AGE-RELATED SHIFTS IN HOUSING AND TRANSPORTATION DEMAND

A Multidisciplinary Study Conducted for Metro
by Portland State University's
College of Urban and Public Affairs

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Executive Summary

Key Conclusions and Policy Implications

Understanding where middle-aged and older adults live, where they are moving, how they get around, and the factors influencing these decisions is essential for planning for the future. To gain an understanding of the impact of age-related shifts on housing and transportation demand, Portland State University's College of Urban and Public Affairs, via its Institute on Aging, was contracted to conduct a review of the literature and to analyze existing key local and national data sources. A multidisciplinary team of faculty and graduate students was assembled and performed the work in the summer of 2006. The literature reviewed and the analyses presented here are intended to inform Metro's Regional Forecast and modeling assumptions and to stimulate policy discussions pertaining to managing the region's land supply and investing in transportation infrastructure.

A central conclusion of this study is that baby boomers must be reached before the age of 60, or even 50, if they are to be enticed to choose higher density living and proximity to transit. Nationally and locally, most seniors lock in their housing choice before they reach the age of 60. The likelihood of moving declines with age; older (70+) householders are much more likely to have moved into the home they occupy before the age of 50 than after that age. When older householders do move, they are more likely to move into higher density housing than middle-age adults.

A second key conclusion is that middle-aged and older adults' clear preferences for suburban living must be acknowledged and plans developed to make suburban areas more pedestrian friendly and homes retrofitted or designed initially to better meet the needs of older adults.

The literature reviewed here has demonstrated the lack of homogeneity among all those aged 65 and older, and thus the folly of assuming homogeneity on the basis of age alone. This same caveat applies to baby boomers. The span of years covered by the baby-boom generation (1946-1964) is large indeed, and individuals born at the end of the time frame are likely to be quite different in their attitudes and behaviors from those born at the beginning. For example, events that occurred during the 60s defined, to a large degree, this generation, yet the baby boomers at the tail end of the period were toddlers during that decade.

When planning for future older adults, policies should take into account the able and active population of seniors, as well as those with disabilities, or, to use Feldman et al.'s (2004) terms, the "advantaged" and the "frail fraction." This will mean creating opportunities to keep advantaged seniors active in their communities, and addressing the challenges to providing needed support services to frail seniors. It will mean having available a range of housing types and transit options, from affordable to luxury, in the central city to the suburbs.

Still, the preference for single-family detached residences and for suburban living among the vast majority of adults aged 65+ and those aged 45-64 has been demonstrated, as has the

predilection of both groups to remain where they were living prior to age 50 – that is, to age in place. In fact, baby boomers in Portland comprise a share of the suburban population that is slightly higher than the national average.

Traditional suburban communities, then, will need to make zoning changes and infrastructure investments, such as in sidewalks, pedestrian-friendly walking environments and destinations, and increased transit (and training in how to use it, such as provided by Ride Connection (www.rideconnection.org) to support an older population. An example is St. Louis Park in Minnesota, a traditional suburb, which created a new urban form that supports residents at all stages of life. The town changed zoning and land-use regulations to allow for both mixed use and high-density living, two characteristics not commonly found suburban communities, but which promote the ability of residents to age-in-place (Howe, 2001). These communities fit Freshley's (1995) plea for "life cycle communities" that work for all age groups. At the same time, we need to begin to advocate for life-cycle housing design. Since the shift from renter to owner is most typical as individuals enter their childbearing years, single family homes have been designed for families, with little thought given to the owners' aging in place. Examples of life-cycle housing include: designed with a bedroom and bath on the main floor so one could downsize to just one floor; designed to be adaptable to people with disabilities, including visitors (e.g., level entry, wide hallways and doors on the main floor, blocking for adding grab bars, cabinets that can be easily altered for use those using wheelchairs); placement of outlets and switches so they are reachable without bending down; zoning allowing accessory units for use by the family or for rental income in the early years, and for caregivers or elderly parents later on.

Advances in technology also will make it easier for older people to remain in the home of their choice as they age. Technologies already being used or developed bring services to the home rather than requiring travel. For example, telemedicine allows distance monitoring and advice on chronic and acute health issues; the internet makes it increasingly easy to shop for a wide variety of goods, including groceries, remotely (Charness, 2003; Dishman, Matthews & Dunbar-Jacob, 2003). Technologies that compensate for cognitive, motor, and sensory difficulties experienced in the home environment are being developed or improved. Other categories of technological improvement include emergency monitoring and response systems and social communication aids (Horgas & Abowd, 2003).

At the same time, there is some evidence that baby boomers may be somewhat more predisposed than current elders to consider living in higher density, more walkable neighborhoods in order to have easier access to social, cultural, and work-related activities. Other trends, too, may increase the future demand for denser environments, including mounting traffic congestion, decreased crime, immigration and enhanced urban vitality, growth of a café culture, the fashionable design of higher density for the middle class, and positive examples created by growing densification (Myers & Gearin, 2001).

To be successful in attracting and retaining older adults as residents, however, traditional high-density designs will need to be rethought, with consideration given to ways to facilitate aging in place, such as minimizing the use of steps, providing for adequate lighting, and having elder-friendly housing managers. Housing choices designed specifically for older populations can be expected to become more diverse, with greater integration between homes in the community and structures built specifically for older adults, with outreach of

services to private homes (Regnier, 2003). New alternatives include co-housing (combining independent living with voluntary shared spaces and activities) and housing on college campuses for elders are being developed (Regnier, 2003). Accessory apartments, even when explicitly allowed, have not appeared as often or been used as often by those over 65 as expected (Chapman & Howe, 2001). They are more likely to be added to homes by people in middle age, with the expectation that they or caregivers might use them in later years.

One impediment to moving in old age is the difficulty of going through the process of sorting through years of accumulated possessions in order to downsize, as well as the physical demands of moving. If policy makers wish to encourage downsizing to high-density locations, they may consider encouraging the development of elder-friendly moving services that can assist movers through this difficult process. There have been a few examples nationally of small companies or non-profits which have developed such services.

Also, creating incentives for future populations of elders to choose to live in downtown areas and eschew private vehicles may prove effective. It should be noted, however, that great success in attracting older adults to downtown areas could have some adverse implications as well, particularly for the buoyancy of the nighttime economy (Bromley, Tallon, & Thomas, 2005). In addition, there is little indication that baby boomers will want to live in age-segregated communities to any greater extent than current generations of elders do. Moreover, research has demonstrated the value of mixing generations to maximize intergenerational support and learning, self-help capability and community contribution (Ball, n.d.)

The literature presented here on transportation and mobility revealed that private vehicles remain the mode of choice for the vast majority middle-aged and older adults, and indications are that rates of licensing and use will continue to increase in the future. Only a small share of older adults report that they are prevented from driving because of medical conditions. Instead, those with medical conditions adjust their travel. Although the number of daily trips taken by adults appears to have leveled off or declined slightly nationwide, the decline is on the part of younger adults. Older adults made about the same number of trips in 2001 and 1995. Still, adults aged 65+ take significantly fewer trips than other adults, and these trips tend to be shorter than those by other adults, although trip length increased for all adults between 1995 and 2001.

The trend of increased driving among people 65 and older is likely to continue. The development of new technologies that improve the safety of vehicles should reinforce this trend. Older drivers will be more willing and able to continue driving longer in life with these new technologies, particularly with improved health conditions. Moreover, if transportation engineers respond to the growing calls for designing highways and related infrastructure (e.g., signage) to accommodate the aging population, the trend will be reinforced even further.

Taken together, these findings point to the need for planners and policy makers to acknowledge and address the continued and growing reliance of older adults on private vehicles. Although increased density is correlated with increased use of transit and walking for older adults, the relationship does not appear until densities reach at least 3,000 units per square mile. Moreover, the correlation is weaker for older adults (65+) than younger adults,

particularly those 25-44. Thus, following implementation of policies designed to increase densities and co-locate needed services in order to minimize the need for driving, infrastructure improvements will be needed to enhance the safety of older drivers and those with whom they share the road.

In addition, better transit, walking, and bicycling systems would allow all adults to transition seamlessly from driving to other travel modes, or to supplement their driving by using these alternatives modes, thereby reducing older adults' loss of independence and enhancing their mobility (Ernst & McCann, 2005). Ernst and McCann (2005) concluded that the following would facilitate the development of policies that support mobility options: (a) provision of a revenue stream or source of funding – this determines success or failure; (b) a focus on improving the supply of transportation facilities and services, not on changing behavior; (c) local or regional control of investment decisions, including strong public participation to ensure that projects are responsive to the unique needs of residents; (d) clear implementation guidance from the state with respect to the setting of goals and objectives for regional and local transportation systems, especially for smaller and rural regions that do not have expertise with transit innovations.

As Rosenbloom (2004) and Bailey (2004) suggested, these findings presented here indicate that no single policy program will address the transportation needs of current and future generations of older adults. People's travel needs and problems result as much from land use and housing patterns, social and human service delivery systems, neighborhood and community design, and the physical specifications of various transportation modes as they do from actual transportation programs and resources. A comprehensive strategy to link all of the policy arenas that affect the travel patterns of older people is needed, involving effective driver evaluation and retraining programs, better designed cars, improved signage and information systems on roads and highways, user friendly transportation alternatives, well-designed land use and housing choices, cost-effective delivery of public and private services, and coordinated delivery of human and social services.

Despite the dominance of private vehicle use, there remains a role for public transit in the lives of older adults (Rosenbloom, 2001). More routes that serve the needs of older adults, such as night routes and routes that include busy shopping malls would be beneficial, as would the establishment of service routes (Rosenbloom, 2001). These routes would include destinations frequented by older adults but open to all, as is the case in Sweden, to provide an alternative to paratransit (Rosenbloom, 2001). There would be stops at regular bus stops, but service to places not accessible to larger buses, such as the front doors of hospitals, day care centers, and even stores, would also be provided. This concept, called "community buses," has been adopted in several U.S. and Canadian cities. Although they are more expensive and are normally operated in conjunction with normal routes, an increasingly older population may provide economies of scale for the future. Although enhanced pedestrian amenities, mixed land uses, and enhanced comfort and security in transit systems may not create a mass defection from the car, older adults may be willing to occasionally, and perhaps increasingly, use other forms of transportation rather than a private vehicle (Rosenbloom, 2001).

Policy makers will need to understand in greater depth the reasons that older people do not choose public transit. In addition to issues of routes and access, a concern that emerges

often relates to safety and security on the bus/train, at the stop, and on the walk to and from the stop, especially among nondrivers and those with poor health (Coughlin, 2001; Ritter, Straight & Evans, 2002). Locating routes where there are few "eyes on the street" (e.g., the MAX line between I-84 and the railroad tracks) will increase safety concerns. Another issue for some older adults is lack of experience with transit. Programs have been developed to complement the usual information systems by providing one-on-one training in the use of transit by older people or people with disabilities, assisting them in moving from paratransit to the regular system (Moakley, 2001), e.g., the local program Ride Connection.

Clearly, more research is needed to fully understand the attitudes and desires of the baby-boom generation. Some of the findings presented here are contradictory, but a larger concern is that there is little information on the baby-boom generation, and our ability to predict their behaviors and attitudes is limited. Nonetheless, planning for this group is crucial, as they comprise such a significant portion of our population.

Specific key points and findings from the study are highlighted below.

Key Findings

The Demographic Imperative: Trends in Population Aging

- "Age" can be defined in many ways, including chronological age, functional age, years left to live, social roles, and subjective age. Chronological age is most typically used to group individuals or households; thus, chronological age is generally used in this report.

- Caution must be exercised when drawing conclusions based on age differences. Differences among age groups may be a consequence of age effects (or changes), cohort effects, or period effects. Cross-sectional data, those most available, generally cannot distinguish among these three types of effects.

- In addition to a general increase in the proportion of the population that is aged 65 or older, the oldest-old sector is growing at the fastest rate. The oldest old are those most likely to have disabilities, and are also more likely to be female, since with age, males are increasingly outnumbered by females. Older women are more likely than older men to experience disability and to live longer than men. Thus, women are likely to spend more of their lives in a disabled state than men.

- The proportion of older adults experiencing disabilities is decreasing, and there has been an increase in active life expectancy; however, due to the overall aging of the population, the total number of those with disabilities is on the rise. At the same time, gains in educational level among baby boomers as a group are likely to translate into higher levels of health, income and wealth than among previous generations.

- The "elderly" are not a homogeneous group. Instead, there are the "haves," or the"advantaged," and the "have nots," or the "frail fraction." The oldest old, women, minority elders and elders who have poorer health, financial insecurity, less education, and who reside in dangerous neighborhoods are those most likely to comprise the latter group.

- Baby boomers are postponing retirement due to a variety of financial and social factors. Later retirement is likely to affect this group's housing and travel patterns.

- Baby boomers are expected to be healthier and better educated as they age than current older populations, but there is conflicting evidence regarding their future financial status. Regardless, it does appear that they will be spending more years in the workforce. Predictions about other behavior are particularly uncertain.

- In 2000, baby boomers and those aged 55 to 64 showed higher concentration in more rural areas, in new subdivisions near the UGB, and in the less walkable areas of the Portland urban core. Persons aged 65 and over were noticeably less concentrated in the most pedestrian-oriented neighborhoods.

- Over the next 30 years, the Portland-Vancouver metropolitan area will see dramatic growth in the proportion of the population that is aged 65 and older. While the total population will increase about 47 percent, the 65+ population will more than double, growing by over 137 percent and comprising 17 percent of the population in 2030 compared to 10.5 percent in 2000. Fueling this increase will be the aging of the baby boomers.

- It appears that rates of disability increased between 1990 and 2000, although this is quite likely due to differences in definition and data presentation in the two censuses. There is variation by county and city, indicating the possible need for special attention to issues of disability among older adults in certain areas.

Housing and Spatial Location Patterns

- Nationally, about 80% of older people own their own homes. Renters tend to be poorer than owners and more likely to be women and members of racial/ethnic minorities.

- Home ownership patterns in the Portland-Vancouver metropolitan region mirror those of the nation. Those aged 55 and older are most likely to own their own homes, and white older adult householders are most likely to be homeowners. Women are less likely to be homeowners than men, and renters have lower incomes than owners. Home ownership rates increased most among the 55 to 65 year-old age group between 1995 and 2002.

- Nationally, the preference for the single family home has remained at 70 -77% among those aged 55+ since 1986. High housing cost burden may limit housing options, particularly for renters.

- Locally, too, the preference for the single family detached home is high, and grew among those aged 55-64. There were minimal changes in the type of structure in which older adults (55+) lived between 1995 and 2002. Householders aged 65+ are more likely than those aged 55 to 64 to live in an age-restricted development. Portland has high housing costs, and received the 8th highest ranking for severe housing cost burden among 23 "Living Cities" examined by the Brookings Institute.

- There is some spatial variation by age within housing type. Among those residing in single family homes, baby boomers are more likely than those aged 65+ to be located

outside the urban growth boundary and to be in higher income neighborhoods and cities. Baby boomer households residing in multi-family housing are found primarily inside the urban growth boundary and in eastern parts of Yamhill county. Mobile homes and other housing (e.g., boats, RVs) are much more likely to be located in rural areas. Persons aged 65+ are more likely than younger persons to reside in mobile homes.

- Although the vast majority of older people prefer to "age in place" in their community and current home, those just reaching retirement age (50-64) are more likely to consider moving to a new home, if not a new community.
- The continuing trend toward "aging in place" is likely to mean that the majority of older adults will continue to living in single family homes and in the suburbs. There are a number of indications, however, that baby boomers are more likely than younger adults to have a preference for more walkable locations, public transit, and higher density living.
- Developers of higher density housing need to rethink their design for an aging population if they are to be successful at attracting and retaining older adults.
- There was an increase between 1995 and 2002 among baby boomers and older adult households who lived in a neighborhood with higher density apartment buildings 2002, but this may be due to the increased densification of the region rather than a preference for higher density living. Although fewer middle-aged and older adult households reported having access to public transportation, more reported regular use of public transportation by someone in the household.
- Nationally, most seniors lock in their housing choice before they reach the age of 60. The likelihood of moving declines with age; older (70+) householders are much more likely to have moved into the home they occupy before the age of 50 than after that age.
- Similar to the national findings, the likelihood of moving among older Portland householders declines with age. However, when older householders do move, they are more likely to move into higher density housing than middle-age adults.
- When older adults do move, transit access is not a primary consideration when choosing a new neighborhood.
- In the Portland region, new suburbs near the UGB have seen a lot of growth in the three age groups from baby-boomers to seniors, while the central core experienced declines in these age groups.
- Both nationally and in Portland, older people are most likely to live in the suburbs. Baby boomers comprise a slightly higher share of the suburban population in Portland than the national average.
- The larger percentage of 45-64 year-olds living in downtown Portland, compared to the national average, may indicate a greater preference for dense living among baby boomers here.

Transportation Patterns and Preferences

- Most older adults aged 65+ do drive; rates drop only for the oldest old. Older women with licenses tend to make fewer trips than older men. Although trip-making rates for the population as a whole declined slightly from 1995 to 2001, this was not the case for people aged 65+. To attract the elderly to transit, information about transportation alternatives and a very high level of access, including in the middle of the day, and service quality would be required. In addition, zoning changes are needed along corridors with good transit services to facilitate building of assisted living facilities and other residential communities for elders.

- In the Portland area, most trips by older adults are by private vehicle. Only a small share of older adults report that they are prevented from driving because of medical conditions. Instead, older adults with medical conditions are more likely to report that they adjust their travel by traveling less, asking for rides or limiting their driving to day time.

- Rates of licensing of older adults have increased and are likely to remain high, or even increase, in the future.

- Adults aged 65 and over take significantly fewer trips than other adults. After significant increases between 1983 and 1995, the number of daily trips taken by adults of all ages appears to have leveled off or declined slightly nationwide. However, most of this decline is on the part of younger adults; older adults made about the same number of trips in 2001 and 1995.

- The vast majority of travel by older adults occurs in private vehicles, both nationwide and in the Portland region. Of all trips made by older adults, a higher share of are made walking than among younger adults. However, because older adults make fewer trips overall, they do not make more walking trips per person. They also use transit less than younger adults, and transit use among older adults declined between 1995 and 2001.

- Older adults' trips are shorter than those by younger adults. Trip lengths for older adults increased from 1995 to 2001, as they did for all adults.

- Increased density is correlated with increased use of transit and walking for older adults. However, the relationship does not appear until densities reach at least 3,000 units per square mile, and only about 15% of the region's residents live at these densities. Moreover, the correlation is weaker for older adults (65+) than younger adults.

Future Research

Additional research, conducted over time with baby boomers and younger cohorts, is needed to fully understand these groups' housing preferences and choices. Current knowledge is limited by the cross-sectional data available. Similarly, to help in forecasting future travel demand, longitudinal data are needed so that modality choice, especially transit use over time, can be assessed and trends identified.

Introduction

Background and Purpose of the Study

As noted in the Scope of Work associated with the contract for this study:

> Metro adopted a regional growth management strategy known as Region 2040 a decade ago. Throughout that period, Metro and local governments in the region have been implementing those growth management policies – encouraging efficient use of land, providing an array of transportation options that move people and goods, helping communities to provide diverse housing options, providing parks and natural areas, protecting the natural environment and enabling communities to enhance their sense of place.
>
> After ten years of experience, a need exists to evaluate Region 2040 and to engage the region on a number of fundamental policy issues concerning growth and quality of life. Crucial to this process is an understanding of the impact age-related shifts on housing and transportation demand.

Portland State University's College of Urban and Public Affairs, via its Institute on Aging, was contracted to examine this issue, and a multidisciplinary team of faculty and graduate students was assembled. The literature reviewed and the analyses presented here are intended to inform Metro's Regional Forecast and modeling assumptions and to stimulate policy discussions pertaining to managing the region's land supply and investing in transportation infrastructure.

Overview of the Report

To address the issue of age-related shifts in housing and transportation demand, this report is organized into four main sections. In the first section, **"The Demographic Imperative: Trends in Population Aging,"** following a discussion of the concept of "age" and the implications for analyses, statistics and projections concerning the numbers of older adults in the United States, Oregon, and the Metro region are presented.

The second section, **"Housing and Spatial Location Patterns,"** addresses the questions of (1) What are the current and projected types of housing preferred by middle-aged and older adults?; (2) What is the spatial distribution of older people – where will they be living?; (3) How likely will older adults be to move?; and (4) Where are older adults likely to move?

The third section examines **"Transportation Patterns and Preferences,"** asking the questions: (1) What are the transportation patterns of older adults in terms of mode choice, trip distance and frequency, what factors influence these patterns, and how do the patterns change with age?; (2) What are the transportation preferences of older people?; and (3) What is the impact of urban form on the transportation choices of older people?

The fourth section focuses on "**Key Policy Issues Influencing Future Housing and Transportation Demand By Older Adults**."

With respect to the report's format, in each section and subsection, a review of the pertinent existing literature, typically national in nature, is presented. To facilitate review of the results by the reader, the main findings are summarized under the heading, "Key Points." Following the review of the literature, analyses are presented of secondary data that were conducted by members of the project team of data specific to urban areas, and where possible, the Portland-Vancouver metropolitan region in particular. Again, key points are summarized for the reader's convenience.

Study Methods

To conduct the literature search, standard electronic databases were used. The focus was on academic and government literature covering the United States and metropolitan regions, in particular.

To supplement the existing literature and to better identify trends and make predictions concerning future housing and transportation choices and how these will affect our region, analyses of several sources of secondary data were conducted. Secondary data sources used included the summary tabulations from 1990 and 2000 Decennial Census prepared by the U.S. Census Bureau, 1994-95 Portland Activity Survey, the 1995 and 2002 American Housing Survey (AHS) samples from the Portland region, the 1990 and 1995 Nationwide Personal Transportation Survey (NPTS), and the 2001 National Household Travel Survey (NHTS).

The 1994-95 Portland Activity Survey was conducted by Metro. For the survey, household members were asked to record their activities for two days, including travel. The analyses presented here use cross-tabulation tables prepared by Metro staff from those data.

The AHS is conducted by the Census Bureau. The sampling unit is a housing unit. The survey collects detailed information about the housing unit, as well as information about the "householder." Data are collected from only one person in each household. Therefore, the analysis presented here is of households and householders, not each individual. A householder is usually the owner whose name is on the deed or mortgage or the renter whose name is on the lease. With some exceptions, householders must be 18 or older. The Census conducts the AHS at the national level every other year and at the metropolitan level on a rotating basis. Data for the Portland region are available for 1995 and 2002. The data include weights so that the information is representative of the region. The region includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon and Clark County in Washington.

Both the NPTS and NHTS are conducted by the U.S. Department of Transportation. Both include the civilian, non-institutionalized population; persons living in nursing homes are not included. The 1995 NPTS user's guide indicated that persons living in assisted living facilities were not included. Alternatively, the 2001 NHTS user's guide provided no indication of whether or not assisted living facilities were included; however, because the

survey was conducted over the telephone using random digit dialing, and since residents of most assisted living facilities have their own phone, they are likely to be included in the sample.

All three of these national datasets include weights to correct for sampling bias and more accurately reflect the U.S. population. For the analyses presented here, we used data only from people living in households in urban areas, as defined by the Census Bureau. Excluding rural households makes the analysis more pertinent to the Portland region.

Although the NPTS was also conducted in 1969, 1977, and 1983, those datasets are not readily available. In addition, significant differences in methodology prevent direct comparisons for many variables across all six years of the survey; thus, those earlier datasets are not analyzed here. Similarly, methodological differences in collecting travel information also prevent direct comparisons of the 1990 data with those from 1995 or 2001 for several variables related to travel, such as the number, mode, or length of trips.

Nonetheless, the analyses that are possible help to shed light on the current situation and trends related to age, housing, and transportation in urban areas, and particularly in the Portland-Vancouver metropolitan area.

The Demographic Imperative: Trends in Population Aging

Defining "Age"

Prior to addressing the key question of the effects of age-related shifts on housing and transportation demand, it is necessary to define a few key concepts. The first of these is "age," and particularly "old age." The most commonly used definition of age is **chronological age**, which is the number of years a person has lived (Hooyman & Kiyak, 2005). Advantages of this definition include the relative ease with which one's age can be determined (i.e., the year born). Thus, chronological age is frequently used as a key criterion for eligibility for programs or services, such as Medicare (generally age 65), Social Security (previously age 62 or 65, but now age 67), Older Americans Act programs (age 60), or in the case of younger adults, the ability to obtain a driver's license and drive independently, to vote, or to purchase alcohol, for example.

As can be seen, the age at which an individual is considered "old" varies, with the most frequently used chronological ages being 65, 60, or 62. Obviously, such variation can make comparative analyses difficult, such as when one study's sample includes adults aged 60 and older, and another study's sample comprises only those aged 65 and older. Similarly, chronological age is often used to delineate subcategories of individuals. In the case of older adults, the categories typically used are the "young-old" (65-74), the "middle-old" (75-84), and the "old-old" (85+). Sometimes, however, different categories are used, such as 60-69, 70-79, and 80+. Nonetheless, these categories serve to call attention to the degree of individual variation among older persons, due to a plethora of factors, and the importance of not assuming homogeneity among older adults.

Furthermore, some persons may be considered "old" at the age of 55, 50, or even 45, such as persons in ethnic and racial minorities, who often have lower life expectancies. This fact leads to the notion of counting backward from projected death, rather than counting forward from birth (chronological age), as a way to look at age (Cain, 1976). Although more complicated to use as an eligibility criterion than the year an individual was born, there is some precedent for using life expectancy, and **years left to live**, as a way of establishing differing chronological age-related eligibility criteria for various groups, such as Native Americans (e.g., access to Older Americans Act programs), and for including such groups in gerontological studies at earlier ages.

Regardless, however, chronological age can be a poor indicator of one's health status or functional ability, as implied by the statement, "Although she is 70, she has the lung capacity of a 40-year-old." Thus, another way of defining who is "old" is an individual's **functional age** (Cain, 1976; Hooyman & Kiyak, 2005). Definitions of functional age measure a person's ability to perform or engage in certain activities. Commonly used classifications grouping individuals according to their functional ability have included: "the well elderly, the somewhat impaired elderly, and the frail elderly;" "the go-go's, the slow-go's, and the no-go's;" and "the frisky, the frail, and the fragile."

One of the most common measurements of functional age assesses the ability to perform Activities of Daily Living (ADLs), including the ability to get in and out of bed, bathe, walk, eat/feed oneself, toilet, and dress oneself. Instrumental Activities of Daily Living (IADLs) measure the ability to do such tasks as light housework, run errands, use the telephone, deal with finances, and take medications. Gerontological researchers frequently use these measures of functional ability to assess and compare groups of elders.

Another way to define old age is with respect to the social roles that older adults perform in life (Cain, 1976; Hooyman & Kiyak, 2005). Social roles are sets of expectations or guidelines for people who occupy given positions, such as widow, grandparent or retiree. Typically, these roles are held at certain phases or ages in life, such as "retiree" at age 65. Events that occur or roles that are held when they would normally be expected are referred to as "on-time;" those that occur out of sequence are referred to as "off-time." The social roles expected at each age may change over time—for example, the likelihood that women will work or drive, or the typical age of retirement. These changes, in turn, may influence housing and transportation demand.

Finally, another way in which age can be defined is subjective age. People who are "young at heart" and/or able to compensate for functional limitations can maintain a subjective age identity of themselves as young. Activity level and health are seen as the most important elements influencing evaluations of subjective age, along with attitudinal predisposition. To illustrate, it is not uncommon to hear individuals who are 80 years of age say that they will make use of programs at a senior center "when I'm old."

KEY POINTS: Gerontologists have differentiated adulthood from old age in several ways in an attempt to capture the heterogeneity in the way people age. Concepts include chronological age, functional age, years left to live, social roles, and subjective age. Chronological age is most typically used to group individuals or households; thus, chronological age is generally used in this report.

Interpreting Age Differences

Researchers in the field of adult development and aging have struggled with the intrinsic relationship between age and time, noting the importance of distinguishing between age changes and age differences. Age changes are the ways that people normally change over time. These changes can be measured only by using longitudinal data gathered by repeatedly measuring the same person or group of persons over a period of time. Age differences are the ways in which one generation differs from another. Age differences are commonly measured using cross-sectional methods, comparing people of different chronological ages at the same measurement period (Hooyman & Kiyak, 2005).

Age differences are difficult to interpret, however, as they may reflect age changes, cohort effects, or period effects (Hooyman & Kiyak, 2005). An age effect (or age change) is a change that occurs as a result of advancing age, such as the increased likelihood of physical disability with greater chronological age. Cohort effects, which are also known as generational effects, are those that represent social differences which occur between groups based, generally, on when people were born. For example, members of the "baby boom"

generation (born from 1946 to 1964) may have different views on war and patriotism, or on central-city living or use of transit, than members of the "swing" generation (born from 1900 to 1926). Period effects refer to the time of measurement. These effects occur as a result of a specific historic event or period and its impact on an entire society. For instance, the terrorist attack on the World Trade Center on September 11, 2001 had far-reaching effects on people of all ages, changing personal and political attitudes, as well as behaviors, such as those resulting from the implementation of vastly increased airport security measures.

For the most part, due to the nature of the literature and data available, primarily age differences, not changes, are addressed in this report. The most commonly used chronological age groupings used here are: 45 - 54, 55 – 64, and 65+. Year born is examined, as well, however, when possible, to examine cohort, or generational, effects, particularly those associated with the baby boomer generation as compared to current elders.

KEY POINTS: Differences among age groups may be a consequence of age effects (or changes), cohort effects, or period effects. Cross-sectional data, those most available, generally cannot distinguish among these three types of effects. Caution must be exercised when drawing conclusions based on age differences.

Recent Past and Future Demographic Trends in the United States

Existing Literature

According to the Administration on Aging's (AOA) *A Profile of Older Americans: 2005* (2005), the population of those aged 65 and older increased 9.3 percent from 1994 to 2004 (from 33.0 to 36.3 million). During that same period, persons aged 46-54, who include a large part of the baby boomer population (defined as those born in the years from 1946 through 1964) increased 39 percent. Overall, in 2004, one in eight Americans was aged 65 years and older, which accounted for 12.4% of the population. Future predictions indicate that by 2030, there will be nearly twice as many individuals aged 65 or older (71.5 million) in comparison to 2004 (AOA, 2005). This will represent a 7.6% increase in those 65 years of age and older, meaning that by 2030 this group will represent approximately 20 percent of the U.S. population.

There are several important factors to which planners and policy makers should pay close attention in regard to the aging population. The first of these is that the oldest old, those aged 85 and older, comprise the fastest growing segment of the U.S. population (He, Sengupta, Velkoff, & DeBarros, 2005). It is this group that tends to be the most frail physically and cognitively (AOA, 2005), and thus presents some unique challenges. The 85+ population is expected to increase from 4.2 million in 2000 to 6.1 million in 2010, to 7.3 million in 2020 (AOA, 2005), to 10 million in 2030, and to 21 million by 2050 (He et al., 2005). These oldest-old elders accounted for 12.1 percent of the older population in 2000; although still rapid, growth in the first few decades of the century will be slower than that which will occur after 2030, when the baby boomers will begin arriving in that age category. By 2050, the oldest old will account for nearly 1 out of every 4 older persons (24 percent) (He et al., 2005).

Another important characteristic concerns the sex ratio of our aging population. Using U.S. Census data, Gist and Hetzel (2004) found that the sex ratio (number of males per 100 females) is much lower among older cohorts. In 2000, there were 96.1 males for every 100 females in the U.S. The ratio differed by age group, however, becoming more disparate as age increased: it was 82.4 for those aged 65 to 74, 64.4 for those aged 75-84, and 40.7 for those aged 85 and older. This is of particular interest because of key gender differences that exist. For example, Gist and Hetzel (2004) found that women are less prepared for retirement, receive less retirement income, are more likely to be in poverty (13 percent compared to 7 percent for men), less likely to be married (41percent compared to 71 percent), and more likely to be widowed (44 percent compared to 14 percent). Although women are currently less likely to have a bachelor's degree than men (23 percent compared to 13 percent), that gap is expected to change in the future, since the current rates of college degree acquisition are roughly the same. Additionally, there are differences in levels of disability between men and women which will be focused on next.

The oldest old and women in older age cohorts require special attention because of the general increase in chronic conditions experienced by these elders. Chronic conditions are defined as physical and cognitive limitations of an individual who requires help with *personal activities of daily living* (i.e., bathing, dressing, eating, walking, toileting, and getting in and out of bed) and *instrumental activities of daily living* (e.g., doing light housework, running errands, dealing with finances, taking medications). The likelihood of experiencing ADL limitations increases with age. For instance, those aged 85 and older report more limitations than do persons aged 75-84, and those 64-74 report even fewer ADL needs (AOA, 2005). Women are at even greater risk: He et al. (2005) found that older women are more likely than men to experience disability, and they are likely to live longer than men. Thus, women may spend more of their lives in a disabled state than their male counterparts (He et al., 2005).

According to the Federal Interagency Forum on Aging Related Statistics (2004), the percentage of non-institutionalized older adults aged 65+ with ADL and IADL needs declined from 1984 to 1999 from 25 percent to 20 percent. During that same time period, however, the total number of individuals with either an ADL or IADL need increased from 6.2 million to 6.8 million (He et al., 2005). He et al. (2005) reported that several surveys show a decline in disability over the past two decades due to multiple factors, including improved medical treatment, positive behavioral changes, more widespread use of existing technology and improvements in socioeconomic status. Still, 14 million people aged 65 and older reported some level of disability in Census 2000, linked primarily to a high prevalence of chronic conditions such as heart disease or arthritis.

KEY POINTS: In addition to a general increase in the proportion of the population that is aged 65 or older, the oldest-old sector is growing at the fastest rate. The oldest old are those most likely to have disabilities, and are also more likely to be female. With age, males are increasingly outnumbered by females. Older women are more likely than older men to experience disability and to live longer than men. Thus, women are likely to spend more of their lives in a disabled state than men.

Life expectancy, which is defined as the average number of years of life remaining to a person at a particular age given certain death rates, continues to increase (National Center for Health Statistics [NCHS], 2005). Specifically, life expectancy in the United States has increased dramatically, from 47.3 years in 1900, to 68.2 in 1950, and 77.5 in 2003 (NCHS, 2005). Life expectancy for those who had reached the age of 65 or older in 2003 was 18.4 years, and 11.8 years for those 75 and older (NCHS, 2005).

Active or *disability-free life expectancy* is a more refined indicator of life expectancy, measuring the average number of years in life free from the need for assistance with ADLs or IADLs and other limitations or impairments. According to Crimmins, Saito and Ingegneri (1997), gains in life expectancy in the 1970s were accompanied by increases in years spent with disability. During the 1980s, however, growth in life expectancy was concentrated in years spent without disability, in which older Americans were living longer and healthier lives. Reasons for the increase overall in disability-free life expectancy include the decrease in disability among community-dwelling adults in their 50s and 60s, who experienced medical advances, higher educational attainment, higher labor force participation and socioeconomic gains. Future older populations, including baby boomers, are likely to be better educated than the current older population (He et al., 2005). Since higher levels of education have been linked to better health, higher income, more wealth, and a higher standard of living in retirement (He et al., 2005), more baby boomers than previous elders can be expected to experience these positive outcomes.

KEY POINTS: The proportion of older adults experiencing disabilities is decreasing, and there has been an increase in active life expectancy; however, due to the overall aging of the population, the total number of those with disabilities is on the rise. At the same time, gains in educational level among baby boomers as a group are likely to translate into higher levels of health, income and wealth than among previous generations.

Frey (1999) noted the differences between the young elderly (aged 65-74), who are in better health, have more resources, and more social support, and the older elderly (aged 75-85 and older). The older elderly have been less likely to accumulate retirement benefits and in general have had lower incomes over the course of their working life than the younger elderly or the baby boomers.

Those who are 65 years of age and older can also be distinguished by sex, race and ethnicity. Feldman, Oberlink, Simantov & Gursen (2004) published a report based on the 2003 national data from the AdvantAge Survey describing two distinct groups of seniors, the "*advantaged*" and the "*frail fraction*." They found that most seniors (defined as persons 65 years of age and older) are thriving, have strong social support networks, self-report good health and are generally satisfied with their communities. Other seniors, who are members of the "frail fraction," are characterized by self-reported fair or poor health, financial insecurity, less than a high school education and residence in a dangerous neighborhood. In addition, minority elders are more likely to be categorized as members of the "frail fraction." When income is used as a predictor, one would expect to find single women,

black and Hispanic elders in the "frail fraction" group more often than white men and white married couples. Schafer (2000) found that 45% of black people aged 55-64 and just over 30% of Hispanics of the same age cohort earn less than $25,000 per year. Among minorities aged 65 and over, 48% of blacks and over 60% of Hispanics earn less than $25,000 per year, as opposed to whites, among whom just 20% earn less than $25,000 per year and over 40% earn over $150,000 per year (Schafer, 2000).

KEY POINTS: The "elderly" are not a homogeneous group. Instead, there are the "haves,"or "advantaged," and the "have nots," or "frail fraction." The oldest old, women, minority elders and elders who have poorer health, financial insecurity, less education, and who reside in dangerous neighborhoods are those most likely to comprise the latter group.

The Baby Boom Generation

The baby boom generation is composed of people born between 1946 and 1964, a span of 18 years. Today in 2006, then, these people are aged 42 to 60; in 2000, they were 36 to 54 years of age. It is conventional wisdom that this generation will have a profound impact on the country, particularly as its members reach retirement age. At the same time, there is little research that helps pinpoint the trends that this massive generation may follow or initiate. In terms of population impact, by 2030 all baby boomers will have reached the conventional retirement age of 65, and for the first time in our nation's history, 20% of the population will be 65 or older. This dynamic has the potential to greatly impact the Social Security system, health and social service provision, and land-use and transportation patterns.

According to the Center for Health Communication (2004) report, baby boomers who turn 65 in the year 2011 can expect to live another 18 years, to be healthier than previous generations, and to attain higher educational levels than any previous generation. Gordon, Keegan & Fisher (2006) surveyed baby boomers and found that 37% expect to continue working indefinitely. The Center for Health Communications study found similar results, asserting that the connection between retirement and age 65 is eroding. There are a variety of factors that contribute to the baby boom generation postponing retirement, including changes to Social Security (full benefits not distributed until age 67), fewer defined benefit pension plans, higher debt and the expectation that more retirement income will be needed due to increased longevity (Center for Health Communication, 2004). These factors could change the timing or likelihood of making a "pre-retirement" move and also influence travel patterns because of continued trip-making due to work.

KEY POINTS: Baby boomers are postponing retirement due to a variety of financial and social factors. Later retirement is likely to affect this group's housing and travel patterns.

Retirement income will continue to differ by gender for this generation. Social Security benefits are calculated using the number of years in the labor force and the amount of total contribution to the system, minus the lowest paid year. According to Dailey (2000), while more baby boom women were in the paid workforce than previous generations of women,

their Social Security retirement benefit may be less than their spousal benefit. This is because baby-boom women often left the workforce or worked part time to provide family care needs, reducing their contributions to Social Security and thus their benefit. By 2030 ,when all baby boomers reach retirement age, only 25% of all baby- boom women will have worked fulltime for 35 years or more, and 60% of baby-boom women will have had multiple years with no income (Dailey, 2000).

There is no consensus on whether the baby-boom generation as a whole will have adequate retirement income. VanDerhei and Copeland (2001) caculated the retirement income of Oregonians, and found that the average retirement income is $80,000 per year for men, $70,000 for families and just under $50,000 for women. These figures, however, are means, and thus are highly influenced by extremes (such as those with unusually high incomes); median incomes would be a better estimate. Median income for baby boomers who have turned or will turn 60 in 2006 (retired and not) is $66,260, and the median income for all baby boomers (again, retired or not) is $64,817 (Gordon, Keegan, & Fisher, 2006). What is not known is the total debt held by the baby-boom generation. Some assert, however, that while the income assets of baby boomers are greater than those of their parents, so is their overall level of debt (Center for Health Communication, 2004).

Predicting the behavior of the baby-boom generation is difficult. According to Tremain (2006):

> No one doubts the significance of the demographic bulge moving inexorably toward retirement age, but CNU market researcher Todd Zimmerman [personal interview, 2001] argues that predicting how an entire cohort will act is perilous. "Who would have predicted that the 60s generation, which protested the Vietnam War and gave us the environmental movement, would move to tract houses in the suburbs and drive around in cars the size of World War II assault vehicles? If we try to predict what they will do based on their predecessors, we will be wrong," he said, adding that while the Boomers have fueled the segmented production pattern, what they will do in retirement won't start to be known for another seven to ten years. (p. 3)

KEY POINTS: Baby boomers are expected to be healthier and better educated as they age than current older populations, but there is conflicting evidence regarding their future financial status. Regardless, it does appear that they will be spending more years in the workforce. Predictions about other behavior are particularly uncertain.

Data Analyses: Local Demographic Trends

The proportion of Oregonians who are 65 years of age and older is similar to, although slightly higher than, the proportion of those 65 years and older in the general U.S. population (see Table 1). In Oregon, 12.8 percent of the population was 65 years of age or older in 2000; in Washington, the percentage was lower than the national average, at 11.2 percent. Table 1 also shows how the number of males to females generally declines with age and is considerably lower for the 65+ population compared to the population aged 45 to 54. For example, in the United States, among those aged 45 to 49, there are 96.8 males for

every 100 females, compared to only 69.8 males for every 100 females among those aged 65 and older.

Table 1: Population by Selected Age Group, Sex-Ratio, and Geographic Area (2000)

Geographic area	Percent of Total Population				Male/Female Ratio			
	45-49	50-54	55-64	65+	45-49	50-54	55-64	65+
United States	7.2	6.2	8.6	12.4	96.8	95.5	91.8	69.8
Oregon	8.0	6.9	8.9	12.8	98.4	98.8	96.2	74.2
Washington	7.7	6.6	8.4	11.2	98.2	99.3	98.5	74.0
Portland-Vancouver PMSA	8.0	6.7	8.0	10.4	98.8	98.2	97.8	68.9
Counties:								
Clackamas	8.7	7.9	9.5	11.1	93.2	97.9	100.3	72.6
Columbia	8.6	7.4	10.0	11.7	111.7	103.6	106.7	84.0
Multnomah	8.2	6.7	7.5	11.2	100.2	99.9	94.2	64.7
Washington	7.5	6.2	7.2	8.8	101.3	94.2	95.4	66.9
Yamhill	7.4	5.9	8.1	11.7	104.5	103.5	100.2	74.9
Clark	7.7	6.6	8.1	9.6	96.4	98.6	102.2	73.1
Cities:								
Portland	8.3	6.6	7.4	11.6	100.5	99.6	94.4	64.1
Vancouver	6.9	5.9	7.3	10.8	91.8	98.6	97.7	66.2
Gresham	7.5	6.4	7.4	9.9	100.0	98.2	88.3	60.5
Beaverton	7.6	6.2	6.9	8.7	101.8	86.0	87.5	54.8
Hillsboro	6.2	4.8	5.9	6.2	101.6	96.7	108.2	61.6

Source: 2000 Census, SFT 1, Table P8. Total Population by Age

The proportion of those aged 65 years and older in the six counties of the Portland-Vancouver Metropolitan Area overall was lower than that for the states of Oregon and Washington, at 10.4 percent. However, there were marked differences in the spatial distribution of older persons across the metropolitan region by county and by city. Figure 1 shows these variations more specifically, and reveals that the proportion of persons aged 65 and over in the total population of block groups varied from less than 1 percent to 80 percent in 2000. The pinkish-to-reddish colors on the map indicate areas where the percentage of seniors was above the regional mean of 10.8 percent[1]; the blue colors were below the mean. The map reveals lower concentrations of seniors in the central core neighborhoods of Portland and in areas along the urban fringe, which had experienced the new housing boom in the 1990s. Similarly low concentrations were found in the cities of Hillsboro, Troutdale, Camas, Tualatin, and edges of Beaverton and Vancouver. While very high concentrations (e.g., King City, Charbonneau District in Wilsonville) were rare, fairly high shares of population of those aged 65+, between 24.0 and 37.5 percent, were found in the inner old suburbs of Portland, Beaverton, Gladstone, Gresham, and in parts of Vancouver.

[1] The regional mean is an average of percent seniors for all block groups, thus it differs somewhat from the population mean.

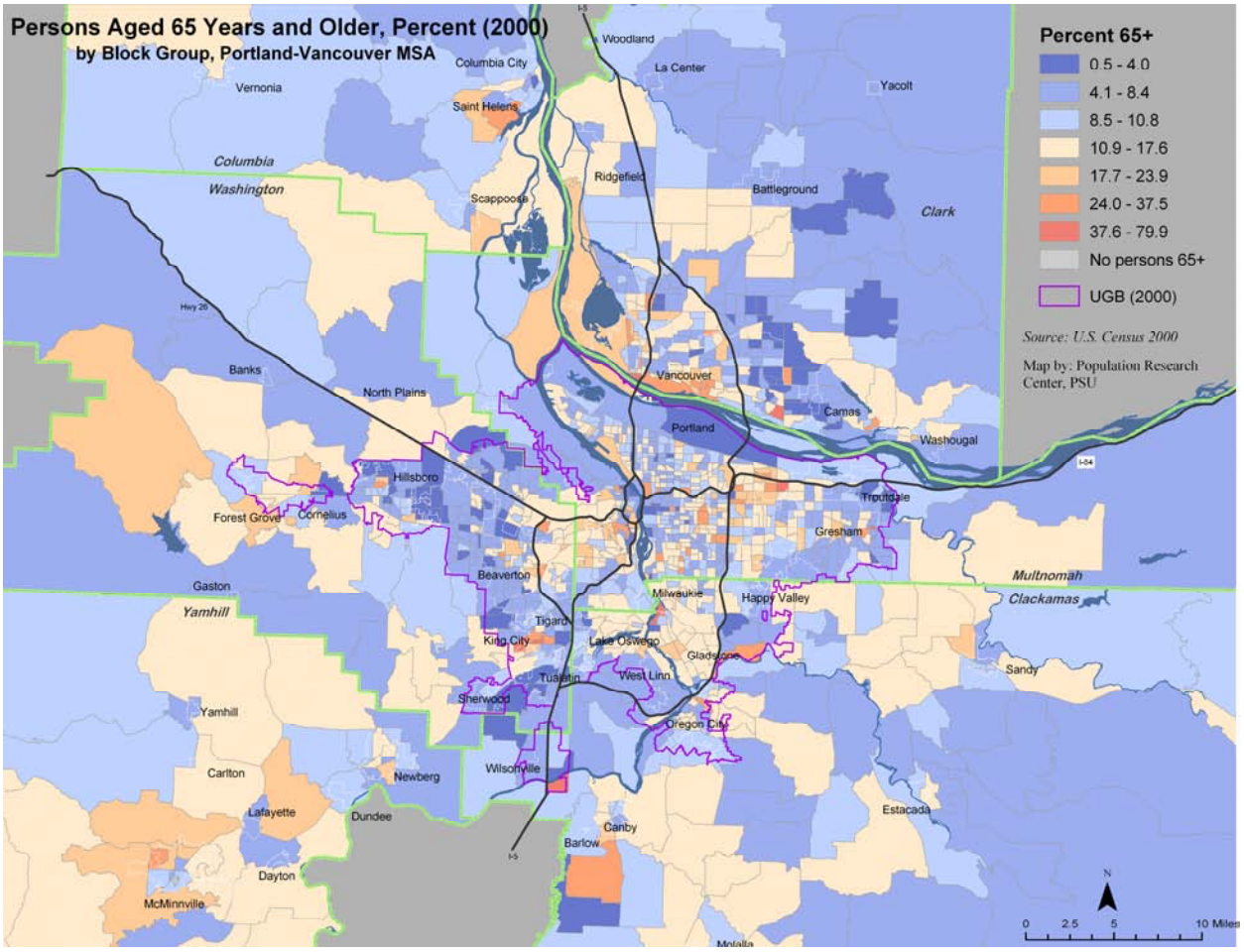


Figure 1: Proportion of Persons Aged 65 Years and Older in the Portland-Vancouver MSA, by Block Group (2000)

In contrast, the proportion of baby-boomers (defined here as those aged 35 to 54 in 2000 due to data constraints) in the total population of block groups varied less: from 2.6 to 55.3 percent (see Figure 2). Areas with concentrations of baby-boomers above the regional mean of 31.8 percent were found in downtown Portland (Pearl District), the Alameda and Irvington neighborhoods, and areas of new housing construction around Forest Park and in outer Beaverton. Boomers comprised between 31.9 and 43.2 percent of the population in wide swaths of land next to and outside the Portland UGB (2000) as well as in suburban Clark County. These location choices reflect the relative affluence of the baby-boom generation, who were in their prime earning years in 2000.

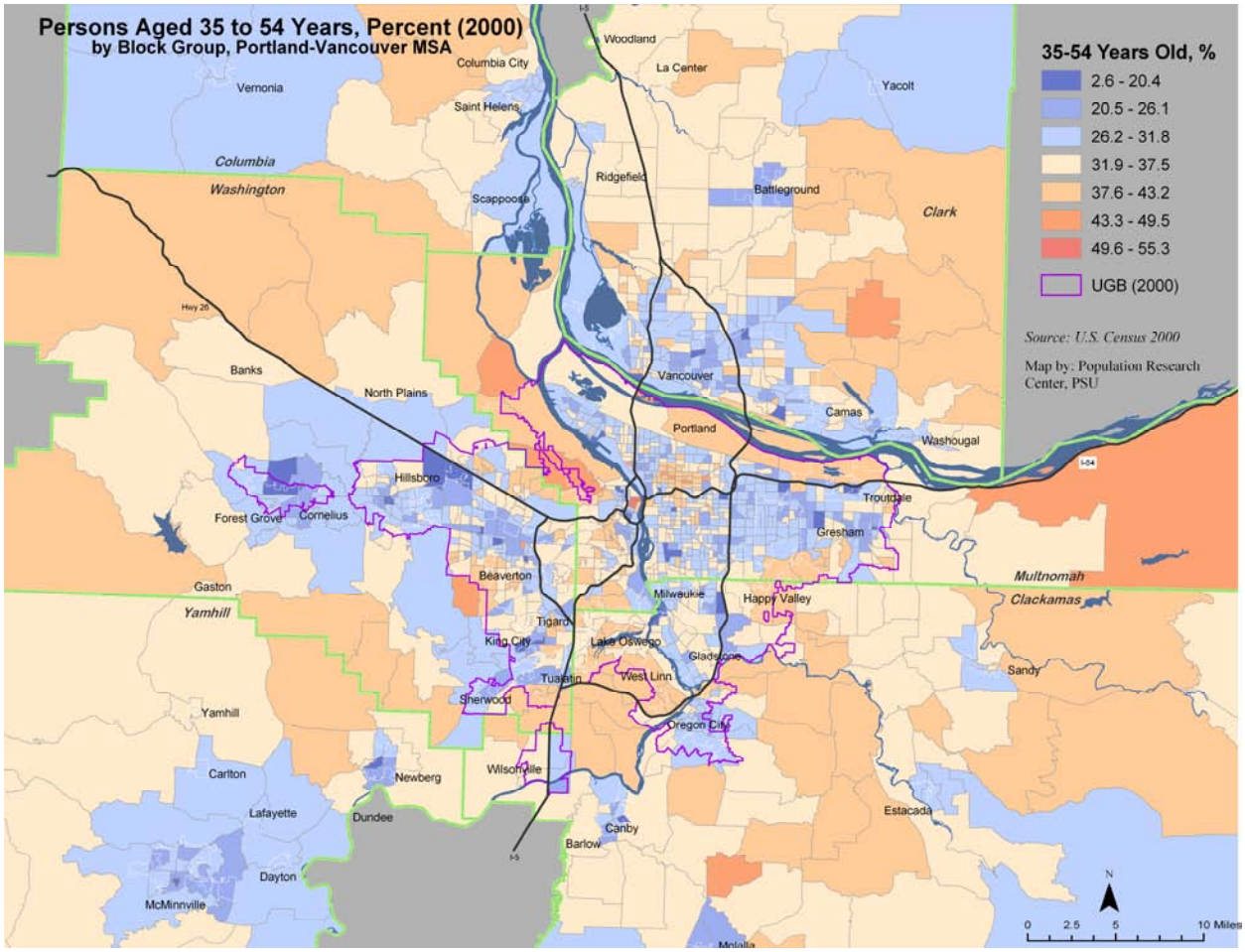


Figure 2: Proportion of Persons Aged 35 to 54 Years in the Portland-Vancouver MSA, by Block Group (2000)

The distribution of the "almost old" (persons aged 55 to 64 years) across the region (see Figure 3) was more similar to that of the baby-boomers than of persons 65 years and older However, in comparison to the "boomers," persons in the pre-retirement ages were relatively more concentrated in rural areas farther away from the UGB, in Clackamas and Yamhill counties. Additionally, lower concentrations of persons aged 55 to 64 years were found inside the UGB, especially in the more walkable Portland neighborhoods.

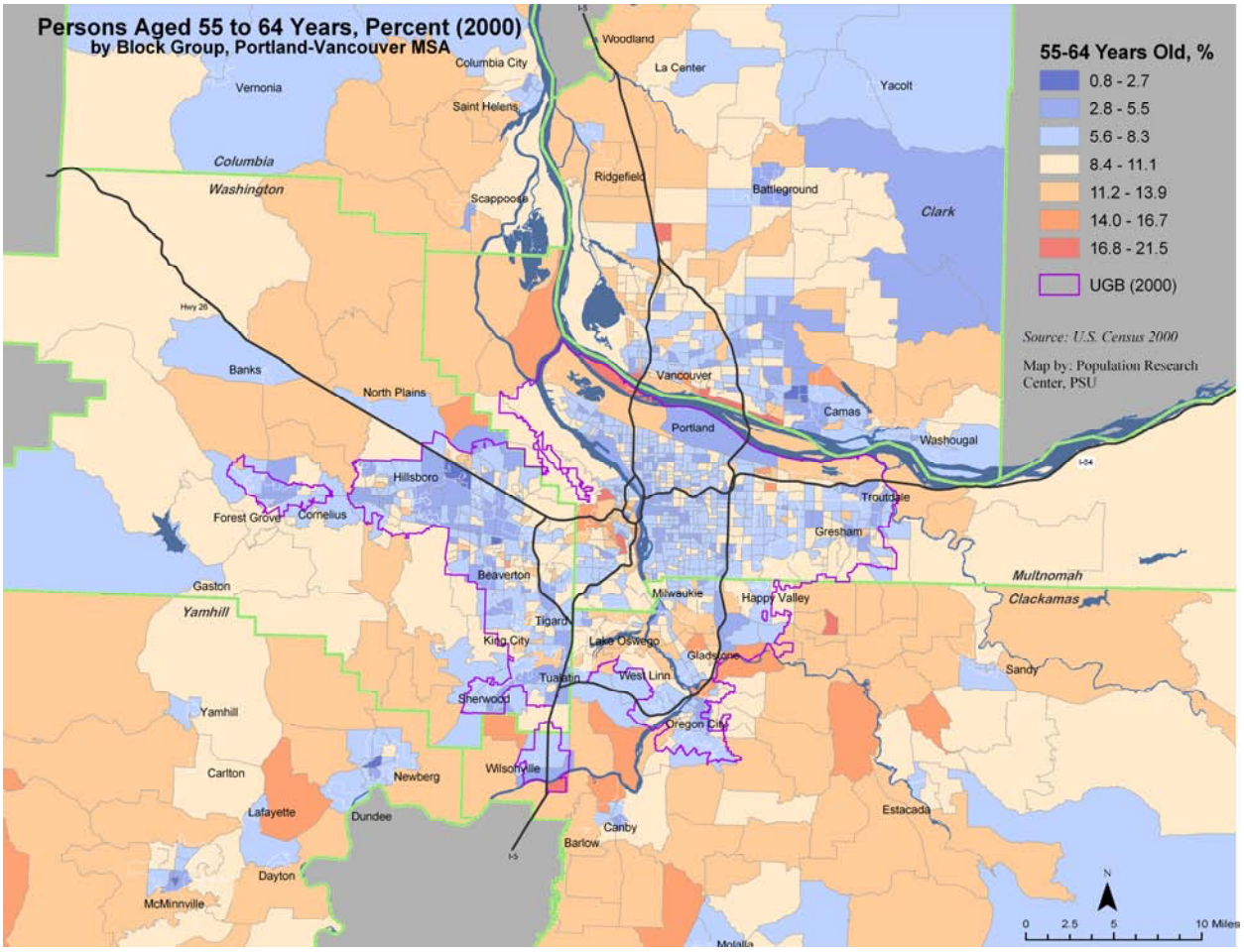


Figure 3: Proportion of Persons Aged 55 to 64 Years in the Portland-Vancouver MSA, by Block Group (2000)

KEY POINTS: In 2000, baby boomers and those aged 55 to 64 showed higher concentration in more rural areas, in new subdivisions near the UGB, and in the less walkable areas of the Portland urban core. Persons aged 65 and over were noticeably less concentrated in the most pedestrian-oriented neighborhoods.

Between 2000 and 2010, the share of persons aged 65 and older in the Portland-Vancouver metropolitan will increase from 10.5 percent to 10.6 of the total population (see Table 2). With the aging of the baby-boomers, however, the share of persons 65 years of age and older is expected to grow to 14.2 percent by the year 2020 and to 17.0 percent by the year 2030. These trends represent an increase in the number of those aged 65 and older by 14.5 percent between 2000 and 2010 (compared to 13.4 percent growth among the total population), by almost 76 percent between 2000 and 2020 (compared to 29.7 percent for the total population), and by 137 percent (compared to 47 percent for the total population) over the 30-year period between 2000 and 2030.

Looking at population trends by age subgroups, Table 2 shows that the growth rates in the Portland-Vancouver metropolitan area will vary by age group as well as by time period.

From 2000 to 2010, the total population is expected to grow by about 13.4 percent. In 2010, baby boomers will be aged 46 to 64. Population loss will actually occur in the 75 to 84 age group, while large increases will occur among those aged 55 to 59 (59.9 percent), 60 to 64 (87.3 percent), and 65 to 69 (55.5 percent).

Between the years 2010 and 2020, the total population is expected to increase by 14.3 percent (calculated, not shown), with increases in all age groups among those aged 45 and older. In 2020, baby boomers will be 56 to 74 years of age. The most dramatic increases are expected to occur in the population of those aged 70 to 74 and 65 to 69 (92 percent and 63 percent, respectively), followed by those aged 75 to 79, the age group just older than the baby boomers (60 percent), and the youngest baby boomers, those aged 55 to 59 (47 percent).

For the period 2020 through 2030, the total population again is expected to grow, by about 13.4% (calculated, not shown). Baby boomers will be 66 to 84 years of age in 2030. The strongest growth will be observed in the 80 to 84 age group (102 percent) and the group aged 75 to 79 (69 percent). Overall, the population aged 65 and over will increase just over 137 percent between the years 2000 and 2030, growing 14.5 percent between 2000 and 2010, 53.5 percent between 2010 and 2020, and 35 percent between 2020 and 2030.

Table 2: Current and Projected Population Trends by Middle and Older Age Groups in the Portland-Vancouver MSA (5 Oregon Counties)

Age Group	Total 2000	2000, %	Total 2010	2010, %	2000-2010 Change	Total 2020	2020, %	Change 2000-2020	Total 2030	2030, %	Change 2000-2030
Total	1,580,850	100.0	1,793,347	100.0	13.4	2,049,654	100.0	29.7	2,325,378	100.0	47.1
45-54	234,841	14.9	259,914	14.5	10.7	276,882	13.5	17.9	305,766	13.1	30.2
55-59	74,672	4.7	119,407	6.7	59.9	125,092	6.1	67.5	137,586	5.9	84.3
60-64	51,660	3.3	96,778	5.4	87.3	117,361	5.7	127.2	123,453	5.3	139.0
65-69	41,125	2.6	63,962	3.6	55.5	104,529	5.1	154.2	111,411	4.8	170.9
70-74	39,143	2.5	42,061	2.3	7.5	80,636	3.9	106.0	100,179	4.3	155.9
75-79	36,250	2.3	30,355	1.7	-16.3	48,498	2.4	33.8	81,993	3.5	126.2
80-84	26,185	1.7	24,581	1.4	-6.1	27,445	1.3	4.8	55,324	2.4	111.3
85+	23,415	1.5	29,302	1.6	25.1	30,961	1.5	32.2	45,499	2.0	94.3
45-64	361,173	22.8	476,099	26.5	31.8	519,335	25.3	43.8	566,805	24.4	56.9
65+	166,119	10.5	190,262	10.6	14.5	292,070	14.2	75.8	394,406	17.0	137.4

Source: Office of Economic Analysis, Department of Administrative Services, State of Oregon (2004)

KEY POINTS: Over the next 30 years, the Portland-Vancouver metropolitan area will see dramatic growth in the proportion of the population that is aged 65 and older. While the total population will increase about 47 percent, the 65+ population will more than double, growing by over 137 percent and comprising 17 percent of the population in 2030 compared to 10.5 percent in 2000. Fueling this increase will be the aging of the baby boomers.

Disability Rates, 1990 and 2000

Table 3, Table 4, and Table 5 provide information on disability type and rates in 1990 and 2000 for the six counties and five largest cities in the Portland-Vancouver MSA, as well as for Oregon, Washington, and the U.S. Unfortunately, the definition of "disability" used in the 2000 Census was different from what was used in the 1990 Census. Additionally, different categories were used by the Census Bureau in its publicly-accessible summary tabulations. Thus, while the 1990 table reports data on persons with mobility and self-care limitations, its equivalent in the year 2000 presents data on persons with all types of disabilities combined. Another available table in the year 2000 provides a detailed break-down by disability type, yet was calculated for all disabilities rather than *persons* with disabilities (and one person can have more than one disability).

The "mobility" question in 1990 was "Do you have a physical, mental, or emotional condition lasting 6 months or more that made it difficult to perform certain activities?" The most comparable question in 2000 was the "go outside alone" question: "Do you have a physical, mental, or emotional condition lasting 6 months or more that made it difficult to go outside the home alone (for example, to shop or visit a doctor's office)?" The "self care limitation" question in 1990 was somewhat comparable to the "self care disability" question in 2000, but the data presented are narrower in scope, as they pertain only to those with self-care limitations or, as in the final columns of Table 3, to those with both mobility and self-care limitations. Thus, it is difficult to compare the disability rates between 1990 and 2000. If such a comparison were to be made, it would appear that disability rates were considerably higher in 2000 than they were in 1990. While this may be a reflection of real trends, it more likely is due to differences in how limitations in mobility, self-care, and other disabilities were defined in 1990 and 2000.

Table 3: Persons by Age Group and Mobility and Self-Care Limitation Status, 1990

	Mobility limitation only				Self-care limitation only				Both mobility & self-care limitations			
Geographic area	16 to 64	65 to 74	75+	65+	16 to 64	65 to 74	75+	65+	16 to 64	65 to 74	75+	65+
United States	1.2	4.9	13.2	8.2	2.4	4.2	4.9	4.5	1.0	4.2	12.4	7.4
Oregon	1.0	4.1	12.0	7.3	1.5	3.1	4.3	3.6	0.8	3.2	10.2	6.1
Washington	1.0	4.0	12.1	7.2	1.5	3.0	4.1	3.4	0.7	3.2	10.2	6.0
Portland-Vancouver PMSA	1.0	4.4	13.2	8.0	1.5	3.5	4.7	4.0	0.7	3.4	11.1	6.6
Counties:												
Clackamas	0.8	3.7	13.2	7.4	1.4	3.6	6.2	4.6	0.5	3.1	10.7	6.1
Columbia	0.9	7.0	12.8	9.2	2.4	3.6	3.4	3.5	1.0	5.3	10.1	7.2
Multnomah	1.2	4.9	13.3	8.5	1.8	3.8	4.0	3.9	0.9	4.1	11.5	7.3
Washington	0.7	4.3	12.6	7.7	1.1	3.3	5.2	4.1	0.6	2.6	10.5	5.9
Yamhill	0.9	3.5	10.6	6.4	1.3	4.9	4.5	4.7	0.7	2.3	11.5	6.1
Clark	1.1	4.4	15.1	8.5	1.4	2.6	4.6	3.3	0.7	3.2	10.7	6.1
Cities:												
Portland	0.6	4.4	18.8	10.5	1.0	3.9	6.2	4.9	0.4	2.5	12.0	6.5
Vancouver	0.8	4.3	17.4	9.7	1.5	4.0	4.7	4.3	0.5	4.4	11.3	7.2
Gresham	0.6	5.4	13.4	8.9	1.3	2.0	6.6	4.0	0.4	6.5	12.2	9.0
Beaverton	1.3	5.1	13.0	8.6	2.0	4.1	4.1	4.1	1.0	4.2	11.7	7.6
Hillsboro	1.9	3.1	16.0	8.9	1.6	3.1	4.8	3.9	0.9	3.8	9.8	6.5

Universe: Civilian noninstitutionalized persons 16 years and over.
Source: 1990 Census, STF 3, Table P69. Sex by Age by Mobility and Self-Care Limitation Status.

Table 4: Census 2000, Disabilities of civilian noninstitutionalized population 65+ years

Geographic area	Total disabilities	Percentage of total disabilities				
		Sensory	Physical	Mental	Self-care disability	Go-outside-home disability
United States	27,856,428	17.0	34.3	12.9	11.4	24.4
Oregon	349,140	18.8	35.0	13.5	10.9	21.8
Washington	544,316	19.7	34.0	13.3	11.0	22.1
Portland-Vancouver PMSA	159,729	17.7	34.6	13.6	11.4	22.8
Counties:						
Clackamas	27,623	18.3	35.3	13.4	10.8	22.2
Columbia	4,267	19.1	37.3	12.7	8.7	22.2
Multnomah	60,315	17.3	34.4	13.4	11.6	23.2
Washington	31,012	16.9	33.9	14.1	12.2	22.9
Yamhill	7,353	18.4	35.1	13.6	11.3	21.5
Clark	29,159	18.1	34.4	13.5	11.2	22.8
Cities:						
Portland	50,704	17.3	34.4	13.4	11.6	23.3
Vancouver	14,833	17.0	33.1	14.3	11.2	24.5
Gresham	7,462	17.2	33.6	14.2	11.8	23.2
Beaverton	6,239	16.5	32.1	16.3	12.5	22.6
Hillsboro	3,659	17.9	34.8	13.1	12.3	21.8

Universe: Total disabilities tallied for the civilian noninstitutionalized population 5 years and over with disabilities
Source: 2000 Census, SF 3, Table P41. Age by Types of Disability for the Civilian Noninstitutionalized Population 5 Years and Over.

Table 5 presents the disability data by age group for the Portland-Vancouver metropolitan area, as compared with the United States, Oregon, and Washington. The rates for Oregon and Washington are similar to those for the nation as a whole, but there is considerable variation by county and city in the metropolitan area, with the highest rates of disability in Columbia and Clark counties, and in the cities of Portland and Hillsboro.

Table 5: Persons with Disabilities, by Age Group, 2000

	Persons with disabilities			
Geographic area	**16 to 64**	**65 to 74**	**75+**	**65+**
United States	18.6	32.3	53.6	41.9
Oregon	17.4	30.8	53.0	41.5
Washington	17.2	31.7	53.9	42.3
Portland-Vancouver PMSA	16.2	29.8	52.9	41.2
Counties:				
Clackamas	14.9	27.5	51.4	38.8
Columbia	18.1	33.4	58.7	44.7
Multnomah	17.4	31.4	52.1	42.1
Washington	13.9	27.0	51.7	39.3
Yamhill	18.4	26.8	52.7	39.4
Clark	17.3	32.8	57.3	44.2
Cities:				
Portland	13.3	31.8	61.1	47.1
Vancouver	17.3	33.8	53.1	43.5
Gresham	14.9	28.6	55.2	41.5
Beaverton	17.6	31.5	52.6	42.5
Hillsboro	18.1	35.6	58.6	47.2

Universe: Civilian noninstitutionalized persons 5 years and over.
Source: 2000 Census, SF 3, Table P42. Sex by Age by Disability Status by Employment Status for the Civilian Noninstitutionalized Population 5 Years and Over.

KEY POINTS: It appears that rates of disability increased between 1990 and 2000, although this is quite likely due to differences in definition and data presentation in the two censuses. There is variation by county and city, indicating the possible need for special attention to issues of disability among older adults in certain areas.

Housing and Spatial Location Patterns

What type of housing do older people live in?

Current Patterns: Owning vs. Renting

Existing Literature

The Administration on Aging (AOA, 2005) found that of the 21.6 million households that were headed by older persons in 2003, 80% were owners and 20% were renters. A series of six studies of the home ownership status of those aged 55 or over by AARP between 1986 and 2003 found a slight increase in the percentage of owners, from 79% in 1986 to 85% in 2003 (AARP, 2003). A U.S. HUD report (1999) analyzed group differences in home ownership and found that ownership varies by age, gender and ethnicity. The 62-74 year old cohort had the highest rate of ownership, at 81.2%. Although 81% of all white non-Hispanic older adults owned their home, the same was not true for minorities, women, and persons with low incomes. Elderly women had a home ownership rate of 70%. Among African American elders, the rate of home ownership was 65%, and it was 60% among Hispanic elders. Among seniors with incomes below $10,000/year, the rate was 59%. Similarly, older (aged 62+) renters (5 million people) tended to be poorer, women, minorities and living alone in urban communities. Although the median family income of older homeowners was $25,353, that for renters was $13,540 (AOA, 2005). Home equity is the largest single component of wealth for older Americans, accounting for 43.6% of their total net worth (AOA, 2005).

KEY POINTS: Nationally, about 80% of older people own their own homes. Renters tend to be poorer than owners and more likely to be women and members of racial/ethnic minorities.

Data Analyses: Portland-Vancouver Region-Specific

As did the rate nationally, overall, Portland's rate of homeownership rose too during the 1990s and was sixth highest among the Brooking Institute's (2003) 23 "Living Cities."

In Portland in 2002, the group reaching retirement age (ages 55-64) had the highest home ownership rate (82%), closely followed by those aged 65+ (81%) (see Table 6). Overall, between 1995 and 2002, Portland's home ownership rate rose by 2%, but for those aged 55-64, it increased by 6%.

Table 6: Homeownership of householders by age, 1995 and 2002, Portland region

	% of householders who are owners		
Year	**55 - 64**	**65+**	**All**
1995	76%	81%	65%
2002	82%	81%	67%
% Change	6%	0%	2%

Source: American Housing Survey, Portland region, 1995 and 2002

White older adult householders were most likely to be homeowners. African American householders and householders of Spanish origin had considerably lower rates of homeownership (see Table 7). However, ownership rates for African American householders did increase with age. As found nationally, older female householders in Portland were less likely to be homeowners than males (see Table 8).

Table 7: Homeownership of householders by age and race, 2002, Portland region

	% of householders who are owners			
Race	**45 - 54**	**55 - 64**	**65+**	**All households**
White	78%	83%	82%	69%
African American	22%	45%	50%	32%
Asian	70%	80%	72%	44%
All races	77%	82%	81%	69%

Source: American Housing Survey, Portland region, 2002

Table 8: Homeownership of householders by age and sex, 2002, Portland region

	% of householders who are owners		
Gender	**45 - 54**	**55 - 64**	**65+**
Male	79%	84%	87%
Female	74%	78%	76%

Source: American Housing Survey, Portland region, 2002

Renters had a lower median family income than owners: the median family income for those aged 65+ in 2002 was $27,500 for owners, compared to $12,150 for renters. Older adults who had a family income of less than $10,000 were more likely to be renters (see Table 9). The AHS did ask detailed information about income and government assistance. Only about three percent of householders 65 and older in 2002 indicated that they received a government subsidy for their rent and less than one percent indicated that they received a voucher to help pay rent.

Table 9: Householders who rent by age and income, 2002, Portland region

	% of	
Age	**All households**	**Households with family income of < $10,000**
45 – 54	23%	48%
55 – 64	17%	41%
65+	18%	37%

Source: American Housing Survey, Portland region, 2002

KEY POINTS: Home ownership patterns in the Portland-Vancouver metropolitan region mirror those of the nation. Those aged 55 and older are most likely to own their own homes, and white older adult householders are most likely to be homeowners. Women are less likely to be homeowners than men, and renters have lower incomes than owners. Home ownership rates increased most among the 55 to 65 year-old age group between 1995 and 2002.

Current Housing Patterns: Single-Family vs. Multiple Family

Existing Literature

As shown in Table 10, between 1989 and 2003, about 76% of people aged 55 and over lived in single-family detached homes. This compares to 70% in 1986, although the population surveyed in 1986 included only those 60+ (AARP, 2003). The percentages choosing multi-unit buildings, mobile homes, and semi-detached homes remained steady over that time. Fader (2000, as cited by Myers & Gearin, 2001), however, thinks that older households may become a niche market for large luxury townhouses.

Table 10: Type of housing for those aged 55+, 1986-2003

	1986+	1989	1992	1996	2000	2003
Single-family detached home	70%	76%	75%	74%	77%	77%
Multi-unit building	10	13	12	12	10	10
Mobile home	7	6	6	6	7	6
Semi-detached home	6	5	6	7	5	6
Other (boat, RV, van, etc.)	7	1	*	1	*	*

+The population surveyed in 1986 included only those aged 60 and older.

* Less than 0.5%

Base: Respondents age 55 and older (1986 n=1,500; 1989 n=1,511; 1992 n=1,503; 1996 n=1,026; 2000 n=1,204; 2003 n=1,202)

Source: Understanding Senior Housing, 1986, 1989, 1992, and 1996; Fixing to Stay, 2000; and These Four Walls, AARP, May 2003

In 2005, one-third of elderly (aged 62+) households had "severe" housing cost burdens, defined as spending 30 percent or more of household income for shelter; 14 percent of those aged 62+ spent more than 50 percent of their income in order to house themselves (AOA, 2005). A total of 12 percent of individuals aged 62 and older had "urgent" housing needs, defined by the U.S. HUD (1999) as spending more than 30% of their income and also receiving less than $10,000 per year in income. Renters in particular were three times as likely as homeowners to have "severe" housing cost burden (with 57% paying more than 30% of their income in rent).

KEY POINTS: Nationally, the preference for the single family home has remained at 70 -77% among those aged 55+ since 1986. High housing cost burden may limit housing options, particularly for renters.

Data Analyses: Portland-Vancouver Region-Specific

In Portland specifically, 40.9% of renters of all ages paid 30% or more of their income in rent, giving Portland a ranking of eighth highest in severe housing burden among the Brookings Institute's 23 "Living Cities" (2003).

Between 1995 and 2001 in Portland, there was a small (3 percentage point) increase in the percentage of the pre-retirement householders (55-64 year-olds) who lived in single-family, detached homes (see Table 11 and Figure 4). Older adult householders (65+) did not experience large changes in the type of structure in which they lived. There was a very small (1 percentage point) increase in the share of householders aged 65+ living in single-family attached homes and apartments. The 2002 AHS also asked whether householders 55 years of age and older lived in an age-restricted development. Of the Portland region's householders aged 55 to 64, only 5% did; however, 17% of householders aged 65 and older lived in an age-restricted development.

Table 11: Structure type by age of householder, 1995 and 2002, Portland region

	% of householders											
	Single-family, detached			Single-family, attached			Apartment with 2 or more units			Mobile & manufactured home		
Year	45-54	55–64	65+	45-54	55–64	65+	45-54	55–64	65+	45-54	55–64	65+
1995	78%	73%	65%	3%	5%	6%	14%	15%	16%	5%	6%	13%
2002	77%	76%	65%	4%	4%	7%	15%	13%	17%	5%	7%	11%
% Change	-1%	3%	0%	1%	-1%	1%	1%	-2%	1%	0%	1%	-2%

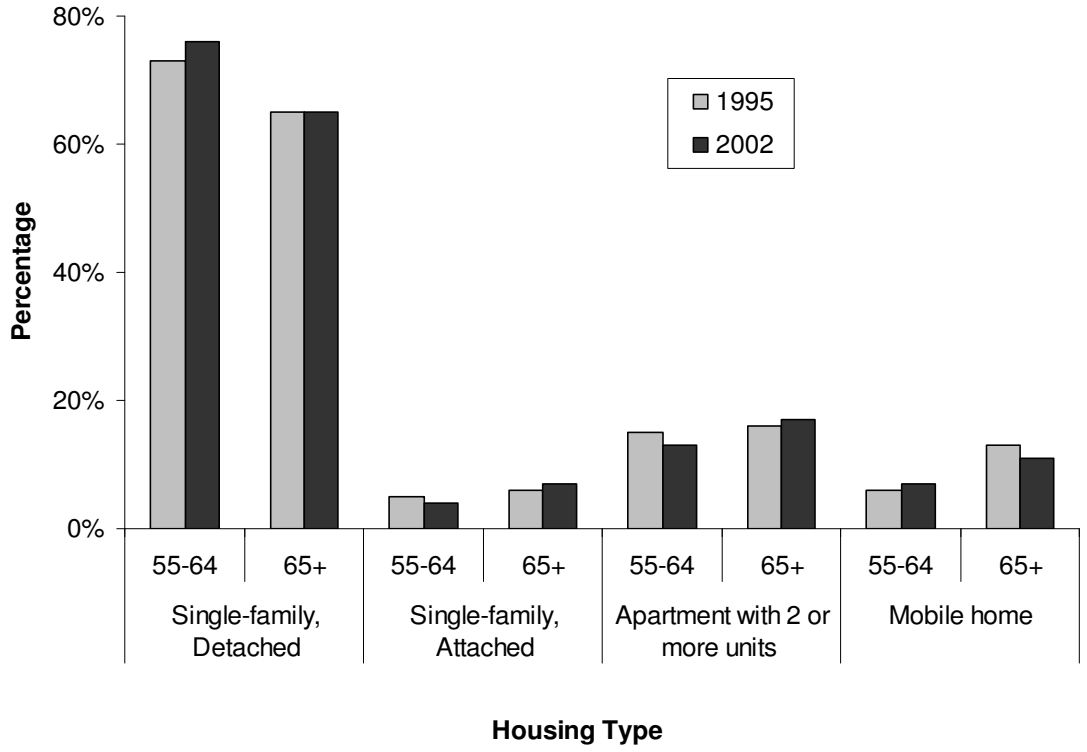


Figure 4: Type of housing for those aged 55+, Portland, 1995 and 2002

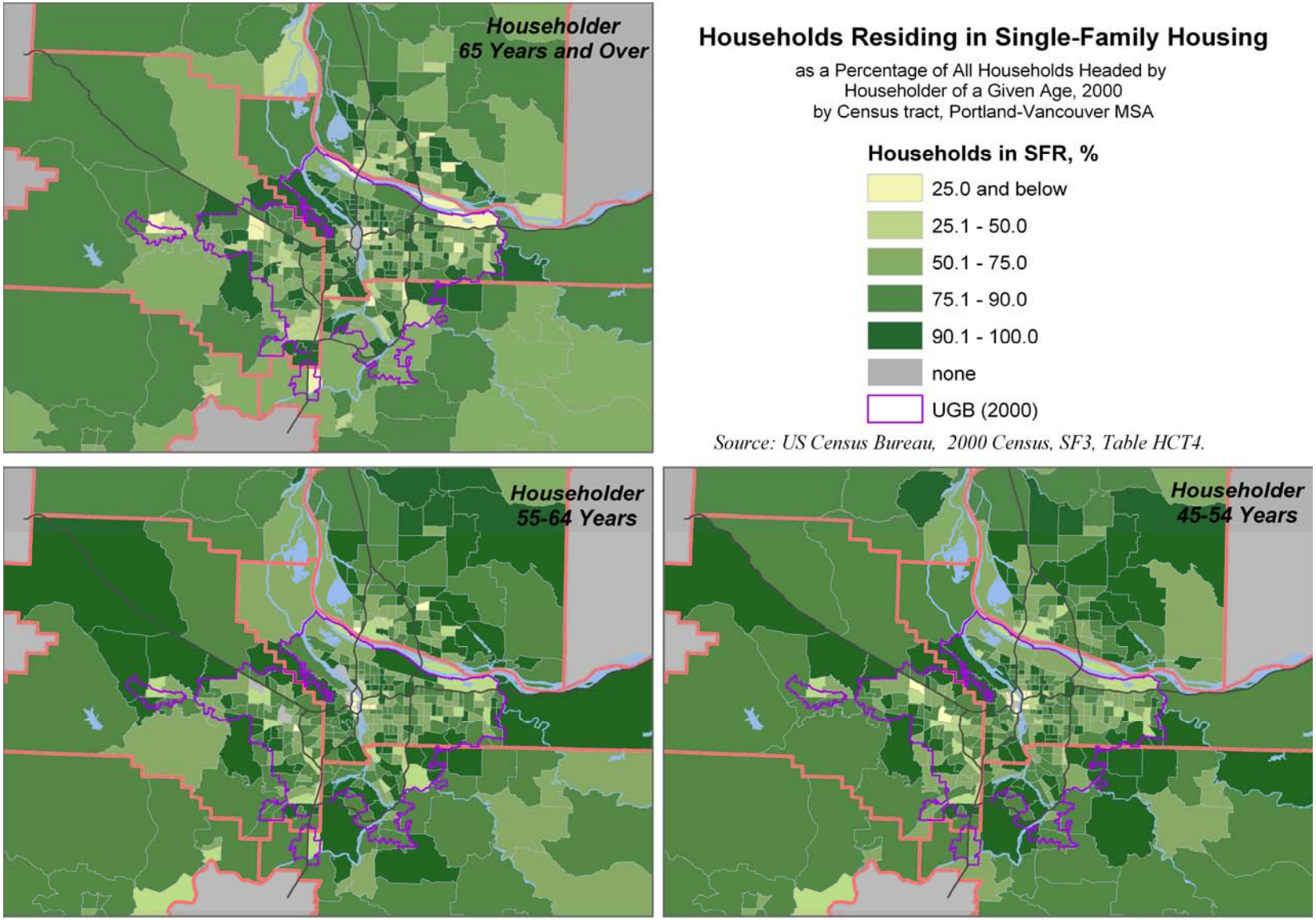
Source: American Housing Survey, Portland, 1995 and 2002

KEY POINTS: Locally, too, the preference for the single family detached home is high, and grew among those aged 55-64. There were minimal changes in the type of structure in which older adults (55+) lived between 1995 and 2002. Householders aged 65+ are more likely than those aged 55 to 64 to live in an age-restricted development. Portland has high housing costs, and received the 8th highest ranking for severe housing cost burden among 23 "Living Cities" examined by the Brookings Institute.

Figure 5, Figure 6, and Figure 7 show the spatial distribution of households by age group (45 - 54, 55 - 64, and 65+) and by type of housing (single-family, multiple family, and mobile home or other housing). Although the overall distributions by age of households residing in single-family homes are similar (see Figure 5), some differences emerge. There are fewer Census tracts in the highest category (90 to 100 percent of households residing in single-family homes) among households headed by persons 65 years old and over, and these tracts are more likely to be located in inner north, north-east, and outer parts on the east side of Portland, and somewhat less likely to be located outside the urban growth boundary. Such tracts are spread more broadly into rural areas for the remaining two age groups. Higher concentrations of households headed by persons 55-64 years old living in single family homes are found on the west side, in better-off neighborhoods and cities: West Hills, Hillsdale, Riverdale, Lake Oswego, West Linn, Stafford Triangle. The trends are fairly similar to those for households headed by 45-54 year-olds.

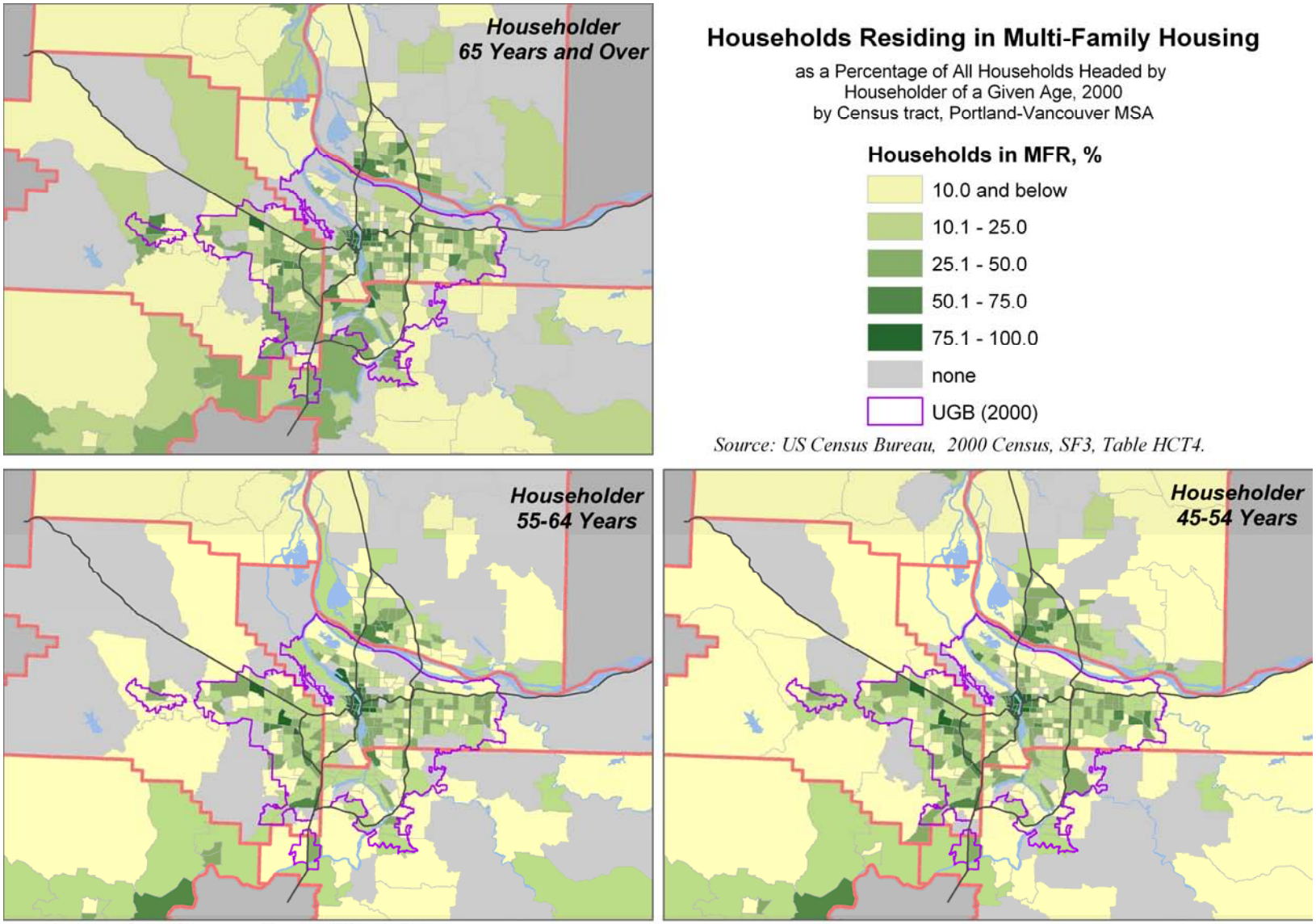
In general the spatial distribution of households residing in multi-family housing appears to differ little by age group and depends mainly on where such housing is located (see Figure 6). Still, householders aged 65+ are more likely to live in multi-family housing near Portland's core (West Hills, Hillsdale), in inner suburbs (Raleigh Hills, east Vancouver), in the northwestern corner of Clackamas county, and in eastern Yamhill county. These older households also are somewhat more concentrated in rural tracts of Washington, Clark, and Columbia counties. Younger (age 45 to 64) households residing in multi-family housing are found primarily inside the urban growth boundary and in eastern parts of Yamhill county.

Mobile homes and other housing (boats, RVs, etc.) are much more likely to be located in rural areas (see Figure 7); there are few tracts inside the urban growth boundary inexpensive enough for mobile home parks. The likelihood of residing in mobile homes and other housing increases with age: 4.6 percent of households headed by someone aged 45-54 years, 6.8 percent of households aged 55-64 years, and 9.2 percent of older households resided in such housing in Portland-Vancouver PMSA in the year 2000. Those 65+ are more likely to live in mobile homes in rural locations, especially so in Clark county.



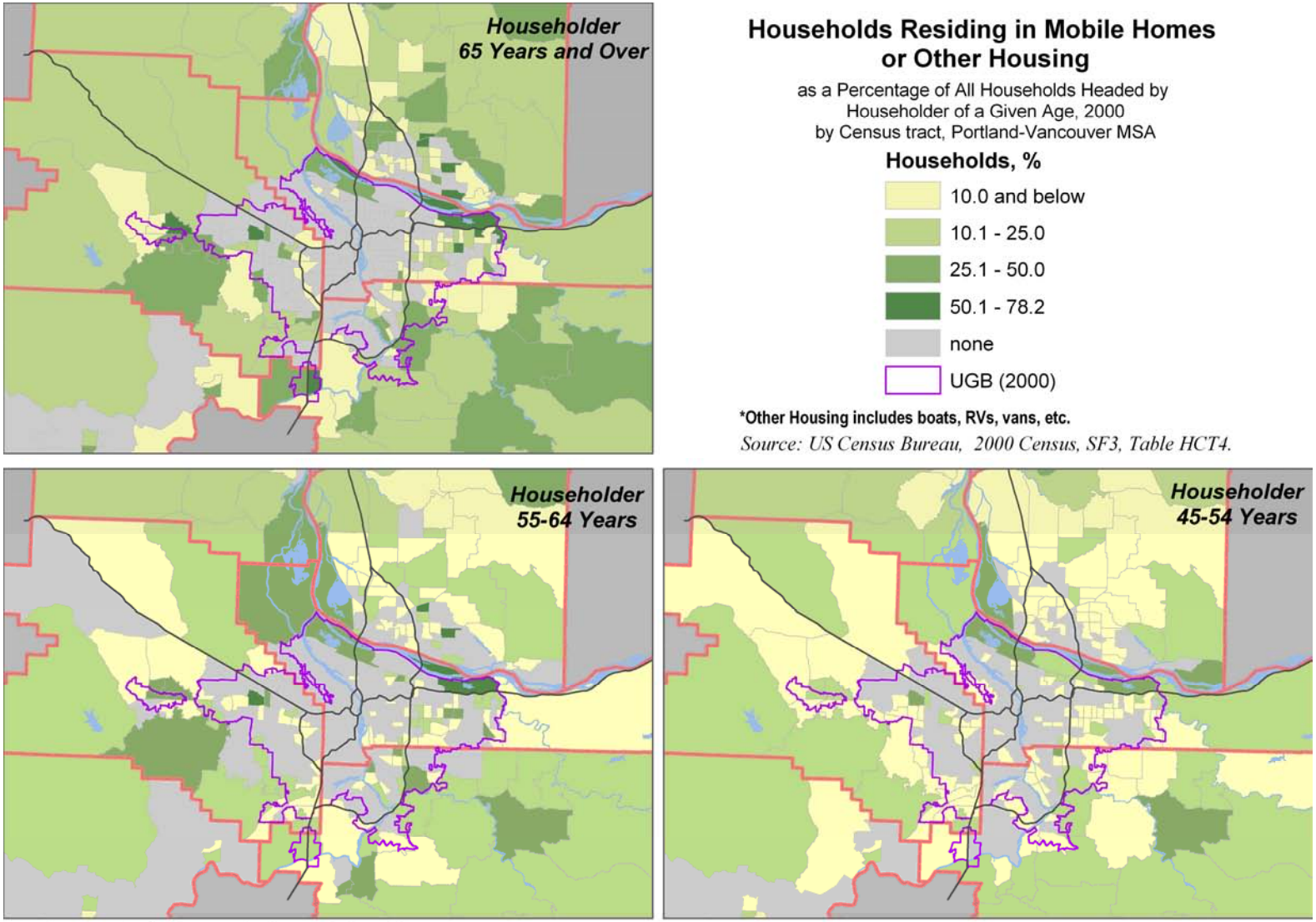
Map by: Population Research Center, PSU (2006)

Figure 5: Proportion of Households by Age of Householder Residing in Single-Family Housing, by Census Tract (2000)



Map by: Population Research Center, PSU (2006)

Figure 6: Proportion of Households by Age of Householder Residing in Multi-Family Housing, by Census Tract (2000)



Map by: Population Research Center, PSU (2006)

Figure 7: Proportion of Households by Age of Householder Residing in Mobile Homes and Other Housing, by Census Tract (2000)

Another approach to understanding the spatial distribution of older populations is to look at the index of dissimilarity by age group and housing type. This index shows what percentage of a given population subgroup would need to be moved to a different Census tract in the study area in order to achieve the same spatial distribution for them as for the comparison variable, "all households." The Index of Dissimilarity is often used to assess racial and ethnic segregation; in this case, higher scores indicate segregation by age and house type. Figure 8 shows this index for the 6-county Portland-Vancouver PMSA.

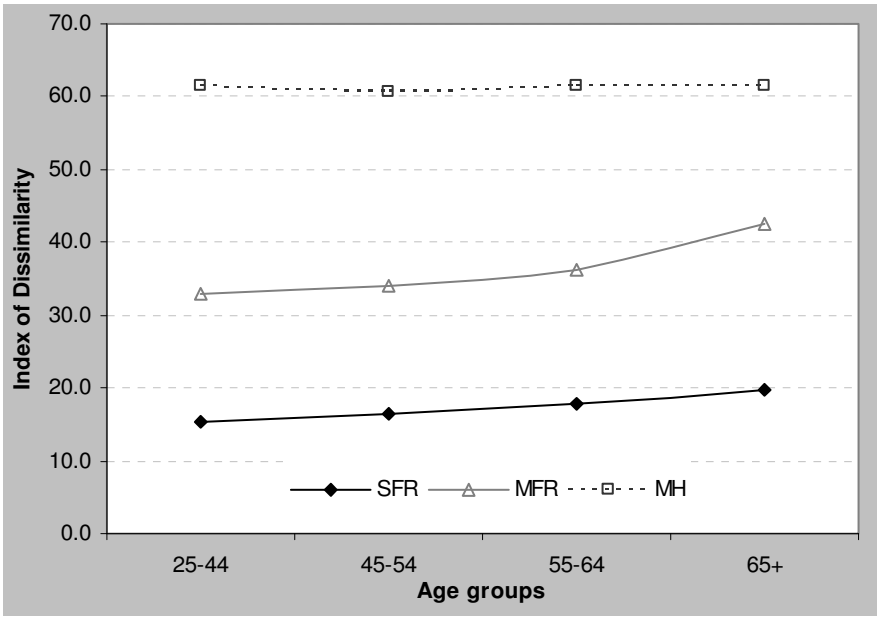


Figure 8: Index of dissimilarity between all households and households by housing type and age of householder, 2000 Portland-Vancouver PMSA

Source: Authors' calculations from tract-level 2000 Census data.

Figure 8 shows that single family homes are distributed across the region in a pattern quite similar to the spatial distribution of all households, while multifamily housing is more concentrated, and mobile homes are concentrated in just a handful of Census tracts. Spatial concentration tend to increase with age: households headed by those aged 65 years and over are most concentrated, particularly among households residing in multi-family housing (the Index is 10 percentage points higher for this group than for those aged 25 to 44 years and 6 percentage points higher than for the 55-64 age group).

KEY POINTS: There is some spatial variation by age within housing type. Householders aged 65+ in single-family homes are more likely to be located in inner north, north-east, and outer parts on the east side of Portland, and less likely to be located outside the urban growth boundary. Baby boomer households in single-family homes are more likely to be located outside the urban growth boundary and to be in higher income neighborhoods and cities. Among those in multi-family housing, householders aged 65+ are more likely to live near Portland's core (West Hills, Hillsdale), in inner suburbs (Raleigh Hills, east Vancouver), in the northwestern corner

of Clackamas county, and in eastern Yamhill county, and are also somewhat more concentrated in rural tracts of Washington, Clark, and Columbia counties. Baby boomer households residing in multi-family housing are found primarily inside the urban growth boundary and in eastern parts of Yamhill county. Mobile homes and other housing (e.g., boats, RVs) are much more likely to be located in rural areas. Persons aged 65+ are more likely than younger persons to reside in mobile homes.

Future Patterns: Aging in Place

Existing Literature

The vast majority of adults aged 50+ would prefer to stay where they are currently living; this is especially true among those aged 65 and older (AARP, 2005). As reported by AARP (2005), older Americans plan to stay in their current community for at least 5 years (about 79% of those aged 50-64 and 83% of those aged 65+), and wish to stay in their own homes "as long as possible" (77% of those aged 50-64 and fully 93% of those aged 65+) (see Figure 9).

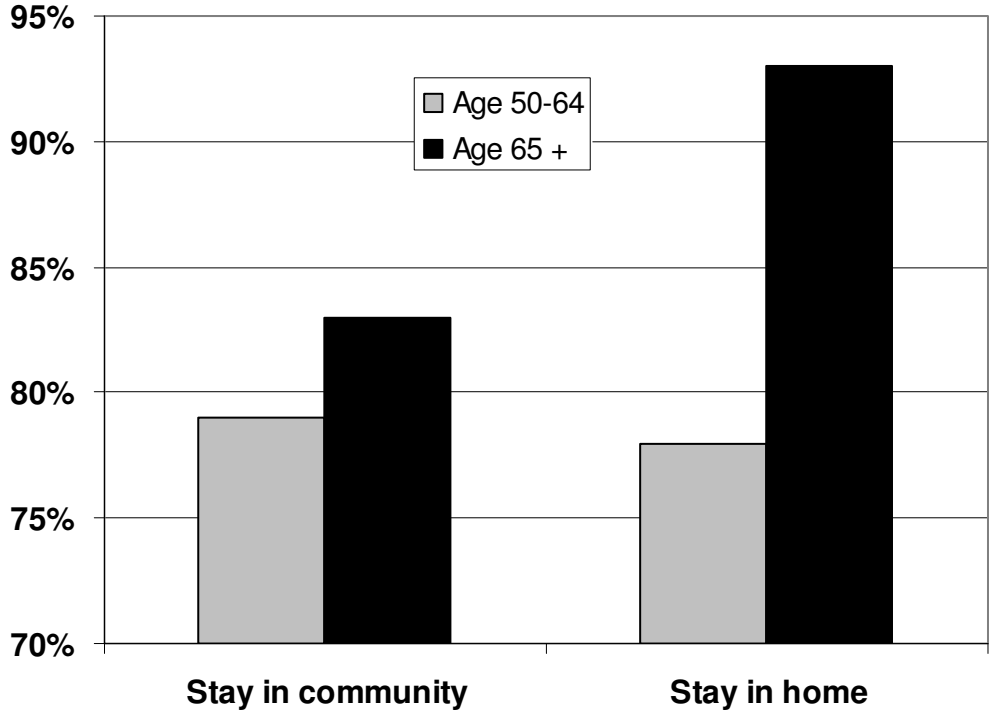


Figure 9: Preference to remain in community and home

Source: AARP (2005)

Another estimate comes from the AdvantAge survey, which found that 93% of those 65 and older wanted to remain in their home and neighborhood (Feldman, Oberlink, Simantov &

Gursen, 2004). The viability of this preference to age in place depends on many factors, including the type of housing that one is living in, the support systems that are available, and one's ability to remain independent based on mobility options and access to services. In addition to remaining in their own community and current home, the vast majority (75%) of older adults aged 70+ live in "conventional" housing rather than age-segregated or supportive housing (see Figure 10; Shafer, 2000).

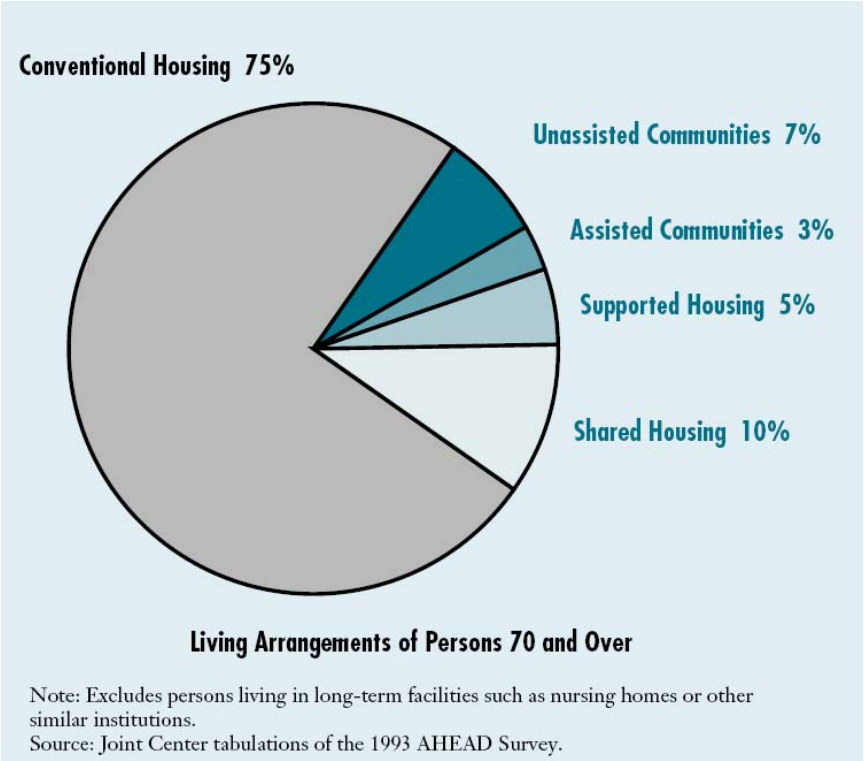


Figure 10: Seniors living in conventional housing

These patterns may change somewhat as the housing choices designed specifically for older populations become more diverse (Regnier, 2003). Regnier expects more integration between homes in the community and purpose-built structures for older adults, with outreach of services to private homes. He notes that housing options, such as co-housing (combining independent living with voluntary shared spaces and activities) and housing on college campuses for elders, are developing.

KEY POINTS: Although the vast majority of older people prefer to "age in place" in their community and current home, those just reaching retirement age (50-64) are more likely to consider moving to a new home, if not a new community.

Future Patterns: Preferences for Housing Features

Existing Literature

Blake and Simic (2005) explored historical patterns and projected trends in elderly housing consumption. They argued that homeownership rates will continue to increase through 2030, partly because baby boomers have the highest home ownership rate of any cohort. Thus, the proportion of older adults who live in apartments is expected to decline, while the proportion of those living in single family attached housing likely will decrease slightly until 2030 (for those aged 45-54 and 55-61) or show rises that increase with age for the 62-74, 75-84, and 85+ age groups..

AARP's report *These Four Walls…Americans 45+ Talk about Home and Community* (2003) presents statistics on preferred housing and community characteristics among those 45+. More than 80% of respondents preferred to have services close to their homes or dwellings, with highest preferences for being near a hospital, shopping, grocery store and place to worship. Another 78% of those surveyed said sidewalks and availability of door-to-door transit were very or somewhat important characteristics to have in a neighborhood. Moderate gaps (at least a 20% difference) were found between what respondents preferred and what they currently experienced with respect to their location near a grocery store, doctor's office, drug store, and hospital. These findings are consistent with a recent local study conducted by Peterson (2006) for TriMet, which found that seniors in the tri-county area served by TriMet prefer to live in communities with a level of housing density that provides good sidewalks, and amenities and services that are within walking distance.

Myers and Gearin (2001) uncovered trends in housing preferences that led them to believe that households with residents aged 45 and older may have a particular interest in more densely configured homes in central locations. Although data from the National Association of Home Builders (NAHB) survey showed that 83 percent of respondents prefer single family detached homes in the suburbs, Myers and Gearin (2001) concluded that the age 45 and older population may be a market segment that can be targeted by policy makers and developers for higher density living. As revealed in Figure 11, those aged 45 and older are considerably more likely than younger adults to prefer a town house in the city to a larger detached home in the suburbs if asked to choose between the two.

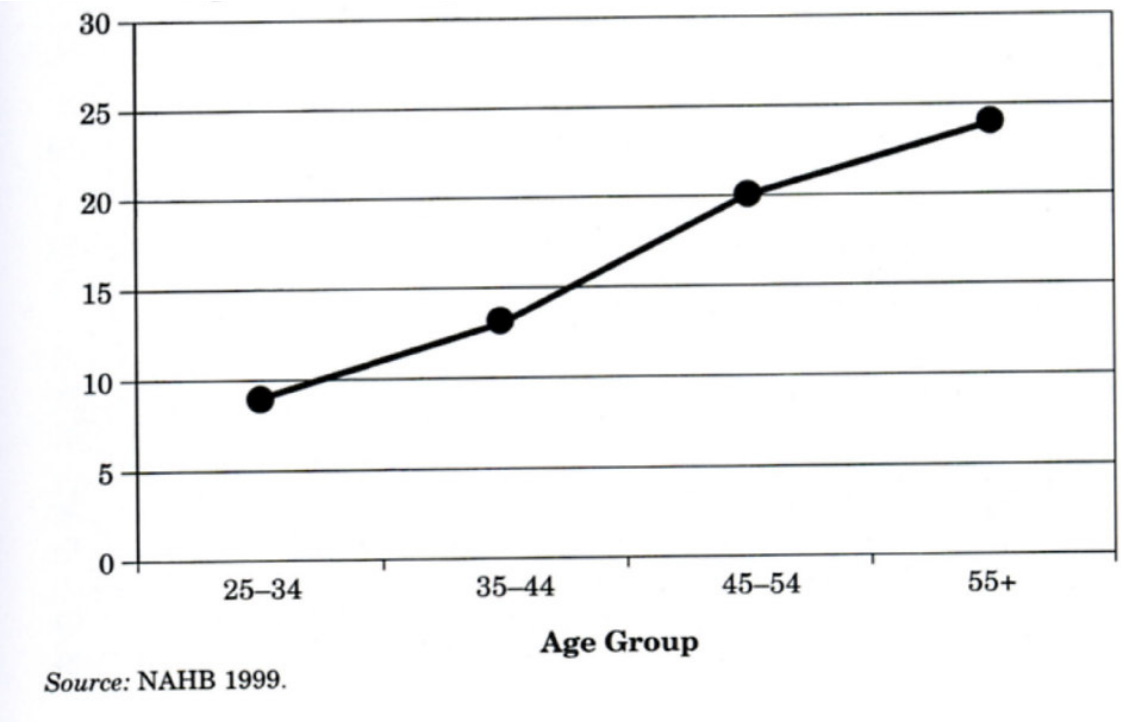
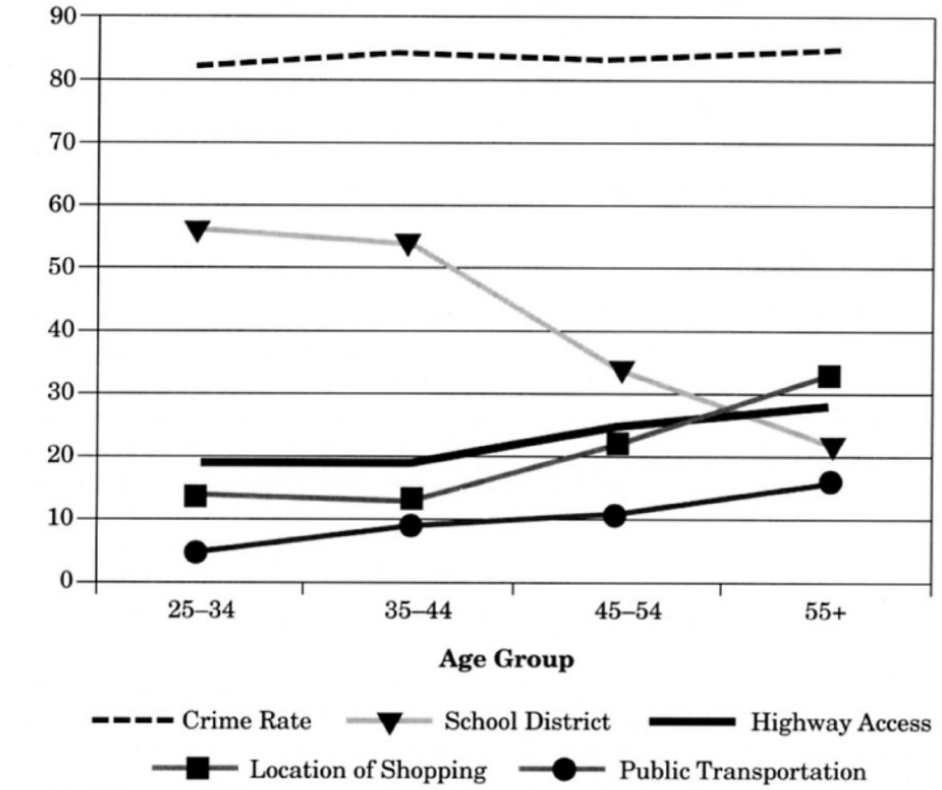


Figure 11: Percentage Preferring a Townhouse in the City

Source: Myers and Gearin (2001)

Myers and Gearin (2001) also conducted subgroup analyses of the NAHB data (N = 1,180) to identify age differences in factors that would be important to respondents if they were to buy a new home. As shown in Figure 12, preferences for nearby shopping, highway access, and public transit increased with age, while the school district receded as an important factor.



Source: NAHB 1999.

Figure 12: Percentage Calling a Particular Factor Very Important if Buying a Home Today

Source: Myers and Gearin (2001)

Based on these data, Myers and Gearin (2001) concluded that the baby boom cohort may demand denser, more walkable neighborhoods. They argued that this demand will grow among the 45+ population in two particular target market populations: "lifestyle renters" (those likely to move to rental units for persons aged 25 and older with at least $40,000 in income) and "compact-city home buyers" (those who prefer denser, more central, accessible, and compact residential locations) (p. 652). They projected that lifestyle renters aged 45 and over will represent one-fifth of all rental growth in the future, and that compact-city home buyers will double, from 15.4 percent in the 1990s to 31 percent in the 2000s, among those 45 years of age and older. Other trends may also increase the future demand for denser environments, including mounting traffic congestion, decreased crime, immigration and enhanced urban vitality, growth of a café culture, the fashionable design of higher density for the middle class, and positive examples created by growing densification (Myers & Gearin, 2001).

As part of a qualitative methods class for planners, PSU planning students conducted interviews and focus groups with 20 downtown residents between the ages of 50 and 80, the majority of whom were renters (Chapman, Carder et al., 1999). Although small in size, the

sample was varied, ranging from residents of condos in the Pearl to those in subsidized housing. Chief reasons for moving downtown were access to social and cultural events (60%), living closer to work (40%) and affordability (20%; multiple answers allowed). Respondents valued the convenience of being able to reach what they needed by walking or mass transit, and the freedom for some of not owning a car. The detractions of urban living were noise, pollution, and traffic. The majority had moved into an apartment or condo from a single family home, and found apartment living had both its positives and negatives. Some were concerned about affordability as rents increased over the longer term. Home ownership allows older people to defer maintenance or perhaps use their equity as a reverse mortgage in order to remain in their homes. Several described their concerns regarding their future health and physical abilities and the need to have properly designed buildings and supportive management. One specific worry was that high-rise buildings might be difficult to evacuate for those with disabilities.

KEY POINTS: The continuing trend toward "aging in place" is likely to mean that the majority of older adults will continue to living in single family homes and in the suburbs. There are a number of indications, however, that baby boomers are more likely than younger adults to have a preference for more walkable locations, public transit, and higher density living.

With respect to features within the residence, there is a preference for a full bath and a bedroom on the main level as well as an entrance without steps (AARP, 2003). About one quarter of older adults have limitations with basic mobility tasks such as walking and climbing stairs (Herman et al., 2005), making the multiple-story houses, townhouses, and rowhouses common in higher density areas often unsuitable for "aging in place."

KEY POINTS: Developers of higher density housing need to rethink their design for an aging population if they are to be successful at attracting and retaining older adults.

Data Analyses: Portland-Vancouver Region-Specific

The share of older adult householders living in a neighborhood with higher density apartment buildings increased from 1995 to 2002 in the Portland region (see Figure 13 and Figure 14). This may reflect an increasing densification of the region.

However, the percentage of householders who live in areas where respondents reported having access to public transit declined between 1995 and 2002 (see Figure 15). At the same time, a higher percentage of households had at least one person who took public transit regularly in 2002, compared to 1995 (see Figure 16).

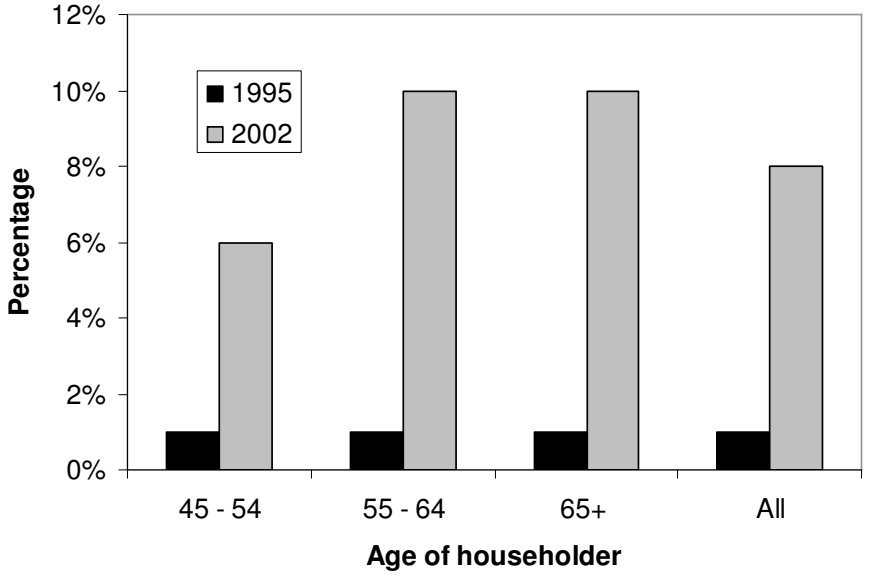


Figure 13: Share of householders by age living in home with 4-6 story apartment buildings within ½ block, 1995 and 2002, Portland region

Source: 1995 and 2002 AHS, Portland region

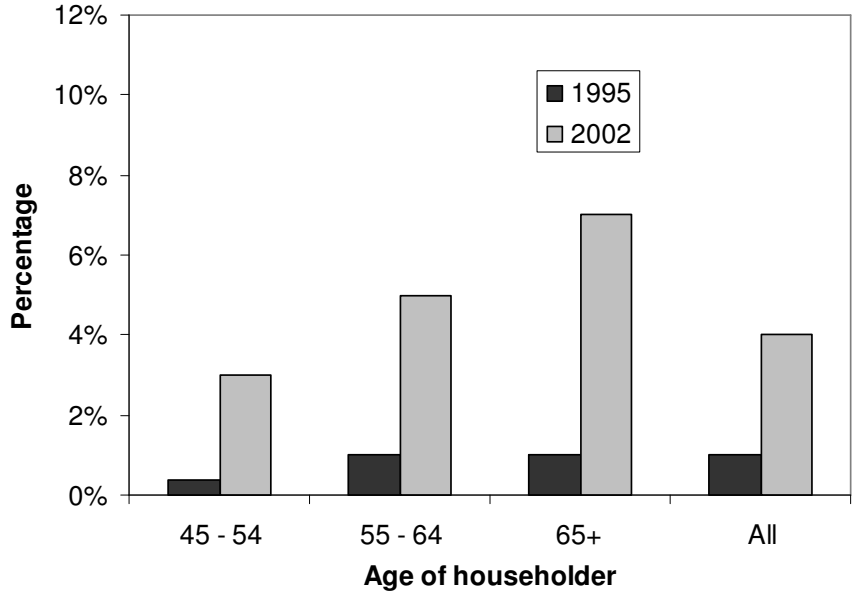


Figure 14: Share of householders by age living in home with 7+ story apartment buildings within ½ block, 1995 and 2002, Portland region

Source: 1995 and 2002 AHS, Portland region

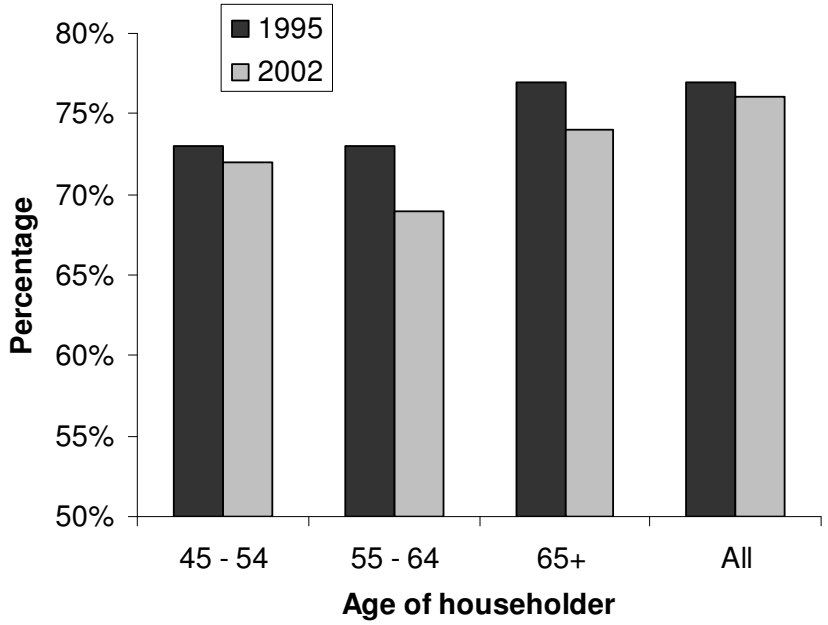


Figure 15: Householders with public transportation in the area, Portland region, 1995 and 2002

Source: 1995 and 2002 AHS, Portland region

Figure 16: Someone in household uses public transportation, Portland region, 1995 and 2002

Source: 1995 and 2002 AHS, Portland region

KEY POINTS: There was an increase between 1995 and 2002 among baby boomers and older adult households who lived in a neighborhood with higher density apartment buildings 2002, but this may be due to the increased densification of the region rather than a preference for higher density living. Although fewer middle-aged and older adult households reported having access to public transportation, more reported regular use of public transportation by someone in the household.

How likely are people to move at different ages?

Existing Literature

Wolf and Longino (2005) provide evidence that the notion of "our increasingly mobile society" is a widespread, but false, belief. They found that mobility rates, both within and between states, have been falling among all age groups since about 1950. The only increase in interstate mobility occurred in the 45 to 64 age group. Myers and Gearin (2001) found that, between 1990 and 2000 and projected to 2010, the fraction of the population in each age group that moves within a five-year period declines from a high at ages 15-24 to a low among those aged 75+ (see Figure 17). Figure 17 also shows that the percentage who are owners following the move increases up until the age of 55, then falls among older age groups.

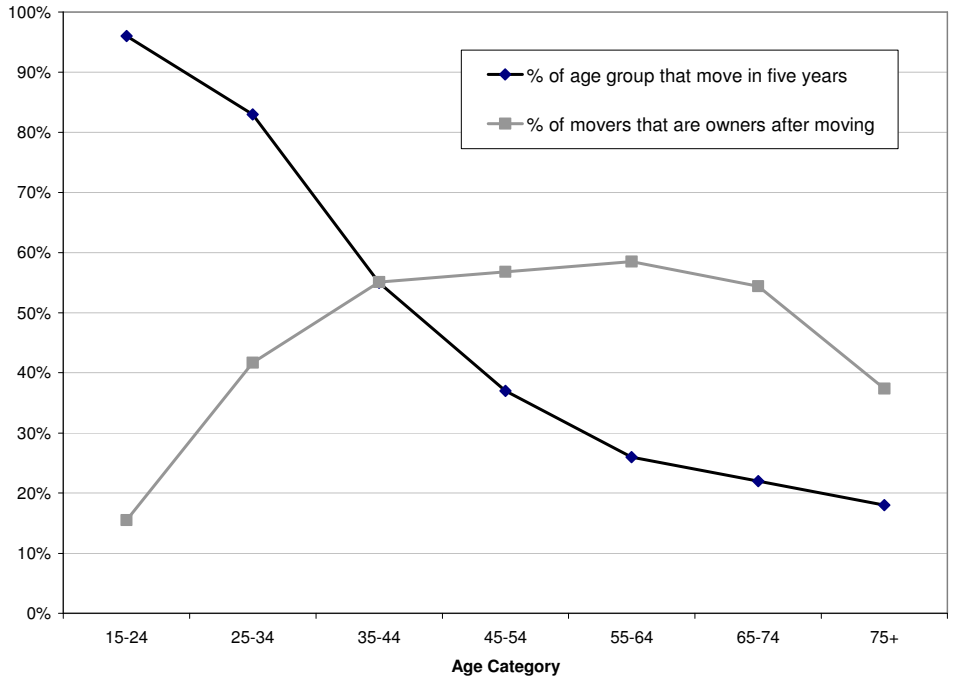


Figure 17: Moving and ownership by age group, U.S.

Sources: Joint Center for Housing Studies (2000 and 2010 data) in Masnick and Di, 2000; U.S. Bureau of the Census 1993 (summary Tape file 1 for 1990: Public Use Microdata Samples 1990 for moving data). Adapted from Myers & Gearin, 2001.

According to Harvard's Joint Center for Housing Studies (Shafer, 2000), most seniors lock in their housing choice before they reach the age of 60 (see Figure 18). This figure illustrates the age at which people in their 70s moved into their current home, with the largest number moving when they were under the age of 50. These findings are most extreme for owners: 53% of owners in their 70s and 45% of all households in their 70s moved into their current home when they were under age 50, whereas only 21% of owners in their 70s and 29% of all households in their 70s moved into their current home when they were 65+,

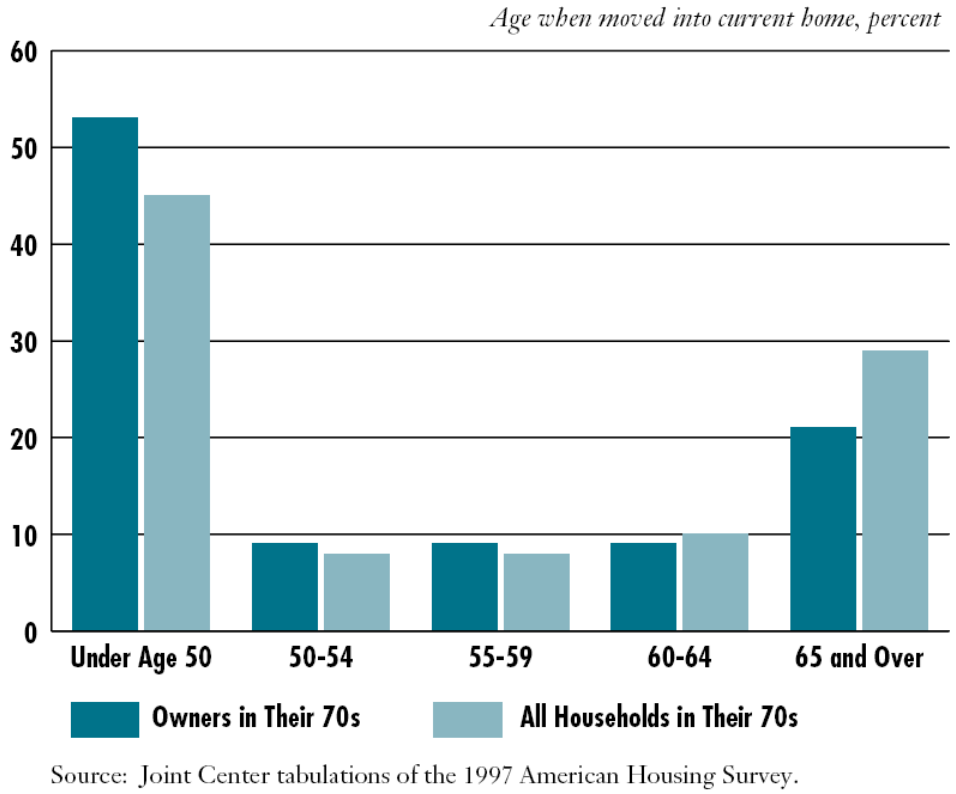


Figure 18: Age when moved into current home, 1997 US

A survey of 30-52 year-olds by AARP (1999) found that 21% expected to move to a new geographic area once they retired. Among a sample of 50-72 year-olds, Robison and Moen (2000) found that moving within two years was more likely among renters and among homeowners who had a mortgage, and less likely among those expecting to age in place. Moving was also more likely among men who retired during that two-year period and among women who experienced a change in marital status.

KEY POINTS: Nationally, most seniors lock in their housing choice before they reach the age of 60. The likelihood of moving declines with age; older (70+) householders are much more likely to have moved into the home they occupy before the age of 50 than after that age.

Data Analyses: Portland-Vancouver Region-Specific

The Portland AHS data confirm that the likelihood of moving declines with age (Figure 19). Less than 10% of householders 65 and older moved within the last two years. Moreover, 44% of householders 65 and older have lived in their current residence for more than 21 years (Figure 20). Householders 45-54 years old are more likely to have lived in their current home for five years or less. This indicates that the younger age group is the most important to target if the aim is to increase the older adult population in higher density areas in the long run.

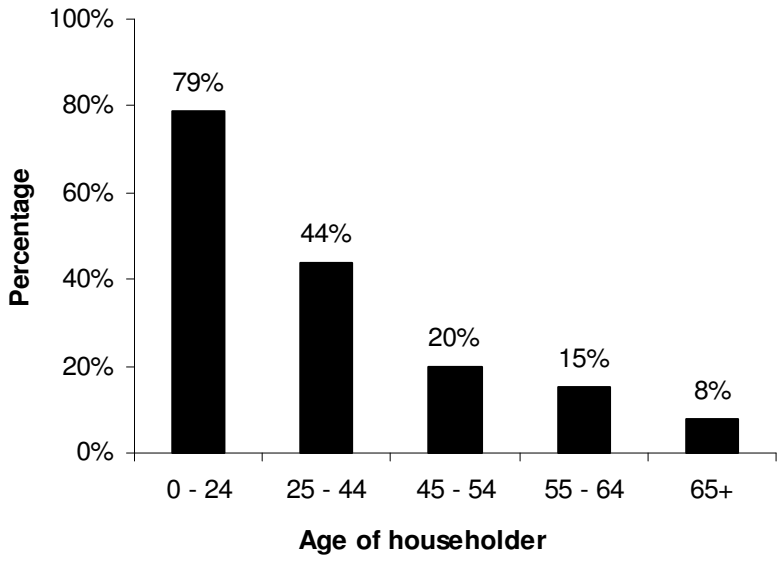


Figure 19: Share of householders that moved within last two years by age, 2002, Portland region

Source: 2002 AHS, Portland region

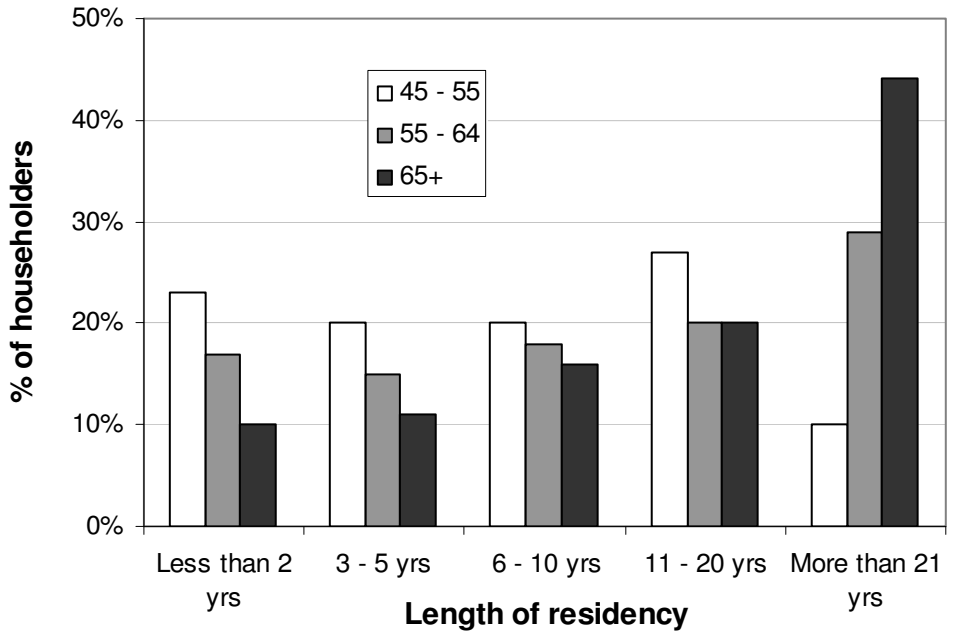


Figure 20: Length of residency by age, 2002, Portland region

Source: 2002 AHS, Portland region

When adults 65 and older do move in the Portland region, they are somewhat more likely than other older adults in the region to move to higher density housing. Older adult recent movers[2] are more likely than adults 45-64 to move into apartments (Figure 21). The percentage of recent movers living in apartments has increased for the reaching retirement group (55-65) and the seniors group (65+ yr old). Table 12 shows how older adults who did move in the past two years changed (or not) between housing types. Thirty-two percent of the householders 65 and older that did move, moved from a single-family detached home to a single-family attached home or apartment. This compares to 22% of householders age 45-54 and 21% of householders age 55-64.[3]

[2] A recent mover is defined differently for the 1995 and the 2002 AHS data: as someone who moved in the past 12 months for the 1995 data, and as someone who moved in the past two years for the 2002 data.

[3] Condominiums may be a subset of any of these housing types. Overall in Portland, according to the 2002 AHS, about 17% of the single-family attached units and 9% of the apartment units were condominiums or cooperatives.

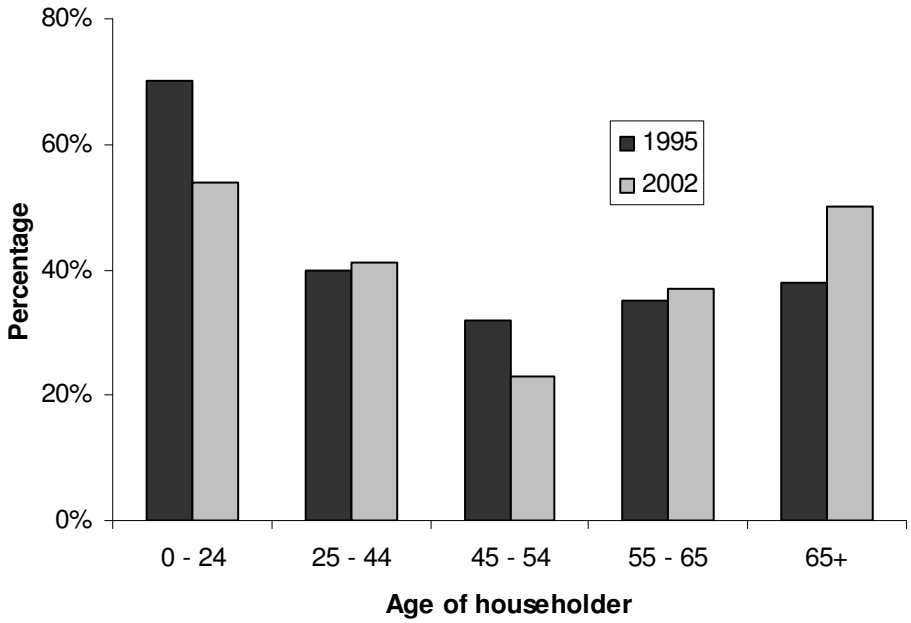


Figure 21: Percentage of recent movers living in apartments by age, 1995 and 2002, Portland

Source: 1995 and 2002 AHS, Portland region

Table 12: Change in housing structure type for recent movers, 2002 Portland region

Housing structure type		Age of recent mover householder		
Before	**After**	**45 – 55**	**55 – 64**	**65+**
House	Single-family house, detached	35.7%	32.8%	20.9%
	Single-family attached or apartment, owned	4.6	4.7	11.3
	Single-family attached or apartment, rented	17.2	17.7	20.2
	Mobile home	2.3	7.5	13.2
Apartment	Single-family house, detached	11.7	11.8	0.0
	Single-family attached or apartment, owned	1.1	1.3	8.0
	Single-family attached or apartment, rented	16.4	14.2	18.0
	Mobile home	1.5	1.8	0.0
Mobile home	All types	5.4	3.3	0.0
Other	All types	4.1	4.9	8.4
Total		100%	100%	100%
% of householders that are recent movers		20%	15%	8%

Note: Totals may not total 100.0% due to rounding

Source: 2002 AHS, Portland region. Householders who moved within the last two years.

KEY POINTS: Similar to the national findings, the likelihood of moving among older Portland householders declines with age. However, when older householders do move, they are more likely to move into higher density housing than middle-age adults.

Why do older adults in the Portland region move?

Adults aged 65 and older in the Portland region were more likely to move to improve the quality of their home or because they were changing ownership or rental status, compared to adults aged 45-64 (see Figure 22). The Census Bureau collected data on reasons for moving and found that 14% of adults 65 and older moved for health reasons (He, et al, 2005). This was not a specific response option on the AHS.

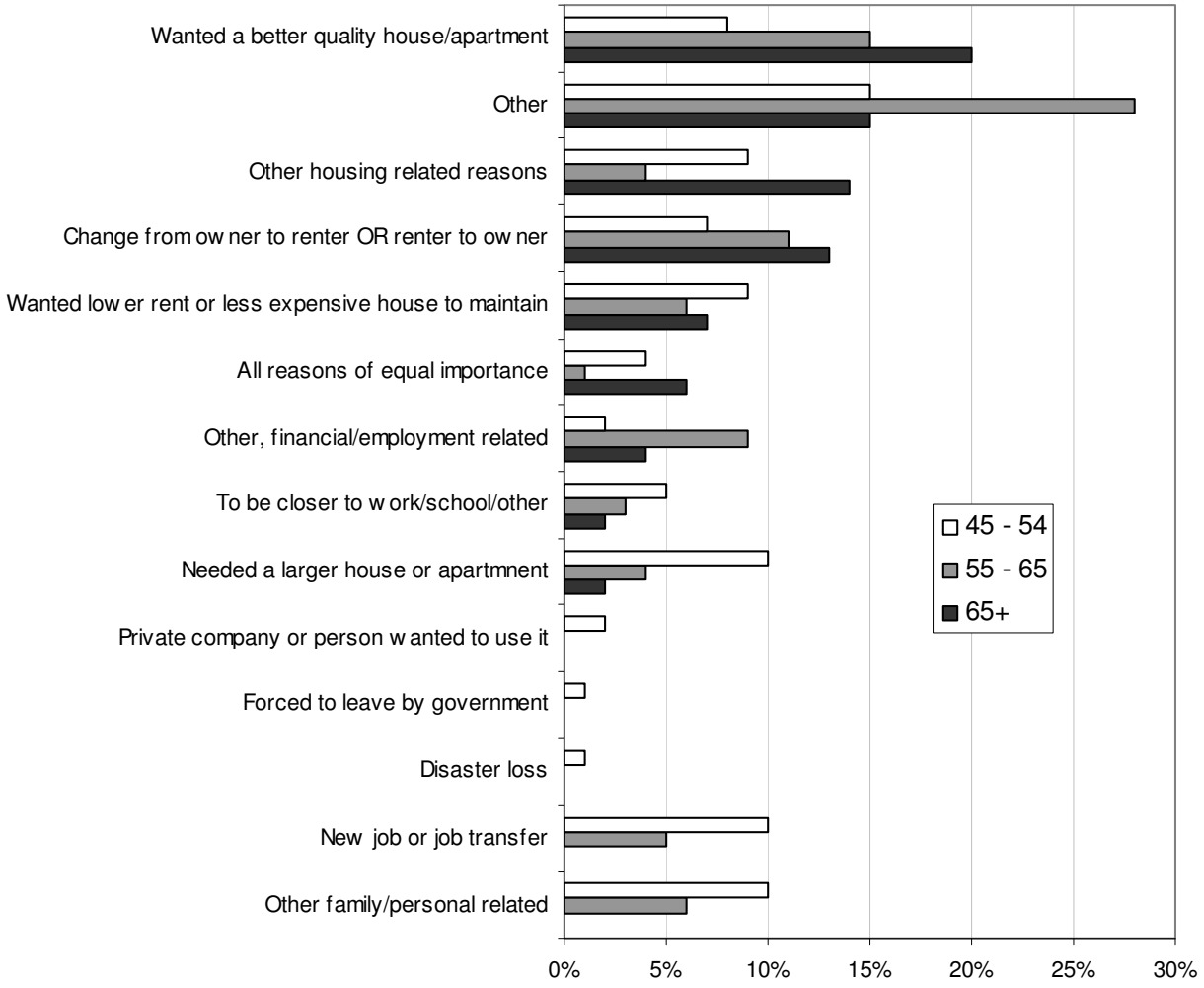


Figure 22: Main reason for moving, 2002 Portland region

Source: 2002 AHS, Portland region

Once they've decided to move, access to public transportation is not a primary consideration for older adults when they choose their new neighborhood. Less than five percent of recent movers age 65 and older gave this as the main reason they chose their new neighborhood (see Figure 23). Moreover, it's the main reason for an even smaller share of householders aged 45-64. If nearly half of householders aged 65 and older chose their home 20 or more years earlier, they are even less likely to be thinking about non-single-occupancy vehicle modes at that point in their lives. The particular house and being convenient to friends and relatives were among the most important reasons for moving among the oldest adults.

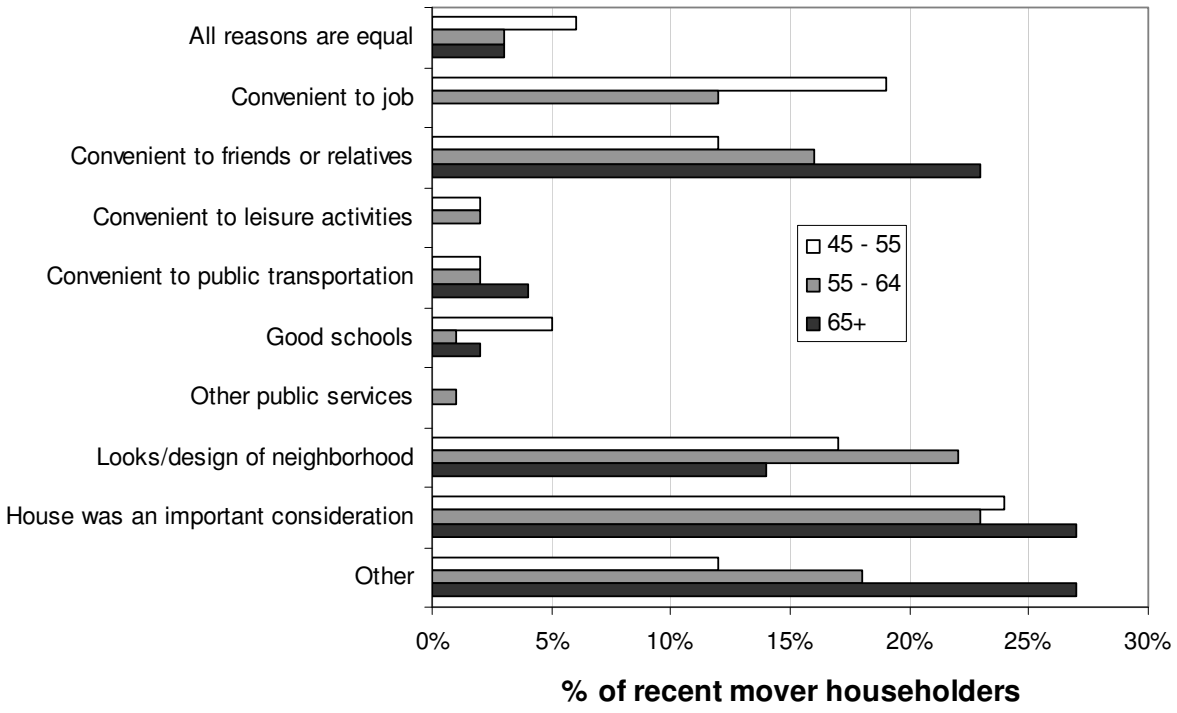


Figure 23: Main reason neighborhood was chosen, 2002 Portland region

Source: 2002 AHS, Portland region, householders who moved within the last two years.

KEY POINTS: When older adults do move, transit access is not a primary consideration when choosing a new neighborhood.

What is the Current and Future Spatial Distribution of Older People?

Existing Literature

In 2003, most persons aged 65+ lived in metropolitan areas (77.4%), with about 50% living in the suburbs, 27.2% in central cities, and 22.6% in nonmetropolitan areas (AOA, 2005). Prior to 1970, the largest concentrations of older persons were in rural counties, small towns and central cities (Golant, 1992). In the last thirty years, however, the older population has grown faster in metropolitan areas, particularly in suburbs, than in nonmetropolitan areas (AOA, 2005). The concentration of older people in suburbs is a consequence both of choices to remain in the homes and communities to which the now elders had moved during their child-rearing years and of the migration of older people to the suburbs (usually from central cities) (Golant, 1992).

Frey (2003) presented Census data showing that in the 1990s, the number of people aged 35 or older increased by 28 percent in the suburbs, compared to an increase of only 15 percent in the cities. Figure 24 shows changes in spatial location by age group.

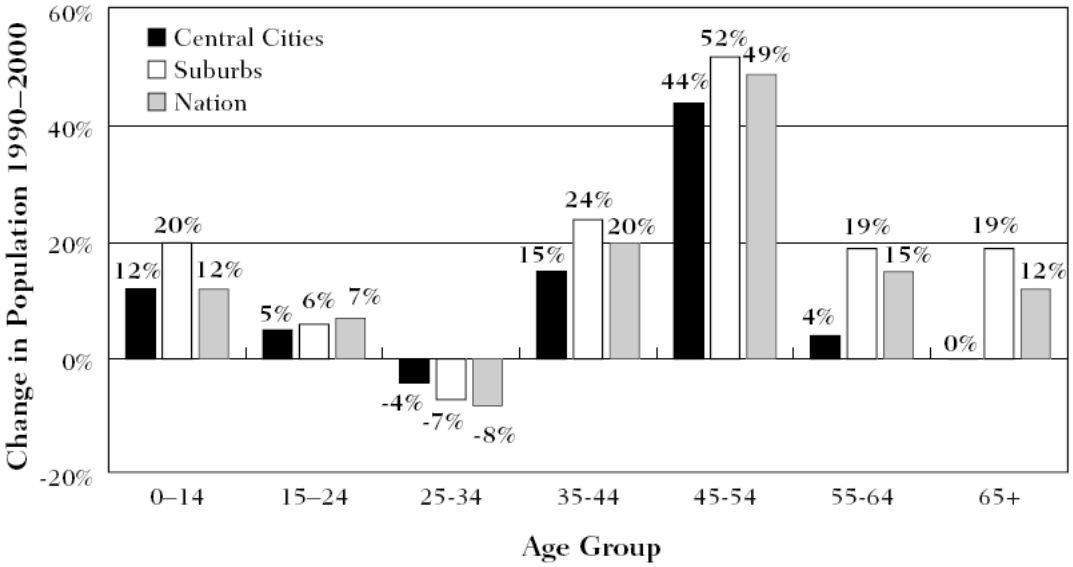


Figure 24: Population change by age group, central cities and suburbs, U.S. metro areas, 1990-2000

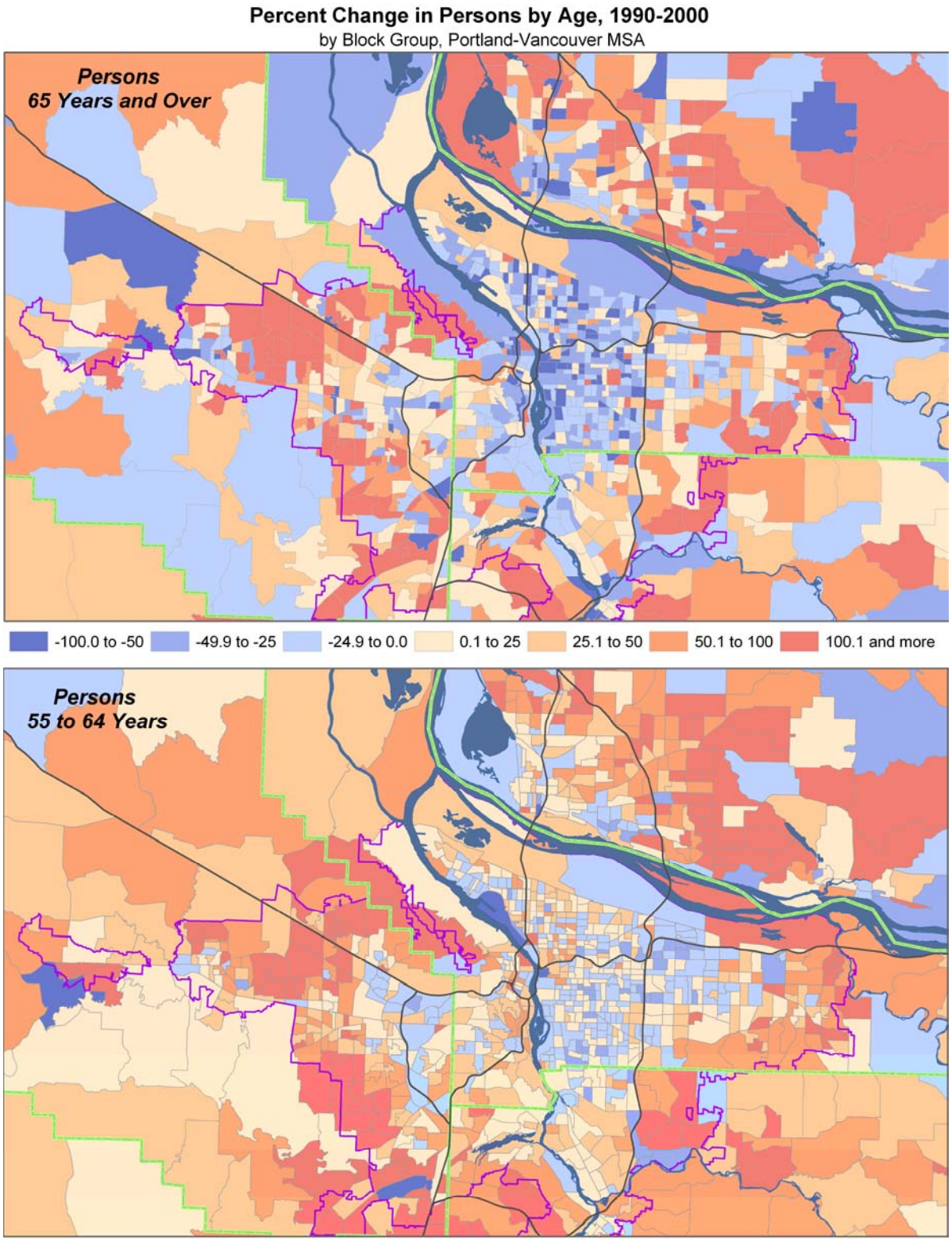
Source: Frey (2003)

According to Frey (2003), "Census 2000 reflects that the dominant growth of the suburbs in the 1990s across the demographic and economic landscape was heavily weighted towards age groups that are not traditionally thought of as 'suburban'—middle-aged family heads,

empty nesters, and retired seniors" (p. 4). Frey's city-specific statistics showed that persons aged 35-54 in Portland comprise a slightly higher share of the suburban population than the national average (31.7% vs. 31%) Given the locations where numbers of baby-boomers increased (see Figure 26), it appears that these boomers relocated from inside and outside the region rather than aged in place. The highest growth took place in areas with a lot of housing construction in the 1990s – those areas along the Portland urban growth boundary and in Clark County.

Figure 25 and Figure 26 show changes in the Portland region between 1990 and 2000 in the spatial distribution of three populations of interest: older persons (65+ years), persons of pre-retirement ages (i.e., those born in 1936 through 1945), and baby boomers (i.e., those born in 1946 through 1964). Comparing those in retirement and pre-retirement years, many similarities as well as several differences emerge (Figure 25). Overall, the number of persons 65 years of age and older decreased across the city of Portland, especially in the central eastside, northwest and large parts of southeast Portland. Declines were lower on the west side. Declines were obvious in downtown Vancouver and in parts of West Linn, Gladstone, Milwaukie, and Beaverton. Strong growth in the number of persons aged 65 and older occurred on the urban fringe (along the UGB and city boundaries) as well as in Clark County, in areas where massive new housing construction took place in the 1990s. In other words, the strongest decline in the number of seniors occurred in areas with the highest level of public transit service, good sidewalks, and stores within walking distance, and the strongest growth occurred where these are lacking.

The trends are fairly similar for persons aged 55 to 64 years, whose numbers decreased in large parts of inner and outer southeast Portland and in the older parts of Gresham, Beaverton, and Vancouver, i.e., in areas with better pedestrian environments. Declines, however, were more moderate than for persons aged 65 years and over and increases were greater and more widespread, affecting a larger number of block groups in the urban core. Still, growth in persons of pre-retirement ages in areas of new construction on the urban fringe was stronger and more universal than for seniors.



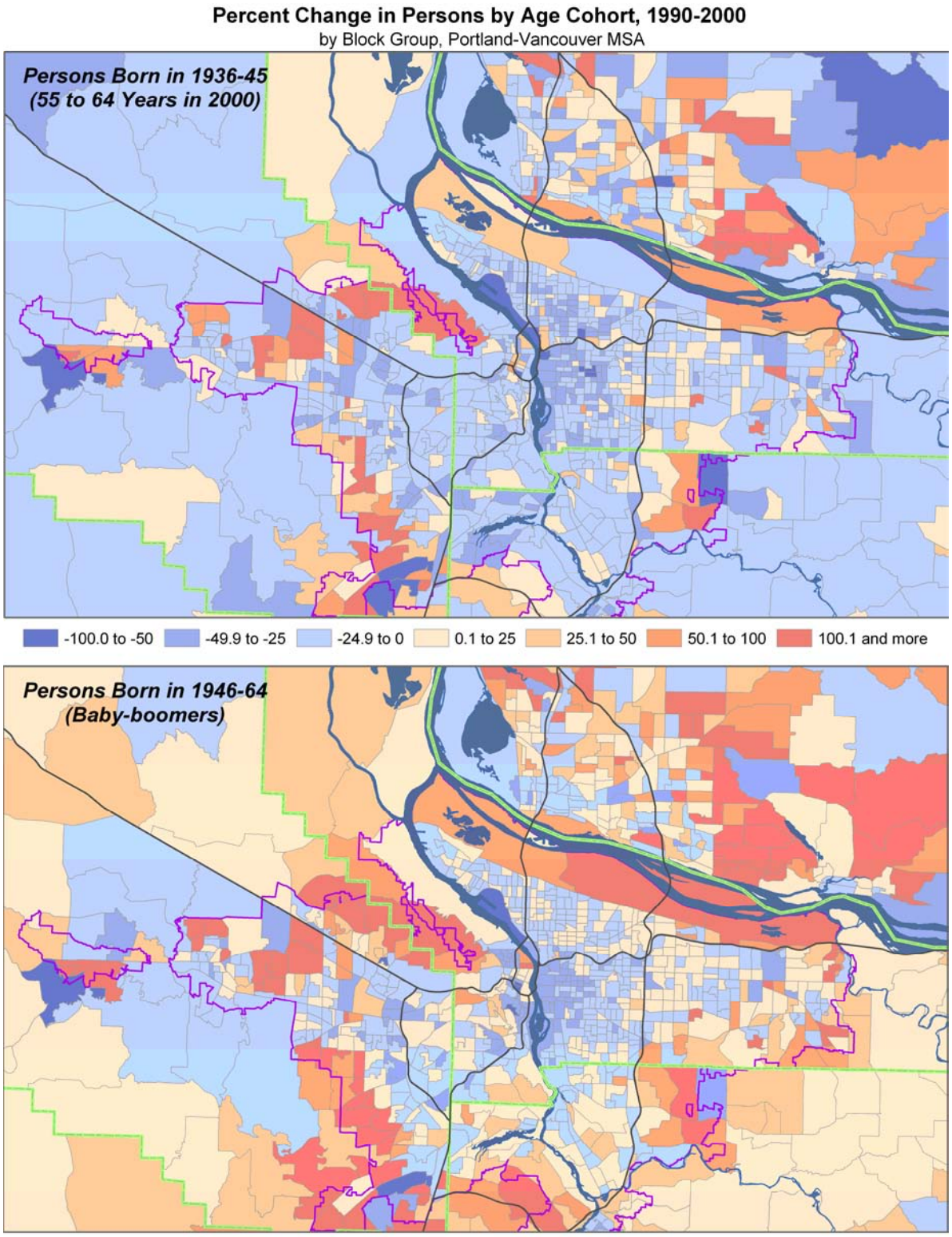
Source: 1990 & 2000 Census
Map by: Population Research Center, PSU (2006)

Figure 25: Percent Change in Persons of Retirement and Pre-Retirement Ages, 1990-2000

Figure 26 shows changes in two population cohorts: people born in 1936-1945, who reached pre-retirement ages in 2000, and people born in 1946-1964, or the baby-boom generation. The numbers of persons born in 1936-1945 decreased across the region, although not exceeding 25 percent in the majority of block groups. The decline was particularly pronounced in the central eastside, north-east, northwest, and some south-east areas of Portland. The growth in this cohort took place solely in the areas along the urban growth boundary and in Camas, WA, where new housing was built in the 1990s.

Overall, the spatial distribution of baby-boomers changed in a similar manner. Baby-boomers decreased in the areas neighboring downtown Portland and in the central eastside, although the declines affected fewer block groups. Additionally, this cohort decreased in the inner suburbs of Portland, the older parts of Beaverton, Gresham, Hillsboro, and Tigard, and in several rural block groups in Washington and Clark counties. Strong growth took place in the same areas of new construction along the urban growth boundary. An increase in baby-boomers took place in rural areas across the region; it was particularly strong in rural Clark County. Some of the increase may represent aging in place; however, it appears that the majority of growth was due to migration in the 1990s.

KEY POINTS: In the Portland region, new suburbs near the UGB have seen a lot of growth in the three age groups from baby-boomers to seniors, while the central core experienced declines in these age groups.



Source: 1990 & 2000 Census

Map by: Population Research Center, PSU (2006)

Figure 26: Percent Change in Population Cohorts Born in 1936-45 & 1946-64 , 1990-2000

This pattern of suburban growth—sometimes called the "graying of suburbia"—has concerned gerontologists for a number of years (Fitzpatrick & Logan, 1985; Golant, 1990). Specifically, gerontologists have expected the physical form of the suburbs—e.g., low density, lack of transportation alternatives, segregation of land uses—to prove problematic for a population that is in danger of losing the ability to drive. Interestingly, the 1996 AARP housing survey showed a sharp discrepancy between the current and preferred geographic location for people aged 50 and over. More people preferred to live in the country or small towns, and fewer to live in the suburbs or city than currently lived in those locations. These preferences have clearly not been translated into action yet, underlining the caution required in making projections based on preferences.

KEY POINTS: Both nationally and in Portland, older people are most likely to live in the suburbs. Baby boomers comprise a slightly higher share of the suburban population in Portland than the national average.

The trend toward suburbanization of both older people and baby boomers has not yet shown a general pattern of change. A recent study by Eugenie Birch (2005), however, found that "During the 1990s, downtown population grew by 10 percent, a marked resurgence following 20 years of overall decline" (p. 1). Her analysis of the downtown populations of 44 cities showed that 5 cities (including Seattle) showed steady increases from 1970 to 2000, and 13 more (including Portland) showed increases since the 1980s. Portland was one of 10 cities that experienced increases in both the downtown population since 1970 (up 55.6%) and the city's entire population (up 39.5%). It ranked third in the downtown share of non-family households (85.5%; defined as single people living alone and unrelated people living together) and seventh in the share of 45-64-year-olds who live downtown (24.8%). Note that "downtown" was defined uniquely for each city through conversations with local public officials (Birch, 2005).

KEY POINTS: The larger percentage of 45-64 year-olds living in downtown Portland, compared to the national average, may indicate a greater preference for dense living among baby boomers here.

Most baby boomers, as with previous generations, want to age in place (AARP, 2005). However, the desire to age in place is less strong for baby boomers, according to the AARP study, than previous generations. Of those persons 65 years of age or older in 2005, 94% expressed a strong desire to live in their current location for as long as possible. Those in the study aged 50-64 expressed the same strong desire 78% of the time. While this may indicate that more baby boomers will move as they age, the figures are far from conclusive. Tremain (2002) asserts that studies suggesting that baby boomers will relocate as they age are often biased as they are a product of developers such as Del Webb; the Center for Communication (2004) found that only 1 in 10 baby boomers expressed a strong preference to move during retirement.

Tremain notes that most baby boomers live in the suburbs, and that these communities are not conducive to aging in place due to reduced mobility, isolation and lack of social services. Frey (2000) looked at census patterns for the baby boom generation and found that the suburbs are home to 32%, on average, of all persons aged 35 to 54.

Suburbs also have some distinct advantages for aging in place over the central city. Tremain notes that the housing stock is newer, it can be cheaper to live there as a result of greater proximity to outlet chain locations, and because the houses are generally larger than those in the central city they may be more easily adapted or modified to support aging in place. AARP (2005) found, however, that many homes are not equipped to support aging in place. For instance, only 33% have grab bars in their bathrooms, and 34% have a house entrance without steps. These can be simple modifications that aid aging in place, but only if one can afford them.

CONCLUSION: For maximum effectiveness, baby boomers must be reached before the age of 60 or even 50, if they are to be enticed to choose higher density living and proximity to transit. At the same time, middle-aged and older adults' clear preferences for suburban living must be acknowledged, and plans developed to make suburban areas more pedestrian friendly and homes retrofitted or designed initially to better meet the needs of older adults.

Transportation Patterns and Preferences

What are the transportation patterns of older people?

Existing Literature

The number of transportation choices available to seniors affects seniors' ability to leave their homes and be active in their community. Bailey (2004) used the 2001 National Household Transportation Survey data to look at aging Americans' mobility patterns, and found that more than one in five (21%) Americans aged 65 and over did not drive. Reasons included declining physical and cognitive limitations, safety concerns, and having no car or no access to a car. Over half of non-drivers aged 65 and older stayed at home because they had no transportation options, thereby increasing this group's social isolation.

The rate of driver licensing among older adults is high, although rates do drop off with increasing age (Figure 27).

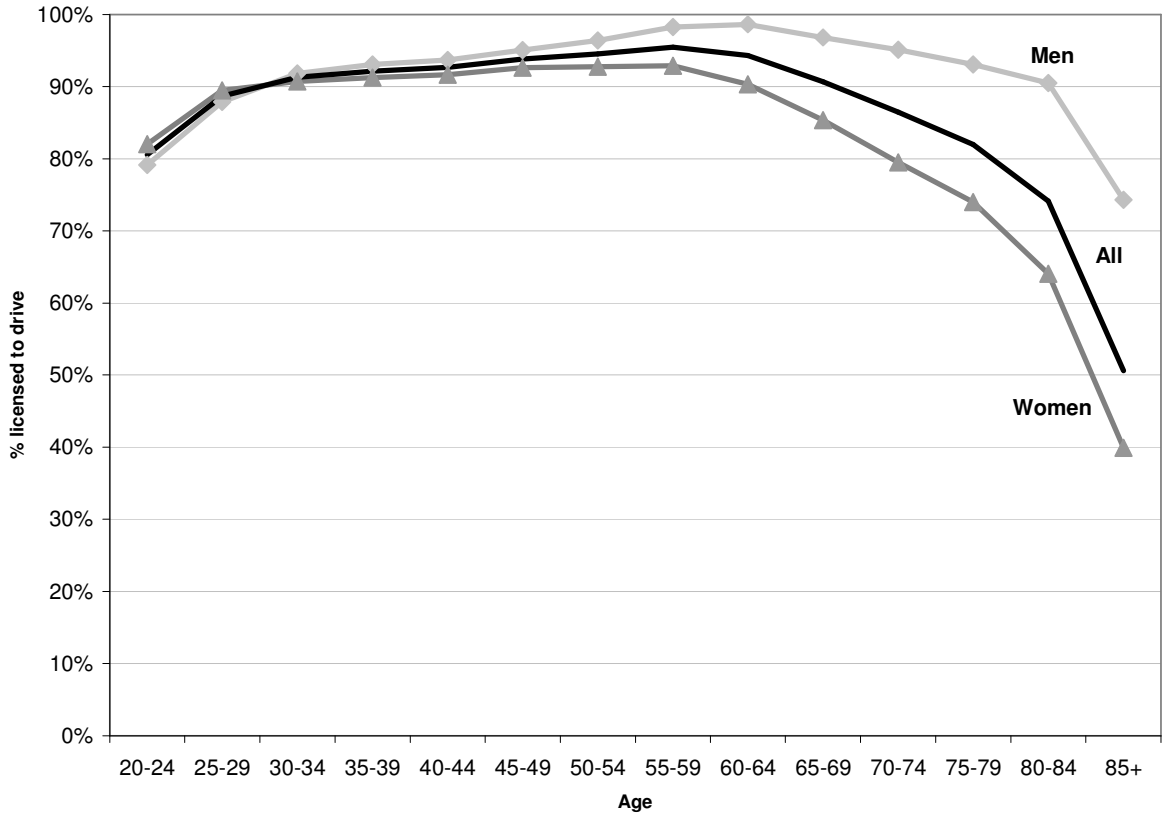
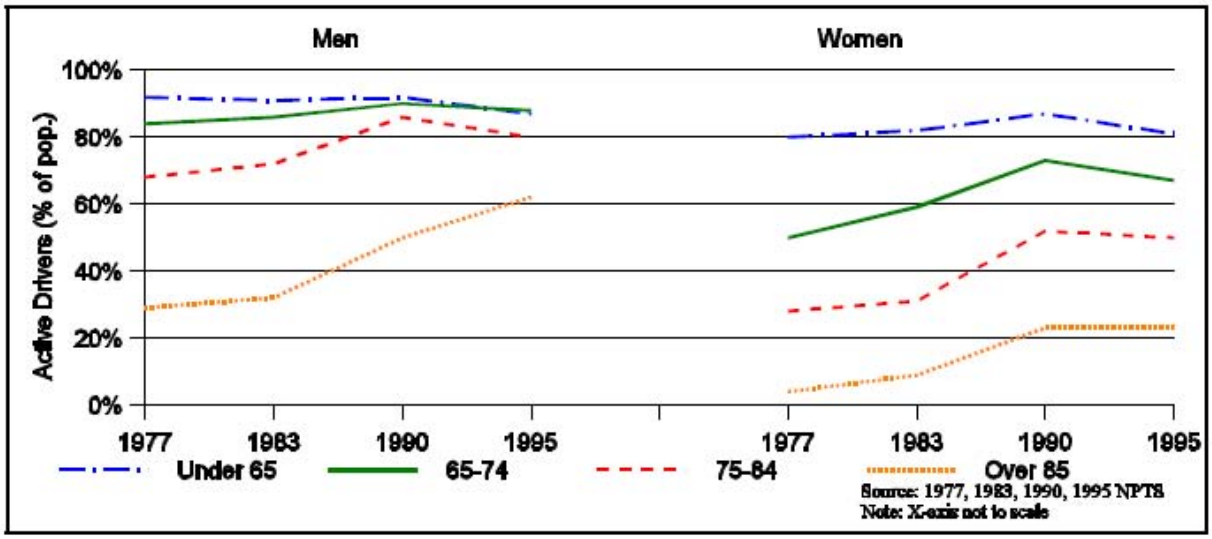


Figure 27: Driver Licensing by Age, U.S., 2004

Source: Federal Highway Administration, *Highway Statistics 2004*, Table DL-20, http://www.fhwa.dot.gov/policy/ohim/hs04/dl.htm.

Rosenbloom (2004) noted that the rates of licensing have increased over time, but that there is not much more room to grow. She forecast that by 2012 almost every man and 90% of women in the U.S. will enter their retirement years as drivers. Hu et al. (2000) defined drivers as people who actually reported driving during the year they were surveyed, rather than simply being licensed drivers. Comparing four years of the NPTS, they found that rates of driving went up for all older drivers (65+) from 1977 to 1990, with the greatest increases in those aged 75-84 (see Figure 28). Rates remained steady or declined slightly in 1995. They attributed some of this dip to methodological problems with the reporting of vehicle miles traveled.



Note: "Active drivers" defined as people who drove during that year. Licensed drivers that did not report driving any miles were not included.

Figure 28: Historical rates of active driving by age

Source: Hu, Jones, Reuscher, Schmoyer, and Truett, 2000, Figure 6.1.

Not having a driver's license negatively affects the mobility of older Americans. In 1995, adults aged 65+ without a license made about half as many trips as those with licenses (Rosenbloom, 2004). Trip making rates do vary by age and sex (see Table 13). For example, older women with drivers licenses tend to make fewer trips than older men with licenses. However, the difference between sexes is diminished for adults without licenses.

Table 13: Daily trips by age, gender, and licensure, U.S., 1995

Age Cohort	Sex	License: With	License: Without	Percent of Difference Between: Trips	Percent of Difference Between: Daily Miles
65–69	Male	4.6	2.1	119.0	80.5
	Female	4.0	2.4	66.7	166.4
70–74	Male	4.3	2.1	104.8	232.1
	Female	3.9	1.8	116.7	181.7
75–79	Male	3.7	2.0	85.0	102.3
	Female	3.3	1.9	73.7	163.9
80–84	Male	3.9	1.4	178.6	343.6
	Female	3.1	1.6	93.8	148.6
85+	Male	2.6	1.1	136.4	24.6
	Female	2.1	1.0	110.0	429.4

Source: Rosenbloom, 2004, Table 8, page 10.

The number of daily trips made by adults nationwide (all modes) increased significantly from 1983 to 1995 (see Table 14; Hu and Reuscher, 2004). Trip-making rates declined slightly from 1995 to 2001, however, although not for people over age 65.

Table 14: Average daily person trips per person by age and gender, 1983, 1990, 1995 NPTS and 2001 NHTS

Age	*TOTAL*					*Men*					*Women*				
	1983	1990	1990 Adj	1995	2001	1983	1990	1990 Adj	1995	2001	1983	1990	1990 Adj	1995	2001
Total	**2.9**	**3.1**	**3.8**	**4.3**	**4.1**	**2.9**	**3.0**	**3.7**	**4.3**	**4.1**	**2.9**	**3.1**	**3.8**	**4.3**	**4.1**
Under 16	2.3	2.6	3.1	3.7	3.4	2.3	2.6	3.0	3.7	3.5	2.3	2.6	3.1	3.8	3.4
16 to 20	3.3	3.5	4.2	4.6	4.1	3.2	3.5	4.2	4.6	4.0	3.4	3.5	4.2	4.7	4.2
21 to 35	3.5	3.6	4.4	4.6	4.3	3.4	3.5	4.2	4.5	4.2	3.5	3.7	4.6	4.8	4.5
36 to 65	2.9	3.2	3.9	4.6	4.5	2.9	3.1	3.7	4.6	4.4	3.0	3.3	4.1	4.6	4.5
Over 65	1.8	1.9	2.4	3.4	3.4	2.2	2.2	2.8	3.9	3.8	1.5	1.7	2.2	3.0	3.1

Note:

- All tables reporting totals could include some unreported characteristics.
- Note that 2001 data excludes persons aged 0 to 4 since such persons were not included in the 1990 and 1995 surveys.
- Note that only the 1990 data have been adjusted to make them more comparable with the 1995 and 2001 data. Thus, there are limits on the conclusions that can be drawn in comparing travel with earlier survey years. The adjustments to 1990 data affect only person trips, vehicle trips, person miles of travel (PMT) and vehicle miles of travel (VMT).

Source: Hu and Reuscher, 2004, Table 13, p. 24.

The majority of older adults' travel occurs in private vehicles. In their analysis of the 2001 National Household Travel Survey (NHTS) data, Collia, Sharp and Giesbrecht (2003) found that both younger (19-64 years) and older (65+) adults made about 90% of their trips in private vehicles. As Giuliano, Hu and Lee (2003) stressed, in land-use and transportation planning for the elderly of today and the future we must acknowledge that most trips are by car.

Not only do most trips occur by car, but those drivers who are 65-74 years of age actually take more trips than those who are 55-64, although the total number of trips does decline after age 75 (Giuliano et al., 2003). Furthermore, although many believe the trips of older people are made as passengers, the majority actually are made as drivers. Giuliano et al. (2003) found that close to 69% of people aged 65 and older were drivers, while just 22.8% were passengers. Although Giuliano et al. (2003) found that adults aged 75 and older did walk more than any other age cohort, there was no significant increase in transit use. This may be because most transit schedules are organized for those in the workforce: "Hence transit is less likely to be used for non-work travel" (Giuliano et al., 2003:47). When looking at all variables, land-use and access are factors in the use of transit in all age categories except for the elderly. Giuliano et al. (2003) explained this phenomenon as follows:

> This is not surprising; transit is less convenient than private auto under most circumstances; it is also a more physically challenging mode of travel. Walking to and from a bus stop or train station, waiting and transferring, boarding and alighting vehicles all make transit use more difficult for those with limited stamina…These results suggest caution in considering more transit-oriented environments as a transit

> mobility strategy for the elderly. A very high level of access and service quality would be required to attract the older elderly to transit. (pp. 63-64)

The prospects for increasing transit use among older adults are not great. Rosenbloom (2003) concluded that older people in the future will be less likely to take the same percentage of trips using public transportation then they did when they were younger or as compared to older adults in the past. This theory is based upon the notion that new generations of older persons will have more active lifestyles, and that non-work travel is not as conducive to transit use. The theory is supported by the fact that from 1983-1995, those 65 and older had average increases in vehicle trips (77%) and vehicle miles (98%).

The American Public Transportation Association (no date) released a cross-sectional telephone survey conducted in 2005 of 404 U.S. older adults (65+) that showed 98% of respondents reported maintaining their independence is extremely important, and that 82% worry that they will be stranded and unable to get around when they can no longer drive. Two-thirds (66%) believe that their community needs to provide more transportation options for older adults, such as easy access buses and senior service mini-van services. Results showed that respondents would use public transportation on a regular basis if transit services were convenient and easily accessible (80%), took them to many of the destinations that they seek (75%), and if stops were located near businesses that offer senior discounts (68%). Another important result showed that 82% of respondents consider public transportation a better alternative than driving alone, especially at night. At the same time, however, 55% of respondents who reported that public transportation was readily available never used it. The most common reason for not using transit was that respondents drove instead.

Coughlin (2001), too, looked at the transportation perceptions and preferences of adults aged 75 and older. A strong preference was seen for the personal automobile, whether respondents were drivers or non-drivers. Alternatives such as public transportation, walking, taxis and senior vans were all seen as less attractive alternatives. Urban non-drivers seemed most flexible in the mode of transportation that they would consider, especially in regard to public transportation. Persons in the suburbs had little information about transportation alternatives to the automobile in the community. A report for AARP concerning people aged 50 and older found that the main problems older people had with transit were crime, unavailable destinations, time, and accessibility (getting to the stop/station); each of these reasons was cited by more than 30% of the respondents. Reasons cited by 20-30% of the respondents included difficult transfers, stations and vehicles not maintained, and the expense of transit (Ritter, Straight, and Evans, 2002).

In a recent local study, Lynn Peterson Consulting (2006) examined seven housing facilities in the Portland-Vancouver metropolitan region that were either assisted living or specifically for disabled adults. The study found that, while many of the facilities were near transit, there were often significant obstacles for older adults to reach the stops or stations. The report also noted a trend toward larger assisted living facilities, which are more likely to be located outside of the urban core (with its high level of transit service) because of land costs. The project team also assessed the potential to site multifamily senior or disabled housing along five corridors with good transit services. They found several obstacles, including zoning that would prevent such facilities and a predominance of small parcels.

Another characteristic of trips made by older adults that is important for regional travel demand modeling and planning is the time of the day when trips occur. Because they are rarely making a commute trip to work, older adults tend to make more of their trips in the middle of the day rather than during the congested peaks in the morning and evening (Figure 29).

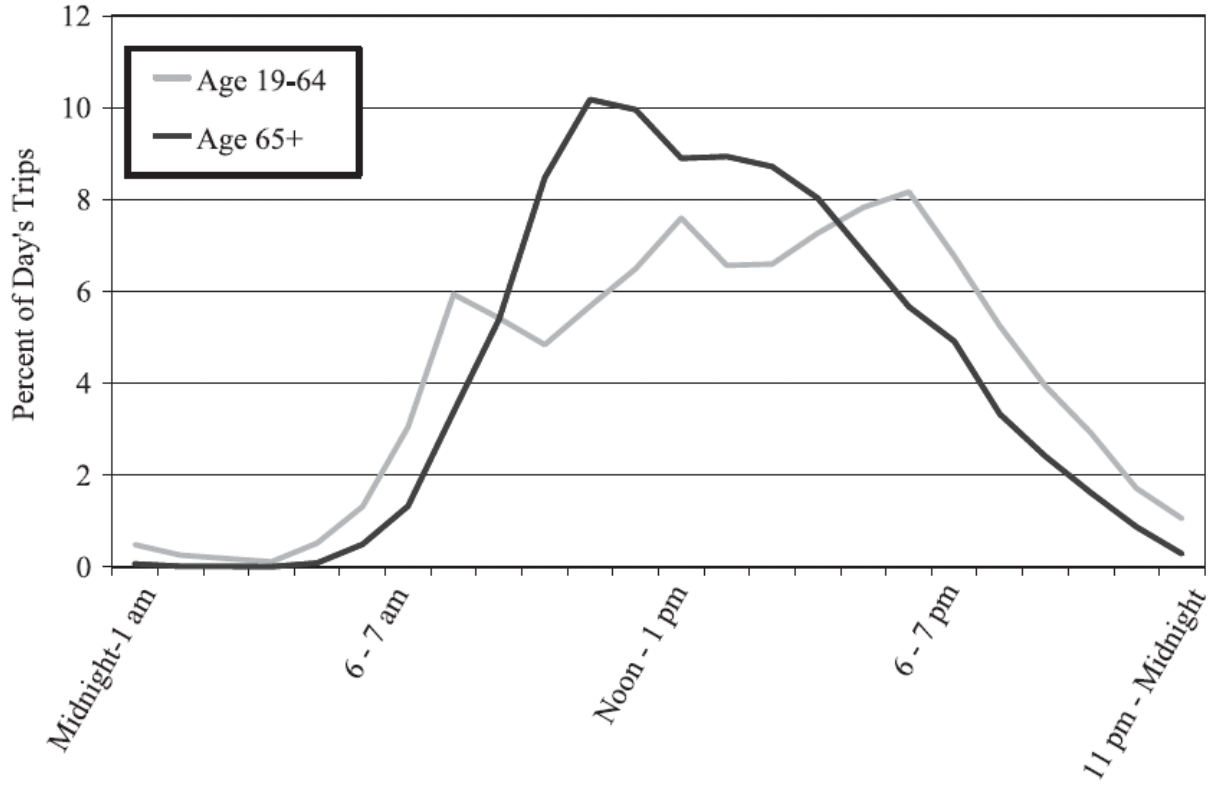


Figure 29: Distribution of trips by time of day, 2001 US

Source: Collia et al (2003), Figure 1, p. 465. Original data is from 2001 NHTS.

However, this may change in the future. Several studies suggest that the share of adults 65 and older that are employed will increase in the future due to several factors, including differences between the baby boomer generation and other cohorts. Srinivasan, McGuckin, and Murakami (2006) examined the potential travel impacts of this trend and concluded that travel among people over 65 will increase in the future. They identified increases in work travel among adults 55 and older between 1990 and 2001. To help in forecasting future travel demand they recommended better data collection, including longitudinal panel surveys. In addition, current survey response options, such as "retired," may not be as useful as people retire but continue to work part-time. They also recommended distinguishing between older workers who work for economic need versus those that work for social interaction or other reasons.

KEY POINTS: Most older adults aged 65+ do drive; rates drop only for the oldest old. Older women with licenses tend to make fewer trips than older men. Although trip-making rates for the population as a whole declined slightly from 1995 to 2001, this was not the case for people aged 65+. To attract the elderly to transit, information about transportation alternatives and a very high level of access, including in the middle of the day, and service quality would be required. In addition, zoning changes are needed along corridors with good transit services to facilitate building of assisted living facilities and other residential communities for elders.

Data Analyses: U.S. Urban Areas and/or Portland Region-Specific

Health conditions affecting travel

Data from the 2001 NHTS reveal that about one-quarter of adults 65 and older in urban areas in 2001 had a medical condition that made travel difficult (see Table 15). However, only 8.0% of adults aged 65+ indicated that they had to give up driving because of a medical condition. Older adults with medical conditions were more likely to travel less, limit driving to daytime, and ask for rides. The 1995 NPTS did not ask questions about medical conditions affecting travel.

Table 15: Medical conditions affecting travel, 2001 U.S. urban areas

	2001 NHTS (urban areas) *Percent of respondents that have a medical condition that…*						
Age	Makes travel difficult	Requires giving up driving	Limits driving to daytime	Limits use of public transit	Results in asking for rides	Requires special transport	Results in less travel
25-44	3.8	0.7	1.4	1.0	2.3	0.6	3.2
45-54	8.5	1.4	3.0	2.1	5.5	1.1	7.3
55-64	12.3	2.3	4.3	2.6	7.3	1.5	10.9
65+	24.4	8.0	11.1	4.5	12.9	3.2	20.6

Source: 2001 NHTS person file, release 3.0

The 1994-95 Portland Activity Survey did collect data about disabilities affecting outside travel. However, the question is quite different from the 2001 NHTS data, making it difficult to compare the data directly. The term "disability" used in the Portland survey is narrower than asking about "medical conditions" that make travel difficult. The types of disabilities included in the question make this more evident (Table 16). In addition, respondents were only allowed to identify one disability. Because of these differences, the share of Portland respondents 65 and older with disabilities is about half the share of national NHTS respondents that had medical conditions making travel difficult (12.5% versus 24.4%). Metro should consider asking a broader question, more like the NHTS question, in their next activity survey. With the Portland data, it is difficult to tell whether these disabilities (except for blindness) are preventing respondents from driving or how else they might be affecting travel.

Table 16: Disabilities by age, Portland 1994-95

	Percent of respondents							
	Blind/ visually impaired	Wheelchair (transferable)	Wheelchair (non-transferable)	Deaf/ hearing impaired	Mentally disabled	Cane/ walker	Other	Total
21-45	0.3%	0.1%	0.0%	0.1%	0.2%	0.2%	0.8%	1.8%
46-54	0.2%	0.1%	0.0%	0.0%	0.0%	0.6%	1.4%	2.4%
55-64	1.1%	0.3%	0.3%	0.1%	0.1%	1.5%	1.6%	5.1%
65+	1.3%	0.8%	0.0%	0.3%	0.4%	5.0%	4.6%	12.5%

Source: Data from tables provided by Metro using data from the 1994-95 Portland Activity Survey.

KEY POINTS: In the Portland area, most trips by older adults are by private vehicle. Only a small share of older adults report that they are prevented from driving because of medical conditions. Instead, older adults with medical conditions are more likely to report that they adjust their travel by traveling less, asking for rides or limiting their driving to day time.

Rates of licensing

The share of older adults who are drivers has increased over time. In 2001, 78.2% of adults 65 and over in urban areas were drivers, up from 73.7% in 1990 (see Table 17; NHTS 1990, 2001). The share of adults 65 and over compared to the share of all adults that drive has increased nationally over time, from 0.84 in 1990 to 0.87 in 2001.

In general, the rates of licensing in the Portland area are higher than those for other urban areas. The differences may be due to variations in sampling and survey methodology. For example, the Portland survey may not have sampled enough non-drivers, particularly in the older age groups.

Table 17: Percent of adults in urban areas who are drivers, by age

Age	1990 NHTS (urban areas)	1995 NHTS (urban areas)	2001 NHTS (urban areas)	1994 Metro
25-44	92.7%	92.1%	93.6%	
45-54*	91.8	92.8	94.0	97.2%
55-64	86.4	88.1	91.6	94.8
65+	**73.7**	**74.6**	**78.2**	**84.0**
All adults, 18+	87.5	87.7	89.6	91.8
Ratio: 65+/18+	0.84	0.85	0.87	0.92

*1994 Metro age categories are 46-54, not 45-54. For all adults, ages 20 and up included.
Notes on question wording:
1990 NPTS: “Are you a licensed driver”?
1995 NPTS and 2001 NHTS: “Are you a driver?”

The trend of increasing rates of licensing is likely to continue in the future, although there will always be a fraction of the adult population that does not drive. In 2030, people born between 1946 and 1965 will be 65-84 years old. In 2001, 94% of those people in urban areas were drivers (see Table 18). In 1990, people aged 65 and older were born in 1925 or earlier. They turned 18 in 1943 and earlier, an era when driving was not as common as it is for people born in subsequent years. The 1990 NPTS data show lower rates of licensing for people born in 1926-1946, even though these individuals were under 65 years old in 1990, and these lower rates continued in 1995 and 2001.

Table 18: Percent of adults in urban areas who are drivers, by year born

Year born	Age in 1990	Age in 2001	Age in 2030	1990 NPTS	1995 NPTS	2001 NHTS	Change: 2001 vs. 1990
1966-75	15-24	26-35	55-64	77.5%	88.3%	92.6%	19.5%
1956-65	25-34	36-45	65-74	92.2	92.6	94.8	2.8%
1946-55	35-44	46-55	75-84	93.4	93.2	94.0	0.6%
1936-45	45-54	56-65	85-94	91.8	90.8	90.7	-1.2%
1926-35	55-64	66-75	95-104	86.4	84.9	86.1	-0.3%
1925 & earlier	65+	76+	105+	73.7	70.5	66.3	-10.0%

Source: 1990 NPTS, 1995 NPTS, 2001 NHTS person files, urban areas only.

Even if older adults don't drive themselves, the chance that they live in a household with at least one driver has increased over time. Within urban areas in the U.S., the share of older adults living in a household with no drivers declined from 15.4% in 1990 to 9.1% in 2001 (see Table 19). The increase is due to two factors – the increase in driving rates discussed above and a decline in one-person households. In 1990 35.3% of adults 65 and older lived in a household with only one adult, compared to 28.0% in 2001.

Table 19: Number of drivers in household (urban areas) by age

Age	1990 NHTS (urban areas)			2001 NHTS (urban areas)		
	0 drivers	1 driver	2+drivers	0 drivers	1 driver	2+drivers
0-24	6.4%	26.1%	67.5%	3.0%	14.3%	82.7%
25-44	3.6	28.4	68.0	2.4	15.9	81.6
45-54	3.7	24.2	72.1	2.4	17.1	80.6
55-64	5.5	30.8	63.7	2.9	22.3	74.8
65+	**15.4**	40.9	43.7	**9.1**	35.6	55.3

Source: 1990 NPTS, 2001 NHTS person files, urban areas only.

KEY POINTS: Rates of licensing of older adults have increased and are likely to remain high, or even increase, in the future.

Number of trips

Older adults make fewer trips per day than younger adults (see Table 20). In both 1995 and 2001, older adults made about 80% of the number of trips made by younger adults. However, the total number of trips made by all adults in urban areas in the U.S. went down almost three percent in 2001 compared to 1995. Trip making by older adults did not decline as much (-0.8%).

Table 20: Average number of trips per day per person, by age group

Data source	Age group				Ratio 65+/18+
	45-54	55-64	65+	All adults, 18+	
1995 NPTS Urban areas	4.52	4.26	3.52	4.46	0.79
2001 NHTS Urban areas	4.59	4.23	3.49	4.34	0.80
Percent change, 2001 vs. 1995	1.5%	-0.6%	-0.8%	-2.6%	

Source: 1990 NPTS, 2001 NHTS person files, urban areas only.

During both 1995 and 2001, baby boomers made more trips than other cohorts of adults (see Table 21). This finding reflects baby boomers' age at the time: 30-49 in 1995 and 36-55 in 2001. These age groups are more likely to work and have children in the household, increasing trip making. Between the two surveys, trip making by the older baby boomers dropped 6.0%, compared to a 0.8% increase for the younger boomers, possibly reflecting a decline in child-care responsibilities for the older group.

Table 21: Average number of trips per day per person (urban areas), by year born

Data source	1966-75	*Baby boomers*		1936-45	1935 & earlier
		1956-65	1946-55		
1995 NPTS Urban areas	4.59	4.81	4.84	4.27	3.68
2001 NHTS Urban areas	4.45	4.85	4.55	4.20	3.45
Percent change, 2001 vs. 1995	-3.1%	0.8%	-6.0%	-1.6%	-6.3%

Source: 1990 NPTS, 2001 NHTS person files, urban areas only.

Adults aged 65 and older in urban areas are more likely than other adults not to travel on any single day. About one-quarter of these older adults did not make any trip on their randomly assigned travel day (see Table 22), both in 1995 and 2001. The share of adults in the other age categories (45-54 and 55-64) making no trips declined slightly between 1995 and 2001. This may indicate greater mobility of these age cohorts. The differences between age groups are also shown in Figure 30.

Table 22: Number of daily trips by age

	1995 NPTS urban areas			2001 NHTS urban areas		
	45-54	55-64	65+	45-54	55-64	65+
0 trips	10.5%	14.0%	25.0%	8.1%	12.4%	24.4%
1-2 trips	21.7	21.2	19.8	21.2	21.5	19.7
3-4 trips	26.0	25.0	22.1	25.4	25.7	22.8
5-6 trips	18.3	18.8	18.0	21.9	19.9	17.4
7 or more	23.4	21.1	15.2	23.5	20.5	15.5

Source: 1990 NPTS, 2001 NHTS person files, urban areas only.

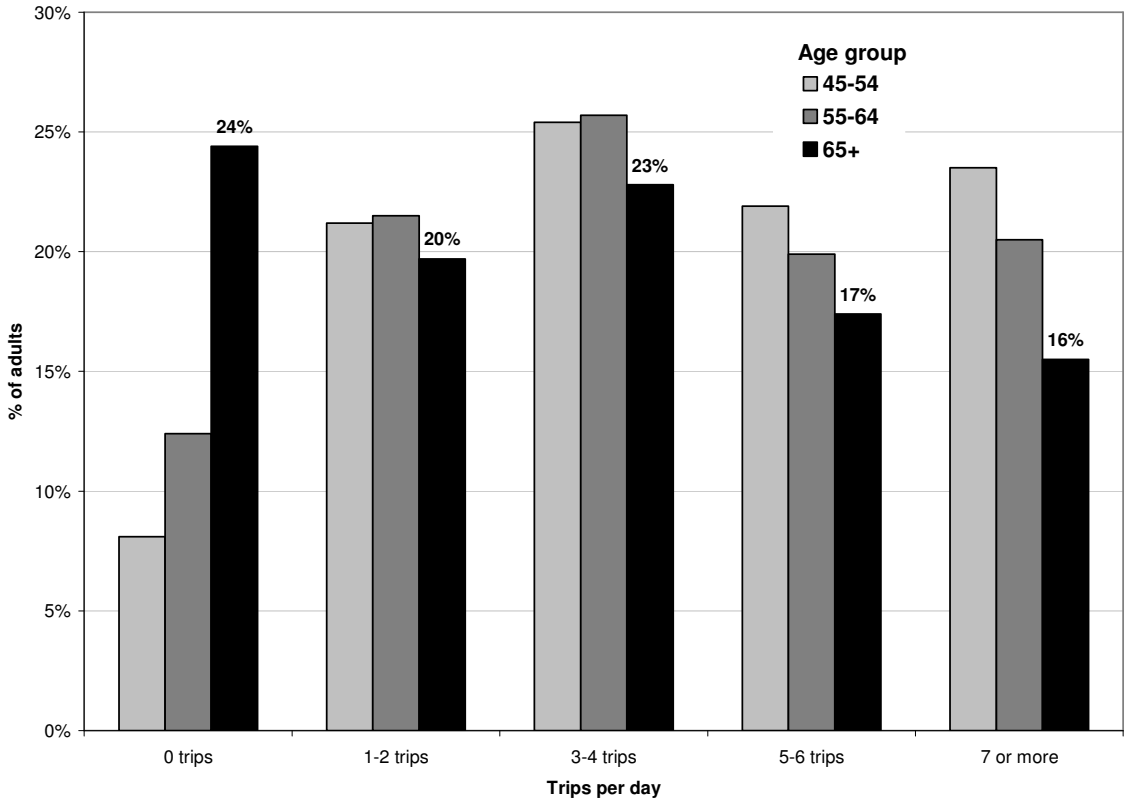


Figure 30: Number of Daily Trips by Age (2001, urban areas in US)

Source: NHTS, 2001, urban areas only.

KEY POINTS: Adults aged 65 and over take significantly fewer trips than other adults. After significant increases between 1983 and 1995, the number of daily trips taken by adults of all ages appears to have leveled off or declined slightly nationwide. However, most of this decline is on the part of younger adults; older adults made about the same number of trips in 2001 and 1995.

Mode of travel

About 90% of all trips made by people aged 65 and older in urban areas in 2001 were made in private vehicles (POVs) (see Table 22). This was true, as well, for persons aged 45-54 and 55-64. The main difference between the age groups is the shift from being a driver to being a passenger as age increases. Still, however, two-thirds of trips made by people aged 65 and older were made as drivers of personal vehicles. The share of trips made on foot increased with age, while the share made on transit remained fairly constant across the age groups. Use of transit declined between 1995 and 2001 among all three age groups, however. It should be noted that some of the differences in the shares of trips made walking between 1995 and 2001 may be due to survey methodology, as the 2001 NHTS made an increased effort to capture walking trips. The distribution of trips in the Metro area in 1994 was similar to the national data (see Table 24). However, the share of trips by adults 65+ made on transit was at least one percentage point below that for adults 45-54 and 55-64.

Table 23: Distribution of daily trips by mode and age, 1995 and 2001, U.S. urban areas

	1995 NPTS urban areas			2001 NHTS urban areas		
	45-54	**55-64**	**65+**	**45-54**	**55-64**	**65+**
Private vehicle	91.3%	91.6%	89.8%	90.7%	89.9%	89.3%
Driver	*76.7*	*73.6*	*67.2*	*76.6*	*72.9*	*66.2*
Passenger	*14.6*	*18.0*	*22.6*	*14.1*	*17.0*	*23.1*
Walk	5.0	5.3	6.6	7.0	7.7	8.4
Transit	2.4	2.2	2.6	1.3	1.3	1.2
Other	1.3	0.9	1.0	1.0	1.1	1.1

Note: Other includes taxi, bicycle, and other modes.
Source: 1995 NPTS and 2001 NHTS, daily trip files, urban areas only

Table 24: Distribution of daily trips by mode and age, 1994-95, Portland Metro area

	1994-95 Portland Activity Survey		
	46-54	**55-64**	**65+**
Private vehicle	90.6%	90.0%	89.6%
Driver	*79.7*	*78.5*	*68.5*
Passenger	*10.9*	*11.5*	*21.0*
Walk	5.5	5.9	7.6
Transit	2.9	3.2	1.9
Other	1.0	0.9	1.0

Notes: Data from tables provided by Metro using data from the 1994-95 Portland Activity Survey. Totals may not equal 100 due to rounding. Other includes bike, school bus, and other.

Across all three data sources (1994-95 Portland Activity Survey, 1995 NPTS, 2001 NHTS), the share of total trips made by walking increases with age at 45 years or older (see Figure 31). The increase is slightly larger for adults in the Portland Metro survey. The share of trips made by Portland area adults 65+ on foot is 7.6%, 38% higher than that for adults aged 45 to 54 (5.5%). For urban areas in the U.S. in 1995, the difference in walking trips between the

oldest adults and younger groups was 32% (6.6% versus 5.0%); for 2001 it was 20% (8.4% versus 7.0%).

Comparing Portland (Table 24) to the national urban area data in 1995 (Table 23), about equal shares of trips by older adults (65+) were in private vehicles, with slight differences in whether the other trips were walking or on transit. Variations in survey methodology may account for some of these differences. In addition, the difference between age groups (45-54, 55-64 and 65+) are about the same in 1995, with the share of trips made walking increasing with age both nationally and in Portland.

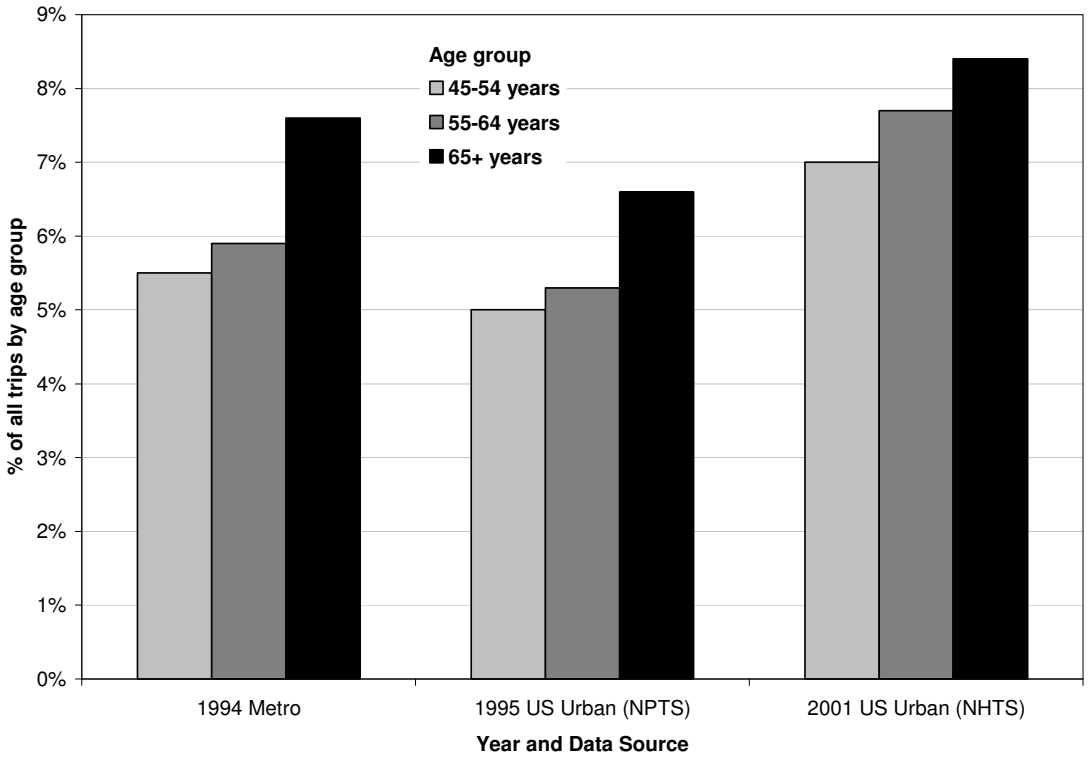


Figure 31: Share of trips made walking

Source: 1994-95 Portland Activity Survey; 1995 NPTS (urban); and 2001 NHTS (urban)

Although a higher share of trips by older adults are made on foot, because older adults make fewer trips overall, they do not make more walking trips per day. The average adult aged 65 or older in an urban area in 2001 made 0.31 walking trips per day, slightly lower than the rate for adults aged 45-64 (see Table 25). Adults 65+ made about 85% as many walking trips per day as all adults (18+).

Table 25: Mean trips per day by mode, 2001 U.S. Urban Areas

Mode	2001 NHTS Urban Areas: Mean # trips/day				
	Age group				Ratio 65+/18+
	45-54	55-64	65+	18+	
Personal vehicle	4.12	3.76	3.09	3.83	0.81
Walk	0.34	0.35	0.31	0.36	0.85
Transit	0.07	0.07	0.05	0.09	0.51

In addition to collecting data on trips made on a randomly-assigned travel day, the 1995 NPTS and 2001 NHTS asked respondents how often they had taken transit in the previous two months. Excluding respondents who said that transit was not available, rates of transit use among older adults declined from 1995 to 2001 (see Table 26). In addition, rates of use for adults aged 65 and older were lower than those for other adults.

Table 26: Frequency of transit use, 1995 and 2001, U.S. urban areas

Frequency of transit use in past two months	1995 NPTS urban areas				2001 NHTS urban areas			
	45-54	55-64	65+	All adults 18+	45-54	55-64	65+	All adults 18+
Two or more days a week	10.6%	7.7%	6.4%	11.3%	7.7%	6.4%	3.6%	8.4%
About once a week	3.0	2.2	3.1	3.4	3.0	2.9	2.4	3.2
Once or twice a month	5.6	5.8	5.2	5.9	5.4	5.6	4.2	5.5
Less than once a month	4.4	4.1	4.1	4.2	4.0	3.4	3.4	4.3
Never	76.1	79.8	80.9	74.7	79.9	81.8	86.4	78.7

Note: Excludes respondents who said that transit was not available.

KEY POINTS: The vast majority of travel by older adults occurs in private vehicles, both nationwide and in the Portland region. Of all trips made by older adults, a higher share of are made walking than among younger adults. However, because older adults make fewer trips overall, they do not make more walking trips per person. They also use transit less than younger adults, and transit use among older adults declined between 1995 and 2001. The data examined did not contain information concerning likelihood of use of transit later in life if it was not used when younger.

Trip Distances

Trips made by adults aged 65 and over tend to be shorter than other adults' trips. Table 27 shows average trip distances for trips from all three data sources (1994-95 Portland Activity Survey; 1995 NPTS; 2001 NHTS). Two sets of figures are shown for the 1995 NPTS and

2001 NHTS – one that includes all trips and one that includes only trips of 100 miles or shorter. In both surveys, one to two percent of the trips were over 100 miles, with maximum trip lengths sometimes exceeding 5000 miles. Because these very long trips influence the means significantly, the second set of figures is likely more useful for regional modeling purposes. Still, the average trip distances for the national urban data are much greater than those for the Portland Metro area, in which all trips are included. Differences in methodology and the size of urban areas may be the cause, however, the ratio of the trip distance for adults aged 65 and older to the distance for all trips (all ages) is fairly consistent. It is interesting to note that trip distances increased nationally from 1995 to 2001 for all three age groups. This is also seen in Table 28. For adults 65 and older, the share of trips of 5 miles or less in length declined from 1995 to 2001, while the share of longer trips increased.

Table 27: Average trip distances in miles, Portland and U.S.

Data source	Age group				Ratio
	45-54	55-64	65+	18+	65+/18+
1995 NPTS Urban areas (all trips included)	9.2	9.0	6.7	8.8	0.76
1995 NPTS Urban areas (only trips 100 miles and shorter included)	7.5	6.4	5.3	6.9	0.77
2001 NHTS Urban areas (all trips included)	11.2	10.4	8.6	10.6	0.81
2001 NHTS Urban areas (only trips 100 miles and shorter included)	8.3	8.4	6.4	8.2	0.78
1994-95 Portland Metro activity survey (all trips included)	5.9	5.3	4.3	5.1	0.85

Sources: 1995 NPTS and 2001 NHTS, trip files, urban areas only.

Table 28: Distribution of trips by length, 1995 and 2001, US urban areas

	1995 NPTS urban areas				2001 NHTS urban areas			
	45-54	55-64	65+	All ages	45-54	55-64	65+	All ages
½ mile and shorter	12.5%	13.7%	15.4	15.7%	11.6%	11.8%	14.7%	13.8%
>½ - 1 miles	13.9	15.1	18.0	14.6	12.3	12.8	15.3	12.9
>1 – 2.5 miles	13.9	15.0	16.6	13.9	11.8	12.4	14.2	12.2
>2.5 – 5 miles	23.4	23.4	24.6	22.9	23.1	23.0	23.9	22.4
>5 – 10 miles	15.1	14.4	12.0	14.3	17.5	16.8	15.5	16.9
11 – 25 miles	13.2	11.7	7.9	11.6	16.2	15.2	11.0	14.9
26 – 100 miles	6.0	4.0	3.5	4.5	6.7	7.2	4.5	6.0
>100 miles	2.2	2.8	2.1	2.4	0.9	0.9	0.9	0.8

Sources: 1995 NPTS and 2001 NHTS, trip files, urban areas only.

KEY POINTS: Older adults' trips are shorter than those by younger adults. Trip lengths for older adults increased from 1995 to 2001, as they did for all adults.

How does urban form affect the transportation patterns of older adults?

Existing Literature

Giuliano (2004) used the 1995 NPTS data and found that the elderly (65 years and older) made fewer trips than the non-elderly (16-64). There were some differences by density (see Table 29), with more trips made by both age groups in medium and high density areas, as opposed to low and very high density areas. Giuliano also found that the share of trips in privately-owned vehicles (POV) as a driver did not vary much between densities, until density reached more than 10,000 people per square mile, at which point transit use and walking increased significantly and driving decreases (see Table 30). Much smaller increases in walking and transit use occur when densities reach 2,000-10,000 persons per square mile.

Table 29: Trips, distance, and time by density, 1995

Age Group	*Density*	*Trips*	*Distance*	*Time*
Non-elderly	Low (<500/mi^2)	4.1	39.8	65.9
	Med. (500–2,000/mi^2)	4.3	35.0	64.4
	High (2,000–10,000/mi^2)	4.4	30.4	63.9
	Very high (>10,000/mi^2)	3.7	21.9	65.4
Elderly	Low (<500/mi^2)	2.9	22.3	46.4
	Med. (500–2,000/mi^2)	3.3	20.7	49.5
	High (2,000–10,000/mi^2)	3.2	16.9	45.9
	Very high (>10,000/mi^2)	2.7	13.3	46.6

Note: Density is defined as population per square mile for the census tract where the respondent lives.

Source: Giuliano, 2004, Table 3, page 198.

Table 30: Mode share (percent) of all trips by density, 1995

Age Group	*Density*	*POV Driver*	*POV Passenger*	*Bus/Rail*	*Walk*
<55	Low (<500/mi²)	79.0	17.5	0.2	2.2
	Med. (500–2,000/mi²)	78.4	17.4	0.5	2.5
	High (2,000–10,000/mi²)	75.3	17.5	1.4	4.7
	Very high (>10,000/mi²)	50.5	15.7	10.8	20.0
55–64	Low (<500/mi²)	77.8	19.3	0.1	2.2
	Med. (500–2,000/mi²)	78.2	18.8	0.6	1.9
	High (2,000–10,000/mi²)	76.8	17.2	1.1	4.2
	Very high (>10,000/mi²)	56.3	16.5	8.5	17.9
65–74	Low (<500/mi²)	74.8	21.6	0.2	3.0
	Med. (500–2,000/mi²)	75.4	19.9	0.4	3.3
	High (2,000–10,000/mi²)	72.4	19.9	1.2	6.0
	Very high (>10,000/mi²)	48.4	21.1	11.6	17.8
75 and over	Low (<500/mi²)	60.7	32.0	0.9	6.0
	Med. (500–2,000/mi²)	64.8	29.1	0.7	4.6
	High (2,000–10,000/mi²)	65.7	25.9	1.9	6.1
	Very high (>10,000/mi²)	42.3	24.8	9.0	22.1

[a] The "other" mode category is not included.
Note: Density is defined as population per square mile for the census tract where the respondent lives.
Source: Giuliano, 2004, Table 6, page 200.

Bailey (2001) found that seniors who live in communities with higher density have a greater likelihood to leave home each day, interact with the community and be less isolated than those who live in less dense communities. This is particularly true of adults aged 65 and older who are non-drivers. "People 65 and over living in areas where houses are built closer to shops and services are less likely to stay home on a given day, and are more likely to use public transportation and walk to get around" (Bailey, 2001, p. 8). The study found that 38% of seniors 65 years of age and older who live in areas with a density of 10,000 persons per square mile used public transportation, and transit use increased with higher density (Figure 32). These findings indicate that the denser a community is, the more likely that older adults will use transit for trips, particularly non-drivers who have limited options.

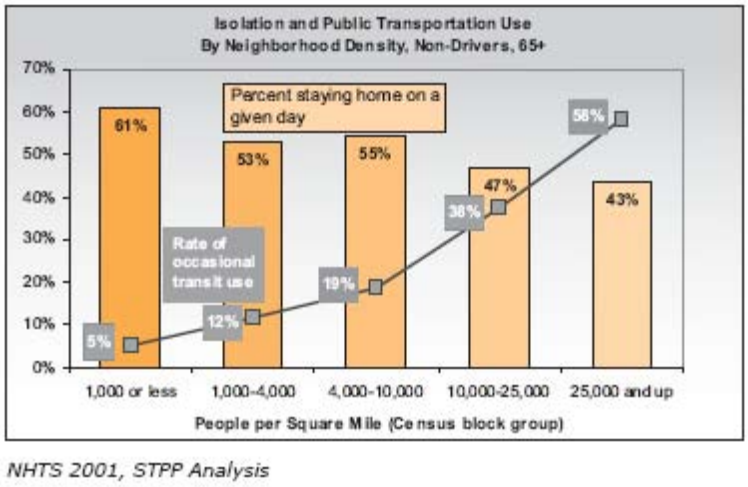


Figure 32: Transit use, density, and mobility

Source: Bailey, 2004

Cunningham and Michael (2004) reviewed 27 articles presenting research linking the built environment to physical activity and only found 6 that directly addressed older adults. Among these 6 studies, the results were mixed and methodologies and measurement techniques varied significantly. However, several of the studies did show a relationship between the built environment and physical activity and travel. King et al. (2003) found that older women in Pittsburgh, Pennsylvania who lived within walking distance (20 minutes) of more destinations, including parks and stores, did walk more. Using data from 582 adults aged 65 or older in the Portland metropolitan region, Fisher, Li, Michael, and Cleveland (2004) also found positive associations between neighborhood factors and walking activity. However, that study did not include common measures of neighborhood form such as housing density or mix of land uses.

Data Analyses: U.S. Urban Areas

The 2001 NHTS provided information about the density of the block group and census tract in which the respondent lived. Those categories and the distribution of respondents are shown in Table 31. For comparison, data from the 2000 Census for census tracts within the Metro urban growth boundary are also shown. About two-thirds of the population within the urban growth boundary live in census tracts with a density of 1,000-2,999 housing units per square mile, and nearly 85% live in areas with densities under 3,000 housing units per square mile.

Table 31: Distribution of population by density, U.S. urban areas (2001) and Portland region (2000)

	% of persons	
Density (units/sq. mi)	**2001 NHTS, urban areas**	**2000 Portland Metro region***
0-49	2.9%	0.3%
50-259	10.0	1.1
250-999	26.0	15.3
1,000-2,999	38.8	67.4
3,000-4,999	11.1	12.7
5,000+	11.2	3.1

*Includes census tracts in Oregon within the urban growth boundary.

Sources: 2001 NHTS person file, urban areas; 2000 Census and RLIS

Nationwide in urban areas, the number of daily trips declines with age, regardless of density. For all age groups, overall trip rates decline once densities of 3,000 or more housing units per square mile are reached (see Figure 33 and Table 32).

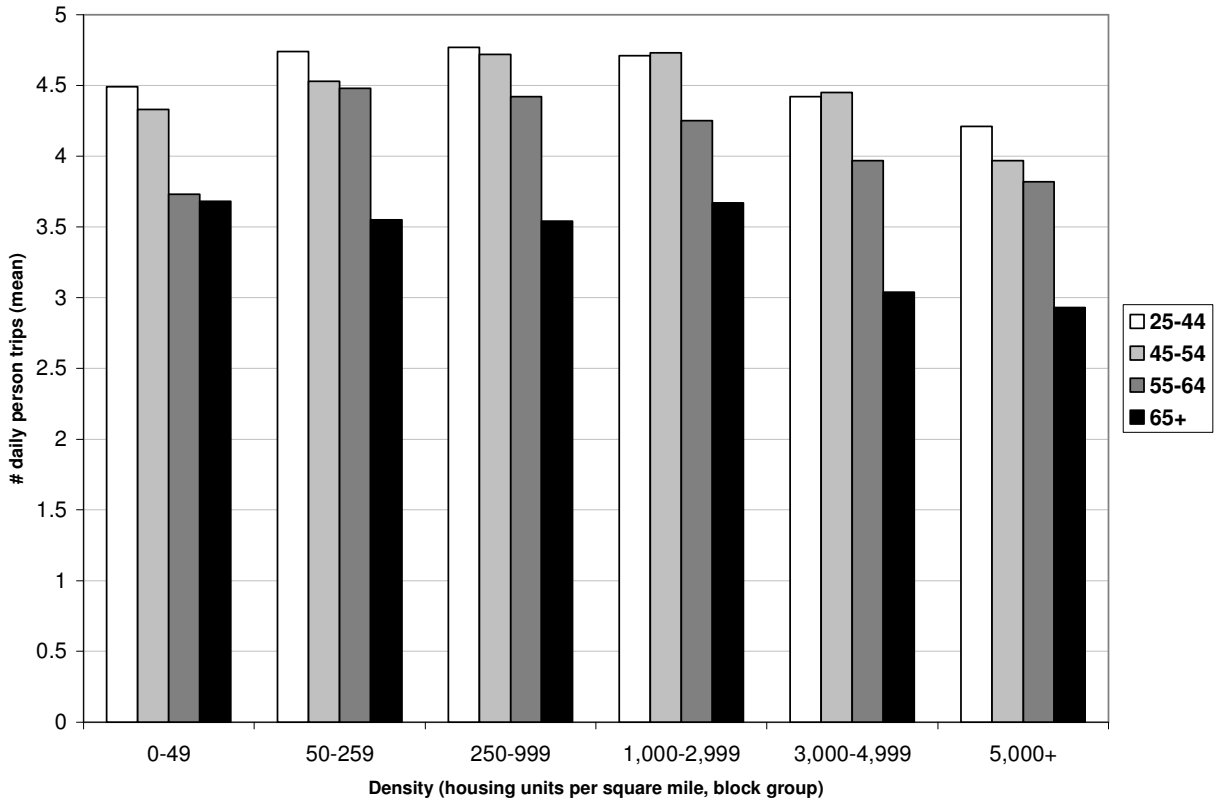


Figure 33: Total daily trips and housing density, 2001, U.S. urban areas

Source: 2001 NHTS, person file, urban areas

Table 32: Total daily trips and housing density, 2001, U.S. urban areas

Density (units/sq. mi)	Mean # trips per day					Ratio: 65+/18+
	25-44	45-54	55-64	65+	18+	
0-49	4.49	4.33	3.73	3.68	4.17	0.88
50-259	4.74	4.53	4.48	3.55	4.46	0.80
250-999	4.77	4.72	4.42	3.54	4.47	0.79
1,000-2,999	4.71	4.73	4.25	3.67	4.44	0.83
3,000-4,999	4.42	4.45	3.97	3.04	4.14	0.73
5,000+	4.21	3.97	3.82	2.93	3.88	0.76
Total	4.62	4.59	4.23	3.49	4.34	0.80

Source: 2001 NHTS, person file, urban areas

Older adults do make more walking trips as density increases from 50-249 units per square mile to 3,000 and more units per square mile (see Figure 34). However, it appears that younger adults are most able and/or willing to take advantage of the increased walkability

that higher density provides. Table 33 shows the difference in the average number of walking trips per day for each age group, using 50-249 units per square mile as the base. For example, adults aged 25-44 living in areas with 1,000-2,999 units per square mile make 74% more walking trips per day than their cohorts living in the lower density environment. On the other hand, adults 65 and older in the higher density areas only make 45% more walking trips per day compared to older adults living in the lower density areas.

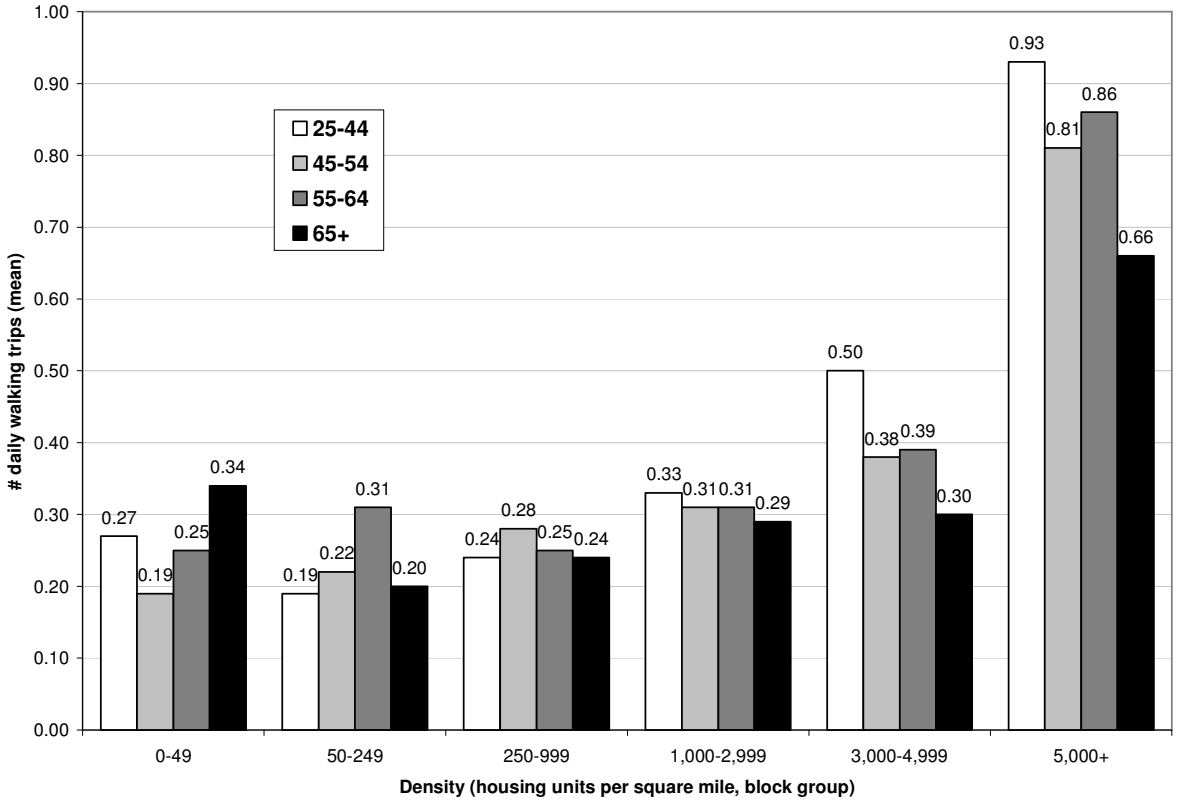


Figure 34: Walking trips per day and density, 2001 U.S. urban areas

Source: 2001 NHTS, person file, urban areas

Table 33: Age differences in number of walking trips with increased density, 2001 US urban areas

Density (units/sq. mi)	% difference in # walking trips compared to 50-249 units per square mile (within each age group)			
	25-44	45-54	55-64	65+
50-249	--	--	--	--
250-999	26%	27%	-19%	20%
1,000-2,999	74%	41%	0%	45%
3,000-4,999	163%	73%	26%	50%
5,000+	389%	268%	177%	230%

Source: 2001 NHTS, person file, urban areas

Frequency of transit use among older adults does increase with density, starting at about 3,000 units per square mile (see Figure 35). However, as with walking, it appears that the increased accessibility that density provides does not have as large an effect on adults aged 65 and older compared to all adults.

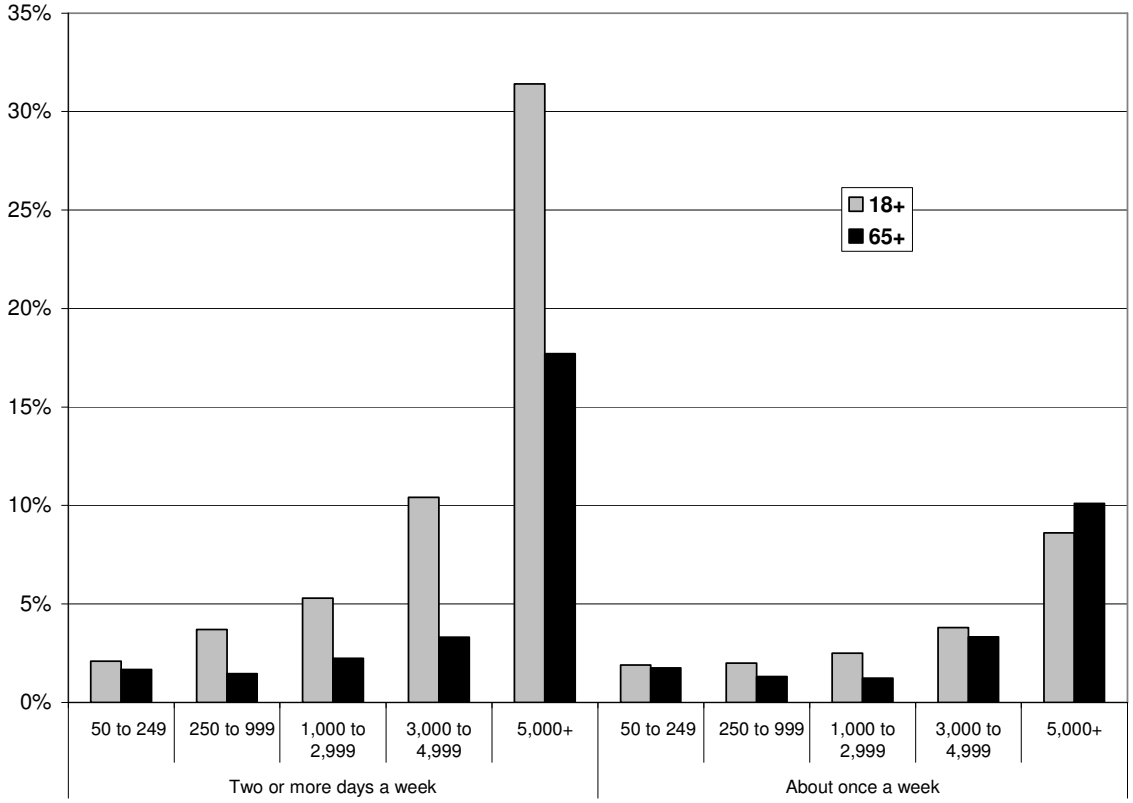


Figure 35: Frequency of transit use and density, 2001

Source: 2001 NHTS, person file, urban areas

KEY POINTS: Increased density is correlated with increased use of transit and walking for older adults. However, frequency of transit use among older adults does not increase until densities reach at least 3,000 units per square mile, and only about 15% of the region's residents live at these densities. Moreover, the correlation is weaker for older adults (65+) than younger adults, particularly those 25-44; younger adults are most able and/or willing to take advantage of the increased walkability and increased access to transit that density provides.

Conclusions and Key Policy Implications for Future Housing and Transportation Demand By Older Adults

Understanding where middle-aged and older adults live, where they are moving, how they get around, and the factors influencing these decisions is essential for planning for the future.

The literature reviewed here has demonstrated the lack of homogeneity among all those aged 65 and older, and thus the folly of assuming homogeneity on the basis of age alone. This same caveat applies to baby boomers. The span of years covered by the baby-boom generation (1946-1964) is large indeed, and individuals born at the end of the time frame are likely to be quite different in their attitudes and behaviors from those born at the beginning. For example, events that occurred during the 60s defined, to a large degree, this generation, yet the baby boomers at the tail end of the period were toddlers during that decade.

When planning for future older adults, policies should take into account the able and active population of seniors, as well as those with disabilities, or, to use Feldman et al.'s (2004) terms, the "advantaged" and the "frail fraction." This will mean creating opportunities to keep advantaged seniors active in their communities, and addressing the challenges to providing needed support services to frail seniors. It will mean having available a range of housing types and transit options, from affordable to luxury, in the central city to the suburbs.

Still, the preference for single-family detached residences and for suburban living among the vast majority of adults aged 65+ and those aged 45-64 has been demonstrated, as has the predilection of both groups to remain where they were living prior to age 50 – that is, to age in place. In fact, baby boomers in Portland comprise a share of the suburban population that is slightly higher than the national average.

Traditional suburban communities, then, will need to make zoning changes and infrastructure investments, such as in sidewalks, pedestrian-friendly walking environments and destinations, and increased transit (and training in how to use it, such as provided by Ride Connection (www.rideconnection.org) to support an older population. An example is St. Louis Park in Minnesota, a traditional suburb, which created a new urban form that supports residents at all stages of life. The town changed zoning and land-use regulations to allow for both mixed use and high-density living, two characteristics not commonly found suburban communities, but which promote the ability of residents to age-in-place (Howe, 2001). These communities fit Freshley's (1995) plea for "life cycle communities" that work for all age groups. At the same time, we need to begin to advocate for life-cycle housing design. Since the shift from renter to owner is most typical as individuals enter their childbearing years, single family homes have been designed for families, with little thought given to the owners' aging in place. Examples of life-cycle housing include: designed with a bedroom and bath on the main floor so one could downsize to just one floor; designed to be adaptable to people with disabilities, including visitors (e.g., level entry, wide hallways and doors on the main floor, blocking for adding grab bars, cabinets that can be easily altered for use those using wheelchairs); placement of outlets and switches so they are

reachable without bending down; zoning allowing accessory units for use by the family or for rental income in the early years, and for caregivers or elderly parents later on.

Advances in technology also will make it easier for older people to remain in the home of their choice as they age. Technologies already being used or developed bring services to the home rather than requiring travel. For example, telemedicine allows distance monitoring and advice on chronic and acute health issues; the internet makes it increasingly easy to shop for a wide variety of goods, including groceries, remotely (Charness, 2003; Dishman, Matthews & Dunbar-Jacob, 2003). Technologies that compensate for cognitive, motor, and sensory difficulties experienced in the home environment are being developed or improved. Other categories of technological improvement include emergency monitoring and response systems and social communication aids (Horgas & Abowd, 2003).

At the same time, there is some evidence that baby boomers may be somewhat more predisposed than current elders to consider living in higher density, more walkable neighborhoods in order to have easier access to social, cultural, and work-related activities. Other trends, too, may increase the future demand for denser environments, including mounting traffic congestion, decreased crime, immigration and enhanced urban vitality, growth of a café culture, the fashionable design of higher density for the middle class, and positive examples created by growing densification (Myers & Gearin, 2001).

To be successful in attracting and retaining older adults as residents, however, traditional high-density designs will need to be rethought, with consideration given to ways to facilitate aging in place, such as minimizing the use of steps, providing for adequate lighting, and having elder-friendly housing managers. Housing choices designed specifically for older populations can be expected to become more diverse, with greater integration between homes in the community and structures built specifically for older adults, with outreach of services to private homes (Regnier, 2003). New alternatives include co-housing (combining independent living with voluntary shared spaces and activities) and housing on college campuses for elders are being developed (Regnier, 2003). Accessory apartments, even when explicitly allowed, have not appeared as often or been used as often by those over 65 as expected (Chapman & Howe, 2001). They are more likely to be added to homes by people in middle age, with the expectation that they or caregivers might use them in later years.

One impediment to moving in old age is the difficulty of going through the process of sorting through years of accumulated possessions in order to downsize, as well as the physical demands of moving. If policy makers wish to encourage downsizing to high-density locations, they may consider encouraging the development of elder-friendly moving services that can assist movers through this difficult process. There have been a few examples nationally of small companies or non-profits which have developed such services.

Also, creating incentives for future populations of elders to choose to live in downtown areas and eschew private vehicles may prove effective. It should be noted, however, that great success in attracting older adults to downtown areas could have some adverse implications as well, particularly for the buoyancy of the nighttime economy (Bromley, Tallon, & Thomas, 2005). In addition, there is little indication that baby boomers will want to live in age-segregated communities to any greater extent than current generations of elders do. Moreover, research has demonstrated the value of mixing generations to

maximize intergenerational support and learning, self-help capability and community contribution (Ball, n.d.)

The literature presented here on transportation and mobility revealed that private vehicles remain the mode of choice for the vast majority middle-aged and older adults, and indications are that rates of licensing and use will continue to increase in the future. Only a small share of older adults report that they are prevented from driving because of medical conditions. Instead, those with medical conditions adjust their travel. Although the number of daily trips taken by adults appears to have leveled off or declined slightly nationwide, the decline is on the part of younger adults. Older adults made about the same number of trips in 2001 and 1995. Still, adults aged 65+ take significantly fewer trips than other adults, and these trips tend to be shorter than those by other adults, although trip length increased for all adults between 1995 and 2001.

The trend of increased driving among people 65 and older is likely to continue. The development of new technologies that improve the safety of vehicles should reinforce this trend. Older drivers will be more willing and able to continue driving longer in life with these new technologies, particularly with improved health conditions. Moreover, if transportation engineers respond to the growing calls for designing highways and related infrastructure (e.g., signage) to accommodate the aging population, the trend will be reinforced even further.

Taken together, these findings point to the need for planners and policy makers to acknowledge and address the continued and growing reliance of older adults on private vehicles. Although increased density is correlated with increased use of transit and walking for older adults, the relationship does not appear until densities reach at least 3,000 units per square mile. Moreover, the correlation is weaker for older adults (65+) than younger adults, particularly those 25-44. Thus, following implementation of policies designed to increase densities and co-locate needed services in order to minimize the need for driving, infrastructure improvements will be needed to enhance the safety of older drivers and those with whom they share the road.

In addition, better transit, walking, and bicycling systems would allow all adults to transition seamlessly from driving to other travel modes, or to supplement their driving by using these alternatives modes, thereby reducing older adults' loss of independence and enhancing their mobility (Ernst & McCann, 2005). After reviewing the laws that promote (or restrict) the mobility options in four states (California, Colorado, Maine, and Oregon), Ernst and McCann (2005) concluded that the following would facilitate the development of policies that support mobility options:

- Provision of a revenue stream or source of funding – this determines success or failure.
- A focus on improving the supply of transportation facilities and services, not on changing behavior.
- Local or regional control of investment decisions, including strong public participation to ensure that projects are responsive to the unique needs of residents (they noted that top-down funding in the past has resulted in highway-oriented

transportation systems that works to move people through the community, not within the community).

- Clear implementation guidance from the state – it is important to have state-level agencies set goals and objectives for regional and local transportation systems, especially for smaller and rural regions that do not have expertise with transit innovations.

As Rosenbloom (2004) and Bailey (2004) suggested, these findings indicate that no single policy program will address the transportation needs of current and future generations of older adults. People's travel needs and problems result as much from land use and housing patterns, social and human service delivery systems, neighborhood and community design, and the physical specifications of various transportation modes as they do from actual transportation programs and resources. A comprehensive strategy to link all of the policy arenas that affect the travel patterns of older people is needed, involving effective driver evaluation and retraining programs, better designed cars, improved signage and information systems on roads and highways, user friendly transportation alternatives, well-designed land use and housing choices, cost-effective delivery of public and private services, and coordinated delivery of human and social services.

Despite the dominance of private vehicle use, there remains a role for public transit in the lives of older adults (Rosenbloom, 2001). More routes that serve the needs of older adults, such as night routes and routes that include busy shopping malls would be beneficial, as would the establishment of service routes (Rosenbloom, 2001). These routes would include destinations frequented by older adults but open to all, as is the case in Sweden, to provide an alternative to paratransit (Rosenbloom, 2001). There would be stops at regular bus stops, but service to places not accessible to larger buses, such as the front doors of hospitals, day care centers, and even stores, would also be provided. This concept, called "community buses," has been adopted in several U.S. and Canadian cities. Although they are more expensive and are normally operated in conjunction with normal routes, an increasingly older population may provide economies of scale for the future. Although enhanced pedestrian amenities, mixed land uses, and enhanced comfort and security in transit systems may not create a mass defection from the car, older adults may be willing to occasionally, and perhaps increasingly, use other forms of transportation rather than a private vehicle (Rosenbloom, 2001).

Policy makers will need to understand in greater depth the reasons that older people do not choose public transit. In addition to issues of routes and access, a concern that emerges often relates to safety and security on the bus/train, at the stop, and on the walk to and from the stop, especially among nondrivers and those with poor health (Coughlin, 2001; Ritter, Straight & Evans, 2002). Locating routes where there are few "eyes on the street" (e.g., the MAX line between I-84 and the railroad tracks) will increase safety concerns. Another issue for some older adults is lack of experience with transit. Programs have been developed to complement the usual information systems by providing one-on-one training in the use of transit by older people or people with disabilities, assisting them in moving from paratransit to the regular system (Moakley, 2001), e.g., the local program Ride Connection.

Clearly, more research is needed to fully understand the attitudes and desires of the baby-boom generation. Some of the findings presented here are contradictory, but a larger concern is that there is little information on the baby-boom generation, and our ability to predict their behaviors and attitudes is limited. Nonetheless, planning for this group is crucial, as they comprise such a significant portion of our population.

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