Policy brief

UNECE

Ageing in sustainable and smart cities

UNECE Policy Brief on Ageing No. 24
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Contents

Challenging context

Most city environments are designed to support an able-bodied working population. Older people are often excluded from the social and economic life of the city, especially when they lose functional ability. With the 2030 Agenda for Sustainable Development policy makers across the UNECE region pledged to ensure that 'no one will be left behind', and one of the Sustainable Development Goals – SDG11- focuses specifically on cities. Urban planning needs to cater for the whole population, developing supportive environments for an increasing proportion of older citizens, creating 'cities for all ages'.

Suggested strategies

In order to move towards sustainable and smart cities for all ages, this policy brief recommends mainstreaming ageing, gender, disability and human rights considerations in urban planning; to involve all generations and stakeholders for people-centred local development planning and to avoid working in silos, cooperating across sectors to connect the dots between different realms of city life. Recommended strategies focus on three domains:

Housing: develop sustainable, smart, age-friendly housing *which facilitates 'ageing in place,' is affordable, smart, secure, safe, functional and comfortable.*

Green spaces and public spaces: develop sustainable, smart, and age-friendly green spaces & public places *which support 'life between buildings,' green spaces, 'life in buildings' and are safe & secure*

Transport: invest in sustainable, smart, safe, age-friendly transport and *reset planning priorities to make public transport acceptable, available, affordable and accessible, as well as safe and secure.*

Expected results

Developing age-friendly physical environments in cities will enhance the lives of older people, contribute to sustainability, encourage socially resilient and inclusive communities and via improvements in public health, and contribute to economic prosperity across the region.

With good practice examples from:

Austria, Belarus, Canada, Czech Republic, Finland, Ireland, Italy, Kazakhstan, Malta, Poland, Portugal, Republic of Moldova, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Turkey, United Kingdom, United States of America.

City examples include Amsterdam, Athboy, Aveiro, Barcelona, Berlin, Bolzano, Chisinau, Côte Saint-Luc, Donostia-San Sebastián, Gothenburg, Graz, Lappeenranta, Ljubljana, London, Manchester, Minsk, New York, Prague, Rzeszów, Udine, Valetta, and Vienna.

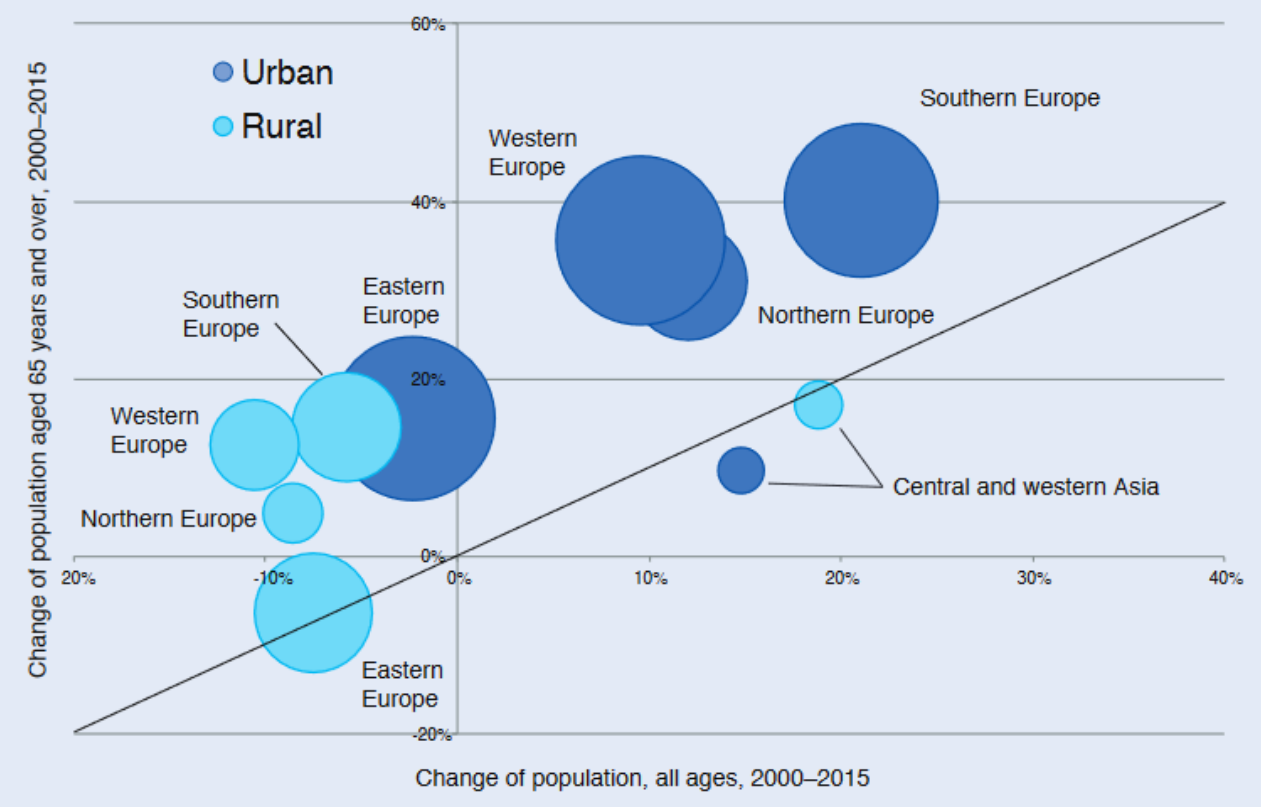
This policy brief addresses **Commitments 1, 2, 7, and 8 of the Regional Implementation Strategy of the Madrid International Plan of Action on Ageing, Goals 1, 2 and 3 of the 2017 Lisbon Ministerial Declaration, with a primary focus on SDG 11 of the 2030 Agenda for Sustainable Development.**

United Nations

Introduction

The UNECE region is among the most highly urbanized regions in the world, with over 75 per cent of the population living in cities in Europe, 80 per cent in North America and close to 50 per cent in Central Asia[1]. Undergoing parallel transformations of urbanization and demographic change for the past decades, the UNECE region is now both highly urbanized and ageing. As Figure 1 illustrates, the majority of the growth among the population aged 65 and older has taken place in urban areas since the turn of the century.

Figure 1
Patterns of ageing by broad geographical region of Europe



Source: WHO Regional Office for Europe (2017) Age-Friendly European Environments: A Handbook of Domains for Policy Action. Calculation based on UN DESA estimates.

This policy brief focuses on ageing in sustainable and smart cities.[2] There is now only a decade left to implement the 2030 Agenda for Sustainable Development and to achieve its 17 Sustainable Development Goals (SDGs). A decade of 'accelerated action' is needed to do so and cities are key actors in this process. City action is critical not only to achieving SDG 11, which explicitly focuses on making cities and human settlements more inclusive, safe, resilient and sustainable but also to driving sustainable development in its totality. In an increasingly digitalized world, Information and Communication Technologies (ICTs) can help cities become more efficient in their operations and services and thus more sustainable, with opportunities for a greater quality of life and well-being of city dwellers.

Focusing on three realms of urban life – housing, green and public spaces, and transport – this brief draws attention to the importance of ensuring that the needs of older persons are taken into account when planning, designing and implementing sustainable development plans at the local level. It addresses the question of how policy-makers, businesses and civil society actors, citizens, young and old, can design age-friendly sustainable urban environments with the help of new technologies that meet the needs of all generations, foster inter-generational solidarity and ensure that older people are not left behind.

[1] Habitat III (2017).
[2] UNECE Policy Brief on Ageing No.18 focused on older persons in rural and remote areas.

Action at the nexus of interlocking frameworks

There are a number of international frameworks and initiatives that can guide local authorities in creating sustainable and smart cities for all ages. For the purpose of this policy brief the following are considered:

- The 2030 Agenda for Sustainable Development
- The Madrid International Plan of Action on Ageing (MIPAA)
- The WHO Global Strategy on Ageing and Health and age-friendly cities framework
- The New Urban Agenda (HABITAT III)
- The United 4 Smart Sustainable Cities initiative
- The Convention on the Rights of People with Disabilities

The 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development with its 17 Sustainable Development Goals provides a universal framework for action integrating environmental, economic and social dimensions. Goal 11 focuses on making cities and human settlements inclusive, safe and sustainable. It includes targets on access to housing, transport and green and public spaces and specifically mentions the needs of vulnerable populations, including older persons in targets 11.2, 11.5, 11.7 (Box 1).

BOX 1

SDG 11 - Make cities and human settlements inclusive, safe, resilient and sustainable

(selected targets)

11.1 By 2030, ensure **access for all to adequate, safe and affordable housing and basic services** and upgrade slums.

11.2 By 2030, provide **access to safe, affordable, accessible and sustainable transport systems for all**, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

11.3 By 2030, **enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning** and management in all countries.

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

11.7 By 2030, provide universal **access to safe, inclusive and accessible green and public spaces**, in particular **for women and children, older persons and persons with disabilities**.

Source: Sustainable Development Goals Knowledge Platform https://sustainabledevelopment.un.org/sdg11.

Madrid International Plan of Action on Ageing (MIPAA)

The Madrid International Plan for Action on Ageing adopted at the second World Assembly on Ageing in 2002 and the UNECE Regional Implementation Strategy adopted in the same year[3] provide an intersecting, progressive framework for ageing societies. With respect to housing and the living environment, the MIPAA set the following objectives:

- to promote 'ageing in place' in the community with due regard to individual preferences and affordable housing options for older persons;
- to improve housing and environmental design to promote independent living by taking into account the needs of older persons in particular those with disabilities;
- to improve the availability of accessible and affordable transportation for older persons.

UNECE Regional Implementation Strategy for MIPAA

The Regional Implementation Strategy for the UNECE region further highlights the role of urban planning in fostering intergenerational relations by noting that "housing policies and town planning should aim to adapt the infrastructure of towns to the needs of families and to enable generations to live together if they so wish. Particular attention should be given to making towns more friendly towards children and older persons, with the purpose of increasing their participation in urban life through a better planning of services and facilities, also taking into account safety issues".[4]

[3] Key policy documents on ageing are available on http://www.unece.org/population/ageing.html.
[4] MIPAA/RIS, paragraph 93.

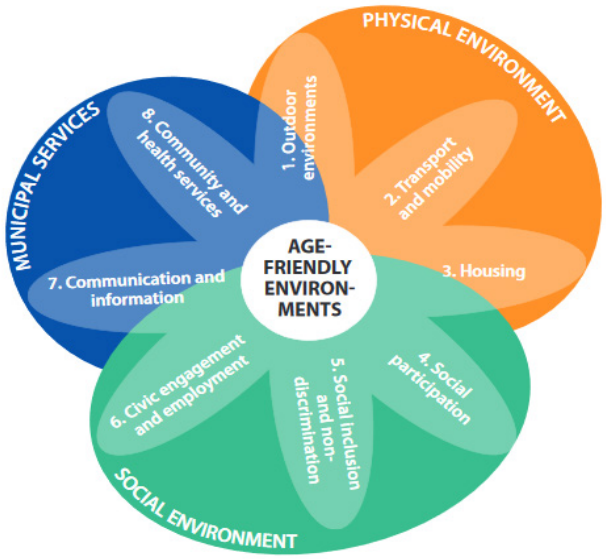
WHO Global Strategy and Action Plan on Ageing and Health and Decade for Healthy Ageing

Enabling and supportive environments, created through appropriate housing policies, urban planning and other measures that provide affordable, barrier-free and age-friendly living environments[5] are considered key in the promotion of healthy and active ageing. The development of age-friendly environments is therefore one of 5 strategic objectives of the WHO Global Strategy and Action Plan on Ageing and Health (2016) and "ensuring that communities foster the abilities of older people" is a key component of the proposal for a Decade of Healthy Ageing developed by WHO. Countries are encouraged to take evidence-based action to foster functional ability and to strengthen the capacity of rural and urban communities to extend options for housing, and improve modifications to their residences that enable older people to age in a place that suits their needs; develop and ensure gender-responsive, affordable, accessible, sustainable mobility by complying with standards for accessibility in buildings and safe systems for transport, pavements and roads; develop and ensure compliance with standards for access to information and communication technologies and assistive technology; among other recommendations.[6]

WHO Age-friendly cities and communities

The WHO Age-friendly Cities concept, first introduced in 2008 to enhance opportunities for active ageing at the local level, provides a framework for the development of age-friendly environments. As elaborated more recently by the WHO *Handbook on Age-friendly European Environments*, and illustrated in Figure 2, supportive environments for older people are both social and physical, mutually reinforcing, with reciprocal benefits. In 2016, the WHO Regional Office for Europe issued a tool for policy makers and planners on creating age-friendly environments in Europe. By 2020, over 1000 cities and communities worldwide have enrolled in the WHO Global Network of Age-friendly Cities and Communities with a commitment to becoming more age-friendly.[7]

Figure 2
Eight domains of an Age-Friendly City



Source: WHO 2017 Age-friendly environments in Europe. A handbook of domains for policy action. Jackisch, J. et al (2015).

[5] MIPAA/RIS, paragraph 77.
[6] The proposal for the Decade on Healthy Ageing is available on https://www.who.int/ageing/decade-of-healthy-ageing.
[7] see WHO (2016; 2017) and Age-friendly World portal at https://extranet.who.int/agefriendlyworld/.

New Urban Agenda

The New Urban Agenda was adopted at the United Nations Conference on Housing and Sustainable Urban Development in 2016. Member States committed to address the social, economic, and spatial implications of population ageing, to adopt a smart-city approach that makes use of opportunities from digitalization and to adopt sustainable, people-centred, age-and gender-responsive integrated approaches to sustainable urban development with specific commitments related to housing, green and public spaces and transport.[8]

United 4 Smart Sustainable Cities

Information and Communication technologies can improve the quality of life and efficiency of urban operations and services. United 4 Smart Sustainable Cities (U4SSC) is an international initiative and global platform coordinated by ITU, UNECE and UN-Habitat to advocate for public policies to encourage the use of information and communication technologies (ITCs) to facilitate the transition to smart sustainable cities. A smart sustainable city is defined to be "an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects".[9] Key Performance Indicators for Smart Sustainable Cities, developed by ITU and UNECE in 2015 span the economic, environmental and social and cultural dimensions of city life. From an ageing perspective, the key challenge is the digital divide that persists between generations and how to make sure that ICT-based services are fully accessible and enjoyable by older city dwellers.

Convention on the Rights of Persons with Disabilities

Adopted in 2006 and ratified by 52 out of 56 UNECE member States, the Convention on the Rights of Persons with Disabilities (CRPD)[10] contains three articles that are particularly relevant to housing, access to green and public spaces and transport:

Article 9 on 'Accessibility' calls upon States to identify and eliminate barriers to accessibility in buildings, roads, transportation, indoor and outdoor facilities such as housing, medical facilities and workplaces and with regard to information, communications and other services, including electronic and emergency services.

Article 19 on 'Living independently and being included in the community' calls upon States to ensure that people with disability can choose their place of residence, have access to in-home or community-based services, and to prevent isolation and segregation from the community.

Article 20 on 'Personal Mobility' calls upon States to take effective measures to facilitate the personal mobility of persons with disabilities in the manner and time of their choice and at affordable costs and facilitating access to quality mobility aids, devices, assistive technologies and forms of live assistance and intermediaries, including by making them available at affordable cost.

Urban environments that are designed to be accessible to and inclusive of persons with disabilities are designed for all ages. At different points across the life course, everyone may experience periods of reduced mobility and dependence on assistive devices, starting from strollers in early life before being able to walk, to rollators in later life when personal mobility might be reduced by frailty.

Against this backdrop of different frameworks relating to urban planning, housing and transport policies at the local level - those with a primary focus on older persons and persons with disabilities on the one hand, and those with a primary focus on sustainable (urban) development and the use of technology on the other, the remainder of this brief will discuss how they can be brought together, leveraging ICTs and sustainability while designing physical urban environments in a way that is accessible to and inclusive of all generations and levels of functional ability.

[8] Habitat III Secretariat (2016).
[9] http://www.unece.org/housing-and-land-management/areas-of-work/housingurbandevelopment/sustainable-smart-cities.html.
[10] CRPD - https://www.ohchr.org/EN/HRBodies/CRPD/Pages/ConventionRightsPersonsWithDisabilities.aspx.

Housing

A roof over one's head and an address in a habitable neighbourhood is a vital starting point for urban residents, from which they can tap into what the city can offer them by way of jobs, income, infrastructure and services. Decent shelter provides older people with a home; security for their belongings; safety for their families; a place to strengthen their social relations and networks and a means to access basic services.[11]

Planning with ageing populations in mind

City governments have a key role in shaping local housing markets to protect and provide for older people. Effective housing strategies combine global evidence with local knowledge of what works in practice. For example, fourteen European cities, led by Barcelona, are signatories to the *2018 Municipalist Declaration of Local Governments for the Right to Housing and the Right to the City*[12] for delivering Sustainable Development Target 11.7: to ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

Their five objectives set an ambitious roadmap towards enhancing living conditions of older citizens: (1) More powers to better regulate the real estate market; (2) More funds to improve the public housing stocks; (3) More tools to co-produce public-private driven alternative housing; (4) Urban Planning that combines adequate housing with quality, inclusive and sustainable neighbourhoods'; and (5) A municipalist cooperation in residential strategies. The best city strategies depend on vertical collaboration between national, regional and city governments, and intersectoral collaboration between public housing commissioners and social housing providers, social services and the private sector. A notable strategic plan which intersects with the needs of older people is the Barcelona Right to Housing Plan 2016-2025.[13] At a political level, Amsterdam's 2018 Coalition Agreement seeks a "fair, united, free, sustainable and democratic city" and "combines budgets for care and work more smartly".[14]

BOX 2
Geneva UN Charter on Sustainable Housing

The Geneva UN Charter on Sustainable Housing, endorsed by UNECE member States in 2015, aims to support member States as they seek to ensure access to decent, adequate, affordable and healthy housing for all.

The Charter includes a section on social inclusion and participation, making reference to:

- State support for adequate, healthy, safe and affordable housing, including access to basic utilities and services, which promote social cohesion and contribute to meeting housing needs of various social groups, including marginalized and vulnerable groups and people
- Planning, housing design, maintenance and retrofitting that promote healthy living / universal design principles to increase usability of homes for all people across generational gender and disability divides.
- Housing and neighbourhoods designed and actively maintained in order to enhance the emotional wellbeing of people, including by involving local communities in the process.

Source: https://www.unece.org/fileadmin/DAM/hlm/documents/Publications/EN_Geneva_UN_Charter_on_Sustainable_Housing.pdf.

Ageing in place

Declines in capacity often require older people to make transitions in their living environments, either by adapting their current residence or by relocating to a more supportive environment. In deciding where to live, older people often view their existing home or community as having advantages of maintaining a sense of connection, security and familiarity; related also to their sense of identity and autonomy.[15] The right for all people with some form of functional limitation to live and be included in their community is also the focus of Article 19 of the United Nations Convention on the Rights of Persons with Disabilities.

[11] World Health Organization/UN-HABITAT (2010).
[12] Cities for Adequate Housing (2018).
[13] Barcelona Councillorship of Housing and Dependent Bodies (2016).
[14] Amsterdam Political Coalition (2018).
[15] World Health Organization (2015).

A common European policy response to population ageing - the first of five principles shaping the Irish Government's Housing policy for our ageing population - should be to encourage 'ageing in place' – that is, the ability of older people to continue living in their own home and community, securely, safely, independently, and comfortably.[16] This requires both strategic intervention at a city level, as in the Municipalist Declaration, and at a micro level, flexible homes. Model houses such as Sredzki 44 in Berlin[17] and Lugaritz in San Sebastian are good examples. Both are new-built clusters of apartments designed so as to adapt easily to changes in functionality and desire over the later stages of life. An innovative feature of Lugaritz is a combination of smart home devices and sensors which transmit these changes in demand so that support services can be adapted.[18]

Smart homes in Donostia-San Sebastián, Spain

The pioneering Lugaritz housing complex aims to improve neighbourhood connectivity and create new methods of social cohesion for a more age-friendly experience. This project is mainly focused on couples ageing in place, where one of the partners has some degree of dependency. The participation of Matia Foundation and the availability of their resources assures the provision of services according to individual needs. Needs and desires are conveyed by a combination of smart devices and sensors. These evolve over time and, according to the architect, Heitor Lantaron, are attuned to the "choreography of being in place".

A direct connection is made between the lower and upper part of the neighbourhood. This vertical connection opens to a public plaza in the upper level with great views to the city, south-east orientation and individual access to all the different programmes located in the proposal: homes for older persons, a day-centre, a cafeteria, a nursery school and a research centre. The new building and public space act as a meeting point for the neighbourhood, an in-between space with an open character to be used by everyone.

Source: https://extranet.who.int/agefriendlyworld/afp/lugaritz-homes-connecting-a-neighborhood/

Affordable housing

Affordability includes the cost of renting or purchasing a home, plus repair, maintenance and adaptations referred to under the four headings, security, safety, comfort and functionality. Affluent older households have many options. For poorer households, assistance is delivered at three levels - national, city and household. First, state funded social security systems operate in all European countries. The United Kingdom is an example of universal state provision for 12 million old-age pensioners, supplemented by 'Housing Benefit' for 2 million pensioner households who cannot afford market rent for their home. Second, poorer senior citizens risk exclusion from the housing market in many dynamic cities.[19] Both the Barcelona Housing Plan and Amsterdam's Coalition Agreement seek to protect low income households by maintaining a vibrant, subsidized social housing sector and moderating the private housing market. Third, older asset rich but income poor home owners can benefit from city schemes such as 'Homeshare.' After raising a family many live alone in large houses now too big for their needs, while young people struggle to find affordable homes. *Homeshare International* is an NGO which supports a network of organizations such as *Wohnbuddy*[20] in the cities of Vienna and Graz in Austria, arranging and supervising rooms for low rent in exchange for companionship and help with household tasks. The Austrian Union of Students contract with older householders to provide for one hour of student help every month in return for each square metre of room space.

[16] Government of Ireland (2019).
[17] Mietergenossenschaft SelbstBau eG (2019).
[18] Matia Foundation (2020).
[19] Hochstenbach, C. (2019).
[20] Wohnbuddy: Impacthub. Vienna. https://vienna.impacthub.net/company/wge-gemeinsam-wohnen/ (Accessed 13/01 2020).

Smart technologies for independent living

Smart technologies associated with energy consumption, automation and 'home comforts' can both assist and empower older people and people with disabilities to maintain independent living in their own homes. However, the benefits of commercially-driven smart devices that have come to the market are often compromised by failure to harmonise the operation of various digital devices in the home. The European Commission supports innovative solutions to such dilemmas. Two examples: the PROGRESSIVE consortium (of NGOs, universities, research institutes and businesses) has addressed the 'Internet of things' by producing standards for the interoperability of devices:[21] and the *European Innovation Partnership for Smart and Sustainable Communities* is a leading platform for innovation and development of smart homes, which harmonises this technology with the economics and management of housing and care provision. Pioneering projects turn the homes of older people into 'Living Labs' for testing the interoperation of a range of commercial devices to improve security, safety, comfort or the functionality of those with limited capabilities.

Cities are faced with the twin challenges of scaling innovative projects up or down to serve the local communities with customised solutions. Members of the Ambient Assisted Living Forum (also co-funded by the European Commission) acknowledge that innovative projects must be converted into good practice and adopted by many housing and social care providers.[22] Holistic approaches are illustrated by the project in Donostia-San Sebastián, Spain (Box 2), and a pilot project in the Canadian City of Côte Saint-Luc[23] which respond to the evolving lives of occupants. The Italian municipality of Bolzano has teamed up with the private sector to install a range of sensors to help older residents stay in their homes longer. These include touch pads on which they can place their medications to be reminded to take their tablets, or if they have already taken them. Water and electricity sensors track the routine of washing up, showering, watching TV, or putting the kettle on. There are door sensors to monitor if residents are getting up and out and about. And bed pads show whether a resident is sleeping, or if they've had a fall out of bed.[24]

Smart technologies gather information to help manage living conditions, but also reveal information about personal behaviours, lifestyles and well-being. Privacy sensors assisting in care or support services can also be intrusive, straying too far into the area of 'surveillance.' The PROGRESSIVE Consortium recommends informed consent, with clear procedures in place that determine how data is gathered, stored and safeguarded; in what circumstances it can be shared; who owns the data and rules for access and erasure.[25] Older people are open to having these technologies in their homes if there are tangible benefits and if their privacy concerns are addressed.[26]

Secure home environments

A secure home environment reduces the fear of crime and stress, enhancing mental health and well-being. Older residents fear intruders into their homes more than most citizens. Increasing the security of their homes requires action at home and within the broader community.

The London Borough of Lambeth in the United Kingdom invested £81 million retrofitting security measures into 23,000 social housing units. Physical measures to prevent intruders include solid doors and windows with high resistant glass and key locks. Smart solutions to both the dwelling and surrounding environment include surveillance systems and sensors to detect movement, video intercoms for apartment blocks and video bells for apartments. There is evidence of a measurable reduction in stress and improvement in mental health and wellbeing.[27]

[21] PROGRESSIVE consortium (2018).
[22] Ambient Assisted Living Forum (2018).
[23] City of Côte Saint-Luc (2019).
[24] Slowey, L. (2016).
[25] PROGRESSIVE consortium (2018).
[26] WHO (2015).
[27] Ambrose et al (2018).

Safe and functional homes for independent living

The World Health Report on Ageing and Health evidences a gradual decline in physical and mental capacity over the course of life. Though trajectories vary, there is a general loss of muscle strength, fitness, flexibility, emotional and cognitive capacity, difficulties with vision, balance and mobility. Such a loss of health-related 'intrinsic capacity' (as WHO defines it) impacts in a domestic setting on (a) 'functional ability' - enabling people to be and to do what they have reason to value - and (b) on risk - of slips, trips, scolds, burns and falls, leading to injuries such as cuts, bruises, fractures or death. The WHO Strategy and Action Plan for Healthy Ageing in Europe[28] reports that falls among older people and the injuries to which they often lead (especially in women) are the underlying causes of a large share of the burden of disease and disability among older people in Europe and a major risk factor for developing frailty.

The challenge for national and city governments is to sustain the independence of older people as both a core human value and to relief pressure on health and social services. Many health professionals focus on (a) enhancing intrinsic capacity. This brief focuses on (b) complementary measures to improve living conditions and recommends both large-scale investment to improve home safety and more targeted investment in personal aids and adaptations.

A good example of a large-scale investment is the Decent Homes Programme supported by the government of the United Kingdom and delivered by the London Borough of Ealing.[29] A £153 million programme for removing environmental hazards in 13,500 social housing units, benefits older occupants disproportionately. In bathrooms, slip-resistant surfaces in baths, showers and floors reduces the risk of falls. In kitchens, even, non-slip floors, better layouts of cupboards, sinks, appliances and electrical connections reduces the risk of electrical shocks, trips, burns and scolds.

Targeted investment in personal aids and adaptations include handrails which compensate for lack of balance and muscle strength. Other physical modifications are designed specifically for those with limited capacity - walk-in showers with seats and handrails as bath replacements, raised WC's, chairs and beds, lowered kitchen worktops, long-lever taps, wider passageways for wheelchairs, sliding doors for better disabled access, bridging ramps over steps. The Wilmankoti comprehensive senior home combines these physical adaptions with digital technologies which adjust to occupants' declining capacity. They can also open up communication with family, friends or neighbours to increase social inclusion.[30]

Wilmankoti comprehensive senior home, Finland

Opened in 2019 with 54 rental flats, Wilmankoti is designed to enhance functionality and support ageing in place. The service provider may be a foundation (Wilmankoti staff: social services, a nurse, a physiotherapist, an occupational therapist, practical nurses and a nursing assistant), the public sector or a private service provider. Any flat in the building can become one of the 24 flats with 24-hour assistance, depending on the residents' service needs. All flats are accessible and equipped in accordance with the 'Toimiva asunto' ('functional flat') concept.

A functional flat includes grab bars on all fixtures and wall-hung cupboards in the kitchen, entrance hall and bedroom, as well as a sturdy safety stool (called 'Jaakko-Jakkara') designed specifically for seniors. In addition, the toilet and shower facilities of the flats are equipped with a sufficient number of grab bars. The toilet is accessed from the bedroom through a sliding door. The lights in the toilet have motion sensors. The use of home appliances, such as a vacuum cleaner, has been made easier with wall sockets placed 60 cm from the floor.

The senior home's wireless network connection and smart lock system support the production and availability of personalised services, enabling residents to use safety systems if they wish. The model of a comprehensive senior home supports communal living while providing residents with personalized housing in their own flats and creating a safe living environment. In a comprehensive senior home, the forms of housing used by the seniors range from independent renting to palliative care, changing along with the residents' life situations and service needs. The services change seamlessly without residents having to move out of their home.

Source: www.lprpalvelukeskussaatio.fi.

[28] WHO (2012).
[29] Gilbertson, J., et al (2008).
[30] Wilmankoti (2019).

Energy efficiency in buildings to enhance comfortable living environments

The EU Energy Poverty Observatory revealed that in 2016, 8.7 per cent of households in the 28 states of the EU reported an inability to keep warm, which is equivalent to 44.5 million people.[31] More people, especially those who are older and vulnerable, die in the winter than in the summer months. It is a story which captures newspaper headlines because these avoidable deaths are a highly visible stain on our society. The experience of Scandinavian countries (where less than three per cent of households have difficulty keeping warm) is that almost all of these deaths can be prevented. Half of these excess winter deaths, often from heart disease, are probably caused by living in cold conditions while excess heat in the summer is also a problem. Older people with multiple co-morbidities struggle in high temperatures due to reduced thermoregulation. WHO suggests a temperature of 20 degrees for the very old.[32]

Energy efficiency polices can also positively address mental health impacts alleviating the chronic thermal discomfort and fuel poverty that is associated with anxiety, stress, depression and concern about physical health. Difficulty paying fuel bills contributes significantly to anxiety, depression and poor mental health.[33]

Research shows that positive health outcomes are consistently strongest amongst vulnerable groups of the population: children, older persons and those with pre-existing illnesses. Improvements include reduced respiratory disease symptoms, and lower rates of excess winter mortality in cold climates. With health impacts representing 75 per cent of total outcomes, and benefit–cost ratios as high as 4:1, several governments are now addressing fuel poverty by using energy efficiency as a central element of energy policy.[34]

BOX 3
UNECE Framework Guidelines for Energy Efficiency Standards in Buildings

UNECE has launched an initiative on high-performance buildings to deploy its Framework Guidelines for Energy Efficiency Standards in Buildings. The aim is to advance the 2030 Agenda and achieve the SDGs: promote sustainable urban development; tackle poverty by reducing energy bills; accelerate a sustainable energy transition by improving the efficiency with which buildings' energy services are provided; and support climate action by reducing the energy requirements and the carbon footprint of buildings. The initiative also aims to educate stakeholders regarding the benefits of high-performance buildings for people and to help countries with best practices and practical advice. For example, the UK Government decided to provide every home with a smart meter by the end of 2020. The Smart Metering Programme already installed over 11 million smart meters and advanced meters across homes and businesses. Smart meters help inhabitants manage their home heating with healthy temperatures that do not harm the environment.

Source: UNECE (2019) Study on Mapping Energy Efficiency Standards and Technologies in Buildings in the UNECE region

Green spaces and public places

Target 7 of SDG11 is to provide by 2030, *universal access to safe, inclusive and accessible, green and public spaces, particularly for women and children, older persons and persons with disabilities*. The city landscape has a major impact on the mobility, independence and quality of life of older people and affects their ability to 'age in place' and participate in community life.

Older people give high priority to a pleasant and clean environment, green spaces, somewhere to rest and with adequate public toilets. Enjoying these aspects of city life raises the spirits, encourages social interaction and improves both physical and mental health. Clean, safe pavements and streets, easy access to shops and services, quiet places to rest or chat with neighbours and friends enhance social life and reinforce a sense of identity.

Strategic plans for land use patterns, urban design and transportation should balance public amenities with commercial imperatives to maximize economic value. Neighbourhood plans and projects should be viewed through an ageing lens and involve older residents.

[31] Thomson, H., & Bouzarovski, S.(2019).
[32] Miller, W., Vine, D., & Amin, Z. (2017); WHO (1987).
[33] Gilbertson, J., Grimsley, M., Green., G. (2012).; Ambrose et al (2018).
[34] UNECE (2017b).

Life between buildings

Older persons have a key role in the planning process, as in the 'participatory urbanism' and 'democratising technology' initiatives[35] fostered by the Mayor of Boston, Massachusetts in the United States and by Exercise Councils in Finland.[36] Active engagement with their city and neighbourhood can also prevent the isolation experienced by many older people.

Smart tools can be used to encourage participation by senior citizens.[37] A good example is the 'Walkable Town Audit' pioneered in the Irish town of Athboy and developed by Age-Friendly Ireland into a generic walkability tool.[38] The tool covers the range of aspects included in the Vancouver Protocol (used to develop the WHO Guide to Age-Friendly Cities) emphasising especially cognitive and sensory impairment as well as physical access issues. Another smart tool to enhance access to public space is the 'Wheelmap' developed with wheelchair users by Sozialhelden - a community organisation in Berlin, Germany. Participatory GIS mapping tags various local venues with traffic light colours indicating their accessibility for wheelchair users.[39]

Green spaces

With more leisure time, older people give high priority to walking, running, resting or socializing in green spaces. Parks, street trees, gardens and well-designed public squares are essential features of an age-friendly city. The green and pleasant spaces which give older people joy also contribute to environmental sustainability.

Mature trees filter pollutants from the air, and improve water retention and quality. Heatwaves put older people more at risk of illness and death. Strategic planting of trees in urban areas can cool the air by 2°C to 8°C reducing the urban 'heat island' impacts that lead to extreme temperatures.[40] Tree planting also provides shade, reducing demand for air conditioning and hence the amount of energy used for cooling buildings. Trees also improve outdoor thermal comfort and provide windbreaks.

UNECE supports mayors to plant trees within and around the city and it launched the global campaign *Trees in Cities Challenge* at the 2019 Climate Action Summit. The initiative raised international support and now the overall commitment reached over 10 million trees to be planted.[41]

Arterial parks connecting transport routes or major destinations make for safer and easier walking and cycling networks, and can be popular places for physical activity in crowded cities contributing to healthy ageing.[42]

Life in buildings - access to public places and services

Public buildings house shops, community venues and health centres which provide essential services and support a good life. Neighbourhoods should be designed to allow easy access routes from homes. The City of Udine in Italy has utilized smart GIS technology to map older people's needs onto neighbourhood amenities and on the basis of this information located new pharmacies close to residential clusters of older citizens rather than following purely commercial imperatives.[43]

Equally, the desire to engage with neighbourhood and city life leads to complementary patterns of entertainment and social interaction. PlaceCal is a smart device developed in Manchester to give older people access to neighbourhood social networks. It's especially aimed at helping people find out about the small, local events that can be hard to discover: "the coffee mornings, sewing groups, computer classes and gardening groups that might be just around the corner."[44]

[35] The Mayor's Office of New Urban Mechanics. Smart City Projects: Participatory Urbanism https://www.betterworldsolutions.eu/smart-city-projects-boston/ City of Boston. (Accessed 03/12/2019)
[36] Säpyskä-Nordberg, M., Havas, A., Karvinen, E (2014).
[37] WHO (2018).
[38] Age-friendly Ireland (2015).
[39] Mobasheri, A., Deister, J. & Dieterich, H. (2017).
[40] https://treesincities.unece.org/ (accessed 26/04/2020).
[41] "Turkmenistan's 2.2 million pledge to the Trees in Cities Challenge brings the initiative to over 10 million trees', UNECE Press release 20 March 2020 https://tinyurl.com/10milliontrees (accessed 26/04/2020).
[42] WHO (2016).
[43] Zamaro, G. (2008).
[44] Foale, K., and White, S (2019).

The New York City Age-friendly Business initiative and Basque Age-Friendly Business Guide[45] are examples of educational outreach campaigns that provide practical low-cost or no-cost tips to help businesses become more age-friendly and attract older customers. Age-friendly practice includes welcoming older persons into their shops, showing special sensitivity to those with impaired vision, physical frailty and especially dementia. Owners of small, often family-owned venues will often have a personal connection to users and understand their needs. But as these are replaced by larger more impersonal stores, staff will require training.

Universal design

Age-friendly buildings should have ramps and escalators, wide doorways and passageways, non-slip floors, rest areas, adequate signage, and public toilets. There are protocols for the universal design of these elements which facilitate accessibility for almost all ages and almost the full range of physical capacities, but so far, there is no internationally-agreed standard. Countries and cities must develop their own protocols. Berlin has the ambition to become a world-class example of a 'barrier-free city' and has produced an notable guide to barrier-free public buildings.[46]

Enabling Accessibility Fund, Canada

The Enabling Accessibility Fund (EAF) is a federal grants and contributions programme that supports the capital costs of construction and renovation projects that improve physical accessibility and safety for persons with disabilities in Canadian communities and workplaces.

People with disabilities often experience barriers to their full participation and inclusion in activities of everyday living. The EAF provides funding to eligible capital projects that increase access for people with disabilities to community spaces and workplaces across Canada, which in turn creates opportunities to participate in community activities, services and programs, or access employment opportunities.

Source: https://www.canada.ca/en/employment-social-development/programs/enabling-accessibility-fund.html

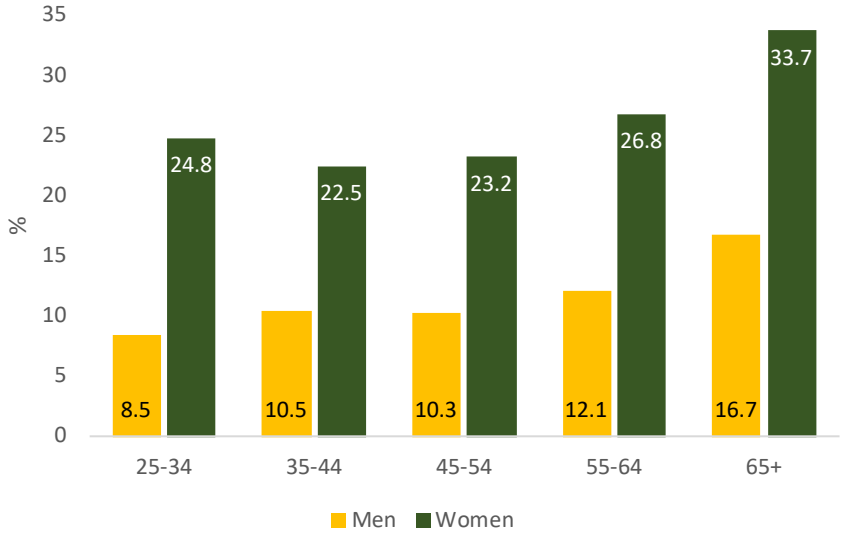
Feeling safe in cities

According to European Social Surveys (ESS), older persons, in particular older women, are more fearful or worried about crime in public places.[47] In the UNECE countries for which data is available[48], more than one in four persons over the age of 65 feel unsafe or very unsafe walking alone in their neighbourhood after dark (see Figure 3). Across all age groups, women feel less safe, and those over the age of 65 are most concerned. The 2018 ESS showed for instance, that over two out of three older women in Bulgaria felt unsafe or very unsafe walking alone in their neighbourhood after dark, while in Finland, Norway and Slovenia, this was the case for less than one out of five older women.

The City of Prague in the Czech Republic developed a Public Space Design Manual,[49] promoting the safety and security of older and vulnerable citizens. The Portuguese city of Aveiro has used similar guidelines to revive its Infante D. Pedro City Park as a safe venue for intergenerational contact.[50]

[45] https://s3.amazonaws.com/production.media.nyam.org/filer_public/bf/f7/bff7621c-cac7-4679-9e0f-f5e8bd6d3ae9/agefriendlybusinessguide.pdf; https://extranet.who.int/agefriendlyworld/age-friendly-business-guide-in-basque-country/ (accessed 24/4/2010).
[46] Senate Department for Urban Development and the Environment (2015).
[47] Ceccato, V. and Bamzar, R. (2016).
[48] European Social Survey Round 9 Data (2018). Data are collected for 19 countries: Austria, Belgium, Bulgaria, Switzerland, Cyprus, Czechia, Germany, Estonia, inland, France, United Kingdom, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Serbia, and Slovenia.
[49] Prague Institute of Planning and Development (2014).
[50] Azevedo, C (2016).

Figure 3
Share of women and men feeling unsafe walking in the dark in their local areas by age group in selected UNECE countries, 2018



Note: based on 19 UNECE countries, calculated adding "unsafe" and "very unsafe" variables
Source: European Social Survey Round 9, 2018 data.

Secure environments are linked to economic prosperity and social harmony which require strategic investment by city and national governments. However, within this macro-economic context, city and neighbourhood landscapes are made more secure both by sensitive, physical improvements (to sightlines and streetlights) and by well-used streets and spaces. A busy environment deters crime and reduces the fear of crime. The New Urban Agenda recommends "*the best possible commercial use of street-level floors, fostering both formal and informal local markets and commerce, as well as not-for-profit community initiatives, bringing people into public spaces and promoting and promoting walkability and cycling with the goal of improving health and well- being"*.[51]

Transport

The ability of older people to get 'out and about' is critical to well-being. Outdoor mobility brings two kinds of benefits. First, 'active travel,'[52] - a key element of 'active ageing' - which includes cycling and walking to connect with public transport, enhances physical and mental health, enabling older people to enjoy life and defer the onset of disability and dependence. Second, transportation itself is crucial for maintaining social connections, keeping engaged in city life and easily accessing health and social services. Many older people with reduced mobility cannot be self-sufficient without transportation. For transport to be sustainable it needs to be accessible, affordable, safe, secure and environmentally friendly. All these factors need to come together with the aim of promoting active mobility through intelligent transport solutions, optimum public transport services that are integrated into wider planning guidelines and allow access for all.

Resetting city planning priorities

With the adoption of the 2030 Agenda for Sustainable Development, countries have pledged to ensure that *no one will be left behind*. Yet city transportation systems often marginalize older citizens. Perceived as a key to unlock prosperity, society in the 21st Century has become so organized around cars that urban neighbourhoods have become more challenging for pedestrians, public transport more difficult to access and those without a vehicle more socially excluded.[53]

[51] HABITAT III (2016) New Urban Agenda. United Nations. New York
[52] Active Travel Network: URBACT III. (undated c2013); UNECE (2015).
[53] Musselwhite, C. (2018).

Target 2 of SDG 11 aims to reset priorities; *to provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons*. Target 6 of SDG 3 aims to halve the number of global deaths and injuries from road traffic accidents.[54]

How will cities deliver these age-friendly, sustainable and smart city transportation systems? State and regional governments can provide a policy and legislative framework for strategic reorientation of priorities. The European Commission Transport White Paper (2011) encourages cities to produce strategic Sustainable Urban Mobility Plans (SUMPS).[55] Adopted by many European cities, SUMPs aim to bring a holistic view to the development of urban transport including by shortening trips and shifting mobility from cars to the more environmentally and age-friendly active modes of walking, cycling and public transport. The objective is to make the transport system accessible to all, improve safety and security, reduce pollution, improve the cost-efficiency of urban transport and to make the urban environment generally more attractive. A related *Topic Guide Urban Road Safety and Active Travel in Sustainable Urban Mobility Planning*[56] highlights the challenge of reconciling necessary motor traffic flows with pedestrian safety, exemplified by the *London Walkability Plan*[57] and Chisinau's plan to create a *SMART district*.[58] Intelligent transport systems now integrate pedestrian requirements and flows into advanced mobility systems.[59]

The Transport, Health and Environment Pan-European Programme (THE PEP) is another key initiative that seeks to achieve transport patterns that are sustainable for human health and the environment through an integrated policy appoach. Its priority goals include the promotion of healthy and safe modes of transport and integrating transport, health and environmental objectives into urban and spatial planning. One of the tools developed to guide local policy makers is a health economic assessment tool for walking and cycling (HEAT), which shows the economic benefits of active mobility such as regular walking and cycling.[60]

Making sustainable transport options acceptable

With ageing, changing requirements and constraints lead to new patterns of mobility. Commuting to work is less important; shops, medical and leisure facilities are now the main destinations. Travel distances shrink; trips to neighbourhood facilities and city or town centres dominate. Public transport, especially buses and trams are key modes of transport for trips further than one kilometre, or less for those with limited physical capacity. They provide an alternative to driving and public transport is the preferred mode of transport for those concerned about climate change or valuing freedom from the hassle of driving and parking.

However, for ageing generations accustomed to car use, high levels of mobility and travel-intensive lifestyles, the transition can be difficult. A system perspective is necessary to respond to the user perspective of older people. To make public transport an attractive alternative, all the elements of the public transport chain need to be considered.[61]

One of the seven action points of the EU funded GOAL Action Plan is "to investigate the transition behaviour from car to other modalities."[62] The status symbol of the car and the convenience of driving diminishes the acceptability of public transport. To become an attractive alternative it must be available, affordable, and accessible.

[54] UNECE (2015).
[55] Directorate-General for Mobility and Transport. (Second edition 2019).
[56] Engels, D., et al (2019).
[57] Mayor of London. Walking Action Plan: Making London the World's Most Walkable City. (2018) Transport for London. London. https://www.london.gov.uk/what-we-do/transport/cycling-and-walking/making-walking-count.
[58] UNDP Moldova Sustainable Green Cities (2018)
[59] ERTICO – ITS Europe (2019).
[60] THE PEP is a joint initiative by UNECE and the WHO Regional Office for Europe. For more information see https://thepep.unece.org/
[61] Shrestha, B. P., et al (2017).
[62] GOAL Consortium. Transport Needs of an Ageing Society. EU Commission of Mobility and Transport. Brussels http://www.goal-project.eu/images/goal-action-plan.pdf (Accessed 08/12/2019).

Adapting transportation to the needs of older persons

Public transport is available in most cities, but older people complain that some districts are not covered by routes taking them to where they wish to go.[63] The revival of public transport systems for all ages will especially benefit older users who use bus services disproportionately. Meanwhile many cities provide personalized transport. Many focus on easing neighbourhood travel. The Silver-T Service in Valetta, Malta, "consists of local transport for older persons to conduct their daily errands within the community, without having to depend on their families and friends." Flexlinjen in Gothenburg, Sweden, operates in almost all neighbourhoods, "with many stopping points which allow passengers to get close to the route".[64] A Senior Taxi Service operates in more than 80 municipalities in the Czech Republic. Popular with those living on the outskirts of a city, older people can call for a subsidized taxi for a return journey to their local destination[65]. In Ljubljana, Slovenia, a fleet of electric-powered vehicles referred to as *Kavalirs* (Gentle Helpers) enable older or mobility-impaired people to easily access the pedestrianized historic city centre.[66]

Affordable transport

Median incomes of citizens over 65 are lower than the working age average in member states of the European Union and in most of Eastern Europe.[67] Considering social objectives, most governments subsidize public transport costs to ensure journeys are affordable for older persons. Concessionary fares secure free or very cheap travel, as in the Russian Federation[68], or by a simple procedure for obtaining and using a pass as for free travel on the state railways in Slovakia. In Turkey, all public transport such as the city and intercity buses, ferries, trains and planes are either discounted or free for individuals aged 65 and above and persons with disabilities and their attendants.[69] At a city level, the *Kavalirs* in Ljubljana and the *Silver T* service in Valetta, are free of charge. Regional governments subsidize the *Senior Taxi Service* in the Czech Republic.

Silver T and scooter service Malta

Malta's public transport system subsidizes the mobility of many older people within their local communities. However, others who have difficulty walking long distances need more personalized transport to conduct their daily errands, without having to depend on their family or friends.

The Silver T service operates between Monday and Friday from 7.00 a.m. and 2.00 p.m., and provides transport facilities to those who might want to go the bank; the market; the clinic; the local council and places of worship and other local destinations. To access this service one has to call and book at least 2 days before and not more than 1 week ahead. The service is provided free of charge.

The electric scooter service within Valletta, the capital city, allows older people with mobility difficulties to rent a scooter for free. These persons would be able to perform their errands within the city Valletta precincts for a maximum period of 3 hours. This service operates from Monday to Friday between 7.00 a.m. and 2.00 p.m. The scooter may be collected from the Ministry for Family, Children's Rights and Social Solidarity or from the bus terminus, where users are provided a brief overview on how to use the scooter.[70]

Source: Information shared by the Government of Malta

[63] WHO (2007).
[64] Jönsson, A. (2018).
[65] Information shared by the Goverment of the Czech Republic.
[66] Ljubljana Tourism (undated). *Kavalir: getting around the city centre by electric car*. City Municipality of Ljubljana. https://www.visitljubljana.com/en/visitors/travel-information/getting-around/kavalir-getting-around-the-city-centre-by-electric-car/ (Accessed 08/12 2019).
[67] Eurostat. (2019).
[68] Ryzkov, AY. and Zyuzin PV.(2016).
[69] Turkish Ministry of Family and Social Policies (2014).
[70] https://activeageing.gov.mt/Elderly-and-Community%20Care-Services-Information/Documents/INF%20-%20SilverTServiceEN.pdf (Accessed 05/12/2019).

Accessible public transport for all

Age-friendly public transport should be safe, secure and easy to use, especially for those with reduced mobility. In compliance with UN Regulation No. 107, administered by UNECE, United Kingdom laws require enhanced accessibility via low floor urban buses with design features related to gangways, handrails and priority seats and spaces other on-board facilities which optimise accessibility, safety and comfort. Low floor buses are operational in many European cities, enhanced in Ljubljana by audio and video announcements. The Flexlinjen route in Gothenburg is operated with spacious minibuses with a low floor for both wheelchairs and walking aids. Easy access to bus transport also requires safe, secure and informative bus stops, exemplified by the new generation of SMART eco-friendly bus shelters in the Polish City of Rzeszów.[71]

Smart, age-friendly bus travel in the City of Rzeszów, Poland

Urban transport in Rzeszów has undergone a real metamorphosis. Every day more than 150 buses (130 of which are monitored, modern and environmentally friendly) serve the city population. Travellers can use ticket machines and the Rzeszów City Card. New, high-quality public transport allows faster travel, safety and more comfort. It is an attractive alternative to travelling by car. New buses with wheelchair space and low floors entered at street level are accessible for older travellers, people with movement, hearing or sight impairments and those with baby strollers or luggage. Buses are fitted with passenger information systems, including monitors and voice prompts, ticket machines and a video monitoring system for safety.

As part of Rzeszów's commitment to investing in renewable technology, the city is constructing 140 new smart bus shelters. These not only provide a bench and shelter from the weather, they also have solar panels that are continually working to absorb the sun's energy. Shelters have been adapted for people with reduced mobility and equipped with ticket machines and electronic passenger information systems. The blind and visually impaired can get voice prompts via buttons with Braille or remote controls.

Source: Wagstaffe, L. (2019).

In compliance with the Convention on the Rights of Persons with Disabilities, many countries have improved the accessibility of urban transports. In Kazakhstan, the *Act on Architectural, Urban Planning and Construction Activities* sets out in full the essential requirements of a favourable environment for the everyday activities of persons with reduced mobility. In 2014–2016, 16,722 special road signs and traffic symbols in the regions and 465 pedestrian crossings with audible signals were installed in areas in which organizations serving persons with disabilities are located. The Act also covers private transportation and specific taxi services for persons with disabilities known as 'Invataksi' were introduced.[72]

Towards barrier-free public transport in Minsk, Belarus

With the *Act on Architectural, Urban Planning and Construction Activities*, Belarus has made provisions for an enabling environment for the everyday activities of persons with disabilities, older persons, persons with locomotor impairments, pregnant women, preschool children and adults carrying children or pushing them in strollers. Thanks to this commitment, in 2017, 89 low-floor passenger transport vehicles (41 buses, 28 trolleybuses and 20 electric buses) were purchased from the national budget at a cost of 452.4 million roubles; 424 pedestrian crossings and 281 stretches of sidewalk were adapted for use by persons with visual impairments and wheelchair users, 166 public transport stops were adapted for use by persons with visual impairments and 94 traffic lights were fitted with audible signals for the benefit of all persons with disabilities. Nine bus stations have been adapted to ensure access for all persons with disabilities.

In the Metro of Minsk, barrier-free access measures have been introduced, information beacons have been introduced for persons with visual impairments at 4 stations, and 24 subway train information systems with scrolling text displays have also been installed. Moreover, Minsk Metro has produced a detailed guide to the barrier-free access measures in place at all stations. The online map can be accessed on the company's website (www.metropoliten.by). There is also a guide showing the route that a wheelchair user, for example, must take to reach the train from street level. Passengers with disabilities are now able to plan their journeys on underground railways in advance and use underground railway services on arrival at the station.

Source: Report by Belarus to the Committee on the Rights of Persons with Disabilities in 2018 (CRPD/C/BLR/1).

[71] Wagstaffe, L. (2019).
[72] CRPD/C/KAZ/1 Initial report submitted by Kazakhstan under article 35 of the Convention on the Rights of Persons with Disabilities.

Towards sustainable and smart cities for all ages

Local policy makers play a key role in the transformations needed to implement the international policy frameworks referenced in this brief and as the examples related to the areas of housing, green and public spaces, and transport have shown, there is a considerable potential for integration between approaches that are often dealt with separately. Environmental, economic and social sustainability considerations are inter-linked.

Smart technologies, as the examples discussed in this brief illustrate hold significant potential for older persons and persons with disabilities assisting them to live independently in their homes, enhancing their mobility and connection with their communities and can be a valuable tool for social inclusion and healthy ageing. However, if designed without the needs of older persons and persons with disabilities in mind, increasingly digitalized services in cities can create barriers to participation, make services inaccessible and reinforce the digital divide.

The following three approaches facilitate a more systematic inclusion of ageing, gender, disability, and human rights considerations in local development planning:

Mainstream ageing, gender, disability and human rights considerations in urban planning

To ensure that the design of housing, public and green spaces, and transport systems in cities is responsive to the needs of all generations and all levels of ability, it is important to take gender, disability, human rights and ageing considerations into account when planning, designing, implementing and evaluating new city developments.

Involve all generations and stakeholders for people-centred local development planning

Following the principle of 'nothing about us without us' it is recommended to engage, consult, design with and for city residents of all ages and abilities to learn about the different needs, preferences and habits of all citizens to ensure that they are not "left behind" through technological developments and urban design that do not cater for their needs.

Avoid working in silos – cooperate across sectors to connect the dots between different realms of city life

Find a synergy between the environmental, economic and social considerations to be taken into account in sustainable urban planning and facilitate developments of projects that are mutually beneficial such as smart housing developments that are energy efficient and connected to public transport, barrier-free and adaptable to the changing needs over the life course, facilitating intergenerational contact and relations. Success will depend on effective cooperation across all sectors, at regional, national and local levels.

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Checklist: Ageing in Sustainable and Smart Cities		
Main areas	**Areas of implementation**	**Key elements**
Housing	Support for age-friendly homes by municipalities, NGOs and the private sector	• Retrofit or design new build homes to facilitate ageing in place
		• Smart technology to monitor living conditions
		• Rent subsidies or controls for affordability
		• Robust windows, doors and surveillance cameras for security
		• Adaptations and aids for safety and improved functioning
		• Energy efficiency for warmth & comfort
		• Reduce energy consumption for environmental sustainability • Ageing in place to enhance sustainability of health and social service systems
Green Spaces & Public Places	Sustainable, age-friendly development of cities and neighbourhoods by municipalities, NGOs and the private sector	• Participatory walkable audits and 'wheelmaps' to encourage life between buildings
		• Plan neighbourhoods and plant trees to enhance green spaces
		• Apps to signal location of amenities; design for easy access to buildings
		• Design parks and buildings to enhance safety and security. Promote intergenerational spaces
		• Switch from car-born journeys to walkable neighbourhoods to enhance environmental Sustainability
Transport	Investment in walkable neighbourhoods and age-friendly transportation systems by municipalities and the private sector	• Reset planning priorities to promote walking and cycling
		• Improve the quality and publicise the advantages of public transport to increase acceptability
		• Plan and subsidise public transport to make it available for all destinations
		• Free passes or subsidised public transport for affordability
		• Design buses, trams and trains for accessibility
		• Switch from car-born journeys to public transport to enhance environmental sustainability