

Inter-shopping duration of maintenance shopping activities of seniors and baby boomers

Behzad Karimi (Corresponding Author)*
Ph.D. Candidate
Department of Civil and Materials Engineering
University of Illinois at Chicago
842 W. Taylor St.
Chicago, IL 60607
Phone: 312-996-0962
Fax: 312-996-2426
Email: bkarim2@uic.edu

Taha Hossein Rashidi, Ph.D.
Postdoctoral Fellow
Department of Civil Engineering
University of Toronto
Galbraith Building, Room 319C
Phone: 647-638-5450
Email: taha.hosseinrashidi@utoronto.ca

Abolfazl (Kouros) Mohammadian, Ph.D.
Associate Professor
Department of Civil and Materials Engineering
University of Illinois at Chicago
842 W. Taylor St.
Chicago, IL 60607
Phone: 312-996-9840
Fax: 312-996-2426
Email: kouros@uic.edu

Karl Sturm, Ph.D. Candidate
Department of Civil and Materials Engineering
University of Illinois at Chicago
842 W. Taylor Street
Chicago, IL 60607-7023
Tel: (312) 996-0962
Fax: (312) 996-2426
Email: ksturm2@uic.edu

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Extended Abstract

A desirable transportation system was depicted by Transportation Charter in 2001 as:

“ ... The transportation system should allow every American to participate fully in society whether or not they own a car and regardless of age, ability, ethnicity, or income.”

However, there is still a huge gap between such an ideal system and what is currently in operation, especially for special age groups and people with disabilities. Thus, this emphasizes serious attention towards elderly people as an important part of U.S. society, and who have their own specific characteristics and travel behaviors.

The elderly population in 2030 is expected to be twice as that of in 2000, and year 2011 is a milestone in U.S. aging process because the first generation of baby boomers turned to 65 which is by definition the first year a middle aged person becomes categorized as a senior. Baby Boomers are referred to as people born in the years following World War II, or between 1946 and 1965. That era's birth rate was the highest in the United States going back to 1930.

Some studies have shown that categorizing the elderly population into more homogenous sub-populations with unique specifications can provide more accurate output on elderly travel behavior. Generally, seniors are categorized in two major ways: based on their lifestyle or their age. In the former way, elderly population is categorized based on their socio-demographic characteristics. For example, Hilderband identified six lifestyle clusters, including workers, mobile widows, granny flats, mobility impaired, affluent males, and disabled drivers. In the latter categorization method, which is widely used, elderly population is usually categorized into three age groups, including young-old (65-74 years), old (75-84 years) and oldest-old (≥ 85 years). In this paper, the age categorization is employed and especially the first cluster, young-old, is compared to age group one younger, which includes middle aged individuals between 55 and 64 years old, first generation of baby boomers. Comparison between these two age groups can reveal useful insights about characteristics of the next generations of seniors.

Seniors spend a considerable amount of their time shopping. It has been shown that seniors assign around one third of their out-of-home available time to shopping activities which is 1.5 times that of baby boomers. Despite the importance of shopping activities, this has not been sufficiently addressed from the perspective of travel attributes in the literature especially for elderly.

Among all shopping attributes, one of the least studied is inter-shopping duration. Those few studies that did analyze this, modeled inter-shopping duration employing a latent variable or latent segmentation approach in the context of the mixed proportional hazard based model (MPH) by endogenously determining erratic shoppers from regular shoppers (Bhat et al., 2007; Kim and Park, 1997). They defined the regular shopper as someone with a fixed inter-shopping duration. This vague definition of shoppers complicates the modeling process, and does not necessarily replicate the reality. In this study, it is argued that an approximate regular inter-shopping duration does not necessitate a routine and preplanned shopping behavior. Instead

shopper's awareness about the regularity of the activity is an enough condition. This awareness of regularity is dealt within this paper by employing the planning time horizon decisions.

In this study, UTRACS, a GPS-based activity-travel survey collected over the course of a year in the Chicago region, is employed in which people have revealed their used planning time horizons for executed activities. In contrast with the results of previous studies, our analysis on planning time horizons shows that routine shopping activities form a small portion of total shopping activities (only 4.5%). In other words, executing a shopping activity on what is approximately a fixed interval does not mean that these activities have been performed routinely.

MPH is the dominant modeling structure which has been used for modeling inter-shopping duration (proportionality assumption), but no test on the proportionality assumption was presented. We test the proportionality assumption on our data set on a Cox's (1972) proportional hazard model (PH) which assumes that the hazard rate is independent of time. It is worth noting that the test outcome rejected the proportionality assumption.

After distinguishing non-routine shoppers based on their planning time horizons, a multivariate accelerated failure time model (AFT) is developed to compare rhythmic patterns and to examine duration between successfully executed maintenance shopping activities for two age group of young-old elderly (65-74) and nonelderly of 55-64 years of age. AFT models in addition to dealing with non-proportional data, can directly measure the effects of covariates on survival time and not on conditional probability which makes interpretation of the results much easier. The results indicate that the rhythms of baby boomers' inter-shopping duration relative to young-old seniors' are more under the effect of household characteristics than activity attributes.