HOUSING
INNOVATION
PROGRAMME

HOMES FIT FOR THE FUTURE

HOMES FOR HEALTHY AGEING CHALLENGES, OPPORTUNITIES AND THE WAY FORWARD

cataPULT
Connected Places

EXECUTIVE SUMMARY

Places succeed economically when their citizens are happy to live there. These places need to be adaptable to an evolving world, and provide homes fit for a rapidly changing future. One of these future changes – our ageing society – has in fact been identified as one of the 'four Grand Challenges' of our time in the UK Government's Industrial Strategy.

So, how might we deliver sufficient and improved age-friendly homes to meet these needs of our ageing population? With 'ageing society' now so close to the heart of the UK's political and strategic agenda, attention is increasingly being drawn to leveraging the potential of innovation to tackle the challenges of homes for healthy ageing. The issues of ageing and housing are also often multi-faceted and interconnected. Yet despite significant work in relevant areas, there remains a limited understanding of the main challenges we are facing, and still no joined-up approach to tackling them.

Which is why, to better understand how innovation and technology can provide solutions, we have outlined the key challenges, the areas where innovation can be harnessed and what steps would ensure a joined-up approach.

Drawing from the great work already undertaken in this space over the last five years, we have summarised the key challenges into five thematic areas: health and care, accessibility and community, adapting home, moving home, and affordability.

We also explore the market potential of later-life housing, the benefits of change, relevant policies and funding, as well as highlighting key innovations with high potential to tackle some major challenges. We also take a look at the following series of ideas – based on insights captured in our workshops and other engagement activities – for how government and other stakeholders might collaborate:

- **Bridging the information gap** on later-life housing options and adaptation services
- **Developing comprehensive service packages** for later-life housing and care
- **Exploring innovative financing models** to improve the affordability of later-life housing
- **Creating an innovation marketplace** to connect innovative solutions with those in need
- **Promoting integrated solutions** that combine ageing and housing with other big agendas
- **Upgrading existing housing stocks** to be interoperable with new technologies and future use
- **Encouraging community-based approaches** to engage senior residents
- **Regulating rental accommodation** for the elderly to improve security and comfort of living
- **Reforming the planning system** to facilitate the development of age-friendly homes
- **Updating obsolete housing standards** to consider the needs of the ageing society and adopt new ways of thinking.

This report is just a first step on the journey towards a shared vision and roadmap for later-life housing, and an invitation for further conversation on the key needs and challenges associated with later-life housing. As a neutral convener in the innovation ecosystem, Connected Places Catapult welcomes partners from across the UK to work with us on a series of healthy-ageing housing pilots to test and scale up new ideas. It is our ambition to demonstrate to government and funding agencies that transforming the UK housing stock to be age-friendly and developing innovative products and services in support of later-life housing is essential, technically deliverable, and could underpin a UK assisted living technology market.

And in so doing we will make connected places that are future-ready, provide a better quality of life, and are built for economic success.

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1 INTRODUCTION

1.1 Homes fit for the future

Getting housing right is essential to building places that are economically successful, great places to live, resilient and adaptable to changes. Towns and, increasingly, cities are more than just engines of growth – they are where we call home, where we all live, work and play. When people speak of 'having a place in the world', they mean more than simply knowing their postcode – they speak of a sense of belonging. But in the face of explosive population growth, demographic shifts, climate change and ever-tightening resources across the world, places and cities especially, are struggling to deliver the kind of housing we can call home.

Here at Connected Places Catapult we believe we need homes fit for the future. We need to build them faster, at lower cost, to higher energy efficiency standards, while ensuring their occupants can live happy, healthy and independent lives. New-builds must be resilient to climate change and adaptable to changing use, while older properties must be refurbished quickly and efficiently to meet future needs.

We believe that with a collaborative approach, with the right insights, interventions and innovations, we can collectively develop and implement the solutions to these housing challenges. Building on research undertaken throughout 2019, this report brings together insights across housing and ageing to outline a vision for Healthy Ageing and the Home.

1.2 Homes and healthy ageing

We are living longer than ever before. By 2050, a quarter of the UK's population will be over the age of 65.[1] The impending society-wide impacts that are emerging have forced 'ageing society' to the top of the UK's political agenda and the government is exploring solutions to address the key issues associated with ageing. With 90% of our time spent indoors,[2] the quality of our indoor environment plays a pivotal role on the health and wellbeing of us all, but especially on the older members of our society. So how we provide enough age-friendly homes to improve the quality of later life becomes a key priority.

In order to find the right solutions we need a comprehensive understanding of the challenges we are facing. While aware of a general lack of age-friendly homes in the UK, the exact issues remain somewhat shrouded in complexity: the diversity of older people's needs and our housing stocks means there can be no one-size-fits-all solution. Furthermore, the issues associated with housing and ageing are all too often treated separately, leading to silos across industry, government, service and care providers, housing developers, charities, and other key actors that can obscure pathways to meaningful innovation.

Which is why at Connected Places Catapult, where later-life housing is one of our main focuses, we are adopting an 'un-siloed' approach to explore the main challenges and opportunities in this area. As a neutral convener operating at the intersection between public and private sectors, we bring together stakeholders from across industries to generate insights and explore potential solutions. To help bring clarity to the complex challenges of healthy ageing and the home, we worked alongside the Centre for Ageing Better to deliver an exploratory workshop to better understand how innovation and technology could play an enabling role in healthy ageing and the home, the findings from which, along with extensive research, underpin this report.

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1 https://www.local.gov.uk/sites/default/files/documents/5.17%20-%20Housing%20our%20ageing%20population_07_0.pdf
2 https://www.england.nhs.uk/wp-content/uploads/2018/09/putting-health-into-place-v4.pdf

2 THE CONTEXT OF AGEING AND THE HOME

2.1 The UK's ageing population and housing stock

Our population is ageing fast. Within the next decade, one-fifth of the UK's population will be over 65 years, which will increase to a quarter by 2050.[3] However, only 1% of Britons in their 60s are living in custom-made retirement homes.[4] Not only is there a supply shortage of age-friendly homes, but there is also a lack of understanding of what the ageing population needs from their homes. Coupled with this lack of understanding is the fact that our older members of society tend to be categorised as a single demographic group despite their housing needs actually being highly diversified across age, income, health, marital status, personal preference and care requirements. For instance, an able-bodied 70-year old might prefer to live in a mainstream house, while a disabled 60-year old might choose an accessible home, and a frailer 80-year old might expect to live in a tailor-made home with care provision.

In the UK, where we have the oldest housing stock in Europe,[5] the existing homes of the elderly are also greatly diversified, ranging from Victorian houses to bungalows and tower blocks, all the way through to modern new-builds. Around 96% of older Britons live in mainstream housing, and most hope to live independently at home for the rest of their lives[6]. But the ability to do so varies dramatically depending on the type of housing stock a person resides in: new-builds can of course be made fit-for-purpose, but with 80% of the homes we will be living in by 2050 already built,[7] how we retrofit and adapt our varied existing housing stock to suit the diverse needs of an ageing population is a critical challenge for the UK housing sector.

2.2 Trends of innovation that are reshaping later-life housing

Thanks to advances in medical and healthcare technologies, we have the opportunity to enjoy longer lives than ever before. And while this increasingly ageing population posits a challenge for our society, it does also create huge opportunities to seek new innovative and technological solutions that enable people to live independently at home for longer. In the UK, as 'ageing society' rises up the political agenda, attention increasingly falls on how innovation that could meet the needs of an ageing society, which includes new policies and funding support, as well as programmes and initiatives.

As we journey into the fourth industrial revolution, we are discovering benefits from new technologies that could drastically improve later-life housing. Modern methods of construction can now deliver new homes and retrofit our existing ones much faster than before. Innovative financing models such as crowdfunding create alternative forms of investment to support the development of retirement homes. And ever-increasing connectivity and automation in our daily life, especially in our homes, means assisted-living solutions and smart home systems are enabling senior adults to live healthier and more independent later lives.

While new technologies facilitate the develop of retirement homes and help improve the physical health of the elderly, supporting older people to live well mentally is equally important. In this respect, urban design has a significant role to play in developing homes and communities that could improve both the mental and physical health of senior residents. And with the concept of Housing-as-a-Service being gradually embraced, new living models such as co-living and co-housing provide further potential solutions to enriching the living experience of later life.

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3 https://www.local.gov.uk/sites/default/files/documents/5.17%20-%20Housing%20our%20ageing%20population_07_0.pdf

4 https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Other_reports_and_guidance/HAPPI3_Report_2016.pdf

5 https://www.bre.co.uk/filelibrary/Briefing%20papers/92993_BRE_Poor-Housing_in_-Europe.pdf

6 https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/appg/appg-for-ageing-and-older-people---report-on-decent-and-accessible-homes-for-older-people.pdf

7 https://www.agileageing.org/site_files/5944/upload_files/NeighbourhoodsoftheFuture2019_250119.pdf?dl=1

3 THE NATION'S CASE FOR CHANGE

Given the rich variety of housing stock in the UK and the diverse needs of our ageing society, the challenges for later-life housing in the UK are multifaceted. To find the right solutions, we need to first have a comprehensive understanding of the challenges we are facing. Through our deep-dive audit of the research – drawing from studies such as 'The state of ageing in 2019'[8], 'Inquiry into decent and accessible homes for older people'[9], 'Housing our ageing population'[10] and 'Future of an ageing population'[11] – among many others, we identified five thematic areas: health and care, accessibility and community, adaptive homes, moving home, and affordability.

3.1 Health and care

As people age their health can begin to deteriorate and care considerations come to the fore. The interaction between home and health is however multi-faceted and needs to be considered from a number of perspectives.

Later-life health conditions affect quality of life. Nearly half of the people over 65 years of age are living with a limiting long-term illness or disability.[12] These include sight and hearing loss, dementia, hip fractures, arthritis, hypertension, urinary incontinence, diabetes, heart disease and stroke. In 2016, Age UK estimated that on in eight people over 65 years old were struggling without the help needed to carry out at least one essential activity of daily living. This increased to one in seven in 2018, of which one fifth needed help with three or more daily activities.[13]

Poor housing quality further affects health. According to the English Housing Survey, around one fifth of homes failed to meet the Decent Home Standard in 2017.[14] Compared with younger generations, the elderly are disproportionately likely to live in housing of poor-quality or in need of substantial repair.[15] Examples of poor-quality housing include stock with issues such as damp and mould, poor insulation and heating, low level of light and unsafe stairs – all of which are detrimental to older people's physical and mental health.

There is a lack of integration of housing with care. Older people who suffer from health issues need housing with care, yet only 0.6% of over-65s in the UK live in homes with care – 10 times less than more mature markets such as the US and Australia.[16] Although the 2014 Care Act introduced a national system of eligibility, local variation is still leaving many of the elderly without care support near their homes.[17] If we look at the current NHS Long Term Plan,[18] there is limited mention of housing and, in local housing strategies, around two-thirds of councils lack any policy relating to dedicated housing supply for the elderly,[19] let alone housing with care. In other words, as well as the lack of a supply of housing with care, there is a lack of integration of housing into healthcare strategies and vice versa.

> How we can make our current social and care system work more effectively is really important. Even some quite transformational changes to our current health and social care system will not be able to deal with the amount of demands we're going to have in 20-30 years' time due to the speed at which our population is ageing — unless we reduce that demand to have social care. So we absolutely have to be thinking about prevention in this agenda. **Workshop participant**

8 https://www.ageing-better.org.uk/publications/state-of-ageing-2019

9 https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/appg/appg-for-ageing-and-older-people---report-on-decent-and-accessible-homes-for-older-people.pdf

10 https://www.local.gov.uk/housing-our-ageing-population

11 https://www.gov.uk/government/publications/future-of-an-ageing-population

12 https://www.local.gov.uk/sites/default/files/documents/5.17%20-%20Housing%20our%20ageing%20population_07_0.pdf

13 https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/reports-and-briefings/health--wellbeing/age_uk_briefing_state_of_health_and_care_of_older_people_july2019.pdf

14 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/834603/2017-18_EHS_Headline_Report.pdf

15 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/816458/future-of-an-ageing-population.pdf

16 https://www.local.gov.uk/sites/default/files/documents/5.17%20-%20Housing%20our%20ageing%20population_07_0.pdf

17 https://www.ageuk.org.uk/our-impact/campaigning/care-in-crisis/

18 https://www.england.nhs.uk/long-term-plan/

19 https://www.architecture.com/-/media/GatherContent/Work-with-Us/Additional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

3.2 Accessibility and community

Ensuring homes and local facilities are accessible to those less mobile is an important contributor to the physical and mental wellbeing of our elderly population. In addition to these material elements, social bonds within a local community also play a key role.

Most of our homes are not accessible. Many forms of long-term sickness or disability make it difficult for senior people to move around their own homes. This is because most of our existing homes were originally built for the able-bodied and as such tend to fail accessible housing standards. Even with new-builds, while accessible homes were referred to by two thirds of local authorities in their plans, only one third of them actually insisted that a proportion of homes were actually built to that standard.[20]

There is a lack of easy access to local facilities and services. To remain physically fit, it is beneficial for elderly people to access local facilities independently. Among over-55s who consider moving home, the majority regard having local facilities within walking distance as a key factor for choosing where to live.[21] According to Age UK, there are 1.45 million of those 65 years and over that find it hard to travel to hospital in England.[22] This situation is even worse in rural areas, where the population is ageing faster and the journeys to local services tend to be much longer. In addition to mobility, inclusive design is also important, the lack of which affects older people's confidence in accessing local facilities independently.

> "People can say, right, I want to live near a city centre, I want to have good amenities, I want to be able to know I can get out the door and I can walk without using the car. And keeping it at a fundamental level, every local authority area should be identifying sites for that." **Workshop participant**

There needs to be more consideration for the community. 85% of older people plan to continue living in their own neighbourhood.[23] To avoid loneliness or social isolation, it is important for the elderly to stay connected to their community. Which is why building or improving homes for healthy ageing is unlikely to succeed without considering the wider community, place and belonging. We need to consider neighbourhoods of the future, and the role older people play in their creation. Despite this, the concept of Lifetime Neighbourhoods failed to appear in the new National Planning Policy Framework (NPPF) and now appears to have altogether dropped off the national policy agenda.[24]

> "It's not necessarily about old people, it's about communities, and how that community design is enabling everyone to use the hallways… For a child in a wheelchair, they want to be able to get somewhere as well, just as much as an old person." **Workshop participant**

3.3 Adapting home

Not only is our population ageing fast, our housing stock is too. And, even if we could simply build our way out of this crisis – and we can't – if enabling our ageing population to continue living in their homes is key to success, then home adaptation is essential.

Our mainstream housing is old and unsuitable. The UK has the oldest housing stocks in Europe[25], with around 38% built before 1946 and only 6.9% built since 2000.[26] As noted, 96% of the UK elderly are living independently in mainstream housing, most of whom hope to continue doing so for the rest of their lives.[27] However, most of our existing homes offer limited to no accessibility and many failed the Decent Home Standard, making them wholly unsuitable for older people with limiting long-term illness or disabilities, and would in fact worsen their health.

There is no easy access to information and services on adaptation. A lot of adaptations have a very clinical feel, and look unsightly. They make older people feel vulnerable, and often cause delay in planning home adaptations until they are already struggling. When the decision is made, they and their family are largely unaware of how their homes could be adapted, a process that is often too complex even for professionals to navigate.[28] In some regions, home improvement agencies and handyman services are available to support the elderly in essential repairs and adaptations, but in the face of current huge demand they can only reach a fraction of those who need help.[29]

> "If you have someone trying to care for a family member at home, there's no clarity around what you can do. You can paint a room, but if you think about something significant, like stairs, you don't know where to even begin. There could be clear pathways around what we can do… And how are we making sure different communities have information?" **Workshop participant**

[20] https://www.architecture.com/-/media/GatherContent/Work-with-Us/Additional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

[21] https://www.architecture.com/-/media/GatherContent/Work-with-Us/Additional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

[22] https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/reports-and-briefings/active-communities/rb_june15_the_future_of_transport_in_an_ageing_society.pdf

[23] https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materials/Other_reports_and_guidance/HAPPI3_Report_2016.pdf

[24] https://www.architecture.com/-/media/GatherContent/Work-with-Us/Additional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

[25] https://www.bre.co.uk/filelibrary/Briefing%20papers/92993_BRE_Poor-Housing_in_-Europe.pdf

[26] https://www.ageing-better.org.uk/sites/default/files/2019-11/The-State-of-Ageing-2019-Adding-life-to-our-years.pdf

[27] https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/appg/appg-for-ageing-and-older-people---report-on-decent-and-accessible-homes-for-older-people.pdf

[28] https://www.ageing-better.org.uk/sites/default/files/2018-10/Adapting-for-ageing-report_CfAB_0.pdf

[29] https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/appg/appg-for-ageing-and-older-people---report-on-decent-and-accessible-homes-for-older-people.pdf

Private renting prevents home adaptation. Although most of the elderly are owner-occupiers, a significant proportion of people do rent in their later life. It is forecast that the proportion of households aged 65 and over who are privately renting will more than triple by 2046.[30] However, given the potential negative impact on the property value, many landlords are reluctant to accept adaptations by tenants. Due to a fear of eviction by landlords, many elderly tenants continue living in unbearable conditions and fail to make home adaptations.[31]

3.4 Moving home

Many elderly people are living in homes which are either no longer a good match for their needs, or are simply larger than necessary. As an alternative to adaptation, moving to a more suitable home can also frequently be a sensible option.

The available housing options are limited. As mentioned earlier, older people have varying preferences for housing. A study shows that 24% of over 55s are considering moving home, but half of them were prevented from doing so by the lack of housing options.[32] For those who want to move there is a long-standing shortage of good quality, desirable or affordable options in the right locations.[33] While those financially better off can move more easily, and those with less financial security are often supported by sheltered rent provisions, those in the middle – who account for 80% of the market[34] – are left with limited options to move as they age.

There is a lack of information on the available housing options. A study shows that elderly people and their families are often confronted with numerous problems accessing information on housing and care options.[35] In the face of the growing demand there is still no strategy in place to link the accessible housing stocks being delivered with those in need.[36] Without knowing what is suitable and available, many of the elderly hold back from moving.

There are considerable costs associated with moving. Most specialist homes are leasehold with high service charges for shared facilities and services, therefore costing more than non-specialist equivalents. Unless the home being sold can cover these costs long-term, it is rarely cost-effective to move.[37] For those who own low value properties, being able to access social rented housing or shared ownership may determine if they can move or not.[38] Meanwhile, for those who can afford specialist housing, the transfer from freehold to leasehold ownership creates a risk of losing security and property value.

3.5 Affordability

Whether they are considering adapting, moving, renting, or receiving care services, affordability is one of the most critical issues facing the elderly.

There is a lack of affordable options for the majority. Although many elderly people are considering moving into a 'right-sized' retirement home, not everyone can afford specialist homes with premium pricing. Those mid-end schemes tend to be sold off-plan very quickly, leaving behind long waiting lists for existing schemes. Although the majority of older people do have some housing wealth, buying a new home outright would still be difficult,[39] and incentives like 'help to buy' and 'help to move' are not always available for those who need financial support to make the transition easier.[40]

> ❝*It's just like the innovations mentioned with the smartphone, we all haven't got an iPhone… Some of us got Samsung and others got others, but we all have the functionality that will be able to connect us with our loved ones… So there's something about a basic level of service, and product offering that should be available, regardless of what your personal financial situation is.*❞
> **Workshop participant**

30 https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materi-
als/Other_reports_and_guidance/HAPPI-5-Rental-Housing.pdf

31 https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/appg/appg-
for-ageing-and-older-people---report-on-decent-and-accessible-homes-for-older-people.pdf

32 https://www.architecture.com/-/media/GatherContent/Work-with-Us/Addi-
tional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

33 https://www.local.gov.uk/sites/default/files/documents/5.17%20-%20Housing%20our%20ageing%20population_07_0.pdf

34 https://pdf.euro.savills.co.uk/uk/spotlight-on/spotlight---retirement-living.pdf

35 https://www.local.gov.uk/sites/default/files/documents/5.17 - Housing our ageing population_07_0.pdf

36 https://www.architecture.com/-/media/GatherContent/Work-with-Us/Addi-
tional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

37 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/at-
tachment_data/file/816458/future-of-an-ageing-population.pdf

38 https://publications.parliament.uk/pa/cm201719/cmselect/cmcomloc/370/370.pdf

39 https://pdf.euro.savills.co.uk/uk/spotlight-on/spotlight---retirement-living.pdf

40 https://www.local.gov.uk/sites/default/files/documents/5.17%20-%20Housing%20our%20ageing%20population_07_0.pdf

Rising rent levels impact the poor. As mentioned earlier, there are increasing numbers of older tenants in the UK living in the private rented sector where rental costs have increased by at least 8% in the past five years.[41] On average, the median private rented property would cost nearly 46% of the median pensioner's income nationally.[42] The rising rent levels significantly affect older tenants, especially those on a low income. A study shows that unaffordable rents put many elderly private renters in poverty – in order to pay landlords, they are forced to compromise on food, heating and social activities.[43] What's more, due to the insecure nature of limited-term tenancies, older private tenants also find it hard to fully put down roots in the community, which in turn further negatively impacts their wellbeing.

Residential care is a financial burden for many. Many elderly people who receive formal care services fund it out of their own pocket.[44] While the industry caters well for the wealthy and those poorest, the middle majority of the ageing population are under-served due to the relatively high cost of residential care. A residential care place can cost anything from £50,000-£90,000 for an average two-and-a-half-year stay – or £380-£700 per week.[45] For those with limited income and savings, this is a significant financial burden that obliges those in need to stay in their homes for longer while receiving unpaid or social care.

41 https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/indexofprivatehousingrentalprices/september2019

42 https://www.housinglin.org.uk/_assets/Resources/Housing/Support_materi-als/Other_reports_and_guidance/HAPPI-5-Rental-Housing.pdf

43 https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/appg/appg-for-ageing-and-older-people---report-on-decent-and-accessible-homes-for-older-people.pdf

44 https://www.imeche.org/docs/default-source/1-oscar/reports-policy-state-ments-and-documents/imeche-healthy-homes-report.pdf?sfvrsn=2

45 https://www.imeche.org/docs/default-source/1-oscar/reports-policy-state-ments-and-documents/imeche-healthy-homes-report.pdf?sfvrsn=2

4 SCALE OF OPPORTUNITY

Although the ageing population poses a range of challenges for the housing market, if we look at the growing size of demand and the potential benefits of change, there are also tremendous market opportunities to be seized in developing age-friendly homes.

4.1 Market potentials

With 12 million people aged 65 and over in the UK,[46] there is huge market potential for later-life housing. To meet future demand, the retirement housing stock in the UK needs to increase by 65%.[47] Healthcare-related property is attracting around $200 billion from global investors, with later-life housing being the biggest segment.[48] It is estimated that over-65s own more than 40% of the housing equity in the UK[49] – tremendous assets which, if even a fraction of them could be unlocked, would have considerable economic and social impacts. A study shows there are about 1.8 million people over 55 actively looking to downsize.[50] This could potentially release more readily available assets from bricks and mortar for the elderly to improve the quality of their later life, while at the same time freeing up a large number of family-size homes to meet part of the current housing shortage.

With 80% of the homes we will be living in by 2050 already built,[51] and most elderly people living in mainstream housing which is either inaccessible or of poor quality, there is clearly a huge market for retrofit or home adaptation services (including smart home technologies). The UK is already the largest and currently one of the fastest-growing markets for smart home products in Europe, a market which is forecast to grow from $8.81 billion in 2018 to $13.85 billion by 2024.[52] Given the growing size and needs of the ageing population, smart home products and services in support of senior living will be a key contributor to the growth of the smart home market in the UK.

4.2 Benefits

It is estimated that poor-quality housing for households aged 55 years or over costs the NHS £624 million in first-year treatment,[53] which is a huge financial burden for the government. According to Savills, the amount of retirement housing delivered each year could generate significant government healthcare cost savings of up to £310 million,[54] not to mention the market value represented by increasing housing supply. A study shows that occupants of specialised housing show high degrees of satisfaction, improved health and wellbeing, and reduced healthcare costs.[55] While new homes built to lifetime standard might be slightly more costly to build, they do however generate considerable long-term savings by significantly reducing future adaptation costs and demands on the NHS and social care.

As we are living healthy lives for longer, many people are deferring retirement. A study in 2014 reported that the contribution of over-65s to the UK economy was around £61 billion per year,[56] which is likely even higher now due to the increasingly ageing population. A study shows that home-working and other flexible working styles allow older people to strike a balance between later-life working and other activities such as care[57] – illustrating once again from both economic and social perspectives the importance of age-appropriate homes.

In addition to the above, we should also not neglect the benefits created by new technologies and business models. For instance, assisted living technologies and smart home systems could support older people to live a healthier and more comfortable life for longer, while co-housing and intergenerational-living could significantly reduce loneliness and enrich later-life living experience. These could all have a positive impact on our economy and society.

As well as the economic and social benefits, the environmental benefits could also be considerable. According to BEIS, housing is the fourth largest sector of greenhouse gases emissions in the UK, accounting for over 14% of the overall emission.[58] If all later-life housing projects – whether new homes or adaptations – could be delivered to high energy efficiency standards, it would help reduce GHG emissions significantly.

46 https://www.ageuk.org.uk/globalassets/age-uk/documents/reports-and-publications/later_life_uk_factsheet.pdf

47 https://pdf.euro.savills.co.uk/uk/spotlight-on/spotlight---retirement-living.pdf

48 https://www.bisnow.com/london/news/healthcare/the-1trn-reason-to-invest-in-uk-senior-living-that-still-isnt-enough-99510

49 https://pdf.euro.savills.co.uk/uk/spotlight-on/spotlight---retirement-living.pdf

50 https://www.architecture.com/-/media/GatherContent/Work-with-Us/Additional-Documents/11756-AgeFriendly-Report-FINALpdf.pdf

51 https://www.agileageing.org/site_files/5944/upload_files/NeighbourhoodsoftheFuture2019_250119.pdf?dl=1

52 https://www.marketsandmarkets.com/Market-Reports/european-smart-homes-market-1290.html

53 https://www.bre.co.uk/filelibrary/Briefing papers/86749-BRE_briefing-paper-PHE-England-A4-v3.pdf

54 https://pdf.euro.savills.co.uk/uk/spotlight-on/spotlight---retirement-living.pdf

55 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/816458/future-of-an-ageing-population.pdf

56 https://www.housinglin.org.uk/_assets/Resources/Housing/OtherOrganisation/HousingAndAgeingReport.pdf

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58 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/790626/2018-provisional-emissions-statistics-report.pdf

4.3 Policies and funding

In the face of various challenges and huge market potential associated with the ageing population, the UK's Industrial Strategy[59] has set out 'Ageing Society' as one of its four grand challenges, with the aim of developing new ways of meeting the needs of an ageing society. In support of this grand challenge, the UK Government has announced £300 million from the Industrial Strategy Challenge Fund (ISCF)[60] to support the development of relevant innovations and technologies.

A key part of this investment is the £98 million Healthy Ageing programme,[61] which supports research and innovations that enable older people to live active and independent lives in their homes for longer. The programme consists of several projects, the largest of which – the £40 million Trailblazers[62] competition – aims to stimulate the development and delivery of healthy ageing products, services and business models at a large scale.

To stimulate thinking about the ISCF Healthy Ageing Challenge, The Centre for Ageing Better has developed a Healthy Ageing Challenge Framework,[63] a core theme of which is 'design for age-friendly homes'. Linking the 'ageing society' and the 'clean growth' grand challenges of the Industrial Strategy, the government also announced a cross-departmental initiative – the 'Home of 2030'[64] design and innovation competition – to prototype homes built to suit the changing needs across a lifetime, while also achieving environmental sustainability.

With the challenge of an ageing population now central to the national political agenda, there will be more policies and funding announced in support of healthy ageing initiatives. Meanwhile, the influence will also trickle down and be reflected in regional and local strategies. For instance, in Greater Manchester's Local Industrial Strategy,[65] one of the key objectives is to promote health and care innovation.

59 https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future

60 https://www.gov.uk/government/collections/industrial-strategy-challenge-fund-joint-research-and-innovation

61 https://www.ukri.org/innovation/industrial-strategy-challenge-fund/healthy-ageing/

62 https://innovateuk.blog.gov.uk/2019/10/03/healthy-ageing-trailblazers/

63 https://www.ageing-better.org.uk/publications/industrial-strategy-challenge-fund-healthy-ageing-framework

64 https://www.homeof2030.com/

65 https://www.gov.uk/government/publications/greater-manchester-local-industrial-strategy

5 HARNESSING INNOVATIVE APPROACHES

To tackle the challenges of later-life housing and leverage its market potential, practitioners from across the industry have been exploring a variety of innovative approaches to providing better accommodation for the ageing population. These include new living models, assisted living technologies and so on.

5.1 Senior co-housing

Co-housing is becoming an increasingly popular potential solution to ease both the housing shortage and social isolation. The model differs from co-living (which offers relatively short-term tenancies) in that it provides a long-term housing solution where people with common interests can co-create and run their new community together. Co-housing communities consist of self-contained, private homes as well as communal space and shared facilities, such as cooking and dining spaces, meeting and playing areas, laundries, etc. Such communities allow residents to live more closely by sharing activities and co-managing community affairs, thus recreating the neighbourly social experience of life in their younger years. For senior groups this is particularly important as social interaction helps reduce the loneliness facing many older people and keeps them mentally healthy. A good example of senior co-housing is the Older Women's Co-Housing Community[66] in North London – a senior co-housing community that aims to enrich the later life of elderly females and reduce pressures on health and care services.

5.2 Intergenerational living

Another new living model – intergenerational living – has also gained traction in recent years, and with good reason. While senior co-housing allows like-mined seniors to live closely together and support each other, intergenerational living delivers something similar for a mixed-age community. The goal for such communities is for the needs of both younger and older residents to be acknowledged and met – the younger participants spend time taking care of and providing support for the seniors, while the seniors can offer them free or more affordable accommodation in return. The Netherlands is leading the way in this where projects such as Humanitas Deventer[67] offer students living space in exchange for 30 hours of their time per month caring for elderly co-residents. A recently established UK counterpart, The Kohab,[68] adopts a similar approach. As an alternative to co-housing, this model creates a win-win solution that can alleviate the financial pressures on students while providing the elderly with companionship and care. There are also emerging practices that combine nurseries with care homes, with the Apples and Honey Nightingale nursery[69] in the UK being an example.

5.3 Assisted living

Assisted living solutions refer to products or services that help maintain or improve the ability of older people to live more independently. These include telehealth, telecare, and wellness and digital participation services. Telehealth and telecare services are the most common types of assisted living solutions. Telecare services combine a range of environmental and personal sensors that monitor the safety and wellbeing of the elderly, enabling speedy response to concerns or incidents. Telehealth services focus on supporting people with long-term conditions to self-manage their conditions and normally consist of a smart hub and sensors that collect users' vital signs data and transmit it to a remote clinical service where their health can be constantly monitored. Wellness services take a more proactive approach, which include online training that improves older people's fitness, nutritional content scanning systems that monitor food intake and improve compliance with diets, as well as mobile messaging to support healthy lifestyle changes such as quitting smoking. While the above solutions focus on physical health, digital participation services also facilitate and stimulate social interaction, encouraging the elderly to maintain contact with family and friends, and interact with like-minded people.

66 https://www.owch.org.uk/

67 https://www.humanitasdeventer.nl/english/73-english/194-the-living-students-of-humanitas

68 https://www.thekohab.com/

69 https://www.applesandhoneynightingale.com/

5.4 Smart home

In the booming smart home market, the elderly – who tend to spend more time at home and require certain levels of support in life – are doubtlessly a key group of consumers and beneficiaries of smart home products and services. At the basic connected level, modern home devices could be connected to a central portal via wireless network protocols. Through mobile apps or hub devices like Google Home,[70] senior occupants can remotely control and monitor connected home devices manually or with voice commands. This could include adjusting indoor lighting and temperature as well as controlling other appliances. Moving into the more advanced autonomous level, emerging AI capabilities enable smart home systems to learn and automatically execute adjustments based on constant tracking and machine learning of human behaviour. Systems such as this could analyse senior occupants' behavioural patterns and even their health conditions through the data collected from different devices, and then adjust conditions accordingly to help ensure an optimal living environment. In addition, the system could also send out alarms in the case of a detected emergency, such as a fire or even heart failure.

5.5 Home adaptation

As the existing housing stock and the housing needs of the elderly are highly diversified, home adaptation requirements vary from case to case. In the Adapting for Ageing report,[71] the Centre for Ageing Better looked into a wide range of exemplar localities across the UK and summarised the key elements of innovative and effective practice in the provision of home adaptations for the elderly. The overarching good practice factors include: raising awareness of what is possible amongst the elderly and professionals; helping elderly people navigate the system to access advices, funding and support on adaptation; and speedy delivery of home adaptations. The report also highlighted a number of factors that increase the probability of accessible and timely adaptation provision:

- Involving older people in service design for home adaptations.
- Including home adaptations in local authorities' strategic planning.
- Integrating home adaptations with health and care services.
- Linking adaptation funding with home repairs to address the disrepair issues facing low income households.
- Working with handyperson services to provide low-cost and accessible help with minor adaptations.
- Leveraging the role of social housing providers by setting out shared responsibilities for adaptations provision.
- Taking a preventative approach to ensure home adaptations are carried out before the occurrence of a crisis.

70 https://store.google.com/gb/product/google_home
71 https://www.ageing-better.org.uk/sites/default/files/2018-10/Adapting-for-ageing-report_CfAB_0.pdf

6 TEN STEPS TOWARDS CHANGE

So, with all the challenges and opportunities outlined previously, what can industry and government do to provide the ageing society with enough age-friendly homes and improve the quality of their later life? Through various discussions we have generated the following ten steps on how we can work together in tackling some of the major challenges we currently face in later-life housing.

6.1 **Bridging the information gap** on later-life housing options and adaptation services to enable earlier planning and more informed decision-making

A key factor that holds older people back from moving home or making adaptations is the inaccessibility of information on the available housing options or adaptation services. Such information does exist but has been stored or published in a fragmented way. A solution would be to create a one-stop platform that brings together all the supply options and relevant guidance. Age UK provides a variety of guiding information on later-life housing. For those looking to start planning for their later life, their website[72] offers guidance on suitable housing routes, including whether they want to stay in their current home or move to a specialist or sheltered home. There is an opportunity to build on this good work by developing a searchable platform that also brings together all locally relevant suppliers and support organisations of different housing routes, thereby allowing those in need to compare different offers and make more informed decisions.

Another issue is that many elderly people and their families fail to consider later-life housing choices until it is too late. Therefore, bridging the information gap should also include awareness raising education and campaigns on the importance of prevention and proactive planning. Public Health England has launched a series of e-learning tools[73] that provide quick access to information and suggestions to help improve approaches to preventing sickness, protecting health and improving wellbeing. While these tools focus on general health and wellbeing, a possible step forward would be to develop similar tools that focus on later-life housing and how it affects health and wellbeing. Such tools would encourage the elderly to be more proactive and plan early enough. Similar approaches should also be taken to raise the awareness of decision-makers and developers to ensure future policies and funding is directed towards developing more age-friendly homes.

6.2 **Developing comprehensive service packages** for later-life housing and care to improve user experience and to complement technology shortfalls

Another factor that discourages older people from moving or adapting homes is the lack of comprehensive service packages. Housing products and care services are mostly provided separately in the market, requiring considerable effort to find them and join them up. In the UK, housing associations provide relatively better service packages for the elderly, including help in finding, moving and settling in to alternative accommodation, accessing social and health services, etc. Charities also play an important role. For instance, the Knowsley Centre for Independent Living[74] provides one-stop health and disability services, as well as a showroom for the elderly to view and try out a range of supportive equipment. In this respect, the private housing sector can learn a lot from the social housing sector and charities. While some general-needs housing providers start to embrace Housing-as-a-Service (eg co-living and built-to-rent), later-life housing providers should also broaden their current models from providing housing as an end product to providing holistic and continuing housing and care services. To reduce the risks of post-purchase dissatisfaction, developers could also provide 'try before you buy' experiences though developing physical or digital show homes.

Although there is a growing number of connected devices and assisted living technologies introduced to senior peoples' homes in support of their daily life, there is often a missing 'service' element in the business model of suppliers. For instance, while detection systems can monitor and alert us to health or safety risks, there is often an absence of a service envelope that provides interventions like home visits or remote assistance to address the risks. In this case, the technologies provide only part of the solution, and rely on an existing family support system to fully realise their potential. To complement what the technologies fail to offer, tech suppliers need to work with other stakeholders such as health and care providers to develop comprehensive service packages that cover both digital and physical assistance, thus providing senior residents with all-round protection in the home.

72 https://www.ageuk.org.uk/information-advice/care/housing-options/

73 https://www.e-lfh.org.uk/programmes/all-our-health/

74 https://www.nwbh.nhs.uk/independent-living

6.3 Exploring innovative financing models to improve the affordability of later-life housing products and services

Given the extra facilities and services required, later-life housing tends to be more expensive to develop or purchase in comparison to general-needs housing, and the general lack of funding is hindering the development of this market segment. All the while public funding tends to be limited and often subject to conditions, securing new sources of funding beyond traditional routes becomes increasingly important. In this respect, crowdfunding platforms such as the House Crowd[75] provide a potential solution to filling the funding gap. Through such platforms, smaller developers could potentially secure funding from the wider public to develop later-life housing products, while senior residents of the same community could pool money together to co-develop shared facilities and care services for their own collective benefits.

Even though new sources of funding could help increase later-life housing supply, it may not address the affordability issue facing most elderly buyers with limited housing wealth. To provide affordable housing products and services for the ageing society, we also need to explore new business models to bring down the development cost for developers and ease the financial burden for senior buyers. Shared living models like co-living or co-housing could be a potential solution that allows residents to join up some communal facilities and services to share the cost. And for the elderly who cannot afford to buy a new home or retrofit their current homes outright, there should be affordable mortgage offers created to help ease their burden for both the short term or in the long run.

6.4 Creating an innovation marketplace that connects innovative later-life housing solutions with those in need

With the support of new technologies and policies to promote innovation, there is a growing number of innovative solutions being developed to help tackle the challenges of ageing and housing. While traditional real-estate products can be promoted and searched for via online property platforms like Rightmove, there also needs to be an online marketplace that connects innovative housing solutions to those who need them. Unissu[76] is a good example and has created an online platform that brings together PropTech solutions from across the globe and allows those in need to find relevant solutions more easily. However, while the platform has a broad focus across the real-estate sector, it currently does not have a dedicated category for later-life housing. Thus, there is a gap to be filled by creating an innovation marketplace for this increasingly important market segment.

While an online marketplace can provide quick access to innovative solutions, it is equally important to physically test and showcase the innovative solutions, and to develop best practices. This could be achieved by setting up a cross-regional or national demonstrator network, allowing potential buyers to test and experience different innovative solutions on the ground before making a decision. Furthermore, if the physical demonstrator network could be joined-up with the online innovation platform, they would then create an online-to-offline innovation marketplace. By building a bridge between the demand and suppler, solutions with high growth potential could be seen and scaled up more easily, helping further address the wider challenges associated with later-life housing.

6.5 Promoting integrated solutions by combining ageing and housing with other big agendas such as climate change and digital transformation

If we look at the bigger picture, the ageing population is only one of the many big challenges facing the housing sector. Other challenges include retrofitting existing housing stock to mitigate the impact of climate change, as well as upgrading obsolete housing infrastructure to pave the way for the smart home revolution. Without holistic thinking, tackling a challenge in one area may risk creating a new problem in another area. Therefore, when trying to address later-life housing issues, it is critical to also consider issues associated with the other big agendas and adopt an integrated approach. For instance, home adaptation for the elderly could be combined with the purpose of retrofitting for lower carbon emission, while assisted living technologies could be joined-up with holistic smart home solutions.

To promote integrated solutions and achieve a wider impact, cross-industry collaboration and policy interventions are needed. However, different segments of the housing sector are still largely working in silos, with policies and funding focused exclusively on specific domains. To break these silos, we need to bring together stakeholders from across industries, such as developers, health and care providers, as well as clean tech and smart home suppliers to co-develop an integrated industry roadmap for housing. When a collective vision is achieved, cross-stakeholder working groups should be set up to explore integrated and collaborative approaches to tackling the challenges associated with later-life housing and other big agendas. To truly succeed there is an urgent need to campaign for trajectory change of national and local policies towards promoting integrated solutions.

75 https://www.thehousecrowd.com/invest/property-development-investment/crowdfunding-for-property-development
76 https://www.unissu.com/

6.6 Upgrading existing housing stocks to make them interoperable with new technologies and adaptable for later-life uses

The UK has the oldest housing stock in the Europe, with most homes built decades ago, and in many cases even a century or more ago. Most of these homes were not originally designed to lifetime standards and are unable to make best use of emerging smart home applications. Therefore, it is necessary to update these existing homes to make them future-proofed for the changing needs and new technologies. For those able to afford it, a deep-retrofit approach would be ideal to help upgrade obsolete housing infrastructure. For those unable to afford thorough retrofit work, a compromise solution would be to add plug-in items, eg smart plugs to create a new interface that connects existing housing infrastructure with new connected home applications.

As noted earlier, the UK Government is investing hundreds of millions of pounds in supporting the industry to understand market needs, identify technical gaps and to demonstrate the impact of new smart home retrofit technologies. In addition to this investment we would suggest that some explicit policy and legislative interventions would be appropriate to incentivise landlords, housing associations, house builders and others to adopt these new innovations. The housing crisis has largely been characterised by the lack of home building – we must be careful that in a rush to build more we don't build badly and thereby fail to ensure current and new stock is suitable for the increasing proportion of the population who are elderly.

6.7 Encouraging community-based approaches to engage senior residents and improve their physical and social wellbeing

With social isolation and loneliness being a common issue for the ageing population, communities have a significant role to play in encouraging older people to go outside their homes and remain socially active. To create an age-friendly living environment, it is important to consider the wider neighbourhood by adopting community-based approaches. For those who choose to move to a new environment, new living models like co-housing and co-living provide the possibility for like-minded elderly people to form a new and close community with easy access to communal amenities and care services. For those who prefer to stay in their existing neighbourhoods, community-wide interventions are also important. Pescueza[77] – a pensioner village in Spain – is a good example that shows how to rebuild and strengthen an existing senior community with age-friendly facilities and services.

Whether in a new development or regeneration, mainstreaming age-friendly design within the community is important as it makes it easier for older people to go outdoors more often, thus improving their physical health and wellbeing. In addition, creating communal facilities and care services within walking distance for senior residents in the same community is equally important, as it reduces the time and cost of travel. Furthermore, it is important to organise social events and activities regularly to engage senior residents with the wider community, which benefit their mental health and social wellbeing. It is worth mentioning too that being age-friendly should not be contradictory to being inclusive to other generations who help create a more vibrant community. Last but not least, engaging the elderly themselves in the process of design and creation of an age-friendly community is also a key to success.

6.8 Regulating rental accommodation for the elderly to offer greater security and comfort of living for senior renters

With the increasing number of older people living in social housing or the private rented sector, issues like rising rent levels, long waiting lists, or landlords' resistance to home adaptation all reduce senior tenants' quality of life. Social housing tends to offer lower rents. But due to chronic undersupply, its priority has always been given to more vulnerable groups, with other senior tenants being forced into private renting until they reach the top of the long waiting lists. To change this, local authorities need to increase the supply of social housing for senior renters, either through developing new council houses or supporting new developments by registered social landlords. Meanwhile, it is equally important to improve the living standards and adaptability of social housing, so as to change the relatively negative perception towards it.

For senior tenants, whether by choice or not, living in private rented homes with higher rents, shorthold tenancies makes it difficult for them to fully put down roots in the community, while landlord objections to adaptation often leads to poor living conditions. In addition to increasing the supply of social housing, the government should also develop new policies and financial instruments that puts more guarantees on shorthold tenancies, controls or reduces rent for senior tenants, and requires private landlords to accept home adaptation. Alongside these legislative corrections, new models like senior co-living, which provide more flexible and better managed alternatives to senior renters who value social interaction in their later life, should also be encouraged.

77 https://english.elpais.com/elpais/2019/05/24/inenglish/1558691924_831230.html

6.9 Reforming the planning system to facilitate the development of age-friendly homes

There is a lack of clear planning policy support when it comes to housing delivery for our ageing society. For instance, the new NPPF only mentions purpose-built accommodation for the elderly without specifying the provision and support, while the majority of local authorities have no planning policies or allocated sites targeting later-life housing. As such we recommend reforming the current planning system to put more emphasis on later-life housing. Firstly, more data and evidence is needed to underpin holistic planning for the housing needs of the elderly. Secondly, a clearer use class categorisation with less restricted planning rules would facilitate the development of age-friendly homes. And thirdly, easier land acquisition, funding support or other incentives like reduced Community Infrastructure Levy charges would also help boost the development of later-life housing.

Aside from having the right planning policies in place, it is equally important to enhance the implementation of planning, such as speeding up the planning application process and developing a tool to monitor the delivery of later-life homes. Connected Places Catapult has been working on a digital planning programme, within which a series of projects have been undertaken to explore the opportunities in transforming the UK planning system. By working with local authorities and various stakeholders, we have developed digital prototypes in support of planning applications, housing delivery monitoring and potential land identification. While our project has to date focused on planning in general, with the ageing challenge gaining importance, more focus could, and should, be integrated into planning reforms to facilitate the development of age-friendly homes.

6.10 Updating obsolete housing standards to consider the needs of an ageing society and adopting new ways of thinking in their development

While many of the homes we build still fail to meet existing housing standards, a lot of these standards are in fact already out of date. The Lifetime Homes Standard – developed in the 1990s and adopted by the UK Government in 2008 – is now neither mandatory nor able to adapt to rapid social and technological changes. In 2019, the UK Government announced a new consultation on the Future Homes Standard[78] for 2025. But it focuses primarily on increasing energy efficiency of new builds to help achieve the UK's net-zero carbon target, with little consideration for housing issues associated with the ageing population.

To avoid solving problems in one area while disregarding pressing issues in another area, we need to put ageing-related issues into the wider context of housing, and adopt new ways of thinking in developing future housing standards. At Connected Places Catapult, our City Standards team is championing new thinking for future housing standards. The key principles include:

- Convening cross-sector conversation to create a shared vision.
- Applying agile and user-centred design methods to improve adoption.
- Employing systems thinking and interactive testing to avoid unintended consequences.
- Assuming a data-driven approach to move towards improved evidence base and ongoing feedback loop.
- Introducing innovative methods and business models to facilitate enforcement.

But this is just a starting point. To promote the development of more comprehensive future housing standards, cross-sectoral dialogues and collective actions are urgently needed.

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78 https://www.gov.uk/government/consultations/the-future-homes-standard-chang-es-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings

7 MOVING FORWARD

Our objective is to lay the foundation for a shared vision and roadmap that different stakeholders from across industries can all get behind and collaborate on. It will provide a clear narrative on what needs to happen to better accommodate our ageing population, as well as showing possible routes to success. With that clear vision and roadmap defined, we will be in a better place to navigate the complex landscape and take collective actions to tackle the common challenges we face.

As a stepping stone to fundamental change, this report is built on a wide range of studies and practices already being undertaken, as well as a variety of stakeholder insights from across industries. In preparation for this report, we have raised some initial discussions among key stakeholders regarding the main challenges in later-life housing and explored potential solutions for tackling them. Now we need to work with more individuals and groups to give ever greater granular definition to that map of the landscape and jointly identify and deliver the best ways forward.

For our next step we would like to extend the conversation to all those who would like to contribute evidence, examples or projects that would help develop the common vision and roadmap for later-life housing. In addition to that we will also bring together key market stakeholders to launch a series of healthy-ageing housing pilots across different parts of the UK.

For each pilot, we will collaborate with relevant stakeholders to strengthen and deepen the story – to advance our understanding of healthy living at home in later-life, to use new technology and innovative approaches to support health and improve the living experience of senior residents, accelerate innovation and demonstrate its use to industry, and shape a business case for developers and potential investors.

In addition, we will be working with all our partners to demonstrate to government and funding agencies such as UKRI that transforming the UK housing stock to be age-friendly and developing innovative products and services in support of later-life housing is essential, technically deliverable, and that it also has the rich potential to become both a practical and profitable reality.

8 APPENDICES

8.1 Methodology

Desk research — To develop a comprehensive understanding of the main challenges and opportunities facing the ageing and housing domain, we have reviewed relevant literature published in the past five years, covering reports and articles from public sector organisations, professional bodies, all-party parliamentary groups, real estate consultants, charities, and academia. Through this detailed review we have identified a range of associated challenges, which were categorised into five thematic areas. In addition, we also reviewed the market potential, benefits, relevant policies and funding, as well as the main innovative approaches for later-life housing.

Insight workshop — In partnership with Centre for Ageing Better, we organised a full-day workshop during our Housing Innovation Week in September 2019. With a focus on 'Homes and Healthy Ageing', we invited thought leaders and stakeholders from across the ageing and housing ecosystem to discuss the key challenges and explore potential opportunities in the sector. In line with our desk research findings, we divided the participants into five thematic groups. Through several exercises, further discussions were had on the challenges identified from our research and potential solutions to tackling the key challenges were explored.

Other activities — In addition to the workshop, we have also run various events and meetings, at which discussion with our partners, guests and colleagues were had on the topic. The insights captured were also used to inform the writing of this report. Meanwhile, we created a LinkedIn group[79] and invited all those who participated in our events to join our online housing community. The purpose is to keep the momentum going beyond the events, moving the conversation forward and promoting collective actions in the future.

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79 https://www.linkedin.com/groups/12298859/

8.3 Acknowledgement

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