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Does urban living influence baby boomers' travel behavior?

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ABSTRACT

We compare the travel behavior of urban versus suburban baby boomers in the Boston metropolitan area. Using propensity score matching to attempt to control for self-selection and data from two surveys implemented in 2008 and 2010, we find that the urban boomers tend to be less automobile-dependent than suburban baby boomers. Urban baby boomers also make more recreational non-motorized transport (NMT), social, utilitarian, and transit commute trips. Most of these differences seem to be primarily a result of the urban setting, not the particular preferences of boomers living in urban settings. We find very small self-selection effects on automobile commuting, recreational NMT, and utilitarian trips: 1–7% of observed influence. We also find some evidence that baby boomers' preference for social activities tends to be mismatched to their environments – suburban boomers want more social opportunities than their settings enable. For public transport, we find a relatively large self-selection effect, 43% of observed influence, suggesting a transit-oriented boomer market segment exists.

1. Introduction

The baby boomers, individuals born between 1946 and 1964, represent the current major wave of aging adults. As of 2010, more than 40 million individuals were aged 65 and over in the United States, representing 13% of the population. By 2030, all of the baby boomers will be aged over 65, pushing the United States' share of 65+ to 19% of the population, or more than 72 million persons (Vincent and Velkoff, 2010).

This demographic reality is related to a range of now well-documented public policy challenges. Among these, mobility looms importantly. Will the baby boomers follow previous generations of older adults, for whom the share of non-drivers increases rapidly after age 65? (U.S. DOT, 2011). If so, how would such a trend be reconciled with the boomers' current high automobile dependency, itself influenced by their apparently overwhelming preferences for non-urban living?

The past decade provided modest evidence that baby boomers became more urban and less automobile dependent (across residential settings in Table 1) and walked for a greater share of all trips (again across residential settings). The 2009 mode shares in Table 1 show that urban boomers' walk mode share is more than double than those of non-urban boomers in second city, suburban, and town and rural. Also, urban boomers' transit mode share is at least seven times greater than their non-urban counterparts (Table 1). If this trend continues, baby boomers may decrease their automobile dependency as urban boomers use private motor vehicles considerably less than their non-urban counterparts. Nonetheless, massive relocation of non-urban boomers to urban areas remains to be seen. While suburban baby boomers may express concerns regarding their current neighborhoods becoming unsuitable for them as they age, they may also be unlikely to forego the privacy, amenity, and social networks suburbia provides (Zegras et al., 2008). Also, it is difficult to implement major environmental changes of non-urban areas – such as radical improvement of density, diversity, and transportation services – to satisfy the travel (and other) needs of their aging demographic.

The boomers' demographic geography and underlying preferences raise a series of inter-related questions for planners, designers, and others concerned with improving current residential settings and/or providing options that support healthy and active aging. How do boomers decide whether to live in "suburban/town" or "urban" environments? How do transportation and the role of the automobile factor into this decision? Does urban and suburban boomers' travel behavior differ and, if so, in what ways? Would an urban migration of baby boomers change their travel behavior? In this paper, we aim to answer some of these questions by comparing the travel behavior of urban and suburban baby boomers in Greater Boston.

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Table 1
Baby boomers' residential location and travel mode share: 2001–2009.[a] *Sources:* U.S. DOT (2005, 2011).

	Urban		Second city		Suburban		Town and rural	
	2001	2009	2001	2009	2001	2009	2001	2009
Share of all boomers	14.3	17.1	16.1	17.1	25.8	24.3	43.8	41.4
Private vehicle share of all trips	77.6	72.3	91.0	87.1	92.4	88.0	93.6	91.2
Walk share of all trips	14.9	18.0	7.5	9.8	5.7	9.7	5.1	7.2
Bike share of all trips	0.6	0.7	0.5	1.1	0.4	0.9	0.4	0.5
Transit share of all trips	6.1	7.3	0.6	1.4	1.1	0.9	0.3	0.4

Notes: For comparability, only trips <50 miles included; baby boomers were represented by individuals aged 37–55 in 2001 and 45–63 in 2009.

[a] The four categories (urban, second city, suburban, and town and rural) reflect the classification of "Urban/Rural Indicator – Block Group" (U.S. DOT, 2011). The classification is based on population density (persons per square mile), which was converted into centiles (a scale from 0 to 99). *Urban:* Downtown areas and surrounding neighborhoods. 94% of "Urban" block groups have a density centile score between 75 and 99. *Second city:* Satellite cities surrounding major metropolitan areas. 96% of "Second City" block groups have a density centile score between 40 and 90. *Suburban:* Areas surrounding urban areas. 99% of "Suburban" block groups have a density centile score between 40 and 90. *Town and rural:* Exurbs, farming communities, and various rural areas. 100% of "Rural" block groups have a density centile score between 0 and 20. 98% of "Town" block groups have a density centile score between 20 and 40.

The present study attempts to assess the role of urban living in influencing baby boomers' travel behavior. We focus on baby boomers aged 55–64, or the "pre-senior" or "pre-retiree" group (Frey, 2003). Hereafter, the term baby boomers in this study refers to this "leading-edge" cohort. Specifically, we examine two issues. First, relative to residence in suburban locations, do urban locations exert causal influences on baby boomers' travel patterns, including driving, transit use, and trip-making for different purposes? Second, to what degree does self-selection, in terms of travel behavior-related residential preferences, influence differences in observed baby boomers' travel behavior? To compare urban and suburban baby boomers' travel behavior, and control for potentially confounding socio-demographic and attitudinal characteristics, we use a propensity score matching approach to approximate "true" versus self-selection effects. Ultimately, we aim to offer a better understanding of baby boomers' travel behaviors in urban versus suburban settings and the role of residential locations in promoting active and healthy aging.

The next section reviews previous studies regarding the built environment, travel behavior, and residential self-selection, as well as aging baby boomers' travel patterns. The following section introduces the data, key variables, and propensity score matching modeling approach, followed by model results. The final section summarizes the results and discusses their implications.

2. Research precedents and approach

2.1. Older adults' travel behavior

Researchers have long been interested in older adults' travel behavior (Wachs, 1979). Recently, Cvitkovich and Wister (2001) focus on the role of transportation in promoting the well-being of older adults. Schmöcker et al. (2005) investigate overall trip generation rates and travel distances of older adults. Despite intensive research activity on the built environment-travel behavior relationship more generally, relatively little of the research into the travel behavior of older adults has focused specifically on the role of the built environment. Bailey (2004) attempts to measure "elderly isolation," using the 2001 National Household Travel Survey (NHTS) data. She refers to people who stay at home on a given day, as related to the auto-dependency of older adults as influenced by urban form. In another study, using the 1999 Nationwide Personal Transportation Survey (NPTS), Rosenbloom and Waldorf (2001) include the effects of relative location (e.g., urban, suburban) on older adults' public transport and automobile choice. Unfortunately, these studies use few controls in their analysis and the crude location measure used provides few insights into neighborhood design and possible influences. Using the 1995 NPTS, Giuliano (2004) attempts to detect the effects of metropolitan-scale and neighborhood-scale (defined at census tract level) on older adults' travel behavior. The neighborhood-scale variables are used to represent the built environment, including population density, employment density, a local services index, 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. For trip distances (for non-work travel), she identifies significant effects of local access and density with differing effects detected between the "younger elderly" (65–74) and "older elderly" (75+).

2.2. The built environment and travel behavior

A rich research base, spanning several decades, now exists on the relationship between the physical form of the built environment and travel behavior. Ewing and Cervero (2010) offer a recent review, including a meta-analysis of more than 50 studies. Their analysis finds reasonably consistent, and relatively modest, correlations among characteristics such as density, land use mix, and street configurations on driving, public transportation use, and walking. As concerns over aging have increased, a growing number of studies have examined various dimensions of older adults' travel behavior and relationships with the built environment, as reviewed by Cao et al. (2010a,b), Zegras et al. (2012), and Lee et al. (2013).

An important challenge to empirical work on the built environment-travel behavior relationships, however, is in inferring causality. A classical experimental design randomly assigns subjects to treatment and control groups, seeking to balance all relevant covariates, whether observed or unobserved, between the groups. This would enable one to infer that the difference between outcomes, post-treatment, is an unbiased estimate of treatment effect. Carrying out such an experiment in the built environment-behavioral realm is clearly a challenge, since rarely does a researcher have the chance to randomly assign subjects to different built environments. As such, much of the relevant research relies on observational studies using cross-sectional data of observed behaviors.

To understand the challenges in such observational studies, consider a basic example: do residents of more "walkable" places walk more because their neighborhoods cause them to walk more or do residents who walk more choose to live in more walkable places (but would walk more regardless)? This example reflects the challenge known generally as "self-selection," which technically arises from endogeneity (simultaneity and/or omitted variable bias), and can result in inconsistent and biased estimates of effects. Mokhtarian and Cao (2008) provide a technical review