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Mobility and wellbeing in later life

Co-Motion

Summary of key findings and recommendations



**Co-Motion: Mobility and wellbeing in later life.
Summary of key findings and recommendations**

2017

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Chapter 1 Introduction

Introduction

Background

Increasing longevity in modern societies, although rightfully celebrated, presents well documented challenges (WHO, 2011). Enabling people to live well and independently as they grow older is a major concern of policy makers across developed and developing nations, and maintaining mobility is seen as key to this endeavour (WHO, 2011). Mobility - viewed as how people connect within society (Parkhurst et al, 2013) - is vital if older people are to access increasingly dispersed services, resources and facilities; employment, and to be socially connected with family, friends, and the wider world. Physical mobility, particularly active mobility such as walking and cycling, also promotes physical and mental health, thus enhancing life satisfaction and subjective wellbeing (Musselwhite et al, 2015; Northey et al, 2017). The sensory and emotional experiences of movement - the embodied experience of mobility - can alter our disposition and sense of self, and is important for identity construction (Adey, 2010; Jenson, 2013). Mobility is also associated with important values such as freedom, autonomy, and flexibility (Mollenkopf et al, 2004). Mobility in later life, however, is not just determined by our own physical capacities, but also by our own motivations (Ziegler and Schwanen, 2011), our physical, cultural, and social environments, and the availability and accessibility of transport systems, and assistive technologies that may help us to overcome any functional limitations.

In order to enhance the mobility of older people much attention has been focused on the physical environment, and designing (or redesigning) environments that are free of physical and structural barriers. However, older people are not a heterogeneous group, and it is challenging to design an environment that meets the varied, changing, and sometimes complex needs of later life. Ageing is experienced differently, indeed defining 'old age' is itself problematic (Boyle et al, 2015; Liang et al, 2012). There is growing interest in understanding ageing through key life transitions rather than chronological age per se (Grenier, 2012). As we age we may experience one or several transitions – some perhaps predictable, others less so - that may be overlaid onto changing health and physical or cognitive capacity, the changing shape and capacity of our family and wider social networks, shifting

physical landscapes, new technologies, and diminishing services and supportive resources. In thinking about mobility in later life and how it might be enhanced, it is essential to recognise this complexity, and how it impacts in diverse ways upon an individual's capacity to adjust to change within their lives.

Report structure

This report summarises the main findings and conclusions of the Co-Motion project. The next sections of this chapter describe the main aims of the project, and describe our approach and methods. Chapter 2 discusses the key findings from the project. The final chapter sets out the main conclusions and recommendations. Further information and outputs can be found on our website: www.york.ac.uk/co-motion.

Research aims

The design of the built environment has a key role to play in enabling - or frustrating - mobility. Thus appropriate design or redesign of the built environment can expand horizons and support wellbeing. However, many well understood mobility barriers remain in place (House of Commons Women and Equalities Committee, 2017). The time and resource intensive nature of design and adaptation also currently operates in a local context of severe budget constraint (New Policy Institute, 2017). Design of the built environment is just one of the determinants of mobility and wellbeing, and this project focused on complements or alternatives to physical design or redesign of the built environment, as well as the development of methods for prioritising local needs. Furthermore, any one environment cannot meet all needs at once, and needs may vary, even for an individual, as people pass through key physical and social transitions, which may alter personal mobility and wellbeing.

Working with older people, this project aimed to explore a range of options and tools that may be able to meet contrasting needs, support mobility and wellbeing, and do so more quickly and affordably than adapting the built environment. The specific aims of the project were to:

- Explore mobility and wellbeing for older people going through critical but common life transitions;

- Investigate and address variation and contradictions in the needs of different groups of older people (and even for single individuals over time), and between different built environment agendas; and
- To co-create practical tools that can act as complements or alternatives to the redesign of the built environment.

Approach and methods

We used a mixed methods approach to address the research aims of the project. We undertook a longitudinal study with older people using quantitative and qualitative approaches to explore mobility and wellbeing for people going through recent changes in their lives. A series of workshops with older people and service providers enabled us to explore specific mobility issues in greater depth, such as driving cessation. Participatory Geographical Information Systems (PGIS) were used to identify barriers and solutions for our study participants in the built environment. This element of the project addressed our second aim and explored a process for establishing local priorities for action for developing age friendly communities, recognising the potential for conflict and consensus between different groups and individuals. The PGIS project also explored the development of a local spatial typology to identify key spatial factors that urban planners need to include in their decision making processes that will encourage the development of health supporting environments for older people.

Two approaches were also taken to develop practical tools that could offer complements or alternatives to the redesign of the built environment. The first approach used a co-design process to explore with older people the development of a prototype app that would promote mobility and wellbeing. The second approach developed new tools to provide an improved basis for understanding the issues faced by mobility scooter users and to obtain new information to enable more detailed studies on mobility scooters in the future that may lead to improvements in their design and operation.

Transitions in later life, wellbeing and mobility

Over three years, the project included a longitudinal study of older people in three locations in the north of England (Hexham, Leeds and York) exploring their mobility and wellbeing as they moved through a range of life transitions. People aged 55 (+)

were recruited to the study who had recent (within 12 months or so of participating in the study) experience of one or more critical but common life transitions:

- Stopping work due to retirement, redundancy, illness or disability.
- Stopping driving (through health, financial reasons or simply choice).
- Losing a significant part of their sight or hearing.
- Starting to live alone.
- Taking on child care responsibilities/becoming a grandparent.
- Becoming a carer for a relative, friend or neighbour or stopping care responsibilities.
- Starting or considering using a mobility scooter or mobility device such as a walker, a stick or wheelchair.
- Moving home.

These transitions are everyday experiences that are not exclusive to people in later life, but are certainly part of many people's experience as they grow older. They reflect a growing interest in exploring later life through the lens of key transitions rather than assuming we will have a similar set of experiences at certain ages. They were chosen as each would seem to have implications - both positive and negative - for 'getting out and about'. For example, retirement - stopping work - means no more work related journeys, but might offer opportunities for more leisure or social related outings and journeys - or it might not, if for example, stopping work was related to poor health, or taking up caring responsibilities, or resulted in reductions in income.

Recruitment

Participants were recruited using a variety of means, and the strategy used in the three settings varied depending on the presence or absence of possible collaborating organisations and local media. The study was advertised in local newspapers, and via posters and leafletting in community and commercial locations (i.e. council 'one-stop' centres, travel information centres at main transport hubs, corner shops, supermarkets, hairdressers, charity shops, and community centres). In addition, information about the project was sent to local chiropodists, opticians, and retailers of mobility and disability aids as well as a range of community organisations (for example, U3A, allotment groups, bowling clubs, Women's Institute groups, local

churches and faith groups). Specific groups were also targeted through local community organisations to ensure diversity in age, gender, socio-economic background and ethnicity attributes. With permission, leaflets and posters were left at key venues, for example, Carers' Resource Centres, the local offices of organisations that support older people (such as Age UK). Information about the project was also presented in a 'talking newspaper' for those with a visual impairment. Researchers also arranged to visit various lunch clubs and social networking groups aimed specifically at older people where they introduced themselves and the project, and invited people to contact them if they were interested in taking part. Researchers also attended the York Older People's Assembly 50+ Festival Information Fair.

Interested individuals were asked to contact the project team for further information either via telephone, email or in writing. During the first contact a screening questionnaire was undertaken to identify eligible individuals. Eligibility criteria included: age 55+; resident within the local authority boundaries of York and Leeds, and Hexham (which also included the surrounding villages of the latter). In addition potential participants were chosen on the basis of having self-identified that in the last 12 months they had undergone one or more of the transitions identified above.

Those identified as eligible and willing to participate in the study received an information pack containing a study information sheet, a consent form and questionnaire. The intention was to recruit 40 participants in each area covering a range of mobility transition experiences. In practice, it proved difficult to recruit this number in Hexham, and instead a higher number of participants were recruited in York and Leeds. Ninety nine participants were recruited in total.

Participants taking part in interviews were contacted by a researcher. Prior to the first interview the researcher gained informed consent for the interview and confirmed anonymity and confidentiality. Prior to subsequent interviews the researcher obtained verbal consent to confirm that the participant was happy to continue with their involvement in the study. Participants were given the option of having a companion or partner present during the interviews.

Data collection

The study used a mixed methods approach, and involved multiple transactions between the recruited participants and the researchers including a self-administered

questionnaire at the beginning and end of the research, a first qualitative face to face interview (usually in people's own homes although a choice was offered to meet elsewhere if preferred), four telephone follow ups and a final qualitative face to face interview. In most cases a participant worked with only one researcher (although 29 participants had their first and final face to face interview conducted by a different researcher).

Measures of wellbeing

The focus on wellbeing led us to explore and use two different quantitative measures. In the initial and final questionnaires we used Ann Bowling's wellbeing questions (Gabriel and Bowling, 2004; Bowling, 2009a, 2009b). This measure (OPQUAL) was chosen because Bowling's questions were based on extensive qualitative research with older people speaking about issues that they valued. In the telephone follow ups however we decided to use the four measures used by the Office of National Statistics (ONS) in order to provide an alternative perspective based on another established wellbeing measure. We were also mindful of the time that participants were generously giving us throughout the project, and using the ONS questions enabled us to draw on a shorter measure of wellbeing within the telephone interviews. The four ONS measures included:

- Overall how satisfied are you with your life nowadays?
- Overall to what extent do you feel the things you do in your life are worthwhile?
- Overall how happy did you feel yesterday?
- Overall how anxious did you feel yesterday?

Qualitative approach

In the first face to face qualitative interviews with participants we explored people's patterns of 'getting out and about', their regular trips and destinations, preferred means of travel, the purpose, nature, value, importance, and practical challenges of their regular outings and journeys. Participants were also invited to reflect on less frequent journeys (i.e. holidays, special days out, or visits to family living at a distance), and journeys that they would like to make. We also talked about their recent transition and how this had impacted on 'getting out and about'. We asked what would make getting out and about easier for them or people in their situation. In the final face-to-face qualitative interview participants were asked how their patterns of mobility had changed over the course of the project, how over time they

had adjusted to the transition that had brought them into the project (and indeed other transitions that had occurred in the meantime). We asked participants to reflect on their personal strategies for managing change. Finally, we asked participants to reflect on their experience of taking part in a longitudinal project.

Transcripts were coded using QSR Nvivo, and framework analysis was undertaken to identify key themes across cases. Analysis also focused on sub-groups of participants to analyse their views and experiences of specific analytic and emergent themes. For example, one focus for analysis was on participants who were recruited to the study because they had stopped or reduced driving in the previous year. This element of the analysis also included participants who had been recruited to the study on the basis of other transitions in the previous year, but who also reflected on driving cessation at other times in their lives as part of their interviews. Another example included the emergent theme of 'mobilities of care'. Many participants discussed how being mobile was linked with care, either for themselves, or for others.

Local and national stakeholders were also interviewed to explore their views on supporting mobility and wellbeing in later life. These stakeholders included local authorities, voluntary sector organisations, community groups and national non-government organisations.

A range of workshops with our participants and stakeholder organisations explored specific aspects of mobility:

- How people adapt when they give up, or reduce, driving;
- Changing behaviour in public places to make them easier and friendlier for older people, and for people of all ages with different types of health problems or impairments.

Limitations

On reflection the research team acknowledges that the list of transitions could have been broader. The experience of the qualitative work revealed that those who were living alone might find a new partner; that those who suffered pain and restricted mobility might enjoy a considerable upturn in their wellbeing and ability to get out and about through hip or knee replacement, or cataract surgery. Similarly

respondents also discussed the impact of new drug treatments, or changes to drug regimes.

Our participants reflected a very diverse range of experiences and backgrounds, especially in relation to mobilities, that is, the capacity of individuals to be mobile (Appendix One summarises the characteristics of the participants who entered the study). Nevertheless, although our recruitment strategies attempted to reflect the experiences of minority ethnic communities and also people on very low incomes, we were less successful in engaging with people from these groups. The purposive nature of the sample limited the generalisability of the quantitative material, but this data sets a context for understanding the views and experiences of participants expressed in the qualitative elements of the study. A further limitation was that we only had measures of participants' quality of life post-transition - we could not compare their quality life with how they felt before a transition took place (although we could reflect the impact of transitions that occurred after the study started).

Participatory mapping: identifying conflict and consensus

Participatory approaches and co-design methods have increasingly been promoted and utilised to develop age friendly design rooted in the experience of residents (Handler, 2014). Using a mixture of methods and tools has been highlighted as a way of facilitating contributions from participants with diverse needs (Coupe and Cruikshank, 2013). This part of the project aimed to assess whether mixed methods could usefully be combined and analysed to generate information on locations and sources of conflict and consensus in a cost-effective way. Traditionally the drawing exercise has been undertaken on analogue interfaces (paper or acetate) and converted to digital formats (Cinderby, 1999; Cinderby et al, 2011). Our approach investigated the opportunities for using new low-cost mobile computing devices for collecting spatial data digitally from the outset. Touch screen enabled devices in a variety of screen sizes were used to explore their efficacy for Participatory Geographical Information Systems, particularly with the challenge of an older stakeholder group who may not be so proficient or familiar with these technologies (Barnard et al, 2013) or have age related impairments that might impede their usage of such interfaces. A further aim was to assess whether the approach could usefully generate options that would overcome some of the conflicts or barriers that were impacting on older people's mobility and consequent health and wellbeing.

Mapping journeys

The project used Participatory Geographical Information Systems (PGIS) to map journeys taken by older people in the study areas to identify both positive and negative aspects of the environment that influence mobility, and engaged with wider groups to identify opinions and views on key potential changes to the design or regulation of the built environment.

The mapping work was undertaken with 39 participants across the three case study locations. They identified the journeys they were undertaking and highlighted benefits of being out and about as well as problems at specific locations. For each problem our participants were asked to identify a possible solution. This information was combined with findings from the photo-diary (see below) and the issues raised in the longitudinal interviews to identify the most significant problems and also the most popular solutions.

Establishing local priorities for action

Material from all three sources of data (the mapping, photo-diary and longitudinal interviews) was entered as transcripts into QSR NVivo for further analysis and coding. At this stage the specific types of barriers identified across all three methods was collated. In addition solutions that participants had identified were coded and linked to particular problems. These were grouped to look for commonalities or overlaps alongside conflicts with the aim of co-designing sets of place specific solutions to improve mobility. The number of participants who experienced particular problems or had identified similar solutions was assessed to identify the most common issues or popular improvements. Typically more problems were identified than solutions. This meant that even if solutions were only suggested by a small number of participants, but addressed a common problem, they were taken forward in the co-design process.

In order to see whether their solutions would be supported by a wider cross section of local residents, or whether they would bring unexpected problems or additional benefits, we ran surveys in our three case study areas. These included:

- An online survey in York with 120 residents.
- An online survey and pop-up stall on Hexham market involving 30 residents.

- An online survey and pop-up stall on Kirkgate market, Leeds with 84 residents.

Developing a spatial typology of urban areas

A further research challenge was whether we could usefully spatially model factors related to older people's mobility and wellbeing to assess the extent of beneficial environment locations and identify neighbourhoods in which to concentrate improvements. These factors would identify key spatial factors that urban planners need to include in their decision making processes that will encourage the development of salutogenic (health supporting) environments for older people.

Spatial information that characterised urban environments in England was compiled drawing primarily upon nationally available information, but supplemented for York with additional local higher resolution data. The spatial information forming this multidimensional typology included the data related to issues raised in the various older people's engagement activities noted above (i.e. the interviews, mapping, and photo diaries). The spatial layers include a mixture of infrastructure information, social characteristics and environmental attributes of place. The information was compiled for York in a GIS database and analysed within Q-GIS. Using buffered point data and the spatial information available for the city it was thus possible to identify statistical associations between the quality of places and their relationships to encouraging or discouraging older people's mobility.

Our participants had only measured a subset of the urban area of our case study city (York). For planning and decision making purposes, information about locations not included in our existing data could reveal the extent of opportunities or barriers to be overcome in relation to promoting or enabling mobility for older residents. To address this need a logistic regression was undertaken in order to develop a model of the probability of places across the city having features likely to result in positive or negative associations with wellbeing. The logistic regression equation generated results that indicate the potential to correctly predict positive locations 70 per cent of the time and negative locations 53 per cent. The primary drivers of these predictions were the presence of narrow pavements, crime scores, the percentage of green and blue space and the air quality (particulate matter).

Co-designing practical tools

Co-designing mobile applications for older people to promote mobility and wellbeing

Technologies such as smartphones and tablet computers can help older people to take part in physical activities and maintain their wellbeing. However, to make sure that such technologies are usable and acceptable by older people, it is crucial they are involved in all stages of their design. This project drew upon a co-design process with older people to develop a prototype app that would promote mobility and wellbeing. The co-design process involved four stages:

- 1) Twenty-six people aged 55 to 84 took part in a photo diary study to explore their mobility and wellbeing needs and wishes (recruited from the longitudinal study with an additional information and consent process). The participants were given disposable cameras, and were asked to take the cameras on any trips they made over approximately a two week period recording photos of things that affected their travel and wellbeing, in both negative and positive ways. Participants subsequently took part in qualitative face to face interviews and talked through why they had taken particular photos. The results of the photo diary study were used to develop a number of ideas for mobile applications that might help older people negotiate the built environment and promote their physical activity and wellbeing.
- 2) These ideas were explored further in a number of workshops with older people. Thirty-three people, aged 55 to 85, took part in the workshops, which each lasted about two and a half hours.
- 3) On the basis of the workshops, we developed a 'Walking for Wellbeing' application for smartphone. The Walking for Wellbeing application allows older adults to plan walking routes in their local area. The routes calculated by the application were tailored to suit the needs, preferences, and interests of the individual user.
- 4) We then organised demonstrations of the application with four groups of older people, aged 56 to 82, a total of 14 people.

Mobility scooter pilot project

The aim of this pilot project was to provide an improved basis for understanding the issues faced by mobility scooter users and to obtain new information to enable more

detailed studies on mobility scooters in the future that may lead to improvements in their design and operation. Specifically, the aims of the pilot project were to:

- investigate the use of sensors and low cost mobile devices to record physical variables during their journeys;
- measure how the urban environment relates to the wellbeing of participants, and;
- assess the use of these new technologies by older people.

The study took place in Leeds and York and used a novel approach mounting sensors on board mobility scooters in order to identify the physical and environmental characteristics and other associated issues faced by scooter users as well as enabling users to record their own experiences. Approximately, 25 journeys were recorded in the two cities made by ten participants, which provided a baseline set of data for analysis. Each participant received instructions and training on using the equipment and the survey was carried out over one week. They were invited to complete a post-trial questionnaire and the outcomes were fed back to them.

The sensors measured the geographic location of the scooter in order to map the routes taken. Motion was detected using an accelerometer which measures velocity in 6 axes. Air and noise quality data was also recorded using additional sensors. These were packaged in an easy to use battery powered unit that had a simple on-off button to start and end data recording. In tandem with sensing the environmental variables, an app was developed for a tablet which enabled participants to qualitatively record any positive and negative aspects of their journey that they experienced whilst undertaking a particular activity (shopping, meeting friends, trip to the countryside) as well as providing a measure of their wellbeing (happy, awake, alert) at the start and end of their journey. These provide some measure of the participants' mental and physical vitality and vigour. Preliminary data analysis sought to ascertain whether:

- the information collected by the sensors provided meaningful results on the physical and environmental journey characteristics;
- these characteristics could be mapped spatially to identify the built environment features that were responsible, and
- the journeys undertaken affected participants' wellbeing.

Chapter 2 Findings

Introduction

This chapter sets out the key findings of the Co-Motion study. The first section draws on the analysis of the longitudinal data to show how wellbeing changed over the course of the study, and how these changes framed the views and experiences of our participants. This section also discusses how participants who were going through particular transitions discussed getting out and about.

The chapter then moves on to identify the barriers and challenges that our participants faced when they were out and about. This section draws on the Participatory Geographical Systems approach to frame these views and experiences in the context of identifying local priorities for action, illustrating how these methods were applied in one of our case study areas, York. This analysis identified the impact of attitudes and behaviours on participants' experiences of getting out and about, as well as physical challenges. The implications of this issue for how policy and practice might enable mobility are discussed in greater detail in the following section.

A key objective for the study was the development of practical tools that could act as alternatives or complements to the physical redesign of the built environment. The final two sections discuss the co-design of the prototype 'walking for wellbeing' app and also the mobility scooter pilot project.

Transitions, mobility and wellbeing

This section sets out key findings from our longitudinal study with older people. The OPQUAL and ONS measures enabled us to track how participants felt about their wellbeing in the context of a recent change in their lives. These measures provided a context for the views and experiences that participants expressed in the qualitative interviews in relation to the recent changes that they lived with; their routines for getting out and about, and the challenges and opportunities that they experienced.

The participants in our study reflected very diverse motilities (capacity to be mobile) and experiences of mobility. Across the age range of people in the study some participants were highly mobile. Others discussed living with lifelong, or long-

standing conditions or impairments that shaped how they made getting out and about 'work', as well as discussing the impact of recent transitions.

The next section discusses changes in overall wellbeing and we focus in this summary on participants who reported lower levels of wellbeing in comparison with the study group as a whole, or reported a decline in their wellbeing between the two OPQUAL surveys. Amongst these latter participants a number of transitions stood out, which were linked with changes in health, starting to use a mobility aid, starting to live alone and also providing care.

Other research has highlighted how older people's accounts challenge our understanding of transitions in shaping later life, and has drawn attention to the impact of multiple and intersecting transitions across the lifecourse; how transitions may be embedded within longer term trajectories related to health or disadvantage, or indeed the impact of 'linked experiences' including transitions amongst other people such as partners, family, friends or others (Grenier, 2012). Our discussion illustrates this complexity by focusing on the example of journeys and routines of getting out and about as part of caring and support, or 'mobilities of care' (see Sanchez de Madariaga (2013). Our summary also highlights how participants framed the impact of changes in health and/or starting to use a mobility aid on their mobility in terms of rhythms and pacing of daily routines, and frustrated mobility. This discussion also includes the perspectives of participants living with long term impairments or conditions, but who had also experienced a recent transition such as starting to use a mobility aid, or starting to live alone.

Ziegler and Schwanen (2011) note the impact of driving cessation as a major life event for older people, and our summary moves on to highlight the impact of stopping or reducing driving amongst the participants in our study. Finally, this section on transitions, mobility and wellbeing reflects on the way that transitions are embedded in longer term or lifelong trajectories, and the way that older people face change.

Changes in wellbeing

There was no significant difference in the overall quality of life scores (OPQUAL) between the first survey (conducted over the summer 2014) and second survey (summer 2016). However, there was considerable movement in the quality of life

scores for individuals within our sample with 68 per cent of participants showing a change in quality of life scores of 5 points or more. Three groups were identified amongst our participants who fully completed the two OPQUAL surveys (66 people in total). The first group were people whose quality of life increased by five points or more between the two surveys (29 per cent of the total group). The second group comprised those whose quality of life score decreased by five points or more (39%), and finally those whose scores did not vary more than five points between the two surveys (32%).

The group of participants who experienced a decline in their OPQUAL scores also reported lower levels of satisfaction with their lives (ONS scores). We were able to look at the mean ONS scores for our three groups of people whose OPQUAL scores decreased, stayed the same, or increased. This analysis showed that there was no significant difference in the mean scores between these groups for whether people felt that their lives were worthwhile, for their health, or levels of anxiety, but that there was a significant difference in the Life Satisfaction means.

A common theme for many of the participants who reported a drop in their OPQUAL scores was living with chronic ongoing and deteriorating health problems. For some people this situation reflected long term or lifelong experiences rather than a more recent transition. Nevertheless, these participants often described living with pain, which had significant implications for getting out and about. Some participants also described living with mental health problems such as depression.

Starting to use a mobility aid

A different way of looking at health and mobility was to analyse the views of those participants who had recently started to use a mobility aid and how their reported quality life compared with our participants as a whole. Starting to use a mobility aid was an important transition for people in terms of how they felt about their wellbeing and quality of life, and participants who joined the study for this reason reported a lower quality of life compared with other participants. This group of participants also reported a lower level of life satisfaction from the ONS questions across the study than other participants, as well as a lower 'Worthwhile' score.

Starting to live alone

About 60 per cent of our participants were single, and had been for some time, but there were a small number who entered the research as people who had recently started to live alone. These latter participants encapsulated a diverse range of experiences, including people whose partner had died; people who had separated or divorced, and also people whose adult children had just moved out. Analysis of the OPQUAL results showed that amongst this group, participants who were widowed were more likely to say that they would like more companionship or contact with other people. The need to keep on getting out was a significant strategy in dealing with initial grief after bereavement.

Clara¹: I suppose I made a resolution with myself that I wasn't going to turn down any offers that I got of things to do because I thought people will all sort of invite me to things at first, and if I keep saying no then they'll stop. So, I think I've gone along with that and anything that's come up, I've said, yes, I'll do that, and I've made myself go out and do it.

The OPQUAL results also showed that chronological age as well as transitions also played a role in how people described their views on companionship and contact with others. Older participants (aged 75 and over) were more likely to express feelings of isolation and loneliness than younger people in the study. One participant in her 80s discussed the most important journeys that she made:

Lily: Oh the most important are the ones, well that's a point, the most important ones are really for [pause] - not being lonely. For meeting, for talk to people, for finding you're not missing anything. Because sometimes you can think that the world's having a wonderful time and you're not. Or you know, because loneliness is really I think one of the worst things in age. However some people are happy to stay in all the time, well I wouldn't be, at all. But I'm fortunate that I've got young neighbours that keep their eye on me and I make use of them. It works out very nice use of them. It works out very nice.

Interviewer: When you say you make use of them?

Lily: Well I make use of, if they say they're going somewhere would you like to come? I'm 'yes'. That's what I mean.

¹ Participants' real names have been substituted with pseudonyms.

However, younger participants also reflected on living alone. Freddy was highly mobile from the perspective of physical journeys, often cycling, but he reflected on the frustrating, unsatisfactory nature of being mobile in terms of social engagement.

Freddy: There's clubs I go to, the 60s club or whatever but they're not really over 60s, they're over 70 to over 80 if they're going. There's not many people my age group that go to those sort of things ...I'm quite fit for my age and I don't seem to fit in those. It's the same when I was going on a coach trip, the Shearings are fine but they're 70 plus and they're fine but you go on the 'Just You' and whatever and they're 40 and under, so there's nothing in between.

Both these participants reflected on the value of organised social activities that were age specific. In Lily's case, she attended a social group organised by a local housing association. Freddy in contrast discussed the absence of organised social groups or networks for people in their 50s and 60s. Some participants were also clear that the most recent changes in their lives were not always the most significant. This was illustrated by Freddy (above), who had recently retired, but discussed the impact of living alone after his partner had died some years previously.

Starting or stopping care

Starting or stopping caring for someone also affected people's views on life satisfaction. Participants who had undergone a caring transition (either started or stopped caring for someone in the previous 12 months) reported lower mean life satisfaction ONS scores over the four telephone interviews (although there was no significant difference between the two OPQUAL scores for this group). Participants described a wide range of circumstances with regard to how caring and support influenced, or impacted on, their individual mobility. These discussions not only reflected daily routines around care and support for another household member, often a partner, but also the extent to which journeys were being made to visit people elsewhere who required care and support. Indeed, as the study progressed and individual narratives of mobility over time emerged, it became clear that for many older people in the study reasons for 'getting out and about' were often related to giving care and support to others, and embraced many of our participants, not just those who reported that they had recently started caring for someone. This issue of 'mobilities of care' is discussed in more detail in the next section.

Mobilities of care²

Journeys were being made by people participating in formal volunteering, as well as those offering informal support to partners, wider family members (including childcare, or for older parents), friends, neighbours, colleagues and others. These journeys can be framed in terms of 'travelling to' someone to provide care and support, or 'travelling with' a person as a shared experience. Participants discussed localised everyday journeys to provide care and support close to their home, often within their neighbourhood. However, caring at a distance also involved longer journeys across cities, or travelling to other towns and cities or other parts of the country.

Participants also discussed their experiences of 'travelling with' someone as part of journeying to provide care and support, and reflected on some of the frustrations and limitations of different aspects of the built environment in limiting these shared journeys. Having someone to 'travel with' was crucial for some participants, especially when the nature of their condition or impairment made sharing a journey with others essential. One participant lived with a condition which meant that she could only be out of doors in the company of another person. This participant noted that although journeys were easier with family members who had the familiarity and knowledge of 'how to make journeys work', that nevertheless a local taxi company could fulfil the same function. Although in our research it was families and friends who provided a key role here, there is also a wider role for volunteers to act as 'travel buddies'.

Narratives of positive ageing emphasise the importance of being socially connected, of getting out and about to engage with the world. Our study demonstrated that for many older people, getting out and about was not just for leisure or utility purposes but for purpose of giving (and receiving) support and care. As such these journeys have a particular significance in the lives of older people and in the construction of roles, meaning, and identity in later life; not least the ambivalence of mobilities of care in relation to perceptions of wellbeing.

² See Sanchez de Madariaga (2013) for a discussion of the concept of 'mobility of care'.

These journeys were thus imbued with a variety of meanings, including a reflection of life transitions both of individuals and of their wider social networks, as well as a representation of established identities and relationships (parent, child, loyal friend), and demonstrations of love, affection, and duty. Thus far this issue seems to have been under explored in the literatures of care as well as those of mobilities.

Rhythms, pacing and energy

Recent research has highlighted how the development of age friendly places could be assisted not only by a greater consideration of older people's descriptions of the rhythms of their daily lives, but how these descriptions sit within the wider context of the way that services, transport infrastructures and strategies are prioritised (Lager et al, 2016). This section frames how participants who had started using a mobility aid, as well as others in the study group, described daily and weekly routines in terms of rhythms and pacing.

The rhythms of daily routines provided a way for many participants in the Co-Motion study to describe how they made 'getting out and about' work in situations where they were starting to live with a condition or physical impairment, had started using a mobility aid, or who were living with long term (or life-long) conditions or impairments. Participants were conscious of the energy that they had available and the importance of pacing their journeys while they were out, or breaking up journeys to build in time to rest. A couple of participants noted how their cars provided important places to retreat to if necessary when they were out: a mobile place of private sanctuary. For others, the emphasis was on how the public and private realms catered, or not, in terms of places for people to rest while they were out.

For some, getting out of the home could take a considerable amount of time that could require planning and preparation, especially in order to meet appointments. For example, one respondent living with arthritis noted that the nature of her condition meant that it might take a couple of hours to get to a point where she could leave her home. Another respondent discussed the impact of living with Obsessive Compulsive Disorder, and the way that this condition could impact on her desire to make journeys in terms of the routines she needed to overcome before she could travel. For these people, the nature of their journeys, or the time it took to prepare for a journey constricted the time that they could spend out of the home.

Frustrated mobility

The capacity to get out and about, and the impact of frustrated mobility on overall quality of life was strongly marked within our participants. One question focused on the desire to be out and about through the statement: 'It is important for me to get out and about'. Nearly all our participants, whatever their circumstances or reported Quality of Life, agreed with this statement. However, there was a shortfall for some participants between this desire to be out and about, and their capacity to fulfil their wishes. Participants were also asked if they could get to places they wanted to go to. Participants who disagreed with this statement were more likely to report a lower quality of life. This finding links with other research which has identified that whilst desired levels of activity may reduce in later life, the experienced importance of being mobile does not diminish (Hjorthol, 2013).

A number of participants, however, reflected on the questions they were being asked by the research team, and discussed how they interpreted the questions in a way that had meaning for their experiences. For example, in response to the question 'I can get to the places I *want* to go to' a couple of participants made it clear that they were framing their answers in relation to places they *could* get to.

The impact of this frustrated mobility was evident amongst participants who could not get to places they might usually expect to. Participants were asked to record how far they could walk on a good day, and also the distance they could walk on a bad day. It was the latter – distance that people could walk on a bad day - that had a particular impact on how people felt. Participants reported a higher quality of life if they could walk further on a bad day, compared with the quality of life of participants who could walk less far on a bad day.

This consideration of 'good' days and 'bad' days gave an insight into the impact of micro-fluctuations of daily experiences, set within the context of the broader changes that participants were experiencing in their lives. Whilst this issue was focused on the impact of micro-fluctuations in health on mobility, some participants also discussed how wider issues such as access to financial resources was layered onto their experiences. Access to financial resources could reflect changes in later life or reflected lifelong experiences. One participant discussed the choices that she had to

make in terms of using money from Attendance Allowance to pay for essential journeys, and how these choices shut off other opportunities for travel for other reasons. In this case, the participant was paying for taxis to get essential equipment from hospital delivered to her home.

Stopping or reducing driving

Our research focused on stopping or reducing driving as a key transition framing mobility in later life. Although the OPQUAL and ONS measures in our study did not show that stopping or reducing driving had a significant impact on wellbeing for our participants, the qualitative data highlighted that the experience of giving up driving was a highly varied one, with some participants expressing feelings of lost independence. While there were participants who had given up abruptly, prompted by an accident/'near miss' or sudden health reversal, there were many others who, conscious of their decline in confidence or poorer health, were driving less. Avoiding poor weather, night driving, motorways, unfamiliar routes, rush hour and city centres were all mentioned as strategies for keeping going longer in safety in common with the findings of other research (Baldock et al, 2006; Charlton et al, 2006). For a small group of participants there was an increase in driving or an increase in long distance driving often brought about by the loss of the primary driver through loss of licence or death.

Those who were living in more rural settings (typically villages near the large cities of York and Leeds though not the rural market town of Hexham) were most dependent on their car for everyday life connectivity. Those who were still driving and those who had given up spoke of using a blend of options. Jacob was typical in mixing the transport modes depending on his destinations and companions.

Jacob: I like to shop for bargains and have particular places I go to for food shopping. I go to the market at least once a week on the bus and I go to local supermarkets and so on either on foot or by bus. I drive and sometimes use the car for out of town shopping or to visit somewhere for the day. I generally have at least one trip a week further afield to meet a friend who I regularly go to places such as Halifax, Harrogate or York – sometimes we go by car but I like the train or the bus.

The diverse experiences of participants showed that our approaches to change are as individual as we are, and that the pathways to change are very different in their quality and impact. So Benjamin, who gave up voluntarily, had dreaded the day

when he might no longer be able to drive but found it a much less difficult transition. He had his bus pass that he described as being “as good as a credit card”; he was able to afford taxis with the money saved and towards the end of the research period he acquired a mobility scooter.

Benjamin: I used to like driving. When we were in [town on south coast of England] I thought nothing of getting the car out early in the morning and going up to Berwick at one hop. Those times did change, but one of the things I thought, oh when the times comes or if the time comes when I have to give up driving I shall be paralysed. But it wasn't like that at all.

For Michelle her sight loss led to her sudden and involuntary loss of licence but this was caused by a serious illness that might also shorten her life. Stopping driving was another loss to be confronted.

Michelle: I was devastated to begin because I always thought I'd get my licence back. I really did think I would be able to drive but then I realised I'd been driving with limited sight anyway before then without blacking out.... So, I just accept it, what more can I do? ... When you've been through lots of things, which it's not relevant to this brain tumour, left to get on with it, you soon have to stand up for yourself and make your own way. It's necessity, survival.

For some participants giving up driving was symptomatic of wider changes in their lives often linked to diminishing sight or sudden health reversal. Discussions with research participants who had recently stopped driving highlighted not only practical issues in making the transition to giving up driving, but also deeper emotional and existential considerations. Whilst current guides and reviews in the UK provide positive and constructive guidance for older people on giving up driving (see for example www.ilcuk.org.uk/files/Successfully_giving_up_driving_for_older_people_1.pdf) there may be room for a guide that explores the emotive process of giving up driving and the experiences that people have gone through, including the impact of significant changes in health that may trigger driving cessation.

Using public transport: double jeopardy

Those who gave up or were reducing their driving developed a range of options from bus, lifts, walking and taxis, though the mix was highly dependent on financial, social and locational resources. In cases where health grounds or increasing sight loss had led to driving cessation, those participants found themselves suffering a

double jeopardy in that getting to the bus stop; determining which bus to flag down and accessing vehicles were problematic.

Tess: [on trying to working out the right bus] "Just ask." they say and I say, "Yes, it's all right asking, but it's sometimes the attitude of people when you ask."

Powerful testimony from visually impaired participants and from a third sector stakeholder affirmed that while the bus fleet may be more accessible this is a narrow response to impairment. For those who have to contend with a sensory impairment there is much to be done in progressing a more barrier free environment.

For those who were urban dwellers there was often an acceptable frequency of public transport taking people to preferred destinations. Those who had given up driving in more rural localities such as Hexham commented that they travelled to the places they could get to rather than they went to the places they wanted to reach. Transport planners in these localities were aware of the responsibility laid on them to keep older people connected to everyday life amenities and the difficulty in meeting this in times of public austerity,

We are not providing services to meet all requests because central government does not provide enough money to provide services for all. So people who live in rural areas who are in danger of becoming more isolated because of changes that you describe end up having to struggle on in their place with few/no transport options or have to leave the community in which they are known to live in somewhere with which they have no connection. This becomes part of the understanding of what growing older in rural places is about. It is a disappointment to us that we cannot always make interventions, so rural areas become ghettos for the wealthy and able bodied. (Local Planner).

The final point is a sobering reminder that a failure to invest in transport networks has profound implications for the demography and socio-economic future of our rural settlements. For providers and policy makers in both urban and rural localities there was an understanding that providing bespoke transport options for those whom public transport was a poor fit was expensive and difficult to sustain in times of cuts to municipal and third sector bodies. One officer reflected that a more radical approach was called for based on community networks that might be less costly to set up and maintain though the lead-in time to impact was longer.

Where you get these door-to-door transports, they're expensive, or even when you've got public transport, you might be going to your GP which is half a mile

away, but the only way you can get there by bus is to get a bus into town and bus out again, it takes 50 minutes and I would be really interested if we could develop some small, local community-based transport, but that takes significant investment at the moment and how would it pay for itself? What we do is pump prime a bit of support for those older drivers who want to get involved. We do a lot of door knocking, making contact with existing neighbourhood groups. A lot of people know someone who isn't getting out as much. A bit of work underneath as it were working at the community level is much more sustainable than overlaying a taxi voucher scheme. Investing £50k in community development might be a lot better than putting that money into another bus. It's not an overnight thing but it does lead to a reduction in costs (Public Health Officer)

Understanding how older people face change

The focus on transition led the team to explore in the final interview the extent to which participants relied on particular strategies for meeting significant change. Participants discussed recent changes in the context of experiences over the lifecourse, including coping with previous transitions. For some participants this included discussions of living for the greater proportion of their lives, or all their lives, with conditions or impairments, and how they navigated and negotiated more recent transitions in the light of lifelong experiences.

Finding alternative 'ways of being'

Our research found many problem solvers who when faced with change focused on the goal and found alternatives. Some participants framed their strategies with beliefs and behaviours learned from an early age "when I was a child we were always told".... "my mother used to say" or the learning from previous difficult situations. However others pointed out the importance of recognising when help is needed or acknowledging that previous strategies have failed or have limited value in a new situation.

Charlie: You just have to sit down and think, okay, this is a problem, this is a kick in the teeth, I could have done without it but I have to work round it. What am I going to do to work round it and solve the problem?

Confronting profound change

It was evident that not all transitions had the same impact. Losing significant sight or hearing and moving house by going into care were changes that were irrevocable, and specific transitions such as these had a detrimental impact on how people felt about their quality of life. Participants who had experienced sight and/or hearing loss reported a lower quality of life in relation to their home and neighbourhood, but not in relation to other aspects of quality life (OPQUAL survey). Sometimes profound changes were the trigger for other transitions.

Verity: It was two different things. The shock of losing the house and everything, you had to accept what you had but when [partner's] illness took over, yes, you had to accept it for what it was but it lives with you. Do you see what I mean? It's there every day and it's not something you can say, right, well that's happened, we move on and forget about it. With the house, that was that but with this one you have it every day because you live with it.

In these cases established ways of being and living were perhaps no longer possible and new practices had to be learned.

Constancy and change

While acknowledging that the essence of life is change, older people were also asked to reflect on the anchors in their life that provided a sense of continuity. Family as perhaps expected was mentioned by almost half our cohort as *the* anchor or one of the anchors. Rebecca reminds us both of the mutability and constancy of family by charting its role as an anchor even though the players themselves may come and go and the relationships that were most relied upon change as we shift our own place in the family order and find sustenance from new as well as old relationships.

Rebecca: I think my family has always been my anchor in my life. When I was growing up it was my parents, they were the anchor, and then I'd left home and got my own family. I would say that I'm fairly well anchored and that once I'd got my family around me then I feel secure and safe. So even once I'd lost my husband, I'd still got my children and then once my children- they haven't gone out of my life.. They're just not physically here anymore and now I've got my husband.

Next to family, it was friends who provided anchors. Some of these had always been there as either contemporaries who had shared the same generational experiences or as near parents where relationships had shifted from teacher/pupil to friends to

mutual carers as Emily recounts. Henry speaks of adversity and how this might be as much a test of one's friends and quality of relationships as of oneself.

Emily: I think there are people anchors, like [name] in [town] who was my music teacher at school, so I've known her since I was eleven, who has always been there. She's an anchor, as I hope I am now for her. She has always been an anchor. Being a parent, albeit a parent to adults, and scattered like dandelions, as you say, but that's an anchor.

Henry: I think if you think you've got lots and lots of close friends I think you are fooling yourself. You don't really know until the time comes that it has to be tested and only then do you find out. When I split with my wife, some people that I'd considered to be pretty good friends turned out not to be so. They either didn't know how to deal with it, or didn't speak, and yet other people were surprisingly supportive and I've, rightly or wrongly, been in a position to be very supportive of other people that have had to go through the same thing because you know what they are going through. There are big feelings of guilt. You don't want to be where you are.

As part of reflecting on the impact of transitions on their lives, the study also asked participants to discuss their routines while out and about, and the nature of barriers and challenges they faced while out. The next section considers how the diverse needs of our participants could be situated in the mobility needs of the wider population within our case study areas, and to move towards methods for identifying priorities for planning and practice in the design or adaptation of the built environment as well as wider service delivery.

Setting priorities for action in local areas: conflict and consensus

A challenge for taking forward the development of age friendly communities in specific localities lies not only in identifying barriers and challenges, but in working with communities to arrive at solutions that minimise the potential for conflict between different users, and work towards a locally recognised consensus for action. In a time of austerity identifying locally set priorities for action also helps to inform how scarce resources might be directed.

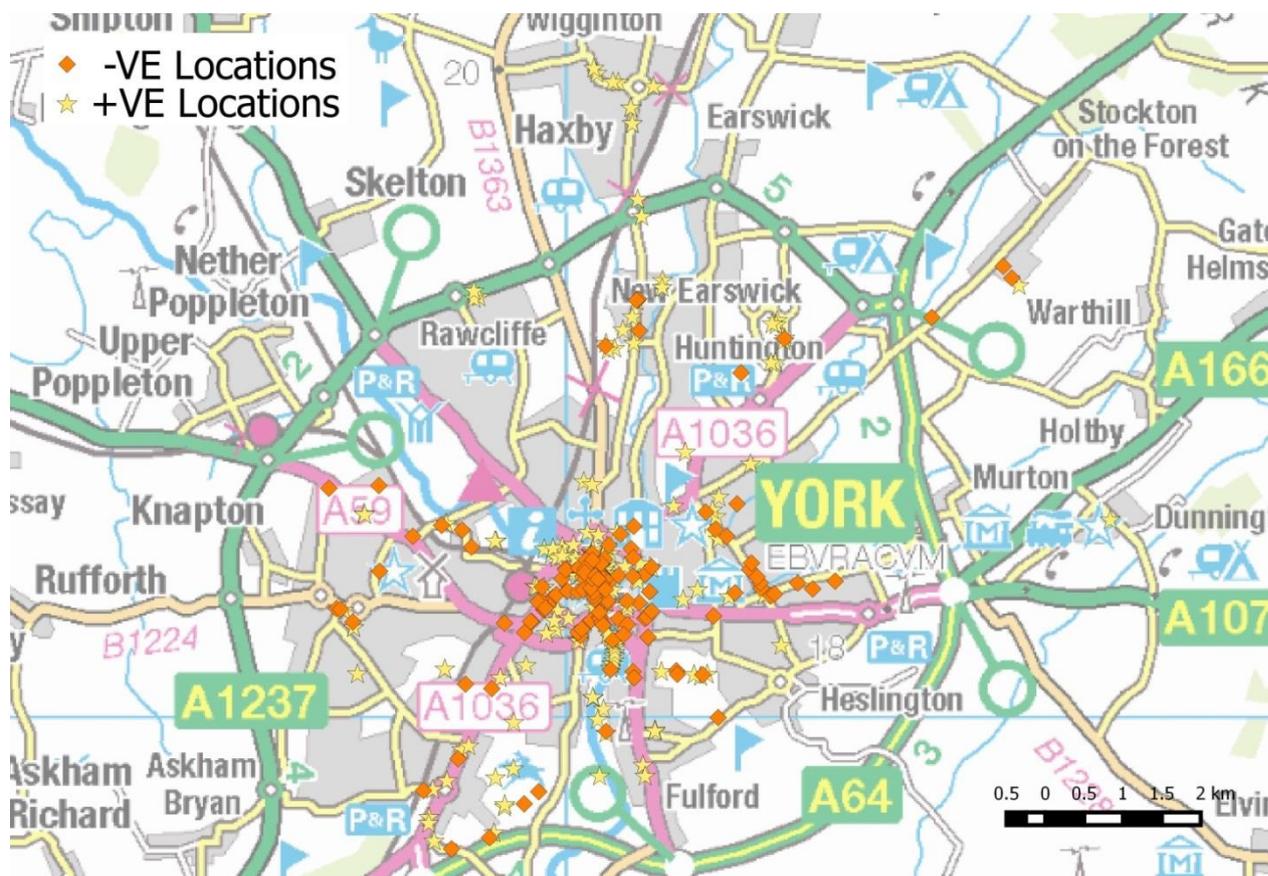
Barriers and challenges in the built environment across the three study areas

The Participatory Geographical Information Systems approach used in our study enabled older people to pinpoint the locations of challenges and positive features of the journeys they made around the areas where they lived. The problems were specific for each case study area but always included a mixture of physical infrastructure challenges (poor pavement surfaces, or absence of road crossing points); problems related to behaviour of other people (such as parking on pavements, inconsiderate use of shared footpaths); and the poor governance of urban spaces (weak enforcement of pedestrianisation zones, traffic congestion and air pollution). The solutions related to these issues but also included some additional ideas that older people felt would encourage them to remain mobile and improve their wellbeing including having buses that ran to local parks. Some of these issues are outlined below:

- Many public and private buildings were considered to be inaccessible to people with a diverse range of conditions or impairments (for example, absence of ramps, heavy doors that need to be opened manually; poor circulation space, or lack of places to rest). Again, this appeared to reflect attitudes as well as awareness of needs. The physical inaccessibility of some public spaces meant that some people were effectively unable to participate in some events and experiences (an example given in the research was participating in jury service).
- There was a lack of toilet facilities generally that are open to the general public, but especially ‘accessible’ toilets suitable for people who use mobility aids or need assistance.
- Design solutions often too narrowly focused on wheelchair friendly design with less awareness among policy makers or members of the public of the needs of people with less visible or obvious impairment (hearing loss being one example).
- Meeting the needs of one group through design features can cause issues for others. Physical modifications intended to help key groups (such as tactile surfaces) or to moderate behaviour (for example speed humps on roads) were noted as causing difficulties for some respondents with physical impairments or conditions.

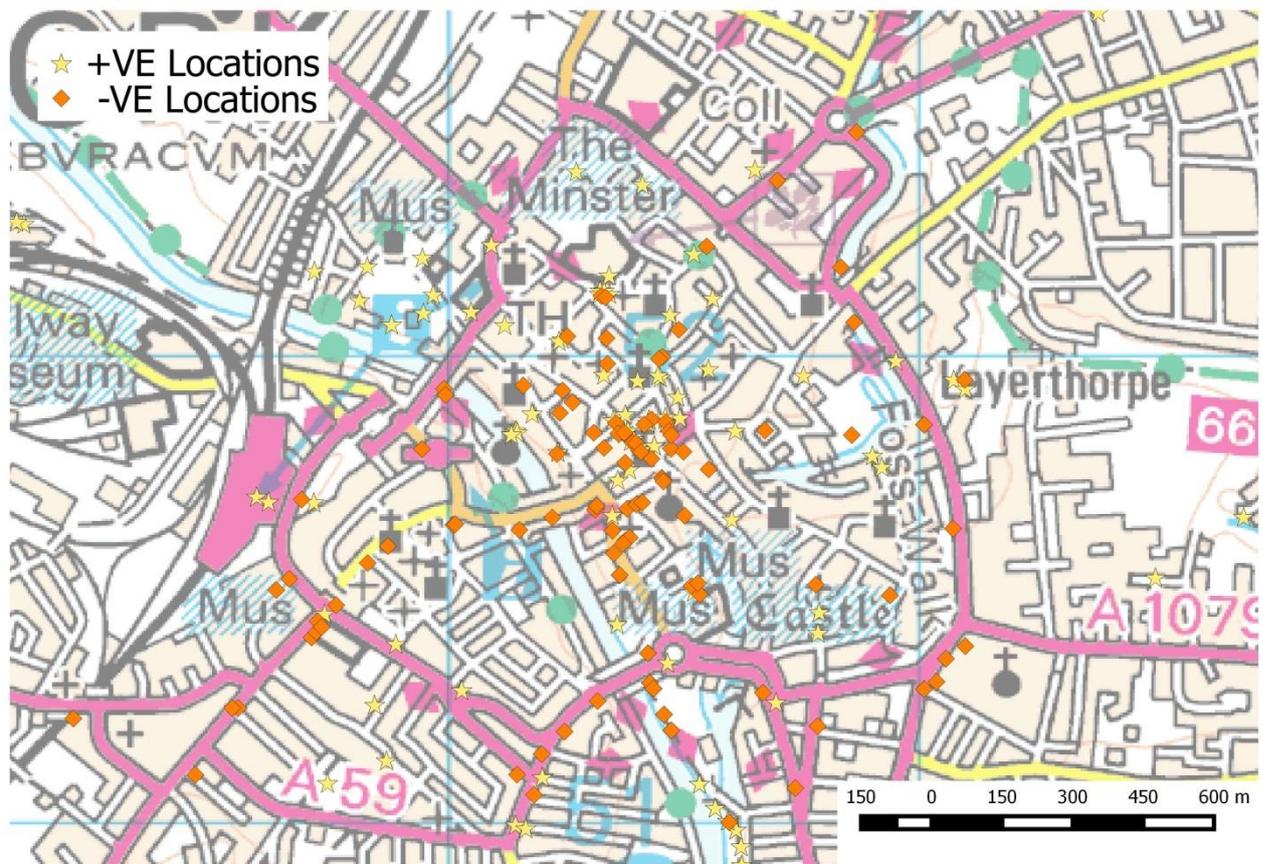
Priorities for action in York

In this report we illustrate our approach to local priority setting by highlighting the results for York (further information about local priority setting in our other case study areas, Leeds and Hexham, is also available on our webpages: www.york.ac.uk/co-motion). Some of the specific issues noted by participants in York included difficulties with pavements (maintenance, trip hazards/uneven surfaces); negotiating traffic in pedestrian areas; parking on pavements; the need for improved facilities such as accessible toilets, and places to rest; more frequent and reliable buses (especially evening services), and bus services that link outer residential areas with out of town shopping centres, safer pedestrian crossings with more time available to cross at controlled crossing, and also about feeling unsafe in the evenings, especially in the city centre. Specific comments were also made that shared spaces (such as Kings Square) were disorienting for people with sight loss. Participants identified some of the specific places in York where there were positive features, as well as locations where they experienced difficulties or problems (see maps below, including a more detailed map of the centre of York).



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Locations of positive and negative features in York identified by participants



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Locations of positive and negative features in York City Centre, identified by participants

Participants also discussed possible solutions to the challenges they had identified. Ten potential priorities for action in York included:

- 1) Enforce York's pedestrian zone more strongly
- 2) Increase seating especially in the city centre
- 3) Remove advertising boards from narrow pavements
- 4) Increase toilet accessibility
- 5) Maintain York's pavement surfaces better
- 6) Reduce congestion with charging and car-sharing
- 7) Make 'Park & Ride' buses more useful - and improve ticket prices
- 8) Ban parking on pavements across the city
- 9) Improve road crossing places
- 10) Improve behaviour on shared use paths

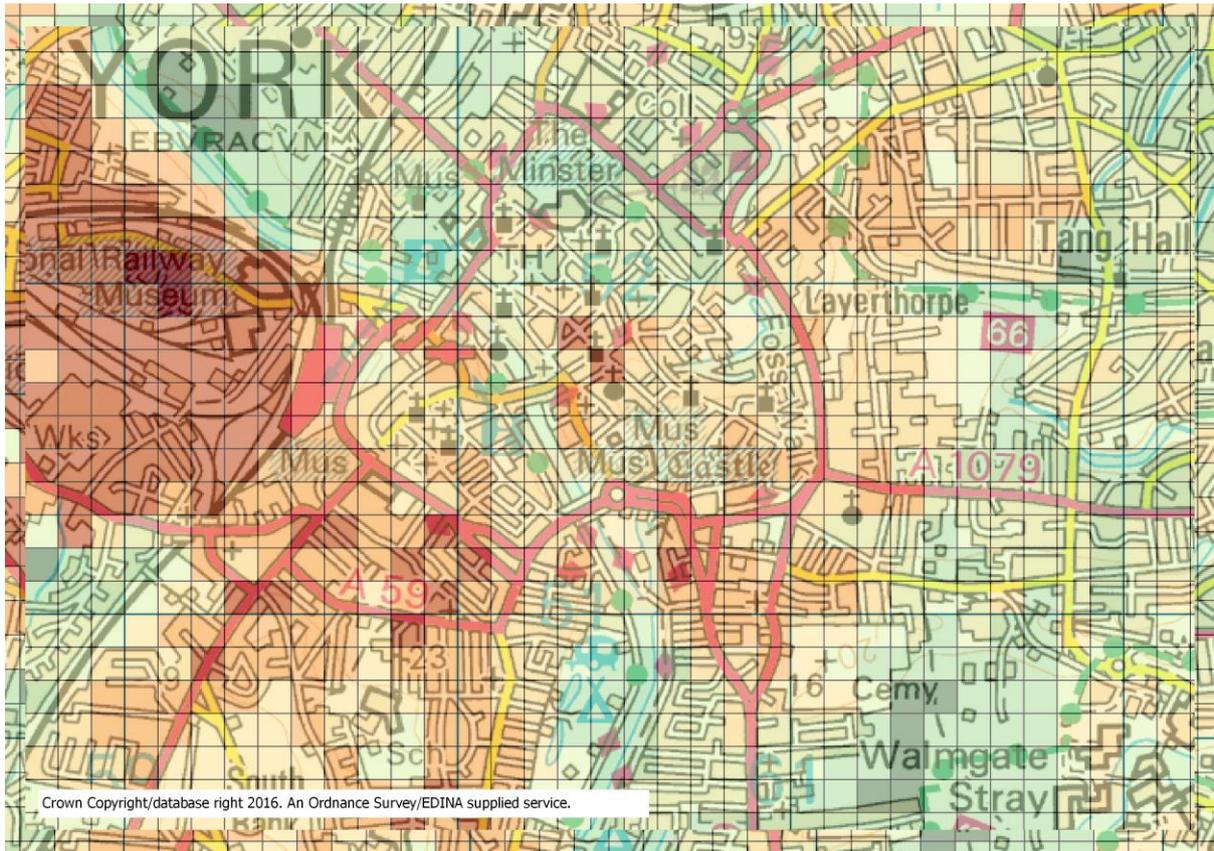
To help identify how far these solutions might be supported by a wider cross section of local people – or whether they would bring unexpected problems or additional benefits, over 120 York residents took part in an online survey. The top three solutions to emerge are shown in the table below. The top three priorities for Hexham and Leeds are also highlighted for comparison.

Priorities for action in the case study areas

| | York | Hexham | Leeds |
|-----|--|--|--|
| 1st | Maintain York's pavement surfaces better | Ban parking on pavements across the town | Improve pavement surfaces |
| 2nd | Enforce York's pedestrian zone more strongly | Maintain Hexham's pavement surfaces better | Ban parking on pavements |
| 3rd | Increase toilet accessibility | Improve road crossing points in the town | More seating in the city centre and shopping centres |

A spatial typology for York

The development of a spatial typology for York resulted in a map that showed the probability that locations were positively or negatively associated with enabling mobility for older people, and contributing to wellbeing. The typology identified patterns that matched those described by the qualitative datasets. These included the larger parks and amenity greenspaces particularly those alongside the river that are also served with shared use cycle paths being positively associated with mobility. The city centre area was mixed with some locations with narrow pavements in the medieval centre being problematic, however there were locations in this older core that were beneficial, for example, around the Minster where significant redevelopment has occurred to improve pavements and make a new public piazza. In addition some of the residential neighbourhoods surrounding the city core with larger areas of greenspace and wider footpaths have high probabilities of being positive for mobility.



Probability that a location is positively (green) or negatively (orange/brown) associated with enabling older people’s mobility, thus contributing to wellbeing.

The use of mixed methods proved particularly valuable in identifying the diversity of factors that influence older people’s mobility that may not have been revealed through either individual approaches in isolation (for example the photo diaries revealed different barriers to those revealed by the mapping such as kerb issues and steps) or alternative methods such as structured questionnaires. The nature of the data we revealed indicates that a mixture of open flexible approaches (such as photo-elicitation) and more constrained methods (such as participatory mapping) can add particular value to exploratory participatory and co-investigation research.

The complexity of the issues facing diverse needs of older people in our study links back to the potential for us to model the interaction between urban characteristics, mobility and wellbeing. Key factors that affect older people’s mobilities were not always readily identifiable from existing available national datasets. These included a lack of data on a mix of physical infrastructure such as the location of benches or the quality of pavements. These were compounded by the absence of reliable information on the quality of urban systems; issues such as the quality of toilet

provision or the operations of delivery vehicles at different times of day. If these issues are not readily identifiable from the datasets they are not likely to be well considered in decision making and are impossible to monitor for changes.

The findings also indicate that we may be able to usefully identify locations that are currently not promoted as positive destinations that might have characteristics which could be beneficial for health and wellbeing. There is a research need to evaluate whether these locations, that seem to have high probabilities of having beneficial attributes actually result in positive experiences amongst older visitors. This would help validate the modelled probabilities indicating that some critical factors can be successfully predicted using existing datasets.

Additionally we need to consider how to target improvements in the spaces identified as problematic. Should decision makers focus on infrastructure improvements that may be hard to deliver in an age of austerity or instead consider behaviour change initiatives that could improve interactions between urban users (including older people) in a wider variety of places? The next part of the findings considers the issue of interactions between people in more detail.

Attitudes and behaviours in public places

Our research participants discussed a range of barriers and challenges that they faced as they were out and about, especially people who lived with impairments and/or conditions. Although many respondents described some of the ways that the physical design and maintenance of outdoor spaces affected their mobility, participants also discussed the impact of experiences of being out and about amongst the wider public as well as interacting with staff in shops, transport operators, and other service providers. The potential nature of social encounters - both positive and negative - also shaped mobility and people's confidence to get out and about.

The confidence to be mobile was an important theme that underpinned the discussions of a number of our participants and played a role in determining how and where they travelled. Phillips et al (2013) highlighted the nature of mobility for older people in places that they were unfamiliar with, and the implications of this for design and urban planning. In contrast, Rowles (1980) discussed the way in which some older people develop an intimate knowledge of the areas surrounding their

homes, and how this familiarity with the physical characteristics of routine journeys meant that they could compensate for limited mobility due to impairments or conditions. However, this familiarity, or ‘insiderness’, can be disrupted by the actions of others.

Participants discussed the very fluid and diverse experiences of day to day interactions with other people, including positive as well as negative encounters. A number of participants emphasised the supportive and positive nature of many encounters, and the influence of this on everyday experiences of being out and about. A participant summarised his experiences of using a mobility scooter:

Interviewer: How are other road users with you?

Richard: They're very helpful. The car and road users are, you know. Other than the certain people who park on pavements which one sometimes have to have words with and. ... But by and large, the vast majority are very helpful and have no problem with. ... You see, you can't judge everybody by the small minorities. I mean, there's minorities in everything.

However, as reflected in the quote above, participants also identified specific ways that the attitudes and behaviours of others could have a negative impact on mobility in specific locations. These latter comments had two distinct elements. Firstly, attitudes and behaviours that created physical barriers for others, and, secondly, negative social encounters and interactions.

Attitudes and behaviours that create physical barriers for others

Respondents identified a number of ways that the attitudes and behaviours created physical barriers for other people. This included:

- Parking on pavements (or parking across dropped curbs).
- Parking in bays for disabled people if none of the occupants live with an impairment.
- Users of parking bays for disabled people leaving shopping trolleys in parking spaces.
- Businesses putting advertising boards on public pavements.

Negative and unhelpful encounters

Participants also emphasised that negative or unhelpful encounters with members of the public, as well as service providers, had a significant reported impact on their confidence to be mobile. Four themes were identified, including interactions between different types of transport user; the physicality of being out amongst other people; using public transport, and finally, attitudes towards disabled people:

Interactions between different types of transport users

- Cyclists on pavements (as distinct from designated routes that are shared between cyclists and pedestrians).
- Mobility scooter users on pavements who drive too quickly or without sufficient attention to other people.
- Speeding by motorists.

The physicality of being out, especially in busy or crowded places

- Being bumped or jostled in busy places
- Feeling unsafe near rowdy behaviour (especially evenings in town or city centres)
- People using mobile phones who are not looking where they are going.

Using public transport

- Getting on or off buses
- Finding and negotiating a seat on public transport

Participants described very varied experiences of using public transport, including some very positive and supportive instances. One aspect was interacting with bus drivers, especially for people who lived with particular conditions or impairments. A participant reflected on the responsibility of individuals to ask for help, but noted that the attitudes of drivers was important:

Tess: Everybody says, "Just ask." I say, "Yes, it's all right asking, but it's sometimes the attitude of people when you ask." I mean, I asked . . . was it one of the bus drivers? . . . I asked was this bus going past the hospital, because there's an orange bus and a yellow bus and I sometimes mix them up..."Does this bus go past

[name]?" Then you get the reaction of, "Well, yes, of course it does, because it's such and such." Or, "It says such and such." And I'll say, "Well, I can't see that."

Another participant noted a positive change in this regard:

Mabel: I have found the buses have improved. When I had my knee replacement, which was three years ago, it took me ages to pluck up enough courage go on a bus. I felt very vulnerable, but over this last year, before I fell over and broke my hip, I was very impressed by the improvement in the attitudes of the drivers. They would wait for you to sit down, if you got up to get off at a stop they wouldn't expect you to walk down the bus ... and I just found it much better.

However, another respondent who lived with sight loss discussed the difficulties of negotiating a seat with fellow passengers:

Christena; Some bus drivers are great and they take my card off me and do it for me, others just let you struggle, not deliberately, I'd like to think, but it can be a struggle. So you've got over that hurdle, and then people are sat in the disabled seats who are not disabled, and you have to ask them if you can sit there because there's no way I could get to the back of the bus with a white cane. Just a little bit more thought from people would be nice, and before I was visually impaired I would never sit in a disabled seat, I'd always leave them spare. I just think it's manners.

Attitudes towards disabled people

One participant who used a wheelchair reflected on some of the attitudes she encountered while she was out and about, and noted how many people seemed to ignore her.

Ruby: I'm going along with the shopping trolley and my stick's in the shopping trolley, but people walk straight into you, you know. I find that a lot when I'm in the wheelchair as well, people don't see you because you're lower down, so they tend to walk into you, but in [supermarket], it's terrible. I mean, there's wide aisles but they always seem to head for you, hitting you with trollies and things and, oh! So we stopped going there.

In contrast, other participants emphasised the invisible or episodic nature of their impairments, or the speed at which they could do things, and the difficulties this could cause as they navigated through public spaces and interacted with services. A couple of participants who lived with sight loss noted that they used symbol canes to alert people around them. However, another participant who used a long cane

discussed the negative comments and behaviours that using a long cane sometimes attracted while she was out and about.

Raising awareness of the needs of older and disabled people in public spaces

The physical design of the built environment is part of the jigsaw that shapes the ease with which people navigate outdoor spaces. The attitudes and behaviours of others can also impact positively and negatively on people's experiences of being out and about, as well as the capacity and confidence to be mobile. Difficult experiences, for example, in negotiating a seat on public transport, or being the focus of negative attitudes or comments can erode confidence and can create anxiety about travelling.

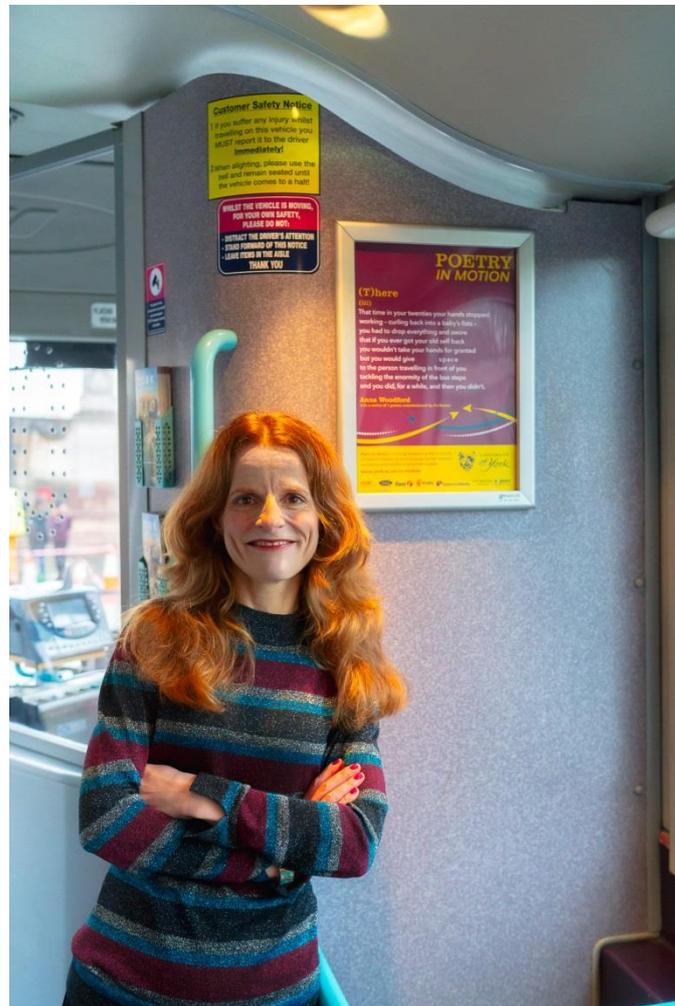
Specific behaviours such as parking on pavements have been the focus of recent reviews that have considered the legal framework available to local authorities; design features that can reduce or limit footway parking, or awareness raising and behaviour change strategies (Butcher, 2016; Road Safety Observatory, 2017) www.roadsafetyobservatory.com/Review/10067.

Attention has also been drawn to the need for ongoing training for the frontline staff of service providers in disability awareness and age-friendly approaches (Ormorod et al, 2015). Further initiatives include the use of 'Better Journey' cards for people who use public transport.

Our participants also highlighted the issue of awareness raising amongst the wider general public, as well amongst service providers, and this is a potential avenue for policy attention as part of a broader focus on factors that can also support age friendly communities. This finding links with previous research in other European countries that have put forward the suggestion of awareness raising campaigns to highlight the needs of older people, especially on public transport (Risser et al, 2010).

The range of impairments that people live with are not always obvious, and awareness raising needs to reflect this diversity. It's possible to draw on examples of current and emerging practice in this regard, including awareness raising as part of the development of dementia friendly communities. Our project also developed a local approach to awareness raising by working with the poet Anna Woodford, who wrote a sequence of poems on mobility in later life. These poems were rooted in the experiences of our participants, and aimed to raise awareness amongst the general

public of travel needs in later life. We also worked with one of the public transport operators in the City and the poems featured on First York buses between January and April 2017 (the poems can be viewed on our project webpages: www.york.ac.uk/co-motion).



Anna Woodford with a poem in situ on a First York bus (January 2017).

Co-designing mobile applications for older people to promote mobility and wellbeing

A key objective of the project was to find ways to use technology to help people get out and about, based upon evidence of the things that help or hinder the mobility of older people. The project was underpinned by the principle that the process should be user-centred.

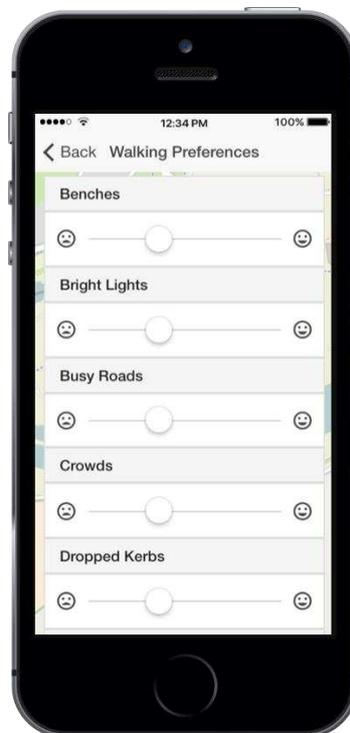
The first step in this part of the Co-Motion Project was the photo diary study to explore the mobility and wellbeing of participants in the case study areas. The participants took a total of 653 photos (about 25 photos per person). Analysis of the photos and interview material revealed 6 themes of importance to the participants:

- *Stability and consistency of the built environment:* negative issues included broken and slippery pavements, protruding gratings and drains.
- *Clarity and visibility of the built environment:* positive issues included clearly marked cycle lanes and pedestrian zones, good signage for public transport, particularly real time information at bus stops.
- *Safety and security in the built environment:* negatives included busy roads that were dangerous to cross, badly planned roundabouts and crossings where visibility is poor; positive issues included traffic calming measures and speed restrictions.
- *Beauty and upkeep of the built environment:* negative issues included litter and animal mess; positive issues included flowerbeds, gardens, trees and shrubs.
- *Propriety and thoughtfulness in the built environment:* negative issues include cars parking on pavements, cyclists riding on pavements or parking their bikes in inappropriate places, bin bags left out, A-boards obstructing the pavement; positive issues were benches and other places to sit, assistance provided by public transport companies.
- *Freedom and flexibility in the built environment:* positive issues here included good public transport (although lack of public transport was also often a negative issue) and free parking for residents.

Using the results of the photo diary study, we developed a number of ideas for mobile applications which might help older people negotiate the built environment and promote their physical activity and wellbeing. These ideas were explored with older people in a number of workshops. The workshops presented the list of themes that came out of the photo study, and asked participants for their feedback on the themes relating their own experiences through a post-it exercise. Participants were then presented with a set of potential applications. As well as group activities, individual questionnaires were also completed by participants which explored their preferences on the different ideas, identifying the most strongly supported opportunities for mobile technology in their own activities.

The workshops showed that older people definitely recognised the value of technology for supporting mobility. They rated four of our ideas highly. The complexity of possible apps appeared to affect their popularity, with participants favouring ideas that were relatively simple. More sophisticated ideas were rated less useful. Participants felt mobile phone and tablet computer applications were effective in ensuring they would be confident, safe and secure when out and about. However, participants emphasised that the information applications provide must be trustworthy, reliable and safe.

On the basis of the workshops, we developed a 'Walking for Wellbeing' application for smartphone. The Walking for Wellbeing application allows older adults to plan walking routes in their local area. The routes calculated by the application are tailored to suit the needs, preferences, and interests of the individual user. This prototype application also permits the customisation of walking routes for its users. The customisation options allow users to specify barriers to avoid on their walks, such as uneven pavements or steep stairs, and things that would increase their aspiration to get out and walking, such as rest stops, nature or heritage sites.



The prototype walking for wellbeing app

We then organised demonstrations of the application with four groups of older people. Participants used the app to find a route from their current location at the University of York to York Minster, via a local pharmacy. For each screen of the app, we discussed the design of the screen with the participants who raised issues and suggestions. These evaluations also produced interesting improvements to the interface, as well as a validation of the types of customisations on routes users would prefer.

The prototype was designed in the Ionic framework (<http://ionicframework.com/>), allowing the designers to deploy the app prototype to different platforms, and to allow more realistic use in evaluations. The prototype provides an initial interface design and implementation that can be extended in the future. This work is of particular interest to clinicians working with patients with mild cognitive decline, where increased exercise can lead to prolonged periods of wellbeing³.

Mobility scooter pilot project

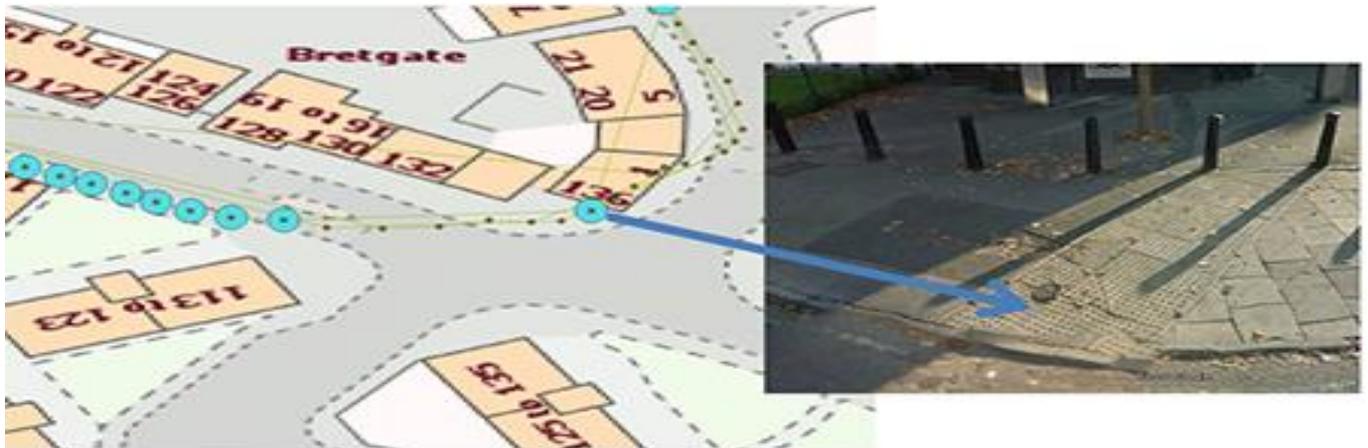
The pilot study recorded sufficient information across the two study areas to provide the basis for an initial understanding of the journey characteristics faced by the mobility scooter users. Some technical issues were experienced by mobility scooter users who were reluctant to record their journey experiences by using a tablet whilst moving. Instead they preferred to provide this information post completion of their trip.

Surface roughness/bumpiness

Pavement and road surfaces are one of the major factors affecting scooter user journeys. Poor quality and badly maintained paths do not provide enjoyable trips and can exacerbate other health issues that are often faced by scooter users such as chronic back pain. Potholes and broken paving slabs are also major hazards for scooter users. The cambers on roads and pavements also caused users to feel unsafe especially crossing driveways. The sensors employed on board the scooters were

³ Additional funding is being sought through Innovate UK and RCUK impact acceleration grants. The research team is collaborating with Schulich Centre for Family Medicine at Western University in Canada who are interested in extending this work into full clinical trials.

able to detect where these were geographically by comparing the data with Google Earth imagery.



Identification of rough surfaces (broken paving slabs) detected using sensor

In York, the historical infrastructure, which is inherent across the city, is not always conducive to scooter use. The Shambles for instance is a cobbled street, popular with tourists, but is comprised of a cobbled thoroughfare which is flanked by two narrow pavements crowded with tourists. Whilst from a historic conservation perspective there is little that planners might be empowered to change, but for scooter users it would be a route that is best avoided. On the other hand planners can make differences (even in historic settings) as demonstrated by the newly paved area next to York Minster. The flat even surface here provides a positive experience for scooter users.

Distances

There were differences in the range that scooter users travelled. This depended on the person rather than their home location and depended on their needs and confidence in using the mobility scooter. For example, where they had access to local services such as shops their journeys tended to be shorter and quicker. In some cases the scooter user only felt confident doing the journey that they knew well and did not venture along new routes.

Weather

Weather played an important factor in the trial but is also one reason why some scooter users do not go out so frequently. There are often concerns about the

pavements covered with leaves which can be a slip hazard to users as the wheels of the scooters often do not have enough grip. This was experienced more frequently on slopes (up and down). During the study in Leeds the inclement weather meant fewer trips were taken by some of the participants. Scooter users are often at the mercy of the weather and this can be a barrier for them going out, especially during the winter months where snow could cause the scooter to become stuck; ice a major skid hazard; leaves reducing tyre grip, and, a lack of protection from the rain.

Air quality

A separate air pollution sensor (Dylos) on-board the scooter was used to measure particulate matter (PM_{2.5}, PM₁₀) to give a relative measure of air quality. Along the journey, the sensor counted the number of particles in the air at the same level as the scooter user indicating their exposure. The sensors calculated the number of particles every second and the data was geo-referenced and mapped to provide a relative measure of which locations along the route had better or worse air quality. Results showed where counts of air particles were higher so that hotspots could be identified. These naturally occurred along major roads and in particular where there was standing traffic. In York, a major hotspot was at York railway station where bus, car and taxi traffic is concentrated at this important interchange.

Noise

A noise sensor was incorporated in the unit mounted on the scooter. This measured relative noise (loud/quiet) not actual loudness values (e.g. decibels). These values were also geo-referenced and thus could be mapped. The York study clearly showed a difference between the pedestrianised area and one of the major roads running through the centre of York. Louder noise from passing traffic was identifiable especially along main transport routes and also at junctions where there was standing traffic. However, the sensor also recorded louder noise when the scooter went over bumpy surfaces.

App development

A bespoke app was developed for the project which enabled users to record perceptions about their journey and about their wellbeing in situ as they were actually taking their trip. The study showed that some older users were more conversant with the technology and happy to use it or were willing to embrace the

use of technology, whilst others were more reluctant as they had not used apps before. The information recorded by the app was time-stamped so it could be synchronised with the data from the sensor. Ideally, participants would record information as they were moving (or stopped briefly to enter data in situ) so that this qualitative information could be geographically matched to the environmental data recorded by the sensor unit.

However, many users were reluctant to do this. The main issue here was the confidence in getting the tablet out whilst en-route to record information either for safety reasons i.e. not wanting to stop due to their position (on a busy street or at a junction) or for security reasons (fear of theft).



Use of the app to record users' journey experiences

Future research directions

The pilot study identified a number of key areas for future research into improvements to urban planning as well as mobility scooter design that could provide solutions for improved wellbeing and mobility for scooter users. These have been categorised under three broad headings: technology, safety and accessibility.

Technology

There is great potential for improving mobility scooter users' experiences by developing and incorporating technology which could serve a number of purposes. Firstly mobility scooter technology that improves comfort and safety – collision detection, improved pneumatics and suspension, battery efficiency, and scooter stability. This kind of technology is often related to improvements seen in the automobile industry, for example parking sensor technology, which could be used for assessing potential collisions.

Secondly, technology can provide mobility scooter users with information about the accessibility of the areas in which they live in the form of maps identifying scooter friendly routes. These could include: the location of, and routing to, key services e.g. health services; notifications of where potential impediments to accessibility might be located e.g. steps; together with positive aspects of urban spaces where scooter friendly shops or buildings are located.

This information could be provided by an advanced dashboard which is linked to a range of location-based information providers as well as to social media channels which could act as a support network for users identifying areas to avoid such as crowded areas.

A dashboard would also be able to display information measured from sensors attached to the scooter which could include the status of the vehicle such as battery charge, range, and servicing required e.g. brakes. Other safety information could also be displayed e.g. for many scooters there is a 'maximum gradient' which is the steepest slope that they can safely be used on.

Safety

There is no legal requirement for scooters to be serviced and often users do not take into account how roadworthy their vehicle is when using it. Brakes and tyres (grip, pressure) are potential causes of accidents. As scooter users are not required to service their vehicles they are potentially unaware of any defects or faults in them. This is an important issue as there is a large second hand market for mobility scooters, which is unregulated.

There is often little knowledge about the law on the permissible speeds for scooter users and where they are able to go (Rica 2014). UK legislation restricts the speeds that mobility scooter can travel depending on the type of vehicle and whether they are travelling on road or pavement. Typically, this is 4 miles per hour (mph) on pavements and 8 mph on roads. On many scooters these maximum speeds can be selected via a switch on the scooter steering column but relies on the user switching this on. Further research that considers safety aspects from different road user perspectives is needed. For example, from a car driver's perspective mobility scooter users driving performance may prove to be erratic and their speeds difficult to judge as well as being able to anticipate manoeuvres. Other safety improvements to mobility scooters could also be investigated including their visibility to other road users.

Accessibility

During the Co-Motion project respondents reported on a number of barriers to movement such as advertising boards, street furniture and other negative features such as bollards and barriers which are placed to deter motorcycle users. Pavements are sometimes difficult to navigate due to the location of dropped kerbs. Often, a corresponding dropped kerb is not found on the opposite side of the road and as a result forces the scooter user onto the road, which is both inconvenient and also a safety issue.

It was also apparent from the study that scooter users' knowledge about accessible routes take time to evolve and this is gained with experience. However, this knowledge is not always easy to share. For instance, routes taking scooter users away from congested areas (both pedestrians and road vehicles); routes which are accessible where scooter users don't end up at a dead-end or are faced with a steep slope to ascend or descend; and routes which have particularly sloping cambers. In the study users often identified accessible routes by taking the route with another person (walking) to check that it was suitable or through sheer adventure and going as far they could before coming to dead end or some other physical barrier.

The sensors deployed on board the scooters during the trial were able to identify where surfaces can be a problem for scooter users. Whilst this was based on only a small number of journeys it demonstrated the potential for creating route maps for scooter users to avoid the worst areas. This could be incorporated with the noise and

air quality sensor data to provide additional layers to plan routes. This opens up new avenues of research where improved interfaces, dashboards and also mobile phone/tablet apps could be co-developed.

Metropolitan and local authority planning departments and highways agencies need to consider the increasing number of mobility scooters in the future. For example town centre re-development should use suitable surface materials that are safe and hard-wearing. They should provide better signage to indicate whether routes are suitable for different types of users (of all ages) not only mobility scooters. They need to re-assess the location of traffic restrictions and pedestrian furniture to enable scooter user access.

Chapter 3 Conclusions and recommendations

Introduction

The Co-Motion project had three overarching aims: to explore mobility and wellbeing for older people going through critical but common life changes; to investigate and address the needs of different groups of older people; and to create practical tools which can act as complements or alternatives to the re-design of the (physical) environment. Below we reflect on the main findings and set out key recommendations for policy and practice, as well as potential directions for future research.

Lived experiences rather than years lived: using life transitions as a framework to understand mobility, wellbeing and ageing

The decision to use key life transitions as an alternative to chronological age as a way of understanding ageing was informed by the work of Grenier (2012), and by a growing recognition of the deinstitutionalisation of the life course (Clerk, 2013; Graham and Sabater, 2015). It was intended to provide a counterpoint to studies of ageing and mobility where participants are clustered or recruited according to age bands, and address well recognised difficulties of defining 'old age', or 'older people', or differentiating and categorising individuals on the basis of years lived rather than lived experiences (Walker et al, 2013; Boyle et al, 2015). In the context of a longitudinal study, using life transitions as a framework for investigation was also intended to allow greater insights into individuals' lived experiences of change and processes of adaption over time, and a longer view of the impact of life transitions on mobility and wellbeing, which in turn would enable new thinking about means of enhancing mobility in later life.

On reflection the research team acknowledges that our list of transitions could have been broader. The qualitative interviews revealed a number of additional transitions: those who were living alone might find a new partner; those who suffered pain and restricted mobility might enjoy a considerable upturn in their wellbeing and ability to get out and about through hip or knee replacement, or cataract surgery, or new drug treatments, or changes to drug regimes. Others, particularly some of those who were newly retired, also talked about seeking (and sometimes) finding new opportunities for work (both paid and unpaid), or learning new skills.

Our work also illustrated the limitations of thinking of life events or transitions as single, unrelated, time limited events impacting only on individuals that, if perceived as likely to have a detrimental impact on health and wellbeing, might be mitigated by preparation or by 'interventions' (for example, retirement planning courses or events). Over the course of the study, it was clear that some transitions were irrevocable, often having a domino or trigger effect leading to a series of other transitions, for example, illness leading to sight loss, in turn leading to driving cessation, in turn leading to retirement or relocation. Other life events are progressive, for example, the onset of a degenerative illness which might start with a relatively mild impairment, but go forward into much more difficult terrain where change is gradual but constant over a prolonged period of time. A further point is the impact of the transitions or life events experienced by significant others, and here caring provides perhaps the most obvious (but not only) example. The qualitative interviews demonstrate both the dynamic and reciprocal nature of caring over time, and how the life events or transitions for significant others impact on the experience of caring for, or being cared for, and in turn on mobility and wellbeing. Finally, wider structural changes such as the withdrawal or introduction of a local bus route or transport service, the advent of new and potentially supportive technologies, and central initiatives to support mobility (free travel passes, the 'blue badge' for cars), the raising of the retirement age, are all part of the bigger picture of navigating and adjusting to change in later life.

Recognising complexity, context and relational resources

Our findings emphasise the need to acknowledge the significance of complexity, context, and relational resources when seeking ways of enhancing the mobility and wellbeing of older people. As we age we may be trying to deal with one or several transitions that may be overlaid onto changing health and physical or cognitive capacity, the changing capacities of the social resources of family, friends and support networks; and the shifting physical landscape of the built environment and services as well as a policy context that may govern the flow of financial and supportive resources, all of which impact in diverse ways upon an individual's capacity to face or embrace change within their lives, and how this relates to getting out and about.

This acknowledgement of complexity challenges the rising neo-liberal flavoured discourse of 'successful ageing' based on the resilient and self-focused individual

who has accumulated a range of secure and unchanging resources over the life course, and with these can overcome adversity and even bounce back. We would concur with Wild et al (2013) when they caution that the concept of resilience might be used as a way of diminishing and downplaying the diversity of experiences in later life that do not conform or live up to the notion of the successful or productive individual, and might also underplay disadvantage and precarity.

Recognising the normality of doing things differently

In understanding mobility, as Manderscheid (2014) has argued, too often movement has been conceptualised as the product of individual decisions by autonomous agents. Wild et al (2013) set out a way to take forwards how this tension between structure and agency can be resolved through the notion of 'mobility resilience'. This approach shifts the focus from the resilient individual and situates the mobility of the individual within overlapping and inter-related scales of household, family, community and neighbourhood as well as societal resilience in enabling or constraining mobility. Stephens et al (2015) also suggest that a focus on supporting the values of older people helps situate policy and research approaches within the wider role of social and spatial contexts and inequalities, rather than an over-reliance on maintaining physical health. Key to this approach is understanding mobility not just as physical capacity to move, but in the ways that people connect with others, and make things flow through these connections. The value of this approach for framing the design of the built environment and wider policy concerns is through an emphasis on understanding the problems and possibilities of 'being differently mobile' (Mansvelt and Zorn, 2012). Mansvelt (2014) describes this approach as recasting how policy can respond to diverse needs in later life by enabling the normality of doing things differently. Our findings support this recasting, and below we propose a series of recommendations, drawing on the different elements of the Co-Motion project that seek to enable and facilitate 'doing things differently'.

Age-friendly mobilities

While there has been much focus on age-friendly cities and age-friendly neighbourhoods, the journeys that were most important to many of the Co-Motion participants were those that connected them with significant others - family, friends, and wider social networks - rather than journeys associated with more functional routines and activities. People rather than places were often the motivation for

getting out and about, and this observation is in line with more recent reflections on the concept of ageing in place that highlight connectivity to social networks as mediator in place satisfaction and attachment to place rather than spaces per se (see Boyle et al 2015; Hillcoat-Nalletamby and Ogg, 2014). Rather than thinking about bounded spaces and how these might be made age friendly, a shift in focus towards age-friendly mobilities rather than age-friendly places might consider:

Ways to change attitudes and behaviours in public places

Attitudes and behaviours in public places may impact on older people's mobility in two ways: actions and behaviours that create physical barriers for others (i.e. parking on pavements, using advertising boards on footways), and also through a lack of awareness or tolerance of the needs of others through incivilities and negative social interactions. The impact of this aspect of mobility should not be underestimated and greater policy attention should focus on behaviour change and awareness raising strategies (including the evidence base for 'what works').

Ways to better address the mobilities of care

Our study demonstrated that for many older people, getting out and about was not just for leisure or utility purposes but for purpose of giving (and receiving) support and care. Some of our participants discussed the importance of shared journeys as a way of making getting out and about 'work' where one person lived with (sometimes concurrent) conditions and/or impairments. Sanchez de Madariaga (2013) argues that transport planning needs to give greater consideration to mobility related to care. Our findings support this conclusion, which has implications for the extent to which transport planning sufficiently recognises public transportation, and travel infrastructure such as stations, as places where care and support is taking place. The same policy implication relates to the wider planning of the built environment. This conclusion links with recent calls for the development of carer friendly communities by national organisations that represent the needs of carers (see for example: <http://www.carersuk.org/for-professionals/policy/policy-library/building-carer-friendly-communities-research-report-for-carers-week-2016>).

In part, improved attitudes and behaviours in public places (see above) would also help to address the needs of people with impairments who prefer or need to travel with someone else. There could be increased subsidies for those travelling together. The Carers Allowance might be enhanced to cover some element of the costs of

mobility for those who are not co-resident carers. Travel buddy schemes would also enable those with impairments to be more mobile.

Development of technologies that can be tailored to the individual needs, preferences and interests of older people.

The prototype 'walking for wellbeing' app highlights how new technologies can be used to enhance mobility, in this case by permitting the customisation of walking routes for its users, taking account of individuals' needs, preferences and interests. The value of such products is in their capacity to address complexity and change, and enhance confidence in undertaking new journeys or accessing different destinations.

A growing way for people to enable and facilitate getting out and about is through mobility scooters. The mobility scooter pilot project also identified a number of key areas of future research into improvements to urban planning, as well as mobility scooter design that could provide solutions for improved wellbeing and mobility for scooter users.

Driving cessation as part of wider transitions

Given the significance of older people keeping mobile by whatever means it seems clear that as a society there is a need to reconceptualise driving cessation as more than a private or family matter but one that has profound health, economic and social consequences. Some of our participants emphasised that dealing with stopping driving was part of a wider process of coping with other change in their lives, often around the onset of health conditions and/or impairments. In short there is a societal challenge to keep older drivers going as long as they may safely do so; to encourage and enable older people to blend the private and public transport options and make transition if they need to away from driving and finally to ensure that older people's quality of life is not impaired by driving cessation.

The issues around keeping older people mobile are complex and demand a range of solutions that meet older people's preferences; are culturally acceptable and pay attention to the diversity of place and service infrastructure. We need to think more deeply about the public transport offer, supporting the role of voluntary and community schemes, and consider the public health implications of changes rather

than simply the economic arguments around cost of provision. Participants in our study highlighted a need for flexible transport options, perhaps because of the limited public transport opportunities where they lived, or the nature of their personal mobility issues. Buses that stop on request, and taxis were noted as important options, but door to door services provided by community and voluntary sectors were a key resource that could be encouraged and supported more strongly through policy.

Approaches to public engagement and priority setting

The participatory Geographical Information Systems approach enabled research participants to pinpoint on maps the specific challenges and positive features of the journeys they made around the areas where they lived. Possible solutions to some of these local challenges were also ranked by members of the public to identify potential priorities for action. Similarly, detailed work with one group - mobility scooter users - enabled research participants to map and describe their experiences, and highlight the effectiveness of design features within the built environment. Both methods - either working with the wider public, or with a focus on the needs of a specific group - have the potential for being used as a means of engaging the public and setting local priorities.

To address complexity, and to encourage the recognition by designers, service providers and planners, as well as the wider public, that mobility can and often has to be 'done differently', participatory approaches also offer a mechanism for engaging widely and exploring how conflicting needs might be better understood and resolved.

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Appendix A Characteristics of participants in the longitudinal study

| | | |
|-----------------------------------|---------------------------------------|-----------|
| Location | Hexham | 13 |
| | Leeds | 35 |
| | York | 51 |
| | Total | 99 |
| <hr/> | | |
| Gender | Female | 68 |
| | Male | 31 |
| | Total | 99 |
| <hr/> | | |
| Age | 50s | 15 |
| | 60s | 45 |
| | 70s | 23 |
| | 80s | 14 |
| | 90s | 2 |
| | Total | 99 |
| <hr/> | | |
| Highest level of Education | No quals | 11 |
| | O/CSE/School Certificate | 17 |
| | A level/Professional /Vocational | 45 |
| | Degree | 17 |
| | Higher degree | 9 |
| | Total | 99 |
| <hr/> | | |
| Marital status | Never Married | 7 |
| | Married/Civil | 38 |
| | Separated | 1 |
| | Divorced | 27 |
| | Widowed | 24 |
| | No Answer | 2 |
| | Total | 99 |
| <hr/> | | |
| Ethnicity | Black/African/Caribbean/Black British | 1 |
| | Mixed | 1 |
| | Other | 2 |
| | White | 94 |
| | Total | 99 |

Characteristics of Participants in the longitudinal study (contd)

| | | |
|---|---|-----------|
| Tenure | Owens outright | 57 |
| | Owens with a mortgage or loan | 13 |
| | Part owns, part rents (shared ownership) | 5 |
| | Rents from a housing association | 4 |
| | Rents from a private landlord or letting agency | 11 |
| | Rents from the council | 9 |
| | Total | 99 |
| | | |
| Day to day activities limited because of a health problem or disability which has lasted, or is expected to last, at least 12 months | Not limited | 34 |
| | Limited a little | 44 |
| | Limited a lot | 17 |
| | Total | 99 |

| Transition within twelve months prior to taking part in the study | Number of participants in this group at recruitment stage¹ |
|--|--|
| Stopping work; | 45 |
| Starting/stopping being a carer (for an adult); | 32 |
| Taken on childcare responsibility | 26 |
| Starting to use a mobility scooter or other mobility aid; | 29 |
| Stopping driving; | 21 |
| Significant loss of sight or hearing; | 40 |
| Starting to live on their own. | 26 |
| Moving house | 12 |
| Base | 99 |

¹ Participants could identify more than one transition

Appendix B The research team

The research consortium was led by the Centre for Housing Policy at the University of York. The consortium included the following departments and partners:

| University of York | | |
|----------------------------------|---------------------------------------|---|
| <i>Centre for Housing Policy</i> | <i>Department of Computer Science</i> | <i>York Stockholm Environment Institute</i> |
| Mark Bevan | Helen Petrie | Steve Cinderby |
| Becky Tunstall | Christopher Power | Howard Cambridge |
| Karen Croucher | Alistair Edwards | |
| Katia Attuyer ¹ | Andrew Lewis | |
| Sophie Gibson | David Swallow | |

| | | | |
|---|---------------------------------|--|--|
| Newcastle University | Northumbria University | Bradford Institute for Health Research | University of Leeds |
| <i>School of Architecture, Planning & Landscape</i> | <i>Department of Psychology</i> | <i>Born in Bradford Research Team</i> | <i>Institute for Transport Studies</i> |
| Rose Gilroy | Lynn McInnes | Elizabeth Andrews | Bryan Matthews |

¹Now at University College London