



cycle BOOM

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Cycling into older age: A review of policy and practice

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1.1. Executive summary

This review helps to address one of the cycle BOOM study's core research questions: How is older people's mobility constructed and understood in relation to UK policy and guidelines and what policies are in place in the UK and across the EU to support older people cycling? This supports the overall aim of one of the project work packages which is to: investigate how older people's mobility is constructed, paying close attention to government policies, programmes and guidance in the UK and across the EU that specifically address design of the built environment and technology to support older people's cycling mobility and wellbeing.

This review of relevant policies, programmes and guidance primarily focuses on the UK context but is supplemented by findings from two research visits to Munich and Seville in 2014. Particularly relevant initiatives from elsewhere in Europe, along with international agendas are also highlighted. In order to capture less readily visible activities, a call for information was made in late 2015 via two online discussion forums¹; we refer to some of the schemes highlighted to us in the review.

In the UK, cyclists aged over 50 are in the minority. Of all journeys made by the over 65s, only 1% are made by bike, this compares to 2% for the rest of the adult population (DfT, 2014a). Yet we know there is the potential to do better. In the Netherlands, for example, the figure is around 23%, while in Germany the proportion of journeys by cycle is closer to 9% (Pucher and Buehler, 2012). Moreover, the political imperative to boost cycling rates is growing. This document explains some of the reasons for this drive, along with examples of specific policy agendas, initiatives and programmes that relate to cycling in the UK. However, given cycle BOOM's focus on cycling in *later life*, we take a slightly different approach to previous reviews of cycling policy (see for example, Golbuff and Aldred, 2011).

While we include an indicative timeline (and linked discussion) of significant cycling policies, interventions and funding streams, as well as a description of how cycling policy is governed at the national, London and local authority level, we keep this deliberately brief. This is because older adults are largely absent from the cycling policy arena. Therefore, given an aim of our research is to increase the visibility of older cyclists' needs amongst policymakers, we need to draw in other policy agendas and measures that have relevance to the issues our research engages with. The uniqueness of this review paper is precisely this; i.e. that it brings together of a number of different policy fields including health, ageing and the built environment – agendas we feel offer the *potential* to support cycling into older age - and explores the current *and potential* placing of older cyclists within these frameworks.

¹ A call for information about programmes, initiatives and policies at the neighbourhood, urban, local authority / regional, national and European scales that have particular relevance for the older cyclist was posted on the 'Cycling and Society Research Group' and 'Cycle Planning' (aimed at local authority transport planners and engineers) email discussion lists in October 2015. A total of 11 replies were received. Some of the initiatives we were informed about are featured in Section 2.

It is worth noting that these fields, while sharing many common policy goals such as the promotion of healthy lifestyles, often exist in siloes. In highlighting where existing agendas might be extended to include cycling as a viable travel option for older adults, this review will help our research findings to inform, influence and impact upon policy.

A full discussion of our research results can be found in the cycle BOOM end of project report available at www.cycleboom.org. However, it is worthwhile briefly summarising some of the main findings. The cycle BOOM study used a range of novel techniques to shed light on older adults' cycling experiences. Together, these have produced a richly detailed data set that has highlighted three groups of potential and existing older riders.

Reluctant riders form a majority of the older population. The possibility of them cycling for everyday mobility is low. At best, cycling is likely to take place in areas away from traffic in fine weather for recreation, for example, while on holiday. **Resilient Riders**, on the other hand, represent only a small proportion of the UK population. They have what can be described as a positive antecedent state towards cycling. They enjoy the convenience of cycling and recognise its health and environmental benefits. They tend to be physically active in other areas of their lives and place importance on staying active and engaged with social activities. However, they are under no illusion that that conditions for cycling are ideal and recognise that cycling today is fraught with challenges. Although they are acclimatised to changes over time they have had to adapt their style of riding to deal with changing conditions and capability, for example by travelling at off-peak times, avoiding challenging junctions, or by making alterations to their cycles through the use of accessories to improve feelings of comfort and safety. In this sense, even ensuring this group's long-term engagement with cycling is precarious.

Finally, our research engaged with people who are interested in (re)engaging with cycling. **Re-engaged Riders** place importance on staying active and participating with social activities and cycling is regarded as a preferable option among others in pursuit of an active ageing project. Many among this group have time and (in many cases) income to devote to cycling but may lack the confidence of more resilient riders, meaning their experience of cycling now and into the future is even more fragile. Importantly, our research also helps to paint a fuller picture of the reasons why older adults choose *not* to cycle. While some of these factors are due to personal preference, others are reflective of an unsupportive physical and policy environment (see 2.2.2).

1.2. Introduction and method

This review paper is structured as follows. First, it outlines how cycling in the UK is governed. It outlines which actors (governmental and non-governmental) have responsibility for the implementation of policies at a range of spatial scales. Those that have a stake in the creation and spending of budgets, and the operation of cycling programmes and initiatives are also introduced. We then briefly chart the history of UK cycling. This includes significant publications, major funding streams, and programmes that have significantly shifted the policy debate on cycling. Given the capital city's

influence over cycling agendas in the UK, we also include examples of key activities of note in London. Finally, we outline the role that local authorities play in relation to cycling and highlight some particularly interesting or innovative activity taking place at the local level, including programmes located in our four case study areas.

The second section of the review paper is more thematic in nature. It presents the outcome of a review of academic and grey literature of relevance to (bi)cycling and older people. The intention is to show how cycling and ageing has been investigated (i.e. in what research and policy domains) and to summarise key findings. It is worth briefly outlining how we approached this task. We first identified relevant policy domains (health, ageing and wellbeing; older adults and the built environment) and conducted a search of research and grey literatures. This search focussed primarily on documentation in the UK context within the last 20 years or so, however documentation of particular relevance referring to the international context was also included. We used a discourse analysis approach² to identify instances referring to issues around mobility, ageing, wellbeing and cycling that we felt told us something about way in which older adults' mobility was represented.

Section 2 of the review is organised as follows. In 2.2.1 we set out some of the challenges facing policy-makers linked to the UK's ageing population, particularly in relation to health outcomes, and highlight some key policy responses that we feel have relevance for our research, including the emergence of the so-called 'wellbeing' agenda. Section 2.2.2 focuses on the relationship between older adults and the built environment. It discusses some of the design and planning guidance used to configure physical environments that have relevance for our study. This includes cycle-specific design guidance. Section 2.2.3 outlines some good practice linked to promoting cycling in later life. This includes data generated from our two European field-visits and preparatory research conducted prior to the visits. We use these findings to begin a discussion about how older cyclists' needs could be better met, as well as considering how those who are *not* currently engaging with cycling might be encouraged to do so. In doing this, we draw upon examples where the goal is to do precisely this. This includes instances highlighted by the call for information (as described above).

Finally, we conclude the review paper by restating which policy agendas and goals we feel our research can inform, and by pointing towards some specific areas of intervention that could increase the propensity of older adults to engage with cycling and / or enhance the experiences of those who do continue to cycle into later life.

² Discourse analysis is a popular social sciences research technique used to assess the content and structure of predominantly text-based sources. The approach can be used to build understanding of how language constructs social identities (see Gee, 2014). In our case, we were interested in how publications focused on themes such as wellbeing, ageing, active travel and planning and design. Being aware of the *absence* of discussion around cycling and older adults was as important as identifying instances of inclusion.

1.3. Cycling policy in the United Kingdom

1.3.1. The governance of UK cycling

Since 2002, responsibility for cycling policy in the UK has been devolved to the Welsh, Scottish, English, and Northern Irish governments (Golbuff and Aldred, 2011)³. In Scotland and Wales, responsibility lies with the Scottish and Welsh Assemblies respectively. In Northern Ireland the Department for Regional Development (DRNI) develop and publish nationwide cycle policy (ibid). Westminster develops policy and provides the bulk of the funding for local transport in England including: buses, walking, cycling and local transport (Butcher and Keep, 2011). The majority of this is administered via the Department for Transport (DfT) who also provide guidance and funding to local authorities through such means as Local Transport Plans (LTP) (Golbuff and Aldred, 2011).

The UK has a rich history of non-governmental activity in the cycling field with a range of bodies playing a significant role in campaigning for, and assisting in, the delivery of cycle infrastructure, training, and awareness programmes. Notable examples include Sustrans (the National Sustainable Transport charity) established as the 'Cyclebag' campaign group in 1977 and which today assumes responsibility for the UK's National Cycle Network, and numerous other groups providing services that aid the uptake of cycling across the country such as the Cyclists' Tourists Club (CTC) formed in 1878⁴, and Cyclenation, a federation of local cycle campaign groups.

1.3.2. A (brief) history of UK cycling policy

Figure 1.1 represents key milestones in relation to UK cycling policy. It highlights major policy publications and interventions as well as significant national events including funding programmes that have driven the development of the cycling agenda since the 1980's. London is included as its approach to cycle policy and promotion since the turn of the millennium has, to some extent, been a driver of progress nationwide. While this may be changing as other towns, cities, regions and local authorities look to become significant centres for cycling in their own right, London nonetheless continues to act as a model. However, it should be noted that London's devolved governance arrangements, including the semi-autonomous body Transport for London, not to mention its economic power and scale, does make it a somewhat unique player in the UK's policy landscape, and particularly in the transport sector. This limits the transferability of some of the lessons that may have emanated from London.

Golbuff and Aldred (2011) have provided a comprehensive summary of the genesis of cycling policy in the UK. Here we provide a brief summary of some of the key milestones, before updating this discussion with information about activity following the election of the Coalition government in 2010. As Golbuff and Aldred (2011) note, the emergence of environmental campaign groups such as Greenpeace and Friends of the Earth, and

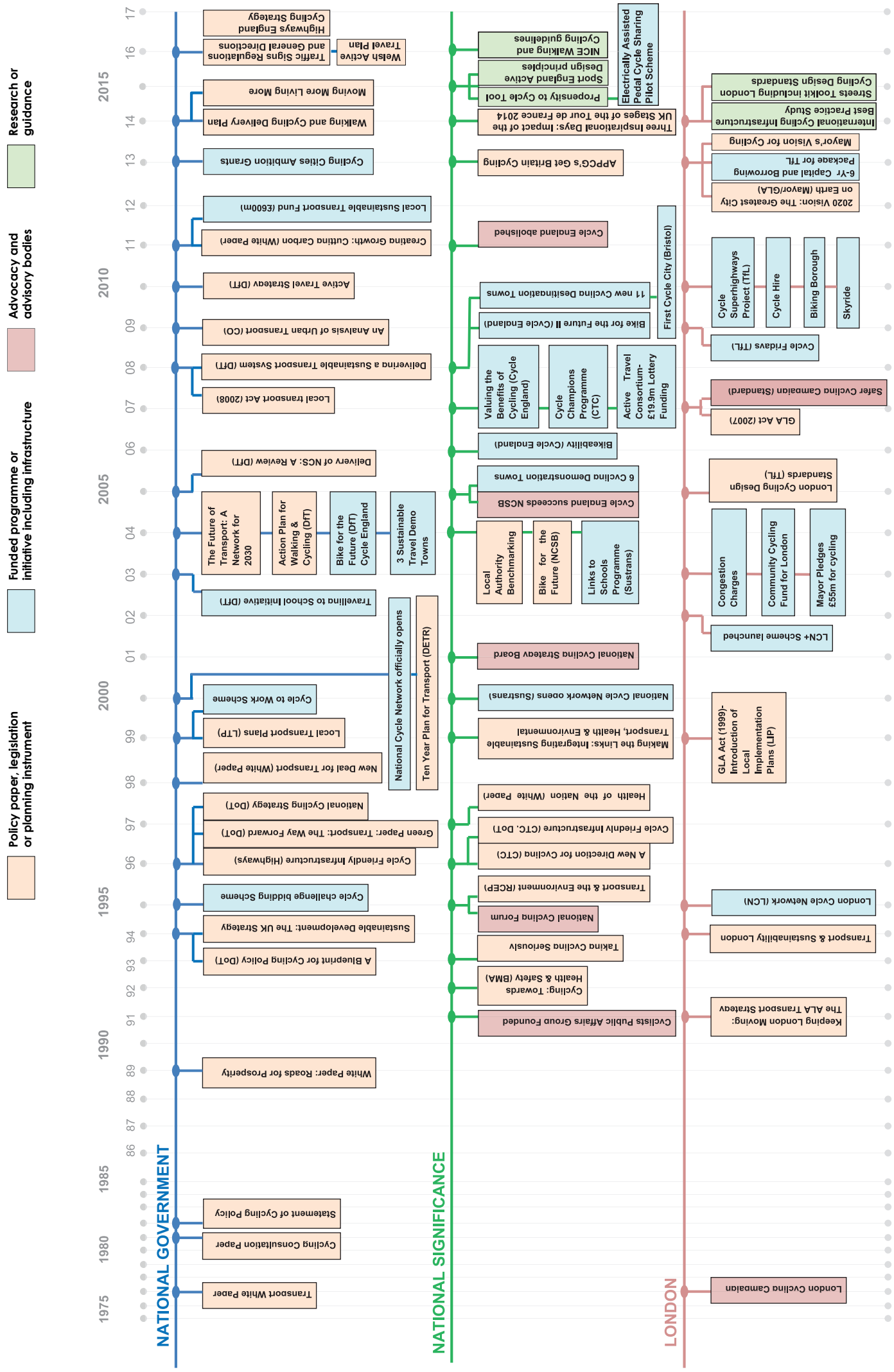
³ As this review includes events prior to this date, and refers to initiatives that continue to be overseen by the British government at Westminster, there is some slippage in the use of 'UK', 'England' and 'Wales' in the paper.

⁴ The CTC is now known as 'Cycling UK'.

transport pressure groups like the London Cycle Campaign during the 1970s began to sow the seeds of political action around cycling in the UK. Although governmental action during the 1970s remained quite limited - stymied, in part, by government's reluctance to promote what was perceived to be a dangerous and / or marginal mode of transport – the discourse on cycling nonetheless began to shift (ibid). Golbuff and Aldred (2007) suggest that a particular turning point was the publication of the Labour government's 1977 'Transport White Paper' (DoT, 1977). Whilst the paper did not go as far as sanctioning the segregated cycling routes being propagated in Denmark and the Netherlands at the time, it did challenge local authorities to consider more practical initiatives to promote cycling (and walking) (ibid). However, a change of government saw something of a setback with the Conservative Government's (1989) White Paper 'Roads for Prosperity' beginning the 'biggest road-building policy since the Romans' (ibid). Institutionally the landscape also changed with, for example, the abolition of the Greater London Council and its cycle unit (ibid). Cycling rates remained very low and in 1989 the European Commission declared that the UK was (along with Belgium) the worst cycling nation in Europe (CTC, 1993, in Golbuff and Aldred, 2011).

It was not until the publication the DfT's (1994), 'A Blueprint for Cycling Policy' which introduced the proposal for a National Cycling Strategy, that central government began to engage seriously with cycling once more (Price, 1997, in Golbuff and Aldred, ibid). The National Cycling Strategy (NCS) was launched in 1996, and set out a series of specific targets regarding cycle numbers, but its main role was to influence change in physical conditions by informing key actors of the benefits of cycling and the means by which to engage with it in policy and in action (ibid). The 1990s also witnessed the launch of the National Cycle Network (NCN) (see Sustrans, undated), a network of sign-posted cycling routes across the country, funded through Millennium Lottery money (Golbuff and Aldred, 2011). It prioritised low traffic routes to encourage a range of cycling, including leisure and sport and is still growing today, although its quality is subject to criticism (ibid). Significantly for our research, it was during the early-mid 1990s that cycling began to feature in public health messages about active lifestyles as concern grew about health problems such as rising rates of obesity. As Horton (1997, in Golbuff and Aldred, 2011) notes, this represented something of a discursive shift from a portrayal of cycling as risky activity to one which could deliver a series of positive health benefits. Notably, this period also saw the publication of the government White Paper 'A New Deal for Transport' (DfT, 1998), featuring more inclusive transport policies that supported modes of other than car for all ages.

Figure 1.1. Key milestones in UK cycling



In 2004, the Labour government introduced a White Paper 'The Future of Transport – A Network for 2030' which saw some of the objectives of the 1996 National Cycling Strategy abandoned (DfT, 2004), leading to accusations of disinterest in cycling policy (Golbuff and Aldred, 2011). However, there were some significant steps forward during this period. The 'Cycling Demonstration Town' project was established in 2006 and saw 6 English towns (Aylesbury, Brighton and Hove, Darlington, Derby, Exeter and Lancaster with Morecombe) receive an annual fund of between £300,000 - £500,000 to spend on cycling. A further 12 'Cycling Cities and Towns' were added in 2009, including one of our case study cities, Bristol. A 2011 DfT report 'Creating Growth, Cutting Carbon' suggested that the public health benefits of the programme outweighed the costs by 3:1. Via the national body for cycling 'Cycling England' (founded in 2005), the DfT promoted a partnership approach involving local authorities, non-governmental organisations, and increased funding to £140 million over three years with the aim of developing an understanding of 'what works best' in cycling interventions (DfT, 2008a).

In 2013, the Conservative-Liberal Democrat Coalition government Prime Minister David Cameron stated his intention to 'kickstart a cycling revolution which would remove the barriers for a new generation of cyclists' (Cameron, 2013: no page). Arguably the measures that were introduced under the Coalition government (2010-15) did not match this level of ambition, with critics suggesting that ten times the promised level of funding would be required in order to increase cycling rates to the level stated (see Walker, 2013). The main funding scheme at this time was the Department for Transport's (DfT's) Local Sustainable Transport Fund (LSTF). Launched in 2011, the programme originally made £560 million available to local bidders. Funding was topped up with a further £40 million in 2012, with the government suggesting that, when taking into account local contributions provided by all funded project teams, over £1 billion was invested in local sustainable travel (DfT, 2016).

The LSTF approach reflected a wider process of devolution and decentralisation, including the abolition of Cycle England in 2011 as part of the so-called 'bonfire of the quangos'⁵. Instead there were plans to devolve powers to local bodies in England to enable them plan and fund their own transport developments, using grants from central government and the private sector (House of Commons, 2013). Major local transport schemes were to be delivered by business-led Local Enterprise Partnerships (LEPs) and Local Authorities, either alone or as part of new governance arrangements called 'Local Transport Bodies'. Local transport funding streams were consolidated into four main grants or allocations, with local authorities retaining responsibility for planning and implementing local transport policy. This arrangement has been retained by the current majority-Conservative government.

In April 2013, the All Party Parliamentary Cycling Group's 'Get Britain Cycling' report was published. This set out 18 recommendations to government including the creation of a cycling budget of at least £10 per person per year, rising to £20 as cycle use increases.

⁵ Quasi-autonomous non-governmental bodies (Quangos) are 'arms-length' bodies used to perform a range of functions, including the delivery of key services and regulation of industry activities. In 2010, the newly-elected Coalition government announced many of these bodies would be scrapped, resulting in the so-called 'bonfire of the quangos' in 2011 (Flinders et al, 2014: 56).

In response, the government consulted on a 'Cycling Delivery Plan' (DfT, 2014b). This 10-year plan for England was designed to foster a step-change in cycling and, encouragingly for our focus on older adults, set out a vision that 'walking and cycling become the natural choices for shorter journeys....regardless of age, gender, fitness level or income' (DfT, 2014b: 6). The draft report built upon two other non-cycling specific but nonetheless significant initiatives. The first was the 'Moving More, Living More' report (HM Government/Mayor of London, 2012) containing a cross-government commitment to increase physical activity for all age groups and carry on the legacy of the London 2012 Olympic and Paralympic Games. The second was the (2014) All Party Commission on Physical Activity report 'Tackling Physical Inactivity: A Coordinated Approach' which set a number of recommendations to help get the UK's population 'more active'. It is also worth noting that a new funding programme was introduced in August 2013. The 'Cycle Cities Ambition Grants' (CCAG) were awarded to eight city/city-regions (including Bristol and Oxford) with initial funding of £77 million, and to four national parks with funding totally £17 million. The Grants were aimed to kick-start 10-year cycling strategies and mainly supported the development of segregated cycling infrastructure. In November 2014 an additional £114 million of phase 2 funding was awarded to the same urban areas to enable them to continue to advance their cycling strategies.

Since the election of the Conservative government in May 2015, the 'Cycling Delivery Plan' has remained at unpublished draft stage. However, it is worth noting that the provision for the Secretary of State to create a 'Walking and Cycling Investment Strategy' was featured in the Infrastructure Act 2015 (Part 2) that came into effect in July 2015 (HM Government, 2015: s.21(9)). The Strategy was due to be published in Summer 2016 (see DfT, 2015a). In November 2015, Highways England, which operates, maintains and modernises the strategic road network, published its own Cycling Strategy (Highways England, 2015). This sets out how an £11bn investment programme, part of the Government's Road Investment Strategy, will provide integrated schemes to improve cycling facilities (ibid). The Delivery Plan makes a commitment to invest £100 million of funding in cycling schemes between 2015-2021 (ibid). As it states: 'this means [investment in] cycling facilities which are safe, separate from traffic and that enable users of all abilities to cycle, encouraging cycling as a sustainable form of transport' (ibid: no page number). Encouragingly, the guiding vision for the Plan identifies the need to plan for a network that is 'safe for all ages and abilities' (ibid: no page). It also cites key findings from Aldred's (2014a) 'Benefits of Investing in Cycling' report for British Cycling suggesting the wider message about the health, social and financial benefits of cycling is beginning to filter into governmental policy (see Section 2).

Given our research's focus on electric bikes as a potential tool to engage more older adults in cycling, an announcement made by the Transport Minister in September 2015 about a new £700,000 electric-bike fund is also worth noting. The 'Electrically Assisted Pedal Cycle Sharing Pilot Scheme' provides funds for local authorities to provide a number of e-bikes as part of existing cycle hire schemes with the aim of: 'encouraging people of all ages and abilities to get on their bikes' (DfT, 2015b: no page).

Some of the more progressive activity relating to cycling is occurring beyond

Westminster. For example, the 'Active Travel Act' (Welsh Government, 2013) made it a legal requirement for Welsh local authorities to map and plan for active travel, and to build and improve infrastructure for walking and cycling. The Welsh Government has also introduced design standards (see Section 2) and the 'Safe Routes in Communities' programme (ibid). This funds capital works such as crossings, traffic calming measures, cycle and footpaths, and secure cycle facilities with £49 million provided to local authorities since 2008/9 under the scheme (ibid).

1.3.3. Local level activity

The main mechanism for transport planning at the local level in England and Wales is the Local Transport Plan (comprising of both 'Full' and 'Implementation' Plans). These are prepared by strategic transport authorities - County Councils, London Boroughs, Unitary Authorities and Passenger Transport Authorities – and submitted for approval to the Secretary of State for Transport in England, the Minister for Economy, Science and Transport in Wales, or, in the case of London Boroughs, the Mayor. Since the abolition of Cycle England in 2011, one of the major sources of income to fund cycling at the local level has been the Local Sustainable Transport Fund (LSTF). Between 2011-2015⁶, 96 sustainable transport packages from 77 local authorities were funded (DfT, 2016). To be considered for funding, applicants had to 'demonstrate how they would boost economic growth, reduce carbon emissions, improve air quality and encourage higher levels of cycling and walking to improve public health' (gov.uk, 2014: no page). All of the packages funded as part of the final round of funding included measures to promote cycling such as cycle hire, maintenance and cycle hubs (DfT, 2014c).

UK towns and cities demonstrate highly varied levels of cycling. For example, the proportion of adults cycling at least five times per week ranges from around 28% in Cambridge and 11% in Oxford (the latter being one of our four case study cities) to less than 1% in some areas (including Reading, also one of our four case studies); this compares to an England average of 3% (based on 2013-14 data, DfT 2015c). As already noted, Bristol (our third case study, Cardiff being the fourth) was selected as one of the second wave of the Cycling (Demonstration) Towns programme and was subsequently named the UK's first 'Cycling City'. Between 2008-2011, the city saw £22.8 million of investment, including infrastructure schemes such as sections of segregated cycle lanes, the introduction of 20 mph speed limit areas and new cycle parking and signage (Better by Bike, 2011). This was followed by £30 million of LSTF funding awarded in 2012 to the West of England councils and in which Bristol shared (TravelWest, undated). A £11.1 million 'Cycle Cities Ambition Grant' was awarded in 2013 and followed by a further £30.7 million grant in 2014.

⁶ £100 million capital funding for the fund was been made available by the UK government through the Local Growth Fund for the years 2015 to 2016. An additional £78.5 million of revenue funding (including Bikeability training) was released by the DfT to 'enable further investment in sustainable transport schemes' (DfT, 2016, no page number).

Bristol's (2015) 'Cycle Strategy' sets out a number of ambitious targets to be achieved by 2020 (Better by Bike, 2015). These relate to investment (with £16 per head of population every year to deliver 'transformational cycle change') and usage (with 20% of all commuter trips to the centre by 2020 being made by cycle). Significantly for our research, targets also relate to 'normalising' cycling by 'progressing delivery of an attractive, safe, 8-80 cycle network' (ibid: p.8). The '8-80' reference made here is to a global campaign and information body (880cities.org) that advocates the creation of environments that are as pleasant and safe for the young and old as the rest of the population. Non-motorised transport, and particularly walking and cycling, are seen as key to delivering this vision (see also 2.2.3). The experience of Bristol is not typical and interventions at the local government level tend to be more ad-hoc and are often community-based. For example, over the course of our research we have picked up on a number of cycle-supportive programmes, schemes and infrastructure, including the 'Taff Trail' walking and cycling route in Cardiff, the CTC (now Cycling UK) and Reading Borough Council's 'Cycle Champions' project designed to support mental health patients to cycle in Reading, and Oxford's Isis Cyclists group which runs short bike rides for women in Oxford with the aim of encouraging non-cyclists to get back on their bikes and commuters to enjoy leisure cycling.

Beyond our case study cities, other local authorities not readily associated with cycling have stated their ambition to increase cycling rates and have prioritised spending as part of their local transport planning. For example, Birmingham City Council's vision is to make cycling an 'everyday way to travel in Birmingham over the next 20 years' (Birmingham.gov.uk, undated). This includes setting targets to increase the number of all trips in the city made by bike to '5% by 2023 and to double this again to 10% by 2033. This will help to make our city healthier, greener, safer and less congested' (ibid). Birmingham has begun working towards this by improving cycling facilities within a 20-minute cycling time of the city centre, with 95km of improvements to existing routes and 115km of new cycle routes also planned (ibid). It is worth noting that Birmingham received £24.3 million in 2013 and £30 million in 2014 from the Cycle Cities Ambition Grant fund to expand its cycling route infrastructure.

While rates of cycling, and local approaches to the funding and promotion of cycling vary significantly, there does appear to be a shared goal, particularly among many 'non-traditional' cycling cities to 'normalise' and extend cycling beyond the 'usual' suspects. This could mean targeting cycling interventions at particular parts of the population for example minority ethnic groups or women, who at all ages, cycle proportionally less than men⁷. The 'normalisation' narrative is further explored below in relation to London, the place in the UK that has seen some of the most notable changes relating to cycling, and transport more generally, in recent years.

⁷ Figures for England (2013-14) indicate that 20% of men report having cycled (any length or purpose) in the last 4 weeks on average (across all ages) whilst only half that proportion of women did so (10%) (DfT, 2015c).

1.3.4. Cycling in London

Following the creation of the Greater London Authority (GLA) in 2002, cycling policy was devolved to the Mayor of London. In the 2010 publication, 'Cycling Revolution London', former Mayor Boris Johnson acknowledged the growth of cycling in the capital since the Millennium and set out his vision for extending this. He argued that cycling was 'arguably the single most important tool for making London the best big city in the world (TfL, 2010: 3). Across the Transport for London (TfL) road network, cycling levels have continued to rise. In Quarter 3 of 2014/15, rates were 10% higher than in the same quarter in 2013-14, and the highest since records began in 2000 (TfL, 2015, no page). Several factors have been put forward in order to explain these increases, including the 'feel good effects' of the London 2012 Olympic Games and the dominance of 'Team GB' cyclists on the world stage, to the cycle hire scheme introduced in 2010. The so-called 'Boris-bike' hire scheme is closely modelled on other urban bike hire schemes such as Paris's successful 'Velib' system, and accounted for 10,023,987 journeys in 2014 (an increase of 25% on 2013 figures) (TfL, 2015: no page). London has also led the way on initiatives such as the Skyride, Freewheel, Biking Boroughs, Cycle Fridays, and the testing of innovative infrastructure designs from across Europe (Golbuff and Aldred, 2011), including, more recently, the £100 million 'Mini Hollands' programme in the outer London Boroughs of Enfield, Kingston and Waltham Forest (see TfL, undated). London also has its own cycle network (the London Cycle Network) (see Londoncyclenetwork.org) and its own design guidance including the 'London Cycling Design Standards' (see Section 2.2.2.).

The Congestion Charge Zone (CCZ) launched in 2003 is seen as another driver of increased cycling rates in London. TfL began monitoring the number of cycle journeys within the CCZ in 2014, with figures suggesting that over 170,000 journeys are now being made daily by cycle, amounting to a modal share of 16% (TfL, 2015: no page). However, this level of progress has been costly to achieve. TfL has ploughed record levels of investment into cycling, with Mayor Boris Johnson's (2013) 'Vision for Cycling' committing to a £913 million spending programme over 10 years to improve infrastructure and safety for cyclists and 'build on the boom in cycling from the last decade' (TfL, 2015: no page). Local authorities outside of the capital are keen to prioritise (or at least be seen to prioritise) cycling as part of their local transport strategies, and some of their policies have drawn inspiration from initiatives such as London's Cycle Hire scheme. One example of this is Reading Borough Council's 'ReadyBike' hire-scheme, introduced in 2014 as part of the town's ambition to increase cycling rates to account for 10% of all journeys from current rates of less than 1% (RBC, 2014).

The 'London effect' may not be limited to the transfer of pro-cycling policies. Mayor, Johnson was a vocal advocate of 'normalising' cycling, suggesting that cycling should be 'something you feel comfortable doing in your normal clothes, something you hardly think about. I want more women cycling, more older people cycling, more black and ethnic minority Londoners cycling, more cyclists of all social backgrounds' (TfL, 2013: 5). While Johnson's Mayoral legacy is now being debated, high-profile statements such as this may have a role to play in fostering a discursive shift in how cycling is represented, portrayed and perceived. Moreover, pronouncements that recognise the potential for

older adults to cycle, and participate more fully in Britain's much-discussed 'cycling revolution' are to be welcomed. However, there is still a long way to go in order to put these words into action. In the following section we outline some of the most significant policy issues relating to ageing, and look for potential areas of overlap with some of the policy ambitions described above.

2.2. Thematic review

This section of the review paper considers the policy, research and grey literatures linked to the health, ageing and wellbeing agendas, and those relating specifically to older adults and their engagement with the physical built environment. These broad themes were derived from an earlier review of the literature, the findings of which informed a 2014 paper published by the project team (Black and Street, 2014). In this section we recap (and in some cases update) this research review and integrate policy and other sources to build up an understanding of how older people's mobility is constructed and understood in relation to policy and guidelines, and what policies are in place in the UK (and across the EU and beyond) to support people cycling into older age.

2.2.1. Health, ageing and the 'wellbeing' agenda

Estimates based on ONS 2012-based principle projections show that between 2015 and 2020 the number of people aged over 65 in England is expected to increase by 12% (1.1 million); the numbers aged over 85 by 18% (300,000); and the number of centenarians by 40% (7,000) (UK Parliament, 2015: no page). This creates a number of policy challenges, many of which relate to health and social care spending. For example, we know that the prevalence of long-term health conditions increases with age. According to estimates made by the Department of Health these kinds of conditions account for 70% of total health and social care spending in England, indicating that improving health outcomes among this demographic is a pressing policy issue (UK Parliament, 2015: no page). Indeed, health data indicate there is a lot of work to do; nearly half of adults aged between 65 and 74 do not meet current physical activity guidelines (NICE, 2013).

As such there is an urgent need to understand older adults' lifestyles and identify where and how policy can support improved health outcomes. It is important to recognise that older people are a diverse group that seek independence both inside of, and outside of, their own homes in a number of different ways. Our research adds to understanding of these issues and, by exploring individual practices and their drivers, helps to highlight variations within them that could be ripe for targeted policy interventions (see Section 3). While, as this section shows, it is (as yet) rarely acknowledged within literature focussed on older adults, our research indicates that cycling could play a significant role in providing this independence, along with the associated benefits in social and mental wellbeing and physical health that cycling delivers. There are clear links here to the 'wellbeing agenda', a set of policy initiatives, goals, programmes, targets and concepts that, broadly, are concerned with (mental, social and physical) health, life satisfaction and quality of life issues. The breadth of the agenda is such that it cuts

across several policy fields offering the potential to address a range of policy goals in a holistic way.

For our research, the wellbeing agenda offers the potential to think more broadly about the challenges but also the *opportunities* associated with an ageing population. This involves exploiting the known links between physical activity and physical and mental health outcomes. According to Friedman (2012), sustained physical activity is 'paramount to ageing well' with regular exercise such as cycling linked to improvements in immune function, resistance to illness, and increased mobility (biologically and socially). In 2014, a Department for Health publication 'Wellbeing: Why it Matters to Health' (DoH, 2014a) highlighted the relationship between health outcomes and levels of wellbeing. It suggested that older adults reporting high levels of subjective wellbeing (a measure of how they think and feel about their own wellbeing, including life satisfaction, positive emotions and whether their life is 'meaningful') are more likely to be active, healthy, independent and socially connected (ibid).

The DoH's (2014b) 'Ageing Well' factsheet highlights how personal mobility, and specifically the ability to travel either independently or by public transport, is a key factor in 'preventing social exclusion and fostering social connectedness among older people, all of which have implications for wellbeing' (ibid: 4). Research by Steptoe et al (2012) (in DoH, 2014b, p.3) suggests those who are sedentary are far more likely to be depressed than those who are active (33% compared with 12%). The same study also discovered large differences for 'enjoyment of life' and 'positive affect', measures that are central to the cycle BOOM study⁸. A systematic review of the wellbeing, physical health and ageing literature conducted by Windle et al (2010) also found a 'small but significant effect of exercise on mental wellbeing, suggesting exercise can improve wellbeing in adults aged 65 and over' (Windle et al, 2010, in DoHb, 2014, p.3).

This finding is significant given our research's focus on establishing the effects of cycling on older adults' physical and mental health outcomes. The cycle BOOM 'wellbeing trials'⁹ – in which two sets of participants underwent an 8-week outdoor pedal or electric cycle trial - provide data on how cycling affects cognitive ability and self-reported health outcomes. These findings have the potential to support public health activities around advising and supporting the population to protect and improve their health. Combining these 'wellbeing trial' data with depth qualitative research data that focuses on participants' experiences of cycling 'in-place' (derived through a series of observational 'mobile ride' interviews), our research also extends Nordbakke and Schwanen's (2014) call for 'detailed attention to [be paid to] the multiple ways in which well-being and its linkages to mobility are context-dependent and shaped by the particularities of time and place'. The temporal dimension of wellbeing highlighted here can be usefully demonstrated by adopting a 'life course' perspective. This is a feature of our research that is also gaining traction in the public health field, a discussion to which we now turn.

8 See for example: http://www.cycleboom.org/wp-content/uploads/2014/09/RGS_Presentation_CycleBOOM_final.pdf

9 See: <http://www.cycleboom.org/wellbeing-and-cognition-cycle-trials/>

The 2010 DoH White Paper 'Healthy Lives, Healthy People' (revised in 2011) emphasises the importance of improving wellbeing across the life course and sets out a commitment to reform the way in which public health is overseen in England. This mirrors publications produced at the global scale. For example, in a 2000 paper, the World Health Organisation (WHO) set out a framework for a life course approach to health, defined as follows: 'A life course approach emphasises a temporal and social perspective, looking back across an individual's or a cohort's life experiences or across generations for clues to current patterns of health and disease, whilst recognising that both past and present experiences are shaped by the wider social, economic and cultural context' (p.4). We adopted a life course perspective in our research, using a series of narrative 'Life History' interviews to establish how and why our participants' mobile behaviours have changed over the course of their lives¹⁰. A life course approach considers the long-term health consequences of biological and social experiences in earlier life that might lead to ill health in later life. It also has a role to play in helping to predict risk factors and guide health interventions.

In our research, we have integrated a timeline activity whereby participants worked with a researcher to visually express how their personal mobility evolved over the years. This activity took place as part of a conversational interview in which the researcher helps the participant to link these changes to particular life events such as a house-move, change of job or move into retirement. This approach has the potential to better target health interventions to life transitions and events. As the WHO notes (*ibid*), ageing is a 'life-long process'; the acceleration in decline often seen in health indicators in later life therefore 'may be reversible at any age and can be influenced at any age through individual as well as policy measures' (p.7). This includes making changes to the living environment, including the 'care unit' (typically family or close friends) and appropriate environmental changes (such as to transport services or home adaptations).

The recognition that ageing is a life-long process and needs to be a major focus for global policy-making across a number of disciplinary areas was further underlined at the 2002 Second World on Ageing (un.org, undated: no page number). The aim of the 'Madrid Assembly' was to design international policy on ageing for the 21st century, this included making 'specific recommendations for action [to] give priority to older persons and development, advancing health and well-being into old age, and ensuring enabling and supportive environments' (*ibid*). Interestingly, the 'Plan of Action on Ageing' agreed at the Assembly also called for changes in 'attitudes, policies and practices at all levels to fulfil the enormous potential of ageing in the twenty-first century' (*ibid*). This represents a more positive approach to the management of an ageing population that echoes our research philosophy that older adults' capacities to age actively and 'well' are currently under-acknowledged in the policy sphere that tends to focus (instead) on the 'problems' associated with an ageing population.

Our research indicates that cycling has an as-yet under-explored role to play in improving the wellbeing of older people. Indeed, research by Woodcock et al (2014)

¹⁰ See: <http://www.cycleboom.org/piloting-cycling-life-history-interviews/>

suggests that it is older adults that stand to make the largest health gains from engaging in cycling. In adding to this evidence base, our research also supports existing discussions around mobility, the prevention of social exclusion and the development of personal connections and relationships (Schwanen and Ziegler, 2011). Propensity to travel often declines with age. This can be due to a number of factors including the move into retirement and the loss of need to commute on a regular basis; although it should be noted that this does not necessarily result in (or reflect) constrained travel behaviours. For example, bus use is higher on average for older age groups compared to the rest of the population (DfT, 2014c). In a DfT (2008b: section 10) review of attitudes to walking and cycling, researchers found that older respondents attached 'great importance to transport for meeting basic needs'. Being mobile helped to preserve a sense of independence, allowed older adults to gain access to sources of mental stimulation such as meeting people and leisure pursuits; assisted them in playing an active role in the community e.g. through membership of clubs; gain physical exercise and take part in activities that they enjoyed (ibid).

Cycling can help to service this need to remain mobile, whilst having the extra benefits of being an excellent form of regular exercise, a social activity, and providing independence (see Tacken, 1998); while the associated costs involved in promoting cycling can be viewed as a sound economic choice given the wider health and social benefits it delivers (see Aldred, 2014a). Fundamentally however, despite some exceptions (see for example, Aldred, Woodcock and Goodman, 2015, Bernhoff and Carstensen, 2008, Pucher and Buehler, 2012, Whitaker, 2005) there is very limited research focussing on the dynamic between ageing and cycling.

Establishing a convincing evidence base is therefore critical, especially in a context of public sector budget cuts. For this reason, it is significant that DfT guidance for transport scheme appraisal now recognises the physical and mental health benefits of transport modes and also recommends the use of the WHO/Europe's 'Health Economic Assessment Tool' (HEAT) to quantify health benefits (Kahlmeier et al, 2011). HEAT is an economic tool designed to help assess the health benefits of walking or cycling by 'estimating the value of reduced mortality that results from specified amounts of walking or cycling' (no page). The tool is applied to groups of the adult population, rather than individuals. Tellingly, the 'cycling adult population' is defined as 20-64 years, with older (and younger) populations excluded due to lack of baseline information. Nonetheless, the existence of the tool does suggest that global bodies such as the WHO are taking the cycling agenda seriously, both on health and, increasingly, economic grounds. The HEAT tool also resonates with the 'normalisation' of cycling conversation, with the WHO's Regional Office for Europe (2014) noting that: 'Cycling and walking can also be more readily integrated into people's busy schedules than, for example, leisure-time exercise. These forms of physical activity are also more practicable for groups of the population for which sport is either not feasible because of physical limitations or is not an accessible leisure activity for economic, social or cultural reasons' (p.1).

What might be called the 'wellbeing *impact* agenda' has begun to filter down to the national-scale. In 2010, the UK Prime Minister David Cameron committed to measuring national 'progress' by attempting to better understand quality of life indicators. In order

to do this, Cameron tasked the Office for National Statistics (ONS) with measuring national levels of wellbeing. The measurement of wellbeing involved obtaining self-reported responses on life satisfaction, feelings of worth, various positive and negative psychological, physical health and sleep (see for example, ONS, 2015). This is significant for our research's focus on wellbeing as it indicates that non-economic outcomes are increasingly central to the policy-making process in different policy fields.

Turning to look in more detail at health care and more specifically, public health, the UK government has looked to promote healthier living and its benefits in part as a bid to reduce spending on the National Health Service by tackling issues such as rising obesity rates. Public Health England (PHE) was established in 2013 as part of a wider set of health care reforms with wellbeing central to its remit. Indeed, one of the 'key indicators' in the 'Public Health Outcomes Framework', designed to set out desired outcomes for public health nationally and locally, is a measure of subjective wellbeing (DoH, 2012). The hope is that monitoring these outcomes will 'help support the drive towards wellbeing in local areas and help measure progress' (HM Government, 2013: 2). PHE is currently orchestrating a 3-year social marketing strategy (2014-2017) which aligns public health activity to 3 life-stages: Starting Well, Living Well, and Ageing Well. Like earlier initiatives such as the 'Living Well for Longer' agenda launched by the Coalition government (see DoH, 2015), PHE's Ageing Well programme focuses on the 'big five' diseases, and more specifically on improving health information and awareness about dementia, cancer and heart disease. For our research, more relevant public health initiatives include Age UK and NHS England's 'Healthy Ageing' campaign. The 'Practical Guide to Healthy Ageing' leaflet includes a series of lifestyle recommendations, including taking part in regular physical exercise. However, notably cycling does not feature among the list of recommended activities which includes swimming, dancing and walking (Age UK and NHS England, 2015).

The absence of cycling is not surprising given the prevailing policy perception that older adults are not capable of cycling. This reflects a broader, often highly stereotypical discourse, about cyclists' identities (see for example, the media attention given over to the 'MAMIL' debate¹¹). These discussions, which often pit cyclists against other road users can reinforce the sense among many that cycling is 'not for them', while, in fact, for older and less able-bodied adults, cycling (as a non load-bearing activity) may actually be easier than walking (see Aldred, 2014b). A failure to broaden the debate around cycling identities may be one reason why the policy focus is typically on walking (and not cycling) as an activity that can be readily sustained into later life (see Pooley et al, 2013). One example of this imbalance is the 'Lifetime Neighbourhoods' agenda, a research programme commissioned by the former government's Department for Communities and Local Government to explore and develop the idea of a 'lifetime neighbourhood', designed to be inclusive regardless of age or disability (DCLG, 2011). Significant consideration has been paid to the creation of 'walkable neighbourhoods' but cycling does not receive the same attention (ibid). However, as cycling rates in

¹¹ The term 'MAMIL' is shorthand for 'middle-aged men in lycra'. This group has received a lot of negative press in the popular media who have labelled 'the mamil' an overly masculine and aggressive symptom of Britain's recent 'cycling revolution'. See for example: <http://www.dailymail.co.uk/femail/article-2869069/Oh-shame-married-MAMIL-s-Middle-Aged-Man-Lycra.html>

other parts of Europe show, older adults can continue to cycle regularly (Pucher and Buehler, 2012). The point here, as Whitaker (2005: 2) notes, is that: 'not everyone conforms to the pattern of declining activity over the life course or to the trend of declining exercise levels across all age groups'. Whitaker's research is an interesting case in point. It considers a group of older male Italian cyclists she calls 'positive deviants' (Hughes and Coakley, 1991, in Whitaker, *ibid*: 2) who maintain high levels of cycling into their 80s. Rather than riding purely for health reasons, Whitaker (*ibid*: 2) finds that their motivations 'often stray to the social, aesthetic, and psychological realms. This makes the activity meaningful rather than just health promoting'. Moreover, she argues, '[t]he cyclists in this study challenge established medical and cultural ideas about what the body is capable of doing as it ages' (*ibid*: 3).

The absence of older cyclists in policy is despite the centrality of cycling to the 'active' travel agenda. This is increasingly well-integrated into the health care field, as well as in the fields of planning, architecture and urban design. For example, the 'Liveable Cities' movement emphasises the need to plan, design and engineer urban environments according to a series of 'liveability' criteria (see for example, liveablecities.org; liveablecities.org.uk). Such movements have the potential to reframe dominant narratives around planning, design and architecture, making them more inclusive for all members of the population, particularly vulnerable groups such as the elderly who can experience the built environment differently to other members of society; a discussion to which we now turn.

2.2.2. Older adults and the built environment

According to Wang and Lee (2010) older adults are more vulnerable to environmental constraints and therefore their physical surroundings can play a significant role in shaping everyday activity, social interactions, and the ability to be independent and achieving high levels of subjective wellbeing. Having a strong 'sense of place', particularly for older adults, can positively impact upon levels of mental health 'independently of socio-economic status, income, state of health, or perceived social support' (Gale et al, 2011: 2). Older adults have been shown to be particularly sensitive to the characteristics of urban form (Lovasi et al, 2008; Black and Street, 2014). This sensitivity has been attributed to a range of variables such as the physical and mental decline that can be associated with age, a reduction in social networks and support, and increased levels of fragility (Yen et al, 2009; Shaw et al, 2007). In addition, older people appear more susceptible to the influence of individual perceptions, especially in relation to issues such as personal safety, neighbourhood design, and aesthetics (Forsyth and Krizek, 2011). While causality is unclear, this may be because older adults are more vulnerable to the influences of their immediate physical environment as they tend to travel outside of their local area less frequently than younger adults (Glass and Balfour, 2003).

Road infrastructure has been viewed as a barrier to freedom of movement and mobility for older people, with studies highlighting how older adults are more delayed in their activities and movements than any other age group when traffic volumes rise (Langlois et al, 1997). A recent thought-piece by the International Longevity Centre (ILC, 2014)

'Public Health Responses to the Challenges of an Ageing Society' also identifies the issue of road infrastructure and, specifically, road safety as an area of concern. Referencing a 2012 study carried out by Morency (2012: 16), it shows that while older people represent 22.8% of the population and the group accounts for 19% of all trips and miles walked, they account for 43.6% of all pedestrians killed. As the ILC review notes, poor road safety not only negatively impacts upon the levels of physical exercise people may undertake, it can create a hostile environment and potentially lead to less social contact, with studies showing that 'people who live on streets with high volumes of motorised traffic go out less and so have fewer friends and acquaintances' (see Berkman and Symes, 1979, in ILC, 2014: 16, see also Biggs, 1997). Interestingly, the report also refers to cycling in this context, citing examples of good practice including a scheme in Leicestershire whereby a commission (made up of members of local Public Health and the Travel Choice and Access teams) funded the purchase of cycling equipment and organised training to support obesity prevention programmes (see ROSPA, 2014 in ILC, 2014: 16).

Guidance about how to plan, engineer and design more cycle-friendly environments has developed significantly in recent decades with a range of publications setting out minimum standards and stipulating best practice. UK guidance follows on from well-established design standards such as the Dutch cycling design guidance (CROW 1993a, 1993b, 2007) which sets out basic infrastructure requirements for cycling including a coherent and comprehensive network, direct connections, an attractive cycling environment, and safe and comfortable facilities to enable the rapid flow of cycle traffic. As Parkin et al (2007) note, these factors (or their absence) are as important in explaining why people do not cycle as accounting for their propensity to do so. Debates in disability studies have identified how bodily norms based around proportion, capability and capacity (amongst other things), and engineers' and designers' perceptions of these, inform such standards (see for example, Imrie, 2000).

Thus far, there has been limited discussion of whether standards take note of variations in bodily capability, capacity and cycle riding style and ability that may be linked to ageing bodies. Aldred's (2015a) work on the impact of infrastructure design on adults' attitudes towards children cycling provides a useful starting point to explore these relationships using the lens of ageing. Aldred's (2015b) review of 56 studies suggests that across ages and genders, cyclists and non-cyclists want separation from motor traffic, with women expressing this view most strongly. Aldred (ibid) hypothesises that older adults also express this view more fervently than the rest of the population. There are some limited data to support this; 72% of 60+ adults agreed with the statement '[It is] too dangerous for me to cycle on roads', compared to 57% of 16-59 year olds (DfT, 2010).

National design standards are in place primarily to assist local authorities in creating more inclusive environments that promote cycling as a viable mobility option for the whole population, but it must be recognised that what constitutes best practice in one location may not be appropriate to replicate elsewhere with no regard for the specific circumstances and design issues (Essex County Council, 2006). The Institute of Highways and Transportation (1996) guidelines on requirements for the introduction of appropriate cycling infrastructure have been the design reference for local authorities in the UK for

the last 20 years. This guidance requires infrastructure to be coherent and continuous (network), direct, attractive, safe, and comfortable (with regards to topography and well maintained surfaces).

There has been a proliferation of level of service tools that relate to these core criteria, including the 'Cycling Level of Service Tool' (CLoS) (included within the TfL's 'London Cycling Design Standards' (2014)), and the Welsh Active Travel Design Guidance's (2013) 'Cycling Route Audit Tool'. These tools are designed to rank current or potential cycle routes, awarding scores for the route according to the listed criteria (safety; coherence, directness, comfort and attractiveness). Figure 2.1 below indicates a typical use of the CLoS tool; scoring a road junction. Older adults do not receive any special attention in these principles. However, most guidance does emphasise the need to service a range of different cycling abilities. For example, Sustrans' (2014) 'Handbook for Cycle-Friendly Design' caters for 'key target users' as part of 'user-focussed cycle design'. This means meeting the needs of 'less confident' cyclists¹² without compromising more confident riders' requirements.

Figure 2.1. Indicative criteria for scoring a junction (CLOs) Source: TfL (2014: 35)

Factors needing removal or mitigation	Possible improvements	Further improvements
RED	AMBER	GREEN
Heavy left turn movement with high HGV mix	Entry treatment at side road junction	Left turn ban for general traffic
Opposed right turns with general traffic accelerating quickly into opportunistic gaps	Continuation of lane across junction	Opposing right turn banned for general traffic
Left slip lane	Right-turn protected island	Physically protected turn
Guard-railing	Tight corner radii; pinch points removed (avoiding nearside lane of 3.2-3.9m)	Left bypass of signals
Large junction radii	Bus lane of 3.0-3.2m or of 4.5m or more	Segregation of cycle movements using dedicated cycle signals
High speed motor traffic through junction	2m wide central feeder lane	Raised tables
Uphill gradients	ASLs (preferably 5m+ deep)	Area-wide speed limit/reduction
Wide junction crossings	Signal adjustments to cycle movements	
No clear nearside access		
Multiple lanes		

¹² Sustrans (2014) define a 'less confident cyclist' as: 'a sensible 12 year old or novice adult who is trained to National Standards/Bikeability Level 2' (p.5).

Figure 2.1 is focussed on outlining an optimum configuration of technical engineering standards, primarily to ensure rider safety, however other 'softer' design principals such as 'attractiveness' do now feature as a part of contemporary cycle infrastructure design. Table 2.1 provides a description of, and typical measures for, the core design principles that typify cycle design guidance.

Table 2.1. Core design principles (Source: Sustrans, 2014)		
Criteria	Description	Typical Measures
Coherence	<ul style="list-style-type: none"> Link all potential origins and destinations Be continuous and recognisable Offer consistent standard of protection throughout Be properly signed Include well located cycle parking 	<ul style="list-style-type: none"> Continuity of suitable provision along the route Routes through areas inaccessible to motor traffic Routes must be recognisable – ideally which the user can follow intuitively, without dependence on frequent signing
Directness	<ul style="list-style-type: none"> Be based on desire lines Result in minimal detours or delays Provide a positive advantage, in terms of directness and priority, over motor traffic 	<ul style="list-style-type: none"> Cyclists being able to maintain an appropriate speed Minimised delays at junctions and crossings Route not perceived as a detour (this may include a trade-off between distance and gradients) Infrastructure to cross physical barriers, e.g. bridges, major changes to junction layouts
Safety	<ul style="list-style-type: none"> Be safe and be perceived as safe Provide personal security Limit conflict between cyclists and pedestrians and other vehicles 	<ul style="list-style-type: none"> Reduced traffic speed and volume Reallocation of road space as the norm Safe provision at crossings and junctions Adequate widths, forward visibility and turning radii on traffic routes Provide lighting where used for utility trips

Comfort	Be smooth, non-slip, well maintained, drained and free of debris Have sufficient width for the level of use Have easy gradients Be designed to avoid complicated manoeuvres Enable cyclists to maintain momentum Minimise impacts of noise, spray and headlight dazzle from other traffic	Dropped kerbs are flush Minimise requirement to give way at junctions Adequate turning radii Lighting on routes used for commuting and utility trips Attention to detail
Attractiveness	Be attractive and interesting Integrate with and complement their surroundings Contribute to good urban design Enhance personal security Be well maintained	A pleasant environment for cyclists exposed to their surroundings Green space/trees In front of buildings rather than to the rear

Source: Sustrans (2014)

However, there is still a general lack of 'place-making' (or urban design) awareness in most cycle design guidance. European countries have placed different levels of prominence on active transport principles in their transport planning and in the use of urban design principles to encourage cycling and walking. The UK has tended to pursue active travel through tax breaks for cycle to work initiatives, training for children, and the drive towards cycle towns and cities (Cycling England, 2009), and there remains a lack of joined up thinking between active transport, ageing and urban design (Fraser and Lock, 2010). This may be, at least in part, due to the lack of an appropriate evidence base. For instance, Fraser and Lock (ibid) argue that despite cycling increasingly being recognised as an important component of both health and active transport policy, 'considerable uncertainty still remains about whether alterations to the built environment and other transport interventions improve cycling rates' (p.739).

Nonetheless, there is a growing body of evidence that design, particularly neighbourhood design, is an important element in facilitating an uptake in active transportation, in particular cycling (Frank et al, 2004; Fraser and Lock, 2010; Saelens et al, 2003; Wang et al, 2005). In a positive sign of shared thinking across policy fields, the National Institute for Health and Clinical Excellence (NICE) (2008) has recommended that policy makers should be aware of the role the design of the built environment plays in encouraging active transport options for local communities.

Boarnet and Crane (2001) argue that 'a city's form, and perhaps its spirit, is shaped in part by its design and transportation infrastructure' (p.177). There are signs that cycling design guidance is becoming more sensitised to the importance of creating attractive places. For example, Sustrans (2014) recognise the need for places that provide a setting for human activity while guidance such as the (2010) 'Manual for Streets 2' calls for a better balance between 'movement' and 'place' in streets and public spaces,

'embracing a new approach to design and breaking away from inflexible standards and traditional engineering solutions' (CIHT, 2010, no page). Going forward, the DfT-funded 'Propensity to Cycle Tool' will help policy makers and transport planners identify where cycling is currently common, where bottlenecks occur and disrupt cycling, and also where it has the greatest potential to grow – with decay rates (i.e. where activity drops off) disaggregated by age and gender (Aldred, personal communication; see also, pct.bike, undated).

Despite the existence of detailed guidance on cycle infrastructure design, and a growing body of research that connects the experience of cycling to the planning, design and engineering of the built environment, there is still a lack of understanding or focus on the role that quality place-making can play in promoting and facilitating cycling. The concept of *place-making* is of intrinsic importance to urban design. Place-making emphasises that creating a successful built environment is not just about providing physical spaces but the sensory experience and activities that take place within them (Montgomery, 1998). Considering the 'mix' of these factors is particularly important when it comes to creating environments in which older people of a range of different abilities feel able to cycle (Black and Street, 2014).

While discussions about urban design's role in creating enjoyable cycling environments are still in their infancy, there are more mature debates about 'ageing well' in the context of other forms of design guidance and agendas, particularly with respect to housing design (Best and Porteus, 2012; Communities and Local Government, 2011; CABE, 2010; Housing Partnership UK, 2012). For instance, as part of the UK government's 'Foresight Future of an Ageing Population' project, the Government Office for Science commissioned a review of developments that supported adaptation and the 'future proofing' of homes and local neighbourhoods over the life course with the goal of maintaining independence into older adulthood (Torrington, 2014). This review briefly discusses some of the accessibility and mobility issues that can be associated with older age, and recognises that 'the configuration of the built environment to support old age has until relatively recently received less attention than the design of the home' (p.13).

The 'Lifetime Neighbourhoods' (DCLG, 2011) programme is another positive example that attempts to promote a coherent approach to urban design and infrastructure planning, avoiding breaks in the planning, design and construction chain can that result in barriers to access being introduced. Other 'generic' guidance tackles issues such as access to facilities and the level of amenity provision in local neighbourhoods (see Newton and Ormerod, 2009), however the issue of cycling is notable only by its absence.

The WHO (2002: 16) argues that the design and implementation of transport and land-use policies that create safe and useful conditions for cycling while understanding and paying attention to the needs of those most vulnerable 'is the single most important tool to increase the number of people who become or remain physically active'. These policies require 'effective inter-sectoral collaboration at different levels in policy-making involving the health, transport, land-use and environmental sectors, including the close involvement of stakeholders' (ibid: 16). While this is encouraging, there is much more to

do to deliver these positive messages about cycling into other policy fields. One example of this is the way that cycling is presented in the WHO's own 'Age-friendly Cities Guide' (2007). The guide's aim is 'to engage cities so as to tap into the potential that older people represent for humanity' (WHO, 2007: v). Arguably this represents a positive development in (policy) attitudes towards ageing, and the hugely varied contributions older adults make to society. Here the tone is less about the 'problems' posed by an ageing population (although this is certainly also in evidence) and more about suggesting ways in which '[the] age-friendly city encourages active ageing by optimizing opportunities for health, participation and security in order to enhance quality of life as people age' (ibid, emphasis added). However, despite the term 'active ageing' (see Figure 2.2) featuring throughout the Guide, there is no mention of cycling within the discussion about transport's role in creating age-friendly cities. Instead, the focus is almost exclusively on public transportation and private vehicle use. While cycle paths are noted (alongside pedestrian pathways) as 'part of a health promoting, age-friendly environment' in a section on 'Age-friendly outdoor spaces and buildings', the subsequent discussion focuses on the fears older adults express towards cyclists, rather than considering cycles as a viable source of mobility, independence and wellbeing.

Figure 2.2. Determinants of active ageing Source: WHO (2007: 5)



To date, built environment policy has tended to take a relatively narrow and 'technical' approach to issues of ageing. The question of mobility and its particular importance for older adults' wellbeing is beginning to receive more attention in cycle design and planning. However, more needs to be done. It is no surprise that the WHO's (2007) 'Age-friendly Cities Guide' (based on focus groups with older adults) suggests that more education about how to meet older peoples' needs, particularly for urban planners and architects, is required. Thus far there has been comparatively little exploration of the positive elements of ageing or the other unique characteristics of the older population (see Skinner et al, 2015).

Exceptions to this certainly exist. One example is the work of 'pioneer' research institutes such as the Manchester Institute for Collaborative Research (MICRA) who have pushed

forward the research agenda surrounding older people and cities. Handler's (2014) 'An Alternative Age-friendly Handbook' (written and devised in partnership with Age UK, the Royal Institute of British Architects, The University of Manchester's Institute for Collaborative Research on Ageing and Age-friendly Manchester; Britain's first 'age-friendly city') is perhaps the most striking example of this. The handbook seeks to respond to the need for better understanding of older adults' needs in the world of practice, and act as a resource to encourage the 'socially engaged urban practitioner' to search for creative solutions in the creation of genuinely 'age-friendly' urban environments (see also 2.2.3).

2.2.3. Meeting the needs of the older (non) cyclist

While there are few instances (in both policy and research) explicitly acknowledging the potential that cycling might play in promoting wellbeing amongst older adults, there are now several well-established policy agendas that could effectively support this viewpoint. Global movements such as the 'Liveable Cities' network, which aims to transform cities to deliver quality of life for all members of society, are gaining both visibility and influence amongst politicians. There are signs of a more positive and progressive attitude towards ageing amongst influential global bodies such as the WHO, whose (2002) report 'A Physically Active Life' (focussed on children and older adults) highlights how: 'People are not always aware that age is not an inherent obstacle to physical activity'. In support of this argument, it highlights research showing how both walking and cycling help to improve leg muscle strength, contributing to reducing the risks posed by falls among older people (ibid). A similarly positive tone is evident in the 8-80 Cities campaign, orchestrated by a Canadian non-profit organisation of the same name which is 'dedicated to transforming cities into places where all people can walk, bike, access public transit and visit vibrant parks, streets and other public places' (see: 8-80Cities.org).

These positive messages are beginning to translate into national-scale activity. For example, in 2013 a network of 12 UK 'Age-friendly Cities'¹³ received affiliation as part of the WHO's 'Global Network of Age-friendly Cities and Communities' (GNAFCC) (see Agenda-EFA.org, 2013). The EU's 'LIFE CYCLE' partnership programme was located across 9 countries and aimed to make cycling the 'natural means of daily transport' (Lifecycle, 2011). The UK partner (the CTC) implemented cycling for health schemes for people aged over 50, including health referrals (made in partnership with doctors and hospitals) and training courses that were modified to the individuals' fitness, health and age. In total, almost 1,500 participants took part in the schemes (Lifecycle, 2011).

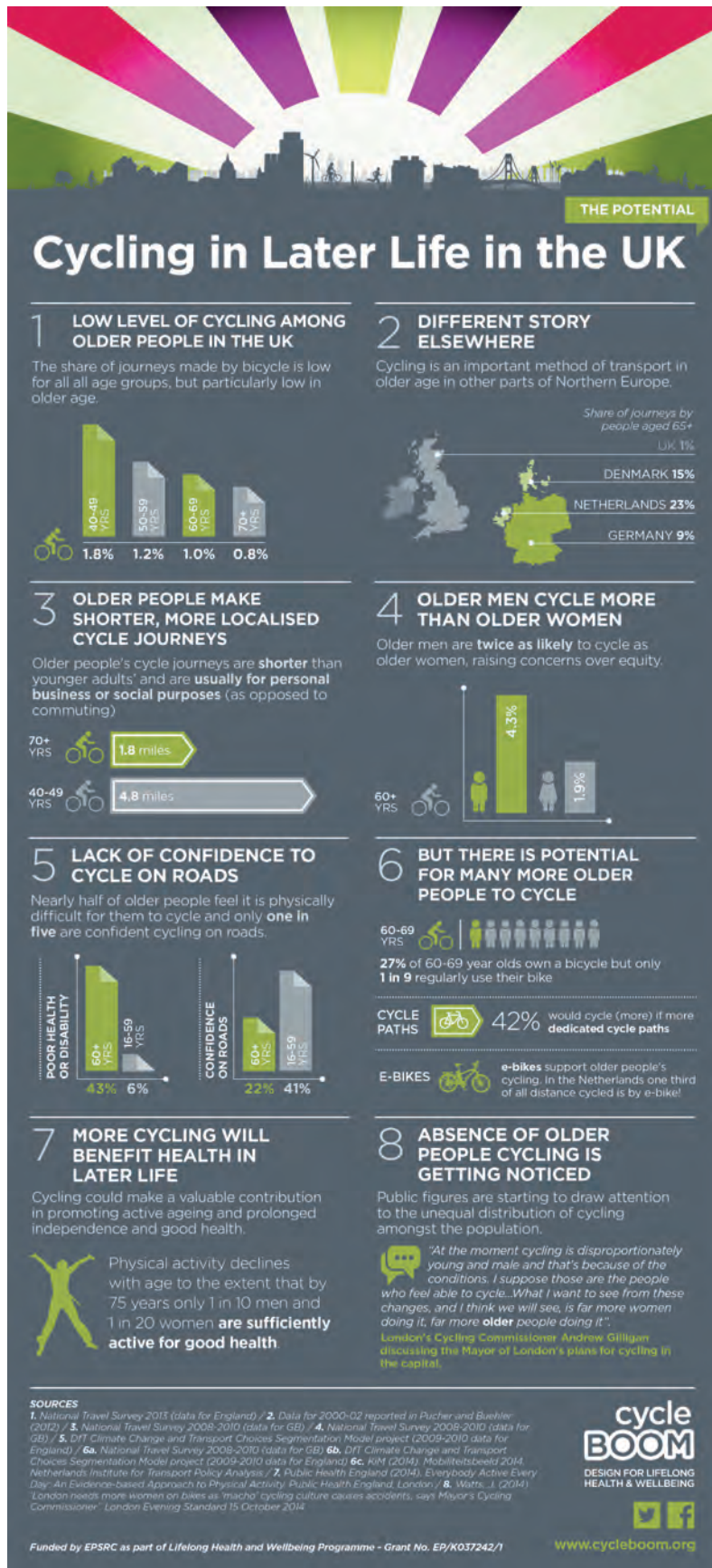
Discourses about 'normalising' cycling play a role here. Although many would argue that it is concrete policy measures such as segregated cycle lanes that are needed in order to deliver real change, nonetheless, words do travel. For example, the Dutch architect Jan Gehl has commented that former London Mayor Boris Johnson needs to turn his attention from the young, male 'Tour de France' cyclist towards the everyday cycling grandmother (see Hill, 2014: no page). Johnson's pronouncements about

¹³ Belfast, Leeds, Sheffield, Manchester, Newcastle, Stoke on Trent, Brighton and Hove, Edinburgh, Cardiff, Nottingham, London Borough of Camden, Glasgow.

'cycling for all' suggest that he may have taken some of this advice on board. Statements like Gehl's certainly lay down the gauntlet for policy-makers to bring the UK into line with countries such as the Netherlands where cycling is a daily and unremarkable part of life for a significant proportion of the population.

However, in order to capitalise on the momentum surrounding the policy agendas outlined in this review paper, there first needs to be a much better understanding of cycling (in)activities amongst older adults, as well as greater awareness of what barriers and disincentives to cycling in later life exist. This is where our research has the potential to add to the - as yet small – existing evidence base (see Figure 2.3 for a summary of some key facts). This is particularly important in the current economic and political climate whereby policy decisions often have to be strongly justified in economic best 'value' terms.

Figure 2.3. Cycling in later life in the UK (Source: cycle BOOM)



Findings from our research indicate that older cyclists use a range of strategies to negotiate what can be, at best an unsupportive, and at worst oppressive, physical environment. This can include both conscious and sub-conscious transgressions of transport infrastructure that, for older adults, can be especially problematic such as right-hand turns at road junctions where riders might dismount and push their bike rather than navigate the junction in the 'expected' or 'normal' way. Often these are pragmatic practices linked to more general experiences of ageing. These could include bodily changes that affect peoples' comfort, ability and confidence to ride a cycle and mean that cycling becomes quite distinct to that experienced earlier in life.

Encouragingly, there are examples of policy-making that attempt to understand and engage with older people and cycling. Here we present some of examples of 'good practice' generated by our call for information and drawn from our preparation for, and fieldwork visits to, Munich, Germany and Seville, Spain, in 2014¹⁴. In one example, the Dutch government, concerned by the number of accidents involving older adults cycling¹⁵ decided to take action (WHO, 2002). In part this was motivated by a recognition that, if large numbers of older adults gave up cycling either due to a real or perceived risk of injury, the knock-on effect could be reduced mobility and independence and the early onset of health problems such as joint pain, breathing issues, heart problems and rheumatism. As early as 1996, the Fietersbond (Dutch Cyclists Union) began training older adults in cycling proficiency and safety. The course includes checks of riders' abilities and cycling equipment. Another initiative highlighted in response to our call for information is the 'The Forgiving Cycle Path' project. This looked at the infrastructural factors that may reduce the chances of an accident and its severity, specifically from the perspective of older adults (personal communication). Results of the project will be translated in existing and/or new CROW/'fietsberaad' (Dutch cycling agency) publications including cycling design guidelines (ibid).

In Germany, work to address older adults' needs in the context of cycling is also well advanced. A response to our call for information from a representative at the Federal Environment Agency Germany highlighted the work of the German (Ecological) Transport Club ("VCD") which as part of its remit focuses on older people and cycling and runs projects on this topic (personal communication)¹⁶. The respondent also referred to the 'Training Programme for Older Cyclists' set up by the University of Leipzig and Technical University Dresden and funded by the German National Cycling Plan (ibid). The programme developed a specific training session which ran in seven German towns and cities (ibid). The training involves an obstacle course as well as gym training with the aim of helping older people improve or maintain their motor skills so that they can increase their frequency of cycling (ibid).

¹⁴ The findings from our field-visits to Munich and Seville are summarized in our short film: <https://vimeo.com/128973646>

¹⁵ In 2000, 83 cyclists aged 65 years and older died in road accidents (WHO, 2002).

¹⁶ See: https://www.vcd.org/fileadmin/user_upload/Redaktion/Publikationsdatenbank/Seniorenmobilitaet/Seniorenmobilitaet_gute_Beispiele_Fahrrad_2013.pdf

We heard first hand about the impact this kind of initiative can have during our study visit to Munich where we met with a representative of Green City, the group responsible for co-ordinating local cycle training programmes. The older adult-specific programme involves three phases spread over a period of around 2 weeks. First, representatives from the Police hold health and safety briefings in care homes, supported housing or community centres. This is followed by a physical health briefing plus Q&A and movement classes led by Occupational Therapists. Again these are typically done *in situ* in sheltered accommodation, care home or community facilities. Finally, participants receive 'on bike' training in safe areas, e.g. in Private car parks, on adapted cycles that are provided by a local firm. The Green City representative we spoke to stressed the importance of a bespoke approach that was designed to build confidence in a supportive and safe environment. They also referred to the importance of role models, telling us about one participant, called Gunda who started cycling again after completing the training programme. Gunda, who is in her 70s, is now an enthusiastic electric trike user who regularly talks at community centres on how 'tri-cycling' has changed her life for the better as part of her mission to encourage more older adults to (re)take up cycling.¹⁷

In Seville, we saw how the municipality has taken a rather different approach. Rather than focussing on the needs of the older population *per se*, activity has instead sought to broaden the appeal of cycling across the whole population, with the concept of inclusivity (of riding style, ability, duration, etc.) being the guiding principal. There are echoes here of the 8-80 Cities agenda, and we heard how the Velo City conference, hosted by Seville in 2011, had fostered the cross-fertilisation of ideas around inclusive urban design and planning. The key means to achieving a more inclusive cycling environment in Seville was the creation of a comprehensive and extensive network of segregated cycle lanes that have been credited with fostering a dramatic increase in cycling, with rates rising from approximately 5000 journeys daily in 2006 to around 72,000 trips in 2010 (Malpica, 2013). Perhaps just as significantly, this investment has helped the municipality to deliver its goal of instigating 'a wider recovery of the human scale in urban and metropolitan space' (Velo City Sevilla, 2011: p.1).

¹⁷ You can hear more about Gunda's cycle journey at: <https://www.youtube.com/watch?v=FYLLPSxhiyU>

Figure 2.4. Seville's segregated cycle lanes

Source: cycle BOOM research



Closer to home, the UK's active third sector means that there is lots of positive action to report. National-scale schemes of note include Cycling Project's 'Wheels for All' scheme. This uses specially adapted cycles to ensure all children and adults with disabilities and differing needs can engage in a quality cycling activity. Cycling UK's 'Big Bike Revival' is programme of events designed to remind us of the thrill of cycling as a child. It includes events where mechanics are on hand to provide repair and maintenance tips, as well as activities for all ages to enjoy, to help everyone get the most of getting about by bike.

Our call for information generated information about several local or community-scale cycle training and social groups that are either older adult-specific or are consciously advertised as being open to all ages and abilities. Examples highlighted to us include the Beeston (Nottinghamshire) weekly ride group of 40-70 year olds that is supported by the Ride Wise and Travel Wise programmes¹⁸, the Yorkshire-based 'First Friday' group which has become popular with retirees and has several members in their 80s and 'Shirley's Wheels' a programme of female-only rides in Herefordshire that includes a special 'Silver Wheels' group¹⁹. In the West Midlands, Centro, the cross-authority body responsible for the delivery of public transport in the region, runs free cycling sessions which have been popular with older adults including groups such as the U3A²⁰. A similar scheme called 'Active Steps' is operated by Sustrans in Portsmouth and is targeted at 50-70 year olds with low levels of physical activity and / or physical or mental health issues²¹.

The goal of the examples highlighted in this section is not necessarily to increase the number of cyclists, but rather to engage *with* cyclists - *including older adults* – as part of a more inclusive approach to cycle planning. In doing so, schemes can seek to increase levels of independence, improve knowledge of existing transport options, reduce access to barriers and motivate the population to be more mobile and active. If older adults are to be a part of this process understanding their diverse needs, behaviours and capabilities is paramount.

¹⁸ See: <http://www.ridewise.org.uk/ride/> and <http://www.travelright.org.uk/>

¹⁹ See: <http://local.gransnet.com/herefordshire/courses-other/54129-shirleys-wheels--bicycle-rides-for-women>

²⁰ See: <http://www.mynetwork.org.uk/offers/offers-list/cycling-offers-2015/>

²¹ See: <http://www.healthwatchportsmouth.co.uk/service-provider/active-steps>

3. Conclusion

This review paper has outlined major policy developments in relation to UK cycling, health, ageing and wellbeing, and the design of the built environment that, collectively, constitute the main areas of policymaking activity that our research engages with. It has highlighted agendas that could support increased cycling amongst a wider section of society, including older adults. The paper provides a platform for the cycle BOOM study to achieve our aim of advising policy makers and practitioners how our environment and technologies can be designed to help people to continue to cycle in older age or to reconnect with cycling.

The measures highlighted in the previous section suggest that this is an achievable goal; the research evidence increasingly suggests it is also a goal that is worth pursuing for a number of reasons. Increased cycling can bring a number of benefits for wider society, including improved wellbeing outcomes and savings for the public purse, for example in health care services. While the UK has a long way to go to embed cycling to the level seen in some European countries, the progress being made in some local authorities indicates a willingness to prioritise and promote cycling. Coupled with a strong, well-organised and influential third sector made up of long-established organisations such as Age UK, Cycling UK, British Cycling and Sustrans, there is the potential for positive change.

3.1. Potential areas of intervention

There are a number of ways that our research helps to support attempts to increase the likelihood of older adults cycling. For example, the London Borough of Brent has promoted 'Learn to Cycle' training sessions via healthcare professionals who have effectively offered adults of all ages the opportunity to participate in the scheme 'on prescription'. The results of our 8-week wellbeing pedal and e-bike trial will help local authorities keen to pursue such an approach to 'make the case' (via an evidence base) that regular engagement in cycling can support improvements to older adults' lives such as increasing their ability to travel beyond their immediate neighbourhood.

Results from life history interviews help us to point professionals and policy makers to life events or particular periods within the life course where targeted interventions could encourage individuals to take up, re-engage with or continue with, cycling. For example, lifestyle advice could be offered to adults approaching retirement where the advantages of regular cycling are highlighted. This could be supplemented by practical information about how to access to cycles (e.g. via cycle hire scheme or through local bike shops), the location of cycle paths and how to contact local social cycling organisation such as Bristol's 'Silver Cycling' group²².

The mobile ride (and post-ride interviews) offer a rich source of information about how older adults make sense of, negotiate, and engage with their local environments. This includes information about the ways in which older adults modify their cycling

²² Silver Cycling is a cycling project for the over 55s who are interested in re-engaging with cycling, keeping fit and meeting new people. See also Lifecycleuk.org.uk/over55s

behaviour in the face of unsupportive cycling environments, for example, by dismounting and pushing their cycle at particular junctions or by avoiding travelling at peak times. The mobile rides also provide information about how cycle journeys might be made more comfortable, safe and enjoyable. While the experiences of riders is very diverse, reflecting a range of factors including levels of confidence, cycling proficiency and health issues, drawing together such experiences can help professionals such as planners, engineers and designers becomes more aware of how older adults navigate, utilise or even just 'cope with' infrastructure. Beyond this, our research findings allow us to point to practical steps that professionals can take to better address some of these needs. We outline these measures in more detail in our end of project report (see cycleboom.org).

This review paper has mapped out a number of points where we can begin the conversation with policy makers and professionals about how to support a more inclusive approach to cycling. It has shown that older people's mobility is currently constructed in rather a narrow way but more positively, that there are a number of potential avenues within existing policy agendas that can be used to broaden this. Understanding the issues that are pertinent to cycling in later life remains very limited in relation to UK policy and guidelines. To a degree, this reflects popular perceptions of cycling as something that the vast majority of older adults cannot or will not do. The lack of existing research evidence makes it difficult to counter such views. Our research has a role to play here.

There are some initial signs that cycling may be becoming seen as a more viable mobility option for older adults. The 'normalisation' of cycling discourse appears to be increasingly prominent in UK transport planning policy, this offers opportunities to widen the appeal of cycling beyond the 'usual suspects'. Finally, there is good practice taking place in the UK and across Europe in support of cycling amongst older adults from which lessons can be learned. Cycling is an increasingly important part of policy-making in the UK. Ensuring that the experiences, needs and aspirations of older adults form part of this process is an important goal for future research.

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