Future mobility in an ageing society – where are we heading?

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Abstract
The demographic profile of UK society is changing as people live longer. At present, one in six people in the UK is aged 65 or over and this is projected to be one in four by 2050 with the over 85s forming the fastest growing group. Maintaining the wellbeing and quality of life of an ageing society is set to be extremely challenging. To what extent can the state afford to meet a potentially burgeoning demand for social care? What expectations will be placed upon informal carers to enable the system to cope? In what ways and to what extent might assistive technologies have a part to play in supporting people both in terms of active ageing and in relation to coping with failing health? Beyond these questions is a one which is more explicitly pertinent to transport policy: how and where will older people live and how will this affect patterns of mobility and levels of travel demand? This paper reports on a scenario planning exercise which has examined four different futures for living in later life, defined by considering two principal uncertainties: the extent to which older people in society engage with new healthcare technologies; and the extent to which the state provides care for people living in later life. The scenarios, explored with transport, ageing and assistive technology experts, serve to highlight how social practices may be shaped in very different ways both for older people and for those with whom they interact. The paper goes on to examine the implications for future mobility – such as the role of the home as a trip attractor as well as a trip generator – as well as to explore the extent to which transport policymakers are equipped to address the uncertainties for the transport system of an ageing society.

1 Introduction

In common with many other developed nations, the UK has an ageing population (UN, 2009). People are living longer and older people make up a growing proportion of the population. A particular area of growth is amongst the older old - those in their 70s, 80s. Current projections indicate that the UK population will increase from around 62 million in 2010 to over 71 million in 2030. The proportion of those aged 60 and over will increase from 30% to 39% and those aged 75 and above from 16% to 23% (ONS, 2011). This evolving population structure has implications for travel demand, and transport policy. Where and how older people will be living in the future is likely to have considerable influence on the nature and extent of their own travel as well as the travel of others associated with attending to their physical, mental and social wellbeing. At the same time, the cost implications of supporting people living in later life are of mounting concern. One consequence of this is that there has been growing interest in the role that 'assistive technologies' could play. The term 'Assistive Technology' has been defined as '*any product or service designed to enable independence for disabled and older people*' (http://www.fastuk.org/about/definitionofat.php). Such technologies support and prolong active ageing as well as helping to accommodate and address disability and illness. One can only speculate about the different manifestations of assistive technologies in the future, given the ever broadening array seen today, but one recent exercise that attempted to do just that suggested three likely areas of development over the coming few decades (Plum, 2012). These focussed on: (i) the move from 'alert' based systems to constant monitoring of health (physical and mental); (ii) technologies to extend 'virtual' engagement in networks, community and society; and (iii) tools which would facilitate older people continuing to be engaged in employment. There is also much interest in the area of home automation, and the use of robots (albeit against uncertain timescales

for substantial realisation). In the coming decades it seems likely that sensor technology and interconnectivity between people, devices and systems will be increasingly pervasive. Assistive technologies will be able to monitor where an individual is, what their state of health and mood is, provide alerts and guidance, remotely administer medication, support active and motorised movement within the home and travel outside the home, provide increasingly realistic remote/virtual interactions with others to enhance social contact, enable remote access to goods, services and employment etc. The emergence of the smartphone and associated 'apps' which feed from an increasingly rich source of (user generated) data are symptomatic of the rapidly evolving capabilities and diversity of technologies – whether or not they are all meeting fundamental needs and heavily used. As the population continues to age, the availability and take-up of a range of aids to living are likely to play an important part in shaping where and how older people live and the associated patterns of support provided to them by other people.

This paper considers living in later life and the role of assistive technologies as a case study of what can be referred to as *non-transport technologies* (Hubers and Lyons, 2013) and how, through influence on social practice, they may indirectly affect the nature and extent of travel. The context for this is what might be considered a growing concern that attempts to explicitly account for non-transport technological developments in projections of future travel demand and formulation of transport policy are conspicuous by their absence (Hubers and Lyons, 2011). In terms of research and development, a considerable amount of activity continues to take place within the transport field concerning *transport technologies*, generally intended to find ways to improve transport system management and performance and the provision of guidance and support to travellers. This might be seen to reflect a focus on 'transport solutions for transport problems'. Beyond such technologies are also what can be referred to as *substitution technologies* or technology-enabled practices – those which have the capacity to replace the need for travel or to enhance economic and social activity without the need for (more) travel. Teleworking and e-shopping have been prime examples (Lyons et al, 2008). Non-transport technologies concern technologies that were not necessarily intended to influence travel but nevertheless, indirectly, can do and perhaps to a significant extent. The full array of technologies across these categories is considerable and yet receiving little apparent attention in travel demand projections or policy formulation and transport investment.

The aim of the paper is to report on a scenario planning exercise that was undertaken to explore possible futures for living in later life. Having examined where and how older people might in future be living, the paper goes on to consider some of the key transport and travel implications. It then concludes by exploring the extent to which transport policymakers are equipped to address the uncertainties for the transport system of an ageing society.

Further to the initial development of four scenarios of the future, a scenario planning workshop was held in London at the Engineering Employers' Federation on 26 March 2012, facilitated by the Futures Company[1]. The event was attended by seventeen invited experts (in ageing, assistive technologies and transport), mostly from academia (along with a small number of practitioners). The workshop explored the scenarios in greater detail. On 16 November 2012 a further workshop was hosted by the Department for Transport and attended by around 30 transport academics and civil servants as well as ageing and technology experts to reflect on the scenarios and critically consider issues for and approaches to transport policy response to such future developments.

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[1] http://www.thefuturescompany.com
[2] http://www.lancs.ac.uk/fass/centres/cemore/
[3] http://www1.uwe.ac.uk/et/research/cts

2 Trends

Scenario planning is about embracing uncertainty about future pathways of development. However, reflecting on trends of development to date is helpful in informing the definition and shaping of future scenarios. In the UK the Government has, on a regular basis, published two key reports reflecting data from a number of surveys about UK society and its travel – Social Trends and Transport Trends. We now briefly consider some of the developments as set out recent versions of these reports (ONS, 2010; DfT, 2009) and implications. The life expectancy gap between men and women is narrowing which could suggest that in future there may be more older couples able to provide care support to each other as opposed to widows with greater dependency on others. However, this may well be countered by the trend in high divorce rates and in turn growth in single person households. With the gap narrowing between men and women for driving licence holding, there is greater prospect that one or both older people where they are in a couple will be able to drive. Retirement age is set to align between men and women and to gradually increase and for some older people extend significantly with implications for the levels and makeup of work-related travel. Particularly seen as a trend in the 1970s and 1980s, there has been a convergence in the employment rates for men and women though with variation between part-time and full-time employment; part-time employment may be a significant feature of active ageing. The makeup of the employment market has also changed substantially with a decline in manufacturing and increase in the service economy and knowledge working – we assume this may positively support people extending their working lives. While life expectancy is increasing there is also a growth in the proportion of the population classified as obese (in tandem with a decline in the number of walking trips on average undertaken) which suggests potential health and mobility problems later in life for parts of our ageing population. A significant and increasingly prevalent health problem in later life is dementia. An Alzheimer's Society (2010) report suggests that "[o]ne in three people over 65 will end their lives with a form of dementia". Assistive technologies in relation to this debilitating condition may be significant to where and how older people will live.

Allied to such trends are advances in information age developments and challenges posed in looking to future scenarios of living in later life in terms of the lifestyles and technology engagement of future older people compared to older people today. It is also important to recognise that in considering living in later life there are very different circumstances faced by an individual according to their state of health and how this changes over time. Herein are challenges in terms of defining older people and making distinctions on the basis of age, continuation in paid employment or wellbeing.

3 Scenario planning

At its simplest, scenario planning is described as a set of "*stories (or narratives) set in the future, which describe how the world might look",* which can be used "*to review or test a range of plans and policy options"* (Government Office for Science, 2009, p5). They can also be seen to be a way of generating 'strategic' conversations about what can be done today to prepare for an uncertain future. A key appeal of scenario planning is that it embraces rather than conceals uncertainty and by identifying the principal drivers of future change, it also allows a range of different (and potentially contrasting) possibilities to be mapped out. Aligica (2005) notes that by using scenarios it is possible to counter tendencies to presume that some developments are more likely than others (overconfidence), to focus on things that are easy to imagine (availability), or futures that are related to or based on past experience (anchoring).

There are multiple unknowns or drivers of change when defining possible futures. In scenario planning exercises it is common to consider two 'axes of uncertainty' to create a 'double uncertainty matrix' in which four divergent future scenarios are then created. The axes are chosen to reflect key considerations for the exercise concerned. In this case the focus was on the one hand, *the extent to which assistive technologies will feature in and support living in later life* and, on the other, *the extent to which the state would be able to provide care for older people*. It is important to recognise that the resultant scenarios are illustrative of the diversity of possible futures of which, ultimately, an infinity of alternatives exist. A time horizon of 2030 was chosen for the scenarios. Although the specific year is arbitrary, it is intended to signify a future horizon far enough away to allow the identified drivers of change to have played out sufficiently to highlight divergence (i.e. uncertainty). To

facilitate and enrich insights into the different scenarios, two further tools were used during the workshop. The first of these was the 'Ethnographic Futures Framework' (Verge) developed by Kaipo Lum and Michele Bowman, which encourages an 'immersive' consideration of how people's needs might evolve in each of the scenarios. It does this by focusing attention on such issues as: what is created; what is consumed; how things are disposed of; how people connect; and how people relate to one another. The second tool, the 'Three Horizons Model' (Curry and Hodgson, 2008), was used to structure participants' thinking about how things might evolve over time to move from the present day to the future scenarios concerned. The way things are now (including any current assumptions) is the first horizon, which it is suggested will decline in 'fitness for purpose' over time. The scenarios then form a future horizon (the third), which will represent a new way of thinking (in this instance in 2030). The second horizon occupies the space between these two, and represents how the wider system will adapt to the pressures of change between the first and third. A more detailed account of the workshop and the application of these techniques is provided in a workshop report (Cook et al, 2012).

The four scenarios are depicted in Figure 1 (below) with the 'x' axis representing the extent of state provision of care and the 'y' axis the extent of healthcare technologies engagement (and by implication prior availability of technologies).

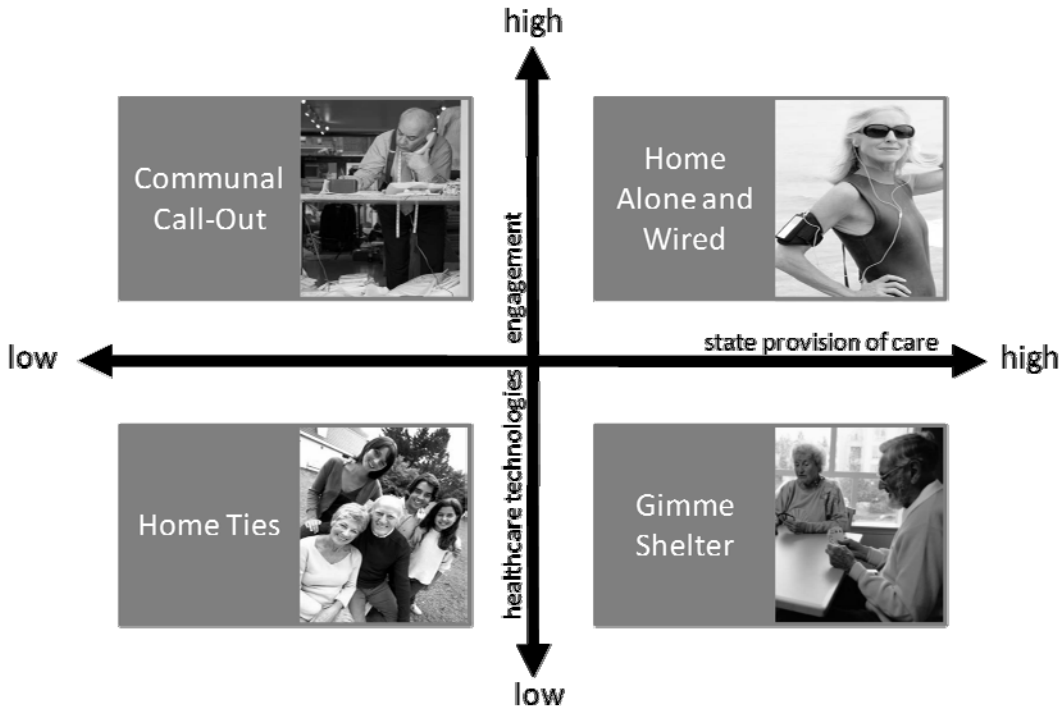

Figure 1: Scenarios for living in later life

At one extreme of the assistive technologies axis, developers have succeeded in dealing with issues that surround the use of such aids, including privacy (in respect of monitoring and surveillance), affordability, user friendliness and personalisation. Appropriate response systems are in place for when technologies set off an alarm, and the huge amounts of data being generated can be managed. They have also responded to the needs of the very heterogeneous population of older people (and their carers). As a result of this, engagement with healthcare technologies is high. At the other end of the continuum, developments in one or more of these areas have been unsuccessful, resulting in much less use of assistive technology and a greater reliance on formal or informal personal care provision. The 'care' axis considers the extent to which people are expected to pay for care themselves, which will affect the provision and amount of both formal and informal care. Low state provision of care will imply people have to pay for services themselves, and their homes might become assets to be sold when such needs (and costs) increase. Levels of care will also impact on the availability and capabilities of assistive technologies, with for example state provision

expected to provide a more limited selection of such aids (and thus care) compared to those on offer in the commercial marketplace.

These two axis then provide the rational for the scenarios, and the paper next sets out summary narratives of each of these before drawing upon them as a platform from which to explore what such visions might mean for the social practices and travel demands of older people.

Scenario A: 'Communal call-out' (low state provision of care; high healthcare technologies engagement)

This scenario embodies a continuation of emphasis on individual choice and responsibilities, encouraged by more extensive 'means-tested' provision of health and social care. This then is both a consequence of, and a driver of low(er) levels of state provision of care. Individual care is increasingly funded through insurance, with premiums and availability based on lifestyle behaviours. There are now greater expectations of healthy ageing (in part facilitated by developments in healthcare), which have increased demand for, and the cost of healthcare services. One consequence of this is that many people are now working into older age to afford such services. This continued employment is facilitated to an extent by the use of information and communications technologies (ICTs) and greater part-time working. These factors also contribute to another key feature of this scenario - a greater number of older people will carry on living in their own homes rather than in residential care than is the norm today. The choice of location for these homes is now more likely to be somewhere convenient for the services and facilities that older people need – curbing current trends for older people to relocate from urban to rural and coastal environments. The other key element of this scenario is a high level of technological development, in particular in the field of assistive technologies, and their take-up by older people. Such technology has provided a means to deal with time-consuming tasks, allowing numbers of formal care workers to stay stable at the same time as a significant growth in numbers of older people needing some form of care. In respect of older people's health, technology is used extensively to monitor not just how people are, but also their behaviours. One area of assistive technology that has not perhaps performed as well as predicted is around the use of 'care-robots'. Although these have been developed, most people would rather spend their money on 'human support'. Technology (in the form of ICTs) is though used for supporting social interaction and to help combat loneliness. Increasingly it may also be used for distance learning and to prolong older people's employability.

Scenario B: 'Home alone and wired' (high state provision of care; high healthcare technologies engagement)

In this scenario there is also an extensive development and use of assistive technologies, but in this instance there is also a high level of state care provision as well. This solution is in part a reaction to the increasing numbers of older people needing care, and a shortage of care-workers, which combine to make human-delivered care unaffordable. Single households are the most common household type, meaning that the informal care that used to be provided by spouses has been replaced by technology-enabled self-care for many. Complex family structures driven by high divorce rates and increases in second marriages also have had a negative impact on informal care provided by children. Technology has provided an alternative though with 'smart' homes the norm and 'care-robots' common (as it is no longer solely individuals paying for them). Monitoring technologies, including those that can detect mental health problems, mean that most care can now be provided remotely, and it is likely that a device in your home now reminds you to take your medicine – it may be your phone or even your fridge or kettle. There are of course still differences between people's homes, but the state provides everyone with a base level of technology. This is sometimes driven by other policy issues, such as smart energy meters in response to climate change targets.

The increased emphasis on self-care (through monitoring) has enabled a shift from treatment to prevention. This has resulted in a healthier population, but not as extensive a reduction in healthcare costs as expected, as the strong emphasis on prevention and active ageing has raised expectations of staying active and feeling good into old age. This has driven up demand for health services; as people no longer accept the infirmities of old age.

Scenario C: 'Gimme shelter' (high state provision of care; low healthcare technologies engagement)

This scenario represents a situation with higher levels of state care provision, but low engagement with assistive technologies. In this future older people are faced with a challenge around their choice of living arrangements. The scarcity of informal carers and the ever growing demand for care means that ageing in one's own house turned out not to be a realistic option for many older people. Yet following decades of ideological imperative towards individualism in society they do not wish to be a burden to their friends and families. Equally, from a practical perspective, moving in with the family is not a viable option for the vast majority of people either, as those families are dispersed and in houses that barely have enough space for their offspring – and smaller family sizes mean fewer children to provide support anyway. The development of assistive technologies has failed to meet the increased demand for care as it became apparent that they relied too heavily on the availability of (the limited numbers of) informal carers to respond to alarms. What developed then was a middle ground between living in your own home and residential care homes in the form of 'sheltered housing'. Here older people could live independently in purpose built accommodation, close to one another.

Sheltered housing then has enabled single carers to look after a greater number of older people, and instead of each individual house being equipped with assistive technologies, there are instances of communal buildings where such technologies can be located and used. This does, however, mean less personalisation and less likelihood of meeting the needs of all people. The bare minimum of formal care is available, and this is skewed in favour of high-need households. Financial stringency means that the focus is on cure rather than prevention. The shortfall in monitoring technologies means that whilst older people are encouraged to live active lifestyles they may well lack the technical resources to monitor their progress.

Scenario D: 'Home ties' (low state provision of care; low healthcare technologies engagement)

In the fourth and final scenario, there are low levels of engagement with assistive technologies, and minimal provision of care by the state. The increased numbers of older people mean that it is no longer feasible to care for them all in residential homes, and thus state care is targeted at high-need recipients. It is also focussed on physical and not mental needs. Everyone else must provide for themselves. Assistive technologies have failed to accompany the growing trend towards older people living independently for longer, with many technologies judged to be too expensive, too invasive, or not able to meet the varied needs of older consumers. As a consequence, the majority of older people rely on informal care through their own social networks. For those with family members or friends living nearby, it is often possible to remain living in their own homes, supported by frequent visits from the informal carers. Others whose (potential) informal carers lived too far away to enable them to visit them on a regular basis have been forced to re-locate. Where possible, people move closer to their social networks while they are still fit and healthy enough to help out friends and family who might be future carers. Such activity also makes it easier for them to build new friendships after moving sometimes over considerable distances to go and live with their children.

Multigenerational homes have increased in popularity for those who have moved. Shared ownership has become the preferred option for the many without family or friends they can count on for support with caring tasks, but who do have some financial means. In these so-called co-housing schemes a group of people combine their resources to develop their own collective housing. The economies of scale and 'community feeling' this generates make sharing the most affordable and desirable option for people who do not have families or do not want to be a burden on their families and can afford not to be. For those who cannot fall back on their social networks for help or who have only very limited financial means, there are still some residential care homes available, but the quality of life in those homes tends to be rated as low.

4 Social practice implications

The indirect (and unintended) effects of assistive technologies (in the main characterised as non-transport technologies), on transport and travel in these four different futures that might unfold will arise through the nature and extent of the intermediate effects they have on social practices. In this section of the paper we therefore identify and explore four key dimensions of social practice by looking across the set of scenarios and drawing upon insights from the workshop:

(i) *Living choices* – how will older people live?

(ii) *Location* – where will older people live?

(iii) *Employment* – what will older people do to support themselves and others?

(iv) *Interaction with significant others* – how will older people socially engage?

Living choices

There are some distinctly different possibilities for how older people will choose to or have to live in future. The two dominant paradigms emerging from the scenarios are either sustaining today's aspirations of living in one's own home (supported by assistive technologies), or a much greater emphasis on communal forms of habitation. The latter are seen to range from a concentration of older people in bespoke, sheltered housing developments, to multi-generational dwelling as well as mixed communities in co-housing schemes. Options such as these may be less desirable for some people, but to an extent forced on them by economic circumstances. This range of living solutions will have consequences for the provision of services and for the nature of community and the involvement of older people therein. It also raises wider implications for issues such as energy use and the availability of housing stock depending on the sorts of homes (individual) older people might be living in, as opposed to multigenerational, sheltered or co-housing alternatives.

Location

Allied to *how* older people might live is *where* they might live. Within the scenarios it can be seen that the importance of services (including care) might mean less urban-rural migration than is being experienced currently by retirees or older people. Meanwhile there is the prospect of a degree of residential mobility driven by more affordable communal solutions (residential and sheltered) being found further 'north' in contrast to more expensive real estate values in the south of the UK. There is also the potential for concentration around social networks, or family, which could in one respect increase moves by older people to cluster in locations that favour their demographic (for example coastal towns), or alternatively to areas where their children live. These choices will have impacts on the age-mix of communities, making them either increasingly polarised, or conversely with a more balanced demographic mix.

Employment

Affordances of how and where older people will live lead on to consequences for how their engagement in employment might change – and indeed how older people may affect the employment practices of their offspring and younger generations in general. There will be different determinants of employment engagement including: the sense of purpose in life that employment can provide; a source of income to support living practices and healthcare needs (including assistive technologies perhaps); and the compatibility between employment on offer and an individual's abilities. Where the costs of care fall to individuals, some older people will need to continue working later in life than perhaps they had intended. Conversely, where older people move closer to, or to live with their offspring they may then be engaging in unpaid 'work' for them, extending their employment options by reducing restrictions on them – carrying out child minding, or taking children to school etc. Older people remaining in employment was seen to be facilitated to an extent by technology solutions, home working for example, and it will be important to understand whether 'digital' divides experienced in current cohorts of older people may persist in future more 'technology aware' cohorts.

Interaction with significant others

Another key area of social practice discussed through the scenarios was how older people would interact with 'significant others', whether that be family or potentially those in wider

social networks. In some instances there was seen to be less need for physical interaction, for example visits by family, as (assistive) technology would provide remote monitoring and increasingly lifelike 'through the screen' tele-presence (with the caveat that in some instances it is only those that can afford such technologies). Such reduced dependence on the need for (but not necessarily desire for) physical interaction could lead to more familial dispersal, allowing family-members to locate themselves to support their life choices – for example around education or employment. Remote working for older people could also reduce physical interaction with work colleagues. In contrast to this apparent downward pressure on physical interaction was an expectation of greater localisation of non-work activity and physical interaction. Communal living offers the potential for more interaction with social networks (family and friends), through the greater reliance on such groups to provide informal care, although perhaps the growth of sheltered housing will mean that others within the same 'community' might increasingly provide some of this. Communal living also offers opportunities for communal access to assistive technologies. The extent to which those living within sheltered accommodation may consider themselves to be part of a community and in turn with responsibilities towards others in that community is debatable.

As noted above, the increasing numbers of older people in the population mean that even the limited range of social practices explored above (and the allied consequences for the nature and extent of travel) will matter considerably to how society will equip itself for an ageing population. The significantly growing proportion of older people has important implications for all of society – not just older people.

5 Transport and travel implications

This section of the paper now moves on to consider, in light of the dimensions of social practice that characterise the scenarios, what the related implications for transport and travel may be. Four aspects are considered in particular:

(i) *Individualised versus collective transport* – what motorised modal preferences will older people have?

(ii) *Engagement in active travel* – will walking and cycling resonate with active aging?

(iii) *Types of journey being made* – why will older people be travelling?

(iv) *Journey substitution through technology* – will older people embrace forms of social participation other than those reliant on personal mobility?

Individualised versus collective travel

Whilst the importance of the car as a means of transport is not discussed expressly in the scenarios, it is possible to draw some inferences from the social practice discussion above. If people continue to live in their own homes, and more often alone, then this would perhaps suggest that the car will remain an important form of travel. The costs incurred in supporting assistive technologies may, however, mean choices will be need to be made between running a car and paying for such technology, unless assistive technologies associated with prolonged safe driving are seen to be central for an individual maintaining independence. In the case of more communal living, then there is the opportunity for older people to combine with others to make journeys, and in the more community-focussed scenarios (co-housing for example), possibly even share ownership of vehicles with neighbours. In addition to the opportunities this might provide in terms of 'inclusion', and companionship it may also offer economic benefits for older people. Discussions in the workshop also hypothesised as to whether new models of vehicle ownership might also emerge from this sharing behaviour. Such journey-sharing solutions may also potentially be realised under multi-generational living, although perhaps less so with demands on car access likely to remain with members of the household engaged in employment (notwithstanding how patterns and extents of remote working may evolve). It is possible to see how some of these responses *may* impact positively to help reduce levels of car use.

In respect of public transport, possibilities emerge from all of the scenarios - for example, in respect of the re-localisation of living enabled by ICTs, and 'assistive' planning tools for using public transport. In situations where people remain in their own homes then the network of (potential) passengers to be supported by traditional public transport modes may be too

dispersed (as is often the case today). Conversely, the relative concentration of older people in sheltered or co-housing developments might help facilitate public transport modes though this might be played out in the face of popularised shared-use of private vehicles within those communities as mentioned above. It is not uncommon today for example for retirement villages to have their own 'pool' transport complete with a driver. Looking at the wider picture, we consider that there must be a substantial degree of uncertainty about future car dependence. The cohort effect, as described above may be particularly relevant here, as those who will be 'older' in 2030 will be those that have grown up with the car both as an aspiration, and then a primary mode of transport – a different experience than the current older-old. Intriguingly if one goes even further forward into the future it is conceivable that the reverse situation might apply as fewer younger people of today are acquiring driving licences (DfT, 2010) and in some instances seem more wedded to mobile ICTs such as iPhones than cars.

Engagement in active travel

Cycling and walking symbiotically relate to active ageing. Here the benefits of assistive technology could be significant (monitoring and reporting on health benefits for example), providing that such technology is widely available. There will still be a degree of physiological decline, even with technical assistance, and as the growth of the older-old continues so the impact this has on active travel will be of interest. Three of the four scenarios explored offer an additional and more explicit opportunity for greater use of active travel modes in one form or another. This might be shorter journeys facilitated by the re-localisation of activities into the community or the fact that use of such modes is seen to be beneficial to health and to successful ageing, or perhaps it is in the sharing of tasks (either across families in multi-generational households, or with neighbours in co-housing). Again the potential cohort effect must be noted. Obesity levels, in the future are likely to significantly influence engagement in active travel.

Types of journey being made

There may be a decline in the number of 'necessary' journeys - it has already been noted how re-localisation of activity might occur, facilitated by decisions on where to live and work (e.g. remote working). Conversely the numbers of commute trips made by older people may (substantially) increase as they are obliged to stay in the workforce (to pay for assistive technologies, or other forms of care). Locating near to services, and avoiding healthcare journeys through extensive use of monitoring technologies will also impact on travel needs. The need for significant others to travel may decrease as technologies provide some of the benefit previously obtained through physical co-presence. In respect of 'discretionary' travel, there is the potential for rebound or replacement journeys, for leisure purposes, either as a way of escaping from the more communal living arrangements, or merely fulfilling a need to travel – to an extent facilitated by the savings made in travel time and budget by such re-localised activity. In the scenarios that see older people living together with their own families in multigenerational homes, or in cohousing schemes then there is scope for greater 'joint' trip making, or for trips being made for communal purposes (necessary or discretionary). Where household tasks are divided between more people, this offers the opportunity for the use of (more) sustainable modes of transport, as parents no longer need to chain trips to work, the shops and their children's schools, as some of tasks (and journeys) will now be undertaken by grandparents.

The living choices that older people make will also have an impact on the journeys made by those providing care. For example, the greater numbers of people living in their own homes might generate more 'care miles' than would be seen if greater numbers were living in residential and care homes, where carers can attend to people in a smaller number of locations. This raises questions about how much an older person's dwelling may shift from being a source of trip generation to a greater source of trip attraction, not just for care visits, but also for services such as meals-on-wheels or the home delivery of shopping from the internet (including food).

Journey substitution through technology

This then leads into the final aspect of travel and older people to be discussed here, journey substitution. With ICT being used to maintain social networks, the extensive use of monitoring tools, and the widespread use of tele-presence facilities, it is possible to see a

range of impacts on travel needs emerging. As already noted, however, a reduction of demand for some types of travel may simply be replaced by other choices, and leisure travel is one area where this may occur. Interestingly, the idea of greater use of 'virtual travel' emerges as one opportunity to satisfy such needs, whilst the notion of replacing travel in some instances by accessing *memories* of past journeys or destinations is also seen as a factor to consider.

6 Implications for (transport) planning and policy

In this final section of the paper we highlight seven implications or considerations for (transport) planning and policy arising from this case study of the relationships between technologies, social practices and travel with its focus upon living in later life.

(i) *Where are we heading?* The paper's title perhaps raised a false expectation. We never set out to offer anything approaching a definitive judgement on the likely future pathway for the nature and extent of travel in an ageing society. Indeed even within each scenario we have refrained from trying to assimilate the net consequences for travel (in numerical or percentage change terms) – this is a practice sometimes applied in scenario planning and has a legitimacy in the sense that it cannot be deemed 'wrong' provided it preserves the internal consistency of the scenario. However, the danger of such assimilation it to give a false sense of precision and indeed temptation to believe the pathways to the future are reduced to only four possibilities. The aim of the scenario planning approach is to expose uncertainty. Indeed scenario planning itself is limited in its ability to reflect the greater extend of uncertainty that faces society. The scenarios have considered some of the uncertainty of the interplay between the information age and the motor age. This relates also to uncertainties in energy supply and end user energy demand. Some commentators are exploring whether capitalism is in crisis and the world looks to lift itself from global recession. Governance of society itself faces potentially major new developments with the ability of the 'power of the crowd' to be mobilised through social media and other forms of Web 2.0.

(ii) *How far do travel demand forecasts take us?* Apparently still central to how imperatives for accommodating future mobility are framed is forecasting. In particular the road transport forecasts are calculated by the Government's National Transport Model. Three 'scenarios' are modelling based on assumptions about assumed key drivers of demand: population, demography, economic growth and cost of travel. All three scenarios creating the latest forecasts result in substantial forecast growth in road traffic between 2010 and 2035 (DfT, 2012). The DfT acknowledges that "*uncertainty around the outturn values of key drivers....forecasts ...should therefore be read as the projected trends...given the most likely path of the input variables*". Yet as Warren Buffet has quoted, "*[in] the business world, the rearview mirror is always clearer than the windshield*". There is a concern that such forecasting, even with its own acknowledgement of uncertainty, engenders a very conservative approach to policymaking and a mentality of rather reinforcing the current 'regime of thinking'. In fact it is important to note that examining future travel demand goes beyond such high level projections. There is a need to understand how patterning of travel might evolve at more localised levels and the extent to which it is in accordance or not with the needs from the population arising from prevailing social practices.

(iii) *Serving or shaping society?* Building upon the observation of conservatism above, there is a need to challenge the very implication of asking 'where are we heading?'. It has been suggested (Lyons, 2004) that the dominant mentality in the transport profession and transport policy has been one of 'transport is here to serve society' – this was epitomised by the era of 'predict and provide'. In this context the logic is that through estimating the nature and extent of travel demand one can then consider how to formulate policy and investment that is able to meet such societal requirements. However, this overlooks the fact that in practice transport shapes society – where people live and work and forms of social practice and economic activity are influenced by transport availability. What this can imply, which can come across as politically troublesome, is that government policy becomes a form of social engineering. This is in fact unavoidable – the question is whether or not government embraces this capacity. The question then changes from 'where are we heading?' to 'where would we like to

head?'. Intriguingly while this is inherently more politically challenging it may offer the prospect of better negotiating the considerable number of unknowns set out above.

(iv) *An inactive, reactive or proactive policy response?* As we have noted near the beginning of this paper, there has been precious little consideration of technological developments in society when framing policy on transport. It leads to the conclusion that Government gravitates towards being inactive in responding to such developments – perhaps for reasons of complexity or because it is seen to be outside of the brief of transport policy, in spite of this paper's underscoring of how many ways in which technology can influence travel through social practice. It is perhaps tempting to assuming that the very complexity of the future precludes trying to make too much sense of it, reinforcing a leaning instead towards assumptions and forecasting. Indeed it could be asserted that a convenient consequence arises from society's heterogeneity – namely that so many different changes at the level of individuals are going on in terms of social practice and travel demands that the effects on aggregate travel are smoothed or even cancel out. There is the option of policy taking a reactive stance to the 'non-transport' and 'substitution' technologies affecting travel. However, to be reactive and effective is likely to require lead times before policies and measures are implemented and in the meantime changes in social practice and travel demands may continue to take place. What remains is the bold option of taking a proactive policy stance. This returns us to the suggestion above of knowingly shaping society through (transport) policy rather than transport being subservient to it.

(v) *Whose responsibility in Government?* The evolution of our ageing society and its implications may ultimately converge upon the transport system in the form of travel demand but the determinants of travel demand are many and span across government departments. Policies on trade and industry, employment, healthcare, energy and so on all have a relevance to travel demand. This prompts the perennial question – should government be seeking a more integrated approach to its policy formulation in seeking to understand and accommodate the needs of an ageing society? Attempts at such integration are, however, notoriously difficult. However, one key advantage of scenario planning is that it is possible to set out depictions of future society in a way that can prompt debate and consideration of implications across policy areas.

(vi) *Influence and equity* – Returning specifically to our case study of living in later life it is important to recognise that older people will represent an increasingly substantial share of the population and associated requirements placed on the transport system. It seems therefore an imperative for transport planning and policy to give much greater attention to the changes and unknowns ahead than currently appears to be the case. Allied to addressing this share of the population's requirements, older people will make up an increasing proportion of the voting public and are thus equipped to exercise increasing influence over government. In this context, however, it is also important to provide a reminder of the considerable heterogeneity of the population of older people – defined by their state of health, where and how they live, their values and affordances. As with policy in general it is important to be alert to 'blunt' policy formulation which implicitly reflects assumptions of homogeneity. Equity considerations are important.

(vii) *The challenge of being visionary* – If policymakers are to assume a more engaged role in the examination of futures and decision making on how to accommodate uncertainty while shaping a better society, there is a collective challenge faced in our capacity to be visionary. There can be a strong tendency to be blinkered in looking at present days norms, values, practices and opportunities and seeking to project these forward into the future. This returns us to a reminder that the older people of tomorrow will very likely be different to the older people of today and will be equipped in different ways and with different pools of social practice in their pursuit of wellbeing in later life. The fiction writer William Gibson has quoted that "[t]he future is already here – it's just not evenly distributed". In other words there are pockets of how people are going to be living in future which may exist today – the challenge is to identify them since they are unlikely to be dominant behaviours. One approach to achieving this is to look across countries and cultures to policies and practices that already exist and consider how they may translate into a future for our own country.

In conclusion of this paper, it is important to underline that preparing ourselves for the future has perhaps never been more challenging. We would certainly not presume to suggest that policymakers are naive in their current approaches or indeed that alternatives are straightforward. One of the challenges at present is that policymaking faces an air of urgency on many fronts allied to significant resource constraints and depleted skillbases with which to thoroughly explore response options. It was a sociologist in the 1930s who coined the phrase unanticipated consequences (Merton, 1936). A key reason he identified for such consequences resulting from policy was what he referred to as 'imperious immediacy of interest'. In other words policy action is taken in response to an over-riding imperative which precludes closer consideration of wider ramifications. It would seem we are currently in a period in which we are especially vulnerable to this imperious immediacy of interest. Yet policymakers should be urged to recognise the value of substantive exercises that seek to better equip us for living in an uncertain world.

7 References

Aligica, P.D. (2005). Scenarios and the growth of knowledge: Notes on the epistemic element in scenario building. *Technological Forecasting and Social Change*, 72(7), 815-824.

Alzheimer's Society (2010). *Nursing and Midwifery Council review of pre-registration education: report on the experiences and views of people with dementia and carers*.

Cook, C., Curry, A., Hubers, C. and Lyons, G. (2012). *Care miles scenarios workshop report*. A report from the ESRC-funded Technologies and Travel project, Centre for Transport & Society, University of the West of England, Bristol (UWE).

Curry, A. and Hodgson, A. (2008). Seeing in Multiple Horizons: Connecting Futures to Strategy. *Journal of Futures Studies*, 13(1), 1–20.

DfT (2009). *Transport Trends 2009 Edition*. Department for Transport, London.

DfT (2010). *National Travel Survey 2010*. Department for Transport, London.

DfT (2012). *Road Transport Forecasts 2011: Results from the Department for Transport's National Transport Model*. Department for Transport, London.

Government Office for Science (2009). *Scenario Planning Guidance Note*. Foresight Horizon Scanning Centre, Government Office for Science.

Hubers, C. and Lyons, G. (2011). New technologies for the old: potential implications for independent living and travel demand. 5th International Specialists' meeting on ICT, Everyday Life and Urban Change, Deutsches Zentrum fur Luft- und Raumfahrt (DLR – German Aerospace Center), Berlin, Germany.

Hubers, C. and Lyons, G. (2013). Assessing future travel demand – a need to account for non-transport technologies? Forthcoming in *Foresight*.

Lyons, G. (2004). Transport and Society. *Transport Reviews*, 24(4), 485-509.

Lyons, G., Farag, S. and Haddad, H. (2008). The substitution of communications for travel? In Ison, S. and Rye, T. (Eds). *The Implementation and Effectiveness of Transport Demand Management measures: An International Perspective*, Ashgate, Chapter 11, 211-232.

Merton, R.K. (1936). The Unanticipated Consequences of Purposive Social Action. *American Sociological Review*, 1(6), 894-904.

ONS (2010). *Social Trends – No. 40 – 2010 Edition*. Office for National Statistics, Newport.

ONS (2011). *National Population Projections 2010-based Statistical Bulletin*. Office for National Statistics, Newport.

Plum Consulting (2010). *Assisted living technologies for older and disabled people in 2030: a final report to Ofcom*. Plum Consulting, London, UK.

UN Department of Economic and Social Affairs (Population Division). 2009. *World Population Ageing.* New York. United Nations.