW HAMPSHIRE	12.0
OREGON	435,099	13.1	WYOMING	11.6
PENNSYLVANIA	1,898,936	15.8	LOUISIANA	11.5
RHODE ISLAND	154,348	14.6	MARYLAND	11.5
SOUTH CAROLINA	473,371	12.2	NEVADA	11.5
SOUTH DAKOTA	105,442	14.4	NEW MEXICO	11.5
TENNESSEE	680,954	12.4	WASHINGTON	11.4
TEXAS	2,016,497	10.1	IDAHO	11.3
UTAH	185,603	8.7	VIRGINIA	11.3
VERMONT	72,916	12.3	CALIFORNIA	11.0
VIRGINIA	774,885	11.3	COLORADO	10.1
WASHINGTON	657,312	11.4	TEXAS	10.1
WEST VIRGINIA	272,896	15.1	GEORGIA	9.8
WISCONSIN	691,409	13.2	UTAH	8.7
WYOMING	55,630	11.6	ALASKA	5.6

Source: U.S. Bureau of the Census, 2000b.

Figure 2

Percentage Increase of the Elderly and Oldest Old Populations: 1995 to 2020



Georgia, Texas, and Utah had the lowest percentages of population age 65 and above—from 6 to 10 percent—whereas Florida, Pennsylvania, and West Virginia had the highest—from 16 to 18 percent. By 2020, all the western states except California are expected to more than double their elderly population, whereas

a substantial number of states in the South are expected to increase their elderly population by three-quarters or more.

Aging in Place

Many people grow older in the communities where they spent their “middle-aged” years,

thus giving rise to the concept of “aging in place.” No official definition exists for aging in place, but many people agree on several key components: living where one has lived many years, living in a private home or an apartment outside of a health care environment, and taking advantage of products and services to allow independence in the face of changing circumstances without a change in residence. Aging in place is often seen as a positive development. Currently, there are a number of resources aimed at helping seniors successfully age in place, from home remodeling programs to arranging for outside assistance when necessary.

According to M. Powell Lawton, a leading expert on housing for the elderly, “only about 7 percent of the elderly move to any kind of organized retirement community” (Starr, 1998). That means that a sizable number of the other 93 percent are staying in the communities where they have lived most of their lives. According to *Senior Resource* (2000), 70 percent of seniors spend the rest of their lives in the place where they celebrated their 65th birthday (Starr, 1998). A newly released study for Baltimore found that 90 percent of the region’s seniors expected to remain in their current residence for the foreseeable future (KETRON, 1999).

A 1992 survey by the American Association of Retired Persons (AARP) showed that 27 percent of older persons live in neighborhoods where more than 50 percent of the residents are over age 60 (Lansperly, 1995). These neighborhoods are being called “naturally occurring retirement communities” (NORCs), a term coined by University of Wisconsin professor Michael Hunt in the 1980s. Essentially, a NORC is an assisted-living community without formal assistance programs. Although

located primarily in urban areas, NORCs can be found in all areas of the country. There are no common characteristics of NORCs, and the people who inhabit them are equally diverse. The unplanned and spontaneous nature of a NORC can make it difficult for a community to plan for and meet its needs (Lansperly, 1995). For example, a rural NORC in Iowa (or one in another Great Plains state) may be as many as 100 miles from the nearest hospital and 40 miles from the nearest ambulance. The cost of transportation to and from health care facilities could overtax a community’s Medicare and Medicaid funds, which in many cases are already stretched very thin.

Some areas are making efforts to address the problem of providing health care to NORCs. *House Bill 942*, introduced to the Missouri State House in 1999 (Missouri House of Representatives, 1999), would have authorized an Aging in Place Pilot Program. This program would have delivered in-home, comprehensive health care services to elderly persons in order to reduce the need for relocating them. The bill would also have authorized the Division of Aging to apply for any federal waivers necessary for providing Medicaid reimbursement. At this point, this bill is not currently on the legislative calendar.

In Australia, the Ex-Service Organizations, major providers of in-home care to elderly war veterans and war widows, are looking for ways to address the health care needs of elderly clients who wish to age in place. The Ex-Service community wants a flexible and individualized array of services including transportation, equipment, respite, housing, personal care, home support, therapy services, and social support. The Ex-Service Organizations are investigating new approaches to service delivery, project management, and coordination with other

providers, in an effort to establish a community health network and provide in-home health services to members of the Ex-Service Community (Australia Department of Veterans Affairs, 1998).

The baby boomers (people born between 1946 and 1964) now inhabiting the suburbs are likely to remain there, placing different demands on transportation and service systems as senior citizens than they did as young parents with children. Homes with multiple levels separated by stairs that were suitable for younger people's physical abilities could become untenable for many people as they age; subdivisions built miles from services such as stores, pharmacies, and health facilities will be difficult to access for many older persons. Seniors living in many rural locations face cutbacks in the local availability of health services as well as a continuing loss of younger people who seek jobs elsewhere. These trends are already resulting in longer trips for health care and other services and fewer available non-driving transportation alternatives (such as rides with adult children).

INCREASING DIVERSITY

Dispersion of Characteristics

Older persons are a heterogeneous group, and their heterogeneity is expected to increase as their population grows. As described in the pages that follow, there are wide differences in education, health, income, activity, creativity, and levels of independence among the elderly. Many older persons are quite capable of caring for themselves; others need substantial assistance. In the future, the number of

elderly persons from minority groups will rise significantly. (See the section on cultural diversity.) Chronological age will become less significant, as more 85-year-olds will have functional abilities that are greater than some people in their 70s. (See the section on health status.)

The age cohort approaching retirement over the next 20 years brings additional diversity to the travel patterns and mobility requirements expected in the future. In addition, recent research shows that mobility and other functional limitation rates among the elderly are actually declining, even as the size of this population, especially those over age 85, is growing. (See the section on health status.) Furthermore, this trend is increasing, suggesting that future patterns and requirements may vary considerably from what is currently the case.

Cultural Diversity

Changes in the size and composition of the elderly population reflect more than the aging of the baby boom era cohort. Much of the increase in numbers of the older population will be among members of minority groups, especially those of Hispanic origin, a group with relatively high public transportation use. As Table 3 shows, growth in the Hispanic elderly population is not only much higher than that of the White and Black cohorts that constitute the aging baby boom generation, but it also follows a much different pattern. Between 2000 and 2020, the Hispanic population age 65 and over will increase by 147 percent, from 1.9 to 4.8 million people.

The problems associated with poverty, health, and longevity combine to make transportation a more pressing issue for

Table 3
**Percentage Increase in the Elderly Population,
by Race and Hispanic Origin, 2000–2030**

Year	Total 65+ Population (%)	White, Non-Hispanic (%)	Black, Non-Hispanic (%)	Hispanic (%)	Other (%)
2000-2005	4.4	2.0	8.1	24.5	25.6
2005-2010	9.2	7.1	12.0	23.4	24.8
2010-2015	15.7	13.7	20.2	26.1	26.9
2015-2020	16.9	14.6	23.8	27.4	25.2
2020-2025	16.6	14.2	23.1	27.6	22.6
2025-2030	12.3	9.5	17.3	25.4	19.6

Source: U.S. Bureau of the Census, 2000a.

minority older persons. The poverty rate is much higher for older persons belonging to a minority group. “The highest poverty rates [among older people] were experienced [in 2000] by older Hispanic women who lived alone or with non-relatives” (AoA, 2001).

Also, elderly Blacks are said to be nearly four times as likely to report using specialized transportation services as older Whites (Netzer et al., 1997).

In 1998, 8.9 percent of elderly Whites were poor, whereas 26.4 percent of elderly Blacks and 21 percent of elderly Hispanics were poor. The highest poverty rate (49.3 percent) was among older Black women living alone (AoA, 1999).

Black elderly men and women can expect to live, on average, 2 years fewer than their White counterparts. High series projections put this number closer to 4 years. Hispanic elderly men and women can expect to live 2 years longer than their White counterparts, according to the Census projections. This projected longevity, along with the continued growth of the Hispanic community, will lead

to substantial growth in the number of Hispanic elderly. According to Census projections, the Hispanic elderly, who constituted 5 percent of the elderly population in 2000, will constitute 17.5 percent of the elderly population by 2050.

As noted by Rosenbloom,

The 1990 *Nationwide Personal Transportation Survey* (NPTS) indicated substantial variations in the trip-making behavior of older persons from different racial and ethnic groups, even when controlling for income. We are still grappling with the causes of these differences: some reflect historical income patterns, some voluntary or involuntary residential segregation, and still others may represent ethnic and racial differences in attitudes, preferences, culture, and family beliefs about travel. (Rosenbloom, 1999)

The real issue here may be one of culture and not minority status. Unfortunately, most available data are on racial or ethnic distinctions, not on culture. In 1976, Wachs et al. found that “the lifestyle patterns and travel behavior of the elderly were closely related, and that the travel behavior and needs of the elderly varied considerably with

location in Los Angeles County” (Wachs et al., 1976). They also found that “propinquity and financial security dimensions were most strongly and consistently related to the travel data . . . and that the spatial patterns of the elderly can be expected to change over time in parallel with those of the general population.” When suburban areas become more culturally diverse, will their travel patterns more closely reflect the travel patterns of culturally diverse center cities or culturally homogeneous suburbs? Although Wachs et al. seemed to say that lifestyle (as determined by factors such as financial security) had a greater influence on travel patterns than culture, a definitive answer appears still to be lacking.

Income Distribution

Income distribution is more uneven among the elderly than among other age groups. Although many older persons experience substantial declines in income as a result of retirement, many own their homes outright (thus making no monthly mortgage payments) and have reduced expenses in retirement. Still, poverty among the elderly remains a significant problem.

The incidence of poverty among the elderly has declined significantly, thanks to a variety of government safety net programs including Social Security, Medicare, Medicaid, the Older Americans Act, and Supplemental Security Income. Social Security is said to have lifted from poverty nearly three of every four elderly persons who would have been poor without it (Porter et al., 1999).

Seniors particularly at risk of poverty status are women, those who live alone, and racial and ethnic minorities. In 2000, 10.2 percent of older adults lived in poverty—about 3.4 million elderly persons

(AoA, 2001). This rate is equal to the poverty rate for people 18 to 64 years of age. Another 2.1 million elderly persons (about 7 percent) lived just above the poverty line and were classified as near poor (incomes between poverty level and 125 percent of poverty level). In total, one of six elderly persons is either poor or near poor.

Higher than average poverty rates for older persons are found for women (12.8 percent) and for those living in central cities (13.8 percent), rural areas (12.5 percent), and in the South (12 percent). Twenty-seven percent of elderly persons with disabilities are below the poverty level, and 49 percent of the elderly disabled population fall below 150 percent of the poverty level (compared with 17 percent and 35 percent of the elderly non-disabled population).

Seniors in poverty are highly susceptible to the disruption of their transportation systems by such occurrences as car repairs, insurance cost increases, or increases in the cost of public transit. When one is lacking adequate financial resources, it is difficult to purchase a new car.

Projections to the year 2020 suggest that the number of elderly persons who are poor will decrease sharply. The percentage of the non-disabled elderly population below the poverty level will decrease from 17 percent in 1990 to 7 percent in 2020, a drop of more than 50 percent. The percentage below 150 percent of the poverty level is expected to decrease from 35 percent in 1990 to 16 percent in 2020, a decrease of more than 50 percent. The percentage of disabled elderly persons living below the poverty level is projected to drop from 27 percent in 1990 to 11 percent in 2020, a decrease of nearly 60 percent. The percentage of elderly

disabled persons at less than 150 percent of the poverty level is projected to drop from 49 percent in 1990 to 23 percent in 2020, again a decrease of more than 50 percent (AoA, 1999). Still, the future distribution of financial resources among the elderly could be more unequal for the aging baby boom generation, especially for those who are poorly educated and do not have marketable labor force skills (U.S. Congress, 1993).

If these projections of improved economic well-being among the elderly of the future prove to be accurate, the additional income and wealth should lead to an increase in the demand for high-quality transportation services. Unless public transit services are reconfigured, this might also create a drop in demand for public transportation among elderly persons.

One would expect older persons with higher incomes to travel more and to demand higher quality services than persons with less income. This would be generally true across all types of residential areas. In the future, suburban seniors generally could be expected to frequently own and drive their own automobiles and also to be able to purchase high-quality services when necessary. On the other hand, future low-income suburban seniors could possibly experience difficulty in meeting their travel needs because of the dispersion of destinations in suburban areas.

One potential effect of the aging of societies could be the inability of governments to fund certain programs because of shrinking tax bases. Transportation services could be one of those programs. At the moment, “the current ratio of tax-paying workers to non-working pensioners in the developed world is 3 : 1. By 2030, this ratio is expected

to decrease to 1.5 : 1 and in some countries may drop to 1 : 1 or lower” (Centre for Strategic and International Studies and Watson Wyatt Worldwide, 1999).

HEALTH STATUS VARIATIONS

Differences in health status are said to be a primary reason for the wide variability in well-being among the elderly. This is because health is a key determinant of the degree to which people can lead independent lives and because poor health can be a significant drain on financial resources.

The elderly of the future will generally be in better health than the elderly of the present, in large part because of better health practices throughout their lives (National Academy on Aging, 1994). But the longer life expectancy for these persons will create a dramatic increase in the number of disabled elderly persons. There will be many more oldest-old people who will require in-home services and nursing home care in much greater numbers than at the present time. Significantly more people will require some kind of assistance with daily living activities (like transportation) that they can no longer perform by themselves. Assuming middle series longevity projections, the number of disabled elderly persons will nearly triple between 1986 and 2040. More conservative projections predict a 68-percent increase in the number of impaired elderly persons between 1990 and 2020 (AoA, 1999).

Aging, Disability, and Health

Federal statistical agencies, health researchers, and service delivery

professionals all use a range of definitions and measures to classify disability among the elderly and other population groups. Most of these definitions and measures acknowledge the complex nature of disability. Key complexities include the interplay among chronic health conditions such as arthritis or a mental illness, the resulting functional limitations such as difficulty walking or understanding written material, and the impact these limitations have on the ability to engage in basic life activities (e.g., personal care, home management, or traveling about the community).

Disability prevalence rates among the elderly vary considerably depending on which concepts, definitions, and measures researchers use. According to the *National Health Interview Survey* (the largest, most comprehensive national survey of disability across the life span including children, non-aging adults, and the elderly), more than one-third (37.2 percent) of elderly people (age 65 and over) experience some form of activity limitation. About 1 in 10 (10.5 percent) are unable to carry out their major activity, which for the elderly is most often independent living (but does include the ability to work for those age 65 to 69) (Benson and Marano, 1998). The Census Bureau's Disability Topical Module from the *Survey of Income and Program Participation* (SIPP) uses multiple measures to identify the prevalence and severity of a disability. These include limitations in activities of daily living (ADLs) such as bathing and dressing. These also include the more complex instrumental activities of daily living (IADLs), which cover care of the home such as preparing meals and shopping for essential items, and functional limitations such as difficulty walking, understanding

speech, seeing, or using stairs. Across all these measures, the Census Bureau classifies more than one-half (52.5 percent) of the elderly population as having a disability and one-third as having a severe disability, the latter generally defined as being unable to carry out one or more of these activities without the assistance of others (McNeil, 1997).

In recent years, there has been a significant change in the definition and measurement of disability. There has been a move away from just identifying chronic medical conditions and a move toward assessing functional capacity as a basis for classifying persons with disabilities and designing programs for them. An emphasis on limitations regarding specific activities, in conjunction with the chronic conditions involved, helps decisionmakers use data to identify particular service requirements that address the real needs of persons with disabilities. Another example of this emphasis on functioning and the participation of persons with disabilities in the mainstream of society is the Americans with Disabilities Act (ADA) of 1990, as amended. The ADA focuses on reasonable accommodation, access to public and private services, and the removal of physical and attitudinal barriers faced by persons with disabilities. The ADA's stated goals are (1) equality of opportunity, (2) full participation in society, (3) independent living, and (4) economic self-sufficiency.

Mobility Limitations

Prior research has shown that age and the presence of chronic medical conditions, even at the advanced end of the age spectrum, are poor predictors of mobility or other limitations and the associated need for services, including transportation

(Ficke, 1992). Data on age and health, in combination with a host of other factors, however, can provide strong empirical evidence for documenting transportation demand and presenting convincing arguments for transit and paratransit options. For example, poor performance in ADLs (e.g., personal care and getting around inside the home) and IADLs (e.g., home management and getting around outside the home) have been linked to impaired driving abilities and to driving cessation in populations of drivers with cognitive limitations (Carr et al., 1990; Wild et al., 2000).

Current Levels of Mobility Limitations

Data from the 1994–95 Supplement on Aging portion of the *National Health Interview Survey on Disability* are shown in Table 4. The figures in the table cover people age 65 and over who report problems with two or more ADLs from a list of six activities: bathing, dressing, eating, transferring between bed and chair, toileting, and getting around inside the home. The figures include any reports of problems with the ADL, whether or not the person receives (or needs) personal assistance to perform the activity.

The first item of interest is the overall number of people who report various levels of disability. The first line of figures in Table 4 shows that among the 31.3 million people age 65 and over, 1.9 million, or 6 percent, report problems with two or more ADLs. (These figures are based on an average of 1994 and 1995 data and may differ from other population counts and sources for this age cohort.) Beyond this overall measure of disability among the elderly, Table 4 also shows

the socioeconomic and demographic characteristics of this population with two or more ADL limitations. The table uses seven characteristics to illustrate which of several subgroups have the highest and lowest prevalence of this level of disability.

For example, the table shows that disability increases substantially with age, rising from 3.1 percent for the 65 to 74 cohort to 18.1 percent for those persons 85 and older. Black, non-Hispanic elderly persons are over two-thirds more likely to have this level of disability than White, non-Hispanic elderly persons (9.4 percent versus 5.6 percent). Certainly as a function of age, women are over 40 percent more likely to report this level of frailty than men (6.8 percent versus 4.8 percent) are.

Poverty is also highly correlated with disability among the elderly. Older persons below the poverty level are more than twice as likely to report two or more ADL limitations than those older persons with incomes at or above the poverty threshold (10.6 percent versus 5.2 percent).

Implications for Transportation Services

As will be discussed at length in Chapter 2, there is a clear demarcation in the use of public transportation—people who reported limitations in performing two or more ADLs use transit significantly less than people with one or no ADL limitations. Elderly persons age 69 and above who reported one or no such limitations had a public transportation use rate of 12.8 percent. Those reporting two ADL limitations had a public transportation use rate of 6.4 percent, and for those reporting three or more ADL limitations, the rate was 6.0 percent.

Table 4

Number and Percent of People Reporting Problems with Two or More Activities of Daily Living (ADLs), by Age, Race, Gender, Poverty, Living Arrangements, Region, and Area of Residence, 1994–1995

<i>Characteristic</i>		<i>Total Population (age 65+)</i>	<i>Number and Percent of People Reporting Problems with Two or More ADLs</i>	
			<i>Number</i>	<i>Percent*</i>
Total	65+	31,245,307	1,862,121	6.0
Age Group (years)	65-74	18,355,635	576,320	3.1
	75-84	10,194,079	796,892	7.8
	85+	2,695,594	488,909	18.1
Race/Ethnicity	White (non-Hispanic)	26,375,021	1,469,260	5.6
	Black (non-Hispanic)	2,474,992	233,460	9.4
	Hispanic	910,906	49,898	5.5
	Others**	1,484,389	109,504	7.4
Gender	Male	13,035,173	623,931	4.8
	Female	18,210,134	1,238,190	6.8
Poverty Index	At or above	24,469,930	1,268,005	5.2
	Below	2,617,225	278,062	10.6
	Unknown	4,158,152	316,054	7.6
Living Arrangements	Living with others	21,473,521	1,271,371	5.9
	Living alone	9,771,786	590,750	6.1
Region	Northeast	6,977,963	386,494	5.5
	Midwest	7,815,246	400,050	5.1
	South	10,411,602	708,165	6.8
	West	6,040,496	367,412	6.1
Area	MSA***/center city	9,139,670	631,041	6.9
	MSA/not center city	14,385,891	767,839	5.3
	Non-MSA	7,719,746	463,242	6.0

* Percent=rounded to one decimal point.

** Others=American Indian, Alaska Native, Native Hawaiian, or other Asian/Pacific Islander.

*** MSA=Metropolitan Statistical Area

Source: National Center for Health Statistics, 1994–1995

The two-or-more disabilities group shown in Table 4 constitutes a particular subset of elderly persons whose level of disability corresponds to relatively low levels of public transportation use and who may require special attention when developing transit options for the elderly. The table shows that the vast majority of older persons do not have ADL limitations. Persons with two or more disabilities constitute an at-risk population of special concern for transportation professionals.

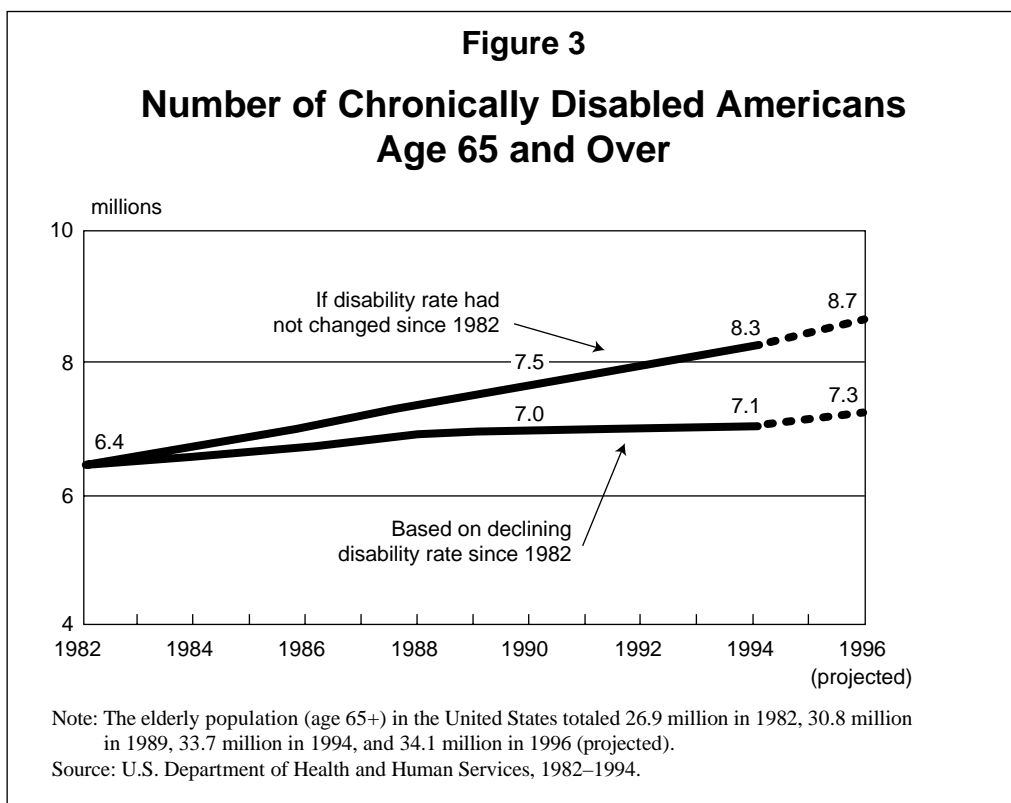
Trends in the Prevalence of Disabilities

Recent research shows that mobility limitation and other functional limitation rates among the elderly are actually declining, even as the size of this population, especially those over age 85, is growing. Furthermore, this trend is increasing, suggesting that future patterns and

requirements may vary considerably from what is currently the case. Identifying the relevant factors and forecasting the needs of older persons over the next 20 years requires a clear understanding of these phenomena.

Figure 3 uses ADL and IADL limitations among the elderly household population to illustrate the extent to which disability rates among older persons actually have fallen and how this pattern is escalating over time.

This research, sponsored by the National Institute on Aging, shows that there were 1.2 million fewer elderly persons age 65 and over with a disability in 1994 than would have been the case had disability rates continued based on 1982 levels (National Institute on Aging, 1997). As a result of this improvement in functional status, there were projected to be 7.1 million elderly persons with disabilities instead of



8.3 million in 1996, a substantial reduction in the rate of increase. Disability is defined as functional problems dealing with several normal activities of daily living (ADL and IADL limitations). These findings are based on the analysis of data from the *1982–1994 National Long-Term Care Survey* (NLTCS), a longitudinal study of elderly persons with mobility and other functional limitations living in the community (U.S. Department of Health and Human Services, 1982–1994). This research also showed that the decrease in disability rates is accelerating and the functional limitations that do exist have become less severe. The study also shows that rates of nursing home placement among the elderly are decreasing as well. This is part of an overall pattern associated with increased emphasis on home care and other community-based alternatives to institutionalization.

Projections indicate that the elderly of the future will experience more years without disabilities. No one has yet been able to prove that this means that people will be able to drive longer; we could have a growing number of fit, rich, active older persons who cannot drive and need alternative forms of transportation. On the other hand, there could be numerous older persons with substantial disabilities living in their own apartments and other locations who will rely on paratransit and other non-traditional public transportation options to address routine travel requirements such as shopping, socialization, and doctor visits.

A Current Example of the Travel Implications of Health Status

A new travel study of elderly persons in Baltimore found that an older person's

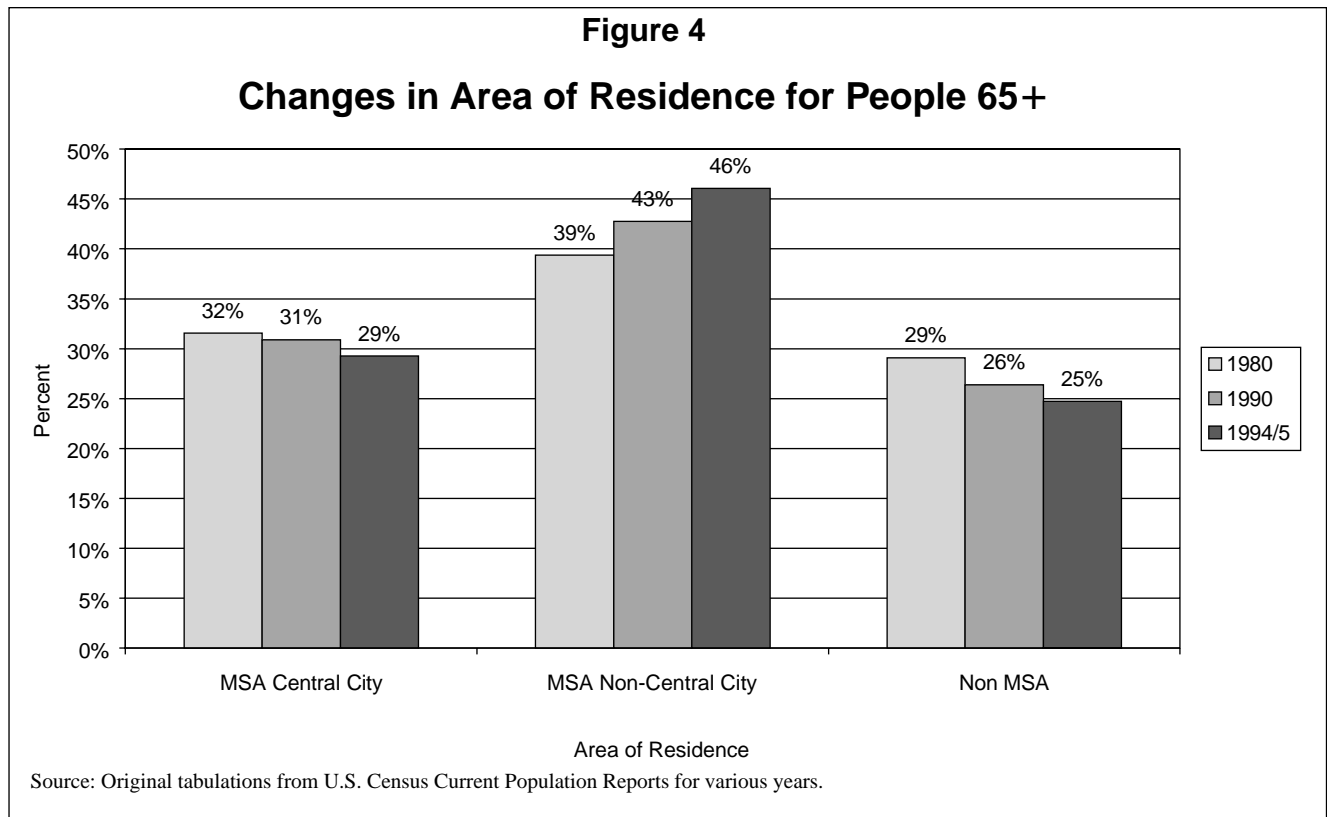
ability to walk three blocks was the most robust of all predictive variables in terms of explaining variations in travel frequency (KETRON, 1999). Those persons who could not walk three blocks and also could not drive were classified into a high travel need category. According to the study, "All individuals in the 'high need' group would experience moderate to severe difficulties in walking to any vehicle that would be available to take them for a ride." This high need group constituted about 6 to 8 percent of the population of the various jurisdictions in the Baltimore region.

SETTLEMENT AND ACTIVITY PATTERNS

Residential and Activity Patterns

Changes in where the elderly live also reflect the rise in the suburban population relative to center cities and rural areas. This change has tremendous policy implications. As Figure 4 shows, the percentage of the nation's elderly living in metropolitan statistical areas (MSAs) classified as non-central city, or suburban, (where the availability of public transit and its use by the elderly is relatively low) increased from 39 to 46 percent between 1980 and 1995. At the same time, percentages of the elderly living in central cities and rural areas were falling. This change is even greater among the age cohort approaching age 65, suggesting that this pattern of suburban growth among the elderly will only increase over time.

Projections are that the numbers and proportions of older persons in suburban areas will increase dramatically. The numbers of older persons in central cities and rural areas will generally increase, but



the proportions of older persons living in these areas will decrease. A number of central cities actually show declining older populations. Baltimore is one of these cities (KETRON, 1999).

A similar rise occurred in the suburbanization of employment and commercial destinations. Automobile travel made a greater variety of travel destinations reachable, leading to a wider range of possibilities, flexibility, and independence.

Certainly some argue that by supporting suburbanization and decentralization of our communities, the car has made it necessary for everyone to drive, removing walking, biking, and transit as options. (Rosenbloom, 1999)

The late 1990s have seen a large increase in activities designed to limit suburban sprawl and to increase densities of development in residential areas and their supporting

services. Greater densities in suburban areas would certainly make these areas more readily served by transit operations in their current configurations. But because seniors tend to age in place, the new developments at higher densities are not likely to attract an overwhelming proportion of seniors. Therefore, although higher density developments are seen as an aid to public transportation, current densification trends cannot be expected to play a large role in addressing the future transportation needs of the elderly.

Urban/Rural Differences

The proportion of residents who are elderly is greater for rural areas than for urban areas. This leads to an older age structure in non-metropolitan areas than in metropolitan areas. In 1998, the median age was 36.0 in non-metropolitan areas and 34.0 in metropolitan areas (Rogers, 1999).

Non-metropolitan populations are both increasing and becoming older. The combination of the out-migration of younger segments of the population and the aging in place of those people who remain has dramatically increased the average age of the rural population in certain areas (e.g., central Iowa). The in-migration of retirees has increased the overall age of the populations in other rural areas, particularly those classified as “retirement destinations.” (“Retirement destination counties” is a U.S. Department of Agriculture (USDA) classification of non-metropolitan counties by policy type. Others are federal lands counties, commuting counties, persistent poverty, transfers-dependent, and not classified.) In 1995, the USDA classified 8.3 percent of non-metropolitan counties in the United States (190 of 2,276) as retirement destination counties (USDA, 1995). They are primarily located in the South and the West. Non-metropolitan retirement counties are expected to continue their rapid growth. Although these counties total just 8.3 percent of all non-metropolitan counties, they accounted for 25 percent of the non-metropolitan population growth from 1990 to 1998 (Rogers, 1999).

In 1997, 18 percent of the rural population was elderly, whereas 15 percent of the urban population was elderly. The majority of non-metropolitan counties with an elderly population of 20 percent or more are located in the Great Plains subregion, often in the states of Nebraska, North Dakota, and South Dakota, but also in Iowa, Kansas, Missouri, and Texas (Fuguitt, 1995). These states have experienced a large out-migration of younger persons and have a large population that is aging in place. Some parts of the

United States—the West North Central region and the West South Central region, for example—have experienced declines in their non-metropolitan elderly populations between 1990 and 1996 because of natural causes (deaths) (Bowers and Hamrick, 1997).

The oldest-old, people age 85 and older, are more concentrated in rural areas (Tauber, 1992; Rosenbloom, 1996). Non-metropolitan elderly persons are significantly more likely to be poor or near-poor than their metropolitan-area counterparts (Rogers, 1999; Glasgow, 1993). In non-metropolitan areas, the oldest-old were twice as likely as the youngest-old (people age 60 to 64) to be classified as poor or near-poor in 1998 (Rogers, 1999).

Many rural areas have fewer transportation options than their urban or suburban counterparts. In 2000, almost three-fourths of people over the age of 65 (73 percent) lived in suburban or rural areas in the United States, where alternatives to the automobile are scarce or non-existent (U.S. Bureau of the Census, 2001b). One reason that transportation issues are particularly important for the elderly is because most rural areas have fewer medical services available than in comparable urban areas. Rogers lists the medical problems of rural communities as a narrower range of health care services for seniors, fewer alternatives available, less accessible and more costly health service, and fewer health care providers offering specialized services (Rogers, 1999).

Rogers writes that

the consequences of changes in the older population vary widely for rural areas based on the county economic type and

the composition of the older population—either young retirees or persons who have remained and grown old in the community . . . [The] mismatch between availability of and demand for services can create serious problems for service delivery in . . . areas [such as non-metropolitan areas dependent on farming and mining where working-age persons have left, creating declining populations, reduced tax bases, and increasing demands for medical and social services]. (Rogers, 1999)

CHANGES IN FAMILY STRUCTURE

Changes currently occurring in family structure might—or might not—diminish the future role of the family in caring for frail or disabled older relatives.

Complicated changes are occurring in the structure of household and kinship roles and relationships because of the growth of single-parent households, the increase in women working outside the home, the high incidence of divorce and remarriage (differentially higher for men), and the “increasing number of ‘blended families,’ reflecting multiple lines of descent through multiple marriages and the birth of children outside of wedlock through other partners” (National Academy on Aging, 1994). One manifestation of these changes is a steady increase in the proportion of older persons living alone. From 1970 to 1998, the proportion of men age 75 and older living alone increased from 19.1 percent to 22.3 percent; during this same time, the proportion of women age 75 and older living alone increased from 37.0 percent to 52.9 percent (Federal Interagency Forum, 2000).

All of these changes could possibly result in less daily assistance for seniors from family

members (with transportation or other caregiving activities). This issue is of serious concern because, according to the National Academy on Aging,

it is well established that family members currently provide at least 80 percent of all long-term care and support to community-based frail older persons through direct unpaid services. The family also plays an important role in obtaining and managing services from paid service providers. If changes in the intensity of kinship relations significantly erode the capacity and sense of obligation to care for older family members just as the population enters a period of rapid aging, the implications for public policy and for the well-being of older persons—particularly the ‘old-old’—may be profound. (National Academy on Aging, 1994)

Living with a Spouse

Living with a spouse can be an important component of independence and support for an elderly person, especially when there are no other family members in the area. Sixty-seven percent of older non-institutionalized people lived in family settings in 1998 (80 percent of older men, 58 percent of older women). As seniors get older, the proportion of those living in family settings decreases significantly: only 45 percent of those age 85 and over are living in family settings. Thirty-one percent of the elderly live alone; only 7 percent live with children, siblings, or other relatives (not spouses, children, or siblings). Only about 5 percent of elderly men and women report never having been married. In the 75-and-older age bracket, widows and widowers become more prevalent. Sixty-four percent of men age 75 and older were married with a living spouse in 1995, but only 21.6 percent of women reported being married with a living spouse. The number of older persons living with their spouses is expected to decrease slightly over time as the life spans of both men and women increase.

Living with Children

Thirty-one percent of all elderly persons lived alone in 1998; four-fifths of those elderly persons living alone were women. In the absence of a living spouse, children are the next best source of support for an elderly person. In 1995, approximately one-third of White women and nearly one-quarter of Black women over the age of 65 were married and had at least one child; 47 percent of elderly White women and 50 percent of elderly Black women aged 65 and over had no spouse but at least one child.

Because of the decline in children's mortality rates and the rise in fertility and marriage during the baby boom era, an increase in the percentage of elderly women with children can be expected, at least in the short term. Experts predict that by 2010, 86 percent of elderly women will have at least one child (AoA, 1999). Some of these children may provide support and relieve some of the burden that the growing elderly population will place on public-sector support services. After 2010, the trend toward fewer children could reverse the assistance that older persons could expect to receive from their children.

RETIREMENT STATUS

In previous generations, many people died before reaching retirement age. Now, the retirement phase of some people's lives may be longer than their work careers. In the future, older persons will be living much longer after the retirement age of 65. According to the high series of U.S. Census Bureau projections, by the year 2050, the average male could live for 25 years after retiring at age 65, and the average female

could live for nearly 30 more years. Middle series projections place these numbers at 20 and 22 years, respectively (AoA, 1999). With elderly persons living twice as long after the age of 65 (retirement age) and elderly populations increasing sharply, it is likely that the demand for all kinds of transportation services could rise dramatically. Although retirement is a time for leisure and the pursuit of hobbies for some people, for others retirement means living on a reduced or fixed income, adapting to a lower standard of living, and coping with the loss of roles such as worker or family provider.

CONCLUSION

In the next 30 years, there will be many more elderly persons living in the United States. Compared with the elderly of the year 2001, most of the elderly of the future are projected to be more highly educated, healthier, and enjoying higher incomes. Despite this predicted overall pattern of well-being for the elderly of the future, it is important to recognize that in the future there might be greater numbers of older persons who have mobility or income limitations. Tomorrow's elderly are projected to be more often residents of suburban or rural communities than of central cities. They are likely to travel more frequently and to a wider range of destinations than the elderly of today. Most future seniors will have been automobile drivers all their lives and can be expected to demand high-quality transportation services. The combination of these factors is expected to pose substantial challenges for public transportation providers wishing to capture a significant proportion of the trips of tomorrow's older persons.