Cities Alive

Designing for ageing communities

ARUP

This report is a product of collaboration between Arup's Foresight, Research and Innovation, and Integrated City Planning teams. We are grateful for the input and advice from a range of internal and external contributors.

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Foreword

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The ageing of the world population will be one of the defining megatrends of this century. For the first time in history, there are now more people aged over 65 than there are children under the age of five.

Nowhere will this shift in demographics be felt more than in our cities. The potential implications for public services, infrastructure and housing are enormous — from more inclusive design to the need for new forms of housing and social care. The challenges are complex and highly context dependent. From 2020, Tokyo's population is projected to start declining, while the proportion of old people will grow significantly, reducing demand for living space and increasing the need for senior care and accessible urban environments. Looking across the emerging economies, there is likewise much diversity.

The future is not evenly distributed. The challenge with any megatrend is our ability to contextualise its impacts. The exact patterns of ageing are different from one city to another, coupled with

more complex variations in culture and lifestyles, existing infrastructure, associated policy and regulation, and economic prosperity. We need to develop a better understanding of the realities of ageing communities across the world and identify common opportunities for us to address the challenge through better decisions today.

Arup's domain is the built environment. Through this report we hope to make a positive contribution to how city mayors, policy makers, planners, architects and engineers approach the megatrend of ageing at all scales: the way cities are planned, infrastructure is designed, services are delivered, and spaces are built. We hope that this research can inform and influence, so that we can all make positive contributions to more inclusive, resilient and integrated ageing communities. All of us will be part of this unstoppable trend eventually. It is up to us to ensure that we can all age well and enjoy the services and opportunities cities might offer for people of all ages, young and old.

4
Needs

14
Strategies

28
Actions

40
Case studies

| autonomy and independence
| health and wellbeing
| social connectedness
| security and resilience

Report framework
This report identifies four needs for older people and 14 strategies and 28 actions to address these needs. Forty case studies provide real world examples of places that have implemented these strategies.

Executive summary

By 2050, the global population over 60 years of age is expected to reach 2.1 billion, more than double what it is today. At the same time, more people will be living in cities and urban areas. These two global megatrends — an ageing population and an increasingly urban population — will have major implications for cities around the world. Cities must prepare for these changes, both the challenges they present as well as the opportunities. *Cities Alive: Designing for ageing communities* examines what built environment professionals can do to cultivate fulfilling, happy lives for older people. This report identifies four key needs of older people and then proposes 14 strategies and 28 actions to meet these needs. Forty case studies serve to inspire and inform readers on how to include this work in their practice.

Many non-governmental organisations and research institutions have developed frameworks describing how communities can be more 'age-friendly'. This report is informed by some of the leading frameworks — including those from the World Health Organization, the United States-based AARP, and the United Nations' Sustainable Development Goals — and adapts them to focus on the built environment's role in creating age-friendly communities.

The report's framework highlights the four central needs that cities should consider when planning with, and

for, older residents: Autonomy and Independence, Health and Wellbeing, Social Connectedness, and Security and Resilience. These needs impact all aspects of a person's life as they age. We have identified ways in which the built environment can help cities continue to meet these needs so that older residents can lead full and productive lives.

This report explores central issues facing ageing populations and provides strategies and actions which design professionals and decision-makers can pursue to make the built environment in their communities better for older residents and everyone who lives, works and plays in those places. Many of the strategies, such as ensuring access to transport, might seem like obviously beneficial planning practice. However, other strategies are less obvious but equally important, such as the creation of intergenerational spaces. Both the obvious and less apparent strategies must be explicitly identified; they have profound implications on the lives of older people, and far too often, they are not characteristic of the built environment.

Case studies from around the globe underscore that each strategy and action is feasible, so long as basic information about the benefits associated with their implementation is provided. While not an exhaustive list, the case studies are exciting examples which provide readers with a good place to start.

The report concludes with a vision for the future. It describes the lives of older people in an age-friendly community, and an illustration shows how the strategies and actions come together holistically to shape a built environment that addresses the needs of older people.

We hope this report encourages our employees, collaborators, clients and peers to think about how they can contribute to this important work. Arup is committed to shaping a better world. We aspire to work hard with creative people to make sure communities are planned, designed and built for all members of society, especially those whose needs have been underrepresented. This is a worthwhile realisation of our mission to 'shape a better world', a mission that will have long-lasting impacts for all of us.

4

needs of older people
autonomy and independence
health and wellbeing
social connectedness
security and resilience

14

strategies
Each strategy is designed to address one of the four needs of older people.

28

actions
The vision for the future lays out 28 actions that built environment professionals should bring to their practice.

Introduction

| An ageing, urbanising world

| Age-friendly city framework

An ageing, urbanising world

"In a world where consensus is increasingly rare, there is sweeping agreement on a simple but powerful truth: the world is getting older — fast and just about everywhere. But far too often, we only see the challenges of aging and not the opportunities it also offers."

—Jo Ann Jenkins, AARP, *The Journal: Leaders in Longevity* (2018)

Two major societal changes are taking place worldwide and reshaping communities: people are living longer, and the global population is becoming more concentrated in cities. These megatrends of ageing and urbanisation mean that cities across the globe are becoming home to larger, older populations. The design of cities must respond to this changing context.

Cities Alive: Designing for ageing communities examines the unique needs among older people and presents strategies and actions for adapting urban environments to better address these needs.

Nearly every country in the world is experiencing growth in the population and proportion of older people.[1] By 2050, the global population over 60 is expected to more than double, increasing from 962 million in 2017 to 2.1 billion in 2050.[2] This segment of the population is growing faster than any other group. Within this segment, the population of people aged 80 years and older is increasing at an even faster rate.[3]

On top of an increase in the global population of older people, urbanisation means that more people, including more older people, will live in cities. Today, half of all people on earth live in urban areas. By 2050, this is expected to increase to 70%.[4] In addition, cities are seeing rapid growth of older populations. Between 2000 and 2015, the population over 60 skyrocketed by 68% in urban areas. By contrast, the population of older people in rural areas increased by 25%.[5]

68%
increase
From 2000 to 2015, the population of older people living in cities increased by 68%, much faster than the 25% in rural areas.[6]

drivers of change demographics

drivers of change urbanisation

Drivers of change
Arup's Drivers of change series identifies 10 drivers that will influence global change, including demographics and urbanisation.

Urban spaces must accommodate people of all ages and abilities, especially as populations grow older.

By 2050, a majority of the world's population is set to be living in cities.

Although cities are home to a significant and ever-expanding population of older people, they are not always designed with this demographic in mind. Contemporary visions for urban spaces and amenities often prioritise the attraction of a younger, working-age demographic, and in some cases, the emphasis on this much-sought-after group means that the needs and wants of older generations are overlooked.

As people grow older, they are more likely to develop physical or mental disabilities, and physical and mental health have a complex and intertwined relationship. Changes to mental health can affect a person's physical health and vice versa.[7] For example, depression experienced by an older person can have a complex two-directional relationship with arthritis, heart failure and cognitive impairments.[8]

Older people are often viewed as a homogeneous group, yet unique desires and challenges exist across different age ranges and populations. For example, the mobility requirements of an active 60-year-old can differ greatly from those of an 85-year-old, as well as from another 60-year-old with health concerns or a lack of social support. Individuals in earlier stages of ageing may be in a "just-retired" phase, seeking active cultural life in the city, while those in later stages of ageing may be more preoccupied with matters of independence, mobility and safety. Health outcomes are also related to environmental conditions, such as whether an individual lives in a low- or high-income country.[9]

80+
years of age
The United Nations defines the population 80 and above as the "oldest old" and the population 60 and above as "older".[10]

300M
increase
The global population 80 years of age and older is expected to triple from 2017 levels by 2050.[11]

This poses an ongoing challenge to establishing standard definitions of ageing across countries and communities. The United Nations refers to the population 60 and above as "older" and 80 and above as the "oldest old".[12] Life expectancies differ around the world, and the process of ageing is defined not only by chronology but also by physical and social transitions. In many developed contexts, people over 65 are viewed as "seniors", and some associate ageing primarily with an accumulation of life experiences and changes to mental and physical capacities, rather than a strictly numerical criterion.[13]

For these reasons, this *Cities Alive* report on global age-friendly practices is not limited to a specific age range. It is, however, orientateated primarily towards issues that people may face in later or "oldest" stages of ageing — at whatever chronological age that may be.

Cities Alive: Designing for ageing communities focuses on the design of the built environment and its implications for older people. In the following sections, the report explores the needs of older people and investigates how cities — and the spaces, services and infrastructure within them — can respond to these needs using planning and design.
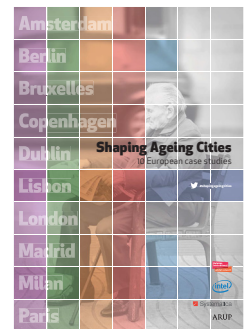
Shaping ageing cities
Arup's investigation of 10 European cities revealed significant differences across metropolises.

Age-friendly city framework

"'Business as usual' approaches to communities, public services and our economy are not an option when faced with such significant demographic change. Instead, transformational change is required to our key institutions, as well as to our communities."

—Greater Manchester Combined Authority, *The Future of ageing in Greater Manchester* (2017)

A framework for defining age-friendliness

City leaders and decision-makers must weigh priorities across a broad range of areas, from capital investment to social programmes and local services. In recent years, numerous organisations, governments and policy experts have been exploring what it means for a city to be "age-friendly" at a city-wide level.

The World Health Organization (WHO) has been an influential leader in advancing how cities understand the concept of age-friendliness. In 2007, WHO established its framework for age-friendly planning in the report *Global Age-Friendly Cities: A Guide*. A range of governments and institutions have used this document to shape their approach to ageing, including the government of Queensland's 2016 Action Plan and Seattle's 2018 Age-Friendly Action Plan. It is featured in the United States–based AARP's library of resources and is widely used among its Global Network of Age-Friendly Cities and Communities.[14] Many adopters of the WHO framework come from higher-income countries, and careful attention must be paid to transferring this knowledge across locations with different economic, political or cultural conditions.

The WHO framework is organised across eight domains.[15] In some uses of the framework, these domains are condensed further into three broad areas: social and civic participation, service provision and the built environment.[16] Social and
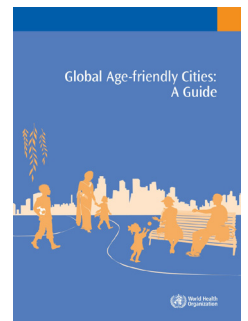
Global age-friendly cities: A guide
WHO is a global leader in ageing policy. Its Global Network for Age-Friendly Cities and Communities provides a framework for cities to become age-friendly.

civic participation refers to strategies that ensure older people have strong relationships and feel a part of civic life. Service provision encompasses the programmes and special assistance that older people receive from the government or non-governmental sectors. The built environment describes the constructed physical features of a place — outdoor environments, transport and mobility, public spaces, and housing.
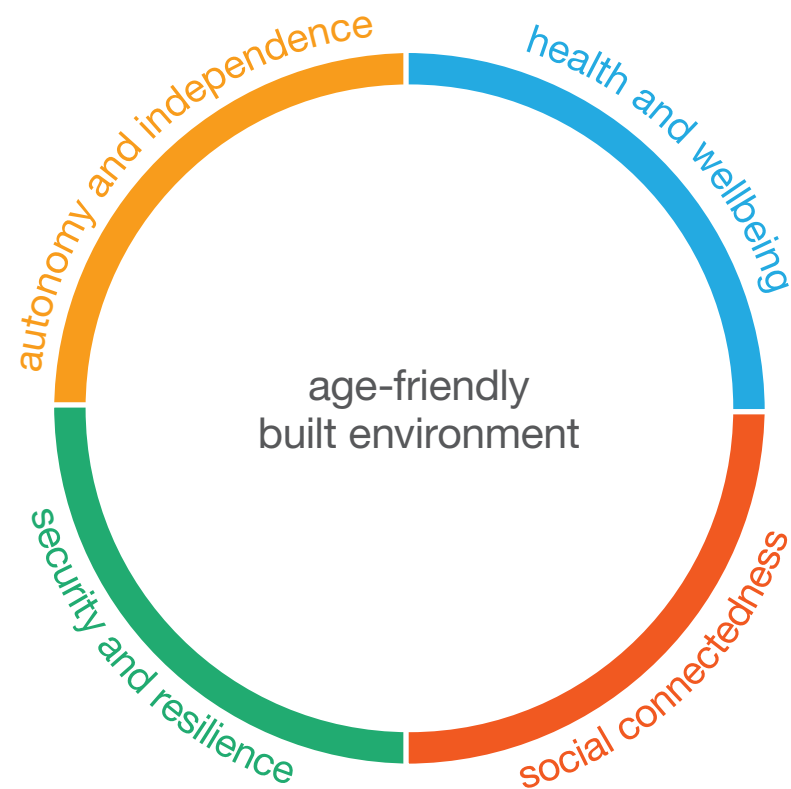
Our approach

Informed by the WHO framework, our approach focuses on the built environment component of the framework and examines the way it also plays a role in the areas of social and civic participation and service provision. We use the design of the built environment as the lens to examine the various aspects of the needs of older people. Through this lens, we explore how the built environment contributes to meeting their needs and identify how cities and built environment professionals can better plan and design the physical spaces in their communities to meet the unique priorities of older residents.

An age-friendly city is a combination of design choices, many of which benefit everyone, regardless of age. For example, walkable neighbourhoods, a robust healthcare system and a reliable transit network are good for everyone. However, there are some strategies that do not serve the broader public, but which are necessary in addressing the specific needs of older people.[17] Our approach recognises both types of design strategies.

In the following chapters, we explore major themes that define the needs of older people, as well as exemplary strategies and actions that planners, engineers and designers from around the world are using to shape the built environment.

SUSTAINABLE DEVELOPMENT GOALS

11 SUSTAINABLE CITIES AND COMMUNITIES

UN SDGs
The United Nations Sustainable Development Goals closely align with the goal of creating age-friendly cities. In particular, Goal 11 calls for Sustainable Cities and Communities.

age-friendly built environment

autonomy and independence

health and wellbeing

social connectedness

security and resilience

Our approach
Adapting the WHO framework, our approach asserts an age-friendly built environment fosters autonomy and independence, health and wellbeing, social connectedness and security and resilience.

Needs

| Autonomy and independence

| Health and wellbeing

| Social connectedness

| Security and resilience

Residential Encouragement Zones

Toyama, Japan

Toyama's residential encouragement zones increase accessibility for the elderly by developing walkable residential neighbourhoods close to public transport services. These zones cover the city centre, areas within 500 metres of tram and rail lines, and areas within 300 metres of high-frequency bus routes. Developers constructing new homes and families moving into residential encouragement zones receive a subsidy from the city, and the subsidy is higher for developers of senior housing. Combined with expanded transit options, whereby newly built transport services parts of the city without a full transit route, the initiative responds to the needs of Toyama's high percentage of elderly residents. Incentivising their occupation of these designated zones increases mobility and accessibility, whilst contributing to an inclusive, age-friendly urban environment.

Autonomy and independence

"Mobility is necessary for accessing commodities, making use of neighborhood facilities, and participating in meaningful social, cultural, and physical activities."

—Taina Rantanen, "Promoting mobility in older people" (2013)

Changes to one's physical and mental abilities are a concern for most people as they approach the later phases of life. These transitions can have a significant impact on daily activities and other elements of one's lifestyle. Autonomy, as defined by WHO, is "the perceived ability to control, cope with and make personal decisions about how one lives on a day-to-day basis, according to one's own rules and preferences."[18] The closely related concept of independence describes "the ability to perform functions related to daily living… with no and/or little help from others."[19] Both independence and autonomy are often hindered during the ageing process.

Many factors in the built environment can limit or contribute to one's sense of autonomy and ability to live independently within a community, possibly none more so than mobility. How people get from place to place is central to determining one's autonomy and independence. A person's degree of mobility defines the range of activities and interactions within reach.

Home environments require modifications that assist with movement, stability and visual clarity to enable people to continue their daily routines as they age. The concept of "ageing-in-place", typically defined in terms of one's ability to stay in their home into old age, has become a major point of discussion in efforts to make age-friendly cities.

89%

want to age-in-place

In a poll of US adults aged 55 and above, 89% said they wanted to stay in their current home for as long as possible.[20]

52%

of older people

In a survey of older people in the UK, 52% said they do not go outside as often as the want because of a lack of public toilets.[21]

There are, however, many aspects of today's cities that pose challenges for efforts to age-in-place, such as the cost of home maintenance over time. Proper insulation, heating and cooling systems, and housing size are also concerns that limit the ability of people to age in their homes.[22] Many older people struggle to pay for repairs and upgrades, and are unable to do the work themselves or temporarily relocate nearby. Research by Harvard University's Joint Center for Housing Studies found that in the US, almost 5 million households with occupants aged 65 and older spend more than half of their incomes on housing.[23]

Beyond the home, factors that negatively impact the outdoor pedestrian experience further limit a person's mobility. As people age, their walking ability and speed generally decline, which is not always well accommodated by city infrastructure. A study conducted in the UK to assess the walking speed of individuals 65 and older found that 76% of men and 85% of women had a walking speed below 1.2 metres per second, the rate used widely around the world to determining pedestrian crossing timings in traffic light design.[24] Many communities suffer from poorly maintained or a lack of elements such as footways, accessible pedestrian ramps, pedestrian signals with countdown clocks, pedestrian crossings, signage and other basic features required for a safe and walkable neighbourhood.

Physical characteristics of the city that reduce mobility not only limit access but can also accelerate the decline in mobility among older people.[25] Environmental obstacles — such as long distances, absence of resting places, hills and slopes, poorly maintained streets, and traffic — have been shown to increase the risk of developing new difficulties in walking by almost three times.[26] Obstacles limiting physical activity are associated with fear of moving outdoors, and that fear leads to greater risk of mobility decline.[27]

9.7M
households
In the US, 9.7 million households with people aged 65 or over spend 30% or more of their income on housing.[28]

3.5%
of US homes
Of all homes in the US, only 3.5% are accessible, defined as having a no-step entry, wide hallways and doors, and single-floor living [29]

43%
of adults 80 and over
Of American adults aged 80 and over, 43% report having mobility challenges, rising from only 11% of those aged 50 to 64.[30]

A study of people aged 80 to 89 in the UK found that fear poses a barrier to independence and access to the outside world, stemming from a perceived risk in leaving the home and a self-perception of vulnerability.[31] Coupled with a lack of facilities, poorly designed environments and unpredictable quality of the public transport service, an unwelcoming outdoor environment can reduce participation in society and further diminish older people's capacity for autonomy and independence to enjoy the public realm.[32]

The tendency for people to drive less frequently as they get older increases the importance of alternative modes of transport in ensuring autonomy and mobility across greater distances. Access to public transit and shuttle services can be essential in enabling people to get from their homes to the amenities they need and enjoy.

Wayfinding — including visual, auditory and tactile cues — is also essential to making places feel safe, accessible and legible for older people navigating the city. Beyond the challenge of making complex environments navigable to all, cities must also ensure that they are accessible to people facing a range of challenges that are widely prevalent among, although not unique to, older populations. An analysis of 2011 to 2015 American Community Survey data for the United States found that 38% of adults aged 65 and older, or 17 million people, reported an age-related difficulty that limited activities of daily living. Among this segment of the population, 25% reported physical difficulties and up to 15% reported difficulties hearing, remembering, seeing or dressing.[33] Systems that assist people in finding their way around the city must consider these common age-related changes in order to be adequately accessible to older people.

65%
of women
A study of Finnish adults aged 75 to 81 found that 65% of women and 29% of men expressed fear of moving outdoors.[34]
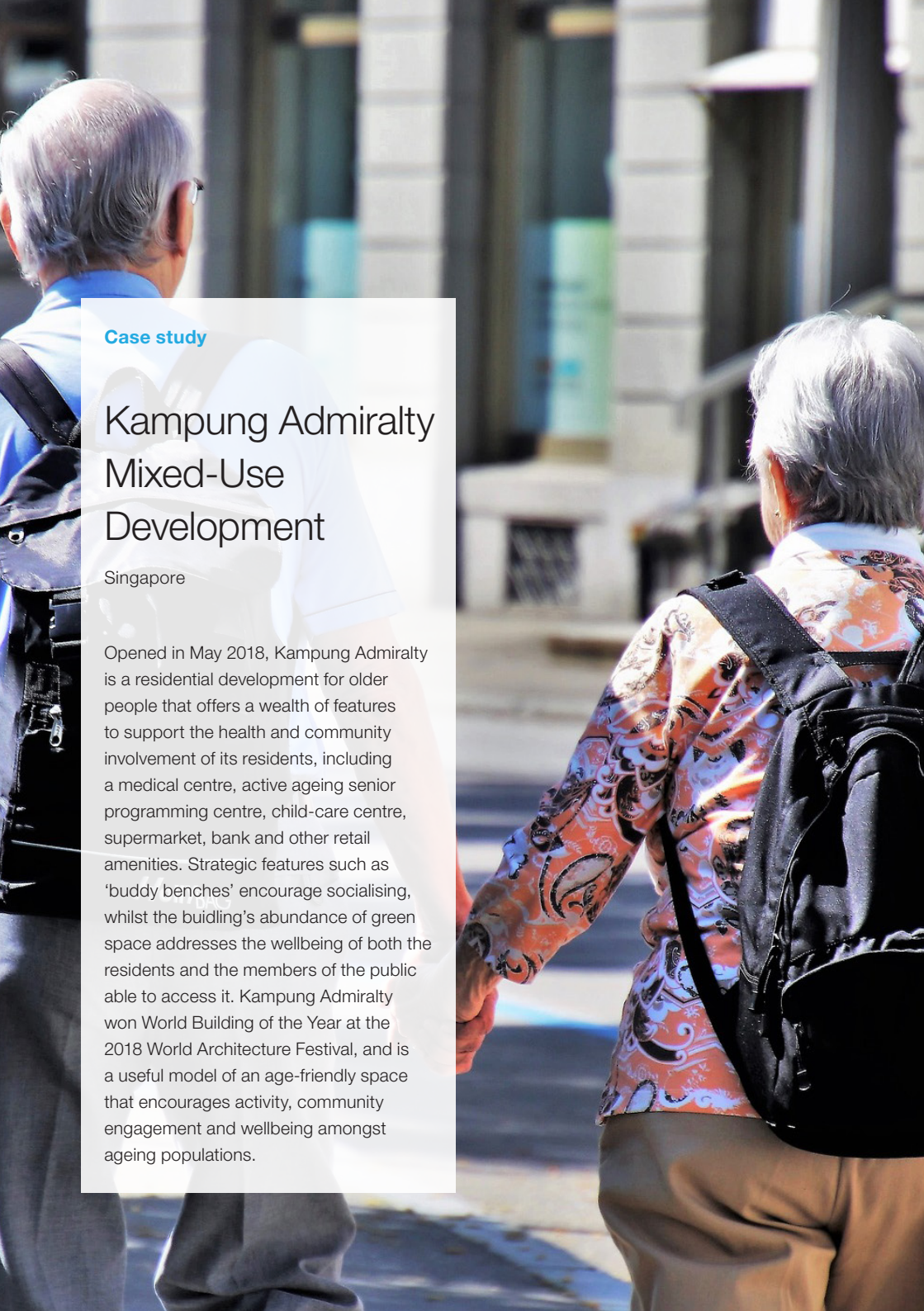
£1bn
cost to the UK
In the UK, falls of older people resulting in injuries are estimated to create costs of over £1 billion for the state.[35]

17M
older people
In the US, 17 million older people have an age-related difficulty that makes it challenging to complete the key tasks of daily life.[36]

Kampung Admiralty Mixed-Use Development

Singapore

Opened in May 2018, Kampung Admiralty is a residential development for older people that offers a wealth of features to support the health and community involvement of its residents, including a medical centre, active ageing senior programming centre, child-care centre, supermarket, bank and other retail amenities. Strategic features such as 'buddy benches' encourage socialising, whilst the buidling's abundance of green space addresses the wellbeing of both the residents and the members of the public able to access it. Kampung Admiralty won World Building of the Year at the 2018 World Architecture Festival, and is a useful model of an age-friendly space that encourages activity, community engagement and wellbeing amongst ageing populations.

Health and wellbeing

"The relationship between the built environment, healthy living, people's behaviour and health status is complex. Even so, cities and communities can be designed and built to set people up for success."

—Public Health Agency of Canada, *Designing healthy living* (2017)

The concepts of health and wellbeing are wide-ranging and touch on quality of life, physical health, mental health and experience of one's environment. Quality of life is a person's perception of their position within the culture and value system that they live in, and their current state in relation to their aspirations, expectations and concerns.[37] Definitions of wellbeing and quality of life are closely connected.[38]

Barriers in the outdoor environment negatively impact physical health, mental health and quality of life through their effects on physical health, self-perceptions of vulnerability, and one's desire for recreational and physical activity.[39] But the importance of one's connection to their surroundings goes far beyond issues of access. In fact, the process of ageing can correspond to an increased attachment to one's environment from the scale of the home to the neighbourhood and community.[40] An attachment to place can be part of what grounds a person in a sense of purpose and can be the anchor stabilising the routines and habits that keep them healthy.

Design of the built environment plays a key role in the health and wellbeing of older adults. A well-designed outdoor environment provides possibilities for exercise and recreation, and can encourage older people toward wellness activities such as walking, swimming, dancing and participating in other outdoor community

2.3x
more likely to make healthcare trips
A survey of older adults in four rural US states found they were 2.3 times more likely to make routine healthcare trips if they lived with someone who could drive.[41]

Access to nature is related to many positive health outcomes.

A built environment that supports active mobility enables a healthy way to moving around.

programmes. Designing the built environment to encourage people to go outside can reduce feelings of isolation, providing mental health benefits. By contrast, the absence of recreational facilities and green space in a neighbourhood is associated with reduced physical activity and its related health impacts.[42] In addition to enabling active recreation, green spaces that provide opportunities to experience nature have a positive influence on wellbeing.[43] High-quality natural landscapes play an important role in enhancing health in cities far beyond their aesthetic value.

Quality health-related services are essential to the wellness of older city residents. The processes that determine the layout of the built environment, such as community land use planning and zoning, influence how easily an older person can access health resources. The location of one's home in relation to care facilities, caretakers and other amenities such as shops and recreational centres can become a challenge as people age. In many of today's cities, zoning and other planning tools encourage spatial separation of residential and commercial areas, making it challenging for older people to access the services they need. However, built environment practitioners have the ability to design places that make it easy to access health services.

30%

decrease in number of falls

Patients with access to outdoor gardens in a dementia care facility in the US had 30% fewer falls and a decline in their severity.[44]

42%

increase in stress levels

In a survey of 11,200 Danish adults, researchers found that living over 1 kilometre from an open space increased stress levels by 42%.[45]

While access to and interaction with nature is closely related to numerous positive health outcomes, many urban environments do not provide enough opportunities for people to engage with the natural environment. This disconnection from nature can have profound and complex effects on a person's physical and mental health. For example, one study found that older people living within walking distance of a park, having easy access to outdoor recreational facilities and reporting attractive outdoor features were less likely to develop difficulty walking.[46] Connection to nature, both through the preservation of the natural environment and the integration of the natural world into built structures, is a key component of the health and wellbeing of older people.

10.5%

less medications used

Patients in a dementia care facility in the US with access to an outdoor garden reduced the amount of medications they used by 10.5%.[47]

Case study

Age-friendly neighbourhoods

Manchester, England

Manchester Age-Friendly Neighbourhoods is a partnership between Manchester School of Architecture, Southway Housing Trust, Manchester City Council and other community groups, aiming to reduce social isolation among older people and promote civic participation. Active across four neighbourhoods, the programme awards small neighbourhood grants for projects such as accessibility improvements, dementia-friendly audits, and other upgrades. It also conducts community-engaged research into the experience of the elderly, and shares the resulting feedback and insights to broaden public awareness of existing issues and of how to build more age-friendly neighbourhoods. Manchester Age-friendly Neighbourhoods actions appropriate, research-driven solutions to social isolation amongst the elderly.

Social connectedness

"Physical and social contexts themselves can be 'inclusive' or not — either facilitating or serving as barriers to resource access, social integration and social support."

—Andrew Scharlach and Amanda Lehning, "Ageing-friendly communities and social inclusion in the United States of America" (2013)

A broad range of characteristics come together to create a supportive urban community for older people. While social interactions are an integral part of one's general wellbeing, the built environment plays a unique role in shaping how and where people interact, from the home environment to the public realm. For example, the arrangement of a city's physical spaces determines where people gather to socialise, how people commute between home and work, and who people cross paths with in daily routines.

Isolation and loneliness are profound challenges for older people around the world. These factors have a powerful impact on quality of life, sense of wellbeing and physical and mental health. Research shows that health outcomes such as depression, cognitive function, cardiovascular disease and mortality are associated with loneliness and social isolation.[48] Changes in older peoples' lives that can lead to both isolation and loneliness include declining health that limits ability to socialise and reduces occasions for interactions in public locations, loss of loved ones who were sources of companionship and an increased likelihood of living alone in one's home environment.[49]

As ability to engage in activities becomes more limited, the surrounding environment can take on a more central role in preserving one's sense of self: home and neighbourhood are repositories of meaning and memory.[52]

43%
of older people
In a survey of 1,604 older people in the US, 43% of respondents said that they felt lonely some of the time or often.[50]

25%
of lonely older people
Of those who felt lonely, 25% also reported challenges with activities of daily living, while only 13% of not-lonely older people said the same.[51]

Everyone, including older people, value their relationships with others.

Better strategies for housing design can support intergenerational relationships.

While older neighbourhood residents are rich sources of local history and knowledge, they are often not engaged meaningfully in planning processes. This exclusion of older people at a time when their connection to their neighbourhood is vital can lead to a diminished sense of self-worth and loss of purpose. A lack of engagement between younger and older residents of a community can also contribute to ageism, or age-based discrimination. This can inhibit social connectedness and cohesion among older people.

Another challenge that can hinder connections between older people and their communities is a lack of adequate housing options. Beyond functional features within a home that help people adapt to changing physical needs, broader housing market trends in many countries can limit the supply of the types of units that might best suit older people.[53] In the United States, approximately 70% of older people live in detached single-family homes.[54] The federal laws that require accessible housing features do not apply to single-family homes, and so much of the broader effort to make the built environment more accessible fails to reach ageing populations in their home environments.[55] Roughly 50% of older people with disabilities do not have the structural modifications that would make it easier for them to operate at home.[56]

2x
more likely
Older people in Amsterdam who reported feeling lonely were two times more likely to develop dementia than those who did not.[57]

70%
of older people
In the US, 70% of older people live in single-family homes, reflecting a lack of housing-type options.[58]

Legal and regulatory obstacles also compound the issue of inappropriate housing types by limiting homeowners' ability to develop what are commonly known as accessory dwelling units. These are typically repurposed garages or small permanent structures in a rear or side yard, which can allow people to easily downsize or accommodate for caretakers and guests. These challenges limit opportunities for independence, autonomy and mobility among older people in their immediate surroundings.

Housing for older people in cities is limited not only by type, but also by cost. Displacement of older people due to gentrification is a major issue. Stable affordable housing is an urgent concern among many living in cities, yet the prospect of a sudden relocation can be particularly destabilising for older people who could be faced with reconfiguring care arrangements, adapting to living in unfamiliar environments and losing social connections that provide emotional support.

Feelings of social connectedness among older people in cities are limited by environments that encourage isolation, planning processes that exclude the expertise and perspectives of older people, and housing options that restrict one's ability to stay in their communities as they age. The right set of planning and design approaches can help to address these challenges and cultivate a sense of support and belonging.

80%
without regular income
An estimated 80% of people in developing countries aged 60 and above lack a source of regular income.[59]

12%
increase in median rent
In the US between 2006 and 2016, rent for older people rose by 12%, but Social Security payments increased by only 6%.[60]

Sheltering Seniors from Extreme Heat

New York City, US

A report conducted by Arup and the New York City Housing Association (NYCHA) examines the effects of extreme urban heat on elderly New York residents. Titled 'Sheltering Seniors from Extreme Heat', the report has led to further research on the subject as well as a design project for Arup. Despite flooding often being the focus of extreme weather and climate emergency, extreme heat sends approximately 450 New Yorkers to the emergency room each year, and results in the death of roughly 115. Often less mobile or already suffering from other health issues, the elderly are disproportionately affected by extreme heat. NYCHA is testing solutions to reduce the threat extreme heat poses to seniors, prioritising preventative planning from the design phase and power backup to combat emergencies. Plans are also being made for Arup to retrofit a property owned by NYCHA and occupied primarily by older people, replacing the gas fired hot water pumps of seven apartments with an electric pump system.

Security and resilience

"Older people have often been overlooked in disasters and conflicts, and their concerns have rarely been addressed by emergency programmes or planners."

—David Hutton, World Health Organization, *Older People in Emergencies* (2008)

Many dangers that affect all members of the population are elevated for older individuals, due to a higher level of physical vulnerability and a decreased ability to escape from hazardous situations. From coping with extreme weather to dealing with reduced mobility and cognition, certain hazards need special attention to ensure a city environment that is safe for all, including older people.

Extreme weather events can be particularly dangerous for older people, and some aspects of dense city environments can make things worse. During Hurricane Katrina in New Orleans in 2005, nearly 50% of the roughly 1,000 who died were aged 75 or older, likely due to a lower willingness and ability to leave their homes and being more susceptible to harm during the violent storm.[61] During Superstorm Sandy in 2012, flooding stranded many older New Yorkers living in urban high-rises for days without light, food or working elevators.[62]

There is also a well-established body of evidence that older people have a higher risk of mortality during hot weather.[63] In the summer of 2003 a record-breaking heatwave in Europe led to the deaths of over 35,000 people, primarily impacting older people, the very young and individuals with chronic illnesses.[64] Factors that contribute to increased risk include higher susceptibility to sickness or injury; stresses on food or water supply, which can be particularly dangerous for older people; and a lower capacity to mobilise or escape efficiently from dangerous conditions.[67]

70%
of deaths were 75+
In France, 14,800 people died during the 2003 European heat waves — 70% of those who died were aged 75 or older.[65]

4,500
patients
In New York City during Superstorm Sandy, around 4,500 people were evacuated from nursing homes and adult care facilities.[66]

Older people are disproportionately the victims in traffic crashes with pedestrians.

Simple design changes can reduce the risk of falls and make walking easier.

Both social isolation and chronic health problems contribute to heightened vulnerability to hot weather, and these factors are prevalent among older communities.[68] This is compounded in cities by what is known as the urban heat island effect, a phenomenon whereby heat trapped in streets, roads and pavements results in cities that are hotter than surrounding rural areas.[69]

In addition to the risks posed by major weather events and other disasters, some daily dangers are also elevated for older people. The risk of falls due to outdoor hazards is an issue with particularly grave consequences for older people. Over half of falls among older people happen outdoors. Yet much of the efforts towards prevention have been focused on interior environments and individual risk factors, with a lack of attention to the design and planning of cities.[70] Falls make up 85% of injury-related hospitalisations among older people in Canada,[71] and in the UK roughly 10% of ambulance calls are due to falls among people over 65.[72] Globally, older people face the highest risk of serious injury or death from a fall, and this level of risk increases with age.[73] Preventative action is a vital priority for older people and is deeply tied to city infrastructure and urban design.

The effects of dementia are another challenge tied closely to ageing that comes with its own set of daily dangers and security concerns. Approximately 50 million people have dementia worldwide, with roughly 10 million new cases

$60M
annually
Falls among the older residents of Baltimore lead to US$60 million in hospitalisation costs each year.[74]

40%
of pedestrian fatalities
In New York City, older people make up 40% of pedestrian traffic fatalities despite being only 13% of the city's population.[75]

occurring each year.[76] Wandering and roaming behaviour is very common among people with dementia, affecting more than half of people with the disease. The Alzheimer's Association estimates that roughly 50% of individuals who disappear while wandering end up suffering a major injury or death if they are not located within 24 hours.[77]

For these reasons, the unique physical and mental conditions typical of older populations would benefit from more thoughtful city design and community planning to keep older people safe and healthy in their communities.

47M
people living with dementia
Worldwide, dementia affected 47 million people in 2015, and the number of people living with dementia is anticipated to triple by 2050.[78]

Strategies

autonomy and independence

Create walkable environments

Ensure access to transport

Enable ageing-in-place

Provide wayfinding and city information

health and wellbeing

Ensure access to health services

Provide space for exercise and recreation

Make connections to nature

social connectedness

Fight loneliness and isolation

Promote inclusion and civic participation
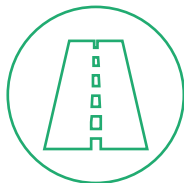
Create intergenerational spaces

Provide options for older people to stay in their communities

security and resilience

Prepare for extreme climates

Design safe streets and public spaces

Promote dementia safety

Strategies for ageing communities

Cities around the world are adapting the way they plan and design physical spaces to enable older people to live independent, healthy, social and secure lives. Thoughtful designs can meet the specific desires of older residents while also making the city more accessible and enjoyable for all.

This chapter identifies 14 built environment design strategies to create age-friendly communities and address the four key needs of older people.

These strategies are not new. Each section provides global case studies, describing implementation programmes and demonstrating that the strategies are possible and beneficial. Taken together, they create an evidence base to justify action and influence decision-makers.

Create walkable
environments

Ensure access
to transport

Enable
ageing-in-place

Provide wayfinding
and city information

Strategies for autonomy and independence

"We all want a future in which we can enjoy our later life to the full — and live it in the way which is best for us and our families. Homes and communities have an essential role to play in supporting older people's health, wellbeing and independence."

—Lord McKenzie of Luton and Phil Hope, MP, *Housing our ageing population* (2009)

Autonomy is fundamental for older people's dignity, integrity, freedom and independence.[79] As people age they often become less mobile, typically driving less and finding it more difficult to walk between places. Designing for a range of abilities so people can travel easily between places with confidence is important for sustaining an autonomous and independent lifestyle for older residents.

Create walkable environments

Planning decisions guide the development patterns of the city, determining the geographic relationships between residential areas, commercial destinations, industrial uses and community facilities. In walkable neighbourhoods, people can travel by foot from their homes to the places they want to go. Footways, open spaces, major corridors and transit stations all play a role in supporting the autonomy and independence of older people.

In Toyama, Japan, city leaders pursued an ambitious initiative known as the Compact City strategy to make it easier for residents to access destinations necessary for daily life. The strategy was implemented within the context of a rapidly ageing population. By 2025, Toyama forecasts that 32% of its residents will be 65 or older.[80] To encourage development of walkable and transit-accessible neighbourhoods, the city created Residential Encouragement Zones covering the city centre and all areas within 500 metres of tram lines and

Cities
Alive
Towards a walking world

ARUP
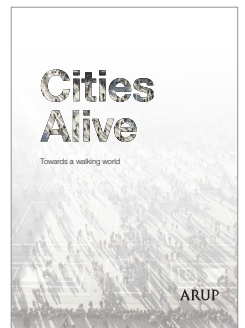
Towards a walking world makes the case for improving walkability in cities, as a catalyst for developing sustainable, healthy, prosperous and attractive urban environments.

Housing Designed for Older People

Birmingham, England

The Birmingham Municipal Housing Trust provides social housing in Birmingham, including homes specifically designed around the needs of older people. A new housing type, the two-bedroom bungalow, is designed to remain fully functional and liveable even without access to the second floor. Occupants can live on the ground floor with access to all the necessary amenities and not need to ascend stairs or undergo the pressures of maintaining a full house. The upstairs has a second bedroom and bathroom, which is flexible and can allow for guests, family or live-in caregivers, further facilitating an age-friendly living space.

Affordable and accessible transit supports the autonomy of older people.

regional rail, as well as within 300 metres of high-frequency bus routes.[81] Residents purchasing or renting homes, homeowners making renovations and developers building new homes within the Residential Encouragement Zones are all eligible for subsidy. Developers receive additional benefits for building senior housing and community facilities.[82]

The Residential Encouragement Zones have been a success for Toyama. The city centre population has been growing since 2008,[83] and the percentage of the population living within these zones continues to rise.[84] These zones have a higher concentration of older people than the rest of the city, and older people are more likely to move into the zones than to other areas.[85]

The city of Viborg, Denmark, also adopted a strategy focused on the interconnection of spaces throughout the city centre. The city's accessibility redesign of the medieval city centre in 2016 took a network approach to siting and designing accessibility improvements, identifying key destinations around the city centre as well as the roads and paths connecting them. The city added accessibility features to overcome difficult slopes, streets paved with uneven cobblestones and places only accessible by stairs. The improvements were blended into the pre-existing urban fabric while making it easier for older people to enjoy the amenities of the city.

37%
of Toyama's residents

In Toyama, Japan, 37% of residents were living in the Residential Encouragement Zones in 2017. The city aims to increase this to 42% by 2025.[86]

¥500k
subsidy

Those looking to purchase a home or apartment in the city centre of Toyama are eligible for a government subsidy towards the cost.[87]

City network accessibility improvements in Viborg, Denmark, make the city easier to navigate.

Feeder buses connect passengers to the light rail system in Toyama, Japan.

Viborg's project created an accessible network by leveraging improvements to pedestrian streets and Saint Mogens Street already underway. Interventions included removing staircases, levelling ramp access points, relocating substantial amounts of parking and adding resting areas with benches on uphill climbs alongside a granite paver path for users with wheelchairs or buggies.

In addition to a continuous network and mixed-use environment, public facilities are essential for enabling people to spend their days out in the city, taking part in shopping, recreation and community events. The London Borough of Richmond has worked to create neighbourhoods that encourage daily outdoor activity for all by providing easily accessible public restrooms. The Community Toilet Scheme, run by the Richmond Council, relies on partnerships with local businesses and institutions to make use of existing city facilities. Shops, restaurants, libraries and other locations that participate in the programme allow the public to use their restroom facilities without making a purchase. Locations are identifiable through standardised stickers displayed in storefronts and an interactive map available online. The programme also aims to combine accessible facilities with special offers from local businesses to provide shared benefit.[88] Efforts like this make a vibrant public realm possible by fulfilling needs that are important to all, and of particular concern for older people.[89]

20%
of Viborg's population
Older people make up about one-fifth of the total population of the city of Viborg, Denmark.[90]

1,000-
year-old medieval city
Viborg's history dates back over 1,000 years. The city centre's design and materials are part of that cultural tradition.[91]

Ensure access to transport

Accessible and reliable public transport is central to creating a city that encourages independence and a range of mobility alternatives. Places that are well connected by public transport can facilitate increased use by older people and support autonomous lifestyles, even if one's driving or walking has become more limited. Transport can grant access to jobs, healthcare facilities, family and other important aspects in the life of an older person.

In Toyama, Japan, improved transit service serves as the foundation for the Compact City strategy.[92] Toyama is widely recognised for bold and innovative steps to transform the built environment into one that works better for older residents: more concentrated in the city centre, with high-quality public transport and integrated facilities that meet the needs of an ageing community. The city has carefully coordinated transport investment with the location of key amenities. The primary transit network hub in the city centre connects high-speed, regional and light rail lines. The city's goal is to focus amenities in the city centre, locating destinations in walkable, transit-accessible areas, making it simple for people to reach destinations without using a car. To that end Toyama has been very successful, bringing a full range of facilities to the city centre including the Grand Plaza indoor public square and event space, a glass art museum co-located with a public library and private bank, and other commercial spaces.[93]

25%
of older people
About one in every four older people in Toyama have the Going Out Pass, which offers reduced fare on transit lines.[94]

7km
light rail
Toyama converted a 7-kilometre heavy rail line into a light rail that runs from the central train station to the port.[95]

Public transit in Lyon, France, is almost fully accessible.

Home design plays a key role in supporting the independence of older people.

Lyon, France, has invested nearly €100 million into its metro and trams to make them almost fully accessible.[96] The tram cars and stations are nearly completely accessible, apart from only one station without an elevator. All buses in the network are accessible, and 70% of all bus stops are outfitted to meet the needs of those with limited mobility.[97] Older people and those with disabilities in Lyon can also use the Optiguide service, which pairs the rider with an assistant to travel using the transit system.[98] The city's public transport app can show users the most accessible route to a location by reporting potential barriers.[99]

Independence and freedom of movement require many components to perform well together — from public transit vehicles to station design, footways, building entrances and interiors. The Whole Journey guidelines adopted by the Australian Government Transport and Infrastructure Council are a unique effort to consider the entire journey from origin to destination, considering all modes.[100] The document encourages stakeholders to think outside "the physical and governance boundaries of services and infrastructure",[101] offering guidelines across multiple stages of a journey: pre-journey planning, journey start and end, public transport stop/station, public transport service, interchange, return-journey planning, disruption to business-as-usual and supporting infrastructure.[102] With Australia's population over 75 forecasted to increase from 6.4% to 14% by 2060 and with

1.7M
daily riders
The TCL transit network in Lyon, France, has about 1.7 million riders across the network of bus, subway, funicular and tram lines.[103]

€100M
investment
Lyon's investment of nearly €100 million retrofitted every mode in the transit system, making it almost completely accessible.[104]

30%
of riders
Around 3 in every 10 riders of Lyon's transit network said the accessibility of the system is relevant to them.[105]

approximately 50% of Australians 65 and older currently reporting having a disability,[106] this end-to-end approach is essential to making sure city residents can move freely within and between neighbourhoods.

Emerging transport technologies, such as autonomous vehicles and on-demand ride services, may also develop to play a larger part in supporting the independence and mobility of older people. Signs of the effects of new technologies are already starting to appear. For example, FlexDanmark is a unified platform for public transport providers in Denmark which offers on-demand, door-to-door public transit. FlexDanmark uses technology to combine requests for different trips into the same car and manage routes, maximising the efficient use of public resources through demand-responsive ridesharing. The service is available for people with limited mobility, those going to visit a doctor and anyone who lives in an area without other forms of public transit.[107]

Enable ageing-in-place

Ageing-in-place requires a living environment that adapts to a person's changing physical needs over time. Features once considered amenities — such as a private upstairs bedroom — can become obstacles for older people. Specific adaptations must be made so that people can continue to navigate and maintain the homes they have enjoyed over the years.
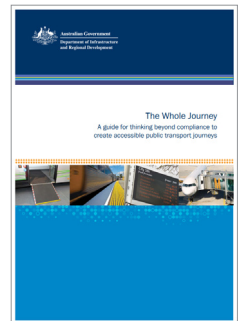
The Whole Journey
The Whole Journey guidelines recommend that transport planners consider the full journey, spanning the trip-planning stage through the return trip.

Bungalows built by BMHT provide older people with housing that allows them to age-in-place.

Navigating the city is easier when older people have access to many modes of travel.

One group in Baltimore, Maryland, has taken a unique approach to facilitating independent living and minimising potential risks within the home environment. Community Aging in Place — Advancing Better Living for Elders, or CAPABLE, is a programme developed by Johns Hopkins School of Nursing targeted at low-income older people with functional impairments. The unique aspect of this programme is the mobilisation of an interdisciplinary team — including a nurse, occupational therapist and community health worker, alongside a housing repair expert — to holistically examine physical and medical issues in the home. This integrated team combines fall risk assessment with selection of modifications and coordination of funding to address functional obstacles, hazards and other concerns in a thorough manner.[108] The pilot phase of CAPABLE yielded positive results, with participants reporting increased ease performing daily activities, reduced pain and fewer falls.[109]

In the United Kingdom, the Birmingham Municipal Housing Trust (BMHT) provides programmes and housing types targeted towards older households. BMHT is constructing two-bedroom bungalows that are smaller than a typical two-bedroom house and designed to address the changing needs of older people over time. These units are designed so that the house remains fully functional even without use of the second floor. The second bedrooms have private bathrooms

6x
return on investment
A study of Baltimore, Maryland's CAPABLE programme found that US$3,000 in programme costs averted medical expenses greater than US$20,000.[110]

37%
increase
The government of Birmingham, England, projects the number of adults aged 65 and over will grow by 37% by 2036.[111]

to accommodate guests, family or live-in caregivers. All units are built to Housing our Ageing Population: Panel for Innovation (HAPPI) standards, a 2009 UK initiative.[112]

The integration of technology into the design of homes can also facilitate ageing-in-place. For example, fall-detection systems can be embedded into the flooring of a home. Upon detection of a fall, the system can immediately call those who are able to help.[113]

Provide wayfinding and city information
Visual cues can support independent and safe movement within the public realm and also helps people to orientate themselves. Wayfinding signage helps people to navigate cities, and other types of markers — footway and planting treatments, public art, use of colour in built elements and distinctive landmarks — also help to orientate people in the places they live or visit.

Wayfinding can also be augmented with other digital, audio and visual information. AccessMap.io, an online mapping tool for Seattle, Washington, adds an additional layer to the traditional information found on services such as Google and Apple Maps.[114] Users can identify routes not only by time and distance, but also by accessibility criteria to avoid obstacles such as missing kerb ramps, construction detours and steep slopes. The University of Washington researchers responsible for the project also launched an OpenSidewalks

~20%
of new housing built
BMHT has been the largest housing developer in Birmingham since 2009, building about 20 to 25% of all new housing in the city.[116]

56%
of older people
Over half of all older households renting from Birmingham City Council live in units that are oversized for their needs.[117]

Public wayfinding helps people orientate themselves and determine the distance to their destination.

project built for the OpenStreetMap platform to encourage the development of an improved data standard for footway routes.[118]

In Bangladesh, WaterAid has developed a mobile app that provides information on country-wide bathroom facilities, orientateated towards women, children and older people. The app provides details on whether the facilities are gender-separated, disability-friendly, free or paid, and in good condition. Users can upload data points to the map so that it can become collectively more robust over time. The app is intended to help people during travel through the city, either on daily commutes or long journeys for the holidays.[119]

wayfinding
Wayfinding is an information system that helps to guide people through a place, providing clarity and improving the experience of the traveler.

4
highways
WaterAid's app-based map of public toilets covers areas along four major highways in Dhaka and other parts of the city.[120]

Cities Alive: Designing for ageing communities

Ensure access to
health services

Provide space
for exercise and
recreation

Make connections
to nature

Strategies for health and wellbeing

*"When 'active aging' is embraced, life expectancy can be extended,
and individuals have the opportunity to experience social, physical, and
mental well-being while remaining connected with their community."*

—Kelly Fitzgerald and Francis Caro, "An overview of age-friendly cities and communities around
the world" (2014)

A vast range of design interventions can contribute to the health and wellbeing of older residents. Design considerations that can help encourage active lifestyles among older people include providing and maintaining high-quality public and green space, increasing dedicated pedestrian environments and promoting the availability of high-quality food. [121] Some researchers are even studying endocrine and physiological responses to experiences of nature to understand how connecting to the natural environment impacts health.[122]

Ensure access to health services

High-quality health services must include a broad spectrum of care, from routine health management to emergency services and preventative programmes. While traditionally many of these functions have been provided within specialised — and often isolated — care facilities, some communities have created innovative solutions to integrate health services for older populations into the public life of the city.

Singapore's Housing Development Board, which provides housing for over 80% of Singaporeans,[123] is actively involved in the creation of housing stock that is integrated into community life, tailored to older people and incorporates health amenities. Kampung Admiralty, opened in May 2018, is a new residential development for older people and a point of national pride.

2.4:1
Citizen old-age
support ratio
Singapore's government projects that there will be only 2.4 working-age adults for every older adult by the year 2030.[124]

80%
of Singaporeans
The Housing Development Board in Singapore provides housing to over 80% of the population.[125]

Outdoor Gyms

Beijing, China

China was an early innovator in active living for older people, creating a physical health law and nationwide physical fitness programme in 1995 that led to the construction of outdoor fitness facilities throughout public parks. Beijing now has more than 4,000 outdoor gyms, promoting the prioritisation of wellbeing and increasing public access to exercise equipment. Low-pressure, easy-to-use equipment enables the elderly to exercise safely in accordance with their abilities, and creates a welcoming space that normalises exercise and physical wellbeing within ageing populations — as well as encouraging them to spend time outside and in social spaces.

Kampung Admiralty in Singapore provides housing for older people and meets many of their daily needs.

Kampung Admiralty offers a wealth of features to support the health and community involvement of its residents. One building on the housing estate includes a medical centre, a programming centre called the Active Ageing Hub, a child-care centre with programming that brings the young and older people into shared activities and places, a 43-stall food vendor area, a supermarket, a bank and more than 15 additional stores.[126] The sixth floor of one building co-locates the community park, healthcare facilities and outdoor space.[127]

The community spaces are also hot spots of programming, and the Active Ageing Hub and childcare centres collaborate in planning the events. The goal of these spaces is to incorporate Kampung Admiralty into the larger Woodlands neighbourhood and to foster a true feeling of an active, engaged life for older people.

In Toyama, Japan, the Kadokawa Preventive Care Centre and Sogawa Legato Square Comprehensive Care Centre are facilities embedded in the core of downtown life, built on former elementary school sites. The Comprehensive Care Centre offers a wide range of services and amenities including a medical centre, medicinal foods culinary school and café, pharmacy, recreational facilities and a nursing school.[128] The Preventive Care Centre focuses on activities to improve the mobility and wellness of older people such as aquatic and fitness programmes as well as medical appointments. well as medical appointments.[129]

100
apartments
Kampung Admiralty has over 100 apartments co-located with a medical centre and other community amenities.[130]

60%
of residents
Of the residents who moved into Kampung Admiralty, 60% moved from a nearby town or housing estate.[131]

Year-round activities are held at the Community Plaza within Kampung Admiralty.

These efforts are one component of Toyama's broader strategy for adapting to its rapidly ageing and shrinking population.

Provide space for exercise and recreation

Design standards and interventions can consider how public places are built and maintained to ensure that they are safe, accessible destinations. In 2016, the city of London implemented a network of "Quietways", or routes following back streets with limited traffic that would guide bikers and pedestrians along tree-lined streets, parks and waterways. The aim was that these connections would encourage older people to walk and bike who might otherwise have avoided traveling among busy traffic in the city.[132] Similarly, Sonder Boulevard in Copenhagen and the Pavement to Parks Initiative in New York and San Francisco both redesign important roadways to give priority to cyclists and pedestrians. The projects change the road hierarchy and create safe, active travel paths through the busy city centres.[133] The additional green space in dense city environments can help address localised air pollution on roadways while improving quality of life and providing healthier urban environments.

Other cities have developed public spaces and amenities more directly targeted at older residents. Preussen Park in Berlin, the first of its kind in Germany when it opened in 2007, offers outdoor exercise machines designed to improve stamina and balance, going so far as to restrict use of the equipment to people 65 and older.

38%

of population

By 2040, Toyama expects the share of the population aged 65 or above to make up 38% of the city's population.[134]

7

Quietways

Transport for London has completed sections of the first seven Quietways in the city, and they have plans for more.[135]

A similar effort in Nuremberg also limits amenities to its older population and has produced the highest number of older-people-orientateated parks in Europe. China was an early innovator in active living for older people, creating a physical health law and nationwide physical fitness programme in 1995 that led to the construction of outdoor fitness facilities throughout public parks. In Beijing alone, over 4,000 outdoor gyms have been built since 1998.[136]

Designing the urban environment with these details in mind enables more people to enjoy the public realm. This in turn supports healthier lifestyles by enticing people into public spaces where they can engage in physical activity, meet friends and family, connect with nature, access services and breathe fresh air, all beneficial to mental and physical wellbeing.

Make connections to nature

The integration of the natural world into the built environment has complex, positive effects on people's lives. For older people and anyone struggling with their physical or mental health, these connections to nature are particularly important. Studies find numerous benefits to the presence of nature in urban communities, including better mental health, lower stress, better wellbeing, lower levels of mortality related to heart disease, lower rates of type 2 diabetes and increased life span.[137]

Parks, community gardens and other green spaces provide essential places for people to spend time connecting with nature. Older people who participate in community gardens are more likely to eat fruits and vegetables, they experience less severe depression and they are more likely to avoid the onset of dementia.[138] The Portland Memory Garden — a project of the Alzheimer's Association, the American Society of Landscape Architects, the Center of Design for an Aging or reduced mobility to spend time in nature.[142]

46%

increase

The UK Office for National Statistics projects a 46% growth in the population aged 65 and older by the year 2029.[139]

4,000

outdoor gyms

The city of Beijing has built over 4,000 outdoor gyms since 1998, providing new opportunities for exercise.[140]

5,112

individuals in a study

A study in Lithuania found that living farther from green spaces increased the risk of cardiovascular disease.[141]

Society, and the city of Portland — provides a space for people with dementia, Alzheimer's disease The design specifically accounts for the needs of its users. It has flat, winding paths with no dead ends and plenty of benches; the entryway is higher than the rest of the park, granting users a full visual overview; and small structures like arbours provide landmarks to help reduce any feelings of disorientateation.[143]

Biophilic design extends beyond the provision of open, green spaces by integrating nature more deeply into urban built environments. Principles of biophilic design introduce natural elements into the exteriors of buildings, infrastructure and the indoors. Using these design strategies can help to maximise the benefits received from connecting to nature by introducing nature into more parts of cities. In Gothenburg, Sweden, White Arkitekter used biophilic principles to design a psychiatric centre at Östra Hospital.[144] The architects ensured that every patient's room had a view of the gardens, and they designed the space to have natural materials, multiple interior courtyards, long views, natural light and other natural elements. A study comparing outcomes between the new psychiatric centre and its previous location shows that patients were less likely to need restraints and less likely to be re-admitted within a week of discharge. Additionally, staff were less likely to miss work due to illness.[145]

biophilic cities

A biophilic city deeply integrates the natural world into the design of the built environment and daily lives of the city's residents. Residents enjoy, respect and benefit from nature.

Cities Alive

Rethinking green infrastructure

ARUP

Rethinking green infrastructure

examines how cities can build nature into our urban systems at all scales through high quality landscape design.

Cities Alive: Designing for ageing communities

**Fight loneliness
and isolation**

**Promote inclusion and
civic participation**

**Create intergenerational
spaces**

**Provide options for
older people to stay in
their communities**

Strategies for social connectedness

*"When communities enable aging adults to work, learn, volunteer, and
participate socially and economically, the benefits accrue to younger
people and the broader society as well."*

—Sindhu Kubendran and Liana Soll, Milken Institute, *Best cities for successful aging* (2017)

Social connectedness and participation help older people feel
that they are a part of society and their communities, and
positively contribute to their health and wellbeing. Social
inclusion can support interdependence, preserve self-esteem,
support recognition from community and offer meaningful
interactions.[146] Older people feel they are a valued part of
society when they can actively engage in neighbourhood
planning and design, and participate in community activities.

Fight loneliness and isolation

As people age, they become less mobile, lose partners and
friends, face health issues and require alternative modes of
transport to stay connected to other people, services, places
and their community.[147] A well-designed environment can
facilitate interaction, and places such as community gardens,
libraries, public parks and civic plazas provide space to
connect with others and meet new people.

Some urban development projects aim to increase social
connections between older people and the broader
community by creating mixed-use areas that include
options for older living. These developments are successful
specifically because they situate housing for older people in
the larger context of the city, avoiding the risks of isolating
older people or creating residential age segregation. U-City
in the city centre of Adelaide, Australia — set to open in
2019 — draws from a desire to connect people, providing age
considerations and inclusivity in development. It integrates

$100M
investment
U-City in Adelaide, Australia,
is a A$100 million project in
the city centre, providing high-
quality facilities tailored to the
needs of older people.[148]

17%
aged 60 or above
The city of Adelaide
forecasts that the
population aged 60 and
over will represent 17% of
the population by 2036.[149]

U-City

Adelaide, Australia

With an onus on inclusivity and diversity, U-City is a development integrating retail, accessible accommodation, retirement residences, aged care, a range of social and health services, and end-of-trip facilities to support and encourage bike use, all within the one building. Based in the city centre of Adelaide, Australia and set to open in 2019, U-City aims to socially connect its residents across generations through mixed-use spaces and housing options that suit the elderly. U-City's central location also challenges the risk of older populations being pushed out of urbanised areas to more isolated regions.

Simple design interventions can create places for social interactions.

retail, accessible accommodation, retirement residences, aged care, a range of social and health services, and end-of-trip facilities to support and encourage bike use, all within the one building.[150] Sitting within the city centre, the U-City building will visibly and socially connect people from a range of ages. A potential catalyst for change in the way people approach retirement and aged care, U-City will work with adaptive technology to maintain flexibility.[151]

In addition to mixed-use community neighbourhoods, co-operative living models are another strategy for tackling isolation among older people. In Florence, Italy, Abitare Solidale is a programme grounded in the idea of mutual aid that works to coordinate cohabitation arrangements between older people and individuals at risk of social exclusion or economic hardship. The initiative is a collaboration between AUSER, an organisation focused on older people, and ARTAMISIA, an organisation that works to support women who have experienced violence. Older people who participate can typically offer housing accommodations in exchange for assistance with daily tasks and companionship. The Abitare Solidale programme also provides access to legal assistance to formalise shared living arrangements and help participants navigate housing laws.[152] In Paris, France, a similar programme called Pari Solidaire matches older homeowners with young adults who can offer their company and the safety of having someone else in the home in case of emergencies.[153]

co-operative living models

In co-operative living models, residents share a home and help to support each other based on their specific needs. Each member benefits.

co-housing

In co-housing communities, members of different households share common spaces, fostering interactions and a sense of community.

The design of communities can foster or impede feelings of connectedness.

Intergenerational spaces provide places for young and old to know one another.

New Ground Older Women's Co-Housing in North London is a leading example of building connectedness, participation and solidarity into the design and operation of housing among older individuals. The founding group of six women were motivated by concerns about loneliness and isolation, frustrations with existing options and the possibilities of mutual support to create a new option for women over 50.[154] The co-housing community comprises 26 owners, who share amenities such as a common room, garden and farm area, and laundry.[155] According to architect Patrick Devlin of Pollard Thomas Edwards, the participatory design process and planning of shared activity spaces played a key role in shaping how people interact within the housing community, highlighting the role of physical design in creating spaces that cater to solidarity and support among older populations.[156]

Another approach to increasing social connectedness is to influence how people interact with one another during their daily routines throughout the city. GoodGym is one creative example of finding ways to increase social connectedness through the daily activities of urban life. Its goal is to harness the energy of everyday runners to engage with older people across the city. As GoodGym explains on its site, "We are a community of runners that combine getting fit with doing good. We stop off on our runs to do physical tasks for community organisations and to support isolated older people with social visits and one-off tasks they can't do on their own."[157] GoodGym operates in 48 local areas in the UK.[158]

130k

good deeds

GoodGym in the UK reports that members have participated in 129,815 good deeds as part of their philanthropic running programme.[159]

131

areas

GoodGym has groups of runners in 131 areas. 48 groups are active and another 83 are in the process of setting up.[160]

New York City's Market Ride programme also takes advantage of existing city rhythms, making use of school buses during off hours to help older people take part in the vibrant cultural life of the city. The buses bring older people to local markets, cultural institutions, performances and other destinations. Originally a pilot, the programme is now available across New York City neighbourhoods.[161] Harnessing a city's assets creatively and resourcefully can help to forge new connections and interactions that might not otherwise occur.

Promote inclusion and civic participation

The inclusion of older people during planning, design and other decision-making processes allows communities to benefit from their experience, extensive knowledge of the places they live and their viewpoints on key issues. It also provides older people with an opportunity for social interaction and a way to ensure that the urban environment is responsive to their needs.

The Access Advisory Panel in Melville, Australia, utilises the experience of local wheelchair users, older people, deaf people, people with Alzheimer's and dementia, people with autism, and blind or partially-sighted people. Meeting every three months, the 20-strong panel makes access-themed comments on important projects like big civic buildings, public realm improvements, apartment towers, park

1,333

older people

In one year, New York City's Market Ride programme completed 52 trips to grocery stores with 1,333 older participants.[162]

25%

of residents are 60+

Melville has a greater proportion of older adults compared to the Perth region: 25% in the former and 19% in the latter.[163]

Community-led programs are the cornerstone of the Manchester Age-Friendly Neighbourhoods program.

Age-Friendly Oslo used safety walks to involve older people in the planning process.

upgrades, major festivals and access/inclusion plans before they are finalised. This initiative helps strengthen the design of projects, so they have a considerate approach for people of all abilities, particularly older people. Using participatory and collaborative approaches to co-design spaces allow older people to draw on years of knowledge, skills and experience to help set future policy and agenda on age-friendly developments and create meaningful, legible, safe, inviting and versatile urban spaces.[164]

Manchester Age-Friendly Neighbourhoods is a partnership between Manchester School of Architecture, Southway Housing Trust, Manchester City Council and other community groups and institutions to reduce social isolation felt by older people and to promote social and civic participation. It is active in four neighbourhoods: Burnage, Miles Platting, Moston and New Moston, and Hulme and Moss Side. Neighbourhood groups have access to an investment fund to award small project grants, and together the four partnership boards have funded 71 projects worth £123,907. Examples of funded projects include accessibility improvements for community facilities, dementia-friendly space audits and other physical upgrades. Older people engaged with the programme can build a sense of self-worth and purpose by solving community problems and seeing the tangible impacts their work has in their community.[165]

£124k

in programme funds
Manchester Age-Friendly Neighbourhoods has funded 71 community-based projects worth £123,907.[166]

5,000

people
Around 5,000 people have participated in Manchester-Age-Friendly Neighbourhood programmes each quarter.[167]

The *Old Moat Age-Friendly Neighbourhood Report*, published in 2013, is an example of using the neighbourhood planning process to address the needs of older people. Southway Housing Trust, a non-profit affordable housing developer and property manager based in Manchester, commissioned the report to assess the existing age-friendliness of Old Moat and to craft an action plan to make it an even better place for older people to live.[168] This included a baseline spatial analysis of physical conditions using an urban design perspective — built form, circulation patterns and history of development — followed by focus groups, surveys and questionnaires.[169] The resulting action plan included 114 discrete actions to make Old Moat more age friendly,[170] more than half of which pertained to housing, transport, and outdoor spaces and buildings.[171] The action items ranged in scale, from small urban design interventions such as adding benches to help older people when shopping[172] to improvements to transport and outdoor spaces.[173]

Oslo's city-wide action plan, titled Age-Friendly Oslo, incorporated a range of community engagement techniques from town hall meetings to senior think tanks, one-on-one interviews and workshops. The engagement programme also incorporated a unique approach to seeing the built environment through the eyes of older individuals: the city conducted safety walks, venturing out into the neighbourhood to allow participants to talk about their

64%

of Old Moat residents
Southway Housing Trust polled the residents of Manchester's Old Moat, and 64% found the neighbourhood to be age friendly.[174]

114

actions
The Old Moat Action Plan laid out 114 actions for housing, transport, outdoor spaces and buildings.[175]

Older people can find feelings of inclusion and connectedness from many sources.

Small public places, like a coffee shop, can be an access point to the broader community.

interactions with the city environment and how they would like it to change. In a second engagement programme, Oslo provided iPads and filmmaking training to older people to make short films on the challenges and opportunities they experienced. As a conclusion to the programme, Oslo invited politicians to a screening of the films created by the participants to see the city from a new vantage point.[176]

Create intergenerational spaces

Intergenerational spaces in the public realm suitable for both young and old can promote mutual understanding and help social connectedness prosper across generations. One study of interactions between younger and older people in a service-learning programme in León, Spain, observed benefits from people of different ages coming together, including a decrease in stereotypical opinions, improved opinions of each other and improved state-of-mind of the older programme attendees.[177]

Creating a supportive, intergenerational home environment was at the core of the design for Armstrong Place, an affordable senior housing development in San Francisco. Armstrong Place includes 116 affordable apartments, 124 below-market-rate townhouses and 7,600 square feet of retail. A desire for accessibility and intergenerational living drove the design of the mixed-use complex. Internal circulation is designed to limit the need for stairs and provide

1,000
people

Planners for Age-Friendly Oslo have interacted with at least 1,000 participants in their community engagement programme.[178]

40
movies

Older people made 40 films through a short film programme. They covered numerous topics on daily life as an older person.[179]

for wheelchair lifts, and the housing forms a ring around a shared green space at its core.[180] In-house social, health and financial services are also available to residents. "Pairing the senior apartments with a family community helps prevent the seniors from feeling isolated," explained Cynthia A. Parker, president and CEO of BRIDGE Housing, the organisation that manages Armstrong Place.[181] This housing model diverges from the enclosed campus style of some older living communities — recent surveys indicate increasing demand for intergenerational, mixed-use living opportunities built into existing communities.[182]

Hong Kong has shown similar demand for intergenerational living that is only beginning to be met. Harmony Place, built by the non-profit Hong Kong Housing Society, is designed for buyers to live alongside their parents and incorporates shared health, fitness and activity amenities.[183] In 2016, legislative council member Tony Tse Wai Chuen suggested that despite interest from developers in creating new age-friendly housing offerings, "few of these projects ever got off the ground for various reasons, including unclear regulatory guidelines and requirements, but more pointedly a lack of government encouragement."[184]

Humanitas is a Dutch care home model that provides housing to students in exchange for spending time with older residents sharing the same living environment. Humanitas began when CEO Gea Sijpkes invited a student to live at the care home

240
housing units

Armstrong Place has 116 affordable apartments, 124 townhouses offered for below the market rate and 7,600 square feet of retail.[185]

4km
to be eligible

Singapore offers a Proximity Housing Grant to parents or children who live in the same household or within four kilometres of each other.[186]

Intergenerational relationships foster social connections and can be sources of learning and sharing.

Remaining in their homes allows older people to stay connected with their existing networks of support.

and received overwhelmingly positive feedback. In the subsequent four years, an intergenerational environment pairing 160 older residents with six students developed, with the goal of engaging in the outer neighbourhood as well in the life of the city. Communal gardens bring in other local residents and act as a shared resource for the larger community.[187]

Spaces that bring generations together can become home to programmes to encourage social interaction. In Australia, intergenerational playgroups have been established to further support the mixing of young and old, breaking down social stigmas around the older population, connecting across generations, improving moods and mitigating feelings of isolation.[188] Supported by the Australian Government and delivered at a state government level, playgroups are available in a number of locations across Australia. They help to support families and strengthen communities, and through dedicated intergenerational playgroups, combat ageism through providing a social connection across many different age groups.

Provide options for older people to stay in their communities

Beyond the conditions of one's home or immediate neighbourhood, a diverse range of housing types is essential to supporting the desire of older people to age-in-place. Options such as accessory dwelling units (ADUs) allow older

5,000+
households
In Singapore, over 5,000 households participated in the first year of the Proximity Housing Grant programme.[189]

25%
of all home resales
In Singapore, 25% of all home resale applications in 2015 and 2016 included an application for Singapore's Proximity Housing Grant.[190]

people to downsize or redesign with new features while staying in their current homes and within existing networks of social support. ADUs can also provide additional rental income or space for caregivers and relatives who may help older people sustain their lifestyle at home.[191]

ADUs are an important strategy for increasing affordable housing options for older people, particularly in major cities with skyrocketing housing costs. The city of Vancouver's Making Room Housing Program aims to increase the supply and diversity of housing and to densify where possible, using rezoning to allow for duplexes in single-family home districts as well as secondary suites and laneway houses.[192] Laneway houses, detached structures located in the rear yard of single-family homes, are a type of ADU that has proven successful at introducing affordable housing in low-density parts of the city. In 2009, Vancouver adopted regulations to allow laneway houses in certain districts, extending this to all single-family districts in 2013[193] and simplifying the process in 2018 by granting outright rather than conditional approval.[194] In the first year of the plan, the city permitted 591 new laneway houses, far exceeding the necessary pace of 400 units per year to meet its planned 10-year goal.[195]

accessory dwelling units (ADUs)
An accessory dwelling unit is a second household on a property that is typically intended for a single family. Examples are basement apartments or lock-off units.

Action Plan for Successful Ageing
Singapore's Action Plan requires its Housing Development Board to ensure its housing stock is accessible and affordable to older people, enabling them to age-in-place.[196]

Many older people have deep knowledge of their communities and much to contribute to their success.

Other cities assist older residents to remain in place by providing financial programmes that support ownership, affordable rental and relocation to more appropriate unit types within their community. In Singapore, the Silver Housing Bonus gives older people up to a S$20,000 cash bonus for rightsizing from a larger apartment to a smaller one.[197] Deferred down payments and temporary loans ensure that older people have the upfront funds needed for the new apartment by leveraging the future funds they will have upon sale of their previous apartment.[198]

$20k
for rightsizing

Singapore's Silver Housing Bonus provides S$20,000 to older people who are rightsizing from a larger apartment to a smaller one.[199]

Prepare for
extreme climates
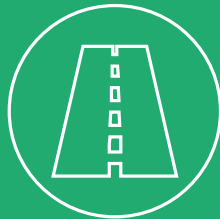
Design safe streets
and public spaces

Promote
dementia safety

Strategies for security and resilience

"Current aging-in-place efforts can be harnessed to strengthen the disaster resilience of older adults. Existing programs and new collaborations between public health departments and these [ageing-in-place efforts] show promise for improving disaster resilience for older populations."

—Regina Shih et al., Rand Corporation, *Improving disaster resilience among older adults* (2018)

Both the natural and built environments present threats to the health and safety of people. From heat waves and snowstorms to high-speed traffic or poorly maintained streets and footways, these threats are especially acute for vulnerable populations, including older people. As the effects of climate change become more pronounced, the threats, especially those in the natural environment, will become more severe. Communities can use design strategies and planning to counter these threats and create safe and resilient communities for older people.

Prepare for extreme climates

Many threats to older people, including including heat waves, snowstorms, flooding and other severe weather events, originate in the natural environment. In response to Superstorm Sandy, which was especially harmful to the young and old, New York City prepared a resiliency plan to make neighbourhoods around the city more resilient. The plan conducts a comprehensive evaluation of critical systems city-wide, identifying vulnerabilities and laying out city-wide and neighbourhood-specific strategies to prepare for sea level rise and the increased frequency of severe storms.[200]

As temperatures rise and the climate changes, extreme weather events become more frequent and design choices become increasingly important to help manage these threats and mitigate their impacts. Trees, shrubberies, green land cover and other urban plantings provide much needed shade,

urban heat island effect
Urban areas are hotter than less developed surrounding areas because the built environment absorbs more heat than more natural environments.

$3.7bn
planned improvements
New York City's post–Superstorm Sandy recovery plan includes 37 coastal protection projects totalling US$3.7 billion.[201]

The Hogeweyk

Weesp, the Netherlands

The Hogeweyk dementia village in Weesp, Holland, is an entire self-contained community designed to allow residents with severe dementia to continue to lead an activity-filled life whilst remaining safe. The non-profit nursing home provides all care support for people living with dementia and is designed to facilitate a familiar way of life, allowing them the privacy, autonomy and amenities to continue the lifestyle they are used to but with added security. The complex is securely closed, but inside residents are free to wander, shop and enjoy public. The Hogeweyk provides four 'lifestyle' options: urban, homely, Goois (formal) and cultural (cosmopolitan). Each household is themed by one of these styles, and houses residents depending on their preferred style, along with permanent staff. The village blends familiarity, freedom and the crucial element of routine with security and staff help to create an environment where people living with dementia can live a dignified and active life rather than suffer isolation at the hands of their illness.

reduce the urban heat island effect and reduce energy consumption. Urban greening strategies aim to plant trees and greenery within cities. The city of Sydney's Urban Forest Strategy will increase the number of trees in the city up to 50% by 2030. A key goal of this initiative is to increase community knowledge through education sessions and to involve public participation in the greening of Sydney.[202]

Chicago's disastrous 5-day heat wave of 1995 killed hundreds of people and catalysed the city to develop a more advanced emergency response system for extreme heat events. Isolated older people living at home were most vulnerable during the heat wave episode.[203] One component of the city's efforts to reduce extreme heat was to make modifications to the built environment. After analysing urban heat island "hot spots", the city added trees and implemented green infrastructure, green roofs, reflective roofing material and cool pavements to engineer a safer and more comfortable temperature.[204] The city's approach also involved strengthening its emergency notification system, conducting a city-wide analysis of vulnerable populations and areas, and developing a public outreach programme in partnership with cultural organisations focused on neighbourhoods most vulnerable to the effects of climate change.[205]

In Ahmedabad, India, a May 2010 heat wave prompted the city Municipal Corporation to develop a coordinated early-warning system and heat preparedness plan in collaboration with academic and health organisations. The coalition identified the most vulnerable residents — older people, children, residents of informal housing communities and outdoor workers — and targeted the efforts towards them through community outreach, early-warning systems and strengthening of medical professional knowledge to treat heat-related illnesses among these populations.[206]

50%
by 2030
Sydney's Urban Forest Strategy calls for a 50% increase in the number of trees, countering the urban heat island effect.[207]

1.8M
square feet
In the first two years of Chicago's Climate Action Plan, 1.8 million square feet of green roofs were completed or in construction.[208]

2
heat waves per year
Chicago projected that by the year 2050 they would experience two heat waves per year like the one in 1995.[209]

Design safe streets and public spaces

City roadways and public spaces define the street life of a city and can be both vibrant and full of potential hazards for older people. Design details, from material selection to heights and gradients, are vital for accessibility; even footway surfaces may make walking possible for someone having trouble lifting their feet, and gradual gradients may expand access for older people and people with disabilities.

Singapore's Silver Zones are designated residential areas around the city that have large older populations, relatively high rates of crashes involving older people and proximity to amenities that older people frequently visit. The Silver Zone programme includes two techniques for changing the built environment to improve older people's safety: efforts to change driver behaviour and efforts to make streets more pedestrian-friendly.

Measures to influence driver behaviour focus on modifications to the design of the roadway itself, such as road markings and signage to remind drivers that they are entering a special area. Narrow roadways and bends to slow speed, roundabouts, raised platform intersections and flashing LED lights embedded in the roadway at pedestrian crossings to slow vehicles and increase driver attention. Interventions designed to help pedestrians include kerb ramps to help people with reduced mobility cross the street, yellow tactile pavers and railings to help people find the safest place to cross the street and centre medians to provide pedestrian refuge points at mid-block crossings and intersections. Singapore completed 14 Silver Zones by December 2017,[210] and the Land Transport Authority (LTA) has committed to creating 50 Silver Zones by 2023.[211] A survey of residents in the first two Silver Zone areas found that 90% believed the improvements had made the area safer for pedestrians.[212]

50
Silver Zones
In addition to the 14 already completed, Singapore's LTA has committed to implementing 50 Silver Zones by 2023.[213]

90%
of residents
LTA surveyed residents in the first two Silver Zones and found that 90% believed the areas are now safer for pedestrians.[214]

69k
activations
Singapore's Green Man Plus programme has 69,600 activations each month, making it safer for older people to cross the street. [215]
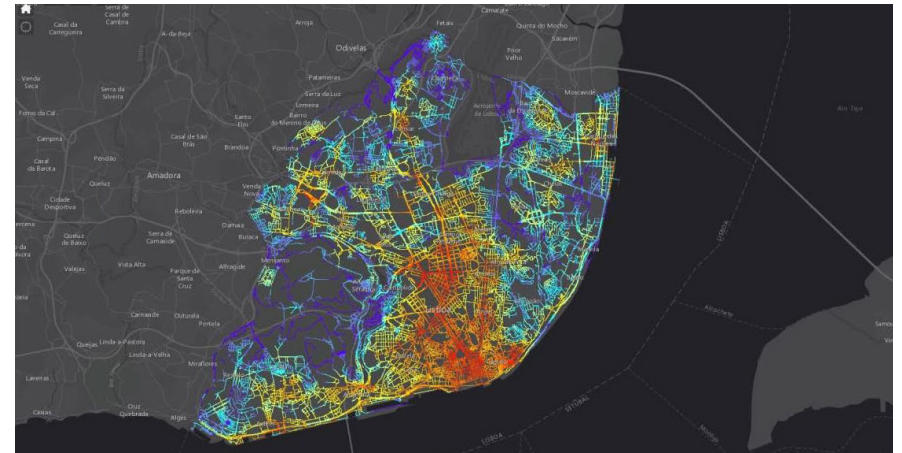
The City of Lisbon mapped areas with the greatest pedestrian activity and the most potential.

One design intervention within Singapore's Silver Zones aims to give older pedestrians power over something simple: their street-crossing signal time. In recognition of their slower-moving older residents, the Green Man Plus programme run by the LTA grants older residents a special card that lengthens street crossing time when tapped against a card reader on nearby traffic light poles. The amount of time added depends on the size of the crossing, but the average is an additional six seconds, with some intersections receiving up to an additional 13 seconds to allow for safe crossing in busy areas. Green Man Plus launched in 2009, and by 2017 there were 800 pedestrian crossings with Green Man Plus with an average of 69,600 activations per month.[216] This small adjustment to the streetscape allows older people to adjust the city to their needs, in real time.

In Lisbon, Portugal, the city council unanimously adopted its Pedestrian Accessibility Plan in 2014 to designate 100 actions to increase the safety of pedestrians and encourage a shift to non-vehicular travel methods. A focus of this initiative was to prioritise interventions that would result in rapid safety improvements. By 2017, 95 of the 100 actions in the plan were completed or underway, making meaningful improvements to safety and mobility for everyone, including older people.[217]

Baltimore is a city that has undertaken a multi-pronged effort to reduce risks of slips and falls for older populations and is

95%
of actions
By 2017, 95 of the 100 actions in Lisbon's Pedestrian Accessibility Plan were complete or underway.[218]

128
bus stops
Lisbon's Pedestrian Accessibility Plan has seen accessibility improvements to 17 bus stops and 111 more in progress.[219]

New York City's Safe Streets for Seniors program has substantially reduced crashes and injuries.

Community design and social networks can support people with dementia.

using a data-driven approach to improving safety. According to the city, falls among older residents results in US$60 million annually in hospitalisation costs, and the city is faced with a hospitalisation rate for falls that is 55% higher than the Maryland state-wide average.[220] With the mission to reduce falls by 20% over the next 10 years, city health officials are prioritising three main strategies: using hospital data to map falls in real time, targeting fall-prevention at key danger zones identified through the data and increasing education and communication with city residents on resources to prevent falls.

The New York City Department of Transportation's Safe Streets for Seniors programme, launched in 2008, aims to make streets safer for older pedestrians — the most vulnerable group in New York City, according to the city's crash and injury data. The programme's baseline assessment found that older people represent nearly 40% of pedestrian traffic fatalities despite being only 13% of the general population.[221] Through a public engagement process, the city pinpointed the most dangerous aspects of the outdoor environment, including insufficient crossing times, pedestrian ramps in disrepair and poor drainage in the pedestrian crossings. Overall, the city has recorded a 15% decrease in pedestrian injuries at the 182 improvement project areas, and some areas have seen pedestrian injuries decrease by as much as 68%.[222]

182

project areas

New York City's Safe Streets for Seniors programme has completed work in 182 improvement project areas since 2008.[223]

15%

decrease in injuries

The 182 project areas in the Safe Streets for Seniors Program have had a 15% decrease in pedestrian injuries.[224]

Promote dementia safety

Loss of mental acuity in later stages of life can lead to safety challenges for older people. Confusion and disorientateation due to dementia can leave people lost in the city, or worse, in hazardous situations. The relationship between the built environment and people with dementia is complex, requiring actions that extend beyond the safety and security component of the framework.

The BRE Innovation Park in Watford, England, is developing a demonstration Dementia Home to offer a vision for housing that accommodates the changing needs of a resident experiencing the onset and progression of dementia. It is a physical translation of research completed by a consortium of health and university institutions alongside dementia organisations, resulting in the *Design for Dementia Home* publication in 2016.[225] "Chris and Sally's house" — the home of a fictional person with dementia and their spouse — is designed by an interdisciplinary team of health, social services and design professionals. It aims to explore how existing housing can be adapted for ageing individuals to both improve accessibility and relieve strain on the community health and social service system. The prototype features custom exercise equipment built into the home, materials and finishes selected for sound insulation, and automated thermal and ventilation features. This interdisciplinary research is
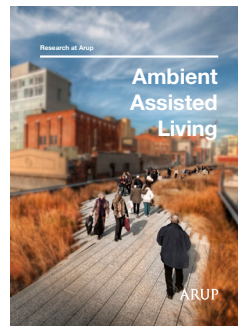
Ambient assisted living

Arup's report *Ambient assisted living* investigates the ways in which technology is making it easier to provide healthcare to people.

The design of public spaces plays a fundamental role in the safety and resilience of older people.

unique in its effort to convene nurses, social care providers, architects and designers.[226]

People with dementia can forget their purpose on a journey and sometimes need additional support navigating their environments.[227] Beyond the scale of a single home, the Hogeweyk dementia village in Weesp, Holland, is an entire self-contained community designed to allow residents with dementia to continue to lead an activity-filled life while remaining safe.[228] The complex is enclosed with security measures, but within the village, residents are free to wander, shop and enjoy the public spaces without fear of encountering dangerous situations. Members of the community retain the routines of neighbourhood life such as shopping, eating out and running errands even as they experience the challenges and limitations of dementia.[229] In Cornwall, England, the Sensory Trust offers dementia-friendly walks to allow caregivers and their clients to safely experience the outdoor urban environment. These walks provide benefits to older people by encouraging exercise, connection with nature and improved moods.[230]

23

houses

The Hogeweyk dementia village has 23 houses grouped into a village setting, serving 152 adults with dementia.[231]

$818bn

societal cost

The World Health Organization estimates the global societal cost of dementia to be US$818 billion.[232]

Perspectives

| Autonomy and independence

| Health and wellbeing

| Social connectedness

| Security and resilience

Autonomy
and independence

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Around the world, populations are ageing. How will this change our cities and affect the lives of older people in cities?

One of the greatest challenges facing cities is the rapid ageing of their populations. This affects even countries with robust younger populations, but it is especially acute in developed countries with low birth rates such as Japan, Italy, Portugal, Spain, Germany, Russia, Singapore and, as result of its one-child policy, China. With increasingly better healthcare, improving social services and safer environments, we have successfully extended citizens' life spans. However, this can put an enormous strain on municipal facilities and budgets as healthcare costs for the elderly raise and the percentage of wage-earners falls. This means that cities must judiciously apportion both fiscal and human resources to the special needs of the elderly in a holistic manner which effectively supports all citizens. Addressing the challenge of an ageing society is central to Toyama's municipal vision, where numerous programs for the elderly are explicitly formulated to have multiple positive pay-offs for all citizens.

What do you think is necessary to support older people's autonomy and independence, and what can our cities do to make this possible?

The central focus of municipal government must be people. In its official vision, Toyama sees itself as comprised of four interrelated elements: people, infrastructure, prosperity, and the environment. Infrastructure enables connectedness, and autonomy and independence are inextricable from connectedness. From connectedness flows a sense of self-worth and a reduction in feelings of isolation. To support older people's autonomy and independence, we must nourish a sense of self-respect and a sense of community, provide convenient access to city resources through hard and soft infrastructure, support intergenerational activities, engender meaningful work, and provide affordable independence-supportive retirement and nursing care.

What key challenges have you faced in your work to create a city where older people can remain autonomous and independent?

It is crucial to proactively involve seniors as stakeholders in city policies, and this often requires coming to them for community Q&As. Providing accessibility for seniors is challenging, though youth and the disabled also benefit from many of the same policies. Silos separating senior care and general population care need to be overcome for greater efficiency and integrative policy development. Isolation of older people, especially widowed women, must be mitigated, and a sense of security for older people must be of paramount importance and constantly improved.

What actions would you recommend cities take to promote autonomy and independence of older adults? What are your favourite case studies or examples?

A key to autonomy and independence is elder-friendly, accessible transportation. Toyama's comprehensive Compact City policy for promoting autonomy and independence for older citizens is based on a revitalised public transportation vision where everything is within walking distance, a new low-barrier light rail network which includes attendants to help older people, and residential encouragement zones in the city centre and along the public transportation lines to bring citizens and facilities closer together.

I would point to six other Toyama City initiatives as potential models for other cities:

1. Intergenerational gardening — Both the city and private corporations have extensive programs for seniors, with their wisdom, to teach children, with their energy, about gardening, benefiting both generations.

2. City facilities passes — The city has a special public transportation discount pass for seniors (held by 30% of seniors) and a cultural facilities pass for grandparents to be admitted free with accompanying grandchildren to museums, the zoo, and other cultural facilities, which has dramatically increased the use of the city's cultural facilities.

3. Older people's mobility — The city has a Let's Walk program where leaders take groups of seniors on long walks throughout the city and countryside.

4. Public walkers — The city partnered with Toyama University to develop specialised free walkers for older people, which are strategically located in the city centre to encourage downtown excursions on public transportation.

5. Healthcare — Toyama has a new city centre healthcare faculty for seniors which provides in-home physician/nurse visits, and the city constructed Japan's first hot spring hydrotherapy Preventative Care Centre with attendant health professionals to increase the mobility of older people.

6. Security — A private company is developing an ICT system to help monitor single seniors in their homes in the event of incidents such as a fall, and the city partners with over 400 city community associations to coordinate potential disaster response for all older people and other vulnerable citizens.

Health and wellbeing

Lindsay Goldman,
LMSW

Director, Healthy Aging,
The New York Academy of
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United States

Around the world, populations are ageing. How will this change our cities and affect the lives of older people in cities?

A large older population can stimulate economic growth and bring added social and financial capital to cities if older people can remain actively involved in public life. To reap the benefits associated with population ageing, cities should prioritise the physical, social and economic participation of older people by leveraging community planning and budgeting, optimising existing resources and creating new opportunities for civic engagement. These are the strategies used by Age-friendly NYC, a public-private partnership between the New York Academy of Medicine, the city council and the Mayor's Office, working to make city life more inclusive of older people since 2007.

What do you think is necessary to ensure good health and wellbeing for older people, and what can our cities do to make this possible?

Because health is 80% determined by social and environmental factors, cities must strive to create a better fit between the person and their environment. Solutions can often be simple and inexpensive. For example, adding new benches that are designed with attention to the needs of older people can positively impact public health by making cities more walkable. At age 85, my father-in-law suffered from COPD [chronic obstructive pulmonary disease] and needed places to stop and rest while walking. He credited two new benches on the route from his apartment to the subway station with enabling him to work for two additional years. Working those extra years kept him financially secure, intellectually stimulated, physically active and socially engaged.

What key challenges have you faced in your work to create a city where older people have positive health and wellbeing outcomes?

There is considerable evidence that the physical conditions and quality of the home environment impact both physical and mental health. However, affordable and accessible housing is in short supply in New York City. Older people have high rates of housing cost burden, with nearly 43% of people aged 65 and over paying 35% or more on housing-related costs, and over 200,000 people on waiting lists for affordable senior housing. The City's housing stock presents additional challenges. Of the housing units in multi-floor buildings, nearly 43% are in buildings without an elevator. As the population grows and we increasingly shift from institutional to community-based long-term care, the need for appropriate housing for older people will become even more pressing, requiring public- and private-sector investment and creative solutions.

In 2010, the New York City chapter of the American Institute of Architects created a Design for Aging Committee with over 50 members who meet regularly, collaborate on projects, organise events and advocate for senior housing. In 2013, the group organised a design charrette to develop solutions to the most common housing challenges faced by older people. One recommendation from this charrette was a toolkit for building owners to make low-cost age-friendly upgrades to existing housing. In 2015, the City passed Local Law 51 which legislated the creation of such a toolkit. The New York City Department for the Aging subcontracted to the Design for Aging Committee to create the toolkit, which was published in 2016. In 2018, the City made a new $150 million commitment to use the toolkit over the next eight years to conduct accessibility audits of individual units and common spaces within city-financed rehabilitation projects to make necessary modifications that will enable more people to age in their homes.

What actions would you recommend cities take to improve the health and wellbeing of everyone, particularly older adults? What are your favourite case studies or examples?

Cities can improve the health and wellbeing of residents by incorporating health considerations across the lifespan into planning, regulation and policymaking, and procurement activities. This approach helps to break down public funding silos and maximise existing and new capital and programmatic resources. For example, New York City's East Harlem Rezoning plan, an initiative to drive economic development and increase affordable housing in an under-resourced community, engaged older residents from the beginning and includes funding for intergenerational playgrounds and a new public restroom.

Data-driven planning is also critical. Evidence suggests that neighbourhood characteristics may affect older people more than other age groups because they may be less mobile, and those who are long-term residents have experienced both positive and negative neighbourhood conditions for longer periods of time, which can result in health disparities. In partnership with the Center for Urban Research at the Graduate Center of the City University of New York, the New York Academy of Medicine created IMAGE:NYC (www.imagenycmap.org), an open-source, interactive map of New York City's current and projected population aged 65 and older with overlays of resources, services and amenities, by neighbourhood. The map serves as a tool to facilitate more informed, equitable and localised planning; to contribute to more culturally and linguistically competent healthcare and social service delivery; and to build connections within and between sectors, institutions and organisations, leading to increased social cohesion to support ageing in community and promote community resilience.

Social connectedness

Paul McGarry
Head of the Greater
Manchester Ageing Hub,
Greater Manchester
Combined Authority,
Manchester, England

Around the world, populations are ageing. How will this change our cities and affect the lives of older people in cities?

I think the next 20 years are going to see a shift in the way we think about and plan our cities, as the realities and opportunities posed by an ageing population become more widely understood. In Greater Manchester, the fastest growing age group are those aged 65 and over, which is expected to grow by 53% by 2039 — a shift that will have profound effects on our city-region. The coming generations of older people are increasingly diverse, with very different needs, expectations and aspirations in later life than our current generation. Our challenge is making sure our cities support all older people, not just those with social or financial means.

What does social connectedness mean to you, and how can our cities help cultivate this feeling among older people?

Social connectedness is the experience of community — the ties between friends, neighbours, colleagues and service providers that support us to do more than we could in isolation. Our connections

don't just provide us with people to socialise with, but the confidence to try new things in the knowledge that others will be there for us regardless of the outcome. Events that people experienced in later life, such as retirement or loss of a partner, can potentially reduce older people's social connectedness, but we need to recognise that this loss of connections isn't the fault of the individual, but a product of the society we all create. Cities can help promote connectedness by investing in social infrastructure or supporting the community services sector, but just as importantly cities need to challenge ageist views that suggest that loneliness in older age is inevitable.

What key challenges have you faced in your work to shape an age-friendly city?

The key challenge facing our programme in Greater Manchester has been economic austerity — we've seen significant cuts to local government funding concurrent with a growing older population. A preventative programme like ours is often first to experience the effects of these cuts, which has forced us to explore new ways to sustain and develop our work, such as partnerships with academic institutions, voluntary organisations and external funding bodies. In this period of austerity, where concepts like *age-friendly* have to compete with broader objectives like economic growth, we have sought to develop age-friendly as part of an integrated strategy within the city-region, with ageing policy embedded within every part of local government. This has been a long-term project of winning hearts and minds, in which we have worked to develop a narrative around ageing that resonates with each department's existing ways of thinking and working.

What actions would you recommend cities take to support older adults' feelings of social connectedness? What are your favourite case studies or examples?

The involvement of older people is central to the success of any programme aiming to improve older people's quality of life. Our programmes in the city-region have always been based on the idea that older people need to be valued as citizens, rather than "patients" or "service users". One of our major policy initiatives in Greater Manchester has been the Mayoral Challenge to create a series of 'age-

friendly neighbourhoods' across the city-region, in which older people take a lead on local decision-making. Projects like the Manchester Age-Friendly Neighbourhoods programme, in which thousands of older people have participated in the creation of local action plans, have demonstrated how older people can take the lead in generating creative ideas about how they can make their communities better places to live. This kind of approach needs us to adopt new ways of working and a shift of thinking from consultation to genuine collaboration.

Security and resilience

Octavio Vergara
Andueza
National Director, Chilean
Agency for Older Persons,
Santiago, Chile

Around the world, populations are ageing. How will this change our cities and affect the lives of older people in cities?

Cities today are not ready for ageing. They have been built and organised with a different population in mind — adult workers, agile and fast — but that group is a smaller number of city residents, compared with older adults. Rapid urbanisation, when not planned well, can ignore the needs of invisible groups like older adults who can be quite sensitive to changes.

As cities change, we need to make sure they allow for the older members of society to maintain activity in their daily lives. We know this helps people stay healthy for longer. Today, many older people are or feel secluded. They are afraid to go out, realising there are obstacles and dangers that await them at every corner. This forces many of them to be alone, and solitude is the first step towards an accelerated deterioration.

Chile is not an exception to this phenomenon. Our cities are facing a huge challenge of adapting for older people. Even though countries in South America still have relatively young populations,

Chile has a similar demographic profile to European countries.

How these demographic trends will change our cities depends on how leaders face the challenges. We need cities in which community members are engaged with each other, where individuals and institutions share responsibility to take care of their neighbours. It is crucial that public administrations and the private sector be aware of the needs of all the population. They must be educated about the special demands of the different groups, as well as how each person can help to be part of the solution.

What do you think is necessary to support older people's security and resilience, and what can our cities do to make this possible?

To support older people's security and resilience, it is necessary to guarantee their participation in the platforms and events that allow them to speak up and make their contribution to the community. These platforms are central to constructing the support networks that can allow older people to confront change with more ease.

The challenge for cities is huge: with the ageing of the population, the city cannot grow old or stay static. It needs to change, to adapt. It has to be able to transform towards the needs of all its inhabitants. A city designed for the needs of older people can respond to the needs of all its population.

What key challenges have you faced in your work to shape a safe and resilient city?

Even though it is widely known that an ageing population is a challenge for Chile, people do not realise yet how important it is to adapt cities for these changes. There is little awareness about the needs older persons may have or the contributions they can still make to society. We need cultural change and awareness before we make infrastructural modifications to cities.

Another challenge is the integration of older people's needs into public policy and the national budget. Big changes require a formal commitment to human resources and capital.

What actions would you recommend cities take to make cities safe and resilient for everyone, including older adults? What are your favourite case studies or examples?

The first step is to understand the needs of older people. The best way is to ask them. Create public spaces of participation not just for them but where they can interact with different ages. Related to that is the need to have a serious commitment to the education of the community on how they can be involved in the creation of cities for all ages.

Align all kinds of organisations towards a common understanding of the main areas where they need to include an ageing

perspective in decision-making and planning processes. The range of these organisations is huge, from groups as small as families to big organisations, public services or industries.

Here are three interesting case studies we have looked to in our work:

Donostia / San Sebastián, Spain — This city has dared to innovate in the ways they organise themselves institutionally, listen to residents and plan future improvements, with a special focus on long-term impacts. Co-creation, co-operation and the assumption of complex scenarios are concepts they kept in mind when looking for new challenges and solutions.

York, England — Throughout its Dementia Action Alliance, established in 2013, York has been working to become a dementia-friendly city. The aim is to maintain independence and quality of life by raising awareness, tackling stigma and improving services, not only for the people with dementia but also for their caregivers.

Valdivia, Chile — This southern city in Chile has been working to become a Gerontological Hub, with the objective of offering elderly people opportunities for real participation and then extending the scheme to the rest of the country. One of the key factors of their initial success has been the coordinated work between all local actors: civil society, private sector, academia and older-persons organisations collaborated with the local and central government to improve the quality of life of older adults.

Actions

| Call to action

| Vision

| 28 actions

Call to action

Stephanie Firestone
Senior Strategic Policy
Advisor, International, AARP

How can built environment professionals contribute to the goals of an age-friendly community?

Greater flexibility is paramount. In the US a primary culprit for today's cookie-cutter communities is rigid zoning and other regulations, and post-WWII automobile-centric planning. Meeting the growing demand for more walkable, mixed-use communities where people can thrive at all ages requires greater flexibility — more choices in the transportation space, the ability to co-locate community amenities and a greater variety of housing options.

In the housing realm, for example, communities must offer options that serve residents across increasingly longer lifespans. Yet numerous barriers — many within the control of local planners and other decision-makers — make difficult or prevent a range of affordable and accessible options. While single-family housing is often allowed by right in the US, multi-family housing often requires a special permit, variance or other actions that are time-consuming and costly. Approvals for accessory dwelling units

(ADUs) — where permitted — often entail numerous fees and red tape that has euphemistically been labeled "death by 100 papercuts". Missing middle housing — comprising multi-unit or clustered housing types such as duplexes or courtyard apartments — was integrated throughout 1940s neighbourhoods that were close to transit and other amenities. Yet, only 1 in 10 cities has zoning that enables missing middle housing today.

There is also a need for greater flexibility in the design of housing, which should be adaptable in order to accommodate changes in people's needs as they age. Built environment professionals must shift their approach to address the changing demographics in their communities, though many have not yet made this connection. In a 2018 international survey of planners, one respondent said: "Urban planning as a field has failed to acknowledge our complicity in creating communities that are exclusionary; unless we acknowledge the problem, we will not be able to rectify it."[233]

What will it take to realise this vision of age-friendly communities?

Planners in many systems are beholden to a public participation process, so they are familiar with soliciting community input. However, multistakeholder planning for age-friendly communities takes this to a whole new level. Some communities have incorporated professional ageing expertise as a structural feature of their master planning processes, such as Washington, DC, where the city's age-friendly programme planner was detailed half-time to the planning department during the course of the city's comprehensive planning process.

Singapore's 2015 Action Plan for Successful Ageing is a multi-agency, government-wide plan that represents a "holistic socio-urban" approach, combining ageing policy and urban development. Melville, Australia's strategic planning director created an advisory committee comprising community members who are older and/or have physical or cognitive disabilities, which reviews and comments on development plans submitted to the city.

Built environment professionals must work across multiple sectors to understand their pain points and leverage overlapping interests, developing a common city-wide agenda that the sectors can pursue both collectively and in tandem. They should encourage collaboration among the public, private and third sectors to create conditions that are favourable for innovation.

Another shift that is critically needed concerns the way in which built environment professionals perceive the growing ageing populations in their midst. Ageism is the last of the -isms that remains unchallenged, yet it is at the root of older adults' marginalisation in many societies; indeed, many senior housing facilities in the US are literally located at the physical margins of communities. Built environment professionals have the opportunity to help combat ageism by creating public spaces that foster regular intergenerational encounters and advancing — even incentivising — multigenerational housing. Closer and more regular intergenerational interactions can lead to a change in the perception of older people — from largely being a burden to a renewed appreciation of older people as assets. Thus, built environment professionals are instrumental in catalysing a cultural shift in the narrative around ageing.

A vision for age-friendly communities

Age-friendly communities are places where people, regardless of age, have the opportunities and settings to live fulfilling, happy lives.

Age-friendly communities provide opportunities for older people to continue their independent lifestyles as they age. Even though they may not be able to move around as easily as when they were younger, their homes are designed to adapt to these changing needs. When they no longer feel comfortable driving, it is easy for them to catch the bus or train. Often, their destination is close enough that they simply walk out the front door. Being able to live comfortably in their homes and access the places they need and want to go allows them to continue living active lives, maintaining their hobbies, friendships and routines.

Older people do not struggle to tend to their health in an age-friendly community. Medical services are easy to access because they are in places along transit or next to the other destinations that older people already use. Even just being outside in the city is good for older people because the city provides an environment that positively affects their health. The natural world is part of the city environment, and older people can maintain a connection to nature. Community gardens and parks offer additional places to commune with nature, exercise, interact with their neighbours or just get some fresh air. A well-designed community provides plenty of safe places to exercise, whether on outdoor gym equipment, trails and paths, or spaces for programmed sports.

In an age-friendly community, older people feel connected to and invested in their communities. They feel like their life continues to have purpose, whether through volunteering, continued employment, second careers or their contributions to the lives of others. Older people engage in the life of their home communities and have many activities to participate in. They know and interact with their neighbours.

Local civic leaders value their opinions and experience. People of all ages share spaces and have some activities in common. Changing communities and changes in personal conditions do not inhibit older people's abilities to stay in their own communities. Older people do not worry that rising home prices or missing housing types will force them to leave their homes.

Here, older people and people living with dementia are just as safe as everybody else. Everyone feels safe and comfortable walking because footways and streets are designed to slow cars and support pedestrians. Public spaces have benches, and the footway is easy to navigate. Older people do not have to worry about extreme weather like heat waves or floods because their community is designed to mitigate these challenges and their neighbours know to check in on them.

Creating age-friendly communities: 28 actions

"No government or ministry can achieve these outcomes working in isolation. It takes the whole community, working together to make environments age-friendly, harnessing innovation and imagination from all sectors and all actors."

—Dr John Beard, World Health Organization, *Looking back over the last decade, looking forward to the next* (2018)

Achieving the vision of an age-friendly community requires action from designers of the built environment. This section describes 28 actions for built environment professionals and community leaders. These actions make a substantial contribution to implementation of the 14 strategies discussed throughout this report, addressing the four key needs of older people. While each action can stand alone, their true strengths are realised when taken in unison.

1. Promote compact, mixed-use development

Creating a compact and mixed-use environment makes it easy for older people to maintain their independence. A compact built form shortens the distances between homes and destinations. Mixing uses allows anyone to live right next to the things they need every day. Cities can encourage this type of development using tools such as zoning or incentives for private landowners.

2. Redesign public spaces for all users

Many public spaces in cities were not built to address a wide range of needs, especially in historic city centres. Increasing the accessibility of public spaces ensures that anyone can enjoy them, regardless of their age or ability. Cities can implement accessibility improvements through retrofits that provide more level walking surfaces, places to rest, and tactile pavers.

3. Locate housing, jobs and amenities along transit routes

When origins and destinations are transit accessible, it makes taking the bus or train a more realistic option. In addition, people who cannot or do not want to drive are able to continue going to all the places they want because they have the option to use transit. Cities control where public facilities are located, and they are also able to regulate the locations of private development through zoning or other built-form regulations.

4. Guarantee transit access to people with limited mobility

Trains and buses need to be accessible for all users. Elevator and escalator access to platforms, low-floor boarding onto cars and ramps onto buses all ensure that everyone can use and benefit from transit. Cities can inventory their existing transit systems, identify where accessibility is missing and create a plan to bring these improvements system-wide.

5. Support home improvements and retrofits

As their needs change over time, some people will need to make updates to their home to ensure that they can continue to live independently. Cities can help by providing information or technical or financial support to those making improvements, such as slip-resistant floors, access ramps or handrails.

6. Build adaptable senior housing

Designs for new housing can anticipate and include strategies to support residents as they age. For example, upper floors accessible only by staircase can be reserved for rooms that are not essential. Cities can build housing that fits these needs or incorporate these needs into elements of the building code. Cities can also involve seniors in the planning and design process.

7. Embrace universal design to improve the public realm

People of differing abilities benefit from small interventions in the built environment to ensure they can move around easily and safely. Cities can install universal design features like handrails, tactile pavers and lowered water fountains to ensure that everyone can equally move around the city.

8. Provide accessible wayfinding

Wayfinding and signage provides a critical service to people navigating their environment. Cities can install wayfinding and signage in public areas, that can meet people's differing needs using design strategies such as providing additional languages, Braille, sufficiently sized type and strategic location of signage.

9. Locate healthcare facilities near transit

A simple strategy to ensure that people have access to healthcare facilities is to build them near bus stops and train stations. Cities can make this action especially effective by combining it with transit accessibility improvements and a compact built form, ensuring that people of differing abilities can get to the medical care when they need to.

10. Co-locate healthcare with daily needs

When healthcare facilities are located near other land uses, it is easier to access those services. For example, if a doctor's office is in a train station, on the ground floor of an apartment, or in the same space as a grocery store, it simplifies the process of having a check-up. Cities can encourage mixed uses and incentivise co-locating other services with healthcare facilities.

11. Install adult recreation centres

Reducing the cost or making it simple to exercise encourages people to get more physical activity. This contributes to overall better health and quality of life, and it can help to activate public spaces. Cities can build adult recreation centres, providing free gym equipment and places for people to exercise and have fun together.

12. Design networks for active recreation

Simply walking or biking around the city can contribute to overall better health, and people are more likely to do it when the environment is pleasant and safe. Cities can designate routes that prioritise pedestrians and cyclists, further encouraging them to get out to explore. Active recreation has additional co-benefits of improving air quality, reducing vehicle use and improving health.
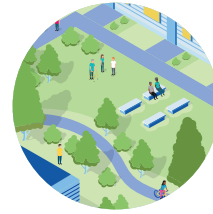
13. Create more green spaces within the city

Green spaces provide opportunities for relaxation, socialising and connecting with the natural world. Cities can provide high-quality green spaces throughout the city, empower neighbourhood organisations to create their own and encourage private landowners to provide public spaces.

14. Apply biophilic principles to new buildings

Biophilic design connects naturel with the objects that humans create. A biophilic city supports wildlife, allows for an abundance of plants and nurtures citizens to appreciate and understand the natural world; it benefits physical and mental health. Cities can use biophilic principles in public spaces and public buildings, and can encourage or require them in private developments.

15. Empower older people to programme community activities

When older people organise activities and events, participate in the broader life of the community, and create places for older people and others to come together, they are taking action to improve their community. Spending time with friends reduces feelings of loneliness or social isolation. Cities have the financial and physical resources to support these activities.

16. Define roles for older people in planning the built environment

Many older people have spent years in their communities. Their knowledge and experience are vital resource for urban planning. Participating in planning can help to gives people ownership of their communities, foster feelings of investment and encourage future involvement. Cities should aim to include more older people, in decision-making processes and urban planning decisions.

17. Build and promote intergenerational co-housing

These programmes gather people of different generations, create shared experiences and provide support networks. For example, a college student can share a home owned by an older adult in exchange for low rent and a commitment to do chores or participate in social activities. Cities can offer these programmes in public housing or near universities.

18. Encourage and enable older people to live with (or near) family

When older people and their families live together or close to one another, they can provide social safety nets for each other and provide opportunities for socialising. Cities can create programmes that provide financial incentives for families to live near each other.

19. Co-locate senior facilities and places for younger ages

Senior housing or senior facilities can be co-located with other amenities that are used by people of all ages, helping to prevent isolation based on age. Cities can build public facilities that locate schools and day care centres alongside senior centres or housing, or ensure that senior housing includes other amenities that are used by all age groups.

20. Legalise and promote accessory dwelling units and other missing housing types

Accessory dwelling units, garden apartments, and duplexes can help to lower the cost of housing and provide spaces that better fit the circumstances of people with different needs. These options can be a reliable source of housing for older people. Cities should remove restrictions on this housing and enact policies and programmes that actively encourage them.

21. Enable older people who are moving (downsizing, etc.) to remain in their community

Sometimes, older people need or want to move from their current home, but they do not want to leave their community. Cities can enact policies that support downsizing or other types of moves. When new housing is built, cities can provide community preference for the units, ensuring thatexisting residents who want to stay have early access to this new housing.

22. Assist older adults burdened by housing costs

The rising cost of housing can be a challenge for anyone, especially older people who are living on fixed incomes. These economic factors should not cause the displacement of older people from the communities in which they wish to stay. Cities can provide rent assistance, regulate rent increases or provide other support to people facing these pressures.

23. Mitigate the effects of heat waves

Prolonged periods of heat can be dangerous for anyone, but are especially so for older people. This threat is compounded in places that do not have electricity or air-conditioning. Cities can reduce the dangers of heat waves by building green infrastructure, encouraging people to check on their neighbours and providing public places of respite.

24. Retrofit existing buildings to be prepared for effects of climate change

Climate change has many effects on the built environment, including more intense rainfall events, more powerful storms, rising sea levels and prolonged periods of drought and heat. Cities can act to mitigate these threats by retrofitting existing buildings and requiring smart changes to future construction.
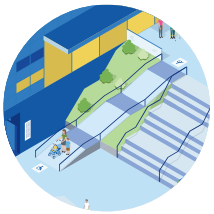
25. Install physical infrastructure that supports walkability

Small infrastructure improvements can encourage walking and make streets safer for everyone. This is especially important along routes with fast-moving or high volumes of vehicles, both of which are dangerous to pedestrians. Cities should make pedestrian safety improvements city-wide, including kerb ramps, guardrails and pedestrian crossings.
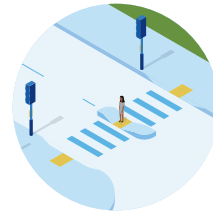
26. Improve dangerous intersections

Pedestrian fatalities and serious injuries caused by vehicles often occur at intersections, but simple changes can dramatically reduce their likelihood. Cities should act to improve all intersections, prioritising the most dangerous. Improvements can include kerb extensions, lowering speed limits, adding pedestrian crossings, changing unsafe traffic patterns and installing safety islands.

27. Create dementia-friendly neighbourhoods

People with dementia can face unique challenges when going about their daily routines in a neighbourhood. Cities can take action to help create a supportive community environment for people with dementia by training local businesses to help respond to the needs of people with dementia, creating dementia safe spots and adapting the built environment to meet their needs.

28. Create dementia villages

The home environment can also pose challenges for those with dementia, who may need additional assistance. Cities can work to create dementia villages, which can integrate the homes of people with dementia into a broader community area. These places are created to meet their specific needs and provide assistance, all while maintaining routines to the greatest extent possible.
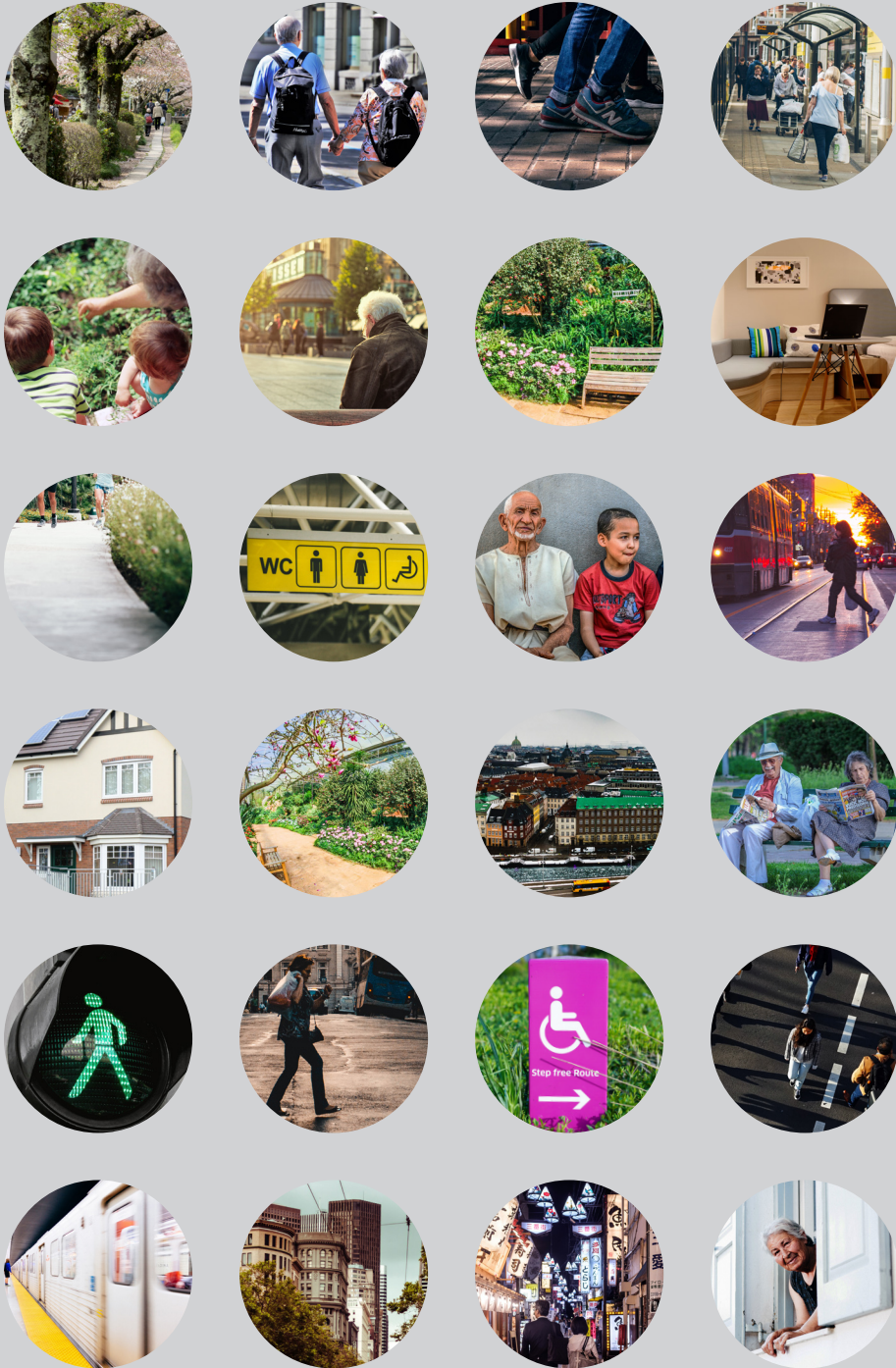
Case studies

"Cities are essential partners for effective policy action in ageing societies and offer inspiring examples. Ultimately, cities are striving, in the face of increasing demographic pressures, to enhance their attractiveness to households and firms."

—Rolf Alter, OECD, *Ageing in cities* (2015)

This case study index identifies 40 global case studies — 10 for each of the major needs of older people. The purpose of the case studies is to inspire city officials, built environment professionals and other decision-makers. They describe ways to implement the strategies and actions identified in the previous sections, providing real-world examples of where they have been carried out and illustrating their benefits.

Residential Encouragement Zones | Toyama, Japan

Toyama's residential encouragement zones cover the city centre, areas within 500 metres of tram lines and regional rail, and areas within 300 metres of high-frequency bus routes. Developers constructing new homes and families moving into residential encouragement zones receive a subsidy from the city, and the subsidy is higher for developers of senior housing.

Accessibility Improvements to Historic City | Viborg, Denmark

Many sensitive historic locations in central Viborg underwent full renovations, bringing accessibility improvements to modify difficult features such as cobblestones, steep hills and places accessible only by stairs.

Easy Access to Public Restrooms | London, England

The Borough of Richmond Community Toilet Scheme organises participating local businesses and existing public facilities that agree to provide access to the restroom without having to make a purchase. Participating businesses place a sticker in their storefront to denote participation in the programme.

Expanded Transit Options | Toyama, Japan

Toyama has expanded transit options as part of its Compact City strategy by building light rail and streetcar lines, improving bus service and developing a feeder bus system that serves those parts of the city without a full transit route.

Fully Accessible Public Transit | Lyon, France

The city's investment of nearly €100 million has created a transit system that is almost fully accessible. Tram cars and tram stations are completely accessible, apart from one station. All buses and funicular lines, as well as 70% of bus stops, are accessible.

Whole Journey Guidelines | Australia

The Whole Journey guidelines encourage stakeholders and transport policy makers to think beyond physical infrastructure and to consider the full process that a user goes through when undertaking a trip. Under these guidelines, a trip begins with pre-journey planning and continues until the return journey.

FlexDanmark Public Transit Service | Denmark

FlexDanmark is a unified platform for the door-to-door, on-demand services offered by Denmark's public transport provider. The service combines different requests for trips into the same car and manages the route the car will take on the trip. This maximises the efficiency of the transit providers. People with limited mobility or others with specific needs are eligible for the service.

CAPABLE Ageing-in-Place Support | Baltimore, US

CAPABLE helps low-income older people with specific needs to age-in-place. The programme sends an interdisciplinary team, including a nurse, occupational therapist, housing repair expert and community health worker, to visit the home of an older person and determine how to adapt the home to meet their needs.

Housing Designed for Older People | Birmingham, England

The Birmingham Municipal Housing Trust provides social housing in Birmingham. A new housing type, the two-bedroom bungalow, is designed to remain fully functional even without access to the second floor. The upstairs has a second bedroom and bathroom, which is flexible and can allow for guests, family or live-in caregivers.

AccessMap.io Online Mapping Tool | Seattle, US

AccessMap.io allows users to find the most accessible walking route to their destination. The tool is built on top of an online mapping interface that has wider applications. When calculating the most accessible route, the tool takes into account slopes, construction detours, missing kerb ramps and other obstacles.

Kampung Admiralty Mixed-Use Development | Singapore

Kampung Admiralty is a residential development for older people that offers a wealth of features to support the health and community involvement of its residents, including a medical centre, active ageing senior programming centre, child-care centre, supermarket, bank and other retail amenities.

Sogawa Legato Square Comprehensive Care Centre | Toyama, Japan

The Sogawa Legato Square Comprehensive Care Centre is a facility built on a former elementary school site that offers a wide range of services and amenities, including a medical centre, medicinal foods culinary school and café, pharmacy, recreational facilities and a nursing school.

Quietways | London, England

The city of London's Quietways are routes following back streets with limited traffic to guide bikers and pedestrians along tree-lined streets, parks and waterways, intended to encourage older people to walk and bike who might otherwise have avoided travelling among busy traffic in the city.

Sonder Boulevard | Copenhagen, Denmark

Sonder Boulevard, an important route in central Copenhagen, was redesigned to give priority to cyclists and pedestrians. The project changed the road hierarchy and created safe, active travel paths through the busy city centre.

Preussen-Park | Berlin, Germany

Preussen-Park in Berlin, opened in 2007, offers outdoor exercise machines designed to improve stamina and balance among older residents. The park equipment is dedicated to users aged 65 and older.

Outdoor Gyms | Beijing, China

China was an early innovator in active living for older people, creating a physical health law and nationwide physical fitness programme in 1995 that led to the construction of outdoor fitness facilities throughout public parks.

Portland Memory Garden | Portland, US

The Portland Memory Garden provides a space specifically designed for people with dementia, Alzheimer's and reduced mobility to spend time in nature while avoiding feelings of disorientateation.

Östra Hospital | Gothenburg, Sweden

The psychiatric centre Östra Hospital, designed by White Arkitekter, incorporates biophilic principles into the design. Every patient's room has a view of gardens, and the design incorporates natural materials, multiple interior courtyards, natural light and other natural elements.

Ciudad Amigable con las Personas Mayores | Valdivia, Chile

A partnership between the city of Valdivia and the Fundación Oportunidad Mayor, this program aims to make Valdivia a gerontological centre — a model city recognised for providing support, opportunities and first-class care to older people. The methods can then be applied in cities across the country.

Toyoshiki-dai | Kashiwa, Japan

The Toyoshiki-dai housing complex in Kashiwa City was built in the 1960s, and the municipality has conducted a major retrofit of the neighbourhood to make it age friendly. The retrofit includes new medical facilities with increased accessibility and more natural surroundings.

U-City | Adelaide, Australia

U-City is a development integrating retail, accessible accommodation, retirement residences, aged care, a range of social and health services, and end-of-trip facilities to support and encourage bike use, all within the one building.

Abitare Solidale | Florence, Italy

Abitare Solidale is a programme grounded in the idea of mutual aid that works to coordinate cohabitation arrangements between older people and individuals at risk of social exclusion or economic hardship.

Pari Solidaire | Paris, France

Pari Solidaire is a programme that matches older homeowners with young adults who can offer their company and the safety of having someone else in the home in case of emergencies.

New Ground Older Women's Co-Housing | London, England

New Ground is a co-housing community designed specifically for women over 50. The co-housing community comprises 26 owners, sharing amenities such as a common room, garden and farm area, laundry, and other facilities.

GoodGym | UK

GoodGym is an initiative that encourages everyday runners to engage with older people across the city. Participants make stops to assist with tasks and support isolated older people with social visits.

Market Ride | New York City, US

New York City's Market Ride programme repurposes school buses during off hours to bring older people to local markets, cultural institutions, performances and other destinations in the city.

Access Advisory Panel | Melville, Australia

The Access Advisory Panel reviews important projects such as large civic buildings, public realm improvements, major events, and access and inclusion plans before they are finalised. The panel draws on the experience of local wheelchair users, older people, deaf people, people with Alzheimer's and dementia, people with autism, and blind or partially sighted people.

Age-Friendly Neighbourhoods | Manchester, England

Manchester Age-Friendly Neighbourhoods is a multi-institution partnership to reduce social isolation among older people and to promote civic participation. The programme awards small neighbourhood grants for projects such as accessibility improvements, dementia-friendly audits, and other upgrades.

Old Moat Age-Friendly Neighbourhood | Manchester, England

The *Old Moat Age-Friendly Neighbourhood Report* assessed the existing age-friendliness of Old Moat. The resulting action plan included 114 directives ranging in scale from small urban design interventions to improvements to transport and outdoor spaces.

Armstrong Place | San Francisco, US

Armstrong Place is an affordable senior housing development in San Francisco comprising 116 affordable apartments, 124 below-market-rate townhouses, and 7,600 square feet of retail. The design of the mixed-use complex was driven by a desire for accessibility and intergenerational living.

Urban Forest Strategy | Sydney, Australia

Sydney's Urban Forest Strategy will increase the number of trees in the city by 50% by 2030. A key goal is to increase community knowledge through education sessions and to have public participation in the greening of Sydney.

Heat Wave Mitigation Strategies | Chicago, US

To handle extreme heat events, Chicago added trees and implemented green infrastructure, green roofs, reflective roofing material and cool pavements. The city also strengthened its emergency notification system and developed a public outreach programme in partnership with cultural organisations.

Sheltering Seniors from Extreme Heat | New York City, US

The New York City Housing Authority provides housing for over 400,000 of New York's residents, many of whom are older people. Arup conducted a research study and created a design strategy that will allow residents to remain safely in their homes during a summer heatwave and power outage.

Green Man Plus and Silver Zones | Singapore

The Green Man Plus programme grants older residents a special card that lengthens street crossing time when tapped against a card reader on nearby traffic light poles. Green Man Plus is a component of Silver Zones, designated areas around the city with large older populations, relatively high rates of crashes involving older people and proximity to amenities that older people visit.

Pedestrian Accessibility Plan | Lisbon, Portugal

The 2014 Pedestrian Accessibility Plan designates 100 actions to increase the safety of pedestrians and encourage a shift to non-vehicular travel methods. A focus of this initiative was to prioritise interventions that would result in rapid safety improvements.

Fall Prevention Strategy | Baltimore, US

Baltimore's Fall Prevention Strategy aims to reduce falls by 20% over the next 10 years by prioritising three main strategies: using hospital data to map falls in real time, targeting fall-prevention at key danger zones identified through the data and increasing education and communication with city residents.

Safe Streets for Seniors | New York City, US

The New York City Department of Transportation's Safe Streets for Seniors programme, launched in 2008, aims to make streets safer for older pedestrians by tackling the most dangerous aspects of the outdoor environment, including insufficient crossing times, pedestrian ramps in disrepair, and poor drainage in the pedestrian crossings.

BRE Dementia Demonstration Home | Watford, England

"Chris and Sally's house" — the home of a fictional person with dementia and their spouse — is a demonstration concept for housing that accommodates the changing needs of residents experiencing dementia. The demonstration project is led by an interdisciplinary team of health, social services and design professionals.

The Hogeweyk | Weesp, the Netherlands

The Hogeweyk dementia village in Weesp, Holland, is an entire self-contained community designed to allow residents with dementia to continue to lead an activity-filled life while remaining safe.

Dementia Friendly Walks | Cornwall, England

The Sensory Trust offers dementia-friendly walks to allowing caregivers and their clients to safely experience the outdoor urban environment.

Leading the way

Cities and built environment professionals have a crucial role to play in cultivating happy and fulfilling lives for older people. The global trends of ageing and urbanisation are already underway, and the built environment must be ready to accommodate the needs that will emerge from these changes.

We hope this report will inspire decision-makers, planners, designers, engineers and others involved with the creation of the built environment to consider the needs of older people and to transform current practices.

The report identifies 14 strategies and 28 actions to implement the strategies. Forty case studies underscore that these strategies and actions are not brand-new; they have been successfully implemented in many locations around the world, and they can be applied elsewhere.

Most importantly, the complex interrelationships between the built environment and the needs of older people make it readily apparent that a holistic approach is needed. While the pursuit of any one of the 14 strategies or the implementation of any one of the 28 actions will make a difference, the mutually reinforcing qualities of a comprehensive implementation plan will have the greatest positive impact.

We all aspire to live long lives with a richness of experience. Together, we can design for ageing communities and help make our aspirations a reality.

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Acknowledgments

The ageing of the global population and increasing urbanisation will be major drivers of change for cities worldwide. These changes will have a profound effect on the design, planning and operation of cities as well as the lives of the people who live in them.

Cities Alive: Designing for Ageing Communities identifies the specific needs of older residents and offers strategies and actions that cities and built environment professionals can take to make communities more age-friendly. The report synthesises these strategies into a vision for the future, showing how communities around the world can achieve this vision and empower their older residents to live happy and fulfilling lives.

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