



# Understanding travel patterns to support safe active transport for older adults



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## ABSTRACT

Transport and mobility needs for all aged road users are diverse and may change with increasing age. With an increasing ageing population throughout much of the developed world combined with increasing life expectancies, there is a growing need to understand the transportation requirements of older adults. Moreover, while car use is still the most popular form of transport for older adults, alternative transport modes are offered and promoted, and their use is increasing.

This paper explores the characteristics of active transport usage among older adults, defined as persons over 65 years of age, in Melbourne, Australia. Data from the Victorian Integrated Survey of Travel Activity (VISTA) was analysed to undertake the assessment.

The analysis revealed that private motorised transport is the predominant mode of transport for older adults, representing approximately 70% of travel. Approximately 22% of travel was made using active transportation, with the majority of these being walking trips. Average trip distance, trip duration and walking speed were found to decrease past the age of 75 years.

The analysis shows that the travel patterns of older adults differ from those of younger adults which may reflect the fact that transitions in lifestyle influence their travel needs, destinations and time of travel, or an overall decrease in mobility. The implications of the findings are discussed in terms of ways to improve participation in active transportation and enhance the safe mobility of older active transport users, including a need to enhance the urban environment.

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## 1. Introduction

In Australia, sustained lower fertility rates and increasing life expectancies are resulting in a continued increase of the median age of the population (ABS, 2010). Between 1990 and 2010, the median age of the population increased by 5.1 years from 31.8 years to 36.9 years, and the proportion of people aged 65 years and over increased from 11.1 per cent to 13.6 per cent of the total population (ABS, 2010). Moreover, population forecasts show that this trend is expected to continue, with estimates that up to 20 per cent of the Australian population will be aged 65 years or older by 2040 (ABS, 2013a). This trend of an ageing population is also occurring in other high-income countries such as the USA, Europe, and Japan (United Nations, 2007). Furthermore, life expectancy of women is longer than men. In Australia, life expectancy is 84.2 years for women and 79.7 years for men (ABS, 2013b). Similarly, in most other countries, the life expectancy of women is approximately 5–6 years longer than men (WHO, 2013). Moreover, while current populations in many middle- and low-income countries are relatively young, the pace of population ageing is faster in these countries than in high-income countries, with an expected increase from approximately 8 per cent to approximately 20 per cent by 2050 (United Nations, 2007). These changes will have profound enduring implications on society.

With a current ageing population throughout much of the developed world, there is an imminent need to understand the current transportation requirements of younger and older adults, and to ensure sustained safe mobility and healthy and active lives. Recent research suggests that the current cohort of older adults is healthier, more affluent, and more mobile than previous generations (Chen and Millar, 2000). As such, older adults are generating a greater demand for travel, particularly for social and leisure activities (Zhou and Lyles, 1997). Private travel offers mobility, utility and creates social inclusion (Whelan et al., 2006), and there is good evidence that mobility is

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crucial in maintaining health and high quality of life and independence for older adults (Metz, 2000). For older people, driving represents the most significant mode of transportation, in terms of mode share and distance travelled. Driving one's own vehicle is associated with higher levels of life satisfaction, higher adjustment, less loneliness and better perceived control (OECD, 2001).

However, as lifestyles change and skills and abilities decline with age, it is inevitable that at some point most individuals will consider reducing or retiring from driving. This can result in a significant reduction in mobility and health problems associated with both physical and mental illnesses (Whelan et al., 2006), and is likely to have a greater effect on older women who tend to reduce and cease driving at an earlier stage than older men (Siren et al., 2001; Oxley et al., 2010); and those living in more remote areas with fewer alternative transport options available (Langford and Oxley, 2006). There is also evidence to suggest that potential negative consequences of driving reduction and cessation can be mitigated through early planning, appropriate timing of decisions and independence in decision making, and good access to and use of alternative transport prior to driving cessation (Oxley and Charlton, 2009). While not practical for all older people, for some, active transportation can provide alternative modes of travel suitable for many daily trips.

Indeed, important health benefits can be generated from participation in active transportation. The health benefits of regular physical activity include a reduced risk of many chronic diseases including obesity, heart disease and diabetes (OECD, 2001). Increased physical activity amongst older adults has also been linked to increased life expectancy, physical fitness, and social connectedness as well as improved mental health and cognitive functioning and independent living (Binder et al., 2002; Wang et al., 2002; Garrard, 2009). Moreover, there are reports that regular daily activities such as walking and sport participation in older age are required to function effectively and independently within everyday life (Salmon et al., 2000). Leading a physically active lifestyle also assists individuals, who may already be experiencing many of the health issues identified above, to manage their conditions more effectively or reduce their risk of developing significant health (and mobility) complications. It is estimated that 60 per cent of Australians are overweight or obese, with obesity now the leading cause of premature death and illness in Australia, representing a significant threat to public health. The prevalence of diabetes is estimated at 7.4 per cent, with the highest rates of incidence observed between the ages of 65 and 74 years (Tanamas, 2013).

Increasing the uptake of active transport as a mode of travel has also been shown to generate economic benefits through reductions in transport-related costs. These include benefits such as lower personal expenditure on vehicle fuel and maintenance. There are also broader societal benefits associated with active transport use, including improved health status of the community, reductions in greenhouse gas emissions and reduced costs associated with maintaining infrastructure, such as the road network (Salmon et al., 2000). These factors can be very important for older adults, who typically have lower annual incomes compared with younger (working) adults, may rely on government assistance and for whom transportation costs may represent a significant component of total expenses (ABS, 2012). The combination of these variables can result in transport disadvantage and social exclusion, which has been identified as a significant problem facing ageing populations (Delbosc and Currie, 2011).

Given the many benefits associated with engaging in active transport, these modes are therefore promoted widely in many European countries (Forward, 1998; ETSC, 1999; Wittink, 2001). This concept is also gaining wide support in Australasia. Notwithstanding, the research is also clear about the need to provide a safe and comfortable environment in which to walk, cycle and use public transport. There is also a growing awareness within the road safety community of the specific needs of vulnerable road users when interacting with the transport network.

Traditionally, active transport users are considered a vulnerable road user group, and crashes involving vulnerable road users represent a major road safety problem world-wide (OECD, 2001). Older adults over 65 years are at a higher risk of injury compared with younger adults due to frailty and associated increased injury susceptibility, placing them at a double disadvantage when walking or cycling, compared to when travelling in a vehicle. Further, age-related deteriorating sensory perception, as well as changes in cognitive abilities such as memory and information processing (Whelan et al., 2006) can increase the difficulty in judging distances and the speed of oncoming traffic, while reductions in physical agility and strength can reduce walking speeds and ability to react to potential hazards making many aspects of the urban road environment difficult to negotiate.

It is therefore essential that safety aspects are considered in addition to the health, mobility and environmental benefits of active travel modes. The aim of this study, therefore, was to identify the current prevalence, patterns and characteristics of active transport participation of younger and older adults. This information can assist in developing appropriate policies and interventions to meet transportation needs, and increase the likelihood of older adults choosing active travel modes while ensuring their safety.

## 2. Method

The characteristics of active transport use amongst older adults in Melbourne, Australia were explored using data from the Victorian Integrated Survey of Travel Activity (VISTA). VISTA is a one day travel diary of representative households located in the metropolitan Melbourne and several regional areas in Victoria, Australia. The survey has been conducted twice, in 2007 and 2009 and contains four datasets relating to individual and household characteristics and their trips and trip components for the day of the travel survey. Data is collected across the year, to allow average daily travel behaviour to be described. The survey is administered on behalf of the Victorian Department of Transport, Planning and Local Infrastructure by a large social research institute. These are the most recent large data sources on travel activity available in Victoria.

Randomly selected households are asked to complete a Household Form, and all household individuals aged 5 years and older are asked to complete an Individual Travel Day Form. The VISTA travel diary for a single specified day.

The Household Surveys collect broad data on the household, including type of dwelling, length of residence, number of residents, relationship of residents, number of vehicles (including bicycles), etc. The Individual Travel Day Forms collect information on a range of variables including the purpose of each trip, transportation mode, time of travel, duration of trip, trip length as well as demographic characteristics of survey participants (age, gender, employment, work arrangements, etc.). For the survey results, data was weighted to represent the approximately 4.3 million residents of Melbourne, Geelong and several regional districts within Victoria.

The 2009 survey includes data collected from 41,627 persons in 16,269 households who made a total of 119,208 daily trips consisting of 135,178 trip components, with a similar sample collected in the 2007 survey. A comparison between the 2007 and 2009 surveys revealed similar data, therefore, for this study, the 2009 survey data were analysed to provide the most recent account of travel mode. Variables identified and extracted for analysis included: age group, gender, trip components, travel distance, purpose of trip, time of day and mode of transport. Active transport trips are defined as trips made by either walking or cycling. Public transport refers to all trips on public transit including train, tram and bus. Private transport includes all trips in motor vehicles including cars and motorcycles. Associations between variables of interest were examined using appropriate tests of significance (chi-square, ANOVA).

For the purpose of this assessment older adults have been classified as people over the age of 65 years. While this is a simplistic classification, in Australia, this represents the traditional age for retirement and tends to signify a shift in travel demand and travel behaviours (Oxley and Fildes, 1999), most notably a reduction in the number of commuting trips.

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