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# **EU-Japan Joint Study: Demographic trends and territorial policy responses**

## **Case studies: Bilbao**

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### Map1 Map of Spain showing Bilbao



### Map2 Map of Bilbao metropolitan area





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## Introduction

Bilbao is the largest city and the main economic and industrial centre of the Basque Country autonomous region in Spain. The city itself currently has around 350,000 inhabitants and the metropolitan area some 1.1 million. It is situated 10 km inland from the Bay of Biscay in the North of Spain, to which it is connected by an estuary (see Maps).

Bilbao started as a small settlement on the banks of the Nervion river with iron ore mining deposits located nearby.. In the early 14<sup>th</sup> century, it became part of the Santiago de Compostela pilgrimage path, which with its port and expanding trade routes led to rapid urban and economic growth. A new growth impetus followed in the late 19<sup>th</sup> century with industrialisation, built on iron and steel making, shipbuilding, and machine engineering. The city attracted migrants from across Spain and its population expanded from just 10,000 in the early 19<sup>th</sup> century to 100,000 in 1900. The urban area also spread out to the surrounding parts during this period.. In the 1950s and 1960s, there was a second wave of industrial expansion and modernisation, the city's population almost doubling: from 216,000 in 1950 to 410,000 in 1970<sup>1</sup>.

In the 1970s, however, its heavy industries all went into to decline and many steel mills, shipyards and factories closed with substantial loss of jobs, leaving empty sites with high levels of both soil and water contamination and the Nervion river 'ecologically dead'. Unemployment rose from close to zero in the early 1970s to 25% in the early 1980s and the youth unemployment rate increased to 50%. Economic decline was followed by population decline, as described below, and, by 1990, Bilbao was a city in deep economic, social and ecological crisis.

Its remarkable revival is well documented. Bilbao is one of Europe's prime examples of successful urban and economic regeneration. Its redevelopment strategy was based on inner-city urban renewal, environmental improvement, the building of a knowledge-intensive high-tech sector, and a strengthening of cultural identity. The regeneration was initiated by the Revitalisation Plan of Metropolitan Bilbao in 1991 and the founding of *Bilbao Ria* (Estuary) 2000 in 1992, in which all levels of government were involved in the regeneration of the metropolitan area (the city, the metropolitan area, the province, the Basque Country regional authority and the Spanish national government) as well as public companies owning land in the area. The regeneration programme was largely financed through land sales, ownership being initially transferred from the public bodies to *Bilbao Ria 2000*, which then implemented the urban regeneration plans. Private partners were also involved, in part through the Association for the Revitalisation of Bilbao Metropoli-30.

A central feature of the strategy – the 'flagship' – was the Guggenheim Museum, which was opened in 1997. This was built in a former industrial area and was linked to a comprehensive transformation of the area and the adjacent inner city. The museum became a major tourist attraction and tourism became one of the most important economic sectors in the city. This strategy of culture-led urban regeneration became known in Europe as the 'Bilbao effect' and is one that many cities have tried to copy since. The strategy, in practice, was inspired in part by earlier successful examples of urban regeneration in other Spanish cities, such as Barcelona and Sevilla<sup>2</sup>. While many outside observers have seen the Guggenheim Museum as the decisive factor in Bilbao's successful regeneration, local observers tend to have a different view. For example, in a special issue on Bilbao in the journal *MAS Context*, architect Koldo Lus Arana states that "(..) *within the process of regeneration it might have been the icing on the cake,*

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<sup>1</sup> Plöger, J. (2008) *Bilbao City Report*. London: London School of Economics, Centre for Analysis of Social Exclusion (CASE). [http://eprints.lse.ac.uk/3624/1/Bilbao\\_city\\_report\\_%28final%29.pdf](http://eprints.lse.ac.uk/3624/1/Bilbao_city_report_%28final%29.pdf)

<sup>2</sup> For analyses of how such 'travel' and 'transfer' of urban regeneration strategies works, see e.g. Gonzalez, S. (2011) Bilbao and Barcelona 'in motion'. How urban regeneration 'models' travel and mutate in the global flows of policy tourism. *Urban Studies* 48 (7): 1397-1418.



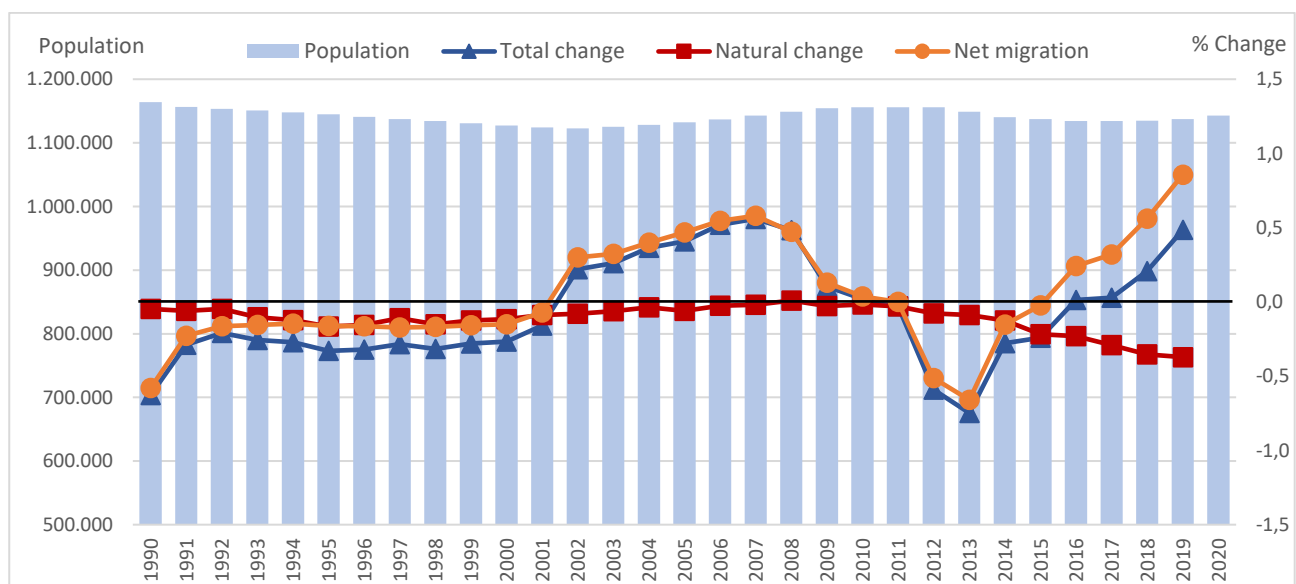
*though it was never designed to be its flagship. Rather than the crown atop Bilbao’s refashioning, it was a happy, unexpected, and most certainly welcomed media success that helped boost and publicize a much larger scale operation of reinvention of the city that had been under development for almost two decades”.*<sup>3</sup>

## Demographic trends

The population of Bilbao metropolitan area grew continuously between 1970 and 1983, by an average of around 1% a year, though at a gradually declining rate, so that by 1982, growth had virtually stopped. From then until the end of the decade, population fell at an increasing rate, falling by over 0.6% in 1990 alone. It continued to decline throughout the 1990s and early 2000s, though at a slower and relatively stable rate (Figure 1). By 2002, population was almost 6% smaller than it had been in 1983 when the earlier growth had come to an end. This decline was a result both of a natural fall in population, as the number of deaths in the area exceeded the number of births, and of an outflow of people from the area which exceeded the number moving in.

Population growth resumed from 2002 for the next 9 years, at an increasing rate up to 2007 and at a much slower rate from then until 2011. The growth was almost entirely because of a reversal of migration flows, the inward movement of people into the region being significant, mostly made up, as in the rest of Spain, by migrants from North Africa, in particular, attracted by the relatively high rate of economic growth and a significant expansion in jobs. The global economic recession which struck in 2008, however, slowed the inward flow of migrants, which was virtually offset by outward flows initially, and from 2011, which was more than offset. Population, therefore, declined up until 2016, when it was nearly 2% less than 5 years earlier, as people who had moved into the region during earlier years moved back to their countries of origin because of the continuing economic recession and the increasing difficulty of finding work. Between 2008 and 2016, employment in Bilbao declined by 10%, whereas in the 8 years up to 2008, it increased by 18%.

**Figure 1 Total population and changes in population in Bilbao metropolitan region, 1990-2020**



<sup>3</sup> Lus Arana, K. (2017) Behind the Bilbao Effect. An overnight success in 20 years. *MAS Context* 30/31: 27-33. <https://www.mascontext.com/issues/30-31-bilbao/behind-the-bilbao-effect-an-overnight-success-in-20-years/>.





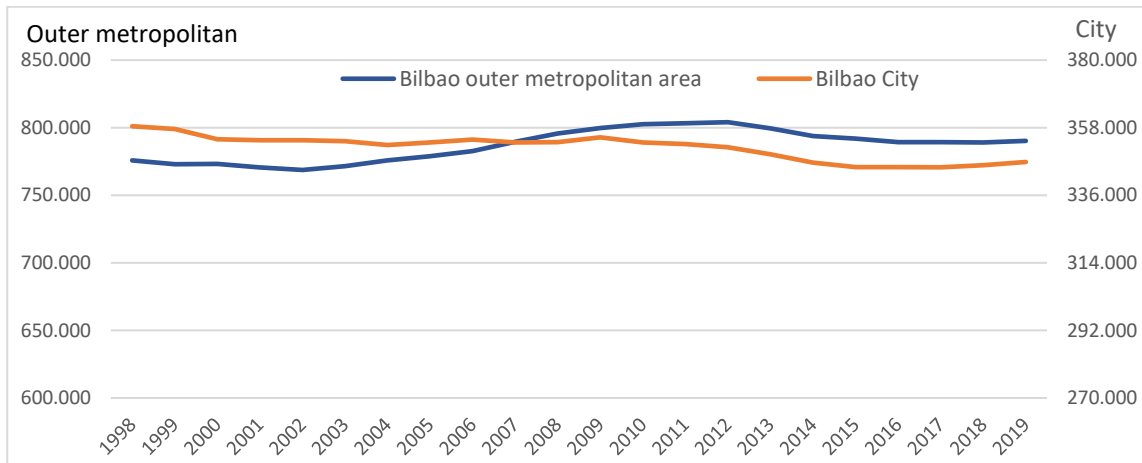
Note: The population figures relate to 1 January of each year. Figures for the total change indicate the percentage change over the year. Figures for the natural change indicate the number of births less the number of deaths over the year as a % of population at the beginning of the year. Figures for net migration are calculated as a residual between the total change and the natural change, again measured as a % of population at the beginning of the year (so including any statistical error in the calculation of the total and natural changes).

Source: Eurostat Regional Population Statistics.

As economic growth resumed and employment began to rise, so did inward migration, pushing up total population in Bilbao and offsetting a natural decline, as the number of deaths significantly exceeded the number of births for the first time since the 1990s. Indeed, between 2001 and 2015, the number of deaths was virtually the same as the number of births and there was little natural change in population. Throughout this period, therefore, the change in overall population closely mirrored the net migration rate. From 2015, the two have moved apart, though it remains the case that the rate of population growth and, more relevantly, whether there is any growth in population at all, depends critically on the rate of net inflow of people into Bilbao from outside.

The decline in population before 2002 occurred both in the city of Bilbao and the outer metropolitan area. The growth from 2002 to 2011, however, as people moved into Bilbao from outside was concentrated in the outer metropolitan area, the population in the city remaining virtually unchanged up until 2009, when it began to decline (Figure 2). Population continued to grow in the outer metropolitan area up until 2012, when it was around 5% larger than it had been 10 years earlier. From 2012 to 2015, population declined in both areas and continued to do so in 2016 in the outer metropolitan area, while in the city, it increased slightly. Over the next three years up to 2019, there was little change in population in the outer area whereas in the city, it grew marginally, so that unlike in the earlier period, the limited increase in population has been a little more in the city than the outer metropolitan area.

**Figure 2 Population of Bilbao city and outer metropolitan area, 1998-2019**



Source: Spanish Statistics Office (INE) and own calculations.

## Changes in the age structure of the population

The trends in population described above, particularly, the tendency for the birth rate to be insufficient to compensate for the death rate, imply, together with an increasing life expectancy, an ageing population and, more specifically, an increase in the proportion of people aged 65 and over. In 1990, this proportion amounted to 12% of the population, but by 2005, it has increased to 19% and by 2020 to 23% (Figure 3). At the same time, the proportion of people of working-age (20-64) also increased between 1990 and 2005, though by less than that of those 65 and older, as the increase in the latter was wholly reflected in a marked reduction in the share of people aged less than 20, while declined from 26% to only 16%, as the birth rate fell

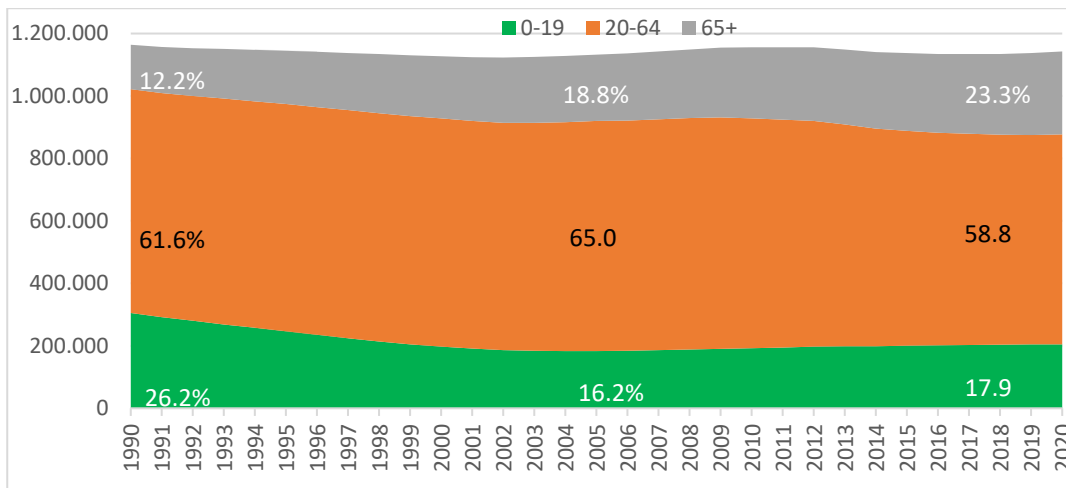


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substantially. Between 2005 and 2020, however, the increase in the share of older people was mirrored by a marked decline in the share of those of working-age, which fell from 65% to 59%, while the share of young people rise slightly.

As a result, the old-age dependency rate (the number of people aged 65 and over as a proportion of those aged 20-64) increased from 20% in 1990 to 29% in 2005 and to 40% in 2020, a doubling of the rate over 30 years.

**Figure 3 Breakdown of population by broad age group in Bilbao metropolitan region, 1990-2020**



Note: Percentage figures indicate the share of total population of each age group in 1990, 2005 and 2020. Source: Spanish Statistics Office (INE) and own calculations.

## Future trends in population

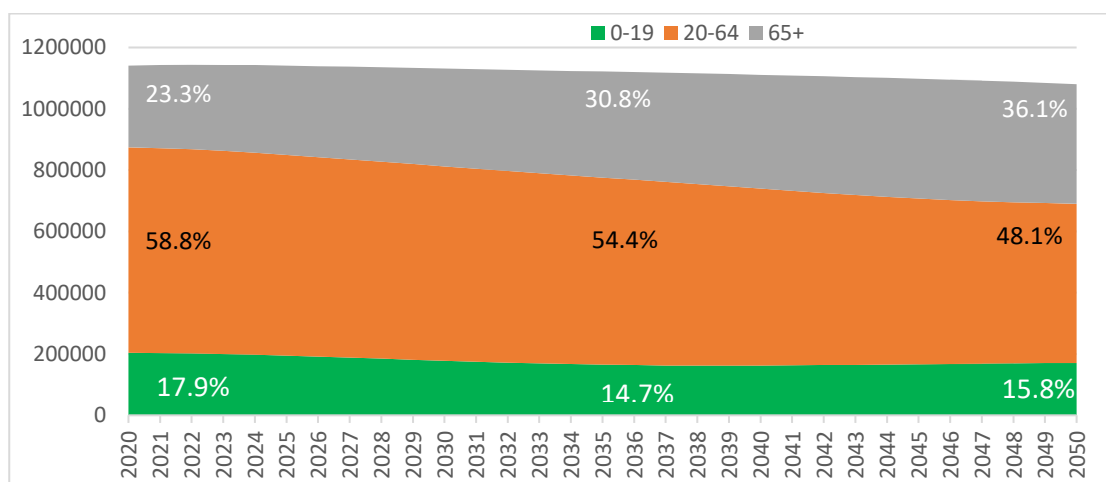
The continuing decline in the fertility rate in the Bilbao metropolitan area (down to only 1.23 in 2018 as against the rate of 2.1 rate needed to maintain population unchanged) implies that the natural population decline will continue in the future. Whether or not this is associated with an overall decline in population depends on net migration and whether or not inflows of people into the region from outside continue to exceed outflows by enough to offset the natural reduction.

The latest forecast, based on 2019 data, is for a continuing increase in population for the next 2-3 years, as inward migration is projected to continue at its recent rate, but followed by a decline as the rate of inflow falls and becomes insufficient to compensate for the natural reduction in population. The decline is forecast to continue throughout the period up to 2050, when population in Bilbao is projected to be around 5% smaller than in 2020.

At the same time, the proportion of the population aged 65 and over is projected to rise from 23% in 2020 to 31% by 2035 and to 36% by 2050, while that of people of aged 20-64 is projected to fall from 59% in 2020 to 54% in 2035 and to 48% by 2050, when, according less than half the population will be of working-age (Figure 4). The increase in the share of older people, is, therefore, forecast to be accompanied by a reduction in the share of those who can be expected to be employment, Accordingly, the old-age dependency rate is projected to rise markedly over the period, to 56% by 2035, when there is expected to be less than two people of working-age to support those of 65 and over, and to 75% by 2050. In 30 years' time, on this forecast, there will, therefore, be three people who are likely to be in retirement (unless there is a marked change in pension arrangements) for every four people who can be expected to provide support.



**Figure 4 Forecast age composition of the population in the Bilbao metropolitan region, 2020-2050**



Note: Percentage figures indicate the share of total population of each age group in 2020, 2035 and 2050.

Source: Eurostat, EROPOP, 2019.

## Main challenges

After the deep crisis of the 1970s and 1980s, Bilbao had to re-invent itself. The city and the metropolitan area faced major challenges on several fronts, economic, social and environmental, and the need to improve the quality of life for its people. The regeneration programme started in the 1990s succeeded in improving the city and the metropolitan area on all these fronts. While manufacturing, despite the crisis of earlier years, is still important, the economy has diversified and has become much more service oriented. Tourism, culture and creative industries, and knowledge-intensive services along with high-tech manufacturing have emerged as major employers. The inner city and several former industrial areas have been redeveloped and some other areas are in the process of being so. The severe environmental problems have been tackled in the course. Infrastructure and accessibility have been improved, including by extending the port, expanding and renovating the airport, and constructing a new metro network. An important by-product of these improvements has been to re-instil a sense of pride in the city among its residents.

Nevertheless, Bilbao remains vulnerable in both economic and social terms. The financial and economic crisis of 2007-2009 hit all parts of Spain particularly hard. The Covid-19 pandemic has affected Bilbao more than many other cities and has demonstrated its dependence on tourism, which suddenly disappeared almost entirely because of lockdowns and travel restrictions.

In addition to the challenge posed by reducing dependence on tourism, Bilbao also faces the prospect, as described above, of population decline, growing numbers of older people and a diminishing number of people of working age, which could become obstacles to an economically and socially sustainable path of development, as well as putting pressure on public finances.

## Recent local and regional policy measures

### Main strategic interventions since the 1990s

It is relevant to outline the projects implemented in the 1990s and early-2000s as part of the regeneration programmes, which were mentioned in the Introduction, before coming on to more recent policies, since the latter are often subsequent phases of these programmes.

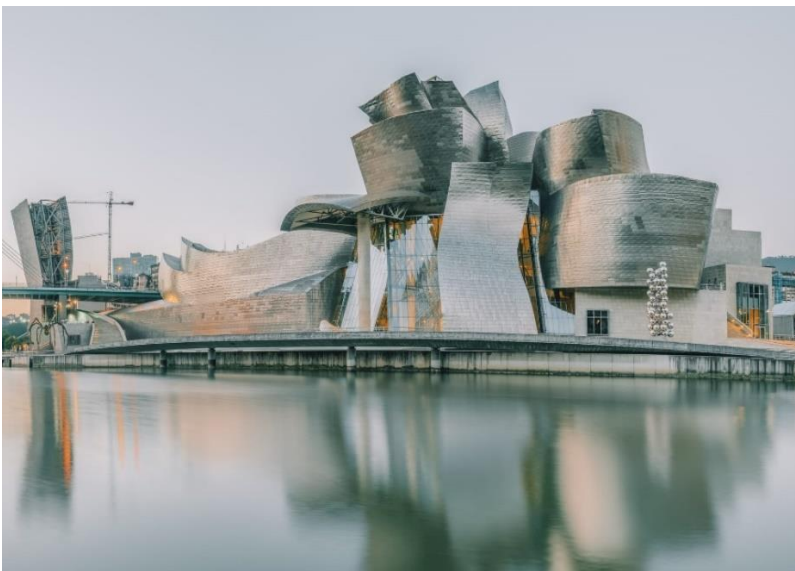




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The sense of urgency of the need for a radical change in Bilbao's urban and economic development was already evident in the 1980s, instigated not only by industrial closures but also by the severe floods caused by the the Nervion river overflowing in 1983. The first industrial area to be redeveloped was Abandoibarra in the industrial heart of Bilbao, with shipyards, warehouses and steel mills. After demolition and decontamination of the sites, redevelopment started with the building of two iconic cultural complexes; the Guggenheim Museum (opened in 1997) and Palacio Euskalduna (conference centre and concert hall, opened in 1999). The surrounding area was turned into a mixed business-education- housing environment with offices, university buildings and residential complexes. An important part of the redevelopment was to bring higher education closer to the city centre, whereas up until then, most university campuses were situated in remote areas at the edge of the city. Along the riverside, parks and promenades were also added, the redevelopment process taking almost 20 years, finally being completed in 2012.

### **Guggenheim museum, Bilbao**



A second focus of regeneration was Miribilla, the former iron ore mining area adjoining Bilbao's historic inner city, where ,as well as in the inner city itself, several housing demolition and renovation programmes were undertaken between 1994 and 2004, along with new housing construction. This was followed by projects to redesign and revitalise public spaces between 2005 and 2010. At the same time, the Ametzola district, which was cut off from the rest of the city by the railway, was also redeveloped, the railway lines and station being moved underground to reconnect the area to the city. At ground level, a new residential area and a park were constructed. The first plans for the redevelopment of the Zorrotzaurre area were also formulated at this time (see the 'Smart city strategies' section below for a description of this).

In the metropolitan area outside the city itself, a new port was constructed at the mouth of the river estuary, in Abra Bay, with direct access to the sea, while of the estuary itself was decontaminated.

### **Towards a new strategy**

By the late 2000s, most of the aims of the Revitalisation Plan for Metropolitan Bilbao had been achieved. This coincided, however, with the financial and economic crisis, which emphasised the need for a new long-term strategy. This was developed by Metropoli-30 and set out in 2016 in



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'Metropolitan Bilbao 2035'.<sup>4</sup> Its goals are summarised as follows: "Within 20 years, we should be amongst the first five EU territories and/or countries of a similar size and socio-economic status, in terms of the following: Employment, GDP, Education (Primary, Secondary, Occupational and Higher), Health, and Care for the Elderly, among other key variables". The aspiration, therefore, was to become more competitive, but also to improve the quality of life, health service and care for an ageing population. Most of the policy areas considered in the following sections are also included in this strategy review.

### Recent spatial planning and housing policies and projects

According to Ibon Areso, Bilbao's former mayor, in his review of the 'The second strategic plan for Bilbao' in 2017: "We are not done with the transformation of the city"<sup>5</sup>. The regeneration of former industrial and port areas is, therefore, continuing. After focusing on the areas close to Bilbao's inner city, more distant areas are also being redeveloped. A prominent example is Bolueta at the southern edge of the city, which was the site of one of Bilbao's first steelworks, Santa Ana de Bolueta, founded in 1841. After the company left the site to move to the new port area, the Basque government bought the land and plans were made to create a new residential area. This consists of 1100 housing units in 7 residential blocks, over half (around 600) being social housing at affordable prices, deliberately targeted at groups that face difficulties finding accommodation. Another striking feature of the plan is that it includes what is, as of now, the highest building in the world to meet the 'Passive House' quality standards (it stands at 88 m). To comply with these, buildings have to be designed to meet insulation, ventilation and airtightness requirements among others in order to be energy-efficient with high air quality and a comfortable temperature throughout the year. The colours of this and other towers, black and grey, recall the industrial past of Bolueta. Around the residential buildings, there are generous public spaces as in Bilbao's earlier urban regeneration programmes. Large parts of the area are pedestrianised, including a riverside walk.

#### Bolueta district in Bilbao



Closer to the inner city, Basurto-San Mamès is another area where regeneration has recently been completed. This is west of the inner city and redevelopment started in 2005 and faced similar issues to those in the Ametzola district described above. As in the latter, the railway was moved underground and parts of the highway and other roads were also covered, creating space for new development. New housing was built, as well as several new civic buildings and a new Medicine School connected to the university hospital which was already located there. The most

<sup>4</sup> Bilbao Metropoli-30 (2016) *Metropolitan Bilbao 2035: a look into the future. Strategic Review.* <https://www.bm30.eus/wp-content/uploads/2017/09/RE-BM2035-EN.pdf>.

<sup>5</sup> Areso, I. (2017) The second strategic plan for Bilbao. MAS Context 30/31: 370-379. <https://www.mascontext.com/issues/30-31-bilbao/the-second-strategic-plan-for-bilbao/>.



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iconic feature of the regeneration is the new San Mamès stadium, home to La Liga football team Athletic Bilbao, opened in 2013, 100 years after the old stadium was built.

## Recent economic policies and projects

In the 'Metropolitan Bilbao 2035' strategy review, a '21<sup>st</sup> century economic model' is proposed to replace the 20<sup>th</sup> century one. A central feature is a shift from the concept of 'turning resources into earnings' to one of 'turning ideas into earnings'. Part of this shift includes replacing 'growth at all costs' with balanced growth and striving for safer and more eco-friendly use of technology which contributes to social stability. Such ambitions are linked to the aim of making the Bilbao economy more knowledge-intensive and innovative, as expressed in the 'Innovation and Intelligent Specialisation Strategy for Bilbao' plan published in 2014 and discussed in the 'Smart city strategies' section below..

As well as large-scale developments as described in earlier, an effort is also being made to revitalise neighbourhood economies. The 'Auzo Factory' project is concerned with developing 'neighbourhood factories', buildings or sites which have been abandoned, to convert them into new business and cultural spaces, especially for small firms in the creative sector, socio-cultural organisations and citizens' neighbourhood initiatives. The 'neighbourhood factories' are intended to become key players in encouraging entrepreneurship and active citizenship in local areas of Bilbao. So far, four 'neighbourhood factories' have been established and the aim is to have a 'factory' in each local area.

## Recent transport and mobility policies

In 2019, a study by Greenpeace of 12 major Spanish cities named Bilbao as the city most committed to sustainable mobility<sup>6</sup>. This was because it had succeeded in promoting and facilitating walking as the main means of getting around in the city, with no less than 64% of journeys being made on foot and only 11% by car. Recent spatial planning and transport projects have made increasing parts of the city pedestrian only zones, reducing the maximum speed of vehicles to 30 km per hour on city streets, and the construction and extension of metro and tram lines have all helped to make transport in the city more sustainable. At the same time, however, the study points to the relatively small share of journeys made by cycling and expresses concern about planned new road projects that might increase the use of cars around the city.

The 30 km per hour zones were initially introduced in 87% of Bilbao's city streets in 2018 but were subsequently extended to cover all streets. In April 2021, Bilbao won the first EU Road Safety Award as a result of this, together with the city's awareness-raising campaigns for road safety and the active involvement of residents in decision-making. The city has also recently introduced several other sustainable urban mobility projects, including an e-bike sharing scheme and replacing traditional buses by e-buses.

Bilbao's most important current public transport project is the redevelopment of Abando station, in south-east of the inner city, which was first opened in 1863, when Abando was not yet part of Bilbao. In 1948, a new station was opened to replace the old one and after several renovations, a plan for a new station was announced in 2018 to be completed in 2023. The new station will be the Bilbao terminus for high-speed trains, though it will also remain connected to regional commuter train networks, and local metro and tram lines will connect to it as well. The project is part of the Basque-Y high-speed rail network plan, which will connect the three main

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<sup>6</sup> <https://www.eltis.org/discover/news/bilbao-leads-commitment-sustainable-mobility-spain>. The Greenpeace study (in Spanish) can be downloaded at [https://es.greenpeace.org/es/wp-content/uploads/sites/3/2019/05/ranking\\_ok.pdf](https://es.greenpeace.org/es/wp-content/uploads/sites/3/2019/05/ranking_ok.pdf).



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cities in the Basque Country of Bilbao, San Sebastian and Vitoria-Gasteiz and link them to the wider Spanish and French high speed rail networks.

## Recent health policies and social policies

Bilbao has expressed its commitment to socially inclusive policies for all in several ways. In 2020, the city joined the 'Inclusive Cities for All' campaign of Eurocities, committing to the European Pillar for Social Rights, particularly principle 11. childcare and support for children, and principle 18, long-term care<sup>7</sup>. And in the Metropolitan Bilbao 2035 strategy review, it is emphasised that Bilbao should better meet the needs and limitations of older people and become a more age-friendly city, though also that "*intergenerational coexistence should be one of the future's main priorities*".

Some years before this, Bilbao had already developed comprehensive programmes for children and young people, on the one hand, and older people, on the other. The latter, the 'Bilbao Age-Friendly City' programme, was developed after Bilbao joined the World Health Organisation's Age-Friendly City campaign in 2012. It focuses mainly on active ageing, participation and improving older people's quality of life and involves measuring and assessing age-friendliness, based on indicators of neighbourhood walkability, accessibility of public transport, availability of social and health services, positive attitudes towards older people and engagement in volunteer activity. One of the indicators for age-friendliness that Bilbao is seeking to improve as a priority is close access, i.e. for 100% of the population to have access within walking distance to at least two of the three major public transport networks – bus/trams, metro and bicycle lanes.

Many municipal organisations and departments are involved in designing and implementing policies in respect of personal autonomy, accessibility, housing, culture and leisure. The Basque Country government has also developed an age-friendly policy programme for all Basque municipalities, as part of the European Innovation Partnership on Active and Healthy Ageing<sup>8</sup>.

The Covid-19 pandemic of 2020-2021 has led the city authorities to take additional action to prevent or reduce the adverse social and economic effects of the pandemic. In response to the first wave of the virus, the #BILBAO AURRERA 2020 plan was approved by the city council in May 2020, with a budget of EUR 15 million. It consisted of 50 extraordinary measures for the economy, employment and the cultural sector as well as social cohesion, with support for vulnerable groups like older people, children, the homeless and those suddenly deprived of their income. The follow-up plan #BILBAO AURRERA 2021 was approved by the city council in January 2021 with the same amount of funding and the same targets.

## Smart city strategies

The smart city strategies of Bilbao are closely linked to the urban renewal which has occurred since the demise of heavy industry and the major destruction caused by floods in 1983. The regeneration policies in Bilbao, implemented from the 1990s onwards, focus not only on environmental sanitation and mobility infrastructure, but also comprise strong and continued investment in the creative sector and measures to attract knowledge-based industries and services, on the one hand, and to improve the quality of life, on the other. These policies were operated by specially formed agencies that were tasked with strategic planning, setting up public-private partnerships, and accelerating technological innovation across the whole Bilbao metropolitan region.

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<sup>7</sup> See <https://inclusivecities4all.eu/pledges/bilbao/> and [https://inclusivecities4all.eu/wp-content/uploads/2020/09/Bilbao\\_pledge\\_principle\\_11\\_and\\_18.pdf](https://inclusivecities4all.eu/wp-content/uploads/2020/09/Bilbao_pledge_principle_11_and_18.pdf)

<sup>8</sup> See [https://ec.europa.eu/eip/ageing/commitments-tracker/d4/age-friendly-basque-country\\_en.html](https://ec.europa.eu/eip/ageing/commitments-tracker/d4/age-friendly-basque-country_en.html)



This set-up led in the 2010s to a natural policy focus on smart city initiatives. Bilbao's smart city strategies were based on its decades-long experience with, and commitment to, central urban planning through public agencies, using statistics and data analytics to assess the challenges facing the city, and incorporating an experimental approach to find solutions. In 2014, the local development agency formulated the "Innovation and Intelligent Specialisation Strategy for Bilbao". It introduced smart specialisation for the Bilbao metropolitan region, focused on three sectors: the digital economy, advanced business services (Knowledge-Intensive Business Services or KIBS), culture and creativity.

In order to operationalise this, following a sector intelligence exercise (i.e. gathering data and knowledge) and a capacity building programme (i.e. a 'facilitator space' where the necessary competences are acquired), a number of flagship projects were initiated, including the Basque GameLab, a brainstorming space where gamification, Augmented Reality and Virtual Reality tools developed by the local gaming industry are made available to other industries to aid them in business modelling innovation, future technologies and service provision. Several smart city initiatives are linked to the redevelopment of the Zorrotzaurre area, a river peninsula within the city.

The strategies appear to be well under way<sup>9</sup>. In the Financial Times 2016/17 Mid-sized European Cities of the Future ranking, Bilbao was listed as 4<sup>th</sup>, and in the Smart City Index 2019 of the IMD World Competitiveness Centre's Smart City Observatory, Bilbao was named the 9<sup>th</sup> smartest city in the world. According to the IMD Smart City Index, the strengths of Bilbao as a smart city include both structural and technological measures, especially in terms of public transport, green spaces and cultural activities, employment and education, and medical services.

Two smart city initiatives are described below: Bilbao Age-Friendly City, and the Zorrotzaurre Innovation Districts.

### Age-Friendly City

As noted above, since 2012, Bilbao has been one of the pilot worldwide sites for the Age-Friendly City campaign of the World Health Organisation (WHO). In 2018, Bilbao adopted a Pact for Social Policies to further promote active ageing and a better quality of life for the elderly. The Bilbao Age-Friendly City programme has so far resulted in higher investment in equipment in nursing homes, but mainly in innovative services for older people living at home, such as a telemonitoring service to monitor the health of people with chronic conditions at home, a Home-Help service that offers technical support to adapt homes for elderly care, the provision of support and accompanying services for older people who live alone at home, and an 'Active Search' programme (*Mirada Activa*) to identify and support those who live alone.

The *Mirada Activa* programme works with 53 local elderly associations, but also with volunteers, in order to establish a network to reach out to older people who are isolated or in need of support. Another initiative targets older people experiencing loneliness and memory loss. In two public parks, the city has installed a range of physical as well as cognitive games for older people. The aim is to improve attention span, memory, mental arithmetic capacity and interaction with

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<sup>9</sup> See e.g. Calzada, I. The Techno-Politics of Data and Smart Devolution in City-Regions: Comparing Glasgow, Bristol, Barcelona, and Bilbao. *Systems* 2017, 5, 18; Jacobs, M. & Estensero, M. (2020) "Smart City Development in Zorrotzaurre, Bilbao: A case analysis", *Cuadernos Orkesta*, 65/2020.





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others. In addition, a specific website was set up targeted at improving the digital skills, digital inclusion and digital participation of Bilbao's sizeable older population. While most initiatives in the Age-Friendly City programme relate to structural and non-technological measures, it also involve telemonitoring, tele-scheduling and other information and communication services.



Bilbao plans to follow up on all of this in 2022 with the launch of the Nagusi Intelligence Centre for research and innovation into ageing and the opportunities provided by the 'silver economy'.

### Zorrotzaurre Innovation Districts

The Zorrotzaurre peninsula is a large (840,000 sqm.) post-industrial derelict brownfield site. As Bilbao did in previous decades with other parts of the city, it is now redeveloping this. As well as green spaces and housing, two innovation districts are planned. The master plan for the redevelopment was designed by the architect Zaha Hadid and includes opening up a canal to turn the peninsula into an island in the middle of the main river.

The public agency in charge of the Zorrotzaurre development has scoped this as a "Human-Centric Smart City". It tasked the Bilbao Next Lab project with a study of successful European smart city districts such as Helsinki's Kalasatama, Barcelona's 22@ and the Rotterdam Innovation District, in order to derive guidelines for the Zorrotzaurre area. The guidelines it came up with are to:

- envisage central multi-actor (i.e. public and private) spaces and to involve them as governance structures for district development;
- implement a 'holistic' system, ranging from online surveys to public events and associations to ensure public participation;
- give an important role to district development facilitators, led by the development agency;
- adopt a 'living lab' approach to smart specialisation, e.g. around a common testbed infrastructure on which companies can cooperate in innovation;
- ensure compliance of real estate with social and environmental standards;
- consider mobility as an essential part of the district development process.

As a result, the peninsula is planned to have zero-emission buildings, electric car facilities and an entirely electric public transport system comprising a tramway, electric buses and a bike sharing scheme. The island is to be accessible by zero-emission vehicles only. The public lighting system will use LED bulbs with energy-saving presence detectors and photocells.

The peninsula will be split into two innovation districts, North and South, which will be aligned with the smart specialisation strategy mentioned above. The North Innovation Urban District



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(50,000 square metres) will be dedicated to creative and cultural industries, and the South Innovation Urban District (90,000 square metres) will focus on KIBS and digital technologies. Several public buildings will be used for training courses for entrepreneurs and to house business incubators and innovation and technology associations.

### **The planned Zorrotzaurre redevelopment**



The first flagship project for the Zorrotzaurre area is the AS Fabrik project, with funding of around EUR 5.8 million,, focused on helping local industry to transition to Industry 4.0, which is characterised by the widespread use of sensor technologies, automation, robotisation, and so on. AS Fabrik is a reference centre on the Zorrotzaurre peninsula that is designed to be a model 'factory' for the creation of KIBS for Industry 4.0.

A second major smart city project for Zorrotzaurre is the ATELIER project, which comprises several initiatives to turn Zorrotzaurre into a 'smart sustainable city'. As an example, it provides investment funds to transform Zorrotzaurre into the hub and demo district for Bilbao's switch of all 3,500 waste collection and cleaning vehicles to electric. It also involves three Positive Energy Districts in Zorrotzaurre, connected via a geo-exchange loop to produce a smart grid of renewable geothermal and hydrothermal energy.

In sum, Bilbao's smart city initiatives are aimed at prolonging and reinforcing the successful urban renewal policies that the city implemented earlier around the Guggenheim museum and the redeveloped waterfront. The main strategy is one of smart specialisation in three areas: culture and creativity, KIBS and digital technology, with a special focus on sustainability (i.e. green spaces, green energy) and care for older people.



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# **EU-Japan Joint Study: Demographic trends and territorial policy responses**

## **Case studies: Genoa**

**Pieter Ballon, Marco Bontje, Erhan Özdemir and Terry Ward**



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**Map 1: Location of Genoa in Italy**



**Map 2: Genoa Metropolitan Area**



**Map 3: Metropolitan City of Genoa (Citta Metropolitana di Genova), with the municipality of Genoa in orange**







## Introduction

Genoa (Italian name: Genova) is the sixth-largest city in Italy and one of the largest ports. It is the capital of the Liguria region in the north-west of the country (Map1), with around 565,000 inhabitants in the central city (2020), and some 1.5 million in its wider metropolitan area, which is spread along the Ligurian Sea coastline for 30 km (Map 2). Its peculiar shape is a legacy of its development around multiple centres and its situation in between the sea and mountains.

The Metropolitan City of Genoa (*Citta Metropolitana di Genova*), which is part of the metropolitan region, consists of 67 municipalities with around 840,000 inhabitants in 2020 (Map 3).

Genoa's residential history goes back to at least the 5<sup>th</sup> millennium BC, making it one of the world's oldest continuously inhabited urban areas. A first town was already established in the 5<sup>th</sup> century BC, but Genoa's growth really took off in the Middle Ages, when, from the 11<sup>th</sup> century to 1797 (when it was occupied by Napoleon), it was the capital city of the Republic of Genoa. This was one of the main maritime powers around the Mediterranean Sea, incorporating Corsica, parts of Sardinia, and several places in the Black Sea as well as other parts of the Mediterranean. In addition to developing as one of Europe's major ports, it was a leading centre of commerce, trade and finance.

In the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, along with Milan and Turin, it became one of the three main industrial centres of Northern Italy, specialising in shipbuilding, steel-making and machine-tools, as well as port-related industries, such as oil refining. Most of the industries, however, went through a deep crisis in the 1970s and 1980s, initiating an outflow of people to neighbouring regions and other parts of Europe. The central city, which had a population of around 850,000 in the 1960s, was reduced to only 565,000 in 2020, as noted above, and while the decline in the metropolitan city was less, it was, nevertheless, significant, as indicated below.

Since the 1990s, several urban regeneration and economic restructuring programmes have revitalised Genoa, especially its inner city and port area, and transformed former industrial districts. The port was modernised and expanded and many historic buildings and streets were renovated or redeveloped along with the waterfront. As in Bilbao (one of the other case studies) and a number of other European cities, culture, and the tourism it generates, was an important element in the regeneration. In 1992, Genoa organised an Expo around the theme of 'Christopher Columbus, the Ship and the Sea', celebrating the 500<sup>th</sup> anniversary of Columbus' voyage to America and redesigning the Porto Antico ('old port') area based on a masterplan by architect Renzo Piano. A decade later, Genoa was the European City of Culture for 2004,, while in 2006, parts of the historic inner city were granted UNESCO World Heritage status. Regeneration, however, was frequently interrupted by disasters, like the periodic flooding of the Bisagno river, and, in 2018, the collapse of the Morandi Bridge. Though these disasters entailed heavy costs, their aftermath also offered opportunities to redevelop the city in more resilient ways<sup>1</sup>.

## Demographic trends

Genoa (defined as the metropolitan city) has experienced almost continuous population decline since the early 1970s. In 1981, population was 5% smaller than it had been 10 years earlier, in 1991, 10% smaller than 10 years before and in 2001, 9% smaller than in 1991 and 22% smaller than 30 years earlier. The decline continued in the following years, with only a small hiatus in 2004 when there was some growth because of a significant net inflow of people moving into the area from outside (Figure1). Indeed, throughout the period from 2001 to 2018, except for the

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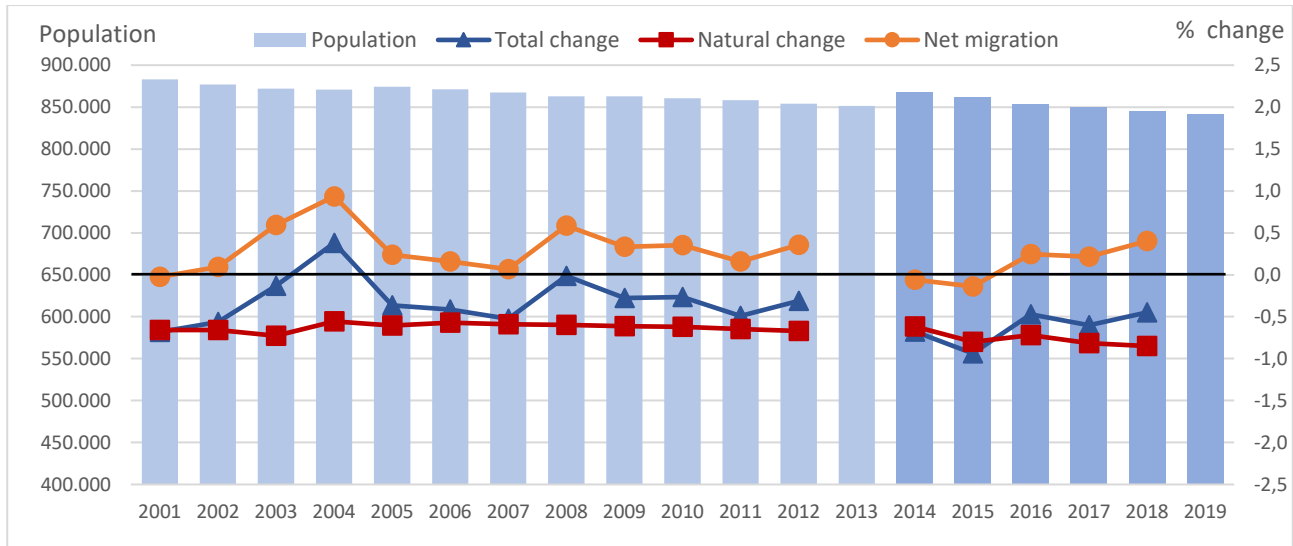
<sup>1</sup> See e.g. Pirlone, F., I. Spadaro & S. Candia (2020) More resilient cities to face higher risks. The case of Genoa. *Sustainability* 12 (12), 4825. <https://www.mdpi.com/2071-1050/12/12/4825/htm>.



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two years 2014 and 2015, the inward movement into the Genoa metropolitan area outweighed the outward movement. However, it tended to be insufficient to offset the natural decline in the population, in each year the number of deaths exceeding the number of births, reducing population by 0.5 to 1% annually. As in many parts of the EU, therefore, growth in population depends essentially on net inward migration continuing at a rate which is enough to more than offset the natural population reduction.

**Figure 1 Total population and changes in population in Genoa metropolitan city, 2001-2020**



Note: The population figures relate to 1 January of each year. Figures for the total change indicate the percentage change over the year. Figures for the natural change indicate the number of births less the number of deaths over the year as a % of population at the beginning of the year. Figures for net migration are calculated as a residual between the total change and the natural change, again measured as a % of population at the beginning of the year (so including any statistical error in the calculation of the total and natural changes).

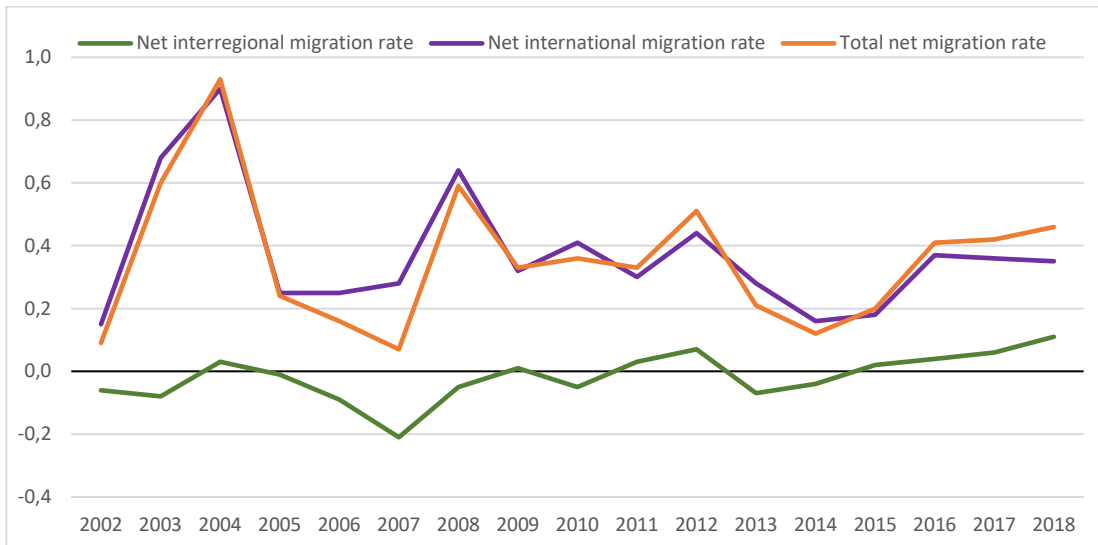
Note that there is an apparent break in the population figures between 2013 and 2014, which may be a consequence of a change in the territorial definition of the region, so that it is not possible to calculate the change in population and in the number of births and deaths between 2013 and 2014, and therefore, net migration in 2014, on a consistent basis.. There is also a break between 2019 and 2020, which has the same effect on the calculation of changes in 2019.

Source: Eurostat Regional Population Statistics..

Most of the new onward migration over the period is made up of inwards flows of people from other countries into the region exceeding outflows to countries outside Italy. These consist predominantly of two groups – people from Eastern Europe, mainly from Romania and Bulgaria, and migrants from developing countries, many of them refugees and asylum seekers. These added almost 1% to the total population in the metropolitan area in 2003, 0.6% in 2008 and between 0.1% and 0.5% in the other years (Figure2). By contrast, the inward movement of people from other regions in Italy exceeded the outward movement in only three years between 2002 and 2014 and then only marginally, and while it exceeded the latter in each year from 2015 to 2018, it did so by only a very small amount. (Note that there is a break in the migration figures between the 1 January 2019 and 1 January 2020, so that the change in 2019 cannot be calculated.)



**Figure 2 Net interregional and international migration rates for Genoa metropolitan region, 2002-2019 (as % of population in each year)**

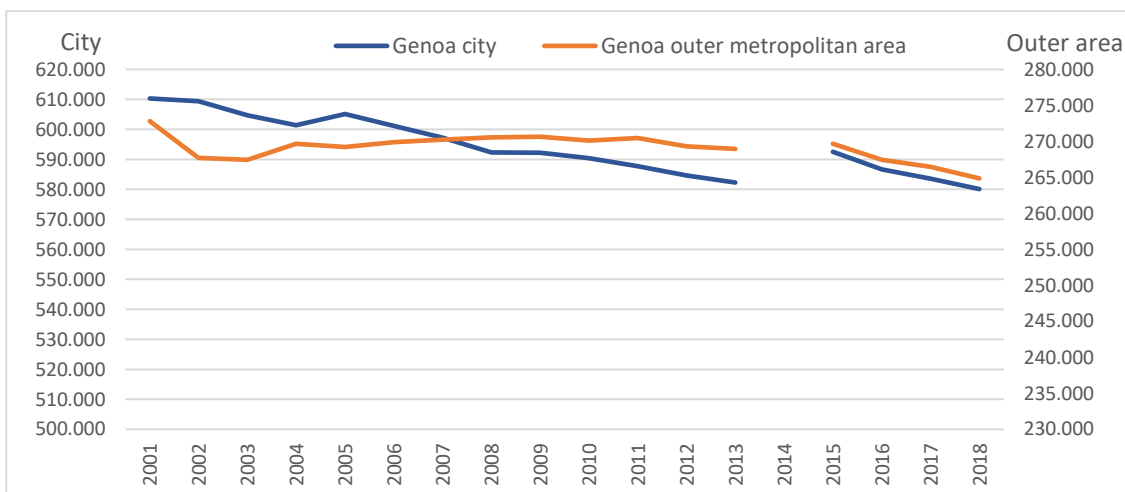


Note: Net migration rates relate to inward migration less outward in each year as a ‰ of population in the region. The net migration rates may differ slightly from those in Figure 1 above as the data here relate directly to estimates of inward and outward movements instead of being calculated as residuals between total changes in population and natural changes.

Source: Istituto Nazionale di Statistica (Istat) and own calculations.

The decline in population between 2001 and 2013 was concentrated in the city of Genoa, while in the outer metropolitan area, apart from a reduction in 2002, population remained broadly unchanged over the period (Figure 3). Population in the city was, therefore, almost 5% smaller in 2013 than it had been in 2002, whereas in the outer area it was slightly larger. From 2015 to 2018, however, the decline in population occurred in the outer area as well as in the city and at a similar rate.

**Figure 3 Total population in Genoa city and outer metropolitan region, 2001-2018**



Note: There is a break in the figures in 2014.

Source: Eurostat Cities and Greater Cities and Regional Population Statistics.

## Changes in the age structure of the population

The trend decline in the population in the region, which is a consequence in large measure of the birth rate being substantially below what it needs to be to maintain population unchanged given the death rate, has implications for its age structure. In particular, there was a gradual increase over the period 2001 to 2020 in the proportion of population aged 65 and over, which

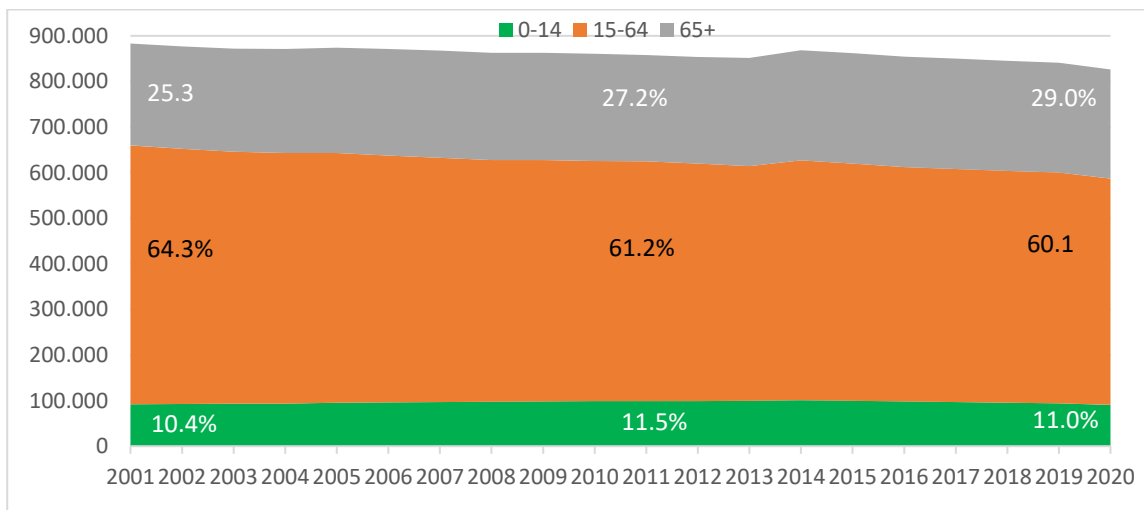


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was already relatively large, as in Italy generally, at the beginning of the period, reflecting the many years before that of low birth rates. The proportion, therefore, rose from 25% in 2001 to 29% in 2020. This was mirrored by a decline of a similar amount in the proportion of those aged 15-64 (here taken as population of working-age since no data are available before 2014 on the 20-64 age group, though the change over the period ought to be much the same) (Figure 4). The old-age dependency rate in 2020, measured as those aged 65 and over as a share of those aged 20-64 was

In relation with the changes in the proportions of 15-64 and 65 and over populations, the old-age dependency rate – here defined as the number aged 65 and over relative to those aged 15-64 – has increased from 39% to 48%. In terms of the old-age dependency rate as defined in the section on demographic trends in this report – i.e. with working-age population defined as those aged 20-64, which gives a rate of 40% in 2020 – the implication is that for every 5 people of working-age, there are just over two people aged 65 and over, who are much more likely to be in retirement than in employment and so who effectively need to be supported by those in work.

**Figure 4 Breakdown of population by broad age group in Genoa metropolitan region, 2001-2020**



Note: Percentage figures indicate the share of total population of each age group at the 1 January in in 2001, 2011 and 2020. There is a break in the population series between 2013 and 2014, which affects the figures for the totals (the increase shown in the total between 2013 and 2014 is not a real one), but may not significantly affect the composition of the population. The same applies to the decline in population between 2019 and 2020, which is exaggerated by the break in the series for total population.

Source: Eurostat Regional Population Statistics.

## Future trends in population

Genoa has among the lowest birth rates and oldest populations of cities in Italy, a country with among the lowest birth rates and the largest proportions of people aged 65 and over in the EU. Demographic trends, moreover, show no sign of this changing in the foreseeable future. In 2018, the overall total fertility rate was just 1.22 in 2018, down from 1.39 in 2012 and well below the 2.1 rate needed to maintain population unchanged. Life expectancy at birth was 83.2 in 2019, also among the highest in the EU, up from 79.9 in 2002, suggesting that the population will continue to age at the same time as the number of people declines in the coming years, unless, of course, these trends are offset by an increase in inward migration.

The latest Eurostat population projections, based on 2019 data, are for a further decline in population of around 5.5% by 2035 and by a further 4.5% by 2050. At the same time, the proportion of the population aged 65 and over is projected to rise from 29% to 33.5% by 2035, while the proportion of those of working age (20-64) is projected to fall from 56% to 52.5% in 2035. This implies an old-age dependency rate of 64%, which is 12 percentage points higher



than in 2020. Although the share of the population of 65 and over, along with the old-age dependency rate, is projected to begin falling slightly from the late-2040s up to 2050, it still means nearly one in three of the population being over what is now the official age of retirement in most parts of the EU, and every 10 people of working age needing effectively to support almost 7 people in retirement.

## Main challenges

The demographic trends analysed above make clear that Genoa's main socio-demographic challenge is a combination of structural population decline and ageing. Since it is unlikely that the birth rate will recover any time soon to a level sufficient to offset the structural ageing trend, the decline in population could only be arrested by increasing internal and/or international inward migration, which seems unlikely to occur on the scale necessary. Although Genoa's economy has recovered from the deep crisis of the 1970s and 1980s and has been restructured to a significant extent, it is still lagging behind most other cities and regions in Northern Italy. Migrants, both from within Italy and from outside, are therefore more likely to go to other places. The economic transformation since the 1990s towards a more service-oriented economy, focusing especially on knowledge-intensive sectors, culture and tourism, has not yet succeeded in closing the economic development gap with other parts of Northern Italy. The recent move towards becoming a more innovative and smart city (see the 'Smart city strategies' section below) may change this, though other cities, like Turin and Milan, are also developing similar strategies.

Additional challenges identified in the 'Strategic Dossier' for the National Operational Plan for Metropolitan Cities in Italy, 2014-2020 (hereafter referred to as Strategic Dossier NOP-MCI) include:

- Spatial development and mobility: unbalanced and partly obsolete infrastructure networks, shortcomings in infrastructure capacity, too sprawled-out construction in the three post-war decades (especially in the 1970s), too much traffic through areas with high population density, and too few green spaces in urbanised areas;
- Environmental and ecological: pollution of the air, water and soil, hydrogeological risks in river valleys (flooding, in particular) combined with increasing frequency of extreme weather conditions and coastal erosion;
- Social: unbalanced distribution of services (especially higher level services concentrated in the central city), accumulation of problems in large housing estates built in the 1970s and 1980s (lack of services, decaying buildings, concentration of vulnerable groups).

While current policies are already addressing these challenges, and indeed have been doing so for a number of years, they remain challenges for the coming decades.

## Recent local and regional policy measures

### Strategy and Action Plan Genoa 2050

Before reviewing strategies in particular policy areas, it is useful to consider a recently-launched longer-term plan for transforming the city which integrates several policy areas: the Strategy Genoa 2050 and the Action Plan connected to this, which together are termed 'Lighthouse - Genoa's city strategy to a better future'.<sup>2</sup> Preparations for this started in 2018, the strategy was approved in late 2019 and it began to be implemented in 2020. The strategy was co-designed with 93 stakeholders from the public sector, private enterprises and various associations. Many

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<sup>2</sup> See <http://www.genovatransformation.com/en/strategy>.





of these were not only involved in the design but also committed themselves to helping to implement the strategy in the coming decades.

The strategy is based on 3 'assets':

- 'Grey' – the innovative development of new infrastructure and proper use of existing infrastructure. This involves the mapping and monitoring of the current distribution and condition of infrastructure and future demand for it, as well as innovative technical and conceptual design.
- 'Green' – urban regeneration and climate change. This includes adaptation to climate change, protection against environmental hazards, urban regeneration with nature-based solutions, and a sustainable energy and climate action plan.
- 'Soft' – the economic and social impact on communities and businesses. This covers a broad range of economic and social issues, targeting 'socio-economic systems' in the city. It includes several dimensions of urban resilience (strengthening resilience of both the urban community and its governance), integrated planning, analysing vulnerabilities, and tools to share knowledge and data on societal and economic trends and responses to them.

For the first phase of the Action plan, 15 actions have been initiated: three in relation to the 'Grey' asset, four in respect of the 'Green' asset and 8 in respect of the 'Soft'. Both the Strategy and the Action Plan will be regularly updated in the coming years.

### **Spatial development strategy: Strategic Plan and General Territorial Plan**

In 2017, the Metropolitan City of Genoa presented its first 'Strategic Plan', which is, in fact, not just a spatial development strategy, but a comprehensive development strategy for the Metropolitan City area (consisting of 67 municipalities, see map above). Such a strategy is in line with the objective stated in the Strategic Dossier NOP-MCI: "(...) *to build an interdisciplinary metropolitan planning, where urban strategic projects, infrastructures, port, valorisation of the environment and the cultural historical heritage are integrated.*" The Plan covers a 3-year period and is updated yearly. Parallel to this, a 'General Territorial Plan' was formulated to coordinate and control local-level municipality plans.

A first step towards both the Strategic Plan and the General Territorial Plan was the preparation of the 'Guidelines for the formation of the General Territorial Plan', approved in 2015, which included the following ideas and principles:

- Strengthening the role of Genoa as 'gateway to Europe' within the network of Italian and European metropolitan cities;
- 'Strategic systems': areas with complex and cross-sectoral problems to be addressed by integrated projects;
- Strengthening the built environment, promoting urban regeneration;
- Security of the territory and prevention of floods as a precondition for the choices made in the Strategic Plan and General Territorial Plan;
- Sustainable economic revival;
- Raising the quality of life and attractiveness of the Metropolitan City area, based on the ecological network, the networks of public services, and the historical heritage;
- 'Homogeneous areas' as means for efficiently organising and managing territorial services, the Metropolitan City being divided into 9 sub-areas for which more detailed plans and area-based projects are developed.

In the Strategic Plan, three themes are set out, including that of the 'Metropolitan City in relationship with the region', which is the most relevant in the present context. This includes



projects for territorial cohesion, economic development, resilience and public services. For each project, short-term (1-3 years) as well as long-term objectives (10 years) are formulated. In line with Italian national policy, projects for **territorial cohesion** focus, in particular, on two types of area: 'peripheral settlement areas, neighbourhoods at Genoa's western city edge and in adjoining suburban municipalities which are socially marginalised and lack services; and 'internal areas', which are less urbanised areas at the eastern edge of the Metropolitan City and some distance from the centre, which equally lack services and are unattractive places in which to live.

Projects for **economic development** include the 'Parco del Basilico', promoting specialisation of the agro-food sector in the west of Genoa (focusing on basil and pesto), combined with restoring an historic villa and developing education and tourist programmes; developing the Fuorigenova web portal to promote the Metropolitan City area outside the central city as a place to live, visit and invest in; and Enterprise+ to encourage the creation of new enterprises and the strengthening of existing ones.

### Parco de Basilico, Genoa



Projects for improving Genoa's **resilience** are aimed at providing better protection against floods, improving air quality and energy efficiency of thermal power stations, and acoustic mapping and planning to reduce traffic noise.

Projects on **public services** include those for improving wastewater treatment and reducing water loss and for managing waste, shifting the focus from waste to recovery in line with developing a circular economy.

While the main focus of the Strategic Plan is on the Metropolitan City, it also expresses the higher level ambition of establishing a 'macro-metropolitan area' in north-west-Italy to encompass the metropolitan areas of Genoa, Turin and Milan as well as the regions in which they are located, Liguria, Piemonte and Lombardia.

Related to projects for improving resilience, Genoa is also participating in the EU-funded UNaLab (Urban Nature Labs) project<sup>3</sup>, aimed at helping to develop smarter, more inclusive, more resilient and increasingly sustainable societies through innovative nature-based solutions. The UNaLab Consortium consists of 28 partners from 10 cities across Europe and beyond, including municipalities, research institutes and businesses. Genoa is one of the three 'front-runner cities' (together with Eindhoven in the Netherlands and Tampere in Finland) which have established Urban Living Labs to demonstrate possible nature-based measures to mitigate and adapt to

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<sup>3</sup> <https://unalab.eu/en/our-cities/city-genova>



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climate change together with sustainable management of water resources. Genoa's Living Lab is in the Gavoglio area in the Lagaccio district, a former military barracks, which have been demolished, and the intention is to create an urban park, in which 12 different nature-based solutions will be implemented. The park will combine several functions. It will have a leisure area and community gardens for urban farming and will demonstrate water absorption and re-use, as well as being part of a green corridor along with other nearby green areas. The same area was also part of the URBACT Network '2nd Chance – Revitalisation of Sleeping Giants' project.<sup>4</sup>

### Economic strategy

Genoa's current economic development strategy is focused on three objectives: promoting an innovative and diversified production system, developing the city as a tourist destination, and increasing the international competitiveness of its port. The deep crisis of the 1970s and 1980s made clear that Genoa's economy had become overly dependent on its port-industry complex. The restructuring since the 1990s has focused on diversifying the economy. While the port, logistics and industrial plants have been modernised and remain important, research, high-tech manufacturing and knowledge-intensive services together with culture and tourism have emerged as additional sources of income and jobs. According to the Strategic Dossier NOP-MCI, however, the strategy should aim not only at increasing competitiveness, but also at improving the quality of life of people in the city and the social inclusion of vulnerable groups.

The city branding site '*Genova Meravigliosa*'<sup>5</sup> highlights 6 sectors which are key: the port, logistics and shipping; transportation and mobility; high tech; tourism and culture; the blue economy and silver economy. Of these, only the 'silver economy' remains to be developed, but it is interesting that an ageing population is seen as an economic opportunity for the coming years and not simply as a problem, both the city and region being keen to promote themselves as attractive places for 'active ageing'.

### The Biosphere in Genoa port



As regards tourism, Genoa has been very successful in recent years in attracting growing numbers of visitors, and, though the Covid-19 pandemic brought this growth to a sudden halt in 2020, it is likely to resume once the effect of the pandemic has diminished. As in the case of many other tourist destinations, the pandemic gave Genoa a chance to rethink its tourist strategy, focusing on ways of reducing the negative impact on parts of the city of excessive numbers of tourists. To this end, Genoa is currently leading an EU-URBACT Action Planning

<sup>4</sup> <https://urbact.eu/2nd-chance>

<sup>5</sup> <http://www.genovameravigliosa.com/en>





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Network project entitled 'Tourism Friendly Cities', which is aimed at exploring how urban tourism can be more sustainable and more in balance with the needs of the local community and sustainable urban development<sup>6</sup>.

In addition, Genoa hosts annually the Silver Economy Forum, an international event designed to highlight the needs of the growing population aged 55 and over and to promote the development of enterprises to produce the goods and services to cater for those needs<sup>7</sup>.

### **Housing and urban regeneration strategies**

Genoa has launched several urban regeneration programmes since the 1990s, often co-funded by the Italian national government and in some cases by the EU. The decline in Genoa's population started in the city centre in the 1970s and 1980s, as a result not only of de-industrialisation and massive job losses but also of the eviction of tenants from decaying housing as property owners took apartments off the rental market. Because the city centre was overcrowded, population decline there was seen at the time as a less pressing problem than a shortage of affordable housing. Large public housing estates were built on the outskirts of the city in response to this, helping to accelerate population decline in the centre.

### **The port of Genoa and surrounding area**



When urban regeneration started in the city centre, port and adjoining neighbourhoods, the objective was to make the areas more attractive for visitors and investors as well as for those still living there. Genoa's urban regeneration programmes, supported by the EU URBAN and URBAN II programmes, also focused on the historic part of the city centre and while they were also intended to tackle social and economic problems of people living there, they did not resolve the shortage of affordable housing. Instead, regeneration resulted in rising housing prices, especially in and close to the historical centre, which previous residents were not able to afford. The ageing population also increasingly became a factor in the mismatch between supply and demand. Many homeowners remaining in the city centre were older people living in apartments that had become too large for them, while younger people had problems accessing the housing market because of the high prices and problems of finding sufficient affordable places to rent.<sup>8</sup>

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<sup>6</sup> <https://urbact.eu/tourism-friendly-cities>

<sup>7</sup> <https://www.silvereconomyforum.it>

<sup>8</sup> Bini, P.C., C. Cortese & A. Violante (2011) The governance of urban shrinkage in Genoa. Shrink Smart Research Report. [https://www.ufz.de/export/data/400/39026\\_D10\\_Genoa\\_final.pdf](https://www.ufz.de/export/data/400/39026_D10_Genoa_final.pdf).



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This happened in a national context of housing and urban policies becoming more neo-liberal in the 1990s and 2000s, resulting in a reduction in housing for rent and marginalising the public rental sector. In the aftermath of the financial crisis of 2008-2009, which had a severe effect on both the Italian economy and housing market, the rental sector as well as public housing have become more important priorities. Large cities like Genoa have initiated affordable housing programmes for vulnerable groups. The Strategic Dossier NOP-MCI refers to the programmes concerned, in which housing and social policies are combined. In addition to the public housing allocation system, several programmes have been implemented, including measures to prevent social exclusion by providing 'emergency housing' and social support to 'fragile' groups like older people, the homeless, single parents and migrants. Other schemes are aimed at improving the living conditions in areas where many public residential buildings are concentrated. These are not only about housing but also include measures to increase safety and to educate residents in ways of maintaining their apartments and neighbourhood in better condition.

### Health care and social policies

Genoa's city government adopted the 'Health City Institute Manifesto' in 2019. By doing so, it committed itself to viewing healthcare as a common good and a guaranteed right for all citizens. It also promised to put health at the centre of all urban policies.

In line with this manifesto, Genoa joined the 'Cities Changing Diabetes' programme in 2020<sup>9</sup>, which was initiated by the Steno Diabetes Centre Copenhagen, University College London, and Novo Nordisk in 2014 and in which 35 cities now participate. The programme's main focus is addressing social and cultural factors that can increase the risk of type-2 diabetes for people living in urban environments.

Several projects to improve the health condition of residents have also been initiated recently at regional level, with a particular focus on older people. An example is the FRAGILE project (Frailty Research and Assessment – Intervention in Ligurian Interdisciplinary Laboratory for the Elderly), in which participants consist of the Liguria regional authority, the University of Genoa and Galliera Hospital in Genoa. Activities include enhancing the use of technologies to enable older people to live independently and to support their wellbeing as well as to help identify those at risk of frailty and functional and cognitive decline and to improve the quality of homecare services. Another project, which is part of the European Innovation Partnership on Active and Healthy Ageing<sup>10</sup>, focuses on education and training to fill the gap between the skills of healthcare practitioners and those needed by older people

### Smart city strategies

Genoa is a city that has been very active in European innovation projects relating to smart cities. EU funding for such projects a decade ago was the starting point for Genoa's smart city strategy. A local governing body, the Genoa Smart City Association, was established to drive the strategy. From the start when it was founded in 2010, it was based on public-private partnership principles, being composed of the Genoa municipality, Italy's main electricity supplier and the local university.

As a major port, Genoa's main objective appears to have been to obtain funding for smart city projects relating to transport, buildings and energy production, with a focus on sustainability and energy efficiency. The number of projects expanded rapidly. By 2014, 52 smart city projects were running, no less than 32 of which were explicitly linked to sustainability and energy

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<sup>9</sup> <https://www.citieschangingdiabetes.com/network/genoa.html>

<sup>10</sup> [https://ec.europa.eu/eip/ageing/commitments-tracker/a3/fragile-frailty-research-and-assessment-intervention-ligurian\\_en.html](https://ec.europa.eu/eip/ageing/commitments-tracker/a3/fragile-frailty-research-and-assessment-intervention-ligurian_en.html)





efficiency, 10 were directly linked to smart and electric mobility and 6 were linked to (digital) inclusion<sup>11</sup>.

Currently, the Genoa Smart City Association has 54 members: 13 public organisations and research centres, 26 companies and 16 non-profit associations. As such, it is the embodiment of the so-called 'triple helix' (public-private-research), and even of the 'quadruple helix' (public-private-research-citizens), form of collaboration. Its goal is not simply to identify and initiate smart city projects, but also to set up a smart city community of citizens, entrepreneurs, researchers and officials, who are all involved in the process of envisioning, testing and carrying out the projects concerned.

The establishment of a formal association, specifically devoted to smart city projects, and presided over by the mayor of Genoa, testifies to the critical importance attached to smart city development. At present, the Genoa Smart City Association is working in five 'smart areas' to produce innovative solutions:

- 'silver': as the self-proclaimed city with the most senior citizens in Europe, the association is focusing on innovations to improve the quality of life for older people, involving universities, research centres, technology companies, health and care systems and medical research in a real innovation incubator to meet the well-being needs of the over 60s while creating new jobs for young people;
- 'blue': as one of the main ports in Europe, the association has selected the 'blue economy' as a second focal point to provide opportunities for both business development and job creation;
- 'space': to explore the economic opportunities that the aerospace sector offers for companies in the Genoa area and for young people;
- 'high tech': to build on Genoa's long history in technological and scientific research as an engine of economic development;;
- 'sustainability': tackling the vulnerability of infrastructure, emergency planning and urban redevelopment while protecting the environment, ensuring safety in common areas and improving energy efficiency and waste management

As a result, Genoa's smart strategy shows distinct signs of gaining momentum. New smart city-related initiatives continue to be undertaken, such as the Start 4.0 competence centre and Genoa's Living Lab Smart City. Genoa has also been selected to be part of the 'Smarter Italy' programme, a EUR 90 million initiative for the joint procurement of smart city solutions, such as for adaptive and predictive traffic management platforms and smart mobility solutions for historical cities. In addition, in 2021, Genoa was named as the city with the best digital infrastructure in Italy by Ernst & Young, based on the presence of a large fibre optic backbone, the launch of 5G projects, advanced energy management systems (a smart electricity grid and smart meters) and investment in environmental and safety monitoring systems.

In the 'Silver' area, the kind of project sponsored is the development of spectacles that enable people with hearing difficulties to focus on the sounds they want to listen to by looking at where they come from. Multiple acoustic sensors enhance the sound concerned and blur surrounding noises. Another is 'Kibi', a monitoring system for older people with mobility difficulties, developed by Teseo, an innovative spin-off company of the University of Genoa, which is based on smartwatches and sensors. The watches identify the location of the person concerned and the

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<sup>11</sup> See e.g. Dameri R.P. (2014) Comparing Smart and Digital City: Initiatives and Strategies in Amsterdam and Genoa. Are They Digital and/or Smart?. In: Dameri R., Rosenthal-Sabroux C. (eds) Smart City. Progress in IS. Springer, Cham.



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sensors evaluate the way they are moving and whether or not they need help, such as in the event of a fall, information which is transmitted to a care home or family member in real time.

Two sets of smart city projects in Genoa are described below, the Port Lab 4.0 and the Living Lab Smart City.

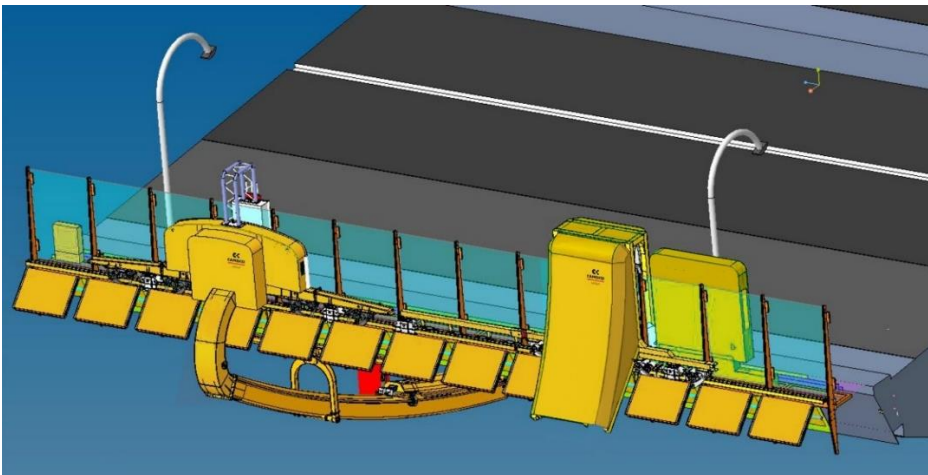
### Port Lab 4.0

Port Lab 4.0 is a programme set up for the port of Genoa to create a 'digital twin' of the harbour, i.e. a digital replica for monitoring and for carrying out simulations. It is fed by large amounts of data collected from different sources –digital databases, a network of sensors, cameras and so on – and involves the modelling of logistical processes, a tracking system based on blockchain technology<sup>12</sup> and the geolocation and automation of operations. It enables the actual situation, the way that it is changing over time and movements of people and traffic to be monitored and modelled, as well as crisis scenarios and responses to them to be tested. As such, it is an important milestone in smart city evolution.

Around EUR 5.5 million has been allocated for the first phase of the programme, financed partly by Start 4.0, a competence centre set up in 2019, based on the same public-private philosophy as the Genoa Smart City Association, to support and co-finance smart projects in the city. The first phase includes the CASTORE project, which makes use of artificial intelligence to analyse real-time data through machine-learning and the Internet of Things (i.e. networked machines, objects and sensors) to monitor passenger flows between the port terminal and the local public transport system as well as the status of infrastructure and equipment. As such, it provides feedback in real-time to transport managers and passengers alike on the travel situation to inform their decision-making and choices.

The Port Lab 4.0 digital twin programme also includes smart technologies for the new Ponte San Giorgio harbour bridge constructed after the collapse of the previous one in 2018. A network of 240 sensors has been installed on the bridge to monitor vibrations, torsion and dilatation and so to ensure the safety of the structure. In addition, 4 autonomous robots have been installed for inspection and cleaning, along with a lighting and dehumidification system. The robots travel from one end of the bridge to the other every 8 hours, the first automatic monitoring system in the world and a replicable model which can improve the safety of both this and any similar type of infrastructure. All the data collected from the bridge will be analysed in the digital twin.

### The inspection and cleaning robots for the new bridge



<sup>12</sup> A digital ledger of transactions, in which individual records, or 'blocks', are linked together in a single list, or 'chain'. Since this is duplicated and distributed across the entire network of computer systems, it makes it virtually impossible to hack or cheat the system.



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<https://news.camozzi.com/projects/the-creation-process-of-the-robots-for-the-new-bridge-in-genoa.kl>

A further feature of the programme is the installation of a local 5G system to transmit a continuous stream of data from drones, public vehicles and private cars to provide information on the state and safety of infrastructure and the use made of it.

As noted above, all these projects are funded through a public-private partnership between the municipality, Start 4.0 and other public bodies, on the one side, and individual businesses, on the other.

### **Living Lab Smart City**

Another interesting case is the “Living Lab Smart City” programme that the University of Genoa has set up in Savona within the greater Genoa metropolitan region<sup>13</sup>. This is a more research- and experimentation driven example of smart city developments, which is complementary to the business- and utility-driven Port Lab 4.0 programme

The Savona campus has around 2.200 students and university staff and 15 SMEs with around 130 workers. It also has a restaurant, sports facilities, green areas and accommodation, and so features many services and facilities of a small city district.

In 2017, an Open Innovation Lab was set up on campus in collaboration with a multinational company to test smart city technologies for energy. In the following years, several innovations were implemented, mainly in respect of sustainable energy, e-mobility, energy-efficient buildings and environmental sustainability. A smart microgrid was installed for electrical and thermal energy, controlled by an energy management system, which links several co-generating units on campus, including a smart energy building, photovoltaic plants, solar thermodynamic dishes, cogenerating micro-turbines, gas boilers, absorption chillers and an electrochemical storage system. In addition, charging stations for e-vehicles, and managed ventilation, air-conditioning, water collection and recycling systems were installed.

The results were not only a reduction in energy costs by around 30% and the generation of electricity but also the involvement of all campus stakeholders, together with outside companies, in sustainable innovation. As such, it achieved the explicit goal of a ‘living lab’ project, which is to research and test prototypes in real-life situations with the involvement of a community of innovators. The living lab can also be used as a demonstration area for the transfer of knowledge and technologies to urban districts on a larger scale.

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<sup>13</sup> See e.g. Bracco, S., Delfino, F., Laiolo, P. and Morini, A. (2018) Planning & open-air demonstrating smart city sustainable districts. *Sustainability*, 10(12).



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# **EU-Japan Joint Study: Demographic trends and territorial policy responses**

## **Case studies: Kortrijk**

**Pieter Ballon, Marco Bontje, Erhan Özdemir and Terry Ward**



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## Map of Belgium showing Kortrijk





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## Introduction

Kortrijk is a small city of around 77,000 inhabitants, with around 40,000 people living in the city itself and the rest in the surrounding districts. It is the main regional centre of the southwest of Flanders in Belgium, close to the border with France and located on the river Leie, which through the Bossuit-Kortrijk canal, connects it to the Schelde and the port of Antwerp in Northern Belgium. It is just 25 km from the city of Lille in Northern France and part of the French-Belgian 'Eurodistrict', or 'Eurometropolis', of Lille-Kortrijk-Tournai, which has a population of over 2 million. It is also only 50 km from Ghent, the third largest city in Belgium and 90 km from Brussels. As such, it both suffers and gains from its close proximity to much larger economic and cultural centres.

In the 19<sup>th</sup> and 20<sup>th</sup> centuries, it was a centre of the flax industry and the production of linen and has continued to produce textiles up until the present day, though the industry has long since ceased to be the source of prosperity and jobs that it was in the past. In the 1970s, the industry in the city and surrounding areas, spreading to Lille in the south-west and Tournai in the south-east, was hit by competition from lower-wage economies which forced them out of traditional markets and led to a substantial reduction in sales, from which it has never recovered. Many factories were closed and textile companies relocated to lower-cost countries or ceased production completely, causing large-scale losses of jobs. The city, therefore, went through a lengthy period of deindustrialisation and economic decline in the latter part of the 20<sup>th</sup> century. Population growth, which had previously been significant as people moved in from rural areas, attracted by the business and employment opportunities it provided, came to an end and there was some reduction as employment fell.

During this period, the economy was restructured, based primarily on services rather than manufacturing, and making use of the many empty and derelict buildings left behind by the textile industry and offering opportunities for redevelopment. The university, set up in 1965 as an offshoot of the University of Leuven, was expanded into a campus and now has over 1,300 students, who have a choice of three-year bachelor programmes in Medicine, Biomedical Sciences, Mathematics, Physics, Computer Sciences, Biochemistry, Biotechnology, Applied Economics and Education. Several hospitals were built and a trade fair complex constructed. (Belgian's first all-pedestrian shopping street had been opened in the city a few years earlier in 1962.) These and other development projects were initiated by the municipality and the *Intercommunale Leiedal* – a collaborative venture of neighbouring municipalities and local authorities, set up in 1960 to further the economic development of the region – with the express purpose of increasing Kortrijk's attractiveness as a city in which to live, work and do business. In addition, a large-scale infrastructure programme was initiated by the Flanders regional government in 1997 to make the River Leie running through the city capable of accommodating larger ships to carry goods to the sea port at Antwerp, which involved the construction of new quays and bridges.

As indicated below, these initiatives have helped to reverse population trends, but there remains the prospect of future population decline unless the inward movement of people into the city from outside continues at relative high rates.

## Demographic trends

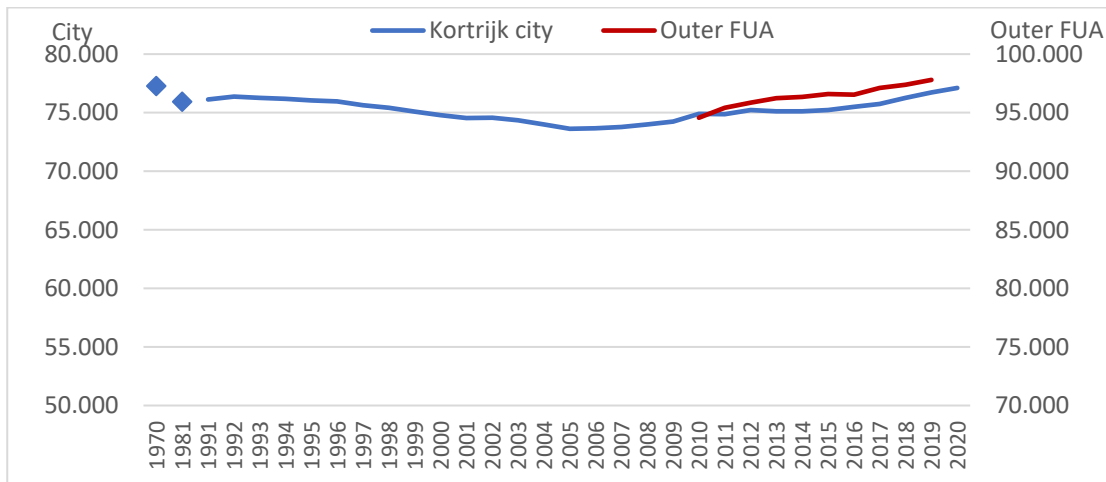
After growing almost continuously in earlier decades, from 1970 up until the mid-2000s, population in Kortrijk either remained virtually unchanged – over the 1980s and early 1990s – or declined – over the 1970s, when there was a reduction of 2%, and from 1995 to 2005, when it fell by 3% (Figure 1). In 2005, therefore, the population of the city was some 5% smaller than it had been 35 years earlier. It is the experience during this period which of particular relevance



for the present study, though as indicated below the slight increase in population which has occurred since 2005 has been wholly a consequence of inward migration into the city exceeding outward migration, which has more than offset a natural decline. Between 2005 and 2020, therefore, total population increased by 5%, though this still meant that there were slightly fewer people living in the city than 50 years earlier.

The functional urban area (FUA) of Kortrijk, i.e. including the suburbs and small towns and villages surrounding the city, which are in commuting distance of the city, is just over twice the size of the city itself, with a population of close to 180,000. Over recent years, the outer FUA – i.e. the area surrounding the city itself – has grown by at much the same rate as the city itself. Although between 2010 (the earliest date for which the relevant data exist) and 2015, population in the outer area increased by slightly more than in the city, between 2016 and 2019, growth in the two was very similar (Figure . , implying a growth of population in the suburbs relative to the city over this period., if by only a little. (Between 2010 and 2019, population in the suburbs increased by 1 percentage point more than in the city.)

**Figure 1 Change in population in Kortrijk City and Outer Functional Urban Area (FUA) 1970-2020**



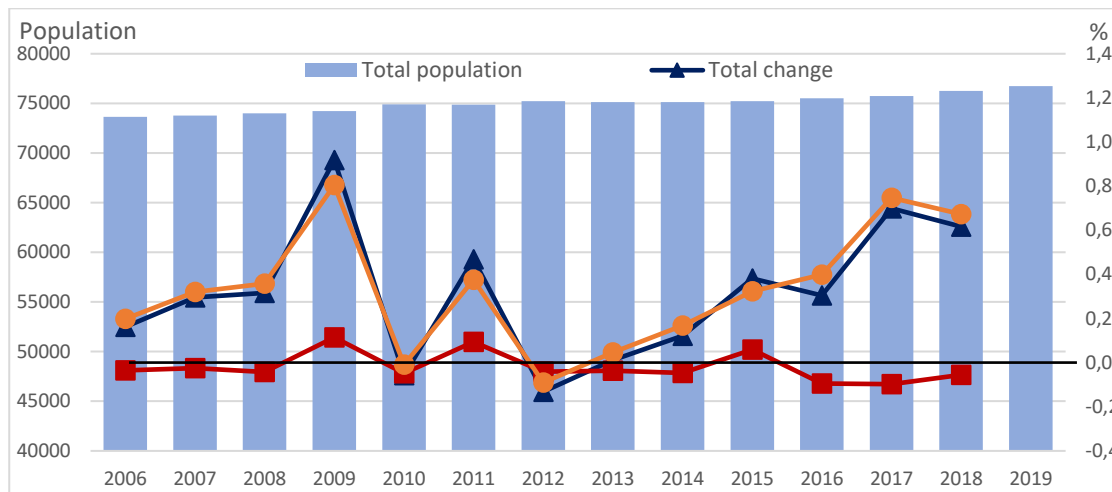
Note: 1970, 1981 and 1991 figures for Kortrijk city are from Census of population data. Kortrijk FUA population data are from Eurostat Functional Urban Area population statistics.

Source: STATBEL Population Statistics and Eurostat Functional Urban Areas Population Statistics

As indicated above, all the increase in the population of the city which has occurred since 2005 is the result of the influx of people from outside into the city. Those moving in more than offset those moving out in every year over the period 2006 to 2018 except 2010 and 2012, in which the latter exceeded the former but in both cases by only a very small amount (Figure 2). By contrast, there was a natural decline in population in most years, with the number of deaths exceeding the number of births in all years apart from 2009, 2011 and 2015. The decline, however – as the increase in the years when it occurred – was small in .all the years, so that the overall change in population closely mirrored the net inflow of people moving into the city from outside.



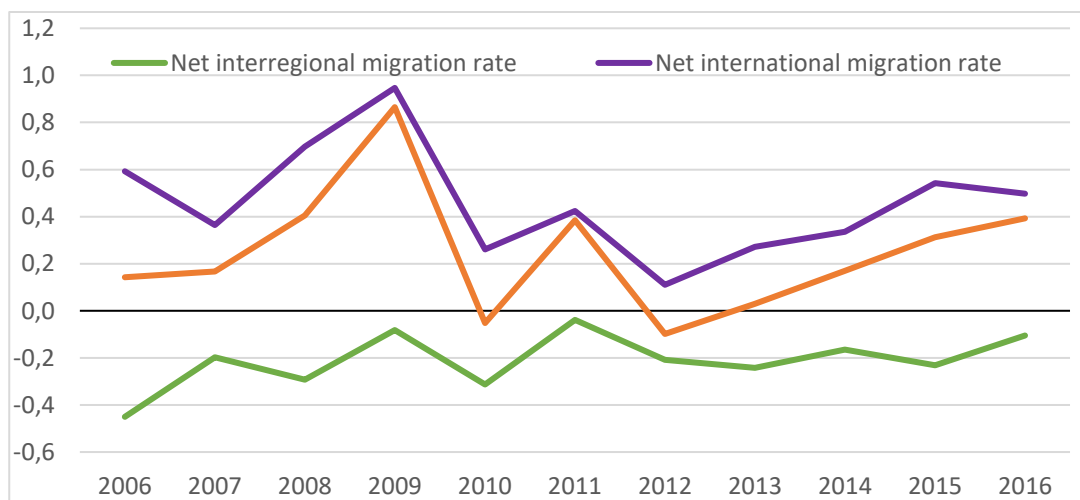
**Figure 2 Total population and population change in Kortrijk city, 2006-2019**



Note: Population figures show population at 1 January each year. Population change figures show the % change each year. Net migration figures are calculated as a residual of the change in total population less the natural change. Source: STATBEL Population Statistics<sup>1</sup> and Eurostat Cities and Greater Cities Population Statistics (for 2017 and 2018)

A closer examination of the net migration figures shows that the inward movement of people into the city from outside is dominated by inflows of people from other countries rather than people moving from other parts of Belgium (Figure 3). Indeed, the number of people leaving the city to live in the other parts of the country exceeded the number moving in from other areas of Belgium in every year between 2006 and 2016 (the last year for which data are available). By contrast, the number of people moving into city from other countries exceeded the number moving out to live abroad throughout the period. Although the rate of inflow slowed down after 2009, it still added 0.5% to the city’s population in 2016.

**Figure 3 Net inter-regional and international migration rates in Kortrijk, 2006-2016 (%)**



Note: Net migration rates are calculated by relating the net migration figures to mid-year population in each year. Total net migration figures may differ from those in Figure 2 above as they relate to official migration statistics.

Source: STATBEL, own calculations.

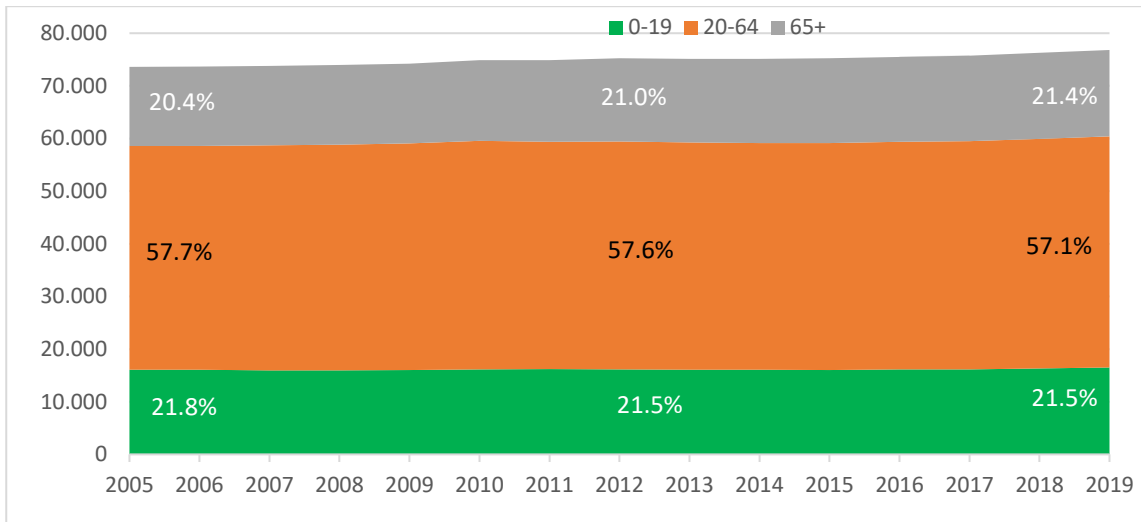
The very slow growth in population since the mid-2000s has been associated with only a small change in the age structure of the population. Although the proportion of the population aged 65 and over has risen over this period, while the proportion of those of working-age (20-64) and of young people (aged under 20) has fallen, each by similar amounts, in 2018, the share of

<sup>1</sup> The national statistics come from Agentschap Binnenlands Bestuur Statistiek Vlaanderen (2018) *Jouw gemeente in cijfers Kortrijk, Editie 2018*.



people of 65 and over, at just over 21%, was only slightly larger than in 2005 (Figure 4). This implies that the old-age dependency rate increased over this period, but again by relatively little – from just over 35% to just over 37%.

**Figure 4 Breakdown of population by broad age group in Kortrijk, 2005-2019**



Note : Percentage figures indicate the share of total population of each age group in 2005, 2012 and 2018, respectively.  
Source: STATBEL Population Statistics<sup>2</sup> and Eurostat Cities and Greater Cities Population Statistics (for 2019 data)

The trends in the age structure of the population reflect the trends in fertility, mortality and migration rates. Total fertility rates in the city (in this case, together with the surrounding areas<sup>3</sup>) varied between 1.66 and 1.82 over the 2014-2019 period, which are below the replacement of just over 2. A continuing decline in the mortality rate, reflected in increasing life expectancy, is to set to slow the natural decline in population that the low fertility rate implies in the coming years, but not to cancel it out completely and with the consequence of continuing ageing of the population.

At the same time, if net inward migration continues at its recent rate, this will be sufficient to offset the natural population decline, and growth of overall population in the city up to 2035 or so can be expected to be at a similar pace as over the past 10-15 years. Indeed, the projections of STATBEL (the Belgian Statistical Office) are for the population of Kortrijk to increase by 3.5% over the period 2017-2035, which implies an average growth rate of under 0.2% a year.

This, however, is based on the assumption that net inward migration will indeed be similar to its rate in the recent past. If it is only slightly lower, then there would be imply that there would be little growth in population at all and if it were significantly lower, which is perfectly possible, that there would be a decline.

Whereas the age structure of the population has changed by relatively over the past decade or two, this is not the case in future years, given current trends in the birth and death rates. By 2035, the latest forecast is for the proportion of population aged 65 and over to increase from 22% to 27%, while the population aged 20-64 is projected to decline from 56% to 53% (Figure 5), implying an increase in the old-age dependency rate over these 15 years from 38% to 50%. Although the rate of increase in the share of older people is forecast to slow down after 2035, by 2050, it is projected to reach 28%, while the share of the 20-64 age group is projected to fall

<sup>2</sup> The national statistics come from *Agentschap Binnenlands Bestuur Statistiek Vlaanderen (2018) Jouw gemeente in cijfers Kortrijk, Editie 2018*.

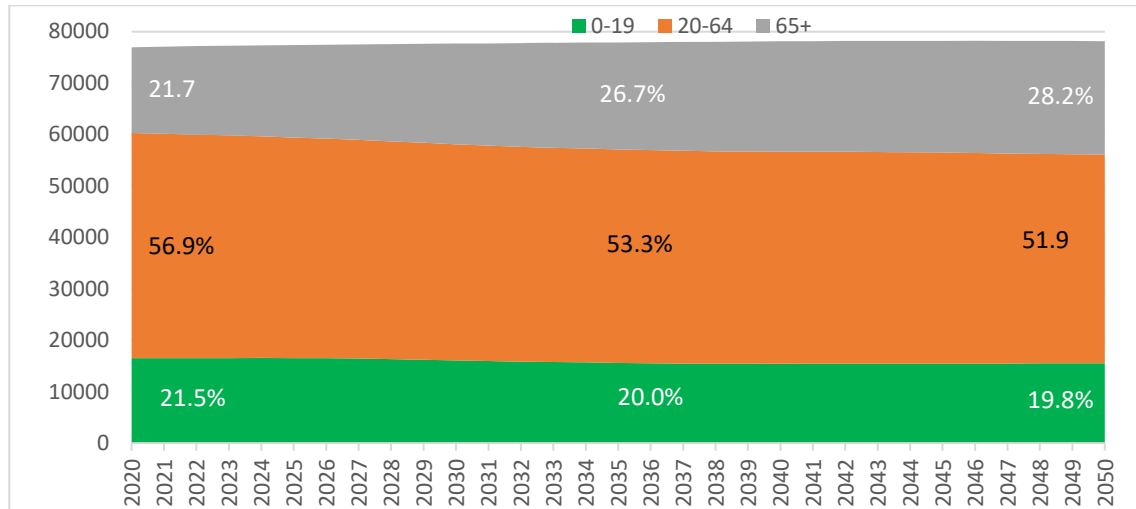
<sup>3</sup> To form the NUTS3 region of Arrondissement Kortrijk, for which these data are available (there are no data on the age composition of the population available for Kortrijk as such and it is here assumed that the NUT3 regional data are indicative of the latter and the way that the composition has tended to change over recent years).





further to 52%. The implication is for the old-age dependency rate to rise to 54%, so that for every two people of working-age, there would be more than one person of 65 and over to support.

**Figure 5 Projected breakdown of population by broad age group in Kortrijk, 2020-2050**



*Note : The graph is based on the Eurostat population projections for the NUTS 3 region of Kortrijk, which is substantially larger than the city itself which is the focus of the study. It is assumed that the growth rate of population in the city in each of the broad age groups over the period which will be the same as for the NUTS 3 region, which in the recent past has been broadly the case. (The breakdown in 2018 is almost identical in the city as in the NUTS 3 region.)*

*Percentage figures indicate the share of total population of each age group in 2020, 2035 and 2050.*

*Source: Eurostat, EUROPOP, 2019.*

These projection may, in fact, understate the increase in the old-age dependency rate which could occur if net inward migration was to decline significantly in future years, insofar as those moving into the region tend to be younger on average than the resident population. A reduction in net migration, therefore, would tend to be associated with a faster ageing of the population in the city.

## Main challenges

The decline in population which occurred in the 1970s, largely as a result of the downturn in the local economy caused by the crisis in the textile industry, the lack of growth in the 1980s and early 1990s and the renewed decline in population from 1995 to 2005 gave rise to a number of policy challenges to the city authorities and the regional government. It led, in particular, to a focus on arresting the fall in population, by both encouraging people, especially the young, to stay and attracting new people to move into the city. To do this, the challenge was to ensure that there were sufficient employment opportunities to accommodate the people already resident in the city and to provide jobs for newcomers. This, of necessity, involved the restructuring of the economy, to shift economic activity away from textiles to other manufacturing sectors but especially to services, and to create conditions which were conducive to business investment.

The challenge was also, however, to turn Kortrijk into a place where people wanted to live, where there were the services and amenities which people needed, such as schools and healthcare facilities, but also where there was decent housing available and leisure and sporting facilities for them to enjoy, as well as an environment which was both attractive and safe. With the increasing focus on environmental issues, this meant that the restructuring of the economy and the regeneration of the city needed to be carried out in a sustainable way and that old industrial sites needed to be cleaned up and empty factories either demolished or preferably converted to other uses.



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It meant, in addition, as elsewhere, that the transport system had also to contribute to sustainability as well as to the attractiveness of the place as somewhere to live, that there was a need a shift away from car use to less polluting means of transport, to buses and trains as well as to cycling.

The ageing of the population equally posed challenges. As well as catering for the needs of young people to encourage them to stay in the city and others to move in, there was a need to ensure that the healthcare and social services met the needs of a growing number of older people, that they were both of a good standard and conveniently located.

## Recent local and regional policy measures

### Strategic development programmes for the city and surrounding area

In Flanders, local municipal elections take place every 6 years. None of the parties usually have a majority, so a coalition needs to be formed and this then has to reach an agreement with the city mayor on a policy agenda for the next 6 years. Both the current city government (formed after the 2018 elections) and its predecessor (formed after the 2012 elections) launched very ambitious policy agendas for Kortrijk, as described below. In addition, strategic policy plans are made at the regional level for the Leiedal area once every 5 years and the current plan is also outlined below.

**Plan Nieuw Kortrijk (2013-2019):** The plan, formulated by the city authority, acknowledges that Kortrijk has already managed to improve and revive considerably since the problematic times of the late 20th century, but sets out a more daring and ambitious policy agenda for the future. Kortrijk is portrayed as having both 'large city allure' and 'village charm', in that although it is small, it has some of the attractions of larger cities, which is a feature to promote. The ambition should be for Kortrijk to 'dare to grow', 'dare to surprise and be original', but also 'dare to choose for its roots' (i.e. to build on its heritage). The authority undertook to liaise with local residents at both city and neighbourhood level to realise this ambition, 'to listen and dialogue with them to develop the plan', 'to rejuvenate the city and make it greener' (i.e. to attract young people and young families, to invest in education at all levels, to expand green spaces, making Kortrijk more environmentally friendly); to create 'an entrepreneurial and sharing city' (i.e. to support businesses, but also to have 'zero tolerance' for poverty); to ensure that the city is 'affordable' (in terms of housing, but also services); and 'full of enthusiasm and ambiance' (in terms of culture and events).

**Local government agreement 2019-2024 - 'best city in Flanders':** Building on what was achieved in the previous period, the same coalition of political parties, aimed to raise the ambition even higher and to make Kortrijk 'the best city in Flanders'. The aim was, therefore, for the city to become the one with most talents and most local pride; the most walking- and cycling-friendly city; with the most ambitious plans to increase biodiversity and reduce pollution; to be super diverse but united ;to keep renewing itself; and a place 'where every Flemish person wants to live, work and play'. A striking feature of the policy agenda is that on its first page, the ambition is expressed to develop Kortrijk as a 'child-rich' city ('*Kortrijk kinderrijk*'), since 'developing a child-friendly city means developing a city that is good for everyone'.

**Regional plans for Leiedal:** In 2019, the local authorities involved in the '*Intercommunale Leiedal*' initiative agreed to continue their regional development partnership until at least 2035, the principles for continuing collaboration being set out in the *Leiedal 2035* strategy document. The intention is develop the region in four 'transition arenas': 'societal innovation', 'territorial transformation', 'digital and technological revolution', and 'administrative shifts'. It is acknowledged that population in the Leiedal area, and South-west-Flanders as a whole, will



probably not grow fast, if at all, in the coming decades, so that throughout the document, the principle is expressed of 'not more, but better'. The strategy is made more concrete in the policy plans that are updated every 5 years. In the Leiedal Policy Plan 2020-2025, the 'transition arenas' are linked to 'transition lines':

- 'accessible and nearby': which means making regional mobility more sustainable, attractive and safe, with the proximity of services and transport nodes being an important criterion for spatial development projects;
- 'liveable, healthy and inclusive': which means limiting loss of open spaces, greening the built environment, ensuring an accessible and affordable housing market, keeping places lively and setting circularity as a point of departure for development;
- 'entrepreneurial and workable': which means fostering and stimulating creative industries, anchoring companies in the local economy, keeping production within the region, and stimulating cross-border labour mobility in the Eurometropolis region;
- 'climate neutral', which involves both climate mitigation and adaptation measures, such as saving energy and encouraging energy-efficiency, making energy production and distribution more sustainable, and improving the storage and filtration of water as well as expanding the spaces for water;
- 'space neutral', which involves limiting space used by the built environment by increasing the density of existing built spaces and bundling multiple functions and facilities together.

### Recent strategic spatial planning and urban regeneration projects

**Leiewerken:** The programme in 5 phases, which was begun in 1997 and completed in 2009, comprised a number of projects to make the Leie river navigable by larger ships to carry cargo to the sea port at Antwerp. It also involved and the construction of the quays and bridges necessary to accommodate larger ships. The programme was initiated by the Flemish regional government and was focussed on infrastructure. It involved the Leie river being straightened, deepened and widened and 7 new bridges being built as well as access roads to and from them being constructed. The programme affected the urban landscape along the river considerably, so the Kortrijk city authority initiated a subsequent programme to improve the attractiveness and accessibility of the quaysides along the river and to create new parks and walking and cycling paths. As part of the programme, the highest building in Kortrijk, the *Collegetoren*, a 64 m high building constructed in 1971 to accommodate pupils of a boarding school but by then largely empty, was demolished and replaced by the new *K Toren*, a residential apartment complex in 2015-2018.

**Buda-island:** The island is situated in the city centre and was created after an old arm of the Leie river was filled in. It was developed in a piecemeal way, hosting a mix of activities, including a hospital, a monastery, factories, schools and housing areas. By the 1990s, it had become a problem area with many vacant and derelict buildings and around 2000, plans were made to transform the island into an 'artists' colony', plans which were met opposition because of a lack of consultation and their perceived elitist nature.<sup>4</sup> The island is now home to a number of cultural centres, such as *Budafabriek* (a mixed-use development combining creative industries, education, art and technology), *Budatoren* (a company producing podium arts), *Budascoop* (a cinema, podium arts stage and art gallery), and *Broelkaai 6* (a regional art museum). As part of the *Leiewerken*, the island was also extended and a park and beach created. The hospital is in the process of being redeveloped into a multi-functional health and wellness centre.

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<sup>4</sup> Corijn, E. & Vermeulen, S. (2009) Stadsvisies ontwikkelen tussen utopie en project in Vlaanderen. *Ruimte & Maatschappij* 1 (2): 27-54.



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## River Leie, Kortrijk



**Railway station area:** In 2010, the city agreed an integrated redevelopment scheme with the Flemish government and the national railway and bus companies for Kortrijk's central railway station area, which was accepted in 2013. The plan was to complete the project by 2020, but after several delays, the work started only in 2019 with planned completion by 2029. The project includes redeveloping the railway and bus stations and the public spaces and transport infrastructure surrounding them. It also includes making the neighbourhoods around the stations greener and improving the connections between those at both sides of the stations. A notable feature of the plans is the reversal of the usual order of priorities, with the needs of pedestrians having the highest priority, followed by those of cyclists and then public transport, with car use being discouraged.

**Westerkwartier:** The site of the former Kortrijk-Weide railway station at the western edge of the city centre has been undergoing redevelopment since n 2001. Most projects have now been completed, including new courts of justice, a new police office, an ecological park (Nelson Mandela Park) on the banks of the Leie river, a new events square, a Faculty of the West Flanders University, a new campus of adult education, an events hall, a new swimming pool, and several housing complexes.

### Urban housing policies

Developing and promoting Kortrijk as an attractive place to live is currently one of the main policy priorities of the city authority. Housing policies are not only about quantity and quality of the housing stock, but also about the quality of the living environment. The aim is to develop a diverse mix of types of housing, with special attention paid to affordability and to regeneration across the municipality, in the centre of the city but also in surrounding areas. Whether these aims are met remains to be seen. The projects being undertaken have attracted criticism as regards the affordability for vulnerable groups of the housing being built, the extent to which it is in line with the objective of attracting young families, when what is being constructed but building projects are mainly apartments more suited to single people and childless couples, and the lack of projects to tackle vacant housing and to redevelop commercial buildings lying empty into housing..

### Urban and regional economic development strategies

While some manufacturing still takes place in and around Kortrijk, the economy is mainly service-oriented. The city is a regional centre of governance, education and healthcare. Most parts of the South-West Flanders regional authority are located there, along with campuses of both Ghent and Leuven Universities and two polytechnics (Howest and VIVES). Together, the latter four have round 15,000 students. The city is also home to one of the largest hospitals in Belgium, AZ





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*Groeninge*, which is also a centre of higher medical education and training. Other major employers are companies in retailing and business and commercial services.

### **AZ Groeninge, hospital, Kortrijk**



Plans for the next few years include upgrading the main central shopping area (by making it greener and public spaces more attractive), promoting Kortrijk as a culinary tourist destination, offering a 48-hour tourist pass for public transport, improving the collaboration between the city and higher education institutes, and redeveloping business sites for new and innovative types of company.

The problem of vacant premises features strongly in both urban and regional economic development strategies. The problem is mostly concentrated in the main shopping areas in the city, where local independent retailers are in decline and bankruptcies are frequent. The Leiedal region is involved in the KI:SS West project, initiated by the Province of West-Flanders and partly funded by the EU Regional Development Fund, to combat these trends by strengthening retailing in the centres of villages, towns and cities through innovation. In addition, the city authority has initiated the '*Kortrijk Zait*' ('Kortrijk Sows') scheme, which offers incentives to owners of vacant commercial buildings to let them, in the form of temporary exemption to the vacancy tax, and to entrepreneurs looking for commercial space, in the form of rent discounts and more flexible contracts.

### **Urban and regional transport/mobility policies**

Transport and mobile

ty are planned partly at local urban level and partly at regional level. For public transport, a regional transport planning body, the *Vervoerregio*, has recently been established by the Flemish government. The *Vervoerregio* for Kortrijk covers the Leiedal area of inter-municipality collaboration. The Flemish government aim is to shift priority in public transport planning from a 'mobility' basis (under which the public transport is made available to everyone within walking distance) to an 'accessibility' basis, under which the supply of public transport is better matched to actual demand. A new public transport plan and a longer-term regional mobility plan will be developed over the next few years, based on the principles of 'network hierarchy' and 'combi-mobility' as well as being demand-driven. The public transport network is, therefore, to consist of four layers: the rail network, a 'core network' (which adds to the rail network on the busiest lines by adding buses), a 'supplementary network' (meaning the connecting lines to and from the railway and core networks; and 'transport on demand', covering buses, group taxis and bike-share schemes developed mainly in areas insufficiently covered by the railway and core networks.

In the city of Kortrijk, the current redevelopment of the central railway station and the area around it, described above, is the most important transport and mobility project for the next few years. As noted, the ambition is prioritise access by foot and cycle, and, indeed, elsewhere in the city walking and cycling are becoming more important means of moving around. The Covid-19 pandemic has accelerated the trend towards cycling significantly, and the city authority is





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meeting the increasing demand by creating designated 'cycling zones' and 'cycling streets'. In these places, while cars are still allowed, their maximum speed is limited to 30 km an hour and they are not permitted to pass cyclists, who are entitled to use the entire width of the street. Plans for these places had e already been announced before the pandemic and included in the 2019-2024 local government agreement, but they will now be implemented faster than planned. The first cycling zone was established in the city centre in 2019 covering 74 streets and before the end of 2021, there should be two additional ones, together covering 65 streets.

### Cyclists in Kortrijk



## Smart city strategies

Kortrijk is one of the most active cities in Belgium in terms of smart city strategies. These are linked to strengthening Kortrijk's status as a regional centre and to reviving the entrepreneurial tradition for which the city was known before the crisis in the textile industry, the decline in population and the brain drain of educated young people out of the area.

Over the past decade, despite its small size, Kortrijk has been one of the national frontrunners in terms of the application of digital technologies and smart city services. This has been driven by the city's strong IT management, in collaboration with two consecutive mayors with a strong interest in innovation. In the current 6-year policy plan for the city, around a third of the just under 300 planned policy activities has a digital component, ranging from ensuring basic WiFi-access in public areas to implementing advanced Augmented Reality and Virtual Reality applications for a local museum.

Smart city projects, which are part of the plan<sup>5</sup>, include major programmes for smart parking sensors and smart security cameras (see below), a pioneering project for scanning passers-bys in shopping streets, installing sensors for measuring air quality, analysing telecom and credit card payment data to help guide tourist and marketing policies, GPS tracking of public vehicles, citizen science projects to involve ordinary people in measuring and analysing traffic and air quality data, a number of projects on digital support for elderly care and experimental projects with camera drones for the local fire brigade and robots for street maintenance.

As a result, Kortrijk has won the Belgian government's annual Smart City Award twice in the past few years, once for its smart parking project and once for its programme of sharing texts, background documentation and practical approaches in relation to its smart city tenders and contracts with other interested cities. The latter award demonstrates that the city is working

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<sup>5</sup> See e.g. Ballon, P. & Smets, A. (2021) "De slimme stad: Stedelijke dataficatie in theorie en praktijk", in: G. Hospers & P. Renooy (eds.) De wereld van de stad: theorie, praktijk toekomst. Berghauser Pont Publishing, 163-178.



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very closely with private technology providers and that it is acting as a role model for other cities in terms of how to approach public-private collaboration and how to ensure sufficient public leverage in this regard.

The two largest smart city initiatives of Kortrijk are outlined below –Smart Parking (to stimulate local retailing and regulate inner-city mobility) and Smart Safety (to increase the sense of security for residents and visitors).

## Smart Parking

Kortrijk first deployed its Shop & Go system 8 years ago. This initially consisted of a limited number of parking spots in the shopping area of the city centre that were fitted with wireless sensors<sup>6</sup> (to monitor these in real-time. Those parking at a Shop & Go spot were allowed to park for free for 30 minutes, after which, if the same car was still occupying the place, a signal was sent to the parking warden to issue a fine.

The goal was to ensure that inner-city shops remain attractive for shoppers looking to spend only a short time in the city centre and removing the need to buy or display a ticket, while at the same time ensuring a high rotation of places, since no car could occupy a parking spot for over half an hour.

As a result, the need for drivers to search for a parking spot was virtually eliminated, and according to the city authority, satisfaction of both shoppers and shop owners was increased, as reflected in the frequent requests to install smart parking at new locations. However, to tackle the potential increase in people driving their cars into the city centre to shop, the need for a more holistic approach to smart parking became evident. A software platform was set up, providing access to both live data from on-street parking sensors and from off-street parking in underground car parks, operated by private companies. In this way, driver could be more readily steered towards car parks at the edge of the city. This has culminated in a mobile website being set up with real-time information on all available parking spots in the city and the different charges that apply.



<https://www.mobielvlaanderen.be/overheden/artikel.php?nav=10&mbnr=170&id=1885>

Because of its success, the Shop & Go system was rapidly expanded and currently over 1.000 parking spots in total are now fitted with sensors, including 380 sensors for resident-only parking and 30 sensors for bus spots. In the future, the system could be expanded, for example, to monitoring parking near charging stations for electric cars. Several cities in Belgium have copied the Kortrijk system since it was installed.

Over the years, the Shop & Go system has been expanded to link with other smart city applications aimed at increasing the attractiveness of Kortrijk for visitors and at supporting local

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<sup>6</sup> Several types were tested, e.g. for extreme weather conditions and whether they were able to spot 'tailgating' cars.



retailers. Scanners to detect the number of passers-by are being deployed to help prospective retailers to pinpoint optimal locations for shops in the city. In addition, 'big' datasets from telecom operators and credit card companies are being used to determine where shoppers and tourists coming to the city originate from as well as the route they take through the city and where they stop to visit, so that city marketing strategies can be adjusted accordingly.

## Smart Safety

The next largest smart city initiative in Kortrijk after the Smart Parking scheme involves the roll-out and integration of a system of around 600 smart cameras. As in many other cities, these are a heterogeneous mix of cameras for licence plate detection, speed cameras, trajectory speed control cameras, police cameras scattered throughout the city, cameras in and near car parks, safety cameras in and near public buildings and even webcams. What sets the Kortrijk case apart, is that all of these cameras are being connected to the same network and linked to the same back-office platform so as to allow powerful detection software to be deployed on all incoming video streams in (near-) real-time.

Another interesting aspect is that a steering committee has been set up, with police, city administration and public policy representatives, to ensure a coherent vision and strategy, common criteria for placing new cameras and a realistic investment plan. One of its goals is to actively drive new, and multiple, use of the camera network. As a result, an application has been launched for measuring and controlling crowds in the entertainment area, and an experiment is planned for activating the camera network using sound sensors, in order to tackle noise pollution from vehicles.

The most important application is the deployment of pattern detection software. This enables targeted police investigation into specific individuals and vehicles to be undertaken, without compromising privacy. Previously, hours of footage had to be scrolled through after the notification of a crime, but the software enables details of all people present in the area around the time of the crime to be retrieved, as well as parameters relating to clothing, types and colours of cars and so on to be searched for in real time. Even though facial recognition is not at present legally allowed, the system is expected to result in marked gains in efficiency and effectiveness, while respecting privacy legislation.

Pattern detection software can also be used to intervene in preventative ways, including in areas other than safety. For example, it can be used for traffic management, since it allows abnormal mobility patterns, such as large or different traffic movements in particular areas of the city to be detected. It can be used too to monitor the impact of policy initiatives, such as systematically detecting cycling patterns in recently introduced cycling zones.

The case of Kortrijk demonstrates the potential of urban data services even for small cities. According to first estimations, the effect of the smart camera network is greatest on safety, because of the possibility it gives of intervening in (near-)real-time. For mobility, the impact is so far limited since action based on the data from the camera is currently restricted to long-term planning. The city authority is considering developing the system further for tackling anti-social behaviour, such as littering. The end goal could be a smart city dashboard, or digital twin of the city, aimed at improving quality of life by enabling smart planning and intervention, while conforming to the necessary privacy norms and regulations.



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# **EU-Japan Joint Study: Demographic trends and territorial policy responses**

## **Case studies: Zuid Limburg**

**Pieter Ballon, Marco Bontje, Erhan Özdemir and Terry Ward**



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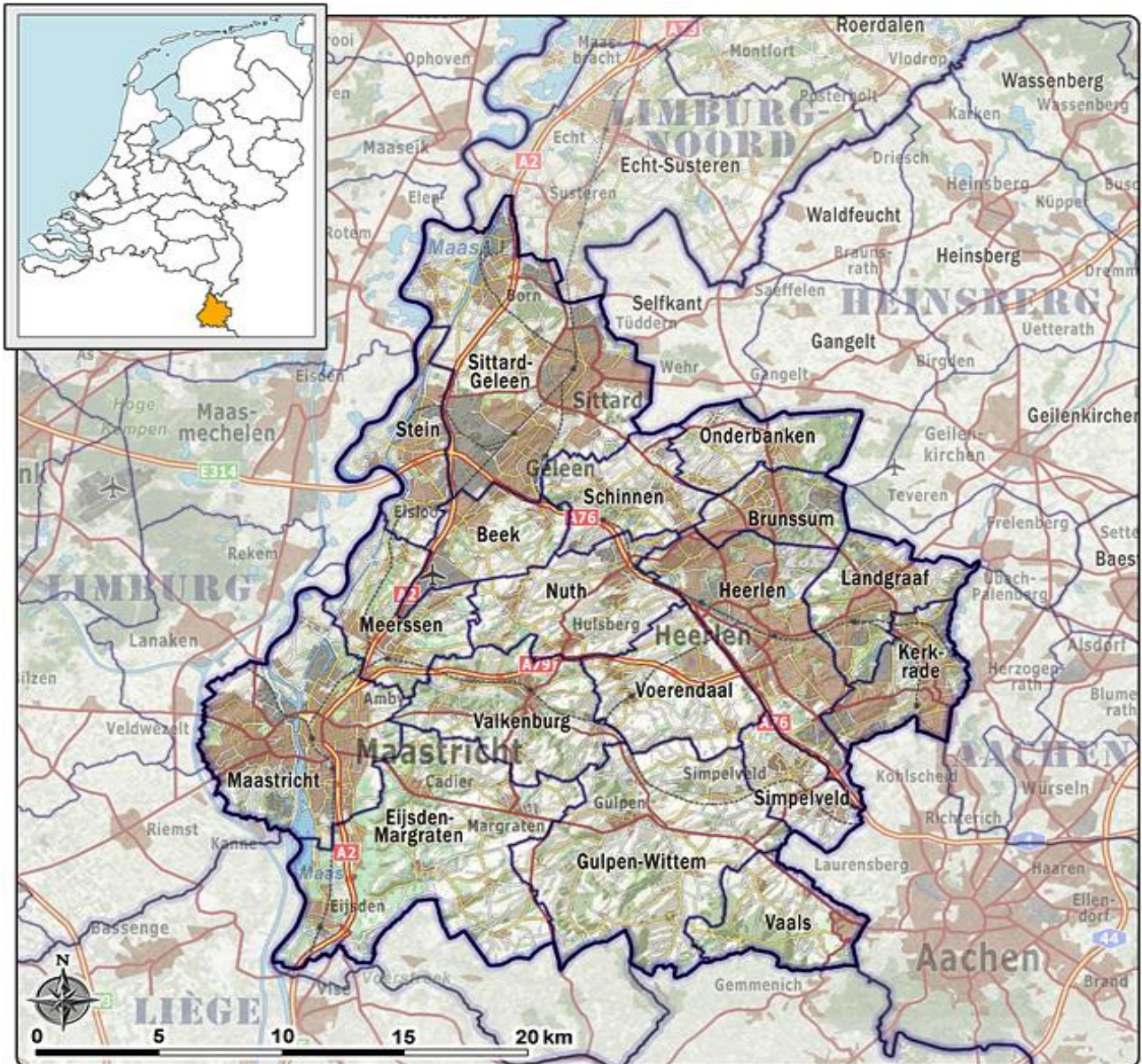
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## Map of Zuid Limburg showing its location in the Netherlands





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## Introduction

Zuid-Limburg is the southern part of the province of Limburg, one of the 12 provinces of the Netherlands. The region currently has some 600,000 inhabitants and a land area of around 660 square km. It borders Belgium to the west and south and Germany to the east, the border with these two countries totalling over 200 km as opposed to a border of just 6 km with the rest of the Netherlands. Its particular position has always significantly affected its development.

The main city, Maastricht, has a population of around 120,000, and apart from this, until the late 19th century, the region was mainly rural with small towns and villages. Then large-scale coal mining started around Heerlen in the east and Sittard-Geleen in the north-west, which brought urbanisation and dramatically changed the regional economy and landscape. Heerlen grew from a village to a city of over 90,000 people and Sittard-Geleen expanded rapidly too. Road and rail links with the rest of the Netherlands also improved considerably and the region became one of the wealthiest in the country.

This changed dramatically with the closure of the mines between 1965 and 1974, with direct job losses of some 45,000 and many thousands more in sectors dependent on the industry. The initial policy response was to subsidise investment in new industries to offset the decline in employment and a number of manufacturers set up new plants in the region, but few lasted long. The main exceptions are the VDL Nedcar automotive plant near Sittard, which started life as Daf, was subsequently taken over by a consortium of the Dutch State, Volvo and Mitsubishi and now produces BMW cars, and DSM (Dutch State Mines), which became a chemical company with factories and laboratories in Sittard-Geleen and headquarters in Heerlen. Contrary to neighbouring mining regions, like the Ruhr area in Germany, no attempt was made to maintain and exploit the cultural heritage by redeveloping mining sites into museums or leisure centres and to create jobs through this means.

However, an initiative was taken in the mid-1970s to move government offices to Heerlen, including Statistics Netherlands, ABP, the civil servants' pension fund, and the Tax Service. At the same time, a new university was opened in Maastricht, followed a few years later by the Open University of the Netherlands in Heerlen. In addition, the polytechnics in the region subsequently merged into one applied science university, with sites in Sittard, Heerlen and Maastricht, to strengthen the provision of higher education in the region and to increase its attractiveness for business development.

Despite the jobs created by these initiatives, they failed to compensate for those lost and many people, especially the young, left the region for better prospects elsewhere. Accordingly, population started to decline in the 1990s and has continued to fall ever since, though the decline is not evenly spread across the region. In Maastricht, one of the three urban centres, population is growing slowly, fuelled by the university and tourism; in Heerlen, one of 7 municipalities with a combined population of around 240,000, which have formed the Parkstad Limburg area in the east of the region to pursue a common redevelopment strategy based on adapting to population decline, it is falling; and in Sittard-Geleen in the west, where industrial production is concentrated, it is also falling. In-between these three urban centres lies 'Heuvelland', a hilly and predominantly rural area with a number of small towns and villages, where tourism has joined agriculture as the main economic activity and where the landscape has protected status.

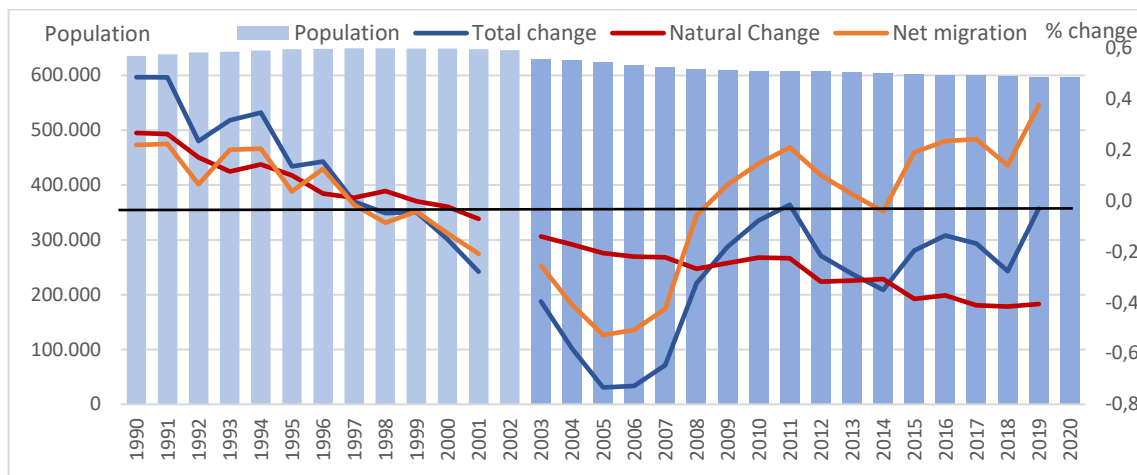
## Demographic trends

After increasing more or less continuously up to the 1990s, as noted above, population began to decline from the mid-1990s. Between 1997 and 2019, the region lost 8% of its population. Initially, net outward migration from the region (emigration less immigration), reflecting the net loss of jobs, reinforced the natural decline in population (deaths exceeding births), which in turn



reflects the movement of young people out of the region. From 2007 onwards, however, inward migration outweighed outward migration, so offsetting in part the continuing natural reduction in population, and, indeed, at an increasing rate, in some years (2009 and 2019), almost wholly offsetting this (Figure 1).

**Figure 1 Total population and changes in population in Zuid Limburg, 1990-2020**



Note: The population figures indicate the population at 1 January of each year. Figures for the total change indicate the percentage change between the beginning and the end of each year. Figures for the natural change indicate the number of births less the number of deaths as a % of total population at the beginning of each year. Figures for net migration are calculated as a residual between the total change and the natural change, again measured as a % of total population at the beginning of the year, so including any statistical error in the calculation of the total and natural changes.

There is an apparent break in the series between 2002 and 2003, which may be a consequence of a change in the territorial definition of the region.

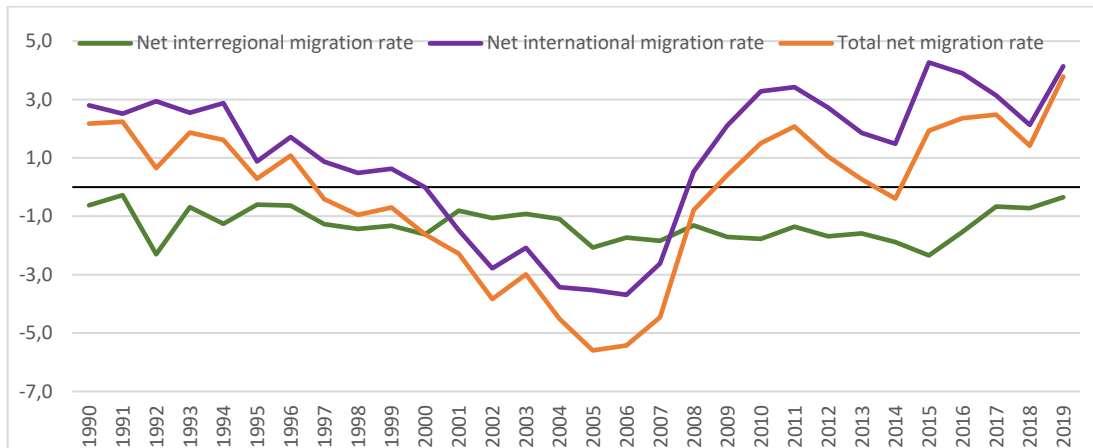
Source: Netherlands Central Bureau of Statistics (CBS) and own calculations .

The figures for net migration conceal differences between movements between the region and other parts of the Netherlands and movements between the region and other parts of the world - or between interregional and international migration. While movements out of the region into other parts of the Netherlands have exceeded movements into the region from other parts of the country in every year since 1990 - and before then in nearly every year since 1970 - and have been relatively consistent at around 1 or 2 in a thousand a year, international movements have been much more volatile (Figure 2). Throughout the 1990s - and in most of the previous 20 years - migration from the rest of the world into the region exceeded migration from the region to other countries. From 2000 to 2007, the reverse was the case with outward migration exceeding inward, but in every year since then, more people have moved into the region from other countries than have moved to other countries. The total net migration rate has mirrored the international rate, the main offset to the trend natural decline in population being the net inward movement into the region from other countries.





**Figure 2 Net interregional and international migration rates for Zuid Limburg, 1990-2019 (per thousand)**



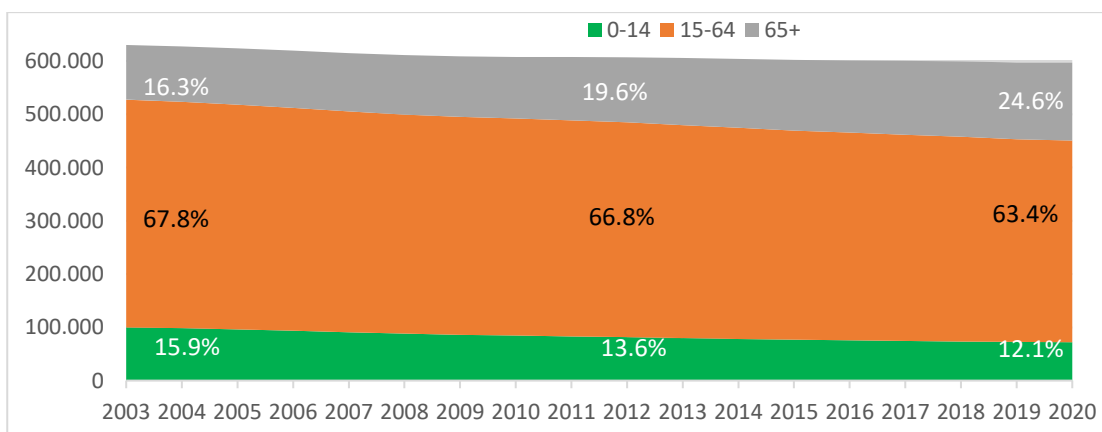
Note: Net migration rates relate to inward migration less outward in each year as a ‰ of mid-year population. Trends in total net migration rates may differ slightly from those in Figure 1 above as the data here relate to estimates of inward and outward movement in each case instead of being calculated as residuals between total changes in population and natural changes.

Source: Netherlands Central Bureau of Statistics (CBS) and own calculations.

### Changes in the age structure of the population

Trends in population and the factors underlying them, have implications for the age structure of the population. In particular, birth rates lower than what is needed to maintain population unchanged imply an ageing population, and this has tended to be reinforced by an outward movement of young people to other parts of the Netherlands as job prospects worsened, though this may have been offset in some degree by inward migration from other countries. Accordingly, a marked feature of recent years (data on an age breakdown of the population are only available since 2003 on a consistent basis) has been a significant increase in the proportion of the population aged 65 and over. This rose from 16% in 2003 to 24% in 2020, mirrored by a decline in the proportions of both those under 15 and those aged 15-64, i.e. of working-age (Figure 3). As a result, the old-age dependency rate – here defined as the number aged 65 and over relative to those aged 15-64 – increased from 24% to 39% over the 17-year period. In terms of the old-age dependency rate as defined in the section on demographic trends in this report – i.e. with working-age population defined as those aged 20-64, which gives a rate of 42% in 2020 – the implication is that for every 5 people of working-age, there are just over two people aged 65 and over, who are much more likely to be in retirement than in employment and so who effectively need to be supported by those in work.

**Figure 3 Breakdown of population by broad age group in Zuid Limburg, 2003-2020**



Note: Percentage figures indicate the share of total population of each age group in 2003, 2011 and 2019.

Source: Eurostat Regional Population Statistics.



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## Future trends in population

Trends in the total fertility rate (1.35 in 2018 down from 1.41 in 2014 and well below the 2.1 rate needed to maintain population unchanged) and life expectancy ((81.5 at birth in 2018 up from 80.8 three years earlier) imply that population will continue to decline in the future, unless there is an increase in inward migration.

The latest Eurostat population projections, based on 2019 data, are for a further decline in population in the region of over 3% by 2035 and by another 4% by 2050<sup>1</sup>. At the same time, the proportion of the population aged 65 and over is projected to rise from 24% to 31% by 2035, while the proportion of those of working age (20-64) is projected to fall from 58% to just over 51% in 2035. This implies an old-age dependency rate of 60%, which is almost half as high again as in 2020. Although the share of the population of 65 and over, along with the old-age dependency rate is projected to begin falling slightly from the late-2030s up to 2050, it still means nearly one in three of the population being over what is now the age of retirement in most parts of the EU and every two people of working age needing effectively to support more than one person in retirement.

## Main challenges

As an old coal mining region, which enjoyed a relatively high level of prosperity – and growing population as a result of this – from the late 19<sup>th</sup> century up until the mid-1960s, the initial challenge was to restructure the economy and create new jobs to compensate for those that were lost with the collapse of the coal industry and the closure of the mines. Although the policy adopted by both the national and regional governments had some success in attracting new economic activities to the region and has slowed the population decline, it has not succeeded in arresting it completely, nor of returning the region to its previous relative level of prosperity. There is now an acceptance that population will almost inevitably continue to decline in the future and that the challenge is to adapt to this, to try to ensure that the region is sufficiently attractive as a place to live and to do business to keep people and companies from leaving and, if at all possible, to encourage new ones to move in.

At the same time, there is growing awareness of the need to protect the regional environment from further incursions into the rural countryside not only because of considerations of sustainability but also for both economic and social reasons. Tourism, attracted by the landscape, has become an important economic activity, and source of income and jobs, while the countryside, and the leisure opportunities it provides, is an equally important reason for people to live in the region. Accordingly, the continuing challenge is to encourage economic development and to ensure the provision of suitable housing for people in pleasant surroundings, while keeping the countryside from being damaged and despoiled by this.

A further challenge is to accommodate the needs of an ageing population and an increasing number of people in retirement as well as being less mobile. This implies a need to ensure that there are sufficient health and social care facilities and services available within easy reach.

## Recent regional policy measures

Regional policy in the Netherlands up to the 1980s was to distribute economic activity more evenly across the country by relieving pressure from the congested core region of Randstad (where Amsterdam, Rotterdam and The Hague are located) and directing development to other regions, especially those suffering deindustrialisation, including Zuid-Limburg. From the late

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<sup>1</sup> Eurostat (2020) Eurostat EuroPop 2019: <https://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-projections-/main-tables>





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1980s, however, policy changed to concentrating development in the Randstad again, and regional and local governments were increasingly encouraged to develop their own strategies. The policy measures described below, therefore, are mostly initiatives originating from the Province of Limburg (i.e. the regional authority for the wider region), the three sub-regions of Zuid-Limburg, Maastricht-Heuvelland, Parkstad Limburg (Heerlen), and Westelijke Mijnstreek (Sittard-Geleen) or local authorities in the region.

Nevertheless, one important national initiative was a new regional governance layer introduced in 2006, under which Parkstad Limburg acquired city-region status and became formally responsible for regional spatial planning, housing, mobility and economic development, which had been the case before but only on a voluntary basis. This helped it to adapt its development policy to the prospect of structural population decline, though this special legal status was abolished in 2015, since when policy collaboration has again been on a voluntary basis.

Another national initiative, the Regio-Deals' programme, has seen Parkstad Limburg receive funding for the 2019-2022 period for projects to strengthen of the socio-economic structure of the region, its housing and liveability; safety; retailing and other service; cross-border collaboration (with the German Aachen city-region) and Heerlen's facilities as a regional centre. In addition, the three main urban centres of Zuid-Limburg are, at present, participating in a 'smart city' project under the Dutch Government's 'City-Deals' programme (this is discussed further below)

## **Spatial development strategy**

A number of spatial development measures have originated at the regional level in recent years. The most important are described below.

### *Provinciaal Omgevingsplan Limburg (Provincial Environmental Plan Limburg) (2014)*

The Provincial Environmental Plan covers both spatial development and the quality of the environment. Two of the main development principles on which this is based are particularly relevant in relation to structural population decline: 'more city, more countryside' and 'from separating to weaving functions together'. Under the plan, the focus is on maintaining and strengthening two types of living environment in the region – urban centres and rural areas – while disinvesting in the areas in-between, especially more 'monofunctional' parts, such as large housing estates and business locations in suburban areas. This is in line with the residential preferences of the population and may help to reduce the pace of population decline as well as attracting people to move in.

### *Programma Nationaal Landschap Zuid Limburg (2018-2021)*

The area in-between the three city-regions of Maastricht, Parkstad-Limburg and Westelijke Mijnstreek acquired 'National Landscape' status in 2018 as a follow-up to the Provincial Environmental Plan of 2014. The four key principles are 'the four V's': *verbinden* (connecting – increasing collaboration between stakeholders representing different economic sectors and interests), *versterken* (strengthening – finding new sources of funding to protect and improve the landscape), *vermarkten* (marketing – improving and communicating the image and 'brand' of the National Landscape) and *verwonderen* (marvelling – encouraging awareness of the landscape's qualities and potential). The programme highlights the importance of tourism to the local economy and maintaining its popularity as a destination for day-tourists but recognises the disruption this can cause to the people living there. It, therefore, sets out to restore the balance between tourists and local residents.



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## Nationaal Landschap Zuid Limburg



### Strategic spatial planning and mobility projects

An important side-effect of population decline is that spatial planning can shift its focus from responding to a growing population needing housing and facilities of various kinds to improving the living environment of existing residents and the transport links with neighbouring regions. Examples of projects doing this are listed below.

*A2 highway, Maastricht:* Up to 10 years ago, the A2 highway ran straight through the outer areas of Maastricht, with a series of road crossings and traffic lights representing a serious bottleneck to through traffic and adversely affecting the quality of life of people living there. Between 2010 and 2017, a two km long tunnel was constructed to take the highway out of the city and the space on top was turned into new city park, 'De Groene Loper' ('The Green Carpet'), while the adjacent residential areas were redesigned to become a more attractive place to live. At the same time, the tunnel greatly improved the connection between the east and the west of the city.

*Light rail Maastricht-Hasselt:* A light railway connecting Maastricht and Hasselt in Belgium (30 km away) is currently under construction with completion in 2024. This will more than halve the travel time to 30 minutes, while shifting from a bus to a more environmentally form of transport, and is part of a wider plan to improve public transport in the area. It will connect to several initiatives on both sides of the border and help to strengthen cross-border links and collaboration.

*Maankwartier, Heerlen:* A new city centre in Heerlen has been developed around the central railway station, designed by an artist rather than by urban planners. The 'Maankwartier' ('Moon Quarter') is a mixed-use development with shops, a hotel, offices and apartment buildings. While it adds to the shopping space in the city, so going against the spatial strategy of redeveloping existing areas and adversely affecting older shops, it also increases the attractiveness of the centre.

### Maankwartier, Heerlen





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*Intercity train to Aachen:* It is planned to have a higher-speed line from Parkstad Limburg to the neighbouring German city of Aachen in operation by 2025, so facilitating closer collaboration between the two and making it easier for young people in the region to take advantage of one of Germany's largest and most prominent higher technical education institutes located there. It will also connect the region with the German ICE high-speed rail network and the French Thalys trains to Brussels and Paris.

## Regional economic strategy

*Structuurvisie Regionale Economie Zuid-Limburg (Structural Vision Regional Economy Zuid-Limburg)*

A new regional economic development strategy covering the period up to 2030 was agreed by all municipalities in the region in 2018 with the aim of reducing the amount of shopping, office and business space in response to a declining and ageing population. This is combined with initiatives to improve the quality of the spaces that remain. The strategy applies to each of the three sub-regions and allows new business locations to be developed, but only if existing locations are closed down so that the overall amount of space occupied does not increase.

*Campus developments in Sittard-Geleen, Heerlen and Maastricht: Brightlands*

A key part of the economic strategy in the region is the Brightlands development which consists of four campuses, three of which are in Zuid-Limburg (the fourth one is the north in Venlo, in the north of Limburg), where businesses and higher education institutes come together. Each of the campuses specialises in a particular area of innovation, the aim being to attract existing companies, recent start-ups and entrepreneurs wanting to start a business in the area of specialisation concerned and to initiate a cluster development process facilitated by shared spaces and facilities. Chemelot campus in Sittard-Geleen is part of the Chemelot Industrial Park, where DSM, the chemical multinational, is located, and specialises in new materials and 'green circular chemicals'. The Smart Services Campus in Heerlen specialises in digital innovations and smart digital services, and is located close to large public sector employers like Statistics Netherlands and the ABP pension fund, with which it works closely (see further on this below). Maastricht Health Campus specialises in healthcare innovations and biomedical science and is home to Maastricht University's Academic Hospital and Faculty of Health, Medicine and Life Sciences.

### Chemelot campus, Sittard-Geleen



## Regional housing strategy

*Structuurvisie Wonen Zuid-Limburg (Structural Vision Housing Zuid-Limburg)*

The Structural vision Housing Zuid-Limburg is a housing strategy which covers all Zuid-Limburg municipalities. Like the spatial strategy, it is aimed at 'less quantity, more quality' and at



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matching supply to demand. It has led municipalities to cancel plans for expanding the housing stock or reducing them in scale and to accepting that new housing can still be built but only if an equal amount of old housing is demolished. The focus is on improving the existing housing stock, especially, in line with the regional spatial planning strategy, in urban centres and villages, while disinvesting in the areas in-between.

### *IBA Parkstad Limburg*

The Internationale Bauausstellung (IBA) started as a large exhibition of building innovations and demonstration projects held in large German cities like Darmstadt, Leipzig, Berlin and Hamburg. Over the past few decades, it has grown into a creative redevelopment approach that aims at transforming not only the built environment but also the urban and regional economy, targeting the city-region dimension rather than a single city, such as the Ruhr Area (IBA Emscher Park in the 1990s) and Sachsen-Anhalt (in the 2000s). Parkstad Limburg was the first region outside of Germany to organise an IBA. It started in 2013 and runs until 2020-2021. The many projects set up as part of the IBA are grouped under 5 main themes: 'Collateral Landscape' (discovering or rediscovering the hidden qualities of the post-mining landscape), 'Re-use and Remodelling' (restructuring and re-using urban areas and materials; including 'circular building'), 'Clever Heritage' (smart solutions to maintain and/or re-use the local heritage), 'Crafts and Manufacturing' ('The New Making') and 'Activating the Mental Space' (encouraging and facilitating citizen initiatives).

### **Health, ageing and Covid-19**

In 2015, the Dutch Government decentralised parts of their policies on health and social participation, with municipalities taking over responsibility for, among other things, youth care, elderly care and care for people with chronic diseases. The rationale for this was to make healthcare more accessible and more individualised, bringing it closer to the daily lives of residents. However, while municipalities may indeed be better suited to providing and organising healthcare services, this decentralisation was accompanied by a substantial reduction in financing. The municipalities, therefore, had much more to do with much less budget. All Dutch municipalities were confronted by serious budgetary problems as a result, but the impact was particularly severe on regions facing population decline and ageing like Zuid-Limburg.

Even before the policy change, it was noticed that the Zuid-Limburg population had more health issues than people in the rest of the Netherlands. In particular, life expectancy and the quality of life in the region were lower than elsewhere, while the proportion of people with chronic diseases was larger. These differences with other Dutch regions, moreover, appeared to be structural.

In 2016, a regional health policy plan was devised by the Province of Limburg, the municipalities and the municipal health services with the ambition of changing all 'red' health indicators to 'green' within a decade. The objective was that, by 2025, all health indicators in Zuid-Limburg should be at least equal to the national average. In addition, the initiative was taken by a group of regional stakeholders to put in place a 'Health Agreement Zuid-Limburg' scheme, linking the health policy agenda to education, employment, social participation and other related policy agendas. Under the regional health agreement, local and regional authorities, accordingly, are working together with partners in education, healthcare, social services and several regional companies, with Maastricht University being a key player. Topics covered include healthy youth/healthy primary schools, work and social participation, and healthy neighbourhoods.

The recent impact of the Covid-19 pandemic has made this initiative even more important. Zuid-Limburg has been one of the most affected regions in the Netherlands, and it is likely that the impact of Covid-19 will worsen rather than improve the relatively deprived health situation of





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the region, as well as increasing problems in related areas like education, labour force participation or active participation in society more generally.

In the region, several projects and experiments to develop and apply innovations in healthcare in general and elderly care in particular have also recently been initiated. Many of these innovations are technology-driven and are considered in the next section.

## Smart city strategies

There are a number of smart city projects deployed in Zuid-Limburg, originating either at the individual city level (Maastricht, Heerlen or Sittard-Geleen), at the regional or provincial level, or at the national level. They include projects intended to cope with demographic decline, as well as those attempting to combat and reverse it.

At the individual city level, the amount of smart city initiatives is limited. An inventory made in 2020 of smart city projects in 40 cities in the Netherlands<sup>2</sup> found that Maastricht only has three smart city projects and that Heerlen and Sittard-Geleen both have just two. This means they are lagging behind not only large cities such as Amsterdam, Rotterdam or Utrecht, but also Dutch cities that are more comparable in size, such as Apeldoorn (14), Breda (26), Delft (30), Dordrecht (38), 's-Hertogenbosch (18), Leeuwarden (31) or Zwolle (26). In addition, the initiatives concerned involve mostly fairly basic smart city applications, such as a free Wifi project in a shopping area (Maastricht), a chatbot for the city Helpdesk (Heerlen) or a test project called the 'Gardener of Tomorrow' (Sittard-Geleen).

This limited individual involvement underlines the need for the Zuid-Limburg cities to engage in inter-city and regional-wide smart city programmes in order to achieve a greater impact. There are three initiatives described below which are examples - Technology in Elderly Care, the Smart Services Campus, and the participation of all three cities in Zuid-Limburg in the national Smart City Deal.

## Technology in elderly care

Several cross-organisational programmes have been developed in the region to introduce a 'smart specialisation' strategy on technology in (elderly) care.

The *Expertisecentrum voor Innovatieve Zorg en Technologie* (Centre of Expertise for Innovative Care and Technology), based in Heerlen, is a collaboration between various higher education institutes in the region. Its purpose is to expand the number of local professionals capable of developing and implementing new concepts in care. After starting in 2012, the centre of expertise has grown into a network of around 40 organisations with a yearly turnover of over EUR 4 million. It has carried out around 70 R&D projects and has created a line of education on care technologies that is unique in the country.

The centre also organises 'living lab' tests that pilot innovations in real-life care contexts. For this, again, multiple collaborations are required, between research institutes, medical companies, technology start-ups, care institutions and elderly homes. The collaborations even extend across national border: the centre is part of the Crosscare network, stretching out over the neighbouring southern region of the Netherlands and the northern region of Belgium. The network organises joint 'waves of innovation' in which the participating living labs jointly test and further develop a range of smart applications for care, including multi-sensory prototypes to support people with dementia, sensors for monitoring incontinence of elderly people, new

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<sup>2</sup> By Teuben et al, 2020, <https://www.g40stedennetwerk.nl/files/2020-09/rapport-Smart-Cities-in-de-G40.pdf>



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prototypes for colostomy patients, and digital surgery solutions. The focus is on accelerating the move from prototypes to market-ready solutions, as well as on rapid adoption in care homes in the Zuid-Limburg region.

The university and academic hospital of Maastricht also play a role in this. In 2019, the *Academische Werkplaats Ouderenzorg Zuid-Limburg* (Academic Workplace Elderly Care Zuid-Limburg) set up the *Kerngroep Zorgtechnologie* (Core Group Care Technology) to further test and demonstrate the value of smart technologies in care. The group brings together the relevant knowledge institutes in the region involving 7 regional care providers. Application domains include domotics for the elderly, monitoring by sensors and cameras, e-healthcare, care robots, virtual reality and big data. Various practical tools and instruments are being developed and made available, such as the Maastricht Electronic Daily Life Observation Tool (MEDLO) and a toolbox to support care professionals in implementing motion-related innovations. The former is a tablet-based tool to monitor four aspects of the daily life of people with dementia living in long-term care facilities: their involvement in activities, the physical environment in which the activities take place, their social interaction with others and their emotional well-being.

Increasingly, activities and applications are targeted not just at professionals but also at informal carers and at the elderly themselves, many of whom live alone to a very advanced age. Prevention and remediation of social isolation is, therefore, a regional priority, as well as remote monitoring, supporting care-givers on the move, and the creation of 'dementia-friendly' neighbourhoods.

### Smart Services Campus

After the end of the mining industry in Zuid-Limburg in the 1960s, the presence of a large pension fund for miners attracted other financial and administrative organisations to the area. As noted earlier, a cluster was formed with other pension funds as well as the national statistics office and tax service, employing altogether around 16,000 people.

In 2015, these organisations started the Smart Services Campus in collaboration with local universities and colleges, regional governments and a few large banks and other corporations. An investment of EUR 100 million has been made over a 10 year-period by a joint venture of the provincial government, the largest pension fund and Maastricht University. The ambition of the Smart Services Campus is to create an internationally attractive campus, specialising in data science and smart services, to turn Heerlen and the surrounding region into a smart city area. The expressed objective is to host 1,600 students, create up to 2,500 new specialised jobs, attract new companies to the region and realise start-up and spin-off companies. The aim, in addition, is to retrain 1,000 current workers in data sciences and to create an innovation hub on Business Intelligence and Smart Services (BISS), for education, research and entrepreneurship.

The Smart Services Campus currently provides flexi desks and office space, event locations and meeting spaces for data-driven companies, as well as a number of laboratories, such as the Human Data Interaction Lab for applied research and education in data visualisation, interface design and human-computer interaction, the Nanolab, where consumers can experience the potential of new technologies for themselves, and the Lab for data solutions in policing.

Special attention is given to small and medium-sized enterprises (SMEs), including among others, the MKB Datalab Limburg (SME Data Lab Limburg), which provides practical advice and support on data science to SMEs and the Blockstart programme for use of blockchain technologies by SMEs. The employability of the existing work force is also a focal point, with the Train4smartservices project, which provides (re)training for IT professional over an 18-month course.





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## Nanolab, Brightlands Smart Services Campus



Since its start, the Smart Services Campus has become one of the constituent parts of Brightlands, an open innovation community in Limburg that links together over 24,000 entrepreneurs, researchers and students. At the time of writing, over 80 companies working with data sciences and smart services have established a presence on the Smart Services Campus.

### Smart City Deal

On 3 December 2020, 16 Dutch cities and one Belgian city, together with over 30 companies and other organisations, signed the City Deal '*Een slimme stad, zo doe je dat*' (A smart city, that's how it's done). The three Zuid-Limburg cities, Heerlen, Maastricht and Sittard-Geleen, all signed up to the City Deal.

By agreeing to this, the cities commit to jointly developing or commissioning a number of smart city projects and, so as far as possible, to implementing them afterwards. Each project is being developed by a working group in which at least three cities are participating. They relate to:

- Processes for working with data (i.e. a rulebook for an effective data strategy for cities, an approach for comparing citizen-generated data and involving citizens, a common tendering procedure for an urban data platform, and privacy guidelines for sensors in the public domain)
- Processes for interpreting data (i.e. a crowd safety management tool that operates in real-time, an online tool that allows people to do a quick pre-check when applying for permits)
- Processes for designing cities (i.e. design guidelines for architects and planners in a smart city, a handbook for using new datasets in city planning and design)
- Processes for policy and organisation (i.e. model regulations for smart city applications in public spaces, business models for smart city applications, guidelines for setting up a local ethical board for smart city developments, indicators and metrics for city planning)
- Processes for smart mobility (i.e. platforms for smart logistics, approaches for shared mobility, smart emergency services)

The Smart City Deal lasts for two years. At the end of this period, all projects should be ready to use, not just by the participating cities, but by every city in the Netherlands and beyond. It is expected that this will stimulate the acceptance of smart city applications, harmonise smart city approaches and turn them from *ad hoc* innovations into common, regular practice.

It is too early as yet to see any effects from the Smart City Deal, but it serves as another clear example that the Zuid-Limburg cities are aware of the need to adopt smart city policies in order to address the challenges they face. It also demonstrates their recognition of the fact that they are not large enough individually to develop smart city policies in isolation, but need to enter into regional, national and even transnational collaboration.