Older people and out-of-home mobility: Is discretionary travel undervalued in current policy?

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Published work and a critical commentary submitted in partial fulfilment of the requirements of the University of the West of England, Bristol for the degree of Doctor of Philosophy by publication (DPhil)

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I am very grateful to my supervisory staff for the help, guidance, and direction they have provided over the course of the DPhil. I would also like to acknowledge the many people, who I have worked with on the six underlying projects, especially those who have allowed me to add-in a few questions on the themes explored here.

I would also like to thank colleagues in the Centre for Transport and Society who have helped me with inspiration, and support during the DPhil and sense-checked or proofread elements of my work over the years.

It goes without saying that I am eternally grateful to my wife for putting up with another academic challenge taking holiday and Christmas (I have promised this will be the last), and to my parents and mother-in-law who are all now older-old living in rural areas and experiencing the reality of the issues discussed here.

I would like to offer particular thanks to my mother-in-law, for the times she spent posing for me in rural locations (especially remote bus stops), to provide me with images for reports and conference presentations. Now she will believe me it was all worthwhile.

Note: References in this document follow the UWE Harvard style. Documents that are part of the DPhil submission will be prefixed with an asterisk (*), in the style *Shergold et al, 2012.

Note: Word count (excluding Appendices) 19533.

Foreword

In accordance with the UWE regulations for DPhil degrees, this thesis incorporates a body of published academic material supported by a critical commentary of the work.

The work collected in this DPhil portfolio reflects a long-standing interest in, and exploration of mobility for older people. Drawing on a range of empirical data and analysis, it provides a novel view of ageing and mobility in a rural context in the UK, although the findings have wider relevance and application.

The topic has long been of interest to researchers, and is particularly relevant now, at a time of growing concern as to what a future ageing society might look like in countries in the UK and elsewhere. The portfolio and supporting work have contributed a new way of thinking about the links from mobility to wellbeing and community sustainability, and new knowledge about the situation of older people in relation to out-of-home mobility based on evidence from the UK. In addition, it has looked forward to explore whether new technologies could offer solutions to some of the issues experienced currently, and better deliver the benefits that mobility offers for older people and their communities.

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1 Introduction

This document is a commentary on a portfolio of published work that explores the causes and effects of transport-related exclusion, seen through the example of out-of-home mobility for older people[1] in the UK. The portfolio, and the underlying research, has at its heart the notion that social justice is a key element of sustainability – in this instance more specifically social sustainability, and that exclusion from being involved in a community will create a social injustice, which can undermine both personal wellbeing and community cohesion. In particular, consideration is then given to whether policy responses undervalue journeys for more social purposes.

The portfolio draws on six separate research projects that the author has either led or been the lead researcher on. These explore ageing and mobility issues in rural and urban contexts, through studies on different modes of travel, and by looking forward to future scenarios and solutions. The commentary looks to identify and contextualise the reasons for pursuing this topic, reflect on the research questions at the heart of it, bring together the discussion and debate running through the portfolio, and draw out conclusions from the body of work.

1.1 Context

Older people are a growing segment of society in the UK (and elsewhere), and transport plays an important role in their ability to participate in a range of out-of-home activities or to access services. However, this submission will explore the premise that as people age, so they are increasingly likely to move from individual modes of transport to some form of shared mobility. Such an approach is seen to mitigate against reductions in mobility following driving cessation (*Musslewhite & Shergold, 2013), yet it risks imposing constraints on community engagement. In particular, limited mobility options in rural communities, and for journeys to non-essential destinations, are seen to create an environment where the risk of exclusion is at its highest.

Much of the work in the portfolio has a UK rural focus, where communities face a 'dispersed' pattern of settlement, and transport provision will likely encounter more challenges (e.g. longer distances and greater costs). An extensive body of work on such rural communities and exclusion has developed over recent decades, with studies often focussed on older people (e.g. Moseley, 1979, Root, Boardman & Fielding, 1996, Durham, 2004, Gray, 2004, CRC, 2012). In the early 2000s, this was supplemented by wider studies exploring 'social justice' and social sustainability

[1] The term 'older people' encompasses a very heterogeneous group in society, but for the purposes of this work refers to those aged 60 plus.

issues related to transport and travel (e.g. SEU, 2003, Lucas, 2004). More recently the focus of such work has moved from the UK to other nations, including Australia (e.g. Currie et al., 2009, Stanley & Vella-Brodrick, 2009, Delbosc & Currie, 2011), the United States (Curl et al., 2013) and Scandinavia (Hjorthol, 2012). Within these studies there is though limited exploration of the role played by journeys undertaken for particular purposes, with Davey (2007), Banister & Bowling (2004), Ahern & Hine (2012) and Curl et al (2013) being exceptions. However, this disaggregation of journey type is important, and is discussed in more detail below.

The issues discussed here are not confined to rural communities but looking at out-of-home mobility through a rural lens provides a possibly more acute view of similar problems and opportunities faced by older people in other locations in the UK (and in other developed countries with ageing populations). What the more recent study of mobility for older people in the inner-city suburb of Fishponds in Bristol showed (*Shergold, 2016b), was that many of the same transport issues are visible here as well, and circumstances are coming together to create many of the same mobility shortfalls previously seen in more rural areas. Thus, what might be being experienced in rural communities now will potentially affect urban contexts in the future. Increasingly, it will not be location, but the mobility choices available that will be important for older people.

1.2 The Published Works

In all, thirteen items are submitted, including seven academic journal articles, four project reports, one book chapter, and one conference paper, as listed below in Tables 1 & 2. In addition, Table 3 lists conference presentations that have provided the opportunity to develop thinking and gain feedback on elements of the narrative within the submission. These are not part of the published works but are included for reference and are referred to in the text below when appropriate.

1.3 Document Content

The remainder of this document is made up as follows:

- **Chapter 2: The research journey.** Explores why this particular topic was selected. This chapter reviews the author's career trajectory, to understand the motivations for an interest in (rural) community sustainability, ageing and transport, and for the research choices made as a result.

- **Chapter 3: The contribution to knowledge.** This chapter explores three distinct contributions to knowledge made by this DPhil submission, incorporating findings from the work as part of the discourse.
- **Chapter 4: Reflection on research methodology and methods.** Critically reflects on the methodological approaches used in the submission and notes how these have developed over the course of the studies.
- **Chapter 5: Critical conclusions on the overall submission.** Provides some overall reflections on the submission, drawing out proposals for policy responses, and some future research directions.
- **Appendices:** Training needs statement, Contributions table, Citations table.

TABLE 1. JOURNAL PUBLICATIONS

Item No	Title (UWE Research repository link)	Date	Author(s)	Conceptual context	Methods used	Key findings / contribution
1	Operationalizing 'sustainable mobility': the case of transport policy for older citizens in rural areas. *Journal of Transport Geography*. 18 (2), 336-339 (http://eprints.uwe.ac.uk/10737)	2010	Shergold I. (1) Parkhurst G. (2)	Transport-related Exclusion from services	Stakeholder and passenger interviews	Rural mobility solutions beyond the car restricted, and fragmented. Mobility important for access to healthcare for older people.
2	Rural car dependence: an emerging barrier to community activity for older people. *Transportation Planning & Technology*, 35 (1), 69-85 (http://eprints.uwe.ac.uk/15525/)	2012	Shergold I. (1) Parkhurst G. (2) Musselwhite C. (3)	Community connectivity, wellbeing and social sustainability	Survey and participant interviews	Community-level activity important for wellbeing and social sustainability. Older people using more than one mode of travel - but car still important. Many activities occur close to home.
3	Transport-related social exclusion amongst older people in rural Southwest England and Wales. *Journal of Rural Studies:* Special Issue on Growing Old in Rural Places, 28 (4). 412-421 (http://eprints.uwe.ac.uk/14050)	2012	Shergold I. (1) Parkhurst G. (2)	Transport-related exclusion from activity / services	As for 2	Exclusion not a binary state - and includes those with car access. Exclusion from non-discretionary services and facilities greater than discretionary activity. Older-old particularly at risk.
4	Examining the process of driving cessation in later life. *European Journal of Ageing* 10 (2), 89-100 (http://eprints.uwe.ac.uk/17846)	2012	Musselwhite C. (1) Shergold I. (2)	The challenge of driving cessation	Participant interviews	Those who prepare can achieve a more successful transition to travel modes other than the car.

5	Future mobility in an ageing society. Where are we heading? *Journal of Transport & Health.* 2 (1). 86-94 (http://eprints.uwe.ac.uk/24393/)	2014	Shergold I. (1) Lyons G (2) Hubers C (3)	Future social practice and mobility behaviour	Scenario-based workshops	Many potential social practice and mobility behaviours are foreseeable - society should plan which to take.
6	Taking part in activities, an exploration of the role of discretionary travel in older people's wellbeing. Accepted for publication in *Journal of Transport and Health* – Jan 2019 (http://eprints.uwe.ac.uk/39280)	2018	Shergold I. (1)	Activity theory and wellbeing	As for 2	Formal activity highly related to mobility (the car), informal activity suggests the opposite.
7	Mobility solution or new grey divide: an analytical review of the role of self-driving cars in an ageing society. Submitted for publication - in review	2018	Shergold I. (1)	Future mobility needs and solutions	Literature review informed by all six projects	Technology-driven mobility may become an assistive technology, but there is a risk of a continuing grey-divide. Driverless cars may remove mobility constraints from location decisions.

TABLE2. SUPPORTING PUBLICATIONS

Item No	Title	Date	Authors
8	Developing community transport as a mainstream travel option. *Proceedings of Transport Practitioners Conference (TPM)*	2012	Cornell L. (1) Shergold I (2) Kimberlee R. (3)
9	Research into the health and wellbeing benefits of community transport in Norfolk. (Report to client - Norfolk County Council)	2013	Shergold I. (1) Kimberlee R (2) Musselwhite C. (3) Parkhurst G. (4)
10	Beyond transport: Understanding the role of mobilities in connecting rural elders in civic society. Chapter 5 in: *Countryside Connections: Older People, Community and Place in Rural Britain* (http://eprints.uwe.ac.uk/26150)	2014	Parkhurst, G. (1), Galvin, K. (2), Musselwhite, C. (3), Phillips, J. (4), Shergold, I. (5), Todres, L (6).

11	Project report *The mobility of older people, and the future role of Connected Autonomous Vehicles.* The Flourish Project. (http://eprints.uwe.ac.uk/31998)	2016	Shergold I. (1) Wilson. M (2) Parkhurst G (3)
12	Project report: *Out-of-home mobility for older people in Gt Fishponds (Bristol): Issues and opportunities*. Bristol Ageing Better (http://eprints.uwe.ac.uk/38955)	2016	Shergold I. (1)
13	Project report: *Findings from Workshops held with Older People considering participating in Connected Autonomous Vehicle trials.* The Flourish Project. (http://eprints.uwe.ac.uk/38956/)	2017/8	Shergold I. (1) Parkhurst G (2) Alford C. (3) Morgan P. (4) Voinescu A. (5) Caleb-Solly P. (6)

TABLE 3. CONFERENCE PRESENTATIONS

Title	Date	Authors
The importance of older people's car access to community connectivity. *British Society of Gerontologists (BSG)Conference*	2010	Parkhurst G. (1), Shergold I. (2)
Re-imagining the bus. *UWE Centre for Transport & Society Winter Conference*	2011	Shergold I. (1)
The role of community transport (CT) in maintaining health, wellbeing and independence. *BSG Conference*	2012	Shergold I. (1)
Missed journeys: The importance of discretionary and social travel. *BSG Conference*	2013	Musselwhite C. (1) Shergold I. (2)
Shared Transport for older people, a lifeline or a constraint? A case study from rural England. *Royal Geographical Society (RGS) Conference*	2013	Shergold I. (1)
Do we need an 'Uber' for older people in rural communities? Exploring the impacts of reduced car access on out-of-home mobility. *BSG Conference*	2015	Shergold I. (1)
Home or away? Making a link between mobility, the geography of activities, and the wellbeing of older people. *RGS Conference*	2015	Shergold I. (1)
Autonomous vehicles; an answer to the issues of giving up driving or a new technology divide? *BSG conference*	2017	Shergold I. (1)
Smart mobility, delivering an assistive technology or creating a digital divide? *RGS conference*	2017	Shergold I. (1)

2 Personal research experience

Interest in exploring the issues discussed here developed in the transition from a career in commercial software development in the private sector to that of academic researcher. Engagement with environmental issues, and involvement with environmental NGOs during the 1980s and 1990s (particularly related to transport) led to a career change in 2003, and the start of a relationship with the University of the West of England (UWE). Whilst pursuing an undergraduate award in 'sustainability', there was an opportunity to also work (part-time) at *Sustainability South West* (SSW), the body charged with offering oversight to the regional administration in South West England in respect of sustainability issues. The combined study and employment facilitated a greater understanding and awareness of what then emerged for me as a more holistic way of understanding and responding to a range of environmental issues, not least climate change. Whilst working for SSW I was able to put into practice some of the academic knowledge that I was acquiring through study. Conversely, the employment offered insights, and practical understanding of 'sustainability' issues being experienced across a largely rural region.

The studies at UWE introduced the notion of 'social justice', and how this related to sustainable development, which was to become a strong influence on my thinking during the UG degree. Also, at this time I began to find and explore contemporary work relating to social exclusion, and the role that transport might play in this issue – in particular studies commissioned by the Joseph Rowntree Foundation (Lucas et al., 2001), and contemporary reports from the then government's Social Exclusion Unit (SEU, 2003). The Rowntree report contributed significantly to my interest in the issues discussed in this submission, being possibly the first time for me that older people (and rural groups) were described as potentially 'disadvantaged groups' in respect of transport. The report also speculated as to whether having access to a car should be considered a 'basic need' for people, and if efforts to curb negative environmental impacts of car use might have social inclusion consequences. This was an early (in my experience) illustration of the interconnectedness of social and environmental sustainability, and of the tensions between the different elements of sustainability. The SEU report provided evidence of the effects of 'social exclusion', and the role of transport, and introduced the concept of 'social justice' in relation to funding streams being allocated to transport resources.

These issues then underpinned my first experience of research: the undergraduate dissertation. The choice of topic was triggered by hearing about health disparities faced by older people in rural communities in South West England at an SSW-sponsored event, and by an article on

ageing rural communities published by the Campaign to Protect Rural England (CPRE). The article encapsulated many of the arguments that still pertain in respect of these issues today.

> *"The countryside is lovely, but being past retirement age in a rural area is not necessarily always a bed of roses… Statistics show that the countryside is changing, perhaps becoming gradually a little richer, but certainly steadily older – and few people are preparing for the consequences" (Durham, 2004)*

More specifically, the dissertation studied the ability of older people to access healthcare in rural communities in the Cotswolds – an area that at the time benefitted from a local authority-supported flexible door-to-door minibus service. The study provided an opportunity to talk in depth with those living in such communities (as well as those delivering services such as healthcare), to better understand issues that older people faced in respect of out-of-home mobility. The publication that followed from this work is included in the DPhil (*Shergold & Parkhurst. 2010) and is discussed in more detail below.

After completing the degree (in 2006), it was possible to work on several short-term projects in the Centre for Transport & Society (CTS). The first commissioned by the UK Department for Transport, explored the 'Distributional Impacts of Transport Schemes' (Parkhurst & Shergold, 2009), extending my understanding that different groups might see unequal benefit from an intervention. This was followed by projects looking at rural transport futures (Shergold & Parkhurst, 2008), and concessionary fares for older and disabled people (Shergold & Parkhurst., 2009), all of which help underpin this submission. I took the opportunity provided by these projects to develop skills in reviewing literature and writing outputs. After a year at SSW developing and delivering sustainability appraisals for regional organisations (and their strategies), I successfully applied for a research associate post on the '*Grey and Pleasant Land?*' project (GaPL) in 2009. This three-year multi-research council funded study explored 'connectivity' and the connectedness of older people in rural communities and provided my first exposure to 'social gerontology' (see definition below), with several project partners active in this field. This discipline seemed particularly apt for my growing interests in older people:

> *Social gerontology: "The application of social science disciplines (e.g. demography, economics, social anthropology and sociology) to the study and understanding of ageing individuals and ageing populations and the interrelation of each with social forces and social change" (Sage handbook of Social Gerontology, 2010)*

It also offered a wider theoretical context for the GaPL research activities and helped initiate an ongoing membership of the British Society of Gerontologists, and regular contributions to their annual conferences.

It was whilst personally collecting data for GaPL that the effects of transport on older people's lives became more 'real' to me. Over the course of thirty-eight qualitative interviews undertaken with older people in their homes in rural communities across South West England and South Wales a number of themes emerged, in particular in respect of what happens when there is no longer car access (or the ability to use it as and when you might want to) in a household. Hearing at first-hand how individuals described their mobility circumstances, and what they could or could not do as a consequence of health, wealth, location or access to transport, underlined some of the weaknesses and shortcomings in existing transport policy for rural communities. The project collected data (both quantitative and qualitative) across a wide range of topics, including mobility. I was able to exploit this to develop several conference presentations, and three journal papers (*Shergold et al., 2012, *Shergold & Parkhurst, 2012, *Shergold. 2018a (submitted)) and a book chapter (*Parkhurst et al., 2014) specifically addressing mobility and connectivity issues for older people in the rural context.

Further opportunities to explore mobility issues for older people (and in a rural context again) came after I successfully led a bid to Norfolk County Council-for a study looking to quantify the health and wellbeing benefits of Community Transport provision in that county. The location was particularly relevant, as it had featured in a keystone work on (rural) mobility and exclusion written by Moseley (1979), as well as the academic paper, (Gant & Smith, 1988), which in part directed my choice of access to healthcare as a topic for the undergraduate dissertation. This project again illuminated the issues experienced by those with mobility shortfalls, for example, a focus group participant who recounted that she spoke to no one after being dropped off on Friday and being picked up on Monday. This was the first project where it was possible to develop and incorporate my own questions specifically related to exclusion, and the ability of older people to make discretionary journeys – a process continued in later projects. Outputs from the project are included in the submission (*Cornell et al., 2012, *Shergold et al., 2013).

Further work involving older people has followed, including an exploration of future models of living for older people and the mobility implications (*Shergold et al., 2014), and documenting urban mobility issues in an inner suburb of Bristol (*Shergold, 2016a). The urban project, which again I had bid for, and then run, included development of the research approach. Most recent work with older people (the Flourish project) has considered how autonomous vehicles might affect their ability to undertake activities or engage in their community. The significant

difference in this instance though is that many of the older people who are participating are looking forward 10 or 15 years to a time when they believe they may personally be experiencing mobility constraints and can see how new technology may help them. Although the project has many technical themes and research questions, my involvement has focussed on how this new form of mobility will support older people's social practice, social inclusion and thereby personal wellbeing and community cohesion. These issues will remain as important and relevant in the future as they are now. I have again taken the initiative in adding lines of questioning for participants in respect of journey purpose, and existing mobility problems related to social travel. Whilst this is a multi-researcher project, with many partners, it has again been possible to reflect on some of the key issues discussed here in project outputs (*Shergold & Wilson, 2016, *Shergold, 2016b). It has also contributed to a journal article (*Shergold, 2018b) which explores how new forms of 'smart mobility'[2] might resolve the mobility needs of older people in the future.

Exposure to first-hand accounts of out-of-home mobility issues for older rural dwellers was the spur to start thinking more deeply about exclusion for that group. What has become increasingly apparent over the years is that mobility is actually a key factor in wider issues – not just wellbeing for older individuals, but also the cohesion and social sustainability of a community, and I look forward to continuing to research this topic in the future.

[2] A term understood to infer a perfectly efficient, technology-enabled mobility system (Papa & Lauwers, 2015)

3 Contribution to knowledge

The work in this portfolio makes three contributions to knowledge. First, it develops a new conceptual model proposing mechanisms that relate mobility to individual wellbeing and community sustainability. This model is then operationalised, through synthesis with theory from the field of social gerontology to provide a new mechanism to explore mobility-related exclusion and older people. Second, using the model above, the out-of-home mobility experiences of older people in rural and urban contexts in the UK are explored through empirical research carried out over the last decade, in particular reflecting on their 'mobility capital'[3]. This provides findings relevant to policy and practice for older people's mobility. Third, it builds on this understanding and knowledge to look forward to new technologies in the home and for mobility. Again, drawing on empirical study, the promise of these technologies is tested to see whether the coming decades offer the chance to resolve mobility problems experienced by older people in rural (and increasingly urban) areas. Each contribution is considered below.

Note: Throughout this section reference is made to items in the portfolio (and supporting documentation) which originally presented an argument or relevant findings. These contributions are presented in summary in a series of Boxes at appropriate points in the text.

3.1 Contribution to the theoretical basis

3.1.1 A new model

Underpinning the material in the submission is a new conceptual model developed in response to the GaPL data and findings (see Fig 1). This model incorporates a range of factors emerging from existing literature on older people and mobility, and a wider interest in sustainability and social justice issues. The model embraces socially just outcomes for both individuals (manifest in their personal wellbeing), and broader community benefits, in the form of social sustainability.

The key axis of the model links 'social inclusion' via 'social capital' to 'social sustainability' at the community level. It is suggested that mobility, and 'motility'[4] are an enabling mechanism that facilitate this. Why these connections are made is discussed in more detail in the papers included in the submission, and briefly below.

[3] See Kaufmann et al., 2004 for a discussion of the concept of mobility as capital

[4] A person's capacity to be mobile. Combines the physical elements of transport systems with their aptitude, mobility aspirations, time constraints and knowledge of how to use such systems (Kaufmann 2002, p. 38)

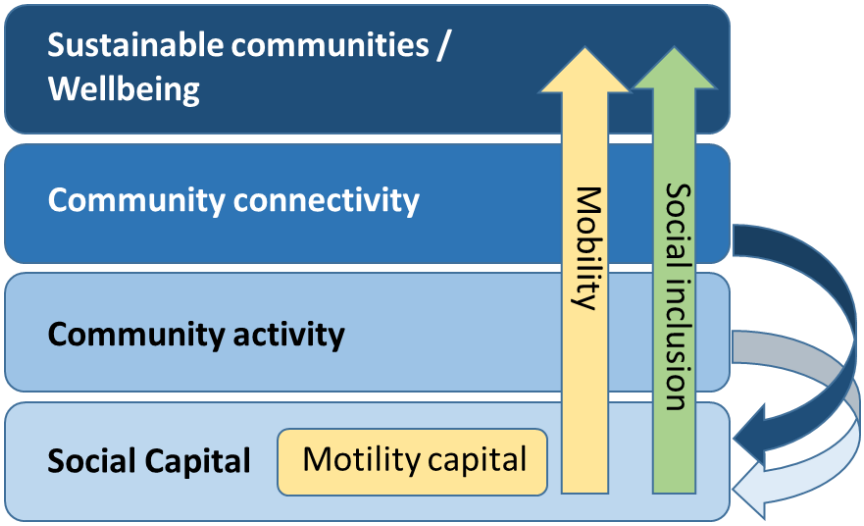

FIGURE 1 CONCEPTUAL MODEL OF THE BENEFITS OF MOBILITY AND INCLUSION FOR OLDER PEOPLE

(Source: Present author, after version in *Shergold et al, 2012)

3.1.2 Context

Sustainability and social justice are of long-standing interest for the author, and as noted in the previous section have been strong drivers of the work in the submitted portfolio. The emerging literature in the early 2000s around mobility and exclusion, and mobility and social justice provided the spur to explore these issues further. Arguments were also being made at that time that social justice and sustainable development should be linked, with interaction and interrelationships seen between them (Foley, 2004). Responding to social injustice in transport systems is seen to require more equitable use of resources, addressing the higher costs of mobility in rural areas for example (Grayling, in Foley, 2004).

With sustainability and social justice as the context for wanting to study older people and their mobility in rural areas, the key illustration of where those ideals are failing is in the notion of 'social exclusion'. Whilst many out-of-home needs can be met online in the 2010s, there are still benefits from the physical journeys (including exercise and importantly social interactions). Not being able to participate or access services is then a form of exclusion, from an element of a normal standard of life (Nutley, 2003). It is acknowledged that the idea of social exclusion itself is contested, and it can be difficult to make a clear distinction between the determinants and dimensions of exclusion (Van Regenmortel et al., 2016). For the purposes of this submission, though, it is seen to address the concept of 'disadvantage' (for individuals and groups) in respect of an individual's engagement in society. There is also an element of social justice in the concept, recognising the need for all people to be able to access those activities regarded as typical of their society (Farrington & Farrington, 2005), albeit with the caveat that they may not wish to participate in such activities (Barry, 2002). It is also acknowledged that exclusion may overlap

with other factors such as poverty, disadvantage, social isolation, and access to services (Scharf et al., 2005). Importantly, older people may be more at risk from exclusion, as a consequence of risk factors such as bereavement and changes in health (Macleod et al., 2017).

More recently, the focus of attention for older people has moved from exclusion, on to what has been described as a "*growing epidemic of isolation and loneliness*" (Sinclair, & Watson, 2014 p16)[5]. This can be seen, though, as just another manifestation of exclusion, with some similar remedies proposed. For example, it is suggested that there should be 'a greater emphasis' on meeting needs for *'*friendship, family and intimacy', including through facilitating mobility solutions: allowing older people to "*engage with family and friends or just get out and about*" (ibid). Isolation is used as a proxy for wellbeing in a later paper in this submission (*Shergold, 2019a), helping to generate evidence of the role of 'activity' (see below).

Mobility and transport are then valid resources to consider in relation to exclusion. '*Making the Connections*' (SEU, 2003) emphasized the link between exclusion and transport, and it is seen to be implicit in determining 'social outcomes' for groups in society since the 1980s (Lucas & Currie, 2012). Importantly, it can be both a cause of exclusion and an indicator of exclusion (Macleod et al., 2017). What is also becoming apparent, is that increasing dependence on the car for transport has led to land use patterns that cause similar problems for those living in peri-urban and urban fringe communities without access to the car (Stanley & Stanley, 2017), which was also manifest in the urban study in this submission, (*Shergold, 2017).

The model (Fig 1) building on these issues was first presented in the conference presentation, "*The importance of older people's car access to community connectivity",* and then described in detail in Item 2, *"Rural car dependence: an emerging barrier to community activity for older people".*

This paper offered an understanding of older people's engagement and involvement in activity within their communities, making the argument that community activity is a key contributor to their 'quality of life'. It made the link from individual activity to community sustainability and cohesion. Importantly, the model also added social capital as an enabler for the processes involved. The complete model then proposes that their motility is co-determinant with social capital as an enabler of more cohesive and sustainable rural communities.

BOX 1 PRESENTING THE MODEL

[5] Although not a direct contributor to this work, I raised issues of discretionary travel whilst participating in a pre-report workshop held by ILC and AgeUK. *Community Matters: are our communities ready for ageing? Topic: Getting out and about,* held at AgeUK offices, Tavistock Sq. London, March 2014.

3.1.3 Social Capital

The inclusion of social capital in the model provides an additional mechanism for understanding the inter-relationship between older people and community sustainability. The interpretation of the term used in this submission follows the communitarian approach of Robert Putnam [see Currie & Stanley (2008) and Almedom (2005) for more detail], where civic engagement will lead to 'reciprocity' and encourage 'social trust' (Putnam, 1995). Whilst acknowledging that some of Putnam's findings are disputed and debated, his approach offers a clear supporting mechanism for the benefits of engaging in activities, (and is commonly, although not exclusively, used in the literature drawn on below). In general, the focus in the submission is on 'bridging' social capital, occurring between groups that are different (i.e. by age, social hierarchy, ethnicity etc.) (Szreter & Woolcock, 2004) particularly its role in connecting 'activities' to community-level outcomes. There is considerable evidence for better social cohesion and less social exclusion in communities with strong bridging capital (Moseley & Pahl, 2007).

The relevance of social capital in the model is drawn from the literature on its relationship to ageing, mobility and health. Social capital is seen to be at risk in older age with a potential decline in physical and social abilities, whilst location changes in later life can interfere with long-term relationships and potentially restrict social interaction and networking (Forsman et al., 2012). Whilst those seen as the younger old may increase their engagement with organisations, this will generally decline in older old age (with perhaps the exception of religious activity). This is particularly important in respect of volunteering, which evidence suggests is predominantly the preserve of the over 50s or, often the over 60s (Moseley & Pahl, 2007). Mobility deficits here have been seen to compromise this contribution (Martinez et al, 2011, Zeitler & Buys, 2014).

In respect of mobility, Urry (2002) identified that reduced mobility can weaken social capital and lead to exclusion. Currie & Stanley (2008) highlight that public transport can help address poor social capital, mobility and accessibility in disadvantaged groups (although they note that to combat exclusion will require a better understanding of the mechanisms involved). Other research suggests that strong bridging capital leads to a virtuous circle of travel, inclusion, and engagement in activity and more travel (Stanley et al., 2010). More evidence of communities with strong bridging capital is seen in the practice of widespread lift-giving for those without access to a car (Gray et al., 2006). In general, there has been limited research on mobility and social capital in rural areas, although the latter is seen to be important as a tool to combat disadvantage in a community.

More consideration has been given to exploring links between social capital and health (e.g. Elgar et al., 2011, Poortinga, 2012, Muckenhuber et al., 2012, Maass, 2016), including mental health (Almedon, 2005, Forsman et al., 2012). It is directly (and indirectly), related to health and life satisfaction in countries across the world, and at all levels of spatial aggregation (Elgar et al., 2011). Importantly, it is seen to be more important to the health of older rather than younger men and women (Muckenhuber et al., 2012). Informal social contact (i.e. with immediate family and friends) is important in respect of mental health (Poortinga, 2012), somewhat at odds with the Putnam view focussed on formal contacts (e.g. groups and organisations). There is though an unresolved debate as to whether good health is a determinant or a covariate of social capital – i.e. do those with better health engage in more social activities and consequently benefit from higher levels of social capital (Poortinga, 2012)?

3.1.4 Discretionary & necessary journeys

Having established the relevance of elements such as social capital, it is also important to better understand the mobility component of the model. Out-of-home mobility is undertaken for a range of purposes, and it would seem pertinent (in respect of deploying resources) to consider if they have equal beneficial value. To do this, it was decided to categorise, and ascribe value to, different types of journey. This process was aided by use of the following models.

The first simple approach considered, was that developed by Allardt (1975 in Swedish, interpreted by Hjorthol, 2012) that explores wellbeing.

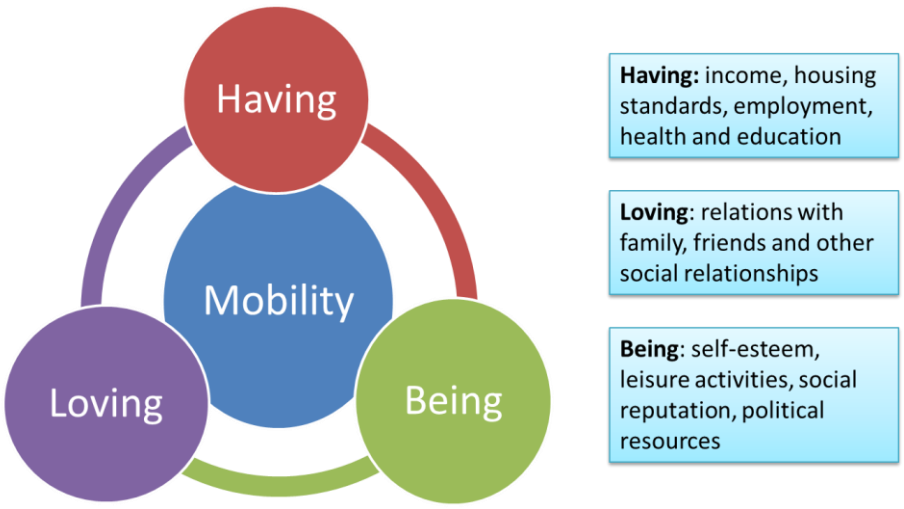

FIGURE 2 CATEGORISATION OF WELFARE NEEDS. AFTER ALLARDT (1975) AND HJORTHOL (2012)

(Source: Present author. Taken from conference presentation: The role of community transport (CT) in maintaining health, wellbeing and independence)

This classifies 'welfare needs' into three broad categories *Having, Loving* and *Being* (see Figure 2), providing a split between areas of welfare that are more 'necessary' (*Having*) in the eyes of planners and decision-makers, and those which might be seen as more 'discretionary' in their nature (*Loving, Being*). Hjorthol (2012) makes the argument that mobility and transport resources will be '*remedies and tools*' which will enable people to '*satisfy welfare and wellbeing needs*' as a result. The paper also usefully suggests that this makes travel a crude measure of older people's participation in the three different domains of welfare. The ability of older people to address the domains is built on a range of personal and societal resources. These then can be seen to form the mobility and motility capital proposed in Fig. 1 as a key enabling mechanism supporting older people's wellbeing.

A second important conceptual model drawn on is that developed by Musselwhite and Haddad (2010), which builds on Maslow's '*hierarchy of needs*' developed in the 1940s (Maslow, 1943). The Musselwhite model describes journeys in respect of 'needs' to be satisfied: *utilitarian*; *affective*; and *aesthetic*.

	Needs satisfied	**Journey purpose**
Tertiary	Aesthetic needs	To visit somewhere aesthetically pleasing, such as nature, or maybe no journey purpose at all, just travel to enjoy the journey itself
Secondary	Social and affective needs	To be independent, in control. Contributing to self-esteem and identity
Primary	Practical and utilitarian needs	Getting from A to B, safely, reliably and affordably

TABLE 4. JOURNEY TYPES IDENTIFIED BY MUSSLEWHITE & HADDAD (2010)

Common to Allardt and Musselwhite, is the idea of different types of journey being made by older people, which will contribute to their welfare, and wellbeing. Underlying both models is a need to make 'necessary' journeys, but beyond that, there are reasons why older people will travel which relate to the journey itself (e.g. independence), and for the activity that will take place at the destination (e.g. a family visit). Simplifying this, there are two journey types, those that are necessary, and those which people (and those that facilitate mobility) might see as more discretionary. This split and the terminology was also used by Ahern and Hine (2012) in their study of older people and transport in Ireland. Exploring how needs for the two journey types are being met could help to answer questions about the impacts on people and communities.

Discretionary journeys maybe viewed as less important by policy makers and transport planners but could be the most important journeys in respect of wellbeing (see the discussion of Activity Theory below). The focus of state intervention for older people, particularly in rural

communities, has traditionally been to support necessary trips – with the expectation perhaps that discretionary travel will be dealt with by car trips (including lifts from family and friends). This creates a gap for those older people who are experiencing reduced mobility without such resources to draw upon (poor mobility capital).

"Transport-related social exclusion amongst older people in rural Southwest England and Wales" (Item 3), explored the two journey types, and found that greater transport-related exclusion potential was identified for access to necessary services and facilities than for involvement in discretionary community activity. In part this was thought to be facilitated by the locations studied being relatively self-contained in respect of community activities, with most seemingly happening locally. Few respondents reported feeling excluded within their communities, although more reported difficulties in accessing specific activities such as specialist hospitals and leisure facilities such as cinemas. The analysis revealed that car availability was not a strong indicator of overall inclusion, although non-availability was important in limiting access to particular types of location.

Further evidence of the value of the classification is seen in the project report "*Research into the health and wellbeing benefits of community transport in Norfolk"* (Item 9). This study provided empirical evidence of shortfalls in the ability of community transport users to undertake discretionary trips, with social and leisure example cited in focus groups and surveys. Such problems were less evident in respect of necessary travel. Quantifiable evidence was also found for a social return on investment (SROI) for community transport services studied here, in respect of health and wellbeing benefits as a result of being able to use the service.

Building on Item 9, a conference presentation ("*The role of community transport in maintaining health, wellbeing and independence"*) introduced the Allardt model, and made a case that the different welfare arenas will have a connection to individual wellbeing. Mobility was proposed as a key enabler to being able to participate in the different activities, with some services only available for necessary journeys for example. The presentation concluded that such restrictions might restrict some older people from engaging in activities, with negative consequences in respect of isolation and loneliness.

BOX 2 NECESSARY AND DISCRETIONARY JOURNEYS

3.1.5 Activity Theory as a link to wellbeing

The final element added to the theoretical model underpinning this submission is 'activity theory', used as a means of further disaggregating and classifying journeys made by older people. The Durham article (2004), which acted as a trigger for this exploration of older people

and mobility, noted the important role of 'activity' for individuals and the community. Implicitly, this would seem to be critically impacted by the ability to get to places, particularly the problems of those who wished to undertake activity in the evening and weekends (*Shergold & Parkhurst, 2010). Social Gerontologists have explored such links through 'activity theory' for over 50 years, starting from the premise that individual wellbeing is enhanced by higher levels of participation in social and leisure activities (Havighurst, 1961). Several reasons are proposed for the positive effects, including the physical benefits of movement itself, social support, and social interactions (providing a sense of belonging and nurturing positive interpersonal attachments) (Adams et al., 2010). Conversely, mobility deficits, which impact on the ability to undertake informal activity have negative effects on an individual's health and wellbeing because of social 'isolation' (Holt-Lunstad et al., 2010).

Activity theory is a mechanism that has had limited use for research into mobility and exclusion, see for example Cutler (1972) for one similar study based on the approach, although engagement in activities is often an element of transport-related studies (e.g. Marotolli et al., 2000, Siren & Hakamies-Blomqvist, 2004, Siren et al., 2015). Use of the theory can though help identify where mobility resources might best be targeted, bringing extra nuance to the consideration of the role of mobility, by facilitating a three-way division of discretionary travel.

The role of different activities and activity theory itself has been considered in a number of the elements of this submission. Earlier work prior to the introduction of the theoretical construct included Item 2. "*The importance of older people's car access to community connectivity*", which explored 'community activity', and Item 4 ("*Rural car dependence: an emerging barrier to community activity for older people*") which looked at more formal activities. The following more explicitly use activity theory:

Conference presentation "*Do we need an 'Uber' for older people in rural communities? Exploring the impacts of reduced car access on out-of-home mobility through the lens of activity theory",* introduced the three types of activity in the theory, their potential relationship to wellbeing, and the role that mobility plays in undertaking the activity. It also presented findings from analysis of activity in the GaPL dataset. For this analysis, a more nuanced distinction is made between those with and without car access and a third category of those over 75 with access to a car. The findings suggest 'no access to a car' seems to lead to fewer solitary activities, informal activity seems to be greater for those without car access and confirms there is less formal activity (such as volunteering) for those with no, or reduced car access. The results in respect of informal activity may reflect location decisions to be nearer family, or relatives visiting more regularly as a consequence of restricted mobility.

A second conference presentation, *"Home or away? Making a link between mobility, the geography of activities, and the wellbeing of older people",* built on the above by using two indicators of wellbeing based on 'Isolation' and 'Loneliness'. The three types of activity are again explored, but in this instance, consideration is specifically given to spatial issues relating to participation. This gives rise to a discussion of what this might mean in respect of the physical 'activity space'[6] that older people might use and exhibit – and whether quantifying this space can tell us something about their wellbeing.

Results suggest older people in this sample are more likely to be lonely if they have no access to a car, but they are actually less likely to experience isolation from relatives and friends. Little difference is seen between the two groups with car access, but clear differences seen for those without access in respect of getting to formal activities or places to socialise (pubs and social clubs for example).

The paper *"Taking part in activities, an exploration of the role of discretionary travel in older people's wellbeing"* (Item 6), documents the analysis used in the conference presentations above. The approach is seen to provide evidence of links between mobility and the different activity types. When moving on to test activity theory, the analysis only finds links to loneliness, and not any other proxy measures of wellbeing.

BOX 3 EXPLORING ACTIVITY THEORY

3.1.6 Conclusions

Underpinning the work in this submission is a conceptual model developed during the GaPL study, which offers a new way of thinking about the issues created by mobility-related exclusion of older people in rural communities. The model provides a mechanism through which to bring together a range of imperatives around the social sustainability of rural communities, and the delivery of a socially just transport system. In doing so, it also helps to explain the benefits seen at an individual and community level. The disaggregation of travel into necessary and discretionary trips and the use of activity theory to drill down further into journey purpose has brought extra clarity to the specific role of mobility. This then provides a new theoretical platform from which to study mobility issues for older people – initially in a rural context, but increasingly across all settlement patterns.

[6] Defined as the locations with which an individual has direct contact as the result of day-to-day activities" (Horton and Reynolds, 1971), as well as the routes and areas the person has travelled through (Schönfelder & Axhausen, 2003).

3.2 Exploring older people's mobility (capital)

The second contribution from this DPhil is a decade of empirical research on the UK experience of out-of-home mobility of older people. The car is a key element of mobility capital for many (if not most) older people, and the role this plays is explored first. Self-regulation and driving cessation will for many though mean a move to a form of shared mobility, and this was a particular theme explored across the work here. Within this context the studies presented here have also considered how well older people's mobility is supported by a range of policy responses (e.g. policy towards different modes of travel).

The discussion here should be seen in the context that mobility and inclusion expectations of older people in rural communities could already be low. For example, an acceptance by some (older) people that the cost of living in an 'amenity' location[7] will be poorer accessibility, and they will need to 'settle for less' (Farrington & Farrington, 2005). The resultant low travel horizons can mean those at most risk of exclusion (including perhaps the older-old) going out less as a consequence (Siraut & Gay, 2009), or changing travel behaviours to engage in fewer activities needing journeys to be made (Stanley et al., 2010). The result being a more 'confined lifestyle' (Davey, 2007), and increased dependence on friends and relatives coming to visit instead (Zeitler & Buys, 2014).

3.2.1 The role of the car

UK society has become organized and arranged around the car (SEU, 2003), with it becoming the primary source of mobility for people living in rural communities in the UK (RAC, 2011). The car (and mobility) is seen to offer independence (Wasfi et al., 2012), and 'independent living' (SIZE, 2006). It is perceived to be convenient, allowing older people to choose when they travel (Holley-Moore & Creighton 2015), with more choice of destinations for activities (Berg et al., 2015), and is direct and 'door-to-door', unlike alternatives such as public transport (Bradshaw et al., 2013).

The vast majority of those in their 60s still have a driving licence, and the same is true for men aged 70+. The proportion of women over 70 with a driving licence has also grown rapidly in recent years[8]. Whilst having a licence does not necessarily predict that people will drive, it is an indication of the importance of the car, particularly in a rural context. Most of the participants

[7] Residential locations that suit older age, for example areas with warmer climates, or attractive natural environments (Poudyal et al., 2008), such as a place in the country (Hardill, 2006) or on the coast.
[8] See Item 16, Section 1.3 for a short review of current mobility trends for older people

in the GaPL study were car drivers, and the findings from that study evidence the role that the car plays.

"*Transport-related social exclusion amongst older people in rural Southwest England and Wales"* (Item 3) explored exclusion in the GaPL data in more depth. The key finding was that accessibility, and the potential for exclusion, were not necessarily 'one-dimensional' issues (i.e. an individual is either socially excluded or not). In general, exclusion was seen to vary across services and facilities, often because of distance, or individual levels of mobility. There were shortfalls in mobility for some participants, and problems identified with access to certain categories of service and/or activity. The paper concludes that the car-dependent nature of travel overall means that there is a rising risk of mobility-related exclusion in rural areas, particularly for groups such as the oldest old.

A conference presentation, "*The importance of older people's car access to community connectivity",* based on the GaPL data focussed specifically on people's inclusion in community activities. It noted that most people reported that they had the level of community involvement they would like, although those without access to a car are significantly more likely not to agree with this sentiment. Two-thirds of this latter group noted that a lack of transport might limit activities, with 26% prevented from participating at all.

The paper (Item 6) *"Taking part in activities, an exploration of the role of discretionary travel in older people's wellbeing"*, explored different discretionary journeys for two groups of car users, and one set without access to a car. Whilst finding expected differences because of car access, it is also possible to see evidence of reduced car use in the over-75 group, likely to reflect self-regulation of use. This group also reduced use of other modes (perhaps through lifestyle choices, or because of health issues). They retain their car though, even if used less, suggesting perhaps that it serves as a mobility aid to overcome some of the barriers to use of public transport they might experience. Access to a car is also highly significant for engagement in formal activity, although not so for informal activity.

BOX 4 EXCLUSION AND COMMUNITY ACTIVITY

Many older people will though face physiological and cognitive issues that might lead to them being unable to drive. This 'driving cessation', is highly relevant to the move to shared mobility discussed below, and is directly considered in one paper included in the submission.

"Examining the process of driving cessation in later life" (Item 4), addresses the change from car use, to potentially relying on other forms of transport to access services, facilities and activities.

Some participants in the study are seen to have a poor understanding of the alternatives, or a lack of engagement with them, whilst trying out alternatives in advance of driving cessation was seen to help people make the transition. Those who made a poor transition might then see constraints on participation, almost a self-imposed constraint on mobility, as others in similar circumstances made more of the mobility options available to them. Conversely, people who planned well in advance of driving cessation were willing to alter travel destinations to reflect new mobility choices and retained some independence. Those who had planned more recently were more likely to be relying on friends and family for lifts, and for some in the study this would extend to include discretionary trips. Adopting such an approach seemed to be dependent on family relationships though, with a reliance on lifts leading to a general reduction in trips for other participants.

BOX 5 THE PROCESS OF DRIVING CESSATION

The EU is seen to be following the US towards growing dependence on the car for mobility (Rosenbloom, 2001), and this mode is likely to "*remain the dominant and safest mode of transport for the elderly*" (GOAL 2012, p15). However, whilst the age at which people cease driving has likely been increasing over recent years, there has also been a parallel growth in life expectancy. Thus, the cohort of older people who have stopped, or who are regulating their driving may just be getting older, and as the older-old increase in number this group may also grow. Declining health will be a particularly important factor here (Mollenkopf et al., 2005, GOAL 2012).

3.2.2 From individual to shared mobility

An important element of the transition away from use of a car is the change from a mode which might be individual, or at least private to the household, to one which is shared with others (i.e. local bus, dial-a-ride, community transport, lifts, taxi). This transition from individual to shared mobility is another conceptual addition explored in the submission, and the diagram developed by the present author to capture it in conference presentations is shown below (Fig 4). In reality driving cessation may be a process, beginning with self-regulation in respect of when and where someone might use a car, before they decide to cease driving. For some though it will be a more abrupt, possibly health-related change, or in response to an incident or accident.

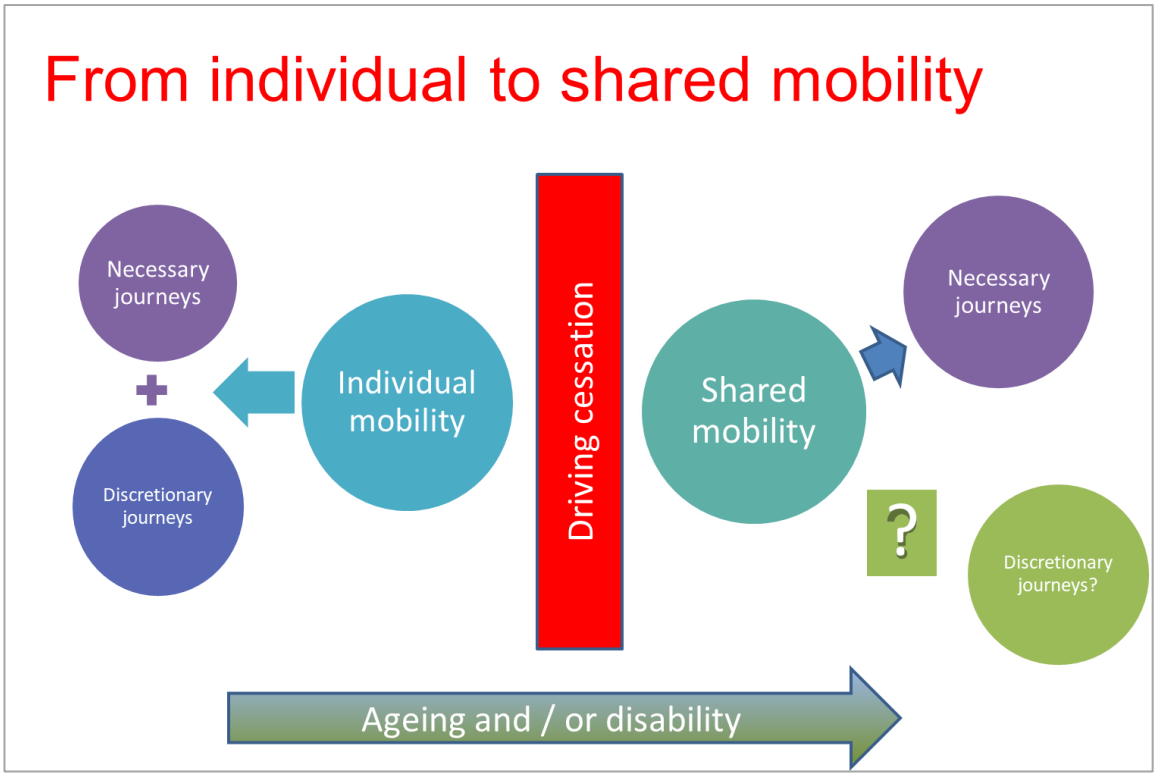

FIGURE 3. THE TRANSITION TO SHARED MOBILITY

(Source: Present author, taken from conference presentation: Missed journeys: The importance of discretionary and social travel)

The key issue highlighted in the diagram is the risk that then arises in respect of the ability to make discretionary trips with shared mobility options. The transition is likely to be an important step for older people, and was explored and evidenced in several components of the submission:

The conference paper and presentation *"Developing community transport as a mainstream travel option"* (Item 8), found that those who had made the transition to community transport saw it as a 'lifeline', and were strong advocates of the service to meet specific mobility needs (often health related). There was the acceptance of less independence as a result of fewer opportunities to undertake journeys to visit friends and family, either because the shared modes did not support such journeys or were just not available at the times when travel was wanted (e.g. outside of working hours Monday to Friday).

Two further conference presentations, *"Missed journeys: The importance of discretionary and social travel"* and *"Shared Transport for older people, a lifeline or a constraint? A case study from rural England"* also looked at the move to shared modes. They explore the situation for older people faced with restrictions on use of a car and note that the alternatives available will require an older person to use a vehicle that is shared. Sharing might mean with just one other occupant, a driver in a taxi, a community car or if being given a lift, or a group of people who may or may

not be familiar. The presentations suggest that this is perhaps an undervalued and important transition and as a consequence of the restrictions it might place on older people's ability to make journeys for social and affective needs (Musselwhite & Haddad, 2010), this may then indicate a degree of losing both control and independence.

A later presentation, "*Home or away? Making a link between mobility, the geography of activities, and the wellbeing of older people"* developed the arguments above by exploring how the activity space within which older people are able to make journeys may be (artificially) constrained by limited mobility resources, thus undermining the very purpose and intent of shared, community-based mobility services. This drew on activity space mapping carried out with participants in GaPL, which produced clear evidence of differences in the scale of people's activities. This could have further implications in respect of interactions with other people – and the creation of social capital.

BOX 6 MOVING TO A SHARED MODE

An example of how the transition might affect older people can be seen be looking at volunteering – a formal activity. As already noted, older people are very involved in these activities, and ceasing to drive could lead to people spending significantly less time in doing such work (Liddle et al., 2012, Curl et al., 2013). Not being able to engage in volunteering (or other activities) could then potentially accelerate decline in physical (and emotional) health (Chihuri et al., 2015).

3.2.3 Shared mobility policy responses

The Bus as the solution: One commonplace rural mobility policy has been the provision of public transport, and in particular local buses. However, low population density, and high levels of rural household car ownership mean services are unlikely to have commercial viability. More generally, public transport is criticised for not being affordable, flexible, convenient (Broome et al., 2009), or accessible (Zeitler & Buys 2014). The concessionary pass[9] has removed a financial barrier to bus use for older people but does not help if there are no viable (and accessible) services to use (*Shergold & Parkhurst, 2010). Buses are also less likely to meet more spontaneous travel needs, for informal activity, visiting friends or just going out to enjoy environment. Where services look to cater for older people they will be oriented

[9] For some years a benefit for all aged 60 and above, the pass is now only available at state retirement age (currently 65, but rising to 66 in 2019 and 67 by 2028).

towards 'serious' needs (Davey, 2007) – such as healthcare and shopping. The evidence for the role and future for local buses was considered in two elements of the DPhil submission:

The conference presentation *"Re-imagining the bus: Public Transport in a world of Falling Subsidies and more Complex Demand*", highlighted the pressures felt by local bus services, not least in rural areas. These included declining passenger numbers, declining public subsidy, and increasing commercial pressures (fuel and labour costs). There were seen to be opportunities from new technologies, and operating practice, and the study identified more co-operative networks, and multi-layered mobility solutions as areas where enhancements might be seen. It concluded that the traditional 'big bus' solution seemed to have a limited future in a rural context, with more flexible solutions such as demand responsive transport (DRT) offering benefits in terms of service efficiency, and economic viability.

Buses were also considered directly in the project report *"Out-of-home mobility for older people in Gt Fishponds: Issues and opportunities"* (Item 12). This urban study uncovered declining bus services also retreating to the main radial routes into the city centre, and loss of services in residential parts of the district. Those that remained offered a limited frequency (hourly), making journeys to the GP for example potentially inconvenient, and longer (depending on appointment times). Some new services were operating to provide a link to the nearest hospital, but their future was uncertain due to the funding environment. Buses were seen to be a poor option for making discretionary trips.

BOX 7 THE ROLE OF LOCAL BUSES

The ten years that cover this submission have run in parallel to the financial crisis of 2008 and the following years of 'austerity' in the UK. This has led to concerns that funding reductions leading to cuts to bus services will significantly impact on older people's ability to make discretionary journeys, such as meeting friends and being involved in social activity (AgeUK, 2013b). This may mean a perceived choice for older people of paying for mobility (e.g. a taxi) or foregoing 'important aspects of social life' (ibid). In many places, participation in social activities for older people might stop in the evenings and at the weekend because of a lack of transport, a situation evidenced for participants in the Painswick, Norfolk and urban Bristol studies undertaken by the author and described here.

DRT – a brief encounter: For a short period in the early 2000s, there was limited funding available to try a different approach to rural public transport: demand-responsive services.

These were often facilitated through Rural Bus Challenge funding[10], allowing rural authorities in England to set up schemes to support travel in their communities. One such scheme operated in and around the village of Painswick in Gloucestershire (for details see Item 1) and provided the opportunity for a study focussed specifically on the ability of older people in that area to access healthcare facilities (particularly those that might have limited or no access to a car).

The paper *"Operationalizing 'sustainable mobility': the case of transport policy for older citizens in rural areas"* (Item 1), identified that the older old, and those without access to a car were at risk of exclusion from health services. The provision of the DRT service illustrated, though, that transport solutions can come with both sustainability benefits and costs. The minibus had less environmental impact than a full-size bus would have had, but it was operating with very low passenger numbers – and most likely a taxi-sized vehicle would have been more sustainable.

The DRT service did though provide inclusion benefits, reaching areas not served by buses and with no restrictions on journey purpose, it was supporting social sustainability needs through providing more accessibility. However, funding for the service was time-limited and, as in many other instances, it was not commercially viable at the end of this period and was withdrawn. The replacement dial-a-ride type service also operated minibuses, but to more restricted destinations, thus reducing accessibility.

BOX 8 THE POTENTIAL OF DRT

A small number of rural DRT services have survived in the UK, but most have had to change to a combination of fixed and flexible routes or moderate the degree of flexibility provided – only picking up on a specified route, for example. Whilst conceptually the DRT approach seems to offer much for the inclusion of those with mobility shortfalls in rural areas, the costs are seen as prohibitive in the current financial climate.

Community Transport – a rural mobility lifeline: Another alternative for older people in rural communities is community transport, particularly at a time when reductions are being seen in commercial services in these locales (The Campaign for Better transport, 2018). Community transport services can though be constrained by the availability of volunteers and vehicles, and this mode is also competing with bus services for funding at a time when local authorities have to consider transport and accessibility issues for their populace in a context of declining state funding.

[10] UK Government funding for new rural bus services aimed at tackling social isolation. £250m made available to approximately 40 local authorities during the period 2001-2004.

The opportunity arose to better understand community transport as a policy option through the GaPL, Norfolk and urban Bristol studies included in the DPhil. The majority of users of these services were older women, who would be classified as older-old[11], and who did not have access to a car. Most journeys made were either for health, or for social and shopping purposes:

The conference paper *"Developing community transport as a mainstream travel option",* and project report "*Research into the health and wellbeing benefits of community transport in Norfolk"* (Item 9), *identified* that community transport was an important component within the rural Norfolk transport mix, often providing 'essential' mobility for those least able to find it elsewhere. It operated at many levels, from a very local car-based service to larger minibus-based schemes.

Users (and stakeholders such as the National Health Service) across the study perceived health and wellbeing benefits as a result of being able to use the services. Whilst in general, people were able to make necessary journeys; they acknowledged problems in making discretionary trips (particularly for social and leisure purposes).

The project report *"Out-of-home mobility for older people in Gt Fishponds: Issues and opportunities"* (Item 12), found that community transport was well used in the study area, but that operators were often unable to meet demand. Some people reported problems of service availability, particularly in respect of reaching evening appointments at the nearest hospital, and thus beyond operating hours for community services. To attempt to remedy this, operators were beginning to introduce charged services (at a level to cover costs), focussing on some necessary journeys such as to hospital. An experimental scheme was also underway, which left vehicles on the street that could then be booked and used by community groups for provision of more discretionary travel.

BOX 9 THE ROLE OF COMMUNITY TRANSPORT

Lifts, taxis and ride-share: Lifts from family and friends were seen to play a role by participants in the GaPL research, and literature suggests their use in rural areas is widespread (Gray et al., 2006), and that some older people rely on them (Zeitler & Buys, 2014). Lifts are, though, subject to time constraints (particularly if reliant on family), and older people may be reluctant to be a burden on others. For some, discretionary travel, (solely for enjoyment and sometimes unplanned) is not seen as a legitimate reason for approaching family and incurring obligations

[11] Older-old in this instance was those aged 75 and above. The meaning of this term is interpreted as a range of ages, 75+, 80+ and 85+ by different authors. *Shergold (2019b) has a fuller discussion of this.

to friends (Davey, 2007). Consequently, lifts may only be contemplated for 'necessary' trips – although even here there may be issues of 'privacy' to overcome in respect of healthcare visits.

Taxis have the potential to offer similar levels of flexibility as a private car but may be difficult to access and expensive in a rural context (if the vehicle needs to travel from a neighbouring town for example). 'Discretionary' travel is also not seen as a reason to spend so much money on a taxi (Davey, 2007). Recent innovation in taxi-style services, with lower fares may herald a different perspective in the future though.

The project report *"Research into the health and wellbeing benefits of community transport in Norfolk"* identified a reluctance to use taxis based on costs of service, and concerns over unfamiliar drivers (particularly those coming from nearby towns who may also have been of non-UK nationalities).

The conference presentation *"Do we need an 'Uber' for older people in rural communities? Exploring the impacts of reduced car access on out-of-home mobility through the lens of activity theory"*, directly addressed these issues. It looked at the potential for new models of transport provision to support older people's engagement in activities in a UK rural context – and what this might mean for their wellbeing. Note: There was no suggestion that some of the negative employment aspects of a service such as Uber were desirable, more that a technology-based solution drawing on existing transport resources might help address shortfalls in rural communities. It again drew on the GaPL dataset, this time with a specific focus on a range of questions exploring activities (solitary, informal and formal). Based on this analysis, it discusses how new models of transport provision, flowing from the 'sharing economy'[12] model (car clubs and services such as Uber for example) might have a role to play in facilitating transport for older people in rural communities in the future.

BOX 10 NEW MOBILITY CHOICES

3.2.4 Active Travel (walking and cycling) and the local environment:

As well as the shared modes discussed above, active travel was also considered as an option to fulfil mobility needs in several of the projects in the portfolio. Putting to one side leisure or holiday related trips, active travel is more likely to offer a solitary as opposed to shared means of mobility in terms of accessing services, facilities and activities. In most cases this is likely to

[12] The using and sharing of products and services among others as opposed to individual ownership. (Puschmann & Alt., 2016.)

be an option more appropriate for relatively short journeys or maybe part of a combination journey involving other modes (buses for example).

Health[13] and confidence issues were seen as important potential restraints on this option, and the characteristics of a neighbourhood may also constrain active travel modes (Broome et al., 2009). This latter issue was identified in the Painswick, GaPL and urban Bristol studies.

The paper "*Operationalizing 'sustainable mobility': the case of transport policy for older citizens in rural areas*" (Item 1), noted the issues faced by older people in reaching bus stops in a rural context, with the need for seating, street lighting or even just a pavement to walk on. The terrain can also be important (this study in the Cotswolds), so even if transport services exist they may be impossible to access.

"*Rural car dependence: an emerging barrier to community activity for older people"* (Item 2), noted that walking and cycling are seen to be options, and that 60% of community activity is taking place within 1.5km of older people's homes. Walking in particular was as common a mode for trips as the car in this sample, but there are barriers, in respect of capabilities, fear of falls, lack of infrastructure (pavements, lighting), as well as safety concerns related to walking on rural roads,

"Out-of-home mobility for older people in Gt Fishponds: Issues and opportunities" (Item 12) found that walking was seen to be problematic away from areas such as shopping streets. Natural and built environment features can create barriers to walking, and poor maintenance of pavements and other walking routes also act as a deterrent to walking. For older women in particular there are also safety concerns about walking after dark, which discourage this practice.

BOX 11 ACTIVE TRAVEL AS A MOBILITY CHOICE

3.2.5 Key findings and policy implications

Across the submission, a broad range of new evidence has been produced on the issues faced by older people in respect of out-of-home mobility in a rural (and more recently urban) context in the UK. In particular, these issues are seen in respect of discretionary travel, especially for

[13] The UK *National Travel Survey* suggests that 30% of individuals aged 70 and over had problems walking or using a bus (DfT, 2017a) and make almost 50% fewer journeys on average as compared to those without mobility problems (DfT, 2017b).

those who have moved from individual to shared mobility. Highlights from these findings are summarised in Figure 4 below.

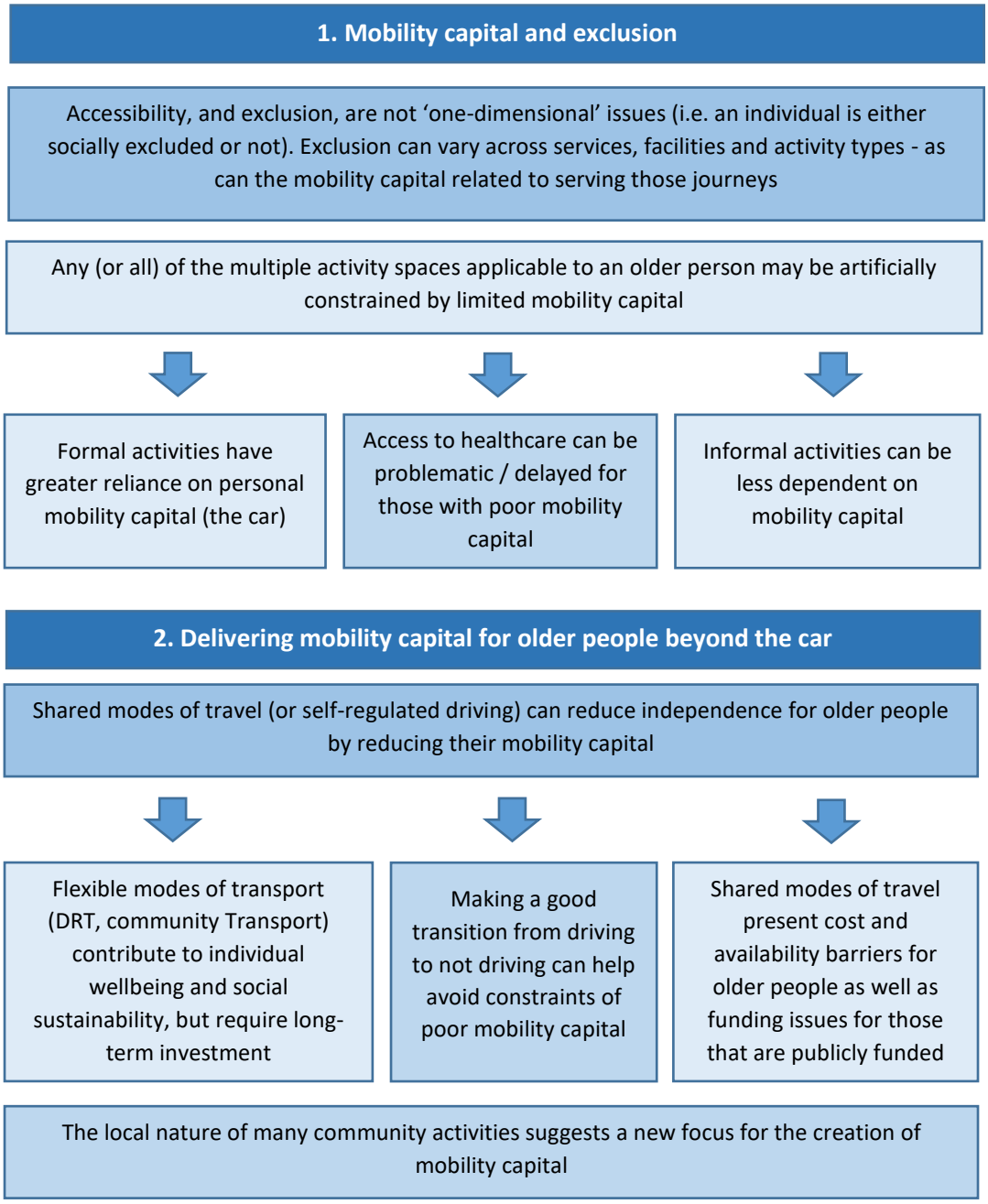

FIGURE 4 FINDINGS FROM THE EMPIRICAL RESEARCH

The first key findings relate to the nature of the relationship between exclusion and mobility (capital), and the second to the mobility experience of older people in the UK in recent years. In respect of the former, the evidence has highlighted that exclusion is not a simple binary condition, and that access to resources and activity types may vary, influencing the ability to reach and engage with them. What this suggests as well is that there is not necessarily one activity space relevant to an older person, there may be multiple spaces, reflecting the mobility

capital available. So, for example, a car may be available in the daytime for necessary trips to health resources, but not driven after dark and this in conjunction with limited shared transport might mean exclusion from social activity.

More generally, discretionary travel can be problematic, but within that categorisation, there are nuances in respect of formal and informal activities - the latter proving to be counterintuitively more prevalent amongst those seemingly with poorer mobility capital. In respect of the lived experience of older people in the UK, confirmation is seen of the importance of the car as a mobility resource, and problems seen in the move to shared modes of travel. Perhaps one of the most important factors seen though is that many activities are taking place relatively locally.

All of these findings have important implications for policy, practice and funding (see section 5.1 for a summary). They emphasise that the mobility needs, and capital of older people are not homogeneous, and that responses to those needs will require more nuanced solutions to be developed. Large-scale, top-down approaches are unlikely to be successful, financially or in terms of delivering mobility. Providing local-mobility, within a community seems to be a key enabler of some activities but may not be a current focus of transport spending, and the benefits from steps such as new pavements or seating not seen in this light.

3.3 New technology as a solution to mobility shortfalls for older people

The third area where this submission has generated new knowledge from empirical research is in terms of looking forward to the potential for new technology to address the exclusion of older people. This has included ICT solutions that provide virtual mobility, assistive technology (AT) which can help older people to stay living in their own homes, and smart mobility, particularly forward-looking technologies now in development such as autonomous[14] or driverless vehicles. Understanding how older people might use such technologies and the potential impacts on the necessary and discretionary journeys they make will provide important evidence as to whether these solutions might better address the social justice issues at the heart of this submission.

3.3.1 Virtual journeys

There is now the opportunity to avoid travel by using ICT and online services; this is not a panacea though, potentially requiring technical knowledge and financial resources. Importantly, it also fails to replicate physical co-presence, which may prove to be an important factor for

[14] Whilst increasingly sophisticated technology will increasingly assist (older) drivers, it is only when vehicles can perform the driving function without human input that they will be autonomous.

many older people (and for social capital). Virtual mobility does present problems for some in the older population, who are not familiar with, or comfortable using, potentially complex new technologies. This was witnessed in the GaPL study, where some interviewees had access to the video-messaging service, Skype[15], facilitated by their children. They were though often-reluctant users, particularly those without earlier experience of ICTs, and the older-old. This highlights a potential 'digital-divide'.

"Mobility solution or new grey divide: an analytical review of the role of self-driving cars in an ageing society" (Item 7), makes the argument that the digital divide is actually more likely a 'grey' divide, as technology use is found to be common in those in their 50s, 60s and for some in their 70s. There does though appear to be a fall in use of all technologies currently for the older-old, aged 80 and above. This is evidenced by use of the internet, smart phones and the mobile internet, all of which are currently key components of accessing virtual services and communities. There are many potential reasons for the grey divide, not least physiological and cognitive decline in later life, but also a range of attitudinal and experience factors that mitigate against the use of virtual alternatives to mobility.

BOX 12 THE GREY DIVIDE

Whilst ICT offers a physical alternative to a journey there are other conceptualisations of non-physical mobility which emerged from the GaPL interviews, and which are explored in the book chapter *Parkhurst et al (2014).

"The 'continuum of mobilities' conceptual framework for understanding the transport needs and aspirations of rural elders" (Item 10) explores connectedness for older people in a rural context in respect of higher-level psychological experience as well as for physiological needs. The result is a continuum of ways in which connectedness might be perceived and expressed, from physical and virtual mobilities, to 'potential' and 'imaginative' mobility. Whilst physiological and economic needs are seen as important, an over-emphasis on these motivations for mobility may under-value the wider importance of being connected. It is possible to see how potential and imaginative mobility may provide individual benefit (wellbeing) but a relationship to social capital and social sustainability is more challenging.

BOX 13 CONTINUUM OF MOBILITY

[15] Skype was popular at this time, and relatively unique as a service. Social media use was less prominent in interviews, although Facebook was mentioned by a few participants as well.

These potentially remove the need for physical mobility at all, but wider impacts on community cohesion require further study.

3.3.2 Assistive technologies – impacts on social practice and the need to travel

The elements of the model developed in 3.1 above also need testing against other important emerging technologies relevant for older people – including the field of assistive technology (AT). People in the UK (and across the world) are living longer, but for many a part of that time will be spent with one or more health conditions associated with later life to manage. Assistive technology (AT) is promoted as a potential aid here, embracing a wide range of personal and domestic needs, with many solutions predicated on access to the internet. Other AT products directly address the need to remain in contact with 'community', although at present the focus is more on communications than out-of-home mobility. It is feasible to see how this may impact on travel patterns and travel demand.

The paper *"Future mobility in an ageing society – where are we heading?"* (Item 5) explores the potential future role of AT, looking to understand how and where older people will live in the near future (to 2030) and how this might affect patterns of mobility and levels of travel demand. The paper finds that, depending on levels of AT deployed, there might be new demand for 'shared' collective transport (as opposed to individual modes such as the car). There could be more engagement in active travel – particularly if walking and cycling resonate with the notion of 'ageing well'. It is also feasible that older people wouldn't need to travel when AT provides links to 'community', and technology can substitute for some journeys made now.

The conclusions drawn are that whether AT helps, or instead just creates a new set of mobility injustices, will depend greatly on how society chooses to deploy and use the technology.

BOX 14 THE ROLE OF ASSISTIVE TECHNOLOGY

3.3.3 Smart mobility as an assistive technology

The final area of technological innovation considered in the DPhil is the range of changes occurring in transport provision under the banner of smart mobility. Individual technologies might concern travel information, ticketing, or matching transport supply to demand, and commonly the functionality is accessed via the internet, or a smartphone-based app. Perhaps the most advanced potential technology is the autonomous vehicle, with the fully 'driverless car'[16] particularly relevant here. These could hold great potential for those older people who

[16] Vehicles with high levels of automation in the form of driver aids would not provide the same solution, as they would still require driver input at some point.

restrict or give-up driving to remain independently mobile (Kreuger et al., 2016), as well as relieving pressures on family and friends giving lifts to cover mobility shortfalls (Harper et al., 2016). The opportunity to consider these issues in light of the model presented in Section 3.1, and activity theory has emerged through participation in the Flourish project (2016-2019) which examined future use of these vehicles by older people.

The project report *"The mobility of older people, and the future role of Connected Autonomous Vehicles"* (Item 11), found that older people seem willing to embrace a range of technological aids and assistance in vehicles (particularly related to safety), but have less appetite for driverless vehicles at present. This finding is though often based on polling amongst those who are not yet aged 70 who are likely still active users of their own cars.

Although (current) driver aids and assistance technologies support continuing to drive, physical and cognitive impairment can impact on how often, where and when journeys are made.

Those who will be in their 70s and 80s in the coming two decades expect to continue to be mobile in later life, believing they will continue to drive. Women, though, are more likely to be thinking that they might have stopped driving by the time they reach the age of 80. For those approaching retirement, transport and mobility are not seen as important issues, and are not necessarily elements of location decisions. There appears to be a similar shortfall in planning the transport network(s) of the future to support a growing older population (who may experience mobility restrictions).

These findings suggest that mobility-shortfalls will likely continue for many of the older-old, and that current technologies do little to prevent this – with commensurate implications for individual wellbeing and community cohesion.

BOX 15 AUTONOMOUS VEHICLES AND OLDER PEOPLE

A series of workshops exposed older people to the potential for driverless vehicles and offered a timeframe in which such vehicles might appear on the streets. In response, participants provided not only information in response to these questions, but also in respect of how they would want to interface and interact with vehicles.

The conference presentation "*Autonomous vehicles; an answer to the issues of giving up driving or a new technology divide?"*, and project report "*Findings from Workshops held with Older People considering participating in Connected Autonomous Vehicle trials"* (Item 13), explored some of the perceived benefits of driverless vehicles for older people. For example, in addressing isolation, and making it easier to access healthcare. Older people could see a range of journeys

they might make (necessary and discretionary), and importantly highlighted three mobility shortfalls they could see being resolved with driverless vehicles. Journeys for those that do not currently drive, replacements for journeys not made at present for health or confidence issues, and new journeys to visit things and people that are either inaccessible or not visited currently. Journeys proposed as illustrations of these categories were almost always 'discretionary' in nature.

A further conference presentation "*Smart mobility, delivering an assistive technology or creating a digital divide?*" looked at the likely residential location decisions of older people in a world of driverless cars. Would it encourage greater migration on retirement to rural and coastal areas - with potential issues for services and community structure(s) in those areas, for example? In particular, this presentation considered what these vehicles might mean for activity spaces. Whereas those suffering mobility shortfalls might see a contraction of their overall activity space as they age, and perhaps particularly that part of the space reflecting discretionary travel. The arrival of these vehicles might radically change that outcome.

The final paper in the submission, *"Mobility solution or new grey divide: an analytical review of the role of self-driving cars in an ageing society"* (Item 7), builds on the preceding presentations, and responds to the social equity and sustainability aspects of mobility for older people. Smart mobility is seen to provide the physical wherewithal to access and be part of the community (e.g. through discretionary journeys), contributing to, and creating social capital in the process. Driverless vehicles then in effect become part of the 'motility capital' discussed earlier, providing the potential now to access anywhere (cost permitting of course). This will be particularly important in a rural context, with more dispersed services and facilities (including social spaces such as pubs), and a growing population of older people. It may also mean that with no need to make a final move to a more accessible location, greater numbers of older people retiring to amenity locations will choose to remain there – supported by AT. The paper also finds that there is real potential for creating a digital divide in respect of the use of AT and driverless vehicles, and it is not between younger and older people but more likely between the younger old and the older old. Evidence reviewed suggests a drop off in the use of technology for those in their late 70s and 80s, just the time when people are likely to be limiting or ceasing to drive.

BOX 16 SMART MOBILITY AND FUTURE MOBILITY

3.3.4 Conclusions

What has emerged from the two projects looking to the future is that new technology has the potential to be a disruptive influence on a range of factors that might affect an ageing

population. Whether this is in respect of AT or driverless vehicles these new technologies have the potential to impact living patterns, location decisions and travel behaviours. However, technology is not a panacea, and it will not necessarily provide all of the same benefits that physical mobility can bring, particularly at community level.

It is also important to consider cohort affects and the current experience of those who will be the older people of 2030 and 2050. It could be argued that those in their 40s and 50s now have a greater understanding of technology, and thus will be more likely to use it in their later life than current cohorts of those in their 70s and 80s. However, the counter argument is that technology is always changing, and what people experience in their younger life will not be what might be available in their later life - so the issues will persist. See *Shergold (2018b) for more discussion of this topic.

Amongst the smart mobility solutions being developed at present, driverless vehicles are attracting interest for the role they might play for older people (hence the Flourish project). They have the potential to address shortfalls in mobility, particularly discretionary travel, and could lead to more travel by older people (Harper et al., 2016) and more discretionary trips for Flourish participants. There are though differences in the views of the older-old and those in their 60s and 70s, the former looking to replace current mobility options with autonomy now. Driverless vehicles could then provide significant motility capital, with implications for engagement in activities, and access to services. They may also disconnect access and mobility from residential location decisions - enabling older people to remain in amenity locations, although this will have implications for other services such as healthcare.

There are then important policy implications that flow from these coming technological changes. Most prescient of these is the need to plan for how as a society these impacts may be managed to achieve the optimum benefits - including in respect of social justice and social cohesion of communities. Without this, there is a risk that technology will be the driver of change, with potentially unforeseen and unhelpful consequences. As part of this planning process, thought needs to be given to issues such as who is providing mobility services, what role might the state play, whether private ownership still has a place, and who will pay for services - particularly in rural contexts. However, as highlighted in the submission, there is also the key issue of dealing with the potential grey-divide. As is also evidenced currently, existing technologies do little to maintain mobility for some groups in the older population, for example the older old, or those who no longer drive (often older women). Without investment into better means for the older-old to interact with technology there is a risk that the perceived benefits will not materialise – and mobility shortfalls for this group in society will continue.

3.4 Reflections on the three contributions

The new conceptual model described above offers an alternative framework within which to consider the out-of-home mobility of older people, exploring benefits at both an individual and community level. This model has informed and been further refined by the research with older people that forms the second contribution of this submission. An important element of this refining of the model has been the disaggregation of older people's travel into necessary and discretionary trips, and the classification of the activities they are undertaking. These steps have led to additional findings emerging around particular journey types.

Whilst the model was conceived as a reflection of issues in rural communities, the evidence collected in this submission finds similar mobility shortfalls in urban contexts as well. This supports arguments that travel for discretionary purposes is problematic, especially for those who have moved from unfettered access to individual private mobility (i.e. a car) to some form of shared resource (e.g. a bus). The evidence also illustrates that exclusion for older people is not a simple binary condition and mobility capital may vary from one activity to another. Such findings are highly relevant for policy and suggest heterogeneous responses – often at a local level are likely to be appropriate.

The submission also looks forward, exploring new technology, in particular driverless vehicles. The conceptual model again provides a framework within which to reflect on the potential of what will be a new form of mobility capital. Using the model and the findings from the empirical work has helped give additional weight and clarity to outputs considering how such technology might resolve mobility shortfalls.

Bringing the three contributions of the submission together will contribute to better understanding of contemporary mobility issues for older people. It will also help inform effective future responses to their needs. Such responses will bring benefits to individuals and their communities and help to address social justice issues and improve community cohesion.

4 Research methodology and methods

This section briefly considers the research strategies and methodological and data generation approaches used within this submission. It then critically reviews research activity in each of the six underlying studies, noting key lessons learned from each.

4.1 Research strategies

The six projects underpinning this submission were unconnected in respect of their commissioning and execution and adopted independent epistemological positions. For some of the projects, these positions derive from the lead discipline in what were multi-disciplinary teams (e.g. social gerontology in GaPL, and Psychology in Flourish). Working in such teams introduced a challenge then in respect of what knowledge was sought, and how it might be generated, aspects likely to be shaped by the disciplinary traditions of those leading the work. This can also be beneficial though, with activity theory from social gerontology providing an opportunity here to develop new understanding across disciplines.

For the purpose of data generation for this submission it has been necessary then to adopt a research strategy that spans across the six projects. This strategy has taken a critical realist perspective of exploring individual's behaviour within the framing of social structures which will influence their behaviour (Sayer, 2000). In this instance the structures are transport, ageing, and rurality. Critical realism offers several benefits to the studies here. It has allowed them to move beyond subjective and socially located knowledge to provide access to real life (Madill et al., 2000). It is also seen to be well suited to exploring research questions that relate to understanding complexity (Given, 2008), a situation manifest at the nexus of mobility, ageing and rurality. A critical realist approach also supports both qualitative and quantitative methods, facilitating collaboration between the approaches (Maxwell & Mittapalli, 2010). It does though need the issues being explored to be well understood, with risks to the quality of knowledge created if this is not the case (Given, 2008). Mitigation of the risk has been helped here by repeated immersion in the extensive body of literature in the topic, and because five of the six projects in the submission have been able to build on the knowledge gained in earlier studies.

As discussed elsewhere in the portfolio there is great heterogeneity across the group labelled older people, and it has been important across the six projects to try and engage with key groups who will be able to inform understanding. Existing literature, and the earlier projects here have identified the older-old and older women as important, as well as self-regulating drivers. One of the key benefits emerging from the number of studies included in the portfolio is that a

significant sample size has now been achieved, which facilitates meaningful comparisons to be made (Given, 2008). In GaPL for example, the selection of individuals with similar socio-demographic profiles, but with different outcomes provided an opportunity to make case-based comparisons that helped illuminate key issues (ibid).

It is accepted that research and researchers cannot be fundamentally free of values (Hammersley, 1995), and it was important in these studies to avoid the imposition of the researchers' preconceptions or ideology on reality (Given, 2008). It is also acknowledged that the (qualitative) data being analysed, and the analyses themselves are subjective, and both may be subject to 'perspectival subjectivity' (Kvale, 1996: 212). To mitigate these issues, there has been an attempt to be reflexive about the research and on assumptions made in the portfolio. This is perhaps particularly pertinent for the earlier research activity, when transport-related exclusions and sustainability issues were more to the fore in society, and particularly so for the author.

In accord with the critical realist approach noted above, the approach adopted across the projects in the submission has attempted to draw value conclusions directly from evidence (Hammersley, 2010). The research strategies pursued here have set out to establish a reality of mobility disadvantage (for individuals and their communities), in order to produce knowledge that might make a difference (Stainton Rogers & Stainton Rogers, 1997). There is also an intent through the work in this submission to conduct research that will inform social commentary and social action (Flyvbjerg, 2001). Adopting such an approach very much accords with the author's perspective on the role of evidence in policymaking (and more generally in making the world a better place). This perspective very much informed perhaps by several decades' engagement and endeavour with the environmental NGO Friends of the Earth (who pursue an evidence-based philosophy in campaigning), and an earlier career in software development – a science firmly rooted in clear, logical cause and effect. Critical realism is not though without critique as an approach. In particular the 'value judgements' made by researchers in respect of the inference of what is 'wrong' in a situation, and in what they might believe to be the truth in evidence (Hammersley, 2010). It is also suggested that many people would reject many of the value assumptions made in such research, and thus their validity should not necessarily be assumed (ibid). Consequently, there will not be a direct route from factual evidence collected in research to value conclusions; it will rely on value assumptions. Such critique of researcher (and societal) values is further nuanced in relation to rural aging, as the travel horizons and expectations of older people in these communities may be lower (Farrington and Farrington, 2005) – and moderated because of other perceived benefits of living in such a location.

4.2 Research Methods

Each item submitted as part of the DPhil portfolio contains a discussion of the methods used and sampling, so this section will offer a reflective overview, rather than repeating that detail.

What is consistent across the projects is the use of mixed-methods, combining quantitative and qualitative research in each study. Benefits of such an approach are the opportunities to gain a greater depth of understanding (Johnson et al., 2007), to triangulate findings (Greene et al., 1989) and to explore different facets of an issue (Bryman, 2006). It has also meant that any weakness in one method will have been offset by strengths in others (ibid). It is also argued by Plano Clark & Ivankova (2016) that there is that there is a social justice rationale for taking this approach, as it can potentially give voice to those who are marginalized whilst producing results that are credible to different stakeholders.

Qualitative methods were used in all six studies, for the insights such data could offer into the experience of mobility and connectivity, and also to deliver the views of those that provide mobility services - key informants in the discourse here about insufficient mobility. Qualitative research offered to provide detailed descriptions of experiences as well as enabling the development of theory and held the promise of giving voice to people (Braun & Clarke, 2013). In respect of the qualitative data, an inductive approach has been followed, and theory built and modified from the data. There is also quantitative research data in the portfolio, as this provides the opportunity to test hypotheses (for example around activity theory), and to compare groups (e.g. under and over age 75 drivers). It would be possible to replicate this test if the same questions were asked elsewhere.

Sometimes the methods have been sequential (for instance in GaPL the survey preceded the interviews), and others concurrent – with both quantitative and qualitative research happening at the same time (the Bristol urban study and Flourish). Using mixed-methods creates a plurality of data sources and offers the benefits of both types of data. Both approaches can be used to collect data on a topic, to provide comparisons. Qualitative work can also inform quantitative instruments or be used to probe results from quantitative activities - all approaches used in the portfolio. There are potential issues that need to be managed, not least the time and effort involved in sequential work, but also important concerns in respect of data and analytical compatibility.

The data-collection approaches used in the studies underpinning the submission are detailed in Table 4 (projects in chronological order). This is followed by a short critical reflection on each. All data collection was undertaken by the author, except for the GaPL doorstep survey (collected

by a market research company), the driving cessation study, the Norfolk community transport survey (collected by operators) and one workshop for the Transport and Technology project. All analysis was by the author (bar the driving cessation study). Each project also entailed literature review and synthesis, and conceptual development of research approaches and instruments. Other skills developed during these projects includes GIS analysis and mapping, statistical techniques, interviewing, leading focus groups / workshops, participant recruitment, and use of analytical techniques and software for both quantitative and qualitative data.

TABLE 5. METHODS IN DPHIL PROJECTS / PUBLICATIONS

Project (Publications)	Methods used	No of Participants	Analysis
Painswick DRT study (Item 1)	Semi-structured interviews with stakeholders – 20-50 mins	3	Simple thematic analysis
	Ride-along in DRT vehicle: Conversations with driver and passengers	3	Simple thematic analysis
	Analysis of local Newspapers / Parish magazines etc.	-	Descriptive analysis
Driving Cessation (Item 4)	Semi-structured interviews – 60 mins, focus groups travel behaviour diary	21	Thematic analysis
GaPL (Item 2, 3, 6, 10)	Household doorstep survey	920	Descriptive, Statistical tests of inference (incl regression analysis)
	Interviews with individuals – 60-90 mins	38	Thematic analysis (Coded in Nvivo)
Norfolk study (Item 8,9)	Stakeholder interviews – 20-30 mins	25	Thematic analysis
	Workshop with operators – ½ day	30+	Descriptive
	Focus group(s) x 2 – 1 hour	7 + 11	Thematic analysis
	Passenger questionnaire (community transport users).	350	Descriptive, Statistical tests of inference.
Transport and Technology (Item 5**)**	Scenario workshops with stakeholders	17 + 30	Thematic and descriptive analysis

Bristol Ageing Better study (Item 12)	Stakeholder interviews – 20-30 mins	10	Simple thematic analysis
	Discussion at 'Lunch club'	12	Simple thematic analysis
	On-street survey	10	Descriptive analysis
Flourish Mobility (Item 7, 11, 13)	Workshops / Focus groups: Five events – 2 hrs each. Data collected on individual qualitative worksheets	87	Mainly descriptive responses, (limited quantitative data)
	Semi-structured interviews – 20-30 mins	14	Simple thematic analysis

All projects complied with University of the West of England ethics requirements - all ethics submissions were either completed or part completed by the author aside from the Transport and Technology project which the previous researcher undertook.

4.2.1 Painswick DRT Study

This was the first significant research activity involving transport and older people undertaken by the author and involved the first interviews of participants and stakeholders in a study. Limited prior experience of interviewing for academic research is likely to have made initial interviews less informative, although they provided very useful experience - beneficial in several follow up conversations with a key informant in the health service. The Painswick work also provided an opportunity to gain experience of using GIS as a tool to interpret data. In this instance, census data were successfully used to map access to transport, and to highlight areas of potential need. Whilst the empirical data collected in the project provided some important insights around access to healthcare and mobility in the study area, the limited nature of the study meant the published output from the study focussed more on issues arising from policy.

Key lessons: The importance of gatekeepers and key informants, and matching expectations on data collection to goals set in research questions.

4.2.2 GaPL

The doorstep survey provided information on a very wide-ranging and comprehensive set of questions about living in a rural community, including mobility and community activity. The tiered levels of rurality and the mirroring of study locations between SW England and Wales also helped make this a very useful dataset to explore the themes of exclusion and community cohesion in a broader rural context. There were some minor drawbacks with the sampling, in a few instances near neighbours took part, and there were one or two occurrences of a husband

and wife at the same address providing data. The sample also had a bias towards rural residents living in larger settlements (over a thousand people), and to car drivers. This may have led to some homogeneity in the sample, (discussed in the statistical analysis in the journal paper exploring activity theory with this data – *Shergold 2019a).

Survey participants provided the pool for the qualitative interviews, although the time delay between the survey and interviews was quite significant (up to 12 months). This meant that some had forgotten about GaPL or were no longer interested in the study, and a small number were no longer sufficiently healthy to participate. Potential interviewees were selected using a matrix of socio-demographic and mobility factors. The same approach was used in each of the six areas, to allow comparison at each level of rurality, and between England and Wales. Although seemingly a large sample, there were only 150 people in each area, and far fewer willing to participate in further research, meaning limited numbers potentially available (particularly non-drivers), and even fewer actually available. This necessitated additional recruitment for top-up interviews with non-drivers from outside of the original sample.

All of the research questions (and sub-questions) were captured in a matrix to help design and populate the interview schedules, and this also generated a coding structure for use in Nvivo analysis software. Whilst generally this worked well, it did produce several hundred predetermined coding points, as well as the many dynamic ones that emerged during analysis. This meant that the analysis process became somewhat rigid at times, and it became very time-consuming trying to fully address the coding framework.

These were also the first lengthy (up to 90 minutes), semi-structured interviews undertaken by the author. Again, the process improved rapidly with experience, generating more follow up questions and probing lines of enquiry, highlighting a benefit of using this approach, flexibility for adaption in the field. At times, three interviews were conducted in a single day at disparate home locations in rural areas, and this was also a useful lesson in what can be achieved realistically by a researcher. This data was also anonymised, and submitted to the ESRC Data archive, allowing use by other researchers.

Key lessons: The need to be aware of the capabilities of older research participants (and researchers), and to be realistic about the analytical framework to be applied to the data. In this instance the framework needed to be more flexible, and the large and detailed coding schema based on it meant there was insufficient time to complete and use it. Notwithstanding these issues, the data generated and analysed here has provided a very rich qualitative and quantitative resource underpinning three of the papers in this portfolio.

4.2.3 Norfolk Community Transport (CT) study

This project also collected a significant set of data, this time around the use of and benefits of community transport in a rural context in the UK. Particularly useful were the insights it provided into the types of journeys people were making - or could not make.

Aside from the workshop and focus groups, much of the data collection here was carried out remotely (e.g. phone interviews) or by operators of community transport in Norfolk (on-vehicle surveys). Numerically, most survey responses came from the passengers of one large operator, who provided a volunteer on their vehicles to help people complete the forms. It is accepted that this approach may have influenced people's answers to some extent (albeit the survey was anonymous); in particular responses to the ONS life satisfaction questions. The questions posed in the survey also changed slightly over the course of the study, to try to generate more evidence for the underlying ROI study.

Whilst stakeholders (from local authorities and the health service) and operators were all generous with their time, it did prove difficult to access information directly from GP practices in respect of 'missed appointments', a key element of the ROI calculations, and also an important reflection of older people's ability to make necessary journeys without a car. After lengthy investigation, some very-relevant NHS data was found online (hospital statistics), along with published material from Practice / Patient liaison groups at one or two GP practices in the study areas. This then facilitated the ROI calculations.

Key lessons: Constraints imposed by budgets, such as interviews and focus groups not being transcribed making them more difficult to analyse (having to repeatedly listen to recordings in order to make notes). Being associated with a funder (Norfolk County Council) which may have caused users to respond more positively in respect of the service they received – to ensure continued funding. However, as questions about service quality were primarily used to provide feedback for the operators, this is not seen to have affected the other elements of the data being collected, which then facilitated the project report, conference paper and presentations. Again, the importance of key informants and gatekeepers was critically important, especially so given the remote nature of some of the study.

4.2.4 Transport & Technology

The author joined this project two-thirds of the way through its course following the departure of another researcher. This presented challenges in respect of assimilating the direction of the research, and the data that had largely been collected. It did though provide an opportunity to influence the direction of the analysis of that data, and of the dissemination and academic

outputs from the project (see *Shergold et al., 2014). This paper would likely have been different had the original team continued, but the participation of co-authors who were fully involved from the outset of the project will have mitigated against any misinterpretation. Although secondary data (census data, NHS data) was used in the projects above, this had primarily been quantitative, whereas here it was qualitative outputs from scenario-based workshops.

Key lessons: Whilst it is possible to immerse yourself in material collected by others, there is an extra level of understanding from developing the research methods and being directly involved with participants, prior to analysis.

4.2.5 Bristol Ageing Better Fishponds mobility and older people study

This project has generated data that provides insights into mobility problems in a context often assumed to provide ample mobility choices. The key issue that emerged during this study was the difficulty in actually being able to talk to older people about mobility issues through an on-street survey approach on the main shopping street, or outside a major supermarket. Approaching people wearing high-visibility clothing, probably suggested a market research survey or the like, and the offer to contribute to the research was normally declined. Notwithstanding the low number of responses, the data that was collected proved to be very informative in conjunction with other sources.

This again highlights the importance of using mixed methods, and of finding 'gatekeepers', who might unlock access to groups of older people. An illustration of this occurred with an interview with a local councillor, who then provided introductions to a lunch club organiser, and a previously unknown-to-the author provider of at-cost taxi transport for older and disabled people. The lunch club visit was very productive, but in an informal setting – where distribution of a questionnaire or recording was not possible, meaning a reliance on notes afterwards. A direct approach to GP practices and transport operators was very successful in respect of stakeholder interviews, but some organisers of activities for older people seemed less willing to collaborate in respect of phone interviews.

Overall, the project illustrated how difficult it is to reach a large number of people for quantitative data in a short, low-budget project. Again, turning to publicly available local authority and census resources did provide comprehensive background data for the research. This then provided an opportunity to use GIS tools to illustrate the socio-demographic context, and potential mobility needs in the area.

4.2.6 Flourish

The Flourish project was the first UK study to explicitly consider the role of autonomous vehicles for the older population, and to collect data from older people involved in real-life trials of vehicles. As such it was a unique source. Some aspects of the data collection could though have been executed more effectively. With over twenty people in the room for several of the workshops, it was difficult to always ensure that individuals captured all of their thoughts during the paper-based exercises – often conversations would take the time available, and for one or two writing was problematic and assistance was needed. Hand-written responses can also be difficult to read, making analysis more complicated. Sometimes a tension emerges between getting people to write down responses and allowing wider discussion – the latter perhaps leading to more homogenised responses within some groups.

The workshops did though generate nearly ninety sets of responses, plus material collected from group feedback. It also provided an opportunity to repeat questions over the three years of the project, to see if the growing profile of driverless vehicles in the media (including the death in the US Uber trial) generated different responses.

Key lessons: Workshops were quite long (up to 2½ hours), requiring attention for a substantial time, and were physically tiring for some older people, which may mean adapting (or creating new) research methods to reflect the capabilities of what is a growing segment of the population. Some participants also struggled to project themselves into a future scenario in which connected automated vehicles will be commonplace. Ensuring older people's understanding of a topic and the line of questioning accords with that of the researcher is then critical, and this is may be where techniques such as scenarios may have a greater role to play.

5 Critical reflections on the overall submission

5.1 Is mobility policy for an ageing population effective and equitable?

The DPhil submission set out to explore the connections between mobility and exclusion for older people in rural areas of the UK. It did so mindful of a social justice and social sustainability context for this interaction. It has done this successfully, adding evidence and understanding of issues around rural mobility and older people to knowledge and literature in the fields of mobility and social gerontology. It has taken opportunities to explore these issues through six projects, advantageously and creatively at times. In many instances, the findings concur with the work of others, but unique contributions are made in this portfolio.

The opportunity to bridge mobility studies and social gerontology has provided a new and illuminating opportunity to understand issues such as exclusion and the role that mobility plays in older people's lives. What perhaps has been less to the fore in the studies, and the outputs collected here is empirical evidence on elements such as social capital and community sustainability. To an extent, these are seen by proxy through the desire of older people to be involved in their community, and to partake in activities. Community cohesion does though emerge in the qualitative evidence collected for the studies here, although sometimes the focus may be more on individual wellbeing generated by activity and connectivity to others.

The title of the submission specifically challenges the notion that sufficient policy interest has been shown in supporting older people in discretionary travel. The substantial body of evidence presented by the portfolio has highlighted areas of policy success, but frequently it found problems in the solutions available. These might relate to funding and availability, or more simply issues such as accessibility. The projects covered by the submission have run concurrently with austerity measures following the financial crisis in 2008 and have reflected reductions in state funding for many policies – including mobility. However, the problems of mobility in rural areas are not new, and research cited in this commentary from the 1970s and 80s illustrates this. What has changed since then is a greater dependence on the car, and a growing rural population of older people, leading to problems for those who lose access to a car (and their communities). In response then to the question posed in the title, it is concluded that discretionary travel has been undervalued compared to necessary journeys in current policy. In response, and drawing on the six projects the following remedies are suggested:

- **There is a need to provide more flexible and appropriate mobility solutions.** Adaptable to the needs of older people in rural communities (alongside other groups unable to access a

car, such as the young, those without sufficient funds, the disabled). The focus should be on smaller scale, and more flexible options such as more formalised lift-giving, community transport schemes, and DRT (depending on the scale of need). Where activity is taking place within the community, then the focus should move to ensuring that older people can safely use active travel modes and mobility scooters, and that walking infrastructure (pavements, lighting, and seats to rest on) is fit for purpose. More consideration should also be given to the provision of, and location of, facilities and services within rural communities to ensure that they are accessible to the mobility solutions proposed above.

- **Planning for better solutions.** Exclusion for older people in rural communities is not a simple binary state (excluded or not), exclusion can vary across services and facilities, because of distance or individual mobility. Planners should look to understand how patterns of travel might evolve at more localised levels, and how this reflects prevailing behaviours. This could be through the practical application of the concept of activity spaces as a measure of the spatial issues effecting current mobility (for both essential and discretionary journeys), and of any proposed solutions.
- **Fostering disruptive change.** Introducing a different approach to public transport services for rural communities through initiatives that might encourage such innovation (regulatory, financial etc.), and taking steps to try to facilitate more rapid change. Providers of new mobility solutions should also think about how these might be best configured and delivered to support older people's independence.
- **Helping older people to be better prepared.** Older people may need support in reducing their dependence on the car and adapting to, and using, new mobility solutions. Options such as peer-support in the community could provide for training for using new modes, and support as older people curtail or cease driving.

The submission has also looked forward, to new and emerging technologies that are predicted to play a role for the connectivity and mobility of older people in the future. It will be critical to ensure that these new approaches also reflect the lessons learnt currently and consider these further proposals:

- **Incorporating older people's needs.** To develop technologies that achieve the optimum benefits for older people it will be critical to incorporate their needs in the design, delivery and operation of solutions.
- **Selecting the future we want.** It is timely to start a discussion about how we want new smart mobility solutions (and technology more generally) to serve us in our later years, ensuring

appropriate steps are then taken to facilitate this and to think about 'reshaping' technology to better serve older people's needs.

- **Balancing equity of access against responsibility.** There needs to also be a debate as to what extent (older) citizens should expect access to services from anywhere, or if accessibility should be a more important factor in residential location choice. This may mean favouring locations with access to the services they are likely to need as opposed to amenity sites, less well served because of location.

5.2 Future research

This submission is not the end of enquiry into these topics by the present author, more an opportunity to reflect on a body of evidence collected to date. The issues will remain and evolve (see 5.3 below), and there are many opportunities to develop new lines of research from this base. These might include some or all of the following:

- Further testing the theory espoused by the model developed here, in particular looking in more depth at the proposition that motility is co-determinant with social capital as an enabler of more cohesive (rural) communities.
- Pursuing the interesting results found so far in respect of the links between mobility and activity. Developing studies with new datasets that better support this analysis.
- Exploring the themes of the submission in differing locales, particularly suburban and peri-urban areas to substantiate propositions made here about the nature of the underlying mobility issues, and to test the model in different community contexts.
- Addressing heterogeneity in the older population by looking specifically at the issues raised in the DPhil for the older-old and older women.
- As new, supposedly technology-aware cohorts of older people emerge, it will be important to understand how they use or adapt to new ways of being mobile, and of ageing based on new technologies.
- The shortcomings in delivering effective rural mobility over recent decades, and the suggested paucity of planning for older people's mobility provide a further area of enquiry into the readiness of the state and other actors for how this future might develop.

5.3 Looking forward

Looking forward, there are questions as to what rural might mean in the UK in the 21st century. The internet, changes in farming and land-use, the prevalence of the car, population growth and many other factors are eroding traditional characteristics of the term, and in England, this increasingly equates to residential hinterland for more urban areas. The questions raised in the submission then become about differences between more densely, or less densely populated areas of settlement, and how best to address out-of-home mobility for an ageing population – many of whom will see reductions in their ability to use the car. Solutions then may apply across urban, suburban and rural contexts. This opens the door to a broader range of solutions, potentially different modes of operation, and likely technology driven solutions. Inherent in this will be a continuation of current policy strategies that keep people driving for as long as they are able, which again will be aided by new technologies in areas such as driver assistance. This trajectory takes us to the future of driverless cars, and the discussion in this submission as to what that might mean for older people. Technology may not be the answer though (or not for all older people at least), and solutions will need to continue to be tested as fit for purpose in this respect.

The UK government provides significant funding for concessionary fares for older people, and central and local government are key funders of community transport. However, as evidenced within the portfolio, there is still sometimes insufficient transport to meet the needs of older people, as well as potentially a lack of planning for the future mobility of a growing ageing population. The predicted proportion, and number, of older people in the population in coming decades suggest that this approach will need revising, not least to ensure that emerging technologies provide the most appropriate solutions for older people. It will be important to address the proposals here and take steps to ensure that older people retain at least the option to continue to engage in the range of activities that represent participation in society. Else, there is the real risk of creating not just exclusion, isolation and social injustice for this group, but also communities that are missing key actors who could and would contribute to cohesion and sustainability.

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Appendix I: Training needs statement

Whilst working on the GaPL project, I undertook an MA Applied Social Research (passing with distinction). Components of this award included Research Methods, Research Practice, Claims and Debates (exploring a range of issues relating to research ethics and philosophical approaches), and a dissertation. The MA provided 180 credits.

Since that time, I have also undertaken training courses in practical research skills such as statistical inference, and qualitative analysis tools such as Nvivo. In 2014, I participated in a two-day qualitative research 'summer school', focussed on analysing qualitative data.

Appendix II: Contributions to papers

Table x below contains details of the materials included as components of this DPhil submission. The 'Item No' referred to in the first column is the reference used throughout the text above. The table also contains information detailing my personal contribution to each item.

TABLE 6. ACADEMIC PUBLICATIONS IN SUBMISSION – AUTHOR CONTRIBUTION

Item No	Title	Date	Author(s)	Personal contribution	%
1	Operationalizing 'sustainable mobility': the case of transport policy for older citizens in rural areas. ***Journal of Transport Geography*. 18 (2), 336-339**	2010	Shergold I. (1) Parkhurst G. (2)	Collected the data and carried out analysis using GIS. Wrote initial content based on UG dissertation, and collaborated with (2) on revisions to text to achieve publication.	75%
2	Rural car dependence: an emerging barrier to community activity for older people. ***Transportation Planning & Technology*, 35 (1), 69-85**	2012	Shergold I. (1) Parkhurst G. (2) Musselwhite C. (3)	Collected the data and carried out analysis. Wrote initial content and collaborated with (2, 3) on shaping of content to achieve publication.	60%
3	Transport-related social exclusion amongst older people in rural Southwest England and Wales. ***Journal of Rural Studies:* Special Issue on Growing Old in Rural Places, 28 (4). pp. 412-421**	2012	Shergold I. (1) Parkhurst G. (2)	Collected the data and carried out analysis. Wrote initial content and collaborated with (2) on shaping of content to achieve publication.	60%
4	Examining the process of driving cessation in later life. ***European Journal of Ageing*** 10 (2), 89-100	2012	Musselwhite C. (1) Shergold I. (2)	(1) led project and wrote paper. (2) provided research support and reviewed / contributed to drafting of paper.	20%

5	Future mobility in an ageing society. Where are we heading? ***Journal of Transport & Health***. 2 (1), 86-94	2014	Shergold I. (1) Lyons G (2) Hubers C (3)	In conjunction with (2) worked through several drafts of paper. (3) reviewed for publication.	50%
6	Taking part in activities, an exploration of the role of discretionary travel in older people's wellbeing. Accepted for publication in ***Journal of Transport & Health,*** Jan 2019	2018	Shergold I. (1)	Carried out the analysis of the data and wrote the paper.	100%
7	Mobility solution or new grey divide: an analytical review of the role of self-driving cars in an ageing society (Paper submitted to ***Ageing and Society,*** in review)	2018	Shergold I. (1)	Carried out the analytical review of the relevant literature and wrote the paper.	100%

TABLE 7. SUPPORTING MATERIAL – AUTHOR CONTRIBUTION

Item No	Title	Date	Authors	Personal contribution	%
8	Developing community transport as a mainstream travel option. ***Paper presented at Transport Practitioners Conference (TPM)***	2012	Cornell L. (1) Shergold I (2) Kimberlee R. (3)	Drafted paper and delivered resultant conference presentation. (1) was lead for project sponsor: Norfolk County Council and contributed material for paper. (3) developed SROI analysis used in the paper.	75%
9	Research into the health and wellbeing benefits of community transport in Norfolk. (Unpublished report to client - Norfolk County Council)	2013	Shergold I. (1) Kimberlee R (2) Musselwhite C. (3) Parkhurst G. (4)	Led the study and collected data from survey etc. Lead author for the report. (2) developed SROI analysis and lead on some research activities for project. (3) Assisted on	65%

				project, and reviewed the final report. (4) Contributed to the report and oversaw project.	
10	Beyond transport: Understanding the role of mobilities in connecting rural elders in civic society. Chapter 5 in: *Countryside Connections: Older People, Community and Place in Rural Britain*	2014	Parkhurst, G. (1), Galvin, K. (2), Musselwhite, C. (3), Phillips, J. (4), Shergold, I. (5), Todres, L (6).	Contributed data collection and analysis that supported the conceptual material in this book chapter primarily written by (1). Other listed authors reviewed drafts for publication.	20%
11	Project report: *The mobility of older people, and the future role of Connected Autonomous Vehicles.*	2016	Shergold I. (1) Wilson. M (2) Parkhurst G (3)	Conducted literature review with support from (2) who wrote one section of the review. Wrote report which was reviewed for publication by (3)	80%
12	Project report: *Out-of-home mobility for older people in Gt Fishponds (Bristol): Issues and opportunities*. Bristol Ageing Better	2016	Shergold I. (1)	Ran study, collected data and analysed it, wrote report to sponsor.	100%
13	Project report: *Findings from Workshops held with Older People considering participating in Connected Autonomous Vehicle trials.* The Flourish project.	2017/8	Shergold I. (1) Parkhurst G (2) Alford C. (3) Morgan P. (4) Voinescu A. (5) Caleb-Solly P. (6)	Co-delivered workshops, and helped develop research instruments. Transcribed and analysed data and wrote report. Other listed authors reviewed drafts for publication.	80%

TABLE 8. CONFERENCE PRESENTATIONS (NOT INCLUDED AS PART OF THE SUBMISSION) – AUTHOR CONTRIBUTION

	Title	**Date**	**Authors**	**Personal contribution**	**%**
	The importance of older people's car access to community connectivity. *British Society of Gerontologists Conference*	2010	Parkhurst G. (1) Shergold I. (2)		50%

	Re-imagining the bus. Presentation to UWE Centre for Transport & Society Winter Conference	2011	Shergold I. (1)	Carried out the research study (UWE funded) leading to this presentation of findings	100%
	The role of community transport (CT) in maintaining health, wellbeing and independence. *British Society of Gerontologists Conference*.	2012	Shergold I. (1)	Developed and delivered presentation	100%
	Missed journeys: The importance of discretionary and social travel. *British Society of Gerontologists Conference*	2013	Musselwhite C. (1) Shergold I. (2)	Carried out analysis, developed material and co-delivered conference presentation	60%
	Shared Transport for older people, a lifeline or a constraint? A case study from rural England. *Royal Geographical Society conference*	2013	Shergold I. (1)	Carried out analysis, developed material and delivered conference presentation	100%
	Do we need an 'Uber' for older people in rural communities? Exploring the impacts of reduced car access on out-of-home mobility. *British Society of Gerontologists conference*	2015	Shergold I. (1)	Carried out analysis, developed material and delivered conference presentation	100%
	Home or away? Making a link between mobility, the geography of activities, and the wellbeing of older people. *Royal Geographical Society conference*	2015	Shergold I. (1)	Carried out analysis, developed material and delivered conference presentation	100%
	Autonomous vehicles; an answer to the issues of giving up driving or a new technology divide? *British Society of Gerontologists conference*	2017	Shergold I. (1)	Carried out analysis, developed material and delivered conference presentation	100%
	Smart mobility, delivering an assistive technology or creating a digital divide? *Royal Geographical Society conference*	2017	Shergold I. (1)	Carried out analysis, developed material and delivered conference presentation	100%

Appendix III Research impacts of submitted publications

Impacts of the material included in the submission can be seen in citations and other uses of the elements included, and the supporting material:

TABLE 9. RESEARCH IMPACTS OF MATERIALS SUBMITTED

Item	Title	Citations (Scopus)	Citations (Google Scholar)	Downloads from UWE research repository (last 12 months only)	Other (see key below)
1	*Operationalizing 'sustainable mobility': the case of transport policy for older citizens in rural areas.*	10	20	Not available from repository	a
2	*Rural car dependence: an emerging barrier to community activity for older people.*	30	64	975	b a
3	*Transport-related social exclusion amongst older people in rural Southwest England and Wales.*	36	72	472	a
4	*Examining the process of driving cessation in later life.*	41	81	546	b c
5	*Future mobility in an ageing society. Where are we heading?*	26	40	155	b
6	*Taking part in activities, an exploration of the role of discretionary travel in older people's wellbeing.*	-	-	-	Accepted for publication Jan 2019
7	*Mobility solution or new grey divide: an analytical review of the role of self-driving cars in an ageing society*	-	-	-	Submitted for publication 2018, currently in review
8	*Developing community transport as a mainstream travel option.*	-	-	-	Presented at the Transport Practitioners Conference, and available to conference delegates

9	*Research into the health and wellbeing benefits of community transport in Norfolk.* *Note: Although full report was not 'published', a short summary version has been provided on request to 4-5 other researchers / CT operators*	-	-	-	Full copy provided on request to staff at the Welsh Assembly Government, and the Scottish Government. Presentation on findings published on Norfolk CT Association website
10	*Beyond transport: Understanding the role of mobilities in connecting rural elders in civic society. Chapter 5 in: Country*side Connections: Older People, Community and Place in Rural Britain	18	30	191	
11	*The mobility of older people, and the future role of Connected Autonomous Vehicles.*	-	10	352	Report published on Flourish project website
12	*Out-of-home mobility for older people in Gt Fishponds (Bristol): Issues and opportunities.*	-	-	-	Report published on BAB website
13	*Findings from Workshops held with Older People considering participating in Connected Autonomous Vehicle trials.*	-	-	-	

a. Cited in "*WebTAG: evidence review of distributional impacts*" (DfT. 2015)

b. Cited in "*How can transport provision and associated built environment infrastructure be enhanced and developed to support the mobility needs of individuals as they age*?" (UK Government office for science. 2015)

c. Cited in "*Creating age-friendly cities*". (The Parliamentary Office of Science and Technology. 2016)

Over 160 citations (Scopus), have been made of the publications in the portfolio, with 2700 downloads made from the UWE online Research Repository. Some further highlights and specific impacts of the published material are noted below.

- Items 2 and 3 were two of only twelve papers selected in a systematic review of qualitative papers recording the experiences of everyday travel for older people in rural areas (Graham et al., 2018a), part of an NIHR research programme. Item 2 was also one of 29 papers reviewed in an earlier study of unmet travel needs of the older population (Luiu et al., 2017), whilst item 3 was identified as relevant in a wide-ranging scoping study looking at older people and exclusion (Walsh et al., 2017). Item 3 was also one of 17 papers selected in a systematic review of literature on social exclusion and older people (Van Regenmortel et al., 2016).
- Mobility issues for older people, and characteristics of the choices open to them in rural areas are cited from Items 1,2 and 3, both in UK studies and international work. This includes papers looking at issues in Europe (N. Ireland, Scotland, Austria, Serbia, Poland, Czech Republic), in Turkey, Kenya, Australia and a well-cited paper on age-friendly communities from Canada (Menec et al., 2011).
- Several papers have cited work in the portfolio in respect of different journey purpose, one paper concluding that is important to support discretionary travel, particularly activity that strengthens the community (Berg et al., 2014). Citations for item 4 also pick up on the need for discretionary trips, and the importance of out-of-home mobility for wellbeing (Mackett., 2017). In their 10-year review of the Musselwhite model (see 3.1.4), the authors use evidence from the GaPL study papers (item 1 & 2) to validate that the model is effective (Musselwhite & Haddad., 2018).
- Item 5 has been cited in respect of the use of technology by older people (transport and non-transport) and looking forward to the potential of autonomous vehicles. Citations consider barriers to use of alternatives to the car (Luiu et al., 2018), and how some older people prefer lower-tech solutions (Harvey et al., 2019). Three separate chapters / authors cite item 5 in the recent book 'Geographies of Transport and Ageing' (Curl & Musselwhite (eds). 2018), exploring how older people interact with technology, future transport systems and older people, and future policy for an ageing population. The role of transport and non-transport technologies is also highlighted in the conclusions of two pre-eminent Scandinavian authors on ageing and transport, in a 2015 paper on older mobility (Haustein &, Siren., 2015).

- Pre-dating the later items in the submission looking explicitly at driverless vehicles, item 5 is also cited in several publications looking at the role these might play for older people, reflecting on the benefits in respect of quality of life (McLoughlin et al., 2018), and in overcoming barriers to out-of-home mobility (Pettigrew et al., 2018).
- As well as being downloaded extensively, Item 11 has been cited in a number of academic publications, and in the 'Future of Mobility White Paper' a review of developments that might impact California's transportation system for planners and policymakers in advance of the next iteration of the California Transportation Plan.

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