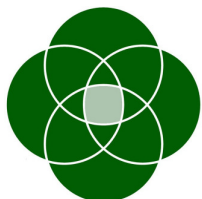




Successfully giving up driving for older people

Dr Charles Musselwhite

November 2011



Centre for
Transport &
Society



British Society of
Gerontology



The International Longevity Centre - UK (ILC-UK) is an independent, non-partisan think-tank dedicated to addressing issues of longevity, ageing and population change. It develops ideas, undertakes research and creates a forum for debate.

The ILC-UK is a registered charity (no. 1080496) incorporated with limited liability in England and Wales (company no. 3798902).

ILC-UK
11 Tufton Street
London
SW1P 3QB

Tel: +44 (0) 20 7340 0440

www.ilcuk.org.uk

This report was first published in November 2011 © ILC-UK 2011

Dr Charles Musselwhite is Senior Lecturer in Traffic & Transport Psychology with the Centre for Transport and Society at the University of the West of England, Bristol, UK. He has a growing portfolio of research addressing older people's travel behaviour, specifically looking at how technology might prolong safe driving for this group and how older people contemplate giving-up driving and life beyond the car, with research funding coming from EPSRC, ESRC and BBSRC. He also has an interest in researching road user safety and has recently completed a project exploring the public's understanding of road user safety interventions for the Department for Transport, UK. A third strand of research work involves looking at public attitudes to travel initiatives and interventions including the use of carbon calculators, road pricing and shared space.

He completed his PhD at the University of Southampton exploring driver behaviour and attitudes to risk and spent some scary moments collecting in-vehicle data with young male "boy racer" drivers. In his spare time he enjoys the ups and mainly downs of following Southampton and Gosport Borough football clubs and escaping by listening to progressive rock music.

Acknowledgements

Many thanks to my participants, to Hebba Haddad and Ian Shergold my Researchers working with me on all of this, to Verity Smith and Peter Lansley for interest and dedication on the SPARC project that got me started on all of this. And for continuing my interest thanks to Professors Graham Parkhurst at Centre for Transport & Society, UWE and John Benyon at University of Leicester and to Geoff Andrews, Centre for Transport & Society, UWE and to ILC-UK's David Sinclair.

Summary

Older people as a cohort are more healthy and active than ever before and as such are also more mobile. They are more likely than ever before to be car users and be driving more miles. Nevertheless, many older people, for one reason or another often associated with physiology or cognitive ageing issues, are the group most likely to need to give-up driving, an act that is associated with an increase in depression and a poorer quality of life. This thinkpiece explores why this is, suggesting that while car travel fulfils practical and utilitarian needs which can be difficult to achieve without a car in an ever increasing hyper-mobile society that is geared more and more around the car, such as accessing shops, services and hospitals, there are also psychological or affective needs and aesthetic needs that are not met in a life without a car. For example, the car provides independence, affords status and conveys roles and responsibilities while showing an engagement with a normal society and allows the individual to engage in travel for its own sake. Life beyond the car is fraught with difficulties in achieving these needs. This paper examines how this might be overcome, discussing whether driving might be prolonged, despite the negative externalities to the environment and society of increased car usage, and the potential safety issues faced by older drivers. It suggests that some of the negative affect from giving-up driving might be mitigated if the locus of control remains with the individual and they plan to give-up driving with the support and help of family and friends over a long period of time gradually trialling other forms of transport. How these other forms of transport, including public and community transport and the walking and cycling infrastructure for example, might be improved to meet older people's needs are also examined. Novel schemes such as lift-sharing or the Independent Transportation Network are noted in the possible package of solutions for a life beyond the car, along with the potential for mobility scooters and virtual mobility to provide some of the solution. Overall, older people need to remain in control and have a say in the transport solutions that are designed for them in a life beyond the car. A full list of recommendations are found in Section 8.

Table of Contents

1. Introduction	6
2. The importance of travel for older people	7
3. Should we encourage older people to continue to drive?	10
4. Process of giving up driving.....	16
5. Using alternative modes of transport	19
6. How to promote alternatives to the car	29
7. Conclusions.....	31
8. Key recommendations	35
References.....	37

1. Introduction

Not only is the population of older people in many Western countries growing at a significant rate, the amount of travelling older people do is rapidly increasing. Older people are more healthy and active as a cohort than ever before and as such are also more mobile (Tomassini, 2004). This is coupled with an ever increasing hypermobile society, where services, shops, work and families are increasingly dispersed, linked only by increasing the distance travelled. Most of the increase in travel amongst older people is as a car driver. The percentage of over 70 year olds holding a drivers licence in Great Britain has grown from 15% in 1985 to almost 54% in 2009, with males increasing from 34% to 76% and females 4% to 37% in this time frame (DfT, 2010a,b) (see figure 1). This rise is expected to continue, and Box et al. (2010) predicts that 10 million people over the age of 70 in Great Britain will have a driving licence by 2050. In addition, the amount of travelling done as a car driver has significantly increased amongst this group, between 1995 and 2010 the number of miles driven by 60-69 year olds grew by 26% and over 70s by 60%. This is a significant increase given the number of miles driven across the whole of the British population grew by only 2% to a peak in 2005 and has now reduced by 6% in 2010 compared to 1995 and people aged 60-69 are now driving more mile per person than the average for the population as a whole (see table 1).

Figure 1: Licence Holding by Gender and Age in Great Britain (DfT, 2010a,b)

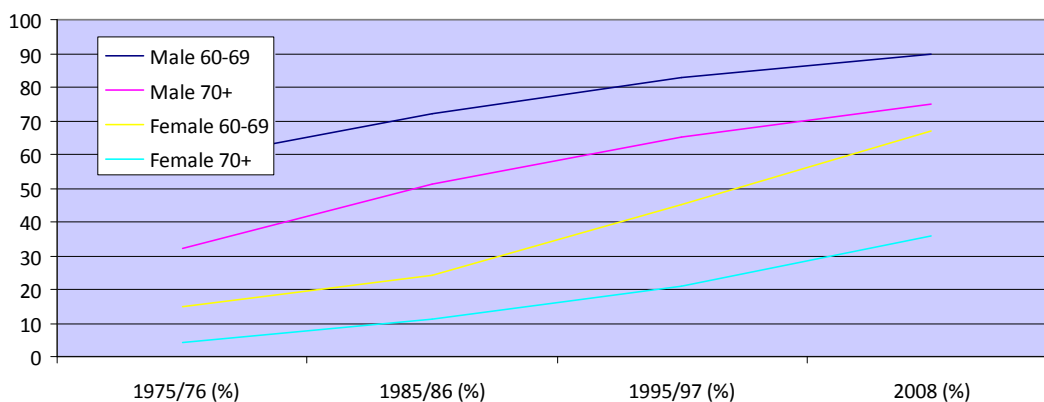


Table 1: Average distance travelled per person per year as a car driver in Great Britain (DfT, 2010a,b)

	1995/97	1998/00	2002	2005	2010	95-10 % change
60-69	3106	3327	3767	4068	3925	26
70+	1103	1326	1562	1828	1767	60
All ages	3623	3725	3661	3682	3416	-6%

Despite this, older people are the group most likely to suffer mobility deprivation. Physiological, cognitive and psychological issues associated with ageing including increased problems with eyesight, stiff muscles, attention, memory and confidence, have a significant effect on an individual's ability to be mobile. Not all individuals will experience such decline in the same way,

but older people are the group more likely to encounter such problems in comparison to younger people. This affects older people's ability to use transport. In 2009, in Great Britain, 39% of individuals aged 70 or over had problems walking or using a bus, compared with 4% of those aged 16-49 (DfT, 2010a). Among people aged 70 and over, those with mobility difficulties make around a third fewer trips than those without difficulties (DfT, 2010a).

The car is often viewed as the panacea to the problem, allowing individuals to travel long distances with minimal physical exertion. However, it could be argued that over reliance of the car as a form of transport is creating the mobility deprivation faced by older people as much as solving it, since it allows goods and services to be placed further away from residential areas, assuming people will access to these by car, which increases the demand for travel by car (and hence contributes to the hypermobile society). An increase in the use of the car also has a detrimental effect on the perceived safety of active travel (i.e. walking and cycling) and hence could be said to reduce the amount of active travel taking place. Increased difficulties associated with physiology, cognition and psychology may mean driving has to cease and consequently accessing services, shops and family and friends is no longer possible without immense difficulty. It is also these very factors that make travelling by alternative means, such as walking or travelling by public transport, difficult too (Broome et al., 2009) Hence, if older people have to give-up driving they are less able to access the goods and services that have become geared around the car for access. This was clearly highlighted in interviews carried out with older people in a study by Musselwhite and Haddad (2007),

"I mean how do you go on now without a car now everything – the hospital, the banks, the post-office is geared around them?" (Male, driver, aged 75).

2. The importance of travel for older people

The importance of mobility has been linked to life satisfaction and quality of life for older people (Schlag, et al., 1996) and giving-up driving in later life can be very painful and have devastating consequences in terms of mental and physical health and is strongly correlated with an increase in depression and loneliness (Fonda, et al., 2001; Ling and Mannion, 1995). Unsurprisingly, the need to give-up driving is coupled with great anxiety for older people.

Many older people manage to fulfil daily practical needs of travel, albeit with some inconvenience. Solutions can be sought that increase older people's ability to access shops and services when they no longer have the car. For example they use public transport (defined here as buses, trams or trains running to a fixed timetable for all public to use), community transport (defined here as travel provided for people who cannot access public transport, such as dial-a-ride services), taxis, access lifts or utilise e-shopping (Box et al., 2010; Musselwhite and Haddad, 2010b, 2008, 2007; Roberts, 2009). They also engage in active travel (defined here as physical mobility without power), and walking in particular increases in older age (Box et al., 2010). For some, giving-up driving can be a positive experience as increased community participation and social interaction can be found when using public or community transport and active travel (Musselwhite and Shergold, 2011; Pellerito, 2009). However, how far these needs are met varies greatly between people, based on practical issues such as the availability of lifts from family and friends and the availability and accessibility of public or community transport, especially in rural areas (Musselwhite, 2010; Musselwhite and Haddad, 2010b, 2007; Shergold et al., 2011). It may also be due to more social or psychological issues, for example older people not wanting to be a burden to family and friends and not asking for lifts that cannot be reciprocated (Davey et al., 2005; Musselwhite and Haddad, 2010b, 2008, 2007), and potentially being embarrassed to use community or public transport (as it perceived for older, poorer or disabled people – see Musselwhite and Haddad, 2010b).

It is increasingly recognised that the importance of being mobile and in particular the importance of driving a car for older people is associated with more than just practical or utilitarian motives and solutions need to take wider psychosocial issues into account. Recent research has highlighted the importance of affective and psychosocial needs as motivation for car driving, including identity, self-esteem, autonomy and prestige (Ellaway. et al., 2003; Guiver, 2007; Steg, 2005). For older people in particular, driving is linked to personal identity and is associated with masculinity, youthfulness, status and power and it can be seen as a way of “warding off old age” (Esienhandler, 1990; Siren and Hakamies-Blomqvist (2005). This was clearly pointed out by an older person in a focus group run by Musselwhite and Haddad (2010b),

“It is the one thing that allows me to compete with youngsters. It is something I can probably still do as well as when I was a young man.” (Male, focus group 1) (Musselwhite and Haddad, 2010b)

Furthermore, driving a car can be used as a tool for impression management, something to show other people aspects about the self (Musselwhite, 2011). Older people tend to use ownership and use of the car as something that shows that they are still part of everyday society. The viewpoint is that an individual who is engaged actively in society is likely to own and use a car. Female drivers talk about how the car gives them a sense of purpose and helps them fulfil social roles associated with being a parent or grandparent, for example (Musselwhite and Haddad, 2010b). Male drivers,

on the other hand are more likely to note how the car defines their personal and financial status (Musselwhite and Haddad, 2007, 2010b; Rothe, 1994), again clearly evidenced in focus groups run by Musselwhite and Haddad (2007, 2010b),

“I worked hard all my life. My cars show how well I did. My father didn’t have a car, so I suppose I was proud and still am of having a decent car.” (Male, driver, aged 85) (from Musselwhite and Haddad, 2007)

The independence the car gives older people is another crucial factor,

“My own car is really important. It’s my independence and although I go with my husband to most places and we then use his car, I really love having my own car, like today if I am on my own I am not stuck so that is really important to me”. (Female, driver, aged 71) (Shergold et al., 2011)

The importance of having the car ready to use if something goes wrong is also championed amongst older people. The very “potential for travel” the vehicle provides is crucial, for example in case of an emergency or a need to visit ill individuals in their home or hospital (Metz, 2000; Musselwhite and Haddad, 2007, 2010b). Amongst older people themselves it is believed that ownership of a vehicle is crucial to maintaining this at present. However, it is suggested that older people could belong to car club schemes for this role and further investigation into such provision should be investigated.

Finally, older people also mention the importance of discretionary travel in later life, including travel to the seaside, the forest or just a drive in the country (Musselwhite and Haddad, 2010b; Shergold et al., 2011). Some of this is to experience the beauty of such places, some of it to reminisce and rekindle older memories (Shergold et al., 2011). The need to be close to nature it has been argued is an innate motivation that Kellert and Wilson (1993) call biophilia. In addition, it has long been established that interaction with nature can create restorative responses and as such can reduce stress (Ulrich, 1979), anxiety (Ulrich, 1986) and improve health (Ulrich, 1984). Indeed, there is an irony here that the types of activities that may benefit people the most, such as getting out of the house and the ones that older people are less likely to feel they can ask for lift for. Since reduced physical mobility to engage with nature is more apparent in older people, travel by car allows these important interactions to take place, for example,

“Until I moved into my [retirement] flat, I loved looking at my garden, how it changes throughout the seasons. With my car, at least, I can still visit parks and the forest regularly to watch them change.” (Female, driver, aged 78) (Musselwhite and Haddad, 2007, 2010b)

“We go down to the coast regularly to see the sea. I love being by the sea. We couldn’t do it if we didn’t have a car.” (Male, driver, aged 80) (Musselwhite and Haddad, 2007, 2010b)

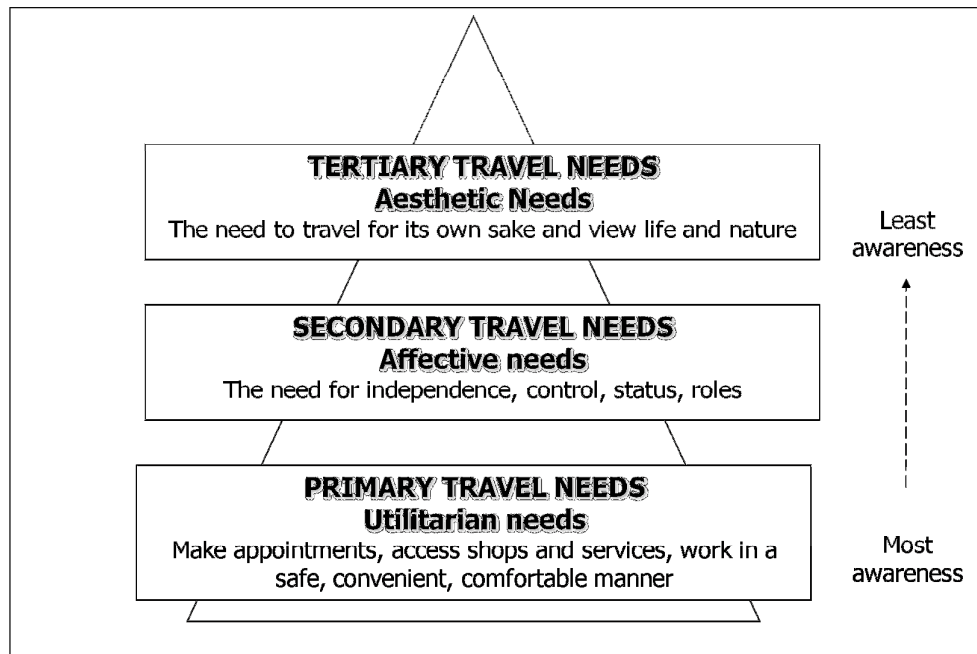
The journey itself can also be a source of enjoyment and when driving older people choose certain routes or certain roads to travel or drive down to be view certain scenery,

“Sometimes I take the long way round to drive past the forest and see the trees, especially in autumn.” (Male, driver, aged 75) (Musselwhite and Haddad, 2010b)

Based on these findings, Musselwhite and Haddad (2010b) developed a three tier model of car driver needs for older people, based on the findings outlined above, *utilitarian* (primary), *affective* (secondary) and *aesthetic* (tertiary) needs, which could be placed in a hierarchy (see figure 2). The level of participants’ self-awareness or consciousness of these needs varied. In interviews and

focus groups older people are very aware and immediately discussed utilitarian needs, but less aware of affective needs and even less aware of aesthetic needs.

Figure 2 The three levels of mobility needs of older drivers by self-awareness of the need (after Musselwhite and Haddad, 2010b)



Hence, solutions for helping older people give-up driving should focus not only on practical or utilitarian issues, but also affective and aesthetic issues. Provision must take into account the wider social context within which giving-up driving occurs. Hence, replacing travel with bus travel may meet utilitarian needs, but fail in meeting affective needs of independence, status and roles that the car used to fulfil. Similarly, older people often rely on others for lifts when they give up driving and find their utilitarian needs can be met. However, the feeling of being a burden and a lack of independence means they feel hugely dissatisfied which can in turn negatively affect quality of life and mental health (Musselwhite and Shergold, 2011)

There are two immediate solutions that could reduce the negative affect suffered when people give-up driving:

- (1) To keep older people driving longer and later on in life, providing they remain safe drivers, thus reducing the need to give-up driving altogether or as late as is possible.
- (2) Provide alternative means, services or solutions in terms of travel or (part) replacements for travel.

Driving is by far the most commonly used transport mode amongst older people (DfT, 2010a,b). It seems sensible to investigate whether safe driving can be prolonged later on in life. However, there are two debates that need to be investigated before that can be achieved. First, is it morally right to encourage more driving, given the negative externalities of using the car to society? Second, are older people safe drivers or could they be encouraged or supported to become so?

3. Should we encourage older people to continue to drive?

It is ironic that at a time when the government is responding to the negative externalities of mass car travel by decreasing demand, that simultaneously there is a need to maintain or indeed increase the mobility of older people.

3.1. Moral argument

The UK government, like other EU and most western governments, are keen on reducing the amount of cars using the roads. Despite the obvious benefits of car use to individuals and society in terms of increased accessibility (and associated economic benefits for society and individuals), there are also associated negative consequences including:-

- a huge growth in pollution which effects physical health of the population and contributes to climate change,
- a severance of society - people do not know their neighbours or explore their neighbourhood and services and shops move away from local areas
- increased safety fears and risks for all users, especially for pedestrians and cyclists
- less use of active modes of travel – less walking and cycling contributing to the negative health of individuals.

The previous UK government actively sought measures to try and reduce the amount of travel people did by car, and opted for an approach that would manage demand, termed smarter choices (DfT, 2004a,b). This involved exploring the use of a variety of carrots (e.g. improving public transport corridors, off road cycle paths) and sticks (e.g. road pricing changes) through the use of education (such as travel awareness campaigns), partnerships and agreements, such as green travel plans (for businesses) and personalised travel plans (aimed at individuals), setting up car share schemes, supporting car clubs and encouraging teleworking (working from home) (DfT, 2004a,b). Despite vowing to end the war on the motorist, the new UK coalition government continues to support schemes aimed at cutting car usage. Older people obviously fit an easy to reach group in terms of changing travel behaviour from use of the car. They are beginning to reduce their amount of miles they do as they retire from work and they are the group most likely to begin to report difficulty with elements of driving and perhaps begin to self-regulate driving behaviour (Musselwhite and Haddad, 2010a). However, given the limitations of ageing on physiology would it be fair to expect this group to give-up driving when they perhaps could not easily engage in active travel and find using public transport difficult? It could be argued that their journeys are less necessary, being more discretionary in nature than younger age groups who have to travel for work. But again, discretionary travel, it seems is actually very important for quality of life for older people (Musselwhite and Haddad, 2007, 2010b; Shergold et al., 2011). Again, it could be counter argued that older people should not be treated differently to the rest of the population and be encouraged to “do their bit” for the environment through cutting their car use. In all cases further research into older people’s attitude towards environmental issues and cutting car use in lieu of these is needed.

3.2. Are older people safe enough to drive?

Whatever the answer to the moral and environmental questions it still needs to be asked if older people are safe enough to continue driving?

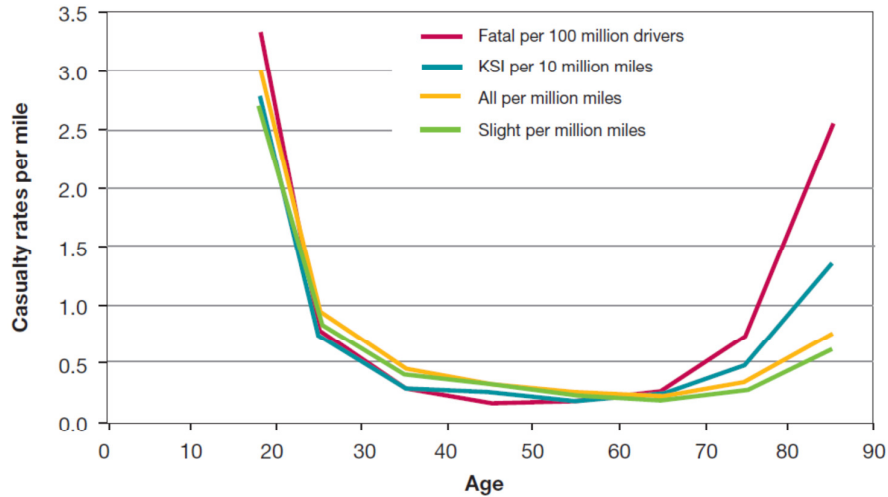
Older people, from the age of around 75 years and above, do pose a greater danger on the road than middle-aged drivers and are more likely to be represented in crashes involving killed or seriously injured casualties (DfT, 2009). However, much of this increase is because the older person is more likely to be susceptible to injury or death due to increased frailty (see Box et al., 2010 for review) and the increase from 75 years onwards is only very slight and they are not as likely to be seriously injured or killed as drivers aged 17-21 years of age (see figure 3; after Box et al., 2010 and DfT, 2009). That said, older people from the age of 70 become more likely than not to be “at blame” for road accidents they are involved in, according to official police records (Clarke et al., 2009, see figure 4). However, it could be argued that older drivers might be more likely to be blamed due to negative stereotypical view that older drivers are poorer drivers. To conclude older drivers are over represented in accidents:

- at Junctions;
- in merging traffic;
- with right-hand turns (when driving on the right-hand side of the road) and;
- in busy traffic (see Clarke et al., 2009 for review)

And mention having problems with:

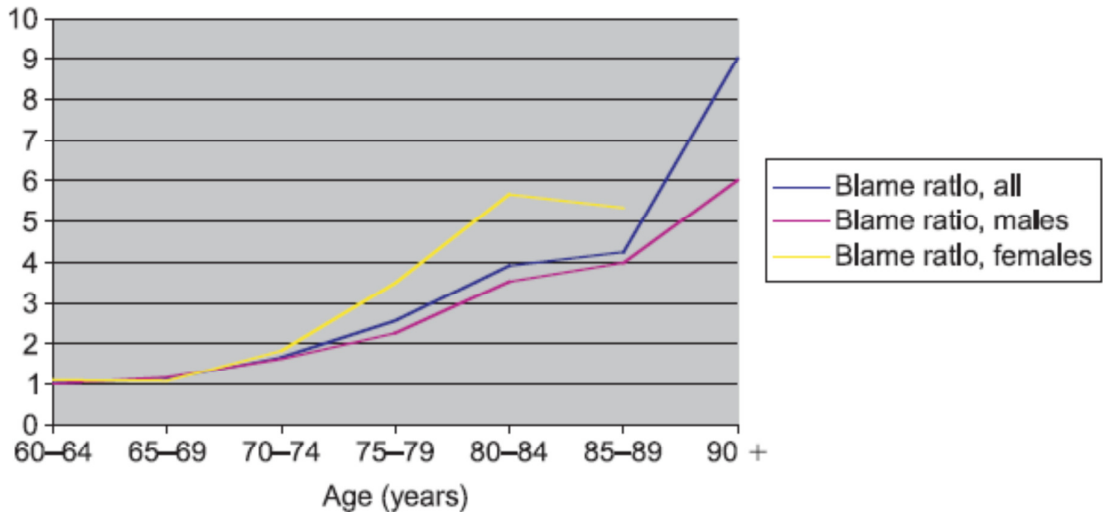
- increased fatigue;
- poorer reactions (for example, on average, drivers over 55 take 22% longer to react than drivers under the age of 30 years) (DfT, 2001);
- difficulty with glare and luminance (average recovery time from glare, from lights from other vehicles or low sun for example, at age 16 is 2 seconds whereas at age 65 is 9 seconds and 75 year old driver requires 32 times the brightness to be able to see the same scene they did at age 25) (DfT, 2001) and;
- difficulty keeping a consistent constant speed (difficulty in detecting changes in feedback from the vehicle speed and difficulty in keeping foot pressed to the floor in the same position for long periods of time) (Musselwhite and Haddad, 2010a).

Figure 3: Road user casualties (Slight, fatalities and KSI: Killed and Seriously Injured) per mile driven by age (after DfT, 2009)



Source: DfT (2009) Road Casualties Great Britain 2008

Figure 4: Ratio of blameworthiness by age and gender (after Clarke et al., 2009)



Langford et al. (2006) suggest that low mileage drivers entirely make-up the increase in killed or serious accidents post 75 years of age. It may be that experience of driving helps keep drivers alert and maximises skills. It could be poorer drivers are regulating their driving and driving less frequently. Finally, the difference could be that drivers who drive fewer miles are spending time on more dangerous road environments, whereas longer distance driving typically involving long stretches of motorways or dual carriageways, the safer routes. It is recommended that more research is carried out into how older people drive from the perspective of the older driver, including how well older people assess their own driving skills and what they do to mitigate any problems or issues and how far experience affects driving ability.

3.3. Improving driving safety through changes to the infrastructure

Box et al. (2010) note a logical conclusion to helping improve safety on the road amongst older people and reduce accidents is to improve the infrastructure. They suggest that creating simple, intuitive easy-to-read roads will benefit not just older people but all road users,

“Providing less complex and ‘self-explaining’ roads, which have clear signage and road markings as well as intuitive infrastructure is likely to benefit all road users, in addition to the older driver” (Box et al., 2010; pg. 43)

Whereas this is indeed likely to benefit older drivers, what exactly constitutes self-explaining roads needs careful attention. If the road is too simple to follow then it is suggested that younger and middle-aged drivers may well drive with less attention and possibly increased speeds (Engwicht, 1999, 2006; Hamilton-Baillie and Jones, 2005). Hence, older drivers could face frustration from other drivers being held up and more importantly such design could increase danger for other road users, especially pedestrians and cyclists. A current school of thought suggests that the road environment actually be made far more complex to encourage sharing of space and a levelling of priorities amongst different users (Engwicht, 1992; Hamilton-Baillie and Jones, 2005). This should help reduce speeds of drivers who have to informally negotiate the space with other road users and the ambiguity of the road scene. Little research has been done to find the appropriate point between increasing the complexity of a scene before it becomes too dangerous to negotiate. Indeed, what may create complexity and additional attention amongst a younger driver may well be very different to that of an older driver who could find a highly complex environment too difficult to negotiate and actually increase the likelihood of an accident. Further research is needed to examine the interaction between infrastructure design and the affect on ability and skill of older drivers.

3.4. Improving driving safety through training and education

Self-regulation is common amongst older drivers (Berry, 2011) and drivers compensate by not driving in busy traffic, in the rain or in darkness, for example (Baldock et al., 2006; Holland, 2001; Musselwhite and Haddad, 2010a; Musselwhite and Shergold, 2011; Rabbitt et al., 1996; Rabbitt and Parker, 2002). They are able to do this mainly through not having to have to drive for work and commuting purposes, with the majority of older people being retired. Hence, there is more flexibility about when and where older individuals can and have to drive. Changes to work patterns, though, such as the increasing of the retirement age will see more older people than ever before commuting and driving for work purposes, perhaps reducing the amount of self-regulation they are able to do.

Re-testing at 65 (and then possibly again at regular intervals) has also been proposed, but there is little evidence from countries that do this to suggest it makes any difference to the road traffic accident rates of older people (see Box et al., 2010). Of course, this does not mean testing is not appropriate, indeed the test itself may not be fit for purpose as is a commonly held view amongst the UK public (Musselwhite et al., 2010).

Training and education is welcomed by older people, and there is an abundance of courses run by local authorities and charities aimed at improving skills and confidence of the older driver.

A systematic review of the evidence from randomised controlled trials and pre-post tests suggests that interventions improve driver awareness of their own skills and ability behind the wheel and can improve driver behaviour but there is little evidence that such interventions reduce crashes, severe or otherwise (Korner-Bitensky, et al., 2009).

Hence it is recommended that while older people evaluate driver training and awareness courses highly, an independent robust evaluation is needed examining whether such courses really improve driver skill and awareness and whether they reduce accidents. In addition, sharing of best practice amongst courses is needed, while maintaining local contextual variance between courses in different localities.

3.5. Improving driving safety through technology

There are plenty of intelligent in-vehicle systems that could aid an older person's driving including those that take-over some of the driving tasks such as intelligent speed adaptation and (adaptive) cruise control and those that provide extra information and suggested driver changes such as Fatigue Detection System, Current Speed Warning, Collision Advice System, Lateral and Trajectory Position Warning. However, Musselwhite and Haddad (2007) suggest in terms of skills and ability the very factors that cause older people to contemplate giving-up driving are often similar aspects they'd struggle with in terms of using new technologies and older people:-

- Are more likely to be distracted by the technology
- Take longer to notice feedback given by the technology
- Are less likely to notice subtle feedback given by the technology
- Take longer to process information given by the technology
- Have different cognitive processing ability coupled with different norms and experience (e.g. they tend to prefer logical one-step one-function buttons rather than bracketed step-through menu driven items).

Hence, it would seem best to have technologies that take over some of the driver's tasks rather than provide extra feedback that might not be noticed or could distract the driver further. However, this is the exact opposite of what older people say they want (Musselwhite and Haddad, 2007). Older people state they want to be able to think for themselves and make their own judgements as they have done all their lives, as one focus group participant in Musselwhite and Haddad (2007) stated,

“Generally the older generation have a different culture to the present generation, as we were not brought up on the computer. We tend to think for ourselves and not rely on the process that computers take you through. Also, Health and Safety regulation was not around when we were younger. Again we had to think for ourselves and make our own judgments.” (Dennis, older driver) (see Musselwhite and Haddad, 2007)

However, this doesn't mean technology might not be the answer. New generations of older people may well be more supportive of such technology as advanced technology is likely to have played a greater part of their lives. In addition, almost all research suggests that older people become more accepting of technology following use of it (see Musselwhite and Haddad, 2007). On the whole, older people also would rather have such technology than give-up driving altogether and many

have readily accepted automatic gears to help with physiological and cognitive demands of gear changing (Musselwhite and Haddad, 2007). Hence, it can be suggested that technologies that take-over driving may well be accepted and used by older people as they enter the market and become more normal, as can be seen with the recent additions on vehicles that can reverse park automatically. One further point to note is that older people do not want technology that makes their car look like an older person's car; perhaps the day of spinners and pedal extenders are limited (Musselwhite and Haddad, 2007)! Car manufacturers are increasingly aware of the importance of designing vehicles to meet the needs of older people, both in terms of appropriate support in the vehicle and also in terms of aesthetics. In terms of support, for example, Ford Motor Company have designed the Third Age Suit, which is worn by designers and testers and enables them to see limitations associated with ageing, such as stiff muscles, poorer dexterity, weaker eyesight and weaker hearing (see http://media.ford.com/article_display.cfm?article_id=2631 for further details). In terms of aesthetics older people are increasingly involved in focus groups and market research groups amongst various motor manufacturers.

To conclude Musselwhite and Haddad (2007) suggest older people would like benefit from the following technologies:

- *Displaying road speed in the vehicle with an additional speed cue* – a system linked to a satellite which displays the speed which the vehicle is travelling at and alerts the driver when the speed limit is either about to be reached, has been reached, or is over by a certain amount.
- *Displaying road signs in-vehicle* – a system linked to satellite that displays some of the key signs on the dashboard or by head-up display (a transparent display on the windscreen that presents data without obstructing the user's view; initially developed for aviation, but now used in some cars).
- *Night Vision* – enhancement to vision of the road at night and how this might be displayed to the driver could be investigated.

It is recommended that more research should now concentrate on getting older drivers and technology experts to work on developing these technologies together.

4. Process of giving up driving

Gilhooly et al. (2002) found that in many cases actually giving-up driving for older people was more positive than the perception or anxiety of giving-up driving. Answers to a variety of questions about life without a car were asked to older people who had given up driving and those who were still driving. Table 2 shows that ex-drivers reported more positive views about having given up driving than drivers anticipated having (although not in relation to saving money). It could be argued much of the anxiety surrounding giving-up driving lies in the perception of life beyond the car, which is not always as bad as individuals perhaps think it might be.

Table 2: Mean levels of agreement of older drivers who had given-up and current older drivers to statements concerned with the advantages and disadvantages of no longer driving. (5 = strongly agree) (after Gilhooly et al., 2002)

	Mean of drivers who had given up	Mean of those still driving	t	Sig (2 tailed)
I felt/would feel relieved of the responsibility of driving	3.22	2.50	4.09	.000
I felt/would feel relieved of the responsibility of owning a car	3.20	2.61	3.26	.001
I missed/would miss the freedom of driving	3.50	4.21	-4.67	.000
I disliked/would dislike relying on other people	2.38	4.05	-10.29	.000
I saved/would save money	2.36	3.71	-7.77	.000
It simplified/would simplify my life	2.98	2.21	4.84	.000
I had/would have to give up certain activities	2.66	3.75	-6.56	.000
It was/would be an unwanted reminder of old age	2.50	3.38	-4.71	.000
It caused/would cause difficulties for friends and family	2.56	3.51	-5.45	.000
I experienced/would experience some difficulty because of poor public transport	2.98	3.61	-3.61	.000
I missed/would miss seeing myself as a driver	2.89	3.42	-2.91	.004

Musselwhite and Shergold (2011) suggest that different groups of older people experience giving-up driving differently based around the amount of contemplation and planning they do before ceasing driving. Older people who plan giving-up driving over quite a lengthy period of time and gradually use alternatives are those more likely to give-up driving successfully, suffering less negative affect and maintaining better quality of life beyond the car. They suggest on the whole that females are more likely to plan, and males are more likely to need to be told to give-up. In addition, those who have close family and friends for practical and emotional support, find giving-up driving less problematic. Those who are successful are those who not only manage to change their mode of transport but also their destinations. In addition, initial periods of trial and error need to be completed alongside using the car, so the process is gradual.

Hence, there is a need to help people begin to try alternative modes of transport and alternative destinations as early on in life as is possible, fostering an environment conducive and encouraging

this, sometime before they have to give-up driving. This requires two key considerations. First, older people need to realise they may need to give-up driving in the future and secondly, they need to be motivated to act on this knowledge. Sometimes this realisation does not occur for one reason or another; individuals may genuinely feel they do not need to contemplate giving-up driving or they may be in denial that they need to look for alternatives. How to raise into the consciousness of older people the need to consider giving-up driving is necessary but fraught with difficulty. Older people, on the whole, would welcome more involvement of healthcare professionals, especially the General Practitioner (GP) and opticians in deciding whether they should or should not drive (Berry, 2011; Coughlan et al., 2004; Musselwhite and Shergold, 2011; Parker et al., 2003). However, healthcare professionals are reluctant to be involved and very few give advice on driving cessation and when they do it is almost exclusively to order someone to give-up driving, rather than just raise the thought into the conscious (Berry, 2011; Hawley, 2010; Musselwhite and Shergold, 2011). Moreover, though, in reality, the process often involves family members and is often not instigated by the person who is the target of the possible cessation. As Coughlan et al. (2004) point out, however, the discussion with family members is not always harmonious and although almost 60% followed the advice given by family members, over half of these were upset by the decision. In addition, the advice is not always followed, as noted in an interview carried out in Musselwhite and Shergold (2011)

“My husband told me to give-up. He said I wasn’t any good. But then he’s always said that since I could drive at 21.” (Female, aged 78)

Much more notice is taken of children or grand-children as again noted in interviews carried out by Musselwhite and Shergold (2011)

“My daughter told me I had to give-up. It came as a surprise she said that to me. Big surprise. I hadn’t realised I’d got that bad. Well, she said it with tears in her eyes, so I think I thought she’s being really genuine here.” (Male, aged 78)

Motivation to look for alternatives stems from a belief that there are alternative transport options or behaviour that can be undertaken (Musselwhite and Shergold, 2011). Individuals who did little or no planning tended to blame external factors for the lack of transport options citing that there was no public or community transport, or that the service was poor, for example. On some occasions there is genuinely poor or no alternatives to the car, on other occasions other older people in the area had managed to find alternative modes of transport and travel behaviour plans. Hence, some of the motivation for change or looking for alternatives rests with the motivation or the ability of the individual to see this change.

It is recommended that there is a need to promote the awareness of the potential to have to give-up driving at as younger age as possible. Brown (2010) suggests leaflets that accompany retirement, as this is at a stage that disrupts habitual travel patterns anyway (i.e. no longer having to drive to work) and is coupled with wider signals about ageing. In addition, this could be targeted beyond the individual to the wider social network of friends and family. A good example of this is a play about the issues of discussing giving-up driving amongst family and friends designed to entertain but to also provide as a prompt to discussing such issues amongst friends and family (see Pauluth-Penner, 2010). It is an issue that wider society needs to play a role too and hence debate needs to embed itself within popular culture, needing more stories in television dramas and discussion on documentaries, for example.

5. Using alternative modes of transport

Improving the available alternatives is crucial. In all cases alternatives not only need to improve in terms of physical accessibility but also affective and aesthetic needs.

5.1. Active travel (walking and cycling)

Older people are over represented in accident statistics - they represent 14.81% of pedestrian casualties and 16% of the population, but around 43% of all pedestrians killed (DfT, 2009). Again frailty is an issue here but there are also behavioural issues, especially with crossing the road, both at controlled and non-controlled crossings. Although older people prefer crossing at signalised formal crossing spots it is not always possible. They tend to not use over or under passes as they feel their personal safety is threatened coupled with the length of time taken away from the desirable journey. They take longer than younger people to cross roads, sometimes longer than automatic controlled crossings allow for, which adds to concerns. In some cases, older people's fear of falling also means they walk more carefully, slowly and look at their feet rather than at potential traffic dangers as a younger person might (Avineri et al., in press).

Older people are also reluctant to use pedestrian areas where they feel threatened by others as these examples from research with older people suggest:

"They probably won't harm you, but they look so threatening. They march up the road and ride the bicycles up and down the pavement." (I'DGO, 2007)

"People are in such a rush these days. You feel like a skittle walking along the road most of the time!" (Musselwhite & Haddad, 2007)

Maintenance of pedestrian areas is also crucial, not just for aesthetics but also for safety and concerns for falling, again as evidenced by older people themselves:

"Maintenance of pavements and roads: they are diabolical around here." (I'DGO, 2007)

"It's not always level, smooth, and safe to walk on. You can be very unstable." (I'DGO, 2007)

Lack of Public Conveniences and benches are key issue for older people:

"[Getting to] a toilet is a big problem... I've got to plan where the next toilet is." (I'DGO, 2007)

Layout of streets themselves makes them inapproachable. In particular older people mention issues with speeding and busy traffic as well as queuing traffic. In addition narrow pavements can be barriers to walking, especially those used for other things like storage of bins, parked cars and shop A-boards, for example.

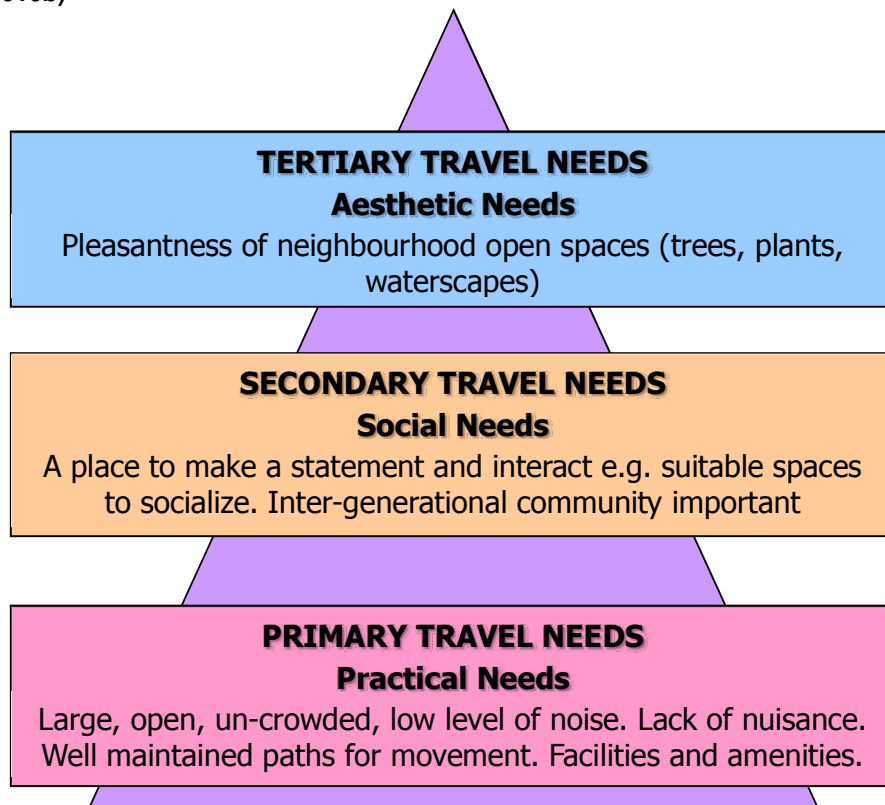
To improve walkability of the neighbourhood, these barriers need to be overcome, but also taking into account the affective and aesthetic qualities of a street. Building on work by Alves et al. 2008 and Sugiyama et al., 2008 and plotting against the transport hierarchy of needs (Musselwhite and Haddad, 2010b) the following are suggested as imperative when designing streets with older pedestrians in mind (see also Figure 5):

- Designing for a lack of nuisance. Decreasing levels of nuisance and addressing perceptions of nuisance. Spaces should be well maintained and be free from graffiti. Reduce litter and rubbish, through provision of litter bins and regular street cleaning. Low levels of noise or be designed in a way to reduce interference from noise. Older people tend to favour street lighting

in order to help with being able to see kerbs, uneven surfaces, changes in surface trajectories and any obstacles, as well as helping reduce fear of personal safety (Bowling et al., 2002), but how this actually translates into use of the area is not known and it is recommended that more research is needed on older people, lighting and the effect on walking and use of outdoor spaces.

- Design quality paths. Paths need to be barrier-free paths that are wide, smooth and free from obstacles are necessary. They should be well maintained and offer borders between pedestrian and traffic environment where appropriate.
- Good facilities and amenities. The regular presence of seats, toilets and shelters are important
- Neighbourhood aesthetics. Enhancing the natural features of the area, such as quality trees and plants should occur. In addition, water features a fountain or a lakeside, may entice older people to use areas more frequently and be conducive to recreational walking.

Figure 5: re-designing the streets for older pedestrians (after Alves et al., 2008 and Musselwhite and Haddad, 2010b)



Hamilton-Baillie and Jones (2005) suggest the provision of shared space on the roads, whereby roads are designed to encourage every road user to have equal priority of the space. This might involve eliminating kerbs, creating a continuous surface with little demarcation to segregate different road users, reducing the amount of signage and making roads less intuitive and introducing the concept of ambiguity. Through such design, drivers remain focussed and drive at slower speeds and other road users, particularly pedestrians and cyclists, get higher priority. The slower speeds means eye-contact amongst users is possible, so that priority becomes one of informal negotiation amongst road users of all types, rather than simply following formal rules.

Hans Monderman first championed the idea of shared space in the Netherlands. Early examples include the “Woonerf”, in the Netherlands, and “Home Zones” in the UK for residential areas. More recent examples, however, are not confined to residential environments and schemes such as these have been a resounding success in mainland Europe, where speeds have fallen and accident severity has reduced for example in Drachten and Haren in the Netherlands (see <http://www.shared-space.org/> for further examples). Schemes have begun to be implemented along these lines in the UK, most notable Exhibition Road, Kensington, London. However, more research is needed on perceptions of safety faced by pedestrians, especially older pedestrians in such environments. There is a need to understand how such design might exclude certain groups from using the street. For example, it is already established that people who are blind or partially-sighted are on the whole quite negative about schemes that have no or very little demarcation since they tend to use kerbs or pavements to orientate themselves and are unable to use eye-contact in negotiation (Parkin and Smithies, 2010; Reid, 2011). This may well extend to older pedestrians who may not share the confidence of interacting with other road user types that other younger pedestrians might. Indeed Kaparias et al (2010) found that while young men felt more comfortable sharing space, those with disabilities and older members of the population are far less positive, albeit in research with hypothetical schemes. It is recommended that research takes place examining older people’s perceptions and behaviour with regards to using shared space and that their needs are taken into account early on in any design process.

5.2. Public transport (buses, trains)

Gilhooly et al. (2002) found the highest barrier to public transport use amongst older people was personal security in the evening and at night (79.8% of over 70s agreed), followed by transport running late and having to wait (see table 3). In addition, Musselwhite (2010) mentions the importance of knowing how to use the bus or a train is a huge barrier, for example knowing the social norms associated with public transport usage. Many older people, especially the younger older people who have driven all of their adult life, may not have used public transport in many years. They are out of the habit, do not have mental preparedness to use public transport and do not know the norms. The infrastructure and norms have changed since they last engaged in public transport. Although important, formal information on timetables, fare structures and the like can often easily be found and understood, it is moreover the informal information that is more difficult to find information on prior to actually using the transport (Musselwhite, 2010). Older people are worried, for example about knowing when the bus really leaves (early or later than its departure time), which buses might be crowded and which are not, which buses might be more accessible, how much can be carried and the procedure for getting off the bus (Musselwhite and Haddad, 2007, Musselwhite, 2010). These are summarised in table 4 and articulated in this interview excerpt from Musselwhite (2010),

“Will it stop where I want it to? That was a big concern. Also I didn’t really know what to do. There didn’t seem to be a bell to press nearby. So I’d have to get up when the bus was moving and walk up to the driver and tell him to stop at the next stop...But I have found the bell now. It’s lower down not on the ceiling. I feel less anxious now.” (Female, gave-up driving 1 year ago, interview, from Musselwhite, 2010)

Table 3: Ten most frequent barriers for respondents aged over 70 years, with the proportion of that age-group who reported each as a ‘problem’ (after Gilhooly, et al. 2002)

<i>Problems</i>	<i>% aged over 70 who agree</i>
Personal security in evening and at night	79.8
Public transport running late	68.3
Having to wait	68.0
Difficulties carrying heavy loads	66.3
The possibility of cancellations	66.0
Behaviour of some passengers	63.5
Lack of cleanliness	53.8
Having to be out in bad weather	53.8
Having to change transport	53.3
Difficulties travelling where I want to	50.0
Difficulties travelling when I want to	48.1

Table 4: Older people’s concerns with bus travel (after Musselwhite 2010; Musselwhite and Haddad, 2007)

<i>Formal information</i>
Alternative transport provided locally
Timetable of buses
Location of bus stops
Walking area
Real time information
<i>Informal information</i>
Does the bus leave when it says it does?
Ease of carrying shopping/luggage on a bus?
Ease of getting a seat on a bus?
State of the pavements for walking?
Provision of benches, formalised crossing areas, toilets etc.
Feeling of safety using transport/walking?
Attitude of bus driver

In terms of public transport the attitude of the staff towards older people is also crucial. On buses, the driver must be sympathetic to older people’s needs. A major concern amongst older people is that the driver will not wait until the older person has sat down and start driving, making walking to a seat difficult. Older people also want a driver to be friendly, knowledgeable and helpful, for

example be able to provide useful information about the journey when prompted. In addition, older people are often responsive to a friendly driver who engages in small talk and the use of a familiar or the same driver on the same routes can be extremely helpful in breaking down barriers and encouraging bus use amongst older people. Hence any attempts at altering bus services to meet older people's needs should consider not only practical concerns like security, lowered floors and free travel but also providing information or support on using the bus (or making it more intuitive) and critically ensuring bus drivers have a positive attitude towards older people. It is similar on trains where station and train staff attitude is crucial to successful journeys and the support needs to include practical help with luggage, direction and train times but also extend to staff having a positive attitude to performing such duties. In addition, new technology can be used to aid information provision, for example presenting real-time public transport information, taking away the uncertainty about waiting. However, crucial for all passengers, especially older passengers facing difficulties with poorer eyesight, is how the information is presented.

Andrews et al. (2011) discuss the importance of bus travel for older people, following the introduction in the United Kingdom of the bus pass for everyone aged over 65 entitling them to free off-peak travel on all buses within the country they live. They suggest that the pass helps people try the bus out for non-important or discretionary travel in the first instance. This helps them to begin to use other alternative travel before having to give-up driving altogether which helps alleviate the negative aspects of giving-up driving, allowing people to gradually get used to the norm surrounding bus use. It has also allowed older people to use bus travel for what might be termed non-utilitarian purposes, for example going out for a ride or enjoying the social engagement or window gazing that takes place. Andrews et al. (2011) also argue that an improvement in the quality of life for older people has come even if the trips are not necessarily taken up, suggesting it provides the "potential for travel" that Metz (2000) and Musselwhite and Haddad (2010b) have found is important for older people. In addition, it works somewhat to creating a sense of freedom and independence for travel unconstrained by financial burden. To encourage this further it is suggested that bus companies support older people in using the bus for discretionary travel. Perhaps promoting the use of bus roulette (rolling a dice to determine what bus might be used and where to get off, a kind of mystery bus tour), and guided bus tours (with commentary provided on headphones), or similar.

Given the austerity drive in the UK, it is likely that question over the long-term sustainability of the free bus pass will be debated. It is recommended that the free bus pass be continued in order to help through transition from driving to other modes, but perhaps alternative ways of paying could be investigated. Perhaps older people would be willing to pay a set amount per year to buy the pass, so that the bus is still free at point of use. Alternatively, perhaps donations or sponsorship could contribute towards the continuation of the scheme, setting up a trust that could support the continuation of the scheme. Finally, innovative third way solutions have been suggested by Andrews (2011), for example, businesses in partnership with bus companies offering deals to those with free bus passes and passing a contribution from the payment for the business back to the bus company. For example, the bus company could advertise 5-10% off meals at a restaurant on production of a bus ticket, the bus company could then claim 5-10% back from the restaurant to help pay for the ticket.

5.3 Community Transport

The Community Transport Association (CTA 2011) state Community Transport is a 'safe, accessible, and cost-effective' solution to mobility needs, run 'by the community for the community'. Hence it has the ability to connect communities both physically and socially. However, provision of community transport in the United Kingdom provision is varied and overall covers only a small number of users. That said the users are extremely satisfied with the community service when provided. The WRVS (2011) and Audit Scotland (2011) state that 'community transport' is vital for combating loneliness and helping older people to live happier, more fulfilled lives through enabling them to visit the shops, social events and to attend vital appointments at the hospital or with the General Practitioner (GP). In addition, the value of community transport goes way beyond fulfilling these utilitarian travel needs and offers social and emotional interaction amongst its users and volunteer and paid drivers, as Webber (2010) concludes from an ethnographic study of older people on community transport:

"When considering the concept and value of travel time use, the 'travel time' spent by older travellers on board community transport is far from wasted or unproductive. It is a time of social interaction, a time which is eagerly anticipated and enjoyed. It is time of humour, song and laughter. It is a time of emotion and feeling, where the realities of human existence are played out, shared and experienced amongst its passengers. It is time that is significant, and that is highly valued."

How far such benefits could continue if community transport was to expand with an increased number of users is not clear. Some of these valuable outcomes for the users are only evident because of a small, niche group of users, where focussed time and effort can be placed with the older people themselves. Further research is needed to examine how such valuable elements of travel can be maintained in later life on community transport.

Hence, it is clearly recommended that community transport be expanded to support a wider and more diverse range of users and their needs. However, this must not be at the expense of decreased driver-user contact which is vital for user satisfaction and quality of life.

5.4. Using cars but not as the driver

Although the amount of travel decreases amongst older people, the percentage of trips that are made by car falls only very slightly (table 5). An examination of data from previous years in Great Britain shows that while for other age groups the percentage of driving and passenger trips remains constant, driving trips for 60-69 year olds and 70 year olds and above are growing significantly. Hence older people are increasingly likely to be making trips as a driver (DfT, 2002, 2006, 2010a; see tables 5, 6 and 7). However, the shift from driver to passenger is more apparent and those aged 70 and above are the group, after those aged 20 or less, most likely to be taking lifts (DfT, 2002, 2006, 2010a; see tables 5,6 and 7) This is shown by older people taking many more lifts from friends and family, but also taking many more journeys by taxi.

Although the amount of travel decreases amongst older people, the percentage of trips that are made by car falls only very slightly (table 5). An examination of data from previous years in Great Britain shows that while for other age groups the percentage of driving and passenger trips

remains constant, driving trips for 60-69 year olds and 70 year olds and above are growing significantly. Hence older people are increasingly likely to be making trips as a driver (DfT, 2002, 2006, 2010a; see tables 5, 6 and 7). However, the shift from driver to passenger is more apparent and those aged 70 and above are the group, after those aged 20 or less, most likely to be taking lifts (DfT, 2002, 2006, 2010a; see tables 5,6 and 7) This is shown by older people taking many more lifts from friends and family, but also taking many more journeys by taxi.

Table 5: Percentage of trips made by car across age groups 2010 (after DfT, 2010a)

Age	<17	17-20	21-29	30-39	40-49	50-59	60-69	70+	All
Car/van driver	-	23	40	55	61	60	52	41	42
Car/van passenger	56	25	16	11	11	13	17	22	22
Total by car	56	58	56	66	72	73	69	63	64

Table 6: Percentage of trips made by car across age groups 2006 (after DfT, 2006)

Age	<17	17-20	21-29	30-39	40-49	50-59	60-69	70+	All
Car/van driver	-	23	42	56	61	58	50	37	41
Car/van passenger	53	24	16	11	11	14	17	21	22
Total by car	53	47	58	67	72	72	67	58	63

Table 7: Percentage of trips made by car across age groups 2002 (after DfT, 2002)

Age	<17	17-20	21-29	30-39	40-49	50-59	60-69	70+	All
Car/van driver	-	23	43	58	61	58	46	35	42
Car/van passenger	56	28	15	13	12	14	18	21	23
Total by car	56	51	58	71	73	72	64	56	65

There is an issue for older people here, with many feeling a burden to others when asking for lifts. Musselwhite and Shergold (2011) suggest that there are a group of older people who have close family and friends who do not feel a burden when asking for lifts and this enables them to easily move away from car driving. There was little guilt shown by this group for getting lifts and they felt justified in having them provided for a variety of reasons, but closeness of family was crucial to reducing any guilt felt when asking for lifts. Reciprocation was a key area discussed in relation to this where lifts could not be offered in exchange then other methods were used like buying the food when out, as suggested in the following two interviews,

“I know she’s busy but I know my daughter well. We get on well. So she won’t find it too much of a burden. I’m careful to only ask when I need, only a necessity but she offers other journeys like to the see.” (Female, aged 76) (from Musselwhite and Shergold, 2011)

“So <my daughter> takes me to the hospital and on the way back we always stop for a meal or for chips and I pay. It’s my treat. And it’s a way of saying thank you and possibly offering a contribution to petrol and that.” (Female, aged 80) (from Musselwhite and Shergold, 2011)

However, some older people felt that accepting lifts created an unnecessary burden on others and they did not want to be dependent on other people for lifts, or were unable to ask other people, as was noted in an interview,

"I don't have family nearby to ask <for lifts> and I don't want to burden friends, so I had to...I had to get the knowledge about the local transport." (Male, aged 80) (from Musselwhite and Shergold, 2011)

One way of overcoming the burden and remaining a form of independence is available through options such as volunteer car-pooling and journey-sharing (Whelan et al., 2006). Freund (2003) proposes an innovative alternative where older people who can no longer drive their own cars "sell" their car to a not-for-profit community-based organisation, the Independent Transportation Network® (ITN). The car provides credit and funds volunteers who provide door-to-door transport, in a donated car, in a close approximation to the flexibility and comfort the individual used to enjoy as a driver (Brown, 2010). ITN schemes are now available in many states of North America. The impact of ITN America on quality of life of its users is reported as:-

- A decrease in transportation difficulty, from 64% prior to ITN membership to 49% six months later and 43% one year later;
- An increase in confidence in arranging personal transportation for daily needs (mean scores for an 8-item scale increased from 55.2 prior to ITN membership to 67.8 six months later and 71.6 one year later);and
- An increase in non-drivers to level of drivers in their confidence in arranging personal transportation (mean scores were 50.1 vs. 60.3 prior to ITN membership, 68.0 vs. 67.9 six months later, and 70.2 vs. 69.4 one year later, respectively).

Six months after the family member's relative joined ITN:

- Worry whether their relative had adequate transportation decreased from 65% to 19%
- Worry about their relative's safety when they travelled from home decreased from 70% to 39%
- Family members who had to miss work because they had to arrange or provide transportation decreased from 64% to 27% (ITN America, 2011)

However, with regards to asking for lifts, whether it is from friends or family, or via carshare schemes or ITN America, it is still more difficult for older people to justify going out for its own sake and hence whether aesthetic needs are met is questionable (Musselwhite and Haddad, 2010b; ITN America, 2011).

Hence it is recommended that the government look into the feasibility, desirability and cost-effectiveness of supporting car journey sharing, especially examining the possibility of developing an Independent Transportation Network in the United Kingdom building on the model from ITN America.

5.5. Mobility scooters

There is a growth in the use of mobility scooters as a way for older people to maintain their mobility beyond driving a car. It is estimated there are around 300,000 mobility-scooter users in the UK (DfT, 2010c). There is very little research on mobility scooters at present, but what there is suggests scooters are very positively received by users as they help maintain freedom and independence following giving-up driving (e.g Barham et al., 2006; DfT, 2010c; Steyn and Chan, 2008). There is some concern however about whether older people should receive training to use

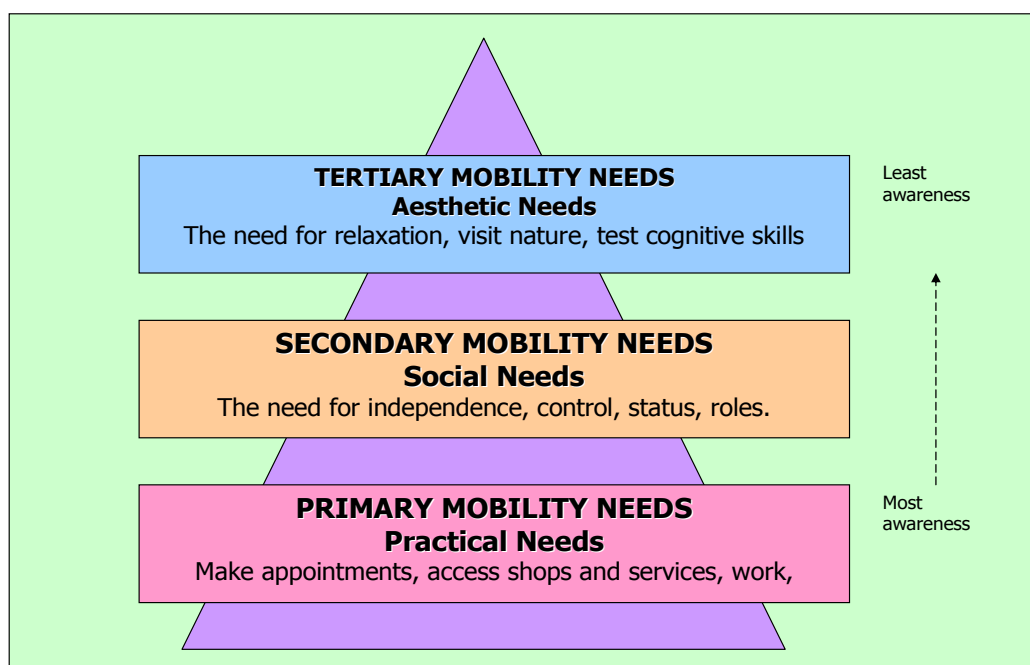
the scooters and whether selling of scooters should receive greater legislation or regulation (DfT, 2010c). Hence, more research is required in the growing and emerging mode of transport.

It is recommended that the role of mobility scooters in providing support beyond the car is examined in more depth, including addressing issues of training and regulation of suppliers.

5.6 Internet and computer technologies

Virtual Mobility refers to the use of Information and Communications Technologies (ICT) as an alternative to physical mobility. Hence, it is about using ICT as the means of "getting to" activities that would previously have required transport. Kenyon et al (2002) suggest that virtual mobility could influence some of the potential exclusionary factors, enabling access to facilities, services and social networks without (necessarily) recourse to physical mobility. Indeed, developments in the World Wide Web have changed the way people access services. Even in recession, shopping volumes in the UK, for example, are continuing with double-digit growth online, whereas traditional shopping is languishing in zero growth or less (BRC, 2008; Deloitte, 2007). The increase in the use of social networks on the Internet show that virtual communities, like real ones, are joined not only because of utilitarian information exchange, but also because they serve the social need of friendship, getting social support and managing an outward identity of the self to others (Ridings and Geffen, 2004). Social networking sites results in people remaining in contact with each other without the need to be geographically close and without the need to travel to interact. Travel can occur through virtual "windows on the world" (for example on Google Streetview or YouTube videos) and destinations experienced through live webcams. It means that "travel" for practical, social for aesthetic reasons can take place in a virtual state without the need for physical travel. Hence, it can be proposed that older people's travel needs can be met utilising a virtual world through the use of the world wide web without the need for physically travelling (very far) (see figure 6).

Figure 6: Meeting older people's travel needs through virtual travel



Research suggests that physically travelling is related to quality of life, positive health and well-being, but could virtual travel, if set-up in an appropriate way, be just as successful or is there something special about physically travelling that the virtual world can never match? There seems to be psychosocial elements missing when older people engage in virtually travelling after giving-up driving. For example casual, unexpected, informal interaction is missing from e-shopping compared to shopping in person (Musselwhite and Haddad, 2010, 2008, 2007). Boden and Molotch (1994, 2004) suggest 'co-present interaction' (e.g. the need to physically interact with other people) is the fundamental mode of human intercourse. In addition, informal co-present interaction is also necessary (Urry, 2002). How far this could be replicated in a virtual world needs to be examined. There has been little in-depth exploration examining this and typically research in the field has focussed on accessibility and usability issues surrounding the World Wide Web and computing for older people. For example, barriers such as a lack of access to the Internet and low awareness of what technology can do coupled with poor design of technology are now well researched (see Bailey and Sheehan, 2009; Selwyn et al., 2003; Tatnell and Lepa, 2003 for reviews). However, although regular internet usage is only at around 35% for the over 65s in the UK (Sinclair, 2011), it is growing amongst older people (though perhaps not as fast as some might have predicted) and it is increasingly likely to have played a greater part in their lives (Roberts, 2009). Yet it is unknown how advances in computing, technology or access to technology could be socially structured or orientated to minimise additional barriers to effective use of such technology and minimise issues caused by becoming more physically immobile.

6. How to promote alternatives to the car

6.1. Formal, personalised travel information

On the formal travel information front, a most basic level of information is missing in terms of highlighting travel options available when giving-up driving. This must be done at a relatively local level and there is an argument for having personalised travel training available on a one-to-one basis at this important key stage of life as suggested by the UK Department for Transport (DfT, 2007). However, in Musselwhite (2010) older people interviewed preferred to have formal information simply presented in conventional leaflet format with details for further information should they need it. Timetables, locations of bus stops and maps were all accessed easily amongst older people (Musselwhite, 2010). However, real time information on public transport was not fully understood or utilised by older people (Musselwhite, 2010).

It is recommended that alternative ways of providing real-time information be examined, perhaps integrating it more naturally and passively within the seating area of buses or train. For example, real-time information could be provided internally at the end of carriages or on the back of seats, including location and details of journeys (departure time, platform, destination) from the next station, for instance.

6.2. Informal information

Informal information that is needed is often overlooked in information provision, perhaps because it more subjective, open to fluctuations and possibly difficult for users to admit to needing to know. Musselwhite (2010) in a qualitative methodology found older people very much needed informal information such as the availability of seats, attitude of the driver and ease of carrying luggage. This could be done through discussions with other people who had previously had similar issues and were now more expert. On the whole, they preferred this to occur in a group context, although there was some support for a buddy system, whereby someone expert would travel with someone learning the norms, as previously suggested by Brown (2010).

6.3. Social Travel Group: Emotional and practical support

Emotional and practical support are also required on top of formal and informal information. Musselwhite and Haddad (2010b) identified independence, status, identity, normalness and belonging as psychosocial or affective needs that the car fulfils. These are largely absent when giving-up driving and some participants noted the need for emotional support in dealing with this loss and reappraising such needs in light of a change in transport use. Musselwhite (2010) suggests that reflective group work would be beneficial where older people contemplating giving-up driving meet alongside others who have given-up driving. The group could provide both emotional and practical support. Practical support could include the ability to share lifts in taxis and travel together on buses and to get together for discretionary travel for days out as a group (Musselwhite, 2010).

Membership could be continuous rather than a programme or cycle of support as is found in an Australian support group (see Liddle et al., 2008, 2006, 2004). It would be a group that could be held together through virtual means, with a dedicated website with links to timetables, maps and real-time information on travel, complete with a discussion forum, with a potential to offer lifts or to

offer accompaniment to forthcoming journeys by bus, cycling or as a pedestrian. Musselwhite (2010) concludes that:

“Meetings could physically take place perhaps on a weekly basis at a convenient place, with thematic presentation and support, with occasional guest lectures or talks from experts, for example on driving skills or from the local bus company. The group could begin with co-ordination and facilitation from a local charity and then grow to sustain a life of its own with members taking on the leadership duties. The group could also lobby for change in local transport and travel.” (pg. 27)

7. Conclusions

Older people need to be mobile for a variety of reasons. These include accessing daily services and shops and remaining connected to friends, family and other social events. Yet travel goes beyond that, it is a way of maintaining independence, of conveying status and image and an access to life beyond the home, a way of engaging with nature and seeing the world. The car has become the dominant vessel of use for people from all walks of life, allowing these needs to be met with perceived minimal hassle and financial commitment. It is increasingly seen as a panacea amongst an ageing population whose physiology and cognition might mean using alternative means are physically, practically and emotionally difficult. Indeed older people who have to give-up the car have become so used to using it to access such needs that they are likely to face depression and a poorer quality of life as a result. However, this is not the case amongst all older people, some find giving-up the car can be coped with and some even find giving-up the car has benefits and results in a better quality of life. The challenge to society is how we can help older people maintain a good quality of life while reducing car use or indeed eliminating the need to drive altogether. This think-piece has attempted to demonstrate how this might happen.

People who do well when giving-up the car are those who have practical and emotional support around them, not just to give lifts but to understand and sympathise with the perceived loss of independent mobility. Such support often comes from friends and family, but this should be extended further. It is suggested that the sharing of giving-up driving should occur with family and friends needing to recognise their role in helping older people give-up driving. Perhaps campaigns could address this across the country. Furthermore, society as a whole needs to recognise it has a role and everybody needs to be take responsibility in helping older people when they have to give-up driving.

The issue of reciprocation is crucial in friends and family in terms of providing practical support. This is very neatly overcome in the excellent ITN-America scheme where, following a decision to stop driving, a car is traded in against credit for lifts (Freund, 2003). It is suggested that this scheme be examined closely for possible introduction in the UK. Though limitations of the scheme are apparent, for example having to give-up the car in totality rather than gradually and that it does not contribute to reducing journeys by car (and associated negative externalities to the environment), the positive benefits to individuals and families possibly in conjunction with other measures means it is very worthwhile exploring.

Successful giving-up driving is also characterised by those who have spent a long time over the process, gradually reducing driving and trialling different modes. This is especially the case for those who do not have close family or do not wish to be burden to family and friends. As a result, there is a need to raise awareness of the potential need to give-up driving at an earlier stage of later-life, for example perhaps to coincide with retirement when travel behaviour is changing and long-standing driving habits broken anyway. Perhaps campaigns could address the need to contemplate giving-up driving around retirement or drawing of pension and leaflets about driving cessation could accompany information on pension drawing (Brown, 2010).

But all this could happen earlier, if individuals reduced car use from much earlier in life and were multi-modal. Hence, it is recommended that any government should continue efforts aimed at reducing our dependence on use of cars, whether that is through better planning laws and

regulations requiring services, work and residential areas to be placed in close proximity, or through continuation of schemes aimed at reducing car use and promoting other modes of transport, including investigating road pricing, parking charges, green travel plans, personalised travel planning and improving public transport and infrastructure for active travel.

The conclusion from this thinkpiece agrees with that of Berry (2011) that self-regulation with regards to driving is crucial and should be encouraged. However, changes in social practices of older people need to be taken into account and the raising of the retirement age and changes in working practices will mean future generations of this age group are more likely to work than ever before. Hence, future generations are more likely than ever before to feel the need to drive, reducing the ability to self-regulate their driving practice. A growing role for healthcare professionals is advocated but more to highlight the possibility of giving-up driving to older people rather than as a gatekeeper for driving. The locus of control during giving-up driving needs to stay with the older person during this process. Hence, the need for early contemplation and trial of alternative transport. The role of family, friends and health professionals must remain respectful to this. Hence, the role must be to encourage the individual to take action themselves, not to tell them to stop altogether. It has to be realised that such a discussion may create tension, anxiety and upset. Hence, strategies should be encouraged that families, friends and healthcare professionals could adopt to help the process.

The virtues of a life closer to home with less travel should be promoted amongst older people. It is hard to change the values of a Western society that champions hypermobility so highly and prizes it above non-movement and its associations with old age, depression and death. People are moving to promote their vitality, their youthfulness and to show to others they're not dead yet! But, those that re-discover a life closer to home tend to be more satisfied than those who are still looking further afield. Activities that are close to home need to be championed, at a local community level, local shops, bars, restaurants and social clubs need to cater for the older person. At an even closer level the virtues of gardening enabling people to get out-of-doors and be physically active without moving very far need to be promoted. For those with no garden (or indeed less of an interest in the garden), a re-focus on home activities and interests can happen. This may involve using virtual travel to remain connected and fulfil certain services (e.g. shopping, health). More research is needed into how the role of computers in enabling older people to live a happy life without recourse to physical mobility. For example, how might computing be set-up to allow the benefits of travel to be mimicked as far as is possible? Is there a need for a gathering of people to be present while using technology to create a social element to technology (for example group based e-shopping) and do they physically need to be there or could this occur as a virtual group of people? Is there a need to virtually travel to the supermarket through a cyberspace "landscape", rather than actually arriving immediately at the required website? And what would such "landscape" consist of, for example.

Alternative modes of transport have to be fit for purpose. Public transport needs to be fully accessible to older people, not just in terms of older people's physiological needs but also their practical, social and aesthetic needs for movement. Positively, the free bus pass in the UK for over 65s has allowed greater use of the bus for aesthetic purposes. However, given many of the service reductions announced recently in the UK it is increasingly the case, for those in rural areas in particular, to have a free bus pass but not actually have any bus services on which to use the pass. It is recommended that the free bus for over 65s be continued as far as is economically

possible, with reviews where appropriate, perhaps a nominal charge or voluntary contribution could be introduced to help keep services going. Buses and trains need to be well maintained and easily accessible and the use and provision of information needs to be carefully managed and presented. Bus driver and railway employee attitude is also essential to successful use for older people. On the buses in particular, it is recommended that all bus companies train their drivers in understanding (older) customer need, especially with regard to issues such as driving only after older people have sat down.

Buddy systems where experienced public transport users accompany less experienced travellers should be established and co-ordinated where appropriate. This would help in particular with informal travel information so missing from those who have not used public transport for a very long time.

The community bus service should be expanded to a wider group of older people, but this must happen without recourse to reducing the importance of the social function of the service. Expansion of this vital lifeline needs to take into account the vital role of the bus driver in maintaining social contact with passengers and cost of this must be factored in to any financial management. In addition, the service should be used for discretionary travel where possible to help meet aesthetic needs of older people. Older people must be involved in decision making around community transport and best practice should involve user-led services where possible.

Changes to the infrastructure need to be carefully planned and involve recommendations as set out in this report. However, it is noted that more research (with older people themselves highly involved) is needed to balance the needs of older people as different types of road user in differing contexts. Tensions between different users must be examined. For example, more benches may result in younger people using them to “hang-out” by, reducing the use by, or creating a barrier to walking amongst older people. Balancing use and needs of all users of all ages must be examined and it must not be thought that providing an environment for older people, is one that would be acceptable for all users. Likewise, creating an environment that is accessible for one type of user will not make it accessible for others; for example, creating an environment conducive to older drivers may exclude older pedestrians and cyclists, as is the case, it could be argued, for “self-explaining” roads.

Much more research is needed into fitness and ability to be an active traveller amongst older people. Older people spend more time than younger people at walking, but are very unlikely to be cyclists. How far this is a perceptual issue about fitness compared to actual fitness levels needs to be investigated so the correct measures be put in place to encourage cycling amongst older people.

Given the anticipated growth in older people and the growth in driving amongst this population, it is suggested that the driving behaviour of older people must continue to be studied. In particular the role of training and education in both helping older people assess and develop their driving skills should be examined. It is suggested that this would be best done through a lifelong process, so that people were continually learning and educating themselves about driving throughout the life-course. In addition, it is suggested that the current training sessions aimed at older drivers be continued but that a formal evaluation of them take place, along with sharing of best practice to create more parity across provision.

Finally, many of these elements could be placed together under schemes such as the social travel group advocated by Musselwhite (2010). In all cases more involvement of older people in transport related decision making is needed, both locally and nationally in order for older people to successfully manage giving-up driving.

There are indeed wider implications of this, older people may actually be just be the first group in society who are responding to similar issues that wider society will need to address in terms of reduced travel in light of the challenges of peak oil, rising fuel costs and climate change. Hence, there is a need to assess what works well for older people and how far this might be further applied to other age groups and generations.

8. Key Recommendations

1. Recognising the importance of travel beyond the need to get from A to B

- a) Need to empower older people to ask friends and relatives for days out to see life and view the world.
- b) The free bus pass for over 65s (off peak) should be continued as far as is economically possible as it allows older people to travel for its own sake and gives them a sense of a “potential for travel” (Metz, 2000) which is missed when driving is ceased. It also allows pass holders to justify trips that they could have afforded, but wouldn't have made on the basis of not being able to justify the cost (Andrews et al., 2011). Alternative methods for keeping the bus pass free or very cheap are discussed in section 5.2.
- c) Need for transport planners and transport policy to view discretionary travel as important and alter economic modelling accordingly. For example, travel time needs to be viewed in different terms other than simply viewed as a cost. The benefits not currently measured (enjoyment etc.) are actually arguably the most important to older people's quality of life).
- d) Maintain independence beyond the car, through investigating the potential of a more formal lift-share or Independent Transportation Network (ITN) (Freund, 2003) to be introduced in the UK.
- e) Provision of public transport should attempt to meet older people's psychological and affective needs, through providing better quality transport services in terms of enjoyment (provision of newspapers, television, guides to the journey and local area, for example) and comfort (drivers not driving off until passengers sat-down on buses, for example).
- f) Provision of pedestrian and cycling infrastructure should attempt to meet older people's psychological and affective needs, through provision of better quality public spaces. There is a requirement to take into account varies needs of older people and for different users, remembering designing for older people may not mean better design for all. Understand the systems approach for designing in that designing for one outcome may lead to other unforeseen outcomes for other users.

2. Recognising the importance of considering early-on in life and giving-up driving gradually

- a) The role of family and friends in this process is crucial, both in terms of practical and emotional support and needs to be encouraged, perhaps through media campaigns, TV programme story-lines and documentaries. The play produced in Canada is one way of raising this into the consciousness of families and perhaps could be trialled in the UK.
- b) To encourage older people to be more multi-modal and try out alternative means of transport from a younger age. In light of this being multi-modal throughout life is useful in helping with life beyond the car. The government should continue to emphasise the importance and promoting of alternative modes to the car for all members of society (and should not single out older people).

3. Keeping the locus of control over the decision to stop driving with the person themselves

a) Encouraging self-assessment of driving, through taking part in good quality fully evaluated driver training and awareness courses, but also through simply being more reflective about the driving process and asking friends and relatives for their views.

4. Helping older people learn the norms associated with travelling in other means than the car

a) Encourage the use of buddying for older people using public transport or walking and cycling for the first time in a long time to with experienced older people who know the norms, in order for older people to learn from experts.

b) Make using alternative modes to the car as simple and intuitive as possible (e.g. through ticketing, clear labelling etc.).

c) Creating a more sympathetic attitude of public transport staff to help older people with queries and needs. Hence, there is a need to provide training and support to staff on working with older people.

d) Older people need to be involved in the design of transport systems and provision and have an input into service delivery. For example, they could set-up and run community transport, be involved in street design. One group in rural Wales for example keep a set of toilets open themselves, maintain them, unlocking them in the morning, cleaning them, promoting them and locking them again at night (see http://www.llansannan.org/item/menter_bro_aled_bro_aled_enterprise.html).

e) Older people need to be involved in consultation and design stages of infrastructure changes, for example shared space, design of open spaces, use of benches and toilets etc.

5. More research is needed into key areas of older people and transport

a) Older driver training courses need to undergo full and rigorous evaluation and sharing of best practice.

b) There needs to be further research into the significance and importance of discretionary travel, including examining links to quality of life indicators may help inform policy and practice with regards to seeing this as an advantage.

c) Research into how the socio-technical environment is needed to show how it can be changed to help older people get the most from virtual travel.

d) Investigate how the free bus pass might be continued for the over 65s, looking for innovative ways to fund it.

e) Further research into the role of mobility scooters and how far they meet the travel needs of older people.

References

- Alves, S., Aspinall, P., Ward Thompson, C., Sugiyama, T., Brice, R. and Vickers, A. 2008. Preferences of Older People for Environmental Attributes of Local Parks: The Use of Choice-Based Conjoint Analysis. *Facilities* 26 (11/ 12), 433-453.
- Andrews, G. (2011). Personal communication
- Andrews, G., Parkhurst, G., Shaw, J. and Susilo, Y. (2011). 'The grey escape': How and why are older people using their free bus passes? *Proc. 43rd Universities Transport Studies Group Conference*, Open University, Milton Keynes, January.
- Audit Scotland (2011) *Transport for health and social care*. Available at <http://www.audit-scotland.gov.uk/media/article.php?id=172> Last accessed 7th November 2011
- Bailey C. and Sheehan C (2009) Technology, older persons' perspectives and the anthropological ethnographic lens ALTER, *European Journal of Disability Research* 3 96–109.
- Baldock, M., Mathias J.L., McLeanb, A.J. and Berndt A. (2006). Self-regulation of driving and its relationship to driving ability among older adults, *Accident Analysis and Prevention*, 38: 1038–1045.
- Barham,P., Fereday, D. and Oxley, P. (2006) *Review of Class 2 and Class 3 Powered Wheelchairs and Powered Scooters* Final Report, Department for Transport
- Berry, C. (2011). *Can Older Drivers Be Nudged? How the Public and Private Sectors Can Influence Older Drivers' Self-Regulation*. England: RAC Foundation and ILCUK.
- Boden, D. and Molotch, H. (2004). Cyberspace meets the compulsion of proximity. In: S. Graham (ed.) *The cybercities reader*. London, Routledge: 101-105.
- Boden, D. and Molotch, H. (1994). 'The compulsion to proximity', in R. Friedland and D. Boden (eds) *Nowhere. Space, time and modernity*. Berkeley: University of California Press
- Bowling, A., Gabriel, Z., Banister, D. and Sutton, S. (2002) Adding Quality to Quantity: Older People's views on their quality of life and its enhancement ESRC Growing Older Programme, Go Findings 4, 2002.
- Box, E., Mitchell., K. And Gandolfi, K (2010). *Maintaining, Safe Mobility for the Ageing*. London: RAC Foundation Report. Available at http://www.racfoundation.org/assets/rac_foundation/content/downloadables/maintaining%20safe%20mobility%20-%20rac%20foundation%20-%2020140410%20-%20report.pdf (last accessed 15th July 2011)
- BRC (2008) *BRC-KPMG Retail Sales Monitor November 2008*, British Retail Consortium, London.
- Broome, K., McKenna, K., Fleming, J., & Worrall, L. (2009). "Bus use & older people: a literature review applying the person-environment-occupation model in macropractice", *Scandinavian Journal of Occupational Therapy*, 16, 1, 3-12.
- Brown, R. (2010).. Maintaining community mobility in Portsmouth after retirement from driving: How do people find out about and gain confidence in using alternative forms of transport? MSc Thesis in Accessibility and Inclusive Design, University of Salford.

Community Transport Association (CTA). 2011. Written submission from the Community Transport Association UK to the Transport Committee in connection with the inquiry into the funding of bus services in England (outside of London) in the light of the outcome of the Comprehensive Spending Review. Available at <http://www.ctauk.org/UserFiles/Documents/Influencing-Government/TransportSelectCommitteeSpendingReview01111.pdf> (last accessed 7th November 2011)

Coughlin, J., Mohyde, M., D'Ambrosio, L.A and Gilbert, J. (2004). *Who Drives Older Driver Decisions?* AgeLab/The Hartford. Available at http://stuff.mit.edu/afs/athena/dept/agelab/news_events/pdfs/AgeLab_driver_decision.pdf (last accessed 14th April 2010)

Davey A., Femia, E.E., Zarit, S.H., Shea, D.G., Sundström, G., Berg, S. et al. (2005) Life on the edge: patterns of formal and informal help to older adults in the United States and Sweden. *The journals of gerontology Series B Psychological sciences and social sciences*, 60(5), 281-288

Deloitte (2007), *All things bright and digital: shopping online and demand for high-tech items sees huge lift*, Deloitte, London.

DfT (Department for Transport) (2001). *Older Drivers: a literature review*. London: Department for Transport. Available at:

<http://webarchive.nationalarchives.gov.uk/+http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/the-me3/olderdriversaliteraturerevie4770> (last accessed online at 10th September 2010).

DfT (Department for Transport) (2002). *National Travel Survey 2002*. London: Department for Transport

DfT (Department for Transport) (2004a) *Making Smarter Choices Work*. London: Department for Transport

DfT (Department for Transport) (2004b) *Smarter Choices – Changing the Way We Travel* London: Department for Transport

DfT (Department for Transport) (2006). *National Travel Survey 2006*. London: Department for Transport

DfT (Department for Transport) (2007) *Workplace travel planning - 'Making Personal Travel Planning Work'* London: Department for Transport

DfT (Department for Transport) (2009). *Road Casualties Great Britain 2008*. London: Department for Transport

DfT (Department for Transport) (2010a). *National Travel Survey 2009*. London: Department for Transport

DfT (Department for Transport) (2010b) *Transport Statistics Great Britain 2010 Edition*. London: Department for Transport.

DfT (Department for Transport) (2010c) *Public attitudes towards mobility scooters*, London: Department for Transport

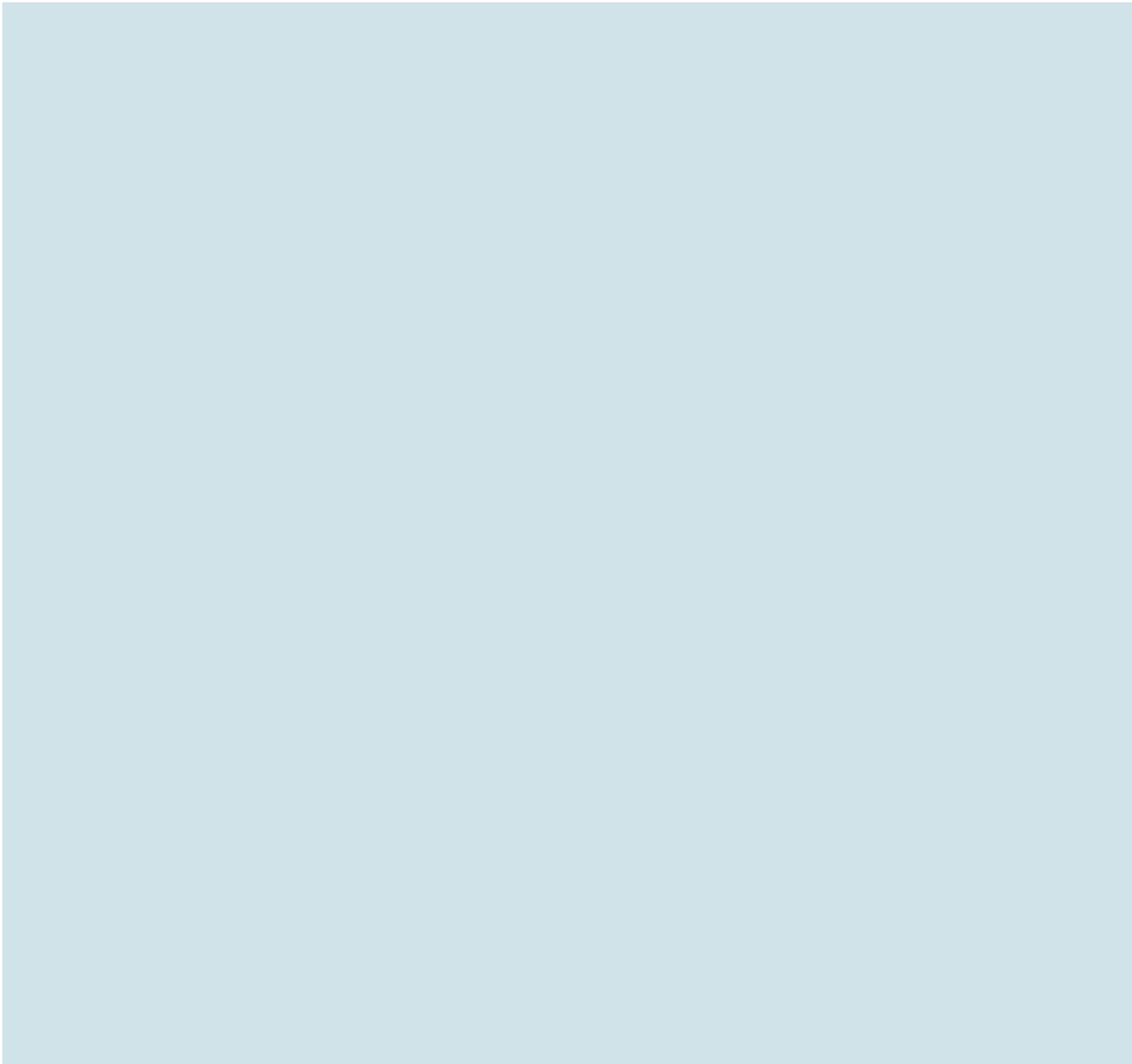
<http://www.dft.gov.uk/adobepdf/162469/221412/221513/mobilityscooters/attitudestowardsmobilityscooters1.pdf> Downloaded and accessed 19-10-10.

- Eisenhandler, S. (1990). The asphalt identikit : old age and the driver's license. *International Journal of Aging and Human Development*, 30(1), 1–14.
- 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.
- Engwicht, D. (1999). *Street reclaiming : creating livable streets and vibrant communities*. Pluto books.
- Engwicht, D. (2006) *Mental Speed Bumps: The Smarter Way to Tame the Traffic*. Envirobook publishing
- Fonda, S. J., Wallace, R. B., & Herzog, A. R. (2001). Changes in driving patterns and worsening depressive symptoms among older adults. *Journal of Gerontology: Social Sciences*, 56B(6), S343-S351
- Freund, K. (2003) „Independent Transportation Network: the next best thing to driving“. *Generations: Journal of the American Society on Ageing* 27(2): 70-71.
- Gilhooly, M.L.M., Hamilton, K., O'Neill, M., Gow, J., Webster, N., Pike, F. and Bainbridge, C. (2002) *Transport and ageing: Extending quality of life via public and private transport*. ESCR Report L48025025, Brunel University Research Archive. Available at: <http://v-scheiner.brunel.ac.uk/bitstream/2438/1312/1/PDF%20ESRC%20Transport%20Final%20Report.pdf> Accessed 15th July 2011.
- Guiver, J. W. (2007) Modal talk: discourse analysis of how people talk about bus and car travel, *Transportation. Research Part. A* 41:3, 233–248
- Hamilton-Baillie, B. and Jones, P. (2005). "Improving traffic behaviour and safety through urban design", *Proceedings of the Institution of Civil Engineers - Civil Engineering*, 158, 39-47.
- Hawley, C. (2010). *The Attitudes of Health Professionals to Giving Advice on Fitness to Drive*, Road Safety Research Report 91, London: Department for Transport.
- Holland, C. (2001). *Older Drivers: a Review*, London: Department for Transport
- IDGO (2011) Inclusive Design for Going Outdoors Website accessed via <http://www.idgo.ac.uk/> Last accessed 15th July 2011
- ITN America (2011) Independent Transportation Network, America website accessed via <http://itnamerica.org/content/Research.php> last accessed 15th July 2011
- Kaparias, I. Bell, M.G.H. Miri, A. Cheng, S. Greensted, J. Taylor, C (2010) Modelling the Willingness of Pedestrians to Share Space with Vehicles. *UTSG*. Imperial College London. pp1-12.
- Kellert, R., and Wilson, E.O. (eds) 1993. *The Biophilia hypothesis*. Island Press, Washington DC.
- Kenyon, S., Lyons, G. and Rafferty, J. (2002). Transport and social exclusion: investigating the possibility of promoting inclusion through virtual mobility. *Journal of Transport Geography*. 10. 207-219.
- Korner-Bitensky, N., Kua, A., Zweck, C.V., & Benthem K.V (2009). Older driver retraining: An updated systematic review of evidence of effectiveness. *Journal of Safety Research*, 40, 105-111.

- Langford J., Methorst, R. and Hakamies-Blomqvist, L. (2006) Older drivers do not have a high crash risk—A replication of low mileage bias, *Accident Analysis & Prevention*, 38 (3) , 574-578.
- Liddle, J., Carlson, G. & McKenna, K. (2004). Using a matrix in life transition research. *Qualitative Health Research*, 14, 1396–1417.
- Liddle, J., McKenna, K. And Bartlett, H. (2006). Improving outcomes for older retired drivers: The UQDRIVE program. *Australian Occupational Therapy Journal* (2006) 53, 1–4
- Liddle, J., Turpin, M., Carlson, G., and McKenna, K. (2008) „The needs and experiences related to driving cessation for older people“. *British Journal of Occupational Therapy*, 71(9): 379-388.
- Ling, D. J. & Mannion, R. (1995), Enhanced Mobility and Quality of Life of Older People: Assessment of Economic and Social Benefits of Dial-a- Ride Services, in *Proceedings of the Seventh International Conference on Transport and Mobility for Older and Disabled People*, Vol. 1, DETR, United Kingdom.
- Marottoli, R.A., Mendes de Leon, C.F., Glass, T.A., Williams, C.S, Cooney, L.M., and Berkman, L.F. (2000) Consequences of driving cessation: decreased out-of-home activity levels“. *Journals of Gerontology: Series B, Psychological Sciences and Social Sciences*, Vol 55B (6), S334-S340.
- Metz, D. (2000). Mobility of older people and their quality of life. *Transport Policy*, 7, 149–52.
- Musselwhite, C.B.A. (2011). Boy Racers, Dunkirk Spirit and the Pompey Bounce: The use of movement and mobility in impression management and identity formation. Paper presented at the British Sociological Association Conference, London School of Economics, London, UK. April.
- Musselwhite, C.B.A. (2010). The role of education and training in helping older people to travel after the cessation of driving. *International Journal of Education and Ageing*, 1(2), 197-212
- Musselwhite, C.B.A., Avineri, E., Susilo, Y.O., Fulcher, E., Bhattachary, D., Hunter, A. and Stockley, R. (2010). *Understanding the public attitudes to road user safety: Final report. Road safety research report No.111*. DfT: London
- Musselwhite, C. B. A. and Haddad, H. (2007). *Prolonging the Safe Driving of Older People through Technology. Final report*, October 2007. Centre for Transport & Society, University of the West of England, Bristol
- Musselwhite, C.B.A. and Haddad, H. (2008). A Grounded Theory exploration into the driving and travel needs of older people. *Proc. 40th Universities Transport Study Group Conference*, University of Southampton, Portsmouth, January
- Musselwhite, C.B.A. and Haddad, H. (2010a). Exploring older drivers' perception of driving. *European Journal of Ageing*, 7(3), 181-188.
- Musselwhite, C. and Haddad, H. (2010b). Mobility, accessibility and quality of later life. *Quality in Ageing and Older Adults*, 11(1), 25-37.
- Musselwhite, C.B.A. and Shergold, I. (2011). Contemplation and planning in successful driving cessation. Paper presented at the *British Gerontology Society Conference*, Plymouth, July.
- Parker, J, Harris, L., Chatterjee, K., Armitage, R., Cleary, J. and Goodwin, P., (2007). *Making Personal Travel Planning Work: Research Report*. Integrated Transport Planning Ltd. Report to Department for Transport.

- Parkin, J and Smithies, N (2010) Accounting for the Needs of Blind and Visually Impaired People in Public Realm Design. *UTSG, January 2010 Plymouth*. pp.1-12.
- Pauluth-Penner, T., (2010). "Bringing data to life": Encountering dilemmas within an applied theatre multidisciplinary research project. *Canadian Journal of Practice-based Research in Theatre*, 2, 1. Found online via <http://cjprt.uwinnipeg.ca/index.php/cjprt/issue/current> (last accessed 1st December 2010)
- Persson, D. (1993) The elderly driver: deciding when to stop. *Gerontologist*, 33, 88-91
- Rabbitt, P., Carmichael, A., Jones, S., and Holland, C. (1996). *When and why older drivers give up driving*. AA Foundation for Road Safety Research
- Rabbitt, P. Carmichael, A., Shilling, V., and Sutcliffe, P.. (2002). *Age, Health and Driving*, Age and Cognitive Performance Research Centre/AA Foundation.
- Rabbitt, P. & Parker D. (2002). *The Ageing Driver*. A Programme of Research, London: Department for Transport.
- Reid, S. (2011) DfT Shared Space Research – Latest. *The 2nd Annual Shared Space Conference: From What? To How?* London, 25 January 2011.
- Roberts, S. (2009). *The Fictions, Facts and Future of Older People and Technology* International Longevity Centre. Available online at http://www.ilcuk.org.uk/files/pdf_pdf_118.pdf (accessed 22nd July '10)
- Rothe, J. (1994). *Beyond Traffic Safety*. Transaction, New Brunswick, New Jersey.
- 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).
- Selwyn, N., Gorard, S., Furlong, J. and Madden, L., 2003. Older adults' use of information and communications technology in everyday life. *Ageing and Society*. 23, 561-582.
- Shergold, I., Parkhurst, G. and Musselwhite, C. (2011). Rural car dependence: an emerging barrier to community activity for older people? *Proc. 43rd Universities Transport Studies Group Conference*, Open University, Milton Keynes, January.
- Sinclair, D. (2011). Can the web transform social care? Paper presented at the *Gerontology Society Conference*, Plymouth, July.
- Siren, A. & Hakamies-Blomqvist, L. (2005). Sense and sensibility : a narrative study of older women's car driving. *Transportation Research, Part F: Traffic Psychology and Behaviour*, 8, 213–28
- Steg, L. (2005). Car use: lust and must. Instrumental, symbolic and affective motives for car use. *Transportation Research Part A*, 39,147–162.
- Steyn, P. V. and Chan, A. S. (2008) *Mobility Scooter Research Project: Final report*, Centre for Education and Research on Aging, University College of the Fraser Valley, Canada.
- Sugiyama, T., Ward Thompson, C. and Alves, S. 2008. Associations between neighborhood open space attributes and quality of life for older people in Britain. *Environment and Behavior*
- Tomassini, C. (2004). Demographic Data for an Ageing Population. In ONS (2004). *Population Trends. Winter 2004*, London: Office for National Statistics, 23-30.

- Tatnall, A. & Lepa, J. 2003, 'The Internet, E-Commerce, and Older People: An Actor Network Approach to Researching Reasons for Adoption and Use', *Logistics Information Management*, vol. 16, no. 1, pp. 56-63.
- Tomassini, C. (2004). Demographic Data for an Ageing Population. In ONS (2004). *Population Trends. Winter 2004*, London: Office for National Statistics, 23-30.
- Tuokko, H. McGee, P., Gabriel, G. and Rhodes, R.E. (2007). Perception, attitudes and beliefs, and openness to change: implications for older driver education, *Accident Analysis and Prevention*, 39(4): 812–817.
- Ulrich, R. S. (1979). Visual landscapes and psychological well-being. *Landscape Research*, 4, 17-23.
- Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224, 420-421.
- Ulrich, R. S. (1986). Human responses to vegetation and landscapes. *Landscape and Urban Planning*, 13, 29-44.
- Urry, J. (2002). Mobility and proximity. *Sociology* vol. 36 no. 2 255-274
- Webber, A.L. (2010). Life on the Buses: Investigating Community Transport as a substitute to the car for the elderly: behaviours, perceptions and meanings. Masters thesis, University of the West of England, Bristol, UK.
- Whelan, M., Langford, J., Oxley, J., Koppel, S. and Charlton, J. (2006) *The elderly and mobility: A review of the literature*. Monash University Accident Research Centre Report No 255, Victoria, Australia.
- WRVS (2011) *Report recognises that community transport is vital to health and well-being* <http://www.wrvs.org.uk/our-impact/blog/report-recognises-that-community-transport-is-vital-to-health-and-well-being> Last accessed 7th September 2011



11 Tufton Street
London
SW1P 3QB
Tel : +44 (0) 20 7340 0440
www.ilcuk.org.uk

