

“Everyday life without a car would be impossible.”

A Comparative Study of Baby Boomers’ Travel Behavior and Residential Preferences in Age-Restricted and Typical Suburban Neighborhoods

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ABSTRACT

Given limited research into the relationships between the built environment and travel behavior of older persons, the apparent “graying” of suburbia in the United States, and the fairly recent emergence of new residential development patterns targeting persons 55 and over, we present an exploratory study of a particular suburban neighborhood type. Specifically, we investigate aging baby boomers’ travel behavior and neighborhood design preferences in four different urban edge neighborhoods in the Boston metropolitan area (two age-restricted neighborhoods, two matching non-age-restricted restricted neighborhoods). We use focus groups and urban design analysis to develop a preliminary understanding of the influence of different neighborhood types on 55- to 65-year old suburban residents. Results indicate that age-restricted, active adult communities (ARAACs) provide physical settings within which residents are more inclined to participate in local walking than those ‘aging-in-place,’ although ARAACs do not necessarily produce different regional travel patterns. Regardless of location or neighborhood type, all participants are aware of the potential problem of auto dependence while maintaining suburban lifestyle as they age. Our exploratory study suggests that the apparent beneficial physical and social aspects of suburban ARAACs do not overcome the lack of destinations near to the neighborhood and the limited availability and knowledge of public transport options.

INTRODUCTION

The number and share of older persons in most countries around the world continue to grow at unprecedented rates (1). In the United States, in 2000, the baby boomers (people born between 1946 and 1964) comprised almost one half of the nation’s family households (2) and over the next two decades 78 million baby boomers will reach retirement age (3). Many of the baby boomers were the first to be born and raised in the proliferating postwar suburbs and evidence suggests that today’s older persons tend to prefer suburban locations – as a result, trends indicate that the percentage of persons over 65 years old will increase more rapidly in suburban areas than in cities (4). These changing demographic and spatial patterns have stimulated a wide range of research into the travel behavior and needs of older adults as part of the larger aging-accessibility-wellbeing research agenda.

In this study, we focus on a particular development type, targeted specifically at older persons: the age-restricted, active adult community (ARAAC). We use “active adult community” in this paper to distinguish this development type from assisted living and congregate care facilities. Age-restricted housing, for residents 55 and older, has become an increasingly prevalent form of residential development across the United States, driven by demographic and market forces, changes in federal housing legislation allowing senior-exclusive housing, and many local communities’ views that these developments bring increased tax revenues with lower public service demands (5,6). Given the apparent increasing growth in ARAACs across the U.S. and continued interest in the travel behavior, public health, welfare, and safety issues related to older persons travel, an exploration of the residential preferences and travel behavior of ARAAC residents seems warranted.

Here we provide just such an initial exploration, focusing on ARAACs in the Boston metropolitan area. Specifically, we aim to offer some initial insights into why households move into ARAACs and the degree to which transportation figures into the residential location choice, whether older adults living in ARAACs have notably different travel behaviors (e.g., increased/decreased auto use) than their counterparts living in “ordinary” suburban settings, and if ARAACs offer particular planning and design lessons that can be adapted in non age-restricted developments and/or vice versa. To examine these questions, we use focus groups, which, while not allowing for statistical inference, are well-suited to the exploratory nature of the research (7). In this research we focus on the “leading edge boomers,” the first wave of baby boomers, aged 55 to 65, transitioning into retirement.

Through this research we ultimately aim to better inform relevant community design and neighborhood development approaches to ensure that current and future communities can adequately meet the mobility/accessibility needs of older adults (including active-living possibilities and subsequent health benefits) and the broader community (congestion, safety, private vehicle use reduction, etc.). The

importance of the latter is underscored by the suggestion, by some, that elderly mobility patterns may have disproportionately negative effects on transportation sustainability, as the elderly may be less inclined to use public transport, may make more polluting trips due to their trip characteristics (e.g., many short trips) and vehicle preferences, and also have higher accident rates (8). This is a global issue, not only in the aging “Old World” – but also in many parts of the developing world where life expectancies keep climbing (1).

RESEARCH PRECEDENTS: OLDER ADULTS’ TRAVEL BEHAVIOR AND THE BUILT ENVIRONMENT

Scholars and others have long been interested in the travel behavior of the aging (e.g., 9). In recent years, research has focused on, for example, the potential influence of advanced technologies in aiding seniors travel (10), transportation’s role in contributing to the well-being of older adults (11), older person lifestyle groups and their related activities and travel behaviors (12), trip-chaining and public transport use propensities among seniors (13), and overall trip generation rates and travel distances of the elderly (14).

Little of the research into the travel behavior of older persons has focused specifically on the role of the built environment, despite intensive research activity on the built environment-travel behavior relationship more generally. Some examples do exist, however, including several using national-level survey data, such as the U.S. Nationwide Personal Transportation Survey (NPTS)/National Household Travel Survey (NHTS). Bailey (15), for example, carries out a descriptive statistics analysis of the 2001 NHTS, proposing a measure of elderly “isolation” – referring to people who stay at home on a given day – and suggesting auto-dependency, influenced by urban form, as a cause. Her analysis, however, includes few controls (e.g., for variations in age, income, etc.) and crude built environment measures (census block group population density). Rosenbloom and Waldorf (16), using the 1995 NPTS, include the effects of relative location (e.g., urban, suburban) on older persons’ public transport and auto mode choice. They also, however, use few controls in their analysis; furthermore, the crude location measure used provides few insights into community design and possible influences.

Giuliano (17) also using the 1995 NPTS, attempts to detect the effects of metropolitan-scale and “neighborhood”-scale (defined at census tract level) influences on elderly travel behavior. The “neighborhood”-scale variables used to represent the built environment included population density, employment density, a “local services index” (derived from the 1992 Economic Census zip code data), housing age as a proxy for land use dispersal, and share of homeowners as an income proxy. She finds few significant built environment effects on trip rates, except for a positive effect of local access (which increases trip rate). For trip distances (for nonwork travel), she finds significant effects of local access and density, with differing effects detected between the “younger elderly” (65-74) and “older elderly” (75+). In terms of mode use, she finds the older elderly more likely to be transit users when transit is nearby and local access is high. Some limitations of Giuliano’s work include: the rough proxies – measured for the census tract – used to represent the local built environment; and, the omission of walking trips from the analysis. The latter are important in understanding whether the built environment leads to more active elderly lifestyles. Most recently, Noland et al (18) use the NHTS to examine trip-chaining behavior of persons 60 years and older, finding that lower density locations appear to increase trip complexity. Finally, the American Association of Retired Persons (AARP) implemented a national telephone survey among adults age 50+, in which respondents identified built environment-related problems with walking – including lack of sidewalks, distances, amenities – as well as non-built environment characteristics such as individual capabilities and fear of crime (19). The survey found differences in suburb versus city travel behavior, including propensity to walk; although the differences may well arise from other correlated factors, such as income.

Several relevant local-level empirical efforts also exist. Kim and Ulfarsson (20) for example, use data from the Puget Sound Transportation Panel Survey to estimate a mode choice model for elderly travelers. The model suffers from limited specification – such as the lack of information on the alternatives (e.g., out of pocket costs) and limited built environment characteristics represented – but

suggests some influence of transit proximity and neighborhood density on automobile mode choice. Smith and Sylvestre (21), studying older persons in suburban Winnipeg (Manitoba), find no influence of local land use characteristics (distances measured to different services and transit) on trip frequencies; they do not specifically examine mode choice or travel distances. Examining older persons' trip-chaining propensity in the London, UK case, Noland et al (18) find more trip-chaining in outer London versus inner London, suggesting, similar to their findings for the US case using NHTS data, that trip complexity increases in lower density areas. In this case, the land use characteristics are crudely represented via the inner/outer London dichotomy.

Within the physical activity/public health research realm, King et al (22) use a survey of activities, destinations and perceptions of the "neighborhood environment," together with a pedometer, to explore factors contributing to the physical activity of older women. They find statistically significant correlations between total physical activity levels and neighborhood convenience (measured by potential destinations/opportunities within walking distance) and a "walkability rating." Berke et al (23) find neighborhood walkability – measured via a spatial buffer of households and accounting for characteristics such as block sizes, dwelling unit density, and the proximity of grocery stores and other destinations – in the Seattle metropolitan area to be inversely associated with depressive symptoms in older (65+) men (but not women). Using the same walkability measure, Berke et al (24) find a statistically significant relationship between neighborhood walkability and the frequency of walking for physical activity among older persons. Belza et al (25) in an ethnographic approach, used detailed interviews among the elderly of a range of ethnicities, and found that, among other factors, neighborhood safety, crime fear, and reliability of affordable transportation influenced activity levels.

Finally, we could find only one published analysis focusing specifically on the transportation characteristics of ARAACs. Flynn and Boenau (26), in an effort to develop traffic data for "this increasingly popular land use type" (p. 30), report on traffic counts carried out for a suburban Virginia ARAAC, designed to have 800 detached residential units at full development. The authors find their counts – for AM and PM peak hours taken over two different days – to produce trip rates comparable to the trip generation factors recommended for Detached Senior Adult Housing by the Institute of Transportation Engineers. Beyond only covering peak periods, times which older persons may well have the flexibility to avoid, the analysis also only considers vehicle trips departing the development, which offers no indication of behavior within the development (nor non-private motor vehicle trip generation).

EMPIRICAL SETTING AND METHODOLOGY

Study Area: The Boston Metropolitan Area

The greater Boston Metropolitan Area (BMA) – including the 164 cities and towns covered by the Boston MPO planning model (the MPO itself has jurisdiction over 101 cities and towns) – had in 2000 about 4.45 million persons (roughly 70% of the state's population), across approximately 2,832 square miles (6,107 km²) (27). As one of the U.S.' oldest cities, the inner core of Boston contains those elements typical to older Northeastern US cities: fairly dense residential development, urban rail and commuter rail services, and a strong central business district. In 2000, the census tracts within 3 kilometers of Boston's downtown contained nearly 19% of the jobs in the BMA (compared to just 8% in Atlanta, for example) (28). Nonetheless, jobs and residences have expanded outward in the BMA; for example, census tracts at roughly 50 km from the downtown increased from 16% to 23% their regional share of jobs and from 20 to 26% their regional share of employed residents between 1980 and 2000 (28). Unfortunately, the most recent complete household travel survey data comes from the year 1991; these data indicate a relatively auto-dependent metropolitan area, with 78% of all travel by private vehicle, 15% by foot, less than 3% by bus and rail, and 1% by bike (27). Looking at travel by persons 55+ in 1991, we see an even more pronounced apparent auto-dependency, coming primarily at the expense of walking, with 88% of travel by private vehicle, 9% by foot, 3% by public transport, and just 0.2% by bike (27).

The Geography of the Aging

With already a higher share (21% as of the 2000 Census) of older persons and baby boomers than the nation as a whole, Massachusetts is expected to experience a greater than 50% increase in residents over the age of 55, almost 715,000 persons, during the period 2000 to 2020 (5). The BMA has a very similar share of persons 55+ as the state (2), with comparable increases in older persons expected. These demographic trends, combined with local land use policies and fiscal considerations, have created something of a mini “boom” in ARAAC development across the state. A recent study identified more than 150 ARAACs existing or under construction in 93 communities across the state, which – if completed as planned – will supply more than 10,000 housing units; another 172 ARAACs accounting for 14,000 additional units were in the proposal or permitting process (5). This largely suburban development pattern, catering to a generation that came of age with the automobile, seems worthy of a closer examination from a travel behavior perspective.

Methodology*Neighborhood Selection and Characteristics*

To examine the residential choice and travel behavior implications of ARAACs, we look at four different neighborhoods in suburban Boston in a quasi-experimental approach, attempting to match ARAACs with nearby “typical” suburban neighborhoods. We chose two suburban locations: Plymouth, approximately 70 kilometers south of downtown Boston, and Chelmsford, approximately 40 kilometers north of Boston. Both towns have fairly nearby commuter rail access and access to several major highways (see Figure 1 and Table 1). To provide a matched comparison, we identified an area of typical subdivisions near to each ARAAC in the same town. The catchment size for typical subdivisions selected covers a bigger land area than the ARAACs, in order to provide a sufficient population from which to draw 55 to 65 year old participants for the focus groups. Table 1 shows basic demographic and urban form characteristics of the four study areas.

Figure 1. The Boston Metropolitan Area, Transportation Network, Older Adult Concentrations, and ARAACs

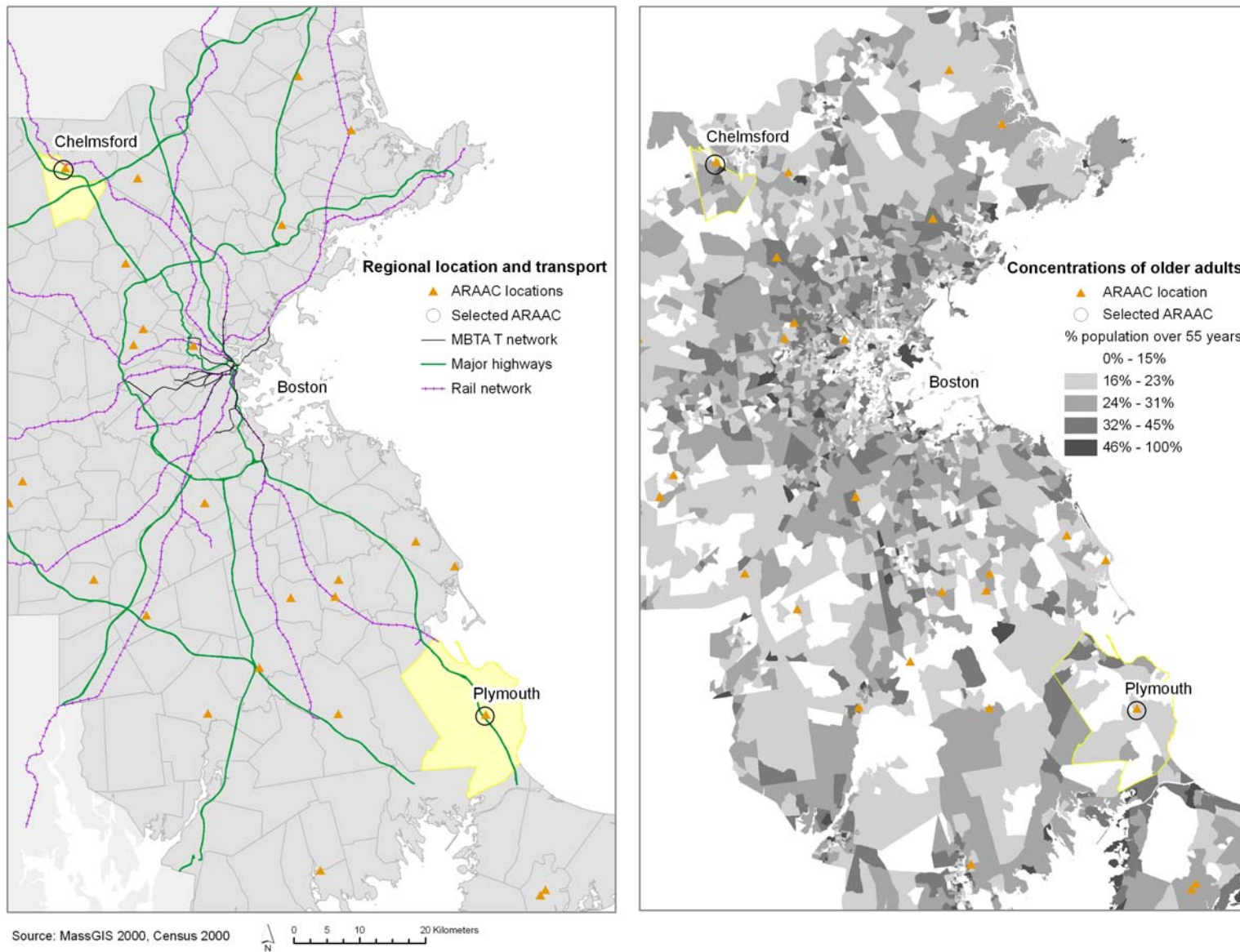





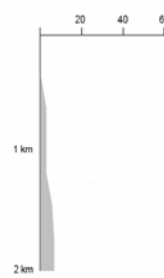
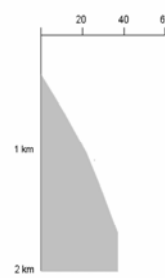
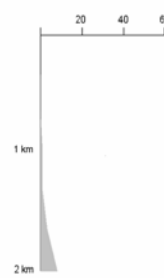


Table 1. Summary of Neighborhood Characteristics

	Chelmsford ARAAC	Plymouth ARAAC	Chelmsford typical	Plymouth typical
Neighborhood characteristics				
Housing type	Detached single family	Mixed	Detached single family	Detached single family
Median year built [a]	1998	1997	1970.5	1977
Area (hectares)	40	1,200	240	5,600
Resident demographics				
Median household income (\$) [b]	49,600	63,700	63,500	56,600
Population 55-65 [c]	17%	8%	7%	6%
SOV commuter % [c]	86%	75%	88%	88%
Rideshare commuter % [c]	7%	14%	7%	6%
Urban form				
Median household value [d]	294,000	392,000	353,000	303,000
Density (households/sq km)[e]	180	28	77	140
Road network density (km paths/sq km)[e]	7.7	4.1	7.7	3.9
Walk network density (km paths/sq km) [e]	7.8	4.5	6.0	4.3
Figure ground and building footprints				
Services and transport				
Distance to highway interchange (km) [f]	<1	1	1.5	6
Distance to rail (km) [f]	5	14	6	20
Distance to downtown Boston (km)	~40	~70	~40	~70
Availability of local services within 2km radius [g]				

[a] Year built is date of first construction for ARAACs, median year built from census 2000 for typical subdivisions. Source: Census 2000

[b] Source: Census 2000, median value taken where multiple block groups intersect the study area

[c] Census 2000

[d] Median value of owner-occupied housing units for the block group containing the centroid of the site. Source: Claritas 2006 census estimates

[e] For ARAACs, the TAZ enclosing the ARAAC was used; for matching areas, the TAZ containing the centroid of the catchment area was used. Source: walk network and TAZ geography CTPS 2000

[f] Source: MassGIS

[g] Calculated as straight line distance from the centroid of the study area. Local services are businesses in any of the following classifications: Grocery, gas; Restaurant; Retail; Speciality; Religious, Recreation, Entertainment. Source: ReferenceUSA Businesses data 2007. Accessed July 20, 2007. <http://www.referenceusa.com/>

Plymouth: ARAAC

The Plymouth ARAAC is a large master planned development with multiple clustered neighborhoods arranged around golf course facilities and open space. Built in stages since 1997, the development has a final target of 2,983 homes when complete. Around 1,000 units are occupied at present. Relatively dense clustering of units within each neighborhood means that 70% of the site's 3,000 acres will remain as open space (29). Housing units are built on loops and cul-de-sacs branching from primary circulation routes, with a mixture of housing types. There are 5 connections from the community into the public road system, with no direct, public roads passing through the site.

The community has been designed to provide a scenic walking environment: a pedestrian path network connects the neighborhoods and golf courses, with no sidewalks on the road loops and cul-de-sacs within each cluster. Internal services are limited to retail outlets located around a village green on the periphery of the site, including a café, post office and other businesses such as insurance brokers. There is no postal delivery within the development, instead residents collect their mail from central mail drop locations. Most of the neighborhoods within the development have an age restriction of 55 years or older.

Plymouth: Typical Neighborhood

We chose matching suburban neighborhoods in Plymouth located near to the ARAAC, with similar regional and demographic characteristics. Some differences naturally result from these being more established subdivisions: the housing stock is older, with a median house construction date of 1975, and a lower median household income. Development takes the form of multiple small subdivisions, with open space and ponds between them. Road densities are similar to the Plymouth ARAAC, but with a more integrated street system that connects in all directions to the wider area. No pedestrian/bicycle path system connects the various subdivisions, however most local streets do have sidewalks on at least one side.

Chelmsford: ARAAC

The Chelmsford ARAAC consists of around 130 single family homes on about 100 acres, arranged on loops and cul-de-sacs without sidewalks or a path system. Two access points connect to the public road network. Permitted in 1998, the development is fully built out and occupied. All homes are covered by the age restriction, making the site a full ARAAC. Limited amenities exist within the development: a clubhouse and a pond for use by residents.

Located near to the city of Lowell, the development has easier access to local retail than the Plymouth ARAAC. It also has the closest freeway interchange and rail stations, and is sited in an area with high road density.

Chelmsford: Typical Neighborhood

The matching suburban area in Chelmsford is located near to the ARAAC, with similar local characteristics. Like the Plymouth matching neighborhood, it is an established subdivision with older homes. No pedestrian/bicycle path system connects the various subdivisions in the area, however most local streets do have sidewalks on at least one side. This area benefits from local services and has a dense street system.

Focus Groups

We carried out four two-hour focus groups of residents drawn from each area during June 2007. We recruited participants from each of the four areas, targeting adults aged 55 to 65, in good health, with no children living at home. Group sizes from each area ranged from 8-11 people, with a total of 45 participants. The participants reflected the variation in ages and work status among leading edge boomers, with a bias towards retired people (all recruited groups had more retired than working participants) and women (28 were women, 17 men). Older adults from the ARAACs had downsized their home, while those living in typical suburbs were "aging in place." Due to the small size and close social network of the ARAACs, some group participants were familiar with others on their discussion panel.

Under the guidance of a moderator, the groups covered two broad topic areas in a structured discussion focused on residential location choice and transportation and activities. The types of questions asked included:

- what would be your ideal neighborhood?
- how would you describe your neighborhood to others?
- what first attracted you to live here, and what is important to you now?
- how does this neighborhood compare to others you have lived in?
- how do you feel about walking locally?
- what trips do you make in the neighborhood and wider area?
- what public transport or shared vehicles do you use?
- if in the future you are unable to drive, how will this impact your day-to-day life?

FINDINGS

In this section we review participant responses within the categories of interest, including residential preferences and transportation choices and travel behavior. Using the participant responses, we attempt to identify primary apparent differences, when relevant, between ARAAC and non-ARAAC residents.

Residential Choices

Ideal Neighborhood: “My neighborhood has everything I would ever want and I never want to leave it”
When asked about their ideal neighborhood, residents of the typical subdivisions and those living in the age restricted ones tended to show similar preferences. Both groups see their ideal neighborhood as solely residential, yet with convenient access to amenities and shopping. Many respondents referred to the desire to be close to major highways, yet still with a level of privacy and isolation. Both groups idealize privacy between the homes, but simultaneously want good neighbors and social contacts. Both groups see their ideal neighborhood containing several amenities including well maintained streets with sidewalks or walking paths, and ample destinations within walking distance. Preferably, streets should be safe with little or no through traffic and with no crime. These apparent contradictions – quiet and isolated suburbia, yet convenient to everything – coincide with general residential preferences uncovered in other research (e.g., 30)

Each group showed an inclination to identify their current social situation and residential location as ideal: “my neighborhood has everything I would ever want and I never want to leave it.” This offers support of evidence found elsewhere (e.g., 30) that people tend to adjust preferences to favor current conditions. Those living in the typical unrestricted neighborhoods described numerous times their ideal as a family neighborhood containing a varied mix of ages, lots of kids and young families. Said one participant: “I like the fact that next door to me, a very young family, with tiny kids just moved in. And they’re all over the place, and they’ve got pets, and they’re noisy. I mean, I don’t want to be in a cloistered community, and not feel a part of that process. I look at them and I see myself years ago. I like that.”

Characteristics of Existing Neighborhood: “There’s no place to get to on foot”

Descriptions of existing neighborhoods revealed clear social differences associated with age restrictions. Those living in the typical open subdivisions firstly describe them as: “family friendly with nice mix of ages.” Regardless of type, all describe their neighborhoods as supportive of an active lifestyle. Activity for those living in the age restricted developments seems to be more organized and built around planned recreation and social functions such as organized walks, golf, restaurant outings, and parties. Those living in the open neighborhoods talk about the feeling of closeness to neighbors, and less structured, more spontaneous activities. These activities do not necessarily involve large segments of the residents, but generate a sense of intimacy as indicated by the following remarks: “It’s an active neighborhood. There are a lot of young children, and they have Halloween parties;” “Everybody knows everybody else, and yet

there's a lot of privacy because it's kind of woodsy;" "you know everybody around you, so even if you have a problem, there's somebody to call quickly."

Residents of the Plymouth ARAAC praised the extensive amenities, especially the walking trails and small village center, and the overall attention to site development, design and the sensitive placement of the homes. Even those from the surrounding non-ARAAC neighborhoods appreciated the Plymouth ARAAC design: "It's beautiful - It's safe. It's designed for pedestrian use." Another added: "It's beautifully designed, I'll grant them that. It's the most perfectly planned community I've ever seen. And it's getting better all the time. I like the idea of having the Post Office so close. I wish we had a Post Office."

Despite apparently enabling internal pedestrian travel (even walking on local streets), none of the neighborhoods offered easy pedestrian connections beyond their neighborhoods. Responses included: "There's no place to get to on foot," and, "there are convenient stores but only if you have a car – you don't walk to any of them." Even the Chelmsford ARAAC, within walking distance to a major commercial and business area, had no pedestrian connection to it: "It's not easily accessible, there's no easy way of getting there....There's not a nice sidewalk where you could say, oh, let's walk down the street and go here."

Reasons for Initial Neighborhood Choice: "Nobody drives through who is not a neighbor"

Participants mentioned housing costs and a location near family, regional accessibility (nearby highways, general proximity to the metropolitan area, ease of access to destinations in the rest of the region) as common reasons for initially choosing their current neighborhood. In terms of local characteristics, those living in the ARAACs specifically looked for a development with integrated amenities like club houses, golf courses, open space networks and housing units designed for one level living to suit their age-related lifestyle. Some mentioned the age restriction and the self contained layout of the development as an attraction. "We wanted somewhere without kids around", one participant mentioned, "a place where there is no maintenance, where they take care of all the lawns and landscaping."

Some residents in the Plymouth ARAAC mentioned that their development's unique appearance – not "just any other subdivision – not a cookie cutter" – attracted them. Nearly all participants voiced a preference for their disconnected street layouts: "We have dead end streets and circles," "in a neighborhood like that nobody drives through who is not a neighbor."

We should note that, although some participants had concern about the current state of the following issues, these were not a consideration when they originally chose their neighborhoods: sidewalks and pedestrian connections, cultural, social and religious activities/centers, health care facilities, and education facilities beyond high school.

Concerns in existing neighborhoods: "The knees are getting sore"

When asked what they would currently change in their neighborhoods, most of those living in the non-ARAACs desired sidewalks and better pedestrian connections to nearby destinations. Regardless of their location, a majority of the participants expressed anxiety about the growth surrounding their neighborhoods and possible impacts on home values and lifestyles. Some see the new growth patterns as inappropriate. "They are building giant houses right on the lake," a participant mentioned. Others are concerned with affordability: "I wish there was more affordable housing, because I don't see my kids...being able to afford to live in this area next to me."

Others seem to be aware of urban planning efforts to create livable communities and neighborhood centers, while separating uses such as big box retail. "The town is growing but in the right way," noted one. "They're bringing in industry, they're bringing in new commercial businesses. And they're doing it in a right way-- They're keeping things away, for example, the Wal-Mart, the huge Wal-Mart--You don't see it. It's not right in your face." Not that participants did not want convenient shopping, including Wal-Mart, which was often mentioned as a typical shopping destination; they just preferred it at a sufficient distance from the residential neighborhood.

Maybe not surprisingly, almost all participants living in the non-ARAACs voiced concerns regarding their existing homes not being suitable for older age living. “I would like to change my home layout to a single floor,” one participant said, “...the knees are getting sore. So we know eventually we’re going to have to change home or else put an addition on...” Maintenance and taking care of the yard was also seen as problematic in the years to come.

Attitudes Towards Age-Restricted Neighborhoods: “Now that the kids have left home...”

Those choosing to live in age restricted communities clearly see added benefits in such developments: housing typologies that suit their lifestyle (one floor living), low maintenance, no kids and teenagers around, amenities such as open space, recreational opportunities, and a similar socio-demographic group. Unlike those living in the non-ARAACs, they do not see the lack of young families as awkward: “It’s a factor, not having kids screaming around and buses driving by”; “Grandkids come but they go home. Age restriction was not the point; it was the lack of kids. Now that the kids have left home, we want the older community.” Some, however, expressed slight dissatisfaction with the many rules and covenants they have to follow and which often prevent personalization around their homes. For example, one participant complained about not being able to place an awning outside his house: “I would like to see not as many rules...in all seriousness, I would change a lot of them. But that’s just local politics.”

Nearly all of those participants living in non-ARAACs knew of this age-targeted development alternative and most voiced unenthusiastic comments about the social rules and limiting nature of the age restricted communities. One respondent from Plymouth, commenting on the mix of ages in his neighborhood noted, positively: “you never lose focus of the young people and the retired people.”

Travel Behavior

Auto Use: “When you live in suburbia, you have to drive”

Auto dependency seems to be uniform regardless of neighborhood type and location. All participants acknowledge that without a car they will not be able to carry on their daily life, as auto travel provides almost the only means to reach destinations beyond their immediate locale. Participants mentioned distances as well as rising gas prices as impacting travel behavior, with many mentioning regular efforts to combine purposes into a single trip. “I find that I’m consolidating trips with the price of gas” one participant mentioned, “Unless I can do three things in one trip, it’s just not worth my while to go out.”

ARAAC residents indicate frequent car pooling to social events such as restaurants, parties, entertainment, and recreational activities, while car pooling does not seem to be a common occurrence in the non age-restricted neighborhoods.

Auto dependency shows itself perhaps most prominently in participant reactions to the premise of possibly not being able to drive in the future: “I couldn’t function”; “Everyday life without a car would be impossible”; “You have to drive. This would not be an accommodating community if you couldn’t drive.” Some considered adaptation to this possible future within their existing neighborhoods by utilizing services, such as: the senior shuttle, family members and/or friends, and social and religious organizations. However, all acknowledged the difficulty that an auto-less lifestyle would pose and some suggested moving to a nursing home or to the city as possible options. “I’m moving back to Quincy on the bus lines”, said one, “When you live in the city, you walk. You walk to restaurants, you walk to stores. You walk to hairdressers. When you live in suburbia, you have to drive.”

Almost all participants acknowledged the need to forestall the difficulties associated with older age and lack of mobility. As one remarked: “You’ve got to have an awareness of what your options are as you age. But you want to delay those options as long as you can.”

Non-Motorized Transportation: “Half the neighborhood seems to be walking”

Irrespective of neighborhood type or location, nearly all participants identified walking for recreational/exercise as a major activity. “Half the neighborhood seems to be walking,” remarked one participant, “that’s like one of the pastimes; people go out in the evening, some with dogs.”

Most residents walk at least two times a week within their neighborhood. Residents of ARAACs tend to walk a bit more than their counterparts in typical subdivisions (see Figure 2). They also tend to be enthusiastic about their immediate walking environment – the condition and layout of the circulation system. Residents of the Plymouth ARAAC (and other non-ARAAC residents in the vicinity familiar with it) raved about the beauty and design of the walks, the integration of benches and places to rest, and the vistas and interest they evoke. They also give high marks to the fact that within the community the pedestrian system connects destinations and amenities such as club houses, golf courses and the village center with the post office.

All participants liked their neighborhood's isolation from through traffic and the local street system – with light traffic – allowing one to walk irrespective of sidewalks during daylight hours. In some of the older subdivisions the lack of sidewalks or their poor condition (maintenance) did not hinder the amount of walking: “in the neighborhood you can walk in the middle of the street, because that's safe to do.” Walking remains confined to internal trips, as the lack of sidewalks, streetlighting and nearby destinations made walk trips beyond the neighborhood infeasible for nearly all participants.

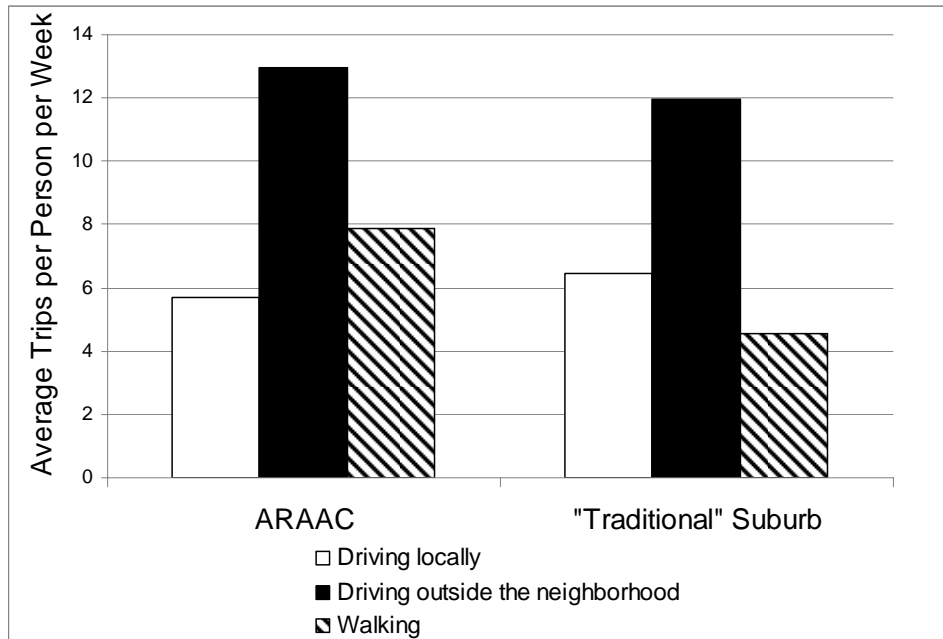
Except for a few avid recreational cyclists, very few participants indicated a tendency towards bicycle use. Issues raised regarding biking included safety, image, physical problems (e.g., knees, hips), vehicle storage at home, and difficulty with socializing (relative to walking). Interestingly, residents considered the Plymouth ARAAC – with its rolling hills and curved streets, identified as attractive for walking – as “not an easy place to bike” by most residents: “too hilly”; “the roads are very narrow and a lot of curves.” Bikes are not permitted on the ARAAC's walking trails.

Public Transportation: “Local buses are terrible”

Residents rarely use the modest public transportation services available, except for a few participants who commute to work regularly via commuter rail. Complaints range from lack of general information (some did not even know of the existence of a local bus), poor levels of service, and inadequate routes. We commonly heard comments like: “Shuttle bus is not for us” and “local buses are terrible- inadequate, and always has been, and may always be, because it's almost unfeasible - can't rely on them.” Exceptions to these attitudes include taking airport bus services and rail service to Boston when going to the city for entertainment.

Summary of Reported Trip Frequencies

Based on responses to a question regarding trip frequency by foot and car, driving trips outside the neighborhood seem to be the most common trip made (see Figure 2). Across all neighborhoods, residents average about 3-4 trips per day. Vehicle trips inside the neighborhood are less common, though those living in the Plymouth ARAAC seem to make more vehicular trips within their community, due likely to the large size of this development. Residents of this neighborhood also reported the highest walking trip rate, with more than half of the participants walking more than once a day – evidence of the effect of the walking network and local services, such as the Post Office. Keep in mind, however, the indicative nature of these numbers: some participants were uncertain about the correct frequency category for their trips, and interpretations of within/outside neighborhood likely vary.

Figure 2. Estimated Trip Frequencies by Walk and Auto as Reported by Focus Group Participants

DISCUSSION: POLICY AND DESIGN IMPLICATIONS AND FURTHER RESEARCH

The above stylized findings enable us to draw some tentative conclusions and identify areas for future research. In terms of residential choice, all participants seemed quite happy with their existing setting, with few – irrespective of community type – evidencing plans to move any time soon. Perhaps not surprisingly, we see a fairly clear divide between ARAAC and non-ARAAC households in terms of their preferences for living among “aged-mixed” or more demographically homogeneous settings. Further analysis of the propensity to adapt expectations to existing residential conditions for this age cohort may be an interesting path of research, particularly if the “graying” of the suburbs begins to pose serious transportation or other challenges. Residents’ almost overwhelming preferences for “convenient suburbs” – isolated and quiet residential areas, yet convenient to daily wants and needs – provides support for apparent “irreconcilable differences” among Americans more generally, in terms of their residential and mobility desires (30, p. 201). Overall, respondents voiced fairly consistent desires for maintaining a suburban lifestyle and its accoutrements. In this respect, both ARAAC and non-ARAAC suburban baby boomers likely have more in common with each other than with their “re-urbanizing” generational cohorts – those forming so-called “naturally occurring retirement communities” (NORCs). Further research in this area would likely yield valuable insights.

In terms of travel behavior, auto dependency dominates the suburban landscape in the U.S. and these community types indicate little variation from this reality. Simply put, respondents view driving as a necessity. This will almost inevitably introduce challenges in later years if driving becomes infeasible – a fact the respondents themselves recognized. This finding raises important issues of regional accessibility and services for suburban ARAACs and non-ARAACs alike: can non-automobile options be realistically introduced to serve the aging boomers’ desired lifestyles? Very few of the residents knew about local public transportation and/or para-transit services, suggesting that better information and/or the introduction of innovative transportation systems – providing on-demand service – could play an important future role in these communities. Better information with a focus on outreach to older adults could help this demographic make the transition to a less auto-dependent lifestyle.

The ARAACs we studied do seem to foster social cohesion, which also leads to beneficial travel outcomes, such as increased ride-sharing. The social networks may also provide a good foundation for increasing shared transportation opportunities, such as car-sharing or community-owned shuttle services,

which might have a wider appeal to residents who seem averse to the apparent stigmatization associated with senior para-transit services. The apparent increased sociability in ARAACs warrants further study, as it may provide a social safety net for aging, with possible mental and physical health benefits; the relevance for traditional suburbs could also be explored.

Despite their auto-dependency, residents in both ARAACs and non-ARAACs do tend to walk, if only for recreation/exercise. The limited evidence from the focus groups suggests that ARAAC residents walk more within their neighborhoods. The Plymouth ARAAC, in particular, with its rolling landscape and winding walking trails, proved particularly attractive for local walking trips and seems to even serve as an amenity for older persons from the surrounding non-ARAAC communities, some of whom also use the place for recreational walking. The Plymouth ARAAC's internal services (local retail and Post Office) also provide a stimulus for making local trips (although not always by foot). Physical planning and design interventions certainly play a role in fostering such settings. Local streets should reflect their pedestrian-oriented role, while the possibility for "localizing" more services (in ARAACs and non-ARAACs alike) needs to be seriously explored. In addition, providing pedestrian links beyond the neighborhood seems a sadly obvious point to make – as seen in the Chelmsford ARAAC, where pedestrian access to a nearby shopping center was virtually impossible.

Overall, our initial findings suggest that community design might help lessen the negative impact of reduced auto-mobility with aging. But, our findings suggest that community design interacts with the social setting, at least to some extent, as the age-restricted communities seem to create new suburban social behaviors. From a design perspective, if "walkability" and its related characteristics such as proximity to grocery stores, block size, residential density – does seem to influence elderly pedestrian activity (e.g., 24) – none of the communities we examined will enable any meaningful walk trips beyond the recreational/leisure purposes. Other interventions will be necessary if we are concerned about the graying of suburbia and its continued auto-dependence.

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REFERENCES

- 1 World Assembly on Ageing II. The Ageing of the World's Population. May 2001: <http://www.globalaging.org/waa2/documents/theagingoftheworld.htm>.
- 2 Census 2000. Table H2. Households, by Type, Age of Members, Region of Residence, and Age, Race and Hispanic Origin of Householder: March 2000
- 3 US Census. Oldest Baby Boomers Turn 60, January 2006, http://www.census.gov/Press-Release/www/releases/archives/facts_for_features_special_editions/006105.html. Accessed July 1, 2007.
- 4 Frey, W.H. Mapping the Growth of Older America. Brookings Institution, Washington, DC, 2007.
- 5 Citizens' Housing and Planning Association (CHAPA). Age Restricted Active Adult Housing in Massachusetts. June 2005.
- 6 Gentile, A. Cities amend codes, attract active adults. *American City and County*, April 2006, pp. 20-22.
- 7 Clifton, K. and Handy, S. Qualitative methods in travel behaviour research. In *Transport Survey Quality and Innovation* (Jones and Stopher, Eds.), Oxford, Elsevier, 2003.
- 8 Rosenbloom, S. Sustainability and automobility among the elderly: An international assessment. *Transportation*, Vol. 28, 2001, pp. 375-408.
- 9 Wachs, M. *Transportation for the elderly: Changing lifestyles, changing needs*. University of California

Press, Berkeley, CA, 1979.

10 Coughlin, J., and Tallon, A. Older drivers and ITS: Technology, markets and public policy. *ITS Quarterly*, 7(1), 1998, pp.39-47.

11 Cvitkovich, Y. and Wister, A. The Importance of Transportation and Prioritization of Environmental Needs to Sustain Well-Being among Older Adults. *Environment and Behavior*, 33 (6), November, 2001, pp. 809-829.

12 Hildebrand, E.D. Dimensions in elderly travel behaviour: A simplified activity-based model using lifestyle clusters. *Transportation*, 30, 2003, pp. 285-306.

13 Hensher, D. Some insights into the key influences on trip-chaining activity and public transport use of seniors and the elderly. *International Journal of Sustainable Transportation*, 1, 2007, pp. 53-68.

14 Schmöcker, J.-D., Quddus, M.A., Noland, R.B., Bell, M.G.H., Estimating Trip Generation of Elderly and Disabled People: Analysis of London Data. *Transportation Research Record No. 1924*, 2005, pp. 9-18.

15 Bailey, L. Aging Americans: Stranded Without Options. Surface Transport Policy Project, 2004.

16 Rosenbloom, S. and Waldorf, B. Older Travelers: Does Place or Race Make a Difference? In *Personal Travel: The Long and the Short of It*, Conference Proceedings, Transportation Research Board (29 June-1 July, 1999), March 2001, pp. 103-120.

17 Giuliano, G. Land Use and Travel Patterns among the Elderly, in *Transportation in an Aging Society: A Decade of Experience*, Technical Papers and Reports from a Conference, November 7-9, 1999, Bethesda, Maryland, published by TRB, September, 2004.

18 Noland, R.B., J.-D. Schmöcker, F. Su, M.G.H. Bell. Trip Chaining Behavior of Older People in the US and London: Effects of Medical Conditions and Urban Form, paper presented at the 11th Annual World Conference on Transport Research, Berkeley, CA, June 2007.

19 Ritter, A.S., Straight, A., Evans, E. *Understanding Senior Transportation: Report and Analysis of a Survey of Consumers Age 50+*. AARP Public Policy Institute, 2002.

20 Kim, S. and Ulfarsson, G. Travel Mode Choice of the Elderly: Effects of Personal, Household, Neighborhood and Trip Characteristics. *Transportation Research Record 1894*, 2004, pp. 117-128.

21 Smith, G.C. and Sylvestre, G.M. Determinants of the Travel Behavior of the Suburban Elderly. *Growth and Change*, Vol. 32, Summer, 2001, pp.395-412.

22 King, W.C., Brach, J.S., Belle, S., Killingsworth, R., Fenton, M., Kriska, A. The Relationship Between Convenience of Destinations and Walking Levels in Older Women. *American Journal of Health Promotion*, 2003, Vol. 18, No. 1, pp. 74-82.

23 Berke, E.M., Gottlieb, L.M., Moudon, A.V., Larson, E.B., Protective Association Between Neighborhood Walkability and Depression in Older Men, *Journal of the American Geriatrics Society*, vol. 55, 2007, pp. 526-533.

24 Berke, E.M., Koepsell, T.D., Moudon, A.V., Hoskins, R.E., Larson, E.B., Association of the Built Environment with Physical Activity and Obesity in Older Persons, *American Journal of Public Health*, vol. 97, No. 3, March, 2007, pp. 486-492.

25 Belza, B., Walwick, J., Shiu-Thornton, S., Schwartz, S., Taylor, M. LoGerfo, J. Older adult perspectives on physical activity and exercise: voices from multiple cultures, *Preventing Chronic Disease*, Vol. 1, No. 4, October, 2004, pp. 1-12.

26 Flynn, T.E., Boenau, A.E., Trip Generation Characteristics of Age-Restricted Housing, *ITE Journal*, February, 2007, pp. 30-37.

27 Central Transportation Planning Staff, data provided to authors.

28 Yang, J. Commuting Impacts of Spatial Decentralization: A Comparison of Atlanta and Boston. *The Journal of Regional Analysis & Policy*, 35, 1, 2005, pp. 69-78. <http://www.jrap-journal.org/pastvolumes/2000/v35/35-1-6.pdf>.

29 Singh, C. The process of and barriers to environmentally-oriented real estate development: examining the role of organizational structure, project delivery methods and contracts in low impact development. Masters Thesis, Dept. of Urban Studies and Planning, MIT, Cambridge, 2006.

30 Talen, E. Traditional Urbanism Meets Residential Affluence: An Analysis of the Variability of Suburban Preference. *Journal of the American Planning Association*, Vol. 67, No. 2, Spring, 2001, pp. 199-216.