TRANSPORT, TRAVEL AND LATER LIFE

TRANSPORT AND SUSTAINABILITY

Series Editors: Stephen Ison and Jon Shaw

Recent Volumes:

Volume 1: Cycling and Sustainability
Volume 2: Transport and Climate Change
Volume 3: Sustainable Transport for Chinese Cities
Volume 4: Sustainable Aviation Futures
Volume 5: Parking: Issues and Policies
Volume 6: Sustainable Logistics
Volume 7: Sustainable Urban Transport
Volume 8: Paratransit: Shaping the Flexible Transport Future
Volume 9: Walking: Connecting Sustainable Transport with Health

TRANSPORT AND SUSTAINABILITY
VOLUME 10

TRANSPORT, TRAVEL AND LATER LIFE

EDITED BY

CHARLES MUSSELWHITE
Swansea University, Wales, UK

United Kingdom – North America – Japan
India – Malaysia – China

Emerald Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2018

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-78714-624-2 (Print)
ISBN: 978-1-78714-623-5 (Online)
ISBN: 978-1-78714-998-4 (Epub)

ISSN: 2044-9941 (Series)

ISOQAR certified Management System, awarded to Emerald for adherence to Environmental standard ISO 14001:2004.

Certificate Number 1985
ISO 14001

INVESTOR IN PEOPLE

For all those who inspire me I've had the pleasure to work with and especially for my daily inspirers William, Art and Claire and also my mum and dad.

This page intentionally left blank

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF CONTRIBUTORS

Maria Attard	Department of Geography, Faculty of Arts, University of Malta, Malta
Kiron Chatterjee	Department of Geography and Environmental Management, University of the West of England
Hebba Haddad	Centre for Environmental Policy, Imperial College London
Stephen Ison	Transport Studies Group, Civil and Building Engineering, Loughborough University, Leicestershire, UK.
Heather Jones	Department of Geography and Environmental Management, University of the West of England
Tim Jones	School of the Built Environment, Oxford Brookes University
Roger Mackett	Centre for Transport Studies, University College London
David Metz	Centre for Transport Studies, University College London
Deborah Mifsud	Faculty of Arts, Department of Geography, University of Malta, Malta
Kit Mitchell, retried	Formerly Transport Research Laboratory
Charles Musselwhite	Centre for Innovative Ageing, Swansea University
Ben Spencer	School of the Built Environment, Oxford Brookes University

This page intentionally left blank

EDITOR

Dr Charles Musselwhite is Associate Professor in Gerontology at the Centre for Innovative Ageing (CIA) at Swansea University and heads-up the groups Environments and Ageing research strand. He is Operational Director of the Centre for Ageing and Dementia Research (CADR) programme, an initiative to develop and enhance research, policy and practice for older people across Wales. Prior to joining Swansea he was Senior Lecturer in Traffic and Transport Psychology at University West of England's Centre for Transport & Society between 2006 and 2013. He completed his PhD at the Transportation Research Group, University of Southampton in 2004. His research interests involve ageing, travel and transport, and he has run research projects for various funders addressing the (1) road user safety and ageing; (2) older people, travel behaviour change and health and wellbeing; (3) giving-up driving for later life and; (4) attitudes to transport and travel. Charles has advised the United Kingdom (UK) parliament on older people's transport issues and is an Executive committee member of the British Society of Gerontology (BSG), where he is editor of their journal, *Generations Review*. He has appeared on BBC TV and internationally across radio stations discussing his research. Charles is an Associate Editor for *Journal of Transport & Health* and for the *Ageing and Society* journal.

This page intentionally left blank

ABOUT THE AUTHORS

Maria Attard is Head of Geography and Director of the Institute for Climate Change and Sustainable Development at the University of Malta. She specialises in urban transport, policy and project implementation. Between 2002 and 2009, she served as a consultant to Government on transport strategy and policy. She was involved in major transport projects in the islands and implemented road pricing, park and ride and pedestrianisation projects in Valletta. She studied at the University of Malta and completed her PhD in 2006 at UCL (London) and has published in the areas of urban transport policy, GIS and human geography. She has recently co-edited a book on *Sustainable Urban Transport* (published by Emerald) and journal special issues on urban transport policy. Maria is currently the co-chair of NECTAR Cluster 2 and co-chair of SIG G3 and Steering Committee member of the WCTRS. She is co-editor of the journal *Research in Transportation Business and Management* and co-editor of the Emerald Book Series on Transport and Sustainability.

Kiron Chatterjee is Associate Professor in Travel Behaviour at the Centre for Transport & Society at UWE Bristol. Kiron's research seeks understanding of the way in which people travel and how this is influenced by the transport system and social, economic and technological change. He has a particular interest in using longitudinal data to understand changing travel behaviour over the life course and has pioneered the use of biographical data collection methods. Current research is investigating how commuting influences personal wellbeing, reasons for the declining car use of young adults and the design, implementation and evaluation of sustainable transport interventions.

Hebba Haddad is an environmental psychologist at the Centre for Environmental Policy at Imperial College London. Between her MSc and PhD, she worked as a research associate for four years at the Centre for Transport & Society, University of the West of England, Bristol where she worked on projects funded by the EPSRC, BBSRC, and the DfT. Her PhD was funded by the ESRC and the Met Office and looked at climate change communication. Broadly, her research uses mixed (qualitative and quantitative)

research methods, to better understand the psychological and social dimensions of transport and environment issues. Hebba's current research is investigating how new technologies (such as air quality sensors and phone apps) may have in changing travel behaviour and engaging the public with the topic of air pollution.

Stephen Ison is Professor of Transport Policy within the School of Civil and Building Engineering at Loughborough University. He has published widely in the area of transport policy and economics and has edited, authored or co-authored 10 books and 120 peer reviewed Journal papers. He is a member of the Scientific Committee of the World Conference on Transport Research, editor of the *Journal of Research in Transportation, Business and Management* [Elsevier] and Book Series Editor of Transport and Sustainability [Emerald].

Heather Jones was a Research Associate on Cycle Boom. She came to the project having worked in Public Health for the NHS, in consultancy as a health specialist on regeneration projects and had most recently completed a PhD using biographical methods to understand individual development of walking and cycling behaviour through the life course. Heather is currently training to be a nurse.

Tim Jones is Reader in Urban Mobility at the Faculty of Technology Design and Environment at Oxford Brookes University. Tim's research focuses on how the social, cultural and physical environment can support and promote healthy and sustainable urban mobility. He is particularly interested in how the combination of methodological approaches can reveal the physical, social, and cultural factors that influence everyday travel decisions and how this affects journey practice and experience. Tim was Principal Investigator for the EPSRC cycle BOOM study.

Roger Mackett is Emeritus Professor of Transport Studies at University College London. He has researched into various aspects of transport policy including ways of overcoming the barriers to access for older and disabled people, the use of the car for short trips, the effects of car use on children's lives and the impact of the Cambridgeshire Guided Busway on levels of walking and cycling. He chairs the Transport Working Group of the Age Action Alliance and is a member of the Disabled Persons' Transport Advisory Committee (DPTAC) and chairs DPTAC's Research and Evidence Group. He is also a member of the U.S. Transportation Research Board's Standing Committee on Accessible Transportation and Mobility. He has published articles in academic journals about the benefits of improving accessibility for

older people, assessing the success of the policy of concessionary bus travel for older people in Britain and the health implications of inequalities in travel.

David Metz is honorary professor in the Centre for Transport Studies, University College London, where his research focuses on how demographic and technological factors influence travel demand. He spent part of his career as a senior civil servant in a number of UK government departments, both as policy advisor and scientist, including 5 years as Chief Scientist at the Department of Transport. He has a particular interest in ageing, co-authoring the book 'Older richer fitter: identifying the customer needs of Britain's ageing population' published in 2005. He has been visiting professor at the Centre for Ageing and Public Health at the London School of Hygiene and Tropical Medicine. His recent research has been summarised in a short book entitled 'Transport Fast or Smart?' published in 2016.

Deborah Mifsud is a current PhD candidate within the Department of Geography at the University of Malta. She holds a Bachelor of Arts (Honors) in Geography and a Master of Science in Sustainable Development, both obtained from the University of Malta. Her specialisation area is transport mobility and travel behaviour of older people. Her PhD deals with understanding the determinants of travel behaviour for the older population in Malta. She is also a Research Support Officer I at the Institute for Climate Change and Sustainable Development. Her PhD supervisors are Prof Maria Attard from the University of Malta and Prof Stephen Ison from Loughborough University.

C. G. B. (Kit) Mitchell is an aeronautical engineer by training, Dr Mitchell worked at the Road Research Laboratory/Transport and Road Research Laboratory/Transport Research Laboratory from 1970 to 1994, working on public transport, transport planning and the social effects of transport policies. From 1982 he was Head of the Environment Division. From the early 1980s he also ran TRRL's research on transport for disabled people and led the group that drafted the first DPTAC specification for local buses in 1988. He co-chaired the U.S. Transportation Research Board Committee on Accessible Transportation and Mobility 2003–09 and is an Emeritus Member of TRB. In 2010, he produced a review of research on older drivers for the RAC Foundation. He was a member of the Road Safety Foundation's Older Driver Task Force which reported in 2016, leading the Working Group that provided evidence to support the work of the Task Force. He also serves on the Hampshire Older Driver Forum, which coordinates police and road safety activities to support older drivers.

Ben Spencer is a Research Fellow in the School of the Built Environment, Oxford Brookes University, with a background in Urban Design, Health and Wellbeing, Mobility and Gerontology. He has experience of mixed-methods research with a particular interest in mobile methods applied to walking and cycling. Following his PhD on Playful public places for later life Ben worked on the RCUK cross-council funded cycle BOOM project on older people's cycling before moving on to the Healthy Urban Mobility project. This aims to understand the impact of everyday (im)mobility on health and wellbeing with a variety of social groups living in different neighbourhoods in Brazil and the United Kingdom.

PREFACE

Ageing societies are almost a universal phenomenon due to a combination of falling fertility rates and substantial increases in life expectancy. Not only are there increasing numbers of older people but we are creating a fitter, more aspirational group of people ageing than ever before. An ageing population who may still be working, have caring responsibilities (for other older people, for children or grandchildren, for example) and social and recreational networks that span over wide geographical distances. Coupled to this, we have a growing hypermobile society, one designed around the car where services, shops and family and friend connections are more dispersed than ever meaning older people more dependent on vehicles than ever before (see Chapters 2 and 4). The result is a large increase in older drivers and a large increase in mileage driven by older drivers. Unsurprisingly, much evidence suggests being mobile in old age is linked to quality of life and in particular, giving-up driving has repeatedly been shown to related to lead to a decrease in wellbeing, an increase in depression and related health problems, feelings of stress, isolation and increased mortality.

We need to ask are older drivers safe? The stereotype of older driver is one that is dangerous, has poor reactions, poor eyesight, drives over cautiously and slowly and can't cope with demands of modern busy traffic. There are calls for older drivers to be tested regularly or at least have training to help them improve. But research suggests that in countries with more stringent testing, older people have no fewer collisions than in countries with more relaxed rules (see Chapters 2 and 9). While training and education might improve knowledge and attitudes toward driving and improve some specific sets of driving skills, no research has yet be found that suggests it makes any difference to road collisions for older drivers (see Chapters 2, 8 and 9).There is a need to take a step back. Are older drivers actually really that unsafe at all? Statistics suggest those killed or seriously injured do increase in number (especially per mile driven) but studies into fragility and frailty suggest this may be an explanation for increases; older people are more likely to be a casualty of their collision because of their susceptibility to injury (see Kit Mitchell's excellent analysis in Chapter 2).

There is a need to help older people think about alternative transport at an earlier stage in their life. For example, those who are successful at giving-up driving (i.e. those with little to no pain after giving-up driving) are those who have planned to give-up driving and begin to use alternative transport before it becomes a necessity to do so. Providing suitable alternative transport is also crucial to this, taking into account a proper analysis of the needs of older people (Chapters 3 and 4). Chapters 5, 6 and 7 show what can be done in terms of transport provision but also in terms of the public realm to keep people connected without using a car.

And what about the future? We are constantly reminded about increased automation in transport, not less the driverless car. Naturally, this will suit older people unable to drive but wanting the freedom and independence the car can give. But what about our journey to getting to the driverless car? Can changes in society, virtual reality (Chapter 10), the sharing economy, improvements in real time personalised information, better more comfortable and accessible mobility (Chapter 11) mean driverless cars may not ever actually be needed?

Hope you enjoy the read and let's make transport and mobility great for us all as we age.

Dr Charles Musselwhite
Swansea University

INTRODUCTION

CONCEPTUALISING TRAVEL, TRANSPORT AND MOBILITY FOR OLDER PEOPLE

Charles Musselwhite

ABSTRACT

Countries across the globe are seeing both an ageing population and an increase in mobility. This chapter looks at how society deals with an ageing population that also wants or needs to be mobile. Lack of mobility is synonymous with poorer health and wellbeing, with research suggesting it can lead to loneliness, isolation and even death. Hence, it seems appropriate to keep older people as mobile as later on in life as possible. The car is often seen as the panacea to this, but older people are the group most likely to have to give-up driving. How society provides alternatives to the car depends on how mobility is viewed. This chapter argues that we need to see older people's mobility as a human issue, understanding their needs and realising there are affective and emotive relationships between people and mobility. We still provide mobility for older people based purely on functional journeys to hospitals, services and shops. Yet research suggests mobility to connect people, for a day out, for leisure purposes and for its own sake are vital to the wellbeing of older people. Services for older people need to recognise this and provide for it and there are some

Transport, Travel and Later Life
Transport and Sustainability, Volume 10, 1–14

ISSN: 2044-9941/doi:10.1108/S2044-994120170000010002

good examples in the community but these are too few and far between. Additionally, because transport is seen as functional for older people, there is a lack of emphasis on the aesthetic or on providing attractive services for older people, as if this isn't important to older people. Finally, mobility doesn't always have to be literal for older people and there is an argument that needs can be met through potential, virtual and imaginative mobility.

Keywords: Demographic change; ecological models; motivation, needs; wellbeing; health

1. DEMOGRAPHIC CHANGE

Many countries across the world are embracing an ageing society. Western countries are seeing both a significant decrease in birth rate and an increase in life expectancy. This results in both a higher number and a higher percentage of people aged in their later years. In 1950, there were 384.7 million people aged over 60 years of age, totalling 8.6% of the global population (UN, 2013). There are now 840 million people over 60 across the World, totalling 11.7% of the population. Projections suggest there will be 2 billion people aged over 60, representing 21.2% of the global population by 2050 (UN, 2015a). As an example, the population of the United Kingdom aged over 65 years, is around 11.1 million (17.4% of the UK population), of which around 3 million were aged 80 and over (Office for National Statistics, 2015a). Looking forwards, the proportion of people aged 65 and over is expected to rise to 23.5% in 2034 (Office for National Statistics, 2015b). In addition, the population that is aged 85 and over is predicted to double in the next 20 years, and treble in the next 30 years (Office for National Statistics, 2015b). Changes in lifestyle as a result of increased longevity and better health and social care mean that older people are more healthy for longer in their lives and as such are more active and more mobile than ever before (Tomassini, 2004). Naturally, these changing demographics have huge impacts for transport policy and practice, especially as we live in a 'hypermobile' society where high levels of mobility are needed in order to stay connected to communities, friends and family and to access shops and services which have become dispersed across space.

In addition, older people are driving later on in life and more miles than ever before (Tomassini, 2004). In the United Kingdom, 70% of adults (an estimated 32.2 million people) currently hold full car driving licences (DfT, 2014). Of those aged 70 and over, 47% hold a driving licence, which has

increased from 32% in 1989 (DfT, 2014). The last 30 years has shown a substantial increase in drivers who are 65 years and over in the United Kingdom, with this increase is most markedly found amongst female drivers – a 200% increase in male drivers and a 600% increase in female drivers over 65 years (DfT, 2001; Oxley, 1991). This rise is expected to continue, and Noble (2000) predicts that 4.5 million people over the age of 70 in the United Kingdom will have a driving licence by 2030. The importance of mobility has been linked to life satisfaction and quality of life for older people (Schlag, Schwenkhagen, & Trankle, 1996). The need to be mobile and to travel is also related to psychological wellbeing and reduced mobility and independence has been shown to be strongly correlated with an increase in depression and loneliness (Fonda, Wallace, & Herzog, 2001; Ling & Mannion, 1995).

2. IMPORTANCE OF MOBILITY

Being mobile is linked to quality of life (Schlag et al., 1996). In particular, giving up driving in later life has repeatedly been shown to be related to a decrease in wellbeing and an increase in depression and related health problems and feelings of stress, isolation and also increased mortality (see AA Foundation, 2015 and Ormerod, Newton, Philips, Musselwhite, McGee, & Russell, 2015 for overviews). In many high income countries, older people are generally in good health. Despite this older people still may have physiological or cognitive changes associated with ageing that restrict or make mobility difficult. For example, compared to younger people, they may find walking or cycling for long periods of time difficult to do without fatigue or muscle ache. They similarly may have increased difficulty in accessing the public transport (Schlag et al., 1996). They are, more than any other age group, also likely to reducing driving or giving up driving altogether (Box, Gandolfi, & Mitchell, 2011). Difficulty in accessing mobility has resulted in mobility deprivation among older people (DfT, 2001), and those aged 75 and over report the greatest difficulties in accessing shops and services and engaging with and feeling part of their local community (Shergold, Parkhurst, & Musselwhite, 2012). A survey from the United Kingdom suggests around 12% of older people feel cut off from society, 9% feel trapped in their own home and 6% leave their house less than once a week (TNS Loneliness Survey, 2014). Over 65s are estimated to spend an average of 80% of their time in the home – 90% for people over 85 (Help the Aged, 2006) and 30% would like to go out more often (TNS Loneliness Survey, 2014).

3. CHANGING PERSPECTIVES

An examination into the importance of mobility for an ageing population results in studying transport and mobility from different perspectives than is traditionally found. It emerges that we need to view transport from a social perspective that it is more than just moving from A to B and that non-vital mobility is important to older people yet often neglected by policy and practice. We aren't that good at providing mobility for older people who don't drive and when we do it is functional at best but largely cumbersome and unattractive, like older people don't have any aesthetic desire at all. Finally, mobility may not actually always be about being literally mobile and different types of mobility can help.

3.1. Transport is about People

Examining relationships between people as they age and mobility and transport reveal the importance of studying transport and mobility from a different perspective than is traditionally found. It is difficult not to study transport in any other way than within the social context of which it is embedded. Traditionally, transport was studied as a rather abstract concept divorced from its social context which has resulted in transport policy and practice with negative unintended consequences for society. The resulting system has seen a discourse dominated by reductions in travel time, of championing the private motor vehicle at the expense of the environment and personal health and safety. In turn the unfettered growth of motoring has created a fragmented society, depleted of local shops and services, dependent on oil and high levels of mobility just to meet basic needs, with an unhealthy acceptance of injury and death. The negation of the social element of transport has reduced the concept of travel and transport to a mere mechanism of getting to a destination as quickly and efficiently as possible for the greater majority at the exclusion of localness and the positive utility of the journey itself.

The growing disciplines of traffic and transport psychology, the mobilities movement in Sociology and the cultural spaces and mobility movement in Human Geography emphasise the importance of placing people at the centre of investigating and understanding transport and mobility (see Fig. 1). A greater emphasis on the transport as embedded within social context is found in these disciplines. Efficiency, speed and economic benefits of mobility are placed against the needs of individuals, the neighbourhood and community, revealing social exclusion and severance in society.

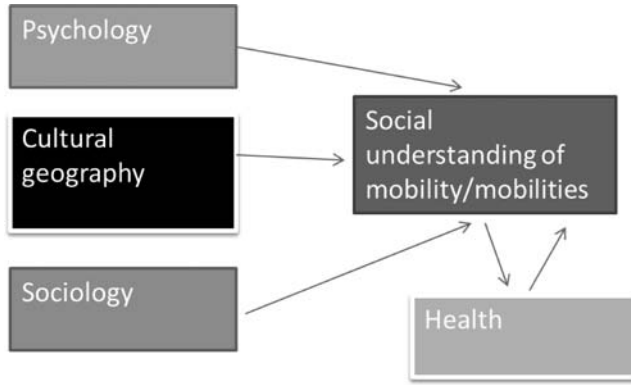

Fig. 1. New Approaches to Transport Studies Showing Social Understanding of Mobility and Relationship to Health and Wellbeing.

Many applied subjects discuss the need for an integrative approach, to bring together the best knowledge and practice from different disciplines, but transport and mobility in later life is certainly a discipline where this is necessary. In order to fully understand and embrace how we achieve better mobility for older people, there is a vital need to draw on research findings, theory and practice across many disciplines. Yet this cannot be done without understanding the relationship of mobility and transport with society. Overall, there is a realisation that social elements of transport are vital to understand the full picture of mobility in later life. As Haglun and Aberg (2000) state, 'traffic and transport should be viewed as a social situation where drivers interact and influence each other' and O'Connell (2002) notes, transport studies 'must not be based on an erroneous model of humans as abstract rational actors, isolated from their social context and operating on purely 'objective' criteria' (p. 201).

Ecological models are increasingly being used to explain such interactional relationships between the external environment including a social context and an individual's behaviour. Such models suggest the behaviour of the individual cannot be isolated from the immediate physical and social environment within which they have a bidirectional relationship. Examples of ecological models used in terms of ageing and the transport and mobility context include Webber, Porter, and Menec (2010)'s conical model of mobility and Bronfenbrenner's Ecological Systems model (Brofenbrenner, 1979, 1989, 2005) which has been applied to transport (Musselwhite, 2016; Musselwhite, Avineri, & Susilo, 2014; Ormerod et al., 2015). Musselwhite (2016), building

on work by Ormerod et al. (2015), suggests a four-stage model based on an ecological approach (see Fig. 2). At the centre is the older person and their needs, desires and motivations. Surrounding this is a legible, attractive local neighbourhood for walking and cycling, followed by an accessible attractive public and community transport system. At the outer layer, these elements are supported by safe, age friendly transport strategy and policy plans.

3.2. Transport and Mobility isn't Just about Moving from A to B

Coupled with the notion that transport and mobility can be studied separately to society is another misconception that the importance of transport and mobility is simply a utilitarian one; that transport and mobility is simply a means to meeting individual needs, a way of getting from A to B. Research with older people, and indeed with people at differing ages, suggests that

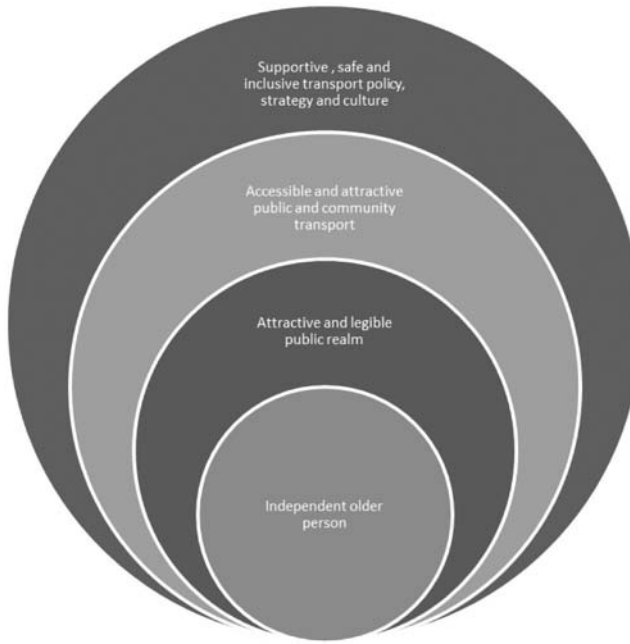

Fig. 2. Domains of an Age Friendly Transport System Utilising an Ecological Approach.
(*Source:* Adapted from Musselwhite 2016).

mobility is more than the product of going from A to B as quickly, reliably and efficiently as possible.

Musselwhite and Haddad (2010) propose a three-tier model of needs and motivations for travel in later life (Fig. 3). The levels are hierarchical and are based on awareness of need by the participant themselves. Musselwhite and Haddad (2010) used re-convened focus groups and interviews with the same participants and the needs mentioned primarily are found at the base of the hierarchy, broadly described as the practical or utilitarian needs which include the need to get from A to B at quickly, reliably, safely and cheaply as possible. The next level of needs mentioned in the focus groups is termed psychosocial need, which relates to how travel fulfils psychological, affective or emotional needs such as a need for independence, control and the need to be seen as normal in society relating to concepts such as roles, identity, self-esteem and

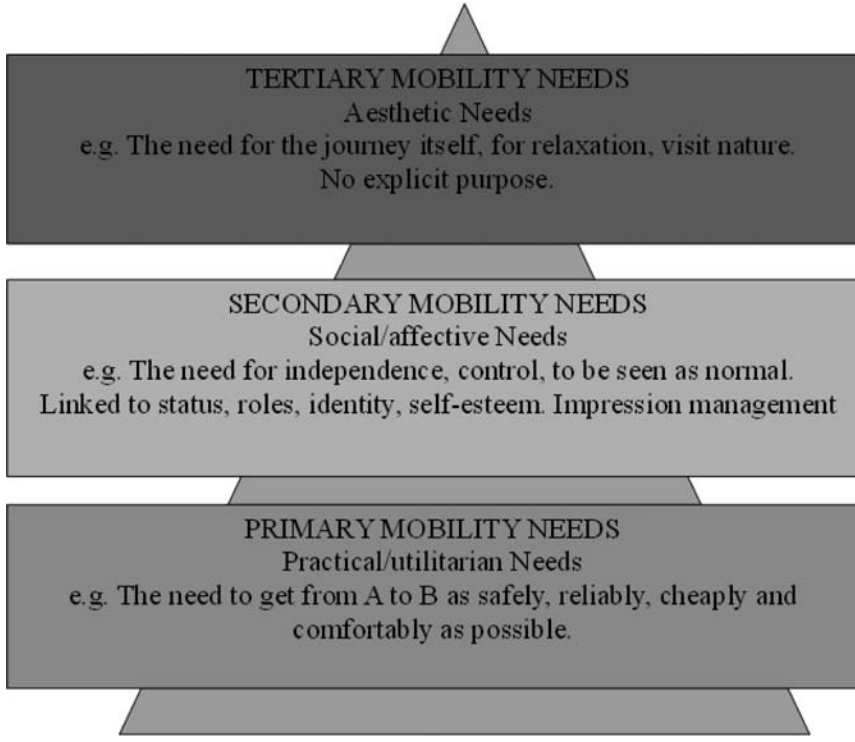

Fig. 3. Hierarchy of Travel Needs in Later Life.
(*Source:* After Musselwhite and Haddad 2010).

impression management. A top level of need, articulated much later on by participants in the research, was the need to travel for its own sake, to get out and about, to people watch, to see nature, to test their own ability, this level of discretionary need is termed aesthetic needs. The model suggest that all three levels of need are important in later life. However, the prevalence of transport meeting each need varies throughout the life course and throughout society. It is very common, for example for older people, practitioners and policy makers to discuss travel at the utilitarian level. It is less common for them to mention social, affective or emotional issues of transport and mobility and even less common is discussion of travel for its own sake or for 'luxury' or 'discretionary' purposes; the aesthetic needs. Hence, transport provision in later life is usually centred on practical or utilitarian support at the expense of fulfilling needs at other levels. Older people's utilitarian transport needs are most likely to be provided for. For example, this is seen in transport solutions for older people being provided through public or community transport. So, older people with mobility difficulties who may have given up driving can actually get their utilitarian needs satisfied somewhat (though this can still be difficult). However, their social, affective and aesthetic needs tend to go unmet. Importantly, in our hypermobile world, driving a car readily fulfils all three level of needs.

Similarly, psychosocial needs for mobility are expanded in the model by Mollenkopf et al. (2011). These were (1) out of-home mobility as a basic emotional experience; (2) physical movement as a basic human need; (3) mobility as movement and participation in the natural environment; (4) mobility as a social need; (5) mobility as an expression of personal autonomy and freedom; (6) mobility as a source of stimulation and diversion; and finally (7) the ability to move about as a reflective expression of the person's remaining life force. The psychosocial element is especially absent if driving is stopped. As Musselwhite and Haddad (2010) and Zeigler and Schwannen (2011) note those who stopped driving feel a particular loss of independence, especially in every car-dependent areas and for those who were frequent drivers throughout life (Adler & Rottunda, 2006; Davey, 2007; Siren & Hakamies-Blomqvist, 2009).

Allardt (1975) model defined welfare or wellbeing as satisfaction of needs relating to three aspects of life – having, loving and being. Having needs are income, hosing, standards, employment, health and education. Loving needs are relationships with others, and with family and friends in particular. Being needs are related to self-esteem, reputation, leisure activities. These map onto Musselwhite and Haddad's (2010) needs to some extent – having as utility, loving and being as psychosocial and aesthetic. This was applied by Hjorthol (2010) to transport in later life. She found a lower level of activities than people desire for all three dimensions. Activities related to the 'loving' and 'being'

are more in demand than those in the having dimension. All three increase in demand for higher frequencies with age. If access to transport is taken into account, there are no gender differences; females tend to have higher demand for frequencies of all three elements but this is due to not having access to transport, rather than different demand, showing males still tend to hold more of the transport resources. Shopping is a quite well satisfied need and it often covers two elements, especially in rural areas, both having (the need to purchase goods) and loving (the social nature of shopping). In rural areas especially shopping would often be combined with a trip to a cafe to meet others.

3.3. Discretionary Mobility is Important

The highest level of need noted in Musselwhite and Haddad's (2010) hierarchy is that of aesthetic needs. This can be further broken down into further sub-set of needs (e.g., see Musselwhite, 2017), often really missed in later life. First, the need to be mobile in order to reach an end product that is discretionary is important to older people. The notion of touristic style mobility, to have a day out somewhere, for mainly leisure purposes, is seen as important to older people. However, in mobility provision for older people it is an often overlooked area of need. There is secondly, a need to traverse through environments to see them. This is often combined with more practical journeys, though sometimes is a journey in its own right. This is driving the long-way round to visit a forest, or to drive past the seaside, for example. Again without a car in later life, these journeys are harder to make. This can make the car or mode of transport a third space, a vessel to watch the world go round from, in relation to an individual themselves. There is also mobility for its own sake, to feel the kinetic property of movement and mobility as opposed to stillness. This is particularly felt through cycling and even motorcycling where exposure of the body to the outside and closeness to elements is noted, but is also felt through driving or being a passenger on public transport. Musselwhite and Haddad (2010) also note the importance of completing the skill required to travel as being a motivator. Mastery of the skill of driving is noted by Ellaway, Macintyre, Hiscock, and Kearns (2003) as a motivator for driving in particular. In terms of older people, Musselwhite and Haddad (2010) note the importance of this as a display of impression management to other people, to show they still can drive, that they are not too old to do it! This could extend to other modes of transport, for example the successful completion of a set of complex or long public transport journeys, especially in unfamiliar places, however, it is still more noted in drivers than passengers.

3.4. Alternatives are Barely Functional and Certainly not Attractive

There is still a tendency to situate mobility solutions for older people around the purely functional level. Services are created on the basis of being cheap, reliable, minimal travel time and getting from A to B. Public transport and community transport vehicles are designed to be accessible and reliable. In this we are treating the situation as simply a functional, rather than an aspirational issue. Aspirational or aesthetics are secondary in nature. Public or community transport is not seen as desirable from the point of view of the individual. There has been some change to this over the past few years in many countries. Buses are more comfortable, offering Wi-Fi, leather seats, ambient lighting and large windows on many showcase bus routes throughout the world (e.g., bus rapid transit corridors) but this is till the exception rather than the rule. Of course no one can benefit from mobility if functional aspects are not addressed, but without understanding the aspirational or aesthetical motivators, this will have limited success. This is seen in options for those who do not drive and in the built environment. In terms of public transport, for example there is still a tendency to create services that are purely functional. There is an assumption that the built environment should cater for issues older people might have with mobility. This is of course important but without creating an attractive built environment, it will have limited success in drawing people into use it. Older people are no different to any other age group on wanting attractive environments, though we are still planning and developing our cities around what younger people want. An attractive city and its marketing is synonymous with growth and economic development, which is often erroneously viewed solely with younger and middle-aged people. There needs to be challenges to development of place. A vibrant city space is surely one that inhabits people of all ages and a variety of backgrounds without segregation.

3.5. Mobility doesn't have to be about Literally Moving

Connections to places of greater geographical distance, further away places become difficult to achieve in a physical sense (Parkhurst et al., 2014). Rowles (1978) describes the potential for older people to become prisoners of space, where physiological and cognitive change associated with ageing, along with economic deprivation can cause older people to withdraw from wider outside world. Time spent at home indoors increases in older age and

research suggests those aged 65 and over can spend around 80% of their time at home, increasing to 90% for those aged 85+ (Handler, 2014; Help the Aged, 2006). Older people can then reconstruct their world and have deep attachment around a very local space. This local space is first and foremost the home but can extend to the immediate neighbourhood and wider community if it is accessible. Parkhurst et al. (2014) discuss how literal mobility can be replaced by recollection, remembrance and imaginative connections and propose a model that involves virtual, potential and imaginary mobility as well as literal or corporeal mobility (see Fig. 4; Parkhurst et al., 2014). Virtual mobility refers to the use of computing and information technology to satisfy mobility needs, for example ordering shopping online, keeping in contact with family and friends over telephone or video links, remotely accessing health or social care with telehealth or telecare. Potential mobility, first coined by Metz (2000) is the perception of being able to be mobile should the individual need to do so. For example, how the car gives people the potential to travel where and when and how often they like should they wish or need to. Shergold et al. (2012) term this potential as motility and include the perceived ability to use different modes, for example knowing and understanding the norms of the mode of transport. Imaginary mobility can be broken down into two different strands, first a construction of travel and mobility in the mind and communicated through story-telling or art, often based on previous travel experiences can occur, sometimes using photographs or props to describe and reminisce about the journeys and places visited. Second, imaginative mobility might refer simply to observing movement from a still place, such as looking out of the window (or watching television).

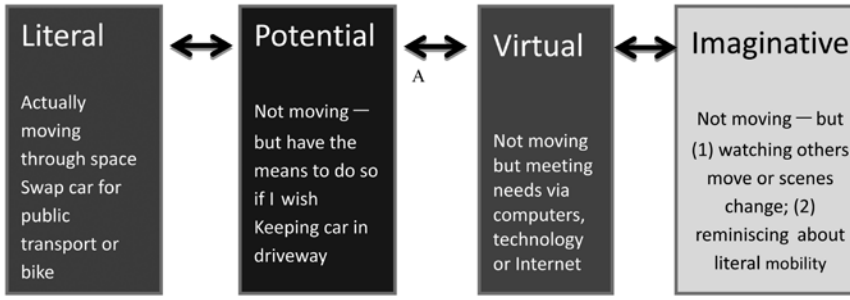

Fig. 4. A Continuum of Modes for Connectivity. (*Source:* Adapted from Parkhurst et al. 2014).

4. CONCLUSION

The following chapters provide an overview of the current knowledge, statistics, debates and concepts in terms of transport and mobility in relation to later life. Each chapter considers some, if not all, of the principles laid out in this chapter. There is an overarching view that, although there are important barriers to be overcome for older people in terms of transport and mobility, over concentration on a deficit approach is unhelpful without understanding the wider social context. In all countries, mobility is wider than simply getting from A to B and examining it in isolation to psychosocial issues misses the point. A change of priority is needed in terms of how mobility is viewed for older people. It requires a change in attitude from policy makers and practitioners to lead this change but also a change in how researchers approach mobility in later life with a more human-centred approach to transport studies.

REFERENCES

Adler, G., & Rottunda, S. (2006). Older adults' perspectives on driving cessation. *Journal of Aging Studies*, *20*(3), 227–235.

Allardt, E. (1975). *Dimensions of welfare in a comparative Scandinavian study*. Helsinki Research Group for Comparative Sociology. University of Helsinki, Research Report, 9.

Box, E., Gandolfi, J., & Mitchell, C. G. B. (Eds.) (2011). *Maintaining safe mobility for the ageing population: The role of the private car*. London: RAC Foundation. Retrieved from http://www.racfoundation.org/assets/rac_foundation/content/downloadables/maintaining%20safe%20mobility%20-%20rac%20foundation%20-%20140410%20-%20report.pdf. Accessed on 24 July 2017.

Bronfenbrenner, U. (1979). *Ecology of human development.* Cambridge, MA: Harvard University Press.

Bronfenbrenner, U. (1989). Ecological systems theory. *Annals of Child Development*, *6*, 185–246.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development.* Thousand Oaks, CA: Sage.

Davey, J. A. (2007). Older people and transport: Coping without a car. *Ageing and Society*, *27*, 49–65.

DfT. (2001). *Older drivers: A literature review.* London: Department for Transport.

DfT. (2014). *Transport statistics Great Britain: (2013)*. London: DfT. Retrieved from www.gov.uk/government/uploads/system/uploads/attachment_data/file/264679/tsgb-2013.pdf. Accessed 12 June 2017.

Ellaway, A., Macintyre, S., Hiscock, R., & Kearns, A. (2003). In the driving seat: Psychosocial benefits from private motor vehicle transport compared to public transport. *Transportation Research Part F*, *6*, 217–231.

Haglund, M., & Åberg, L. (2000). Speed choice in relation to speed limit and influences from other drivers. *Transportation Research Part F*, *3*, 39–51.

Handler, S (2014). *A research and evaluation framework of age friendly cities*. London: UK Urban ageing Consortium.

Help the Aged. (2006). *Older people, decent homes and fuel poverty.* London: Help the Aged.

Hjorthol, R. J., Levin, L., & Siren, A. (2010). Mobility in different generations of older persons: The development of daily travel in different cohorts in Denmark, Norway and Sweden. *Journal of Transport Geography*, *18*(5), 624–633.

Metz, D. (2000). Mobility of older people and their quality of life. *Transport Policy*, *7*, 149–152.

Musselwhite, C. B. A. (2016). Vision for an age friendly transport system in Wales. *EnvisAGE, Age Cymru*, *11*, 14–23.

Musselwhite, C. B. A. (2017). Exploring the importance of discretionary mobility in later life. *Working with Older People*, *21*(1), 49–58.

Musselwhite, C. B. A., Avineri, E., & Susilo, Y. O. (2014). Legitimising risk taking: Articulating dangerous behaviour on the road. *Transportation Planning and Technology*, *37*(1), 62–82.

Musselwhite, C. B. A., & Haddad, H. (2010). Mobility, accessibility and quality of later life. *Quality in Ageing and Older Adults*, *11*(1), 25–37.

O'Connell, M. (2002). Social psychological principles: 'The group inside the person'. In R. Fuller & J. A. Santos (Eds.), *Human factors for highway engineers* (pp. 201–215). Amsterdam: Pergamon.

Office for National Statistics (ONS). (2015a). *Annual mid-year population estimates for the UK*. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/latest. Accessed on 25 November 2016.

Office for National Statistics (ONS). (2015b). *2014-based national population projections*. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/nationalpopulationprojections/2015-10-29. Accessed on 26 March 2017.

Ormerod, M., Newton, R., Philips, J., Musselwhite, C., McGee, S., & Russell, R. (2015). *How can transport provision and associated built environment infrastructure be enhanced and developed to support the mobility needs of individuals as they age? Future of an ageing population: Evidence review*. London, UK: Foresight, Government Office for Science. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/443508/gs-15-7-future-ageing-transport-er23.pdf. Accessed on 24 July 2017.

Oxley, P. R. (1991). *Elderly and disabled car users: A growing market in private transport for the elderly*. TRL CR308, Crowthorne, Berkshire.

Parkhurst, G., Galvin, K., Musselwhite, C., Phillips, J., Shergold, I., & Todres L. (2014). Beyond Transport: Understanding the role of mobilities in connecting rural elders in civic society. In C. Hennesey, R. Means, & V. Burholt, V. (Eds.), *Countryside connections: Older people, community and place in rural Britain* (pp. 125–156). Bristol: Policy Press.

Rowles, G. D. (1978). *Prisoners of space?: Exploring the geographical experience of older people*. Boulder, CO: Westview Press.

Schlag, B., Schwenkhagen, U., & Trankle, U. (1996). Transportation for the elderly: Towards a user-friendly combination of private and public transport. *IATSS Research*, *20*(1), 75–82.

Shergold, I., Parkhurst, G., & Musselwhite, C. (2012). Rural car dependence: An emerging barrier to community activity for older people? *Transport Planning & Technology*, *35*(1), 69–85.

Siren, A., & Hakamies-Blomqvist, L. (2009). *Mobility and well-being in old age*. *Topics in Geriatric Rehabilitation*, *25*, 3–11.

TNS Loneliness Survey. (2014). *Loneliness survey for Age UK.*

Tomassini, C. (2004). Demographic data for an ageing population. In *ONS* (Ed.). *Population trends* (pp. 23–30). London: Office for National Statistics.

UN (United Nations). (2013). *World population ageing 2013.* New York, NY: United Nations. Retrieved from http://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf. LAccessed on 24 July 2017.

Webber, S. C. Porter M. M., & Menec V. H. (2010). Mobility in older adults: A comprehensive framework. *Gerontologist*, *50*(4), 443–450.

Ziegler, F., & Schwanen, T. (2011). I like to go out to be energised by different people: An exploratory analysis of mobility and wellbeing in later life. *Ageing and Society*, *31*(5), 758–781.

CHAPTER 1

OLDER PEOPLE'S TRAVEL AND ITS RELATIONSHIP TO THEIR HEALTH AND WELLBEING

Roger Mackett

ABSTRACT

As people age they tend to do more local journeys, shown by a lower mean trip length, from around 50 years onward. One reason for this is increased difficulty with mobility as people age; around one-third of those aged over 70 have mobility difficulties. Physiological changes in later life that have consequences for travel include deterioration of hearing and seeing, decreased skeletal muscles and reduced mobility of joints. Another reason for the decrease seen in many western countries is retirement from work, with many fewer trips made for commuting purposes. However, there are increases in shopping, personal business and leisure trips when commuting is reduced. That said, older people would still like to make more discretionary journeys in later life, especially to visit family and friends more often. A review of literature suggests how important mobility is for wellbeing through social interaction and being involved in activities outside the home.

Keywords: Travel; health; wellbeing; transport statistics; active transport; public transport

Transport, Travel and Later Life
Transport and Sustainability, Volume 10, 15–36

ISSN: 2044-9941/doi:10.1108/S2044-994120170000010001

1. INTRODUCTION

Travel is an essential element of everyday life, enabling people to work to obtain money to purchase goods and services, to receive education to enhance their knowledge and skills, to go to the shops, to interact with others to undertake leisure activities and to contribute to society and so on. As people move through the life cycle their travel patterns change. The purpose of this chapter is to establish the factors that influence travel by older people, and to examine how travel affects their lives.

In the next section, changes in the total volume of travel by age and the effects of impairments and lifestyle on this are examined. The implications of travel for wellbeing including maintaining independence are then considered. After examination of the trips that older people would like to make but are not able to and why, individual modes of travel are discussed, including the difficulties posed by some modes for older people and the implications for their health and wellbeing.

Whilst the data are for the United Kingdom, similar trends in ageing can be observed in many other countries in Europe (Giannakouris, 2008) and elsewhere, so it is likely that the findings have widespread implications.

2. TRAVEL BY OLDER PEOPLE

Table 1 shows how the volume of travel varies with age in England. As children grow up they travel further, with the most travel being made by those aged 40 to 49. After that age, people make fewer trips and travel less far. However, even those aged 70+ still make about two trips a day, but the trips are more local, as shown by the lower mean trip length. It can be seen that as people move beyond their 50s, the number of trips only declines slightly, but the trips tend to be shorter. As people move beyond their 60s, they make considerably fewer trips and travel much less far.

One reason why people travel less as they age is increasing difficulty in being mobile, as indicated in Table 2. Some younger people have such difficulties, but the proportion increases significantly with age, so that about one-third of those aged 70 and over have mobility difficulties. This affects trip making as shown in Table 3. People of all ages with mobility difficulties make fewer trips than those without, but as people move beyond middle age the decline in the number of trips made is steeper.

'Mobility difficulty' covers a variety of conditions because the ageing process can lead to a number of physiological changes which can have

Table 1. Number of Trips and Total Distance Travelled per Person in km by Age in England in 2015.

	All Ages	0–16	17–20	21–29	30–39	40–49	50–59	60–69	70+
Number of trips	914	821	782	843	1,021	1,061	994	972	760
Total distance	10,638	6,806	8,330	10,698	12,458	14,285	13,530	11,608	7,619
Mean trip length	11.6	8.3	10.7	12.7	12.2	13.5	13.6	11.9	10.0

Source: Tables NTS0601 and NTS0605 in Department for Transport (2016).

Table 2. Percentage of People with or without Mobility Difficulties by Age in England in 2015.

Mobility Status	All Aged 16+	16–49	50–59	60–69	70+
With a mobility difficulty	9	3	8	13	30
No mobility difficulty	91	97	92	87	70
Total	100	100	100	100	100

Source: Table NTS0622 in Department for Transport (2016).

Table 3. Trips per Person per Year by Age and Mobility Status in England in 2015.

Mobility Status	All Aged 16+	16–49	50–59	60–69	70+
With a mobility difficulty	605	768	691	703	474
No mobility difficulty	968	961	1,019	1,014	859
All	935	955	995	972	760

Source: Table NTS0622 in Department for Transport (2016).

consequences for travel, for example deterioration of hearing and seeing, decreased skeletal muscles, reduced mobility of joints, reduced flexibility of ligaments and reduced pulmonary elasticity and increasing stiffness of the thorax which can make breathing more difficult (Millonig et al., 2012). Travel requires both physical and mental abilities: the physical include walking, standing or pedalling a bicycle, the ability to board and alight from a bus or train and to enter or leave a car and to control it. The mental abilities include the ability to remember information about the route, the ability to receive audio and visual information, the cognitive skills to process that information

and take decisions, interpersonal communication skills to obtain tickets and information and confidence in travelling. The percentages of population groups with various impairments are shown in Table 4. A whole range of impairments increase with age, with the proportion of people above the state pension age with various impairments being about five times as high as that of working age adults. The impairment which affects the highest proportion of older people is lack of mobility, followed by lifting and carrying, possibly causing some older people to use the car rather than walking for shopping trips. Martin, Meltzer, and Elliot (1988) show that 19.8% of those aged 60–74 and 49.6% of those aged 75 and over have locomotion difficulties compared with 3.1% of those aged 16–59. The third highest category is manual dexterity, possibly caused by arthritis in some cases, which can affect the ability to manipulate coins and credit cards for ticket and car parking machines, and the fourth category is physical co-ordination. About 10 million people in the United Kingdom have arthritis (Arthritis Care, 2014). Although it can affect people of any age, it is particularly common amongst older people. One cause is arthritis which is inflammation of the joints and causes pain and difficulty in moving around. It can cause loss of strength and grip which in turn may make movement more difficult. According to Martin et al. (1988), 5.4% of those aged 60–74 in Britain and 14.9% of those aged 75 and over have difficulty in reaching compared with 0.9% of those aged 16–59.

Table 4 shows that 8% of the people of state pension age have communication difficulties compared with 2% of working age adults. Around 1,000,000 people in Britain have such impairments, for example a speech impairment, which may make communicating with bus drivers and ticket office staff

Table 4. Percentage of Population Groups with Impairments in 2010–2011 (Prevalence).

Impairment	State Pension Age Adults	Working Age Adults
Mobility	30	5
Lifting, carrying	28	5
Manual dexterity	12	3
Physical co-ordination	11	2
Communication	8	2
Continence	7	1
Memory, concentration and learning	7	2
Recognising when in danger	2	1
Other	12	4

Source: Department for Work and Pensions (2012) and Office for National Statistics (2013a, 2013b).
Note: In Britain, the state pension age was 65 for men and 60 for women in 2010–2011.

difficult. Memory, concentration and learning impairments affect 7% of older people compared with 2% of working age adults. There are 835,000 people in the United Kingdom who have dementia of whom about 795,000 are aged over 65, with the total number projected to increase to over 1 million by 2021 and over 2 million by 2051 (Alzheimer's Society, 2014). About 35% of people with dementia only go out once a week or less and 10% leave their home once a month or less (Alzheimer's Society, 2013).

Other impairments which can make going out difficult are visual and hearing impairments. Around 2 million people in Britain have sight loss (RNIB, 2014). Martin et al. (1988) found that 5.6% of those aged 60–74 in Britain and 26.2% of those aged 75 and over have difficulty seeing, compared with 0.9% of those aged 16–59. Hearing loss affects more than 10 million people in the United Kingdom (Action on Hearing Loss, 2013). About 11% of those aged 60–74 in Britain and 32.8% of those aged 75 and over have difficulty hearing compared with 1.7% of those aged 16–59 (Martin et al., 1988).

As well as the various conditions indicated above, many older people become increasing frail as they age. Frailty is a clinically recognised condition resulting from a decline in the body's physical and psychological reserves leading to increased vulnerability (British Geriatrics Society, 2014). Gale, Cooper, and Sayer (2015) examined 5450 people aged 60 and over from the English Longitudinal Study of Ageing. They found that the overall weighted prevalence of frailty was 14% with prevalence rising with increasing age, from 6.5% in those aged 60–69 years to 65% in those aged 90 or over. Frailty occurred more frequently in women than in men (16% compared with 12%). Mobility difficulties were very common: 93% of frail individuals had such difficulties compared with 58% of the non-frail individuals. Difficulties in performing instrumental activities of daily living were reported by 64% of frail individuals, compared with 15% of the non-frail individuals. Among those with difficulties with mobility or other daily activities, 71% of frail individuals and 31% of non-frail individuals said that they received help. Of those with difficulties, 63% of frail individuals and 20% of non-frail individuals used a walking stick, but the use of other assistive devices was uncommon.

Part of the reason for the decrease in travel as people grow older shown in Table 1 is because of changes in the reasons that trips are made, reflecting progress through the life cycle. People in England tend to retire from full-time employment in England between the ages of 60 and 65. This can be seen in Table 5 where the number of commuting trips between the ages of 50–59 and 60–69 declines from 224 to 87. However, the total number of trips made decreases by much less, suggesting that after retirement people make more of other types of trips. There are increases in shopping trips, personal business

Table 5. Average Number of Trips (Trip Rates) per Person by Age and Purpose in England in 2015.

Purpose	All Ages	50–59	60–69	70+
Commuting	142	224	87	8
Business	31	65	27	4
Education	62	1	–	–
Escort education	48	22	21	8
Shopping	177	220	281	289
Other escort	83	73	65	38
Personal business	89	96	124	131
Visit friends at private home	87	83	107	76
Visit friends elsewhere	47	52	61	54
Sport/ entertainment	64	54	79	59
Holiday/day trip	39	46	56	44
Other including just walk	43	60	63	47
All purposes	914	994	972	760

Source: Table NTS0611 in Department for Transport (2016).

and all types of leisure trips. After the age of 70, the main types of trip made are shopping and personal business plus various types of leisure travel.

Because commuting and business trips tend to be longer than most other types of trips, when people move from full time work to retirement, the overall distance they travel tends to decrease, as shown in Table 6. They are able to travel further for shopping and leisure trips, probably because they have more time available.

It is interesting to note that some people aged 60 and over are making escort trips to education establishments. In many cases, this is probably grandparents taking their grandchildren to and from school, enabling the children's parents to work. Older people aged 60–69 make almost as many other escort trips as those aged 50–59. Some of these may be to take spouses and friends to medical appointments, or to take others who are no longer able to drive shopping or on personal business.

3. THE IMPLICATIONS OF TRAVEL FOR OLDER PEOPLE'S WELLBEING

Travel facilitates engagement with others, enjoyment obtained from leisure activities and satisfaction from contributing to society. It can also provide the means

Table 6. Average Total Distance in km Travelled per Person by Age and Purpose in England in 2015.

Purpose	All Ages	50–59	60–69	70+
Commuting	2,093	3,274	1,206	83
Business	997	1,968	707	82
Education	542	5	2	2
Escort education	192	184	96	83
Shopping	1,200	1,578	2,016	1,896
Other escort	701	738	618	333
Personal business	733	947	1,078	984
Visit friends at private home	1,542	1,773	2,051	1,450
Visit friends elsewhere	490	515	704	568
Sport/entertainment	803	824	869	686
Holiday/day trip	1,494	1,630	2,144	1,382
Other including just walk	106	96	115	72
All purposes	10,638	13,530	11,608	7,619

Source: Table NTS0612 in Department for Transport (2016).

to obtain healthcare and some forms of travel offer health-enhancing physical activity through walking and cycling. According to the Health White Paper 'Healthy Lives, Healthy People' (Department of Health, 2010) 'Maintaining social networks, being part of a community and staying active all benefit health and wellbeing in later life'. This means that the ability to travel is as important in later life as in childhood and middle age. Banister and Bowling (2004) argue that there are six 'building blocks' of quality of life for the elderly. These include engaging in a large number of social activities and feeling supported, living in a neighbourhood with good community facilities and services (including transport and feeling safe in one's neighbourhood). They suggest that these contribute more to perceived quality of life than material circumstance such as levels of income and social class. Spinney, Scott, and Newbold (2009) found a significant association between transport mobility benefits and quality of life in their research into the quality of life for non-working elderly Canadians.

Banister and Bowling (2004) examined a survey of 1,000 respondents aged 65+ in the ONS Omnibus Survey with an average age of 73. They found a positive link between the number of social activities which require going out (and so travel) and the quality of life. The number of such social activities increased as the rating of local transport increased (i.e., the better that local transport was perceived, the more social activities participated in). Those with higher quality of life made more contact with friends than those with lower values.

It can be argued that mobility is an essential part of later life, because lack of it brings loss of independence (McInnes, 2011). Gabriel and Bowling (2004)

carried out interviews with 999 older people in private households in Britain and found that the respondents regarded being able to walk and having good mobility as important to them as it helped them to retain independence which they saw as an important element of a good quality of life and enabled them to avoid dependence on others. However, Schwanen, Banister, and Bowling (2012), using the results of 42 interviews with older people aged 70 and over, found that trips outside the home could imply either dependence (relying on others for lifts) or independence (when they could drive, walk or use buses or taxis).

Whilst, intuitively, there is a link between mobility and the quality of life, Metz (2000) argues that the relationship is ill defined, based on anecdotal evidence. He argues that five elements of mobility seem to be important: travel to achieve access to desired people and places, the psychological benefits of movement – 'getting out and about', the exercise benefits, involvement in the local community and the potential to travel: knowing a trip could be made even if it is not actually undertaken.

The evidence cited above shows that making it easier for older people to travel produces various benefits, including improved quality of life and health. It may also help society by allowing older people to make a greater contribution. WRVS (2011) (now the Royal Voluntary Society) commissioned a study to estimate the economic contribution of older people to society, through spending in shops, voluntary work, looking after grandchildren while their parents work and through taxes on expenditure and employment. It can be argued that making it easier for older people to travel would enable them to make an even greater contribution (Mackett, 2015).

4. THE TRAVEL THAT OLDER PEOPLE WOULD LIKE TO DO

In 2001, the Department for Transport (2001) published the results of a survey of 1,445 people aged 60 and over about their travel needs, and the barriers that stop them travelling more. As Table 7 shows, the types of activities they would like to make more of are leisure and shopping trips, the types of trips that they already make. The principle barriers to making the journeys are divided into three types: direct transport or journey, mobility, sensory or health and non-transport. The main type of barrier for each type of trip has been highlighted. Transport and journey barriers are the most important for the three types of activity that most people would like to do more of, namely visiting family and friends and meeting friends elsewhere.

Table 7. Barriers to Activities for People Aged 60 and Over.

	Would Like to Do More	Principal Barrier Preventing More Trips Being Made		
	%	Direct transport or journey %	Mobility, sensory or health %	Non-transport %
Visit family	12	**58**	18	24
Visit friends' homes	10	**46**	27	25
Meet friends elsewhere	10	**46**	21	33
Leisure and sport	8	15	24	**57**
Other shopping	7	37	**43**	21
Food shopping	6	33	**50**	16
Day centre visit	2	25	30	**45**
Post Office	2	40	**42**	19
Visit others in hospital	1	**65**	23	13

Source: Table 5.3 in Department for Transport (2001).

This is probably because the destination for many of these trips will be in the suburbs and rural areas, unlike many shopping and leisure trips. Trips to the suburbs and rural areas are usually fairly straightforward by car, but not by public transport. If older people are not able to travel by car, then such journeys are very difficult. If this is the case, the barriers are the lack of suitable transport. For shopping and post office trips the main barriers are mobility, sensory and health. The destinations for these trips are likely to be in shopping centres, and so served by public transport. Mobility, sensory and health barriers may be associated with the need to board or alight from buses, and walk to and from bus stops, which may involve crossing the road, walking up or down steps or gradients. These can present various barriers to older people. For trips to leisure and sport and to day care centres, the barriers tend to be non-transport and so are at the destination, which may reflect poor access into and within buildings or unsuitable equipment or staff who are not able to provide suitable support. It is clear that the main barriers that prevent older people enjoying the activities that they wish to attend are related to transport, including its absence for some journeys. This issue can be explored further by considering the modes of travel used by older people, as discussed in the next section.

5. HOW OLDER PEOPLE TRAVEL

Turning to the modes of travel used by older travellers, it can be seen in Table 8 that the dominant mode is the car, particularly as a driver, even for those aged

Table 8. Average Number of Trips per Person by Age and Mode in England in 2015.

Mode	All Ages	50–59	60–69	70+
Walk	200	174	178	139
Bicycle	17	17	17	5
Car/van driver	481	586	511	341
Car/van passenger	204	124	165	163
Other private transport	9	9	9	8
Local and non-local buses	62	44	65	82
Rail	29	30	17	8
Taxi/minicab	10	8	8	9
Other public transport	3	3	2	3
All modes	914	994	972	760

Source: Table NTS0601 in Department for Transport (2016).

Table 9. Average Total Distance in km Travelled per Person per Year by Age and Mode in England in 2015.

Mode	All Ages	50–59	60–69	70+
Walk	294	286	267	190
Bicycle	85	98	83	24
Car/van driver	5,227	8,654	6,608	3,515
Car/van passenger	3,029	2,389	2,858	2,478
Other private transport	205	234	197	216
Local and non-local buses	534	384	659	728
Rail	1,096	1,306	776	371
Taxi/minicab	88	112	77	62
Other public transport	83	64	83	32
All modes	10,638	13,530	11,608	7,619

Source: Table NTS0605 in Department for Transport (2016).

70 and over. This is particularly the case when distance is considered, as shown in Table 9. Those aged 60–69 travel further by car than the average across the whole population and even those aged 70 and over make over 75% of their travel by car and almost half as car drivers.

The bus is unique among the modes shown in that its use increases with age from 50 onward, possibly partly because of the decrease in car use. Rail use declines with age, probably because much of its use is associated with commuting. Taxi use is low for each age group, but its use does not decline with age, with slightly more use for the 70+ age group than the two immediately younger groups.

Walking is second only to car use for all the age groups shown in terms of the number of trips, and does not decline until people reach the

highest age group. Cycling is low for all the age groups and declines at high ages.

Some of the changes in modal use with age reflect the change in the mix of trip purposes arising from lifestyle changes associated with retirement, for example less rail use because rail is often used for commuting. However, there are barriers associated with individual modes as discussed above. More information is provided in Table 10 based on the results of the survey carried out in 2001 (Department for Transport, 2001). It may be noted that car driver does not appear as a mode, presumably because those older people who have a car to drive do not see any barriers to their use of it. Over 40% of those using each mode have a difficulty in doing so. The most common reason for the difficulty in all cases except train is accessibility which is associated with personal mobility and health problems. For train, the main barrier is affordability, followed by the nature of the journey. It is interesting that accessibility is a larger barrier to taxi use than affordability. Overall, accessibility is the biggest barrier, followed by other reasons, which covers a wide variety of issues, then the availability of the mode and the nature of the journey, followed by affordability. Concerns about safety come very low.

Table 10. Proportion of People Aged 60 and Over that have Difficulty using Current Modes.

	% Using Each Mode	% That Would Have Difficulty	Reasons for Difficulties with Current Modes					
			Affordability %	Availability %	Accessibility %	Safety %	Journey %	Other %
Bus	37.6	56.9	8	12	38	4	18	20
Car passenger	33.5	53.0	5	29	38	1	8	19
Walk/cycle	19.7	41.9	–	–	40	6	16	38
Taxi	15.0	65.4	24	6	44	3	4	20
Train	3.5	53.1	33	6	8	–	32	21
Tram/tube	2.8	44.0	9	–	56	3	23	9
Door-to-door	2.5	60.9	7	13	36	13	5	27
Wheelchair/ shop mobility	1.5	64.3	–	8	65	–	6	22
Taxi subsidised	1.0	44.4	–	–	63	–	19	19
Total		56.4	10	16	40	3	12	19

Source: Table 5.5 in Department for Transport (2001).
Note: The percentages are proportions of total responses for each mode.

6. CAR TRAVEL

For older people, car driving represents a symbol of freedom, independence and self-reliance and having some control over life while poorer mobility without a car places a substantial burden on the individual, family, community and society (Whelan, Langford, Oxley, Koppel, & Charlton, 2006). Banister and Bowling (2004) found that people with access to a car had a more positive quality of life rating than those without. Those with access to the car were consistently more likely to participate in more social activities. Car access seemed to be a stronger indicator of out-of-home social activity participation than the rating given to local transport.

In order to drive a car, it is necessary to hold a driving licence following passing the driving test. In the United Kingdom, a car driving licence is held until the age of 70. From that age it is necessary to renew it every 3 years. Some older people choose not to renew their licences whilst others may be required to give up driving because they are no longer safe to drive. Table 11 shows the percentage of the population who hold a licence. Generally, licence holding increases with age, and then decreases. There are three effects going on here: the levels are lower at younger ages because not everyone choses to drive from the age of 17, so there is a cumulative effect. At the upper end of the age range, some people cease to hold a licence because they no longer wish to drive or they have been prevented from doing so on health grounds. The third effect arises because levels of licence holding have increased over time: this is illustrated in Table 12. In 1975/1976, levels of licence holding were much lower for all age groups than they were in 1985/1986. For people aged over 40, it grew in each time period after that, but with the decline in older ages discussed above.

For each age group, in each year shown, more men hold a licence than women, but there has been a dramatic growth in the number of older women who hold a licence particularly over the age of 70, where the level grew from 4% in 1975/1976 to 50% in 2015. This is because in 2015 more women had

Table 11. Full Car Driving Licence Holders by Age and Gender in England in 2015.

	All Aged 17+	17–20	21–29	30–39	40–49	50–59	60–69	70+
Men	80	33	67	81	88	90	90	81
Women	68	32	61	74	80	78	73	50
All	74	33	64	78	84	84	81	64

Source: Table NTS0201 in Department for Transport (2016).

Table 12. Full Car Driving Licence Holders by Age and Gender in England over Time.

	All Aged 17+	17–20	21–29	30–39	40–49	50–59	60–69	70+
All								
1975/1976	48	28	59	67	60	50	35	15
1985/1986	57	33	63	74	71	60	47	27
1995/1997	69	44	74	82	82	76	64	39
2005	72	31	65	82	84	83	75	52
2015	74	33	64	78	84	84	81	64
Males								
1975/1976	69	36	78	85	83	75	58	32
1985/1986	74	37	73	86	87	81	72	51
1995/1997	82	51	81	90	89	89	83	65
2005	81	36	68	86	90	91	88	74
2015	80	33	67	81	88	90	90	81
Females								
1975/1976	29	20	43	48	37	24	15	4
1985/1986	41	29	54	62	56	41	24	11
1995/1997	58	36	68	74	74	63	46	22
2005	64	26	61	77	79	75	62	36
2015	67	32	61	74	80	78	73	50

Source: Table NTS0201 in Department for Transport (2016).
Figures prior to 1989 are for Great Britain, rather than England only.
Figures prior to 1995 are based on unweighted data.

passed the driving test when they were younger than in earlier years, plus the growth in car ownership related to the general increase in prosperity. Back in the 1950s and 1960s, very few households owned more than one car, and in those households that owned a car, the adult male drove it. As motoring became cheaper and more women became employed, multiple car ownership grew. This effect now means that about half the females aged 70 or over have a licence to drive. However, it is noticeable that the decline in licence holding in later life is much steeper for women than men. This is partly because women tend to live longer than men so there are many more women than men aged 70 and over and their average age is higher.

As discussed above, some older people cease driving, either voluntarily or because they are regarded as unsafe. Musselwhite and Haddad (2010) examined the travel needs of older people by conducting three focus groups with 26 current car drivers aged 68 to 90 years old and then interviews with 31 older ex-drivers aged 65 to 92 years old. They found that ceasing to drive caused many changes in travel behaviour, including anxiety about being able to go shopping and to hospital and to attend doctors' surgeries, with respondents mentioning feelings of depression and annoyance, particularly amongst those

'forced' to give up driving following advice from others or a driving incident. Isolation and exclusion from society were mentioned as resulting feelings. It is possible to mitigate the effects of driving cessation by engaging in pre-planning the process of ceasing to drive (Musselwhite & Shergold, 2013).

Once people have ceased to drive they have to find alternative ways of meeting needs previously met through driving. In a New Zealand study, Davey (2007) interviewed 28 couples and 43 single people with an average age of 84.5 for men and 81.4 for women who had all been without private transport for at least 6 months. They coped in various ways, with the 'serious' transport requirements often being provided by alternative means, but many of the discretionary trips that contribute to the quality of life had been lost. Other problems included not being able to get to special occasions such as funerals and reunions, the unreliability of taxis which do not turn up, erratic bus services, missed opportunities such as access to sales in the shops, fresh fruit and vegetables and the opportunity to shop at a leisurely pace and make comparisons. For some of them, visits to friends and relations were replaced by them visiting the person. Some people had home deliveries from supermarkets or by friends and relatives and bought clothes from catalogues. This means that at least some of their needs were met, but they missed the social contact and stimulation of leaving home and the physical activity.

In some cases it is possible for people who have been advised to cease driving to refuse to do so. In a study carried out in isolated communities in the United States, Johnson (2002) carried out 45 interviews with people aged 71.1 to 91.4 who had all had been advised to cease driving but had decided to continue to do so. The older people refused to believe that they were unsafe, they valued their independence and feared isolation if they could not drive.

7. PUBLIC TRANSPORT

Older people in Britain are offered a number of concessions to use public transport. Usually this is in the form of a card that offers travel at a reduced price or free of charge, often in the off-peak.

Public transport can make a significant contribution to the quality of life of older people. Gabriel and Bowling (2004) interviewed 80 older people and found that good public transport was mentioned as contributing to the quality of life of 31 of the respondents. Positive factors mentioned included free bus-passes or discounted fares for older people, comfortable buses with a drop-step to make getting on and off easier and having a regular and reliable service. Poor public transport was mentioned as having a negative effect on

the quality of life of 26 respondents. Factors mentioned included uncomfortable buses, walking distance to bus stops, difficulty getting on and off buses, particularly older ones and expensive journeys, even with discounts.

In the United Kingdom, everybody who reaches the state pension age for women can obtain a concessionary travel pass (CTP) allowing free off-peak bus travel often with some locally funded extensions such as travel in the morning peak or local rail travel (Mackett, 2013, 2014a). The policy has been successful in achieving its aims of increasing public transport usage by older people, improving their access to services and increasing social inclusion (Mackett, 2014b). One-third of the bus trips in England are now made free because of CTPs most of which are held by older people. Nearly 80% of those eligible for a CTP on the grounds of age have one (Department for Transport, 2016). The main reason that some people do not have a pass is that they have access to a car, either one they can drive themselves or as a car passenger (Humphrey & Scott, 2012). The take-up of passes tends to be lower for those with mobility difficulties than those without (Humphrey & Scott, 2012).

Over recent years, older people have increased their frequency of bus use. Prior to the introduction of free local bus travel nationally in 2006, about 30% of those aged 60 or over used the bus at least once a week (Department for Transport, 2016). This rose to 40% by 2010. Conversely, the proportion that never travel on a bus fell from about 46% to 32%, suggesting that offering CTPs has induced some older people who did not travel by bus to do so.

CTPs offer a number of benefits to older people, including access to recreation and leisure facilities (Hirst & Harper, 2011; Kelly, 2011), reduced social isolation (Andrews, Parkhurst, Susilo, & Shaw, 2012), better physical and mental health (Transport Scotland, 2009; Webb, Laverty, Mindell, & Millett 2016; Whitley & Prince, 2005), ease of driving cessation (Andrews, 2011; Hill, Sutton, & Cox, 2009) and improved quality of life (Andrews, 2011; Jones, Goodman, Roberts, Steinbach, & Green, 2013; Rye & Mykura, 2009).

In some places, the population density is too low to make conventional bus services viable. In these areas, community transport often has a useful role to play. This is transport, often using minibuses, with volunteer drivers which provide a service to meet a community need including for many older passengers. Funding comes from the fares paid and sometimes from local authorities. Volunteer drivers using their own cars are another type of community scheme. For example, the Volunteer Driving Service operated by the Retired Senior Volunteer Programme (RSVP) North East uses older drivers to offer transport to people who need to attend health appointments and collect repeat prescriptions. There are similar schemes all over the country

(Community Service Volunteers, 2007). Another type of service is Dial-a-Ride, which provides free door-to-door transport service for disabled people who cannot use conventional public transport. The service is provided by minibuses, taxis, people carriers or cars. The services have to be booked in advance, typically the day prior to travel. The service in London has been operating for over 30 years (Transport for London, 2014). One of the grounds for eligibility for the scheme in London is being aged 85 or over. The other grounds are based on various aspects of disability or eligibility for various benefits.

People aged 60 or over in Great Britain are eligible to buy a Senior Railcard for £30 a year. This entitles the holder to a saving of 1/3 on Standard and First Class rail fares throughout Great Britain. The only travel not included is during the morning peak period, Monday to Friday (excluding public holidays) for journeys are made wholly within London and South East England (National Rail, 2014a).

'Passenger assist' is a scheme in which passengers who need assistance boarding or alighting from trains can request assistance, for example those with a mobility or other disability that makes getting on and off trains difficult including many older people (National Rail, 2014b).

An important way of buying travel tickets and obtaining information about routes and public transport timetables is through the internet. Whilst many older people have used computers in their employment, and some have learnt in later life for communicating with family and friends, some will not. Others may have used it earlier in life but be no longer able to do so, because of deteriorating health, for example difficulties in reading the screen or using the keyboard. As Table 13 shows, use of the Internet decreases with age from over 80% use when people are in their 50s to well under half after the age of 75. It is worth noting that even amongst the younger age groups in the table, computer use is not universal, and that quite a large proportion of those over the age of 80, particularly men, are still using the Internet and email. Internet usage is lower for women than for men for all age groups, and declines more rapidly at higher ages.

Table 13. Use of Internet and/or Email by Age and Sex in 2012–2013.

	52–54	55–59	60–64	65–69	70–74	75–79	80+	Total
Men	91.7	87.6	83.5	74.4	58.5	47.0	36.0	73.7
Women	85.6	85.1	77.3	67.9	53.4	35.3	15.3	63.8

Source: Table S3a in Banks, Nazroo, and Steptoe (2014).

8. ACTIVE TRAVEL

Most journeys involve walking, for example to the bus stop or from the car park. Many journeys involve standing, for example whilst waiting at the bus stop or on the bus. According 'Inclusive Mobility' (Department for Transport, 2005), standing is difficult and painful for some people, particularly those with arthritis, rheumatism and back problems which are often associated with older people. Walking provides various benefits for older people, including preventing a decline in health-related quality of life (Choi et al., 2013), increased life expectancy and lower risk of Alzheimer's disease (Small et al., 2006). Walking offers the opportunity to meet people and socialise, including chance encounters with friends and new places, escape from indoors or from routine places and to enhance good feelings or positive experiences such as from the countryside. Banister and Bowling (2004) found that those who could walk 400 metres tended to report better quality of life than those who could not.

Walking is important both as a means of local transport and as a form of exercise. As Tables 8 and 9 show, those aged 60–69 walk more than aged 50–69, but less as they age further. This ageing effect is illustrated in Table 14 which shows how walking speed decreases with age. This not only means that they are not able to reach such a wide range of shops and leisure facilities, but may have implications for their safety as they may not be able to cross the road in sufficient time before the pedestrian lights turn to red (Asher, Aresu, Falaschetti, & Mindell, 2012).

There are some barriers to walking for older people: poorly kept pavements, lack of public conveniences and lack of benches, busy roads and difficulties crossing the road (Musselwhite & Haddad, 2010). Certain street attributes can make it easier for older people to walk, including provision, maintenance, ease of use, comfort, safety, protection and enjoyment (Newton, Ormerod, Burton, Mitchell, & Ward-Thompson, 2010).

Tables 9 and 10 show that very few older people in Britain travel by bicycle. Work in Canada found that barriers to cycling for older people included fears about sharing the road with cars, personal safety because of interactions with

Table 14. Mean Walking Speed (m/s) by Age and Sex in 2012–2013.

	60–64	65–69	70–74	75–79	80+	Total
Men	1.01	0.97	0.92	0.83	0.71	0.92
Women	0.96	0.92	0.85	0.78	0.61	0.85

Source: Table H4a in Banks et al. (2014).

pedestrians and other cyclists and concern about bicycle theft (Winters, Sims-Gould, Franke, & McKay, 2015). One possibility for older people is use of the electric bicycle. Research in Australia has found that take-up of electric bicycle was often associated with lifestyle changes associated with retirement, for example moving to a hilly area (Johnson & Rose, 2015). Carrying loads and dress for the destination were among the benefits of electric bikes.

Mobility scooters offer older people with mobility difficulties a means of getting out of the house. They are a relatively recent innovation. RICA (2014) has estimated that there are about 350,000 users of mobility scooters in the United Kingdom, with annual sales of about 80,000 vehicles and annual growth rates of 5–10%. In the RICA survey, 74% of respondents said that they could not have made the same journeys if they did not have their mobility scooters. Mobility scooters appear to have a positive impact on the lives of their users (Thoreau, 2015).

9. CONCLUSIONS

In this chapter, it has been shown that volumes of travel vary throughout the life cycle. Two major factors influence older people's travel: many older people have completed their full-time education and employment, so that they have more time available for leisure activities and the travel that they generate, and secondly, their faculties are declining which affects their ability to travel.

Evidence suggests that key factors in the quality of life are the ability to participate in a large number of social activities, the ability to access good quality community facilities and services and being independent. These factors require mobility which transport provides. Whilst good quality public transport, walking and cycling facilities all contribute to this, the key factor in mobility is access to a car. A major issue for many older people is that, as they age, some of them are no longer able to drive, either because they realise that they no longer have the mental or physical faculties to do so, or because they are no longer permitted to do so. This can lead to feelings of anxiety because of the feelings of isolation and exclusion that it engenders. Giving up driving means that older people have to find alternative ways of meeting the needs that car travel facilitated such as shopping, but there may well be a loss of discretionary trips such as visiting friends and relatives. These are the types of trips that older people would like to make more of. The barriers to doing so, apart from no longer being able to drive in some cases, are accessibility issues to do with boarding and alighting from vehicles, health problems and the attitudes of staff.

The ability to travel has a significant impact on older people's independence, which in turn can affect their health. Travel has impacts on older people's health through physical activity from walking and cycling and better mental health through social interaction and being involved in activities outside the home. For these reasons, there is a good case for improving accessibility for older people so that they can enjoy healthy lives and contribute more to society.

REFERENCES

Action on Hearing Loss. (2013). *Annual report and financial statements for the year end 31 March 2013*. Retrieved from http://www.actiononhearingloss.org.uk/~/media/Documents/Corporate%20planning%20and%20business%20analysis/Annual_Report_and_Accounts_2012_13.ashx

Alzheimer's Society. (2013). *Building dementia-friendly communities: A priority for everyone*. Retrieved from http://www.alzheimers.org.uk/site/scripts/download_info.php?downloadID=1236

Alzheimer's Society. (2014). *Dementia 2014: Opportunity for change*. Retrieved from http://www.alzheimers.org.uk/site/scripts/download_info.php?fileID=2317

Andrews, G. (2011). *Just the ticket? Exploring the contribution of free bus fares policy to quality of later life*. Ph.D. thesis, University of the West of England, Bristol.

Andrews, G., Parkhurst, G., Susilo, Y. O., & Shaw, J. (2012). The grey escape: Investigating older people's use of the free bus pass. *Transportation Planning and Technology*, *35*(1), 3–15.

Arthritis Care. (2014). *About arthritis*. Retrieved from http://www.arthritiscare.org.uk/AboutArthritis

Asher, L., Aresu, M., Falaschetti, E., & Mindell, J. (2012). Most older pedestrians are unable to cross the road in time: A cross-sectional study. *Age and Ageing*, *41*(5), 690–694.

Banister, D., & Bowling, A. (2004). Quality of life for the elderly: The transport dimension. *Transport Policy*, *11*(2), 105–115.

Banks, J., Nazroo, J., & Steptoe, A. (Eds.) (2014). *The dynamics of ageing: Evidence from the English Longitudinal Study of Ageing 2002–2012 (wave 6)*. London: The Institute for Fiscal Studies. Retrieved from http://www.elsa-project.ac.uk/uploads/elsa/docs_w6/ELSA%20Wave%206%20report.pdf

British Geriatrics Society. (2014). *Fit for frailty*. Retrieved from http://www.bgs.org.uk/campaigns/fff/fff_short.pdf

Choi, M., Prieto-Merino, D., Dale, C., Nüesch, E., Amuzu, A., Bowling, A., …, Casa, J. P. (2013). Effects of changes in moderate or vigorous physical activity on changes in health-related quality of life of elderly British women over seven years. *Quality of Life Research*, *22*, 2011–2020.

Community Service Volunteers. (2007). Retire into action: Retired and senior volunteer programme. Retrieved from http://www.csv-rsvp.org.uk/site/home.htm

Davey, J. A. (2007). Older people and transport: Coping without a car. *Ageing and Society*, *27*(1), 49–65.

Department for Transport. (2001). *Older drivers: A literature review*. Retrieved from http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme3/olderdriversaliteraturerevie4770

Department for Transport. (2005). *Inclusive mobility: A guide to best practice on access to pedestrian and transport infrastructure*. Retrieved from https://www.gov.uk/government/publications/inclusive-mobility

Department for Transport. (2016). *National travel survey*. Retrieved from http://www.dft.gov.uk/statistics/series/national-travel-survey/

Department for Work and Pensions. (2012). *Family resources survey, United Kingdom, 2010/11, National Statistics*. Retrieved from http://research.dwp.gov.uk/asd/frs/2010_11/frs_2010_11_report.pdf

Department of Health. (2010). *Healthy lives, healthy people: Our strategy for public health in England, HMSO*. Retrieved from http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_127424.pdf

Gabriel, Z., & Bowling, A. (2004). Quality of life from the perspectives of older people. *Ageing and Society*, *24*(5), 675–691.

Gale, C., Cooper, C., & Sayer, A. A. (2015). Prevalence of frailty and disability: Findings from the English Longitudinal Study of Ageing. *Age and Ageing*, *44*(1), 162–165.

Giannakouris, K. (2008). *Ageing characterises the demographic perspectives of the European societies*. Eurostat Statistics in Focus, 72/2008. Retrieved from http://polennu.dk/sites/default/files/Eurostat%20befolkningsprognose%202008-2060.pdf

Hill, K., Sutton, L., & Cox, L. (2009). *Managing resources in later life: Older people's experience of change and continuity*. Joseph Rowntree Foundation. Retrieved from http://www.jrf.org.uk/publications/managing-resources-later-life

Hirst, E., & Harrop, B. (2011). *Getting out and about: Investigating the impact of concessionary fares on older people's lives*. Transport Action Group – Manchester. Retrieved from http://www.healthandtransportgroup.co.uk/health_transport/Bus-Pass-Use-Qual-of-Life-Final20110707.pdf

Humphrey, A., & Scott, A. (2012). Older people's use of concessionary bus travel. Report by NatCen Social Research for Age UK. Retrieved from http://www.ageuk.org.uk/documents/en-gb/for-professionals/research/concessionary_bus_travel_2012.pdf?dtrk=true

Johnson, J. E. (2002). Why rural elders drive against advice. *Journal of Community Health Nursing*, *19*(4), 237–244.

Johnson, M., & Rose, G. (2015). Extending life on the bike: Electric bike use by older Australians. *Journal of Transport and Health*, *2*, 276–283.

Jones, A., Goodman, A., Roberts, H., Steinbach, R., & Green, J. (2013). Entitlement to concessionary public transport and wellbeing: A qualitative study of young people and older citizens in London, UK. *Social Science & Medicine*, *91*, 202–209.

Kelly, E. (2011). A ticket to ride: Does free bus travel promote active ageing? Job Market Paper, University College London and Institute for Fiscal Studies. Retrieved from http://www.homepages.ucl.ac.uk/~uctpeke/Research_files/A%20Ticket%20to%20Ride%20Sept%202011.pdf

Mackett, R. L. (2013). Impact of concessionary bus travel on the wellbeing of older and disabled people. *Transportation Research Record*, *2352*, 114–119.

Mackett, R. L. (2014a). The impacts of concessionary travel passes for older and disabled people – A review of the evidence. Report produced as a contribution to the work of the CILT Concessionary Travel Group and the CILT Accessibility and Inclusion Forum, Chartered Institute of Logistics and Transport. Retrieved from http://www.bit.ly/concessionary

Mackett, R. L. (2014b). Has the policy of concessionary bus travel for older people in Britain been successful? *Case Studies in Transport Policy*, *2*, 81–88.

Mackett, R. L. (2015). Improving accessibility for older people – Investing in a valuable asset. *Journal of Transport and Health*, *2*, 5–13.

Martin, J., Meltzer, H. & Elliot, D. (1988). *The prevalence of disability among adults*. London: OPCS Surveys of Disability in Great Britain, Social Survey Division, Office of Population Censuses and Surveys. HMSO.

McInnes, L. (2011). *Importance of maintaining mobility to elderly health. Aging Health*, *7*(2), 165–167.

Metz, D. (2000). Mobility of older people and their quality of life. *Transport Policy*, *7*(2), 149–152.

Millonig, A., Mandl, B., Lackner, B., Massink, R., van Buuren, S., Perenboom, R., …, Baldanzini, N. (2012). Profiles of older people, Deliverable D2.1, GOAL Growing Older, staying mobile: Transport needs for an ageing society Collaborative Project. Retrieved from http://www.goal-project.eu/images/d2-1_final_20120725.pdf

Musselwhite, C. & Haddad, H. (2010). Mobility, accessibility and quality of later life. *Quality in Ageing and Older Adults*, *11*(1), 25–37.

Musselwhite, C. & Shergold, I. (2012). Examining the process of driving cessation in later life. *European Journal of Ageing*, *10*(2) 89–100.

National Rail. (2014a). *Senior railcard*. Retrieved from http://www.senior-railcard.co.uk/

National Rail. (2014b). *Information for disabled passengers*. Retrieved from http://www.national-rail.co.uk/stations_destinations/disabled_passengers.aspx#TravelAssistance

Newton, R. A., Ormerod, M. G., Burton, E., Mitchell, L., & Ward-Thompson, C. (2010). Increasing independence for older people through good street design. *Journal of Integrated Care*, *18*, 24–29.

Office for National Statistics. (2013a). *Revised annual mid-year population estimates, 2001 to 2010*. Retrieved from http://www.ons.gov.uk/ons/dcp171778_345500.pdf

Office for National Statistics. (2013b). *Pension trends, chapter 5: State pensions, 2013 edition*. Retrieved from http://www.ons.gov.uk/ons/dcp171766_341468.pdf

RICA. (2014). *Mobility scooters: A market study*. Research Institute for Consumer Affairs. Retrieved from http://www.rica.org.uk/content/mobility-scooter-research

RNIB. (2014). *Key information and statistics*. Royal National Institute of Blind People. Retrieved from http://www.rnib.org.uk/knowledge-and-research-hub/key-information-and-statistics

Rye, T. & Mykura, W. (2009). Concessionary bus fares for older people in Scotland – Are they achieving their objectives? *Journal of Transport Geography*, *17*, 451–456.

Schwanen, T., Banister, D. & Bowling, A. (2012). Independence and mobility in later life. *Geoforum*, *43*, 1313–1322.

Small, G. W., Silverman, D. H. S., Siddarth, P., Ercoll, L. M., Miller, K. J., Lavretsky, H., …, Phelps, M. E. (2006). Effects of a 14-day healthy longevity lifestyle program on cognition and brain function. *American Journal of Geriatric Psychiatry*, *14*, 538–545.

Spinney, J. E. L., Scott, D. M., & Newbold, K. B. (2009). Transport mobility benefits and quality of life: A time-use perspective of elderly Canadians. *Transport Policy*, *16*, 1–11.

Thoreau, R. (2015). The impact of mobility scooters on their users. Does their usage help or hinder? A state of the art review. *Journal of Transport & Health*, *2*, 269–275.

Transport for London. (2014). *Dial-a-ride*. Retrieved from http://www.tfl.gov.uk/corporate/about-tfl/what-we-do/dial-a-ride

Transport Scotland. (2009). *Evaluation of national concessionary travel in Scotland, carried out by the Halcrow Group Limited, Transport Research Series, Transport Scotland*. Retrieved from http://www.scotland.gov.uk/Resource/Doc/272719/0081408.pdf

Webb, E., Laverty, A., Mindell, J., & Millett, C. (2016). Free bus travel and physical activity, gait speed and adiposity in the English Longitudinal Study of Aging. *American Journal of Public Health*, *106*, 136–142.

Whelan, M., Langford, J., Oxley, J., Koppel, S., & Charlton, J. (2006). *The elderly and mobility: A review of the literature*. Report number 255. Clayton, Victoria, Australia: Accident Research Centre, Monash University. Retrieved from http://monash.edu/miri/research/reports/muarc255.pdf

Whitley, R. & Prince, M. (2005). Fear of crime, mobility and mental health in inner-city London, UK. *Social Science & Medicine*, *61*, 1678–1688.

Winters, M., Sims-Gould, J., Franke, T., & McKay, H. (2015). "I grew up on a bike": Cycling and older adults. *Journal of Transport & Health*, *2*, 58–67.

WRVS. (2011). Gold age pensioners: Valuing the socio-economic contribution of older people in the UK. Retrieved from http://www.royalvoluntaryservice.org.uk/our-impact/reports-and-reviews/gold-age-pensioners