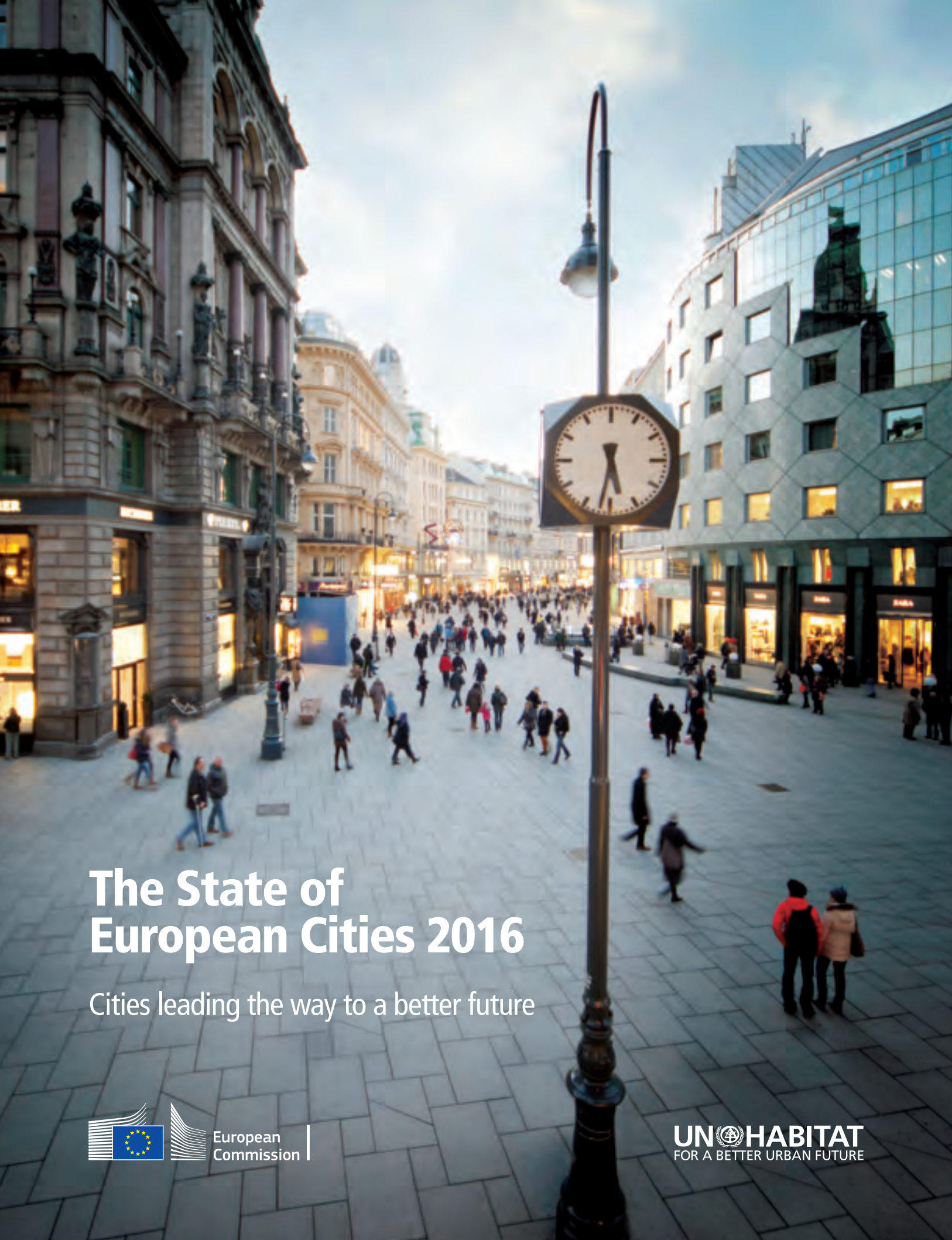

The State of European Cities 2016

Cities leading the way to a better future

European Commission

UN HABITAT
FOR A BETTER URBAN FUTURE

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Cities leading the way to a better future

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This report was published as a Commission Staff Working Document with the agreement of UN-Habitat. It can be consulted online at: http://ec.europa.eu/cities-report. The indicators in the report can also be accessed through: http://urban.jrc.ec.europa.eu

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Foreword

It gives me great pleasure to introduce this first *State of European Cities* report which is the outcome of close cooperation between the Directorate-General for Regional and Urban Policy (DG REGIO) of the European Commission and the United Nations Human Settlements Programme (UN-Habitat).

This publication - which covers the 28 EU member states and the countries of the European Free Trade Association (EFTA), i.e. Iceland, Liechtenstein, Norway and Switzerland - is timely since the 'European Project' finds itself in a period of major change in turbulent years with significant impacts on cities.

This report is also timely in the light of the third United Nations Conference on Housing and Sustainable Development (Habitat III), scheduled for October 2016. Supported by a wealth of new data, the analyses in this publication show how European cities are in the vanguard of forging new ways, whether in economic, environmental or governance terms.

This publication sheds light on Europe's unfolding demographic, economic, mobility, societal and environmental trends and the associated challenges faced by the region, its governments, the business sector and civil society.

It further shows how the countries of the EU-13 group (the eastern and central European nations that had embarked on a major transition to democratic and market-based societies) have made tremendous progress, even though there still remains much to be done before their full unification is achieved.

Many of the challenges ahead have policy sensitive aspects; whether that be Europe's demographic ageing or the still significant north-south and east-west differences within the Union in terms of productivity, unemployment and well-being.

The current report further introduces an entirely new methodology for more accurately measuring nations' degree of urbanisation. Although still experimental, it hints at a new and better approach to defining, quantifying and comparing degrees of urbanisation worldwide than currently exists.

The above issues and many others are explored in-depth in the present report, whose production was facilitated by commendable cooperation between DG REGIO of the European Commission and UN-Habitat.

Joan Clos
Under-Secretary-General of the United Nations and Executive Director of the United Nations Human Settlements Programme (UN-Habitat)

Foreword

Cities are leading the way to a more innovative, inclusive and sustainable future.

City authorities are at the forefront of societal change addressing both new challenges and new opportunities. With this report, we want to change the perception of cities from being a source of problems to places with potential. Cities can boost innovation, embrace people from different backgrounds or with different lifestyles and reduce our impact on the planet. To maximise this potential, however, policies at all levels of government need to consider the unique role of cities.

A concentration of innovation and high-growth firms has helped cities to create more jobs and grow faster. This performance, however, requires high-quality research, good connections with the private sector and an excellent business environment.

European cities attract new residents from inside and outside the EU. They come looking for a better education, a better job and a higher quality of life. Integrating these newcomers requires action on many fronts: building more housing, expanding public services, linking training to job opportunities and combatting discrimination.

Cities by their very nature make it easier to walk, cycle or take public transport. More and more cities have signed up to reducing their greenhouse gas emissions and adapting to climate change. Achieving these reductions will require efforts to make buildings more energy efficient and make low-carbon modes safe, efficient and attractive.

Cities have important investment needs. Through EU Cohesion Policy, they will benefit from more than EUR 100 billion support for financing projects on innovation in SMEs, social integration, low-carbon mobility and energy efficiency.

This report, produced in close cooperation by UN-Habitat and the Directorate-General for Regional and Urban Policy, was created to support the Urban Agenda of the EU and its goal of better urban intelligence and information. It will also feed into the third United Nations Conference on Housing and Sustainable Development (Habitat III). To facilitate access to the data behind the report, the Joint Research Centre has set up an urban data platform, which will collect city data from many different sources.

Only with a better urban knowledge and evidence base, can we improve our urban policies and investments.

I hope that this report will help cities to learn from each other's experience not only within Europe but across the globe.

Corina Crețu
Commissioner for Regional Policy

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The report was coordinated and edited by Lewis Dijkstra of the Economic Analysis Unit of the Directorate-General for Regional and Urban Policy, European Commission in Brussels and Jos Maseland of the Technical Advisory Branch of UN-Habitat in Nairobi. In the coordination of all activities they were assisted by Katharina Rochell, Human Settlements Officer in Nairobi and Alexandros Karvounis, Policy Analyst in Brussels.

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Executive summary

The State of European Cities report was prepared jointly by the Directorate-General for Regional and Urban Policy of the European Commission and the United Nations Human Settlements Programme (UN-Habitat) to support the Urban Agenda for the EU and the United Nations Conference on Human Settlements (Habitat III). It analyses the performance of European cities with regard to the priority themes of the Urban Agenda for the EU (jobs and skills, poverty, climate change mitigation and adaption, energy transition, air quality, mobility etc.) as well as the 2030 Urban Sustainable Development Goal of the United Nations to make cities safe, inclusive, resilient and sustainable. In addition to this report, a new Eurostat publication, *Urban Europe - statistics on cities, towns and suburbs,* provides additional insights and should therefore be read in conjunction with this report.

The objective of the report is to support more evidence-based urban policy making in Europe. Besides assessing economic, social and environmental trends at the city level, the report also presents a wide range of projects promoting urban development throughout the EU. Many EU cities have benefited from the more than EUR 100 billion invested through EU Cohesion Policy programmes since 2007. In addition, the report describes many of the other EU actions with a strong urban dimension.

The publication is addressed to policy makers both inside and outside Europe. Many mayors are keen to learn from each other and this report aims to facilitate such exchanges by comparing the performance of cities and by providing concrete project examples with a view to sharing best practice and promoting cooperation between cities.

Cities are no longer seen as only a source of problems

For a long time cities were seen as a problem rather than a potential. Urban policies in Europe, for instance, were mostly focused on problems of poverty, crime and urban decay. Despite progress, these issues have not gone away. Cities today, however, are increasingly recognised for their economic, social and environmental potential. As a result, urban policies are expanding their scope to ensure these benefits are fully exploited.

European cities are distinct in terms of size and density

The average density of a European city is 3,000 inhabitants per km^2. This density is often described as the minimum required to sustain efficient public transport. North American cities, with a median density of only 1,600 inhabitants per km^2, have greater difficulty sustaining public transport. Cities in Africa, Asia and Latin America are much more compact than their European counterparts with densities ranging between 4,000 and 8,000.

Another distinctive feature of European cities is their relatively smaller size. Only two cities, Paris and London, can be considered megacities with populations of just over 10 million. Other major global regions have megacities exceeding 15 or even 30 million inhabitants, with the number of megacities worldwide almost tripling from 10 to 28 over the last 25 years.

Cities attract working-age and foreign-born residents

Population growth in cities is fuelled by higher natural change and higher net migration. Working-age people in particular tend to move to a city looking for education and job opportunities, while those over 65 tend to move to less expensive locations (towns, suburbs or rural areas). Due to these movements, city dwellers tend to be younger and projections indicate that demographic ageing among city populations is lower.

Migrants from outside the EU are also more likely to live in cities and especially the large western European cities host a significant share of the non-EU born population.

Capital cities tend to have the highest population growth as well as the highest share of working-age population and of foreign-born population within their country.

Cities generate growth and jobs but some risk falling into the middle-income trap

The economic power of cities is growing. Between 2000 and 2013, GDP growth in cities was 50% higher than in the rest of the EU and employment in cities grew by 7% while it declined slightly in the remainder of the EU. This higher performance is due to the economic advantages of cities, including innovation, specialisation and better access to local and global markets. Not all cities, however, have been able to fully exploit these advantages. Ensuring

Cities can change their road infrastructure to make walking and cycling more convenient and safer

that more cities live up to their potential would boost economic growth and job creation throughout Europe.

The high- and very high-income cities in Europe have generated the highest GDP and employment growth, which has led to higher population growth. The low-income cities are catching up, with the highest GDP per capita growth, but so far they have experienced very little population growth.

Economic growth in medium-income cities was lower than the EU average, which raises the concern that some of these may be facing the middle-income trap, with stiff competition from lower-cost locations but lacking the means to move into higher value-added activities.

Cities are centres of innovation and education

Cities host most of the institutes of higher education in Europe. Specialisation and innovation generate a demand for a highly educated labour force, which encourages city residents to gain qualifications and attracts qualified people from elsewhere. In addition, close interaction between highly skilled workers in cities generates even more innovation.

Some of these effects are stronger in big cities but medium-sized cities can also offer such advantages. Many European cities provide excellent examples of how innovation can foster urban development and some of these cities are quite moderate in size, like Eindhoven or Cambridge. Successfully bringing innovation to the market can create new high-growth firms, which tend to concentrate in cities and especially in capital cities.

Due to the dense and well-connected network of cities in Europe, some benefit from 'borrowed size'. This means that cities in close proximity to other cities can become more productive than their size alone would predict. The exact mechanism of this phenomenon is not yet fully understood but is likely to require coordination of specialised services among them.

Cities contribute to achieving the targets of the Europe 2020 strategy

The Europe 2020 strategy promotes smart, inclusive and sustainable growth in the EU. Overall, cities are closer to the employment, education and poverty reduction targets than towns, suburbs and rural areas. Employment rates in cities have increased since 2010, but are still slightly below pre-crisis levels. Increasing employment rates requires action at national level to encourage employment creation, and at the local level to facilitate jobs and skills matching. The population born outside the EU, on average, has low employment rates and tends to live in cities. Therefore, cities can play an important role in the economic integration of this population segment.

On the education front, cities perform very well. In 2010, cities had already reached the Europe 2020 target of 40% of their population aged 30-34 having a tertiary education and increased it further to 48% in 2015. By 2014, cities had reduced their share of early school leavers to 10%.

The economic crisis has increased the at-risk-of-poverty and social exclusion rate in cities. Reducing urban poverty requires a concerted effort by multiple levels of government. Income taxes and wealth redistribution are primarily organised at the national level and have the biggest impact on incomes. Cities can improve their poor neighbourhoods. Although this may not necessarily affect incomes, it can substantially improve access to services, schooling and education, and improve safety and integration.

Housing in cities is expensive, small and crowded

More households in cities have a high housing cost burden than in other areas. Also, more households in cities live in a crowded dwelling than in towns, suburbs and rural areas. But this varies between cities, even within the same country. For example, in Helsinki only 10% of people thought it was easy to find good housing at a reasonable price compared to 75% in Oulu.

Cities can facilitate the construction of more (affordable) housing to reduce housing costs and crowding and thus also contribute to a lower level of poverty. High housing costs may contribute to more people living in informal housing or even on the streets.

European cities are relatively safe but city dwellers tend to feel less secure

From a global perspective, European cities are safe with very low homicide rates. Homicides in the EU dropped by

40% between 2002 and 2014. Nevertheless, people living in cities are less likely to feel secure. The differences between countries, however, are much more pronounced than between cities and rural areas within a country, implying that the national context matters. Three times as many people in cities say they live in an area with crime, violence or vandalism compared to those in rural areas. So despite a positive trend, improving safety and feelings of security should remain a priority in cities.

Cities offer accessibility but must improve green mobility

Living in a city means that there are a multitude of destinations within a short distance that could easily be walked or ridden by bike. In addition, the concentration of people, jobs, and shops makes it efficient to offer a dense network of public transport lines with a high frequency service. Cities also tend to have safer traffic, with substantially lower road traffic fatality rates than rural areas. These benefits, however, do not occur automatically.

Cities can change their road infrastructure to make walking and cycling more convenient and safer. Ensuring that public transport is not stuck in traffic, for example by introducing dedicated bus or tram lanes, can increase both its speed and reliability. Cities can use their parking policies to reduce greenhouse gas emissions and become more accessible. As people with better alternatives shift to other transport modes, fewer people will drive, which will reduce congestion and improve air quality.

Cities are more resource efficient

Per inhabitant, European cities cover less land with buildings and have fewer kilometres of local roads than towns, suburbs or rural areas, which implies lower costs of installing and maintaining utility lines.

These urban advantages, however, do vary between cities and can deteriorate over time. The resurgence of urban living, however, is helping cities become more efficient. Most of the growing European cities successfully reduced the amount of land they use per inhabitant, in part due to measures that invested in and renovated historic urban centres. Public policies can help by promoting mixed-use development, close to public transport stops with sufficient density, by allowing cities to grow and by discouraging dispersed, low-density development.

Access to green space can help to make dense urban living more attractive. The key to good access to green space is not the share of green space within a city but rather its distribution across the different neighbourhoods.

Many cities still struggle to reduce air pollution below EU thresholds

Over the last two decades, the concentration of air pollutants like lead, sulphur dioxide and carbon monoxide has been significantly reduced through combinations of EU, national and local action. Nevertheless, nitrogen dioxide, ozone and particulate matter (PM_{10} and $PM_{2.5}$) still exceed both WHO guidelines and EU thresholds in many cities.

Despite improvements over the past decade, many cities also still have to make significant investments to recycle more of their solid waste, reduce landfill and to collect and treat their waste water appropriately.

Cities are committed to reducing GHG emissions and adapting to climate change

Efforts to mitigate climate change by reducing greenhouse gas (GHG) emissions have become a common feature across European cities and these are now increasingly combined with measures focused on climate change adaptation. Increasing the energy efficiency of the existing building stock will be critical to reducing energy consumption more quickly.

In the past, policies to reduce floods and other natural hazards relied mostly on grey infrastructure, such as flood-protection barriers and water run-off basins. Increasingly, natural wetlands, networks of city parks, green roofs and other nature-based solutions are used to reduce risk, while improving the quality of life in cities.

City governments are increasing their autonomy and their scale

Local authorities are the most important sub-national authority in all but five countries. In two out three

countries, the average population size of municipalities has increased since 1990. This trend, however, is slow and far from comprehensive. Many countries still have local authorities with little autonomy and/or very small populations.

Local governments are responsible for a quarter of all public expenditure and almost half of public investment. Over the past 20 years, the local share of public expenditure has grown but dropped off following the economic crisis. The local share of public investment, however, has remained stable over the past twenty years. Relative to GDP, local public investment increased up to the crisis, with particularly large increases in central and eastern Member States helped by co-financing from EU Cohesion Policy. After the economic crisis, public investment dropped substantially relative to GDP. This raises concerns about long-term growth prospects.

In many countries, cities have expanded beyond their municipal borders and commuting distances have increased, further extending the reach of these economies. To better reflect this new urban reality, more and more countries have established metropolitan governments and/or merged municipalities. The keys to good urban governance are high levels of trust, efficient service delivery and good stakeholder and public involvement. This improves policy effectiveness which in turn inspires more trust and involvement, thus creating a virtuous cycle.

The Urban Agenda for the EU
http://urbanagendaforthe.eu/

The Urban Agenda for the EU was adopted at an informal meeting of the Council of European Affairs ministers of the EU on 24 June 2016. It aims to promote cooperation between Member States, the European Commission and cities in order to stimulate growth, liveability and innovation in EU cities.

It is a new working method to ensure maximum utilisation of the growth potential of cities and successfully tackle the social challenges. This new approach includes the development of a range of European partnerships under which the European Commission, Member States and cities will work together to ensure that the urban dimension is strengthened in EU policies through:

- Improving the development, implementation and evaluation of EU legislation and instruments ('better regulation');
- Ensuring better access to and utilisation of European funds for cities ('better funding'); and
- Enhancing the urban knowledge base and the sharing of best practices and cooperation between cities ('better knowledge').

Four such two-year partnerships have already been launched covering air quality, housing, inclusion of migrants and refugees, and urban poverty.

The 2030 Agenda for Sustainable Development of the United Nations

The 2030 Agenda for Sustainable Development of the United Nations was adopted in 2015. It includes a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change. Each goal has specific targets to be achieved by 2030. The urban challenges are tackled mainly through Goal 11, which aims to "make cities and human settlements inclusive, safe, resilient and sustainable".

This report covers five SDG indicators for European cities:
SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable

- Proportion of the population that has convenient access to public transport (Indicator 11.2.1.)
- Ratio of land consumption rate to population growth rate (Indicator 11.3.1.)
- Annual mean levels of fine particulate matter (e.g. $PM_{2.5}$ and PM_{10}) in cities (Indicator 11.6.2)
- The average share of the built up areas of cities that is open space (Indicator 11.7.2)

SDG 3: Ensure healthy lives and promote well-being for all at all ages

- Road traffic fatal injury deaths within 30 days, per 100,000 population (Indicator 3.6.1)

Lexicon

City (Box 2.1)
A city is a local administrative unit (LAU) where the majority of the population lives in an urban centre of at least 50,000 inhabitants.
http://ec.europa.eu/eurostat/web/cities/spatial-units

Commuting zone (Box 2.1)
A commuting zone contains the surrounding travel-to-work areas of a city where at least 15% of employed residents are working in the city.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Commuting_zone

Degree of urbanisation
The new degree of urbanisation indicates the character of the area where the respondent lives. Three types of area have been identified: (1) cities, (2) towns and suburbs, and (3) rural areas. Urban areas are defined as cities plus towns and suburbs.
http://ec.europa.eu/eurostat/web/degree-of-urbanisation/overview

Functional urban area (FUA) (Box 2.1)
The functional urban area consists of a city plus its commuting zone.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Functional_urban_area

Metro regions
Metro regions are NUTS-3 regions or groupings of NUTS-3 regions representing all functional urban areas of more than 250,000 inhabitants. The typology distinguishes three types of metro regions: 1. capital city regions; 2. second-tier metro regions; and 3. smaller metro regions.

The capital city region is the metro region which includes the national capital.

Second-tier metro regions are the group of largest cities in the country excluding the capital. For this purpose, a fixed population threshold could not be used. As a result, a natural break served the purpose of distinguishing the second tier from the smaller metro regions.

Smaller metro regions are the remaining ones.
http://ec.europa.eu/eurostat/web/metropolitan-regions/overview

Local administrative unit (LAU) or Municipality
Local administrative units, abbreviated as LAUs form a system for dividing up the economic territory of the European Union (EU) for the purpose of statistics at local level. They have been set up by Eurostat and they are compatible with NUTS.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:LAU2

Population grid
A grid with cells of one km² containing total population.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Population_grid_cell

Rural area
Municipalities where more than 50% of the population lives in rural grid cells, as used in the degree of urbanisation.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Rural_area

Town and suburbs
Municipalities where 50% of the population lives in urban clusters and it is not a city, as used in the degree of urbanisation.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Town_or_suburb

Urban area
The sum of city, towns and suburbs.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Urban_area

Urban centre
Urban centre is a cluster of contiguous grid cells of 1 km² with a density of at least 1,500 inhabitants per km² and a minimum population of 50,000.
http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Urban_centre

Country names and their abbreviation

BE: Belgium
BG: Bulgaria
CZ: Czech Republic
DK: Denmark
DE: Germany
EE: Estonia
IE: Ireland
EL: Greece
ES: Spain
FR: France
HR: Croatia
IT: Italy
CY: Cyprus*
LV: Latvia
LT: Lithuania
LU: Luxembourg
HU: Hungary
MT: Malta
NL: Netherlands
AT: Austria
PL: Poland
PT: Portugal
RO: Romania
SI: Slovenia
SK: Slovakia
FI: Finland
SE: Sweden
UK: United Kingdom
IS: Iceland
NO: Norway
CH: Switzerland

* Data for Cyprus only cover the areas under the effective control of the Government of the Republic of Cyprus.

Member State groupings

EU-13: All Member States that joined the EU in 2004, 2007 or 2013. Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

EU-28: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

EU-27: EU-28 without Croatia.

Geographic groupings

Central and Eastern Member States: Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

Southern Member States: Cyprus, Greece, Italy, Malta, Portugal and Spain.

Western Member States: EU-15

Nordic countries: Denmark, Finland, Iceland, Norway and Sweden.

Baltic States: Estonia, Latvia and Lithuania.

Europe: EU-28, Iceland, Norway and Switzerland (except in Chapter 1 see below).

Countries included in the major global regions in chapter 1

Europe

Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Faeroe Islands, Finland, France, Germany, Greece, Holy See (Vatican City), Hungary, Iceland, Ireland, Italy, Kosovo*, Latvia, Liechtenstein, Lithuania, Luxembourg, the former Yugoslav Republic of Macedonia, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

* This designation is without prejudice to positions on status and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence.

Belarus, Republic of Moldova, Russian Federation and Ukraine are reported separately from the rest of Europe.

Africa

Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau,

Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mayotte, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic Mauritius, Reunion, Rwanda, Saint Helena, São Tomé and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Western Sahara, Zambia and Zimbabwe.

Asia

Afghanistan, Armenia, Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, Georgia, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Oman, Pakistan, Philippines, Qatar, Saudi Arabia, Singapore, South Korea, Sri Lanka, Palestine, Syrian Arab Republic, Tajikistan, Thailand, Timor-Leste, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam and Yemen.

Latin America and the Caribbean

Anguilla, Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil, British Virgin Islands, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Curaçao, Dominica, Dominican Republic, Ecuador, El Salvador, Falkland Islands, French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Barthélemy, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Saint-Martin, Sint Maarten, Suriname, Trinidad and Tobago, Turks and Caicos Islands, United States Virgin Islands, Uruguay and Venezuela.

Northern America

Bermuda, Canada, Greenland, Saint Pierre and Miquelon and the United States of America.

Oceania

American Samoa, Australia, Commonwealth of the Northern Mariana Islands, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Federated States of Micronesia, Nauru, New Caledonia, New Zealand, Niue, Norfolk Island, Palau, Papua New Guinea, Pitcairn, Republic of the Marshall Islands, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wallis et Futuna and Western Samoa.

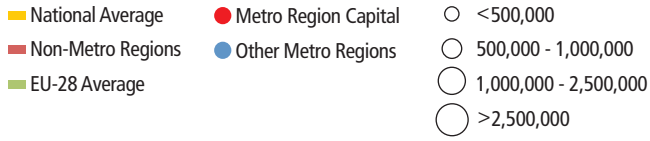
How to read a metro region graph

For this report, a metro region graph template was created to show the performance of metro regions relative to the EU, the country and the non-metro regions in that country. As these graphs are complex, this page explains how they are built and how to read them. Each metro region graph shows five different components: the national average value; the capital metro region value; the other metro region values; the non-metro region value; and the EU-28 average value.

The EU-28 average is displayed as a solid green line. Short lines show the values for the non-metro regions (dark red) and the national average (yellow). The order of countries is determined by the national average values in an increasing order.

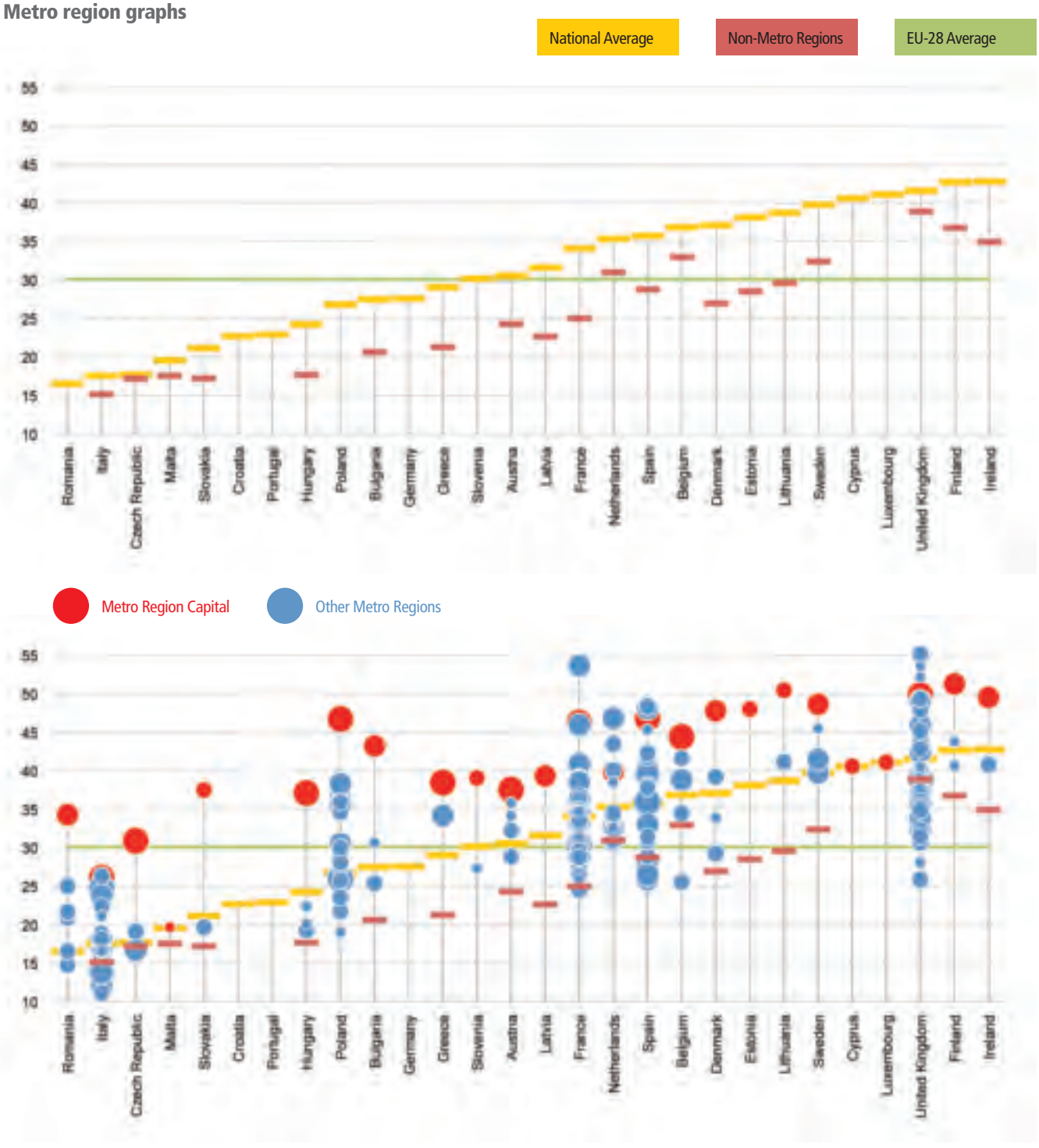
If the non-metro region value is lower than the national average value, the metro region average will be higher than the national average. As a result, the size of the gap between the non-metro and the national average is indicative of the overperformance of the metro regions in that country (or underperformance if non-metro regions perform better than the country).

Bubbles show the values of the capital metro region (red) and other metro regions (blue). The size of the bubbles shows the population size in four classes.



If the large bubbles cluster at the top, it means that large metro regions perform better than small ones. The distinction between the capital metro region and the other metro regions shows whether the capital metro region performs better and if there is a (big) gap between the capital and the other metro regions in a country.

Metro region graphs



Chapter 1.
European cities in a global context

- Within the EU, city comparisons used to be hindered by differences in urban definition. Since 2011, this problem has been overcome by a new methodology, the degree of urbanisation, which classifies population distribution into three groups: cities, towns and suburbs, and rural areas. Urban areas include both cities and towns and suburbs. Eurostat today publishes more than 100 indicators by degree of urbanisation.

- The degree of urbanisation can be used as a global, people-based definition of cities and settlements. Chapter 1 shows the first draft results of applying this methodology to a new global population grid. It reveals that, today, 52% of the global population lives in cities and another 33% in towns and suburbs. It also shows that Africa and Asia are far more urbanised than the figures in the World Urbanization Prospects suggest.

- European cities have an average density of 3,000 inhabitants per km^2. This density is often described as the minimum required to sustain efficient public transport. North American cities have an average density of only 1,600 inhabitants per km^2. Cities in Africa, Asia and Latin America have densities ranging between 4,000 and 8,000 inhabitants per km^2.

- Out of the 79 cities worldwide with more than five million inhabitants, only four are in Europe. A mere 16% of city residents in Europe live in such large cities, compared to 30% in Asia and 28% in North America.

By using a population grid, cities can be defined in a harmonised manner across the globe

Chapter 1.
European cities in a global context

The degree of urbanisation helps classify cities, like Badajoz in Spain, which have a low municipal population density because the dense city is part of a municipality which is much larger

1.1. Introduction

Before exploring European cities in more detail, this chapter shows how these cities relate to cities in other parts of the world. This chapter presents, for the first time, a brief comparison of cities in the world based on a harmonised definition - the degree of urbanisation - applied to a simple, single and freely available data source: a new global population grid.

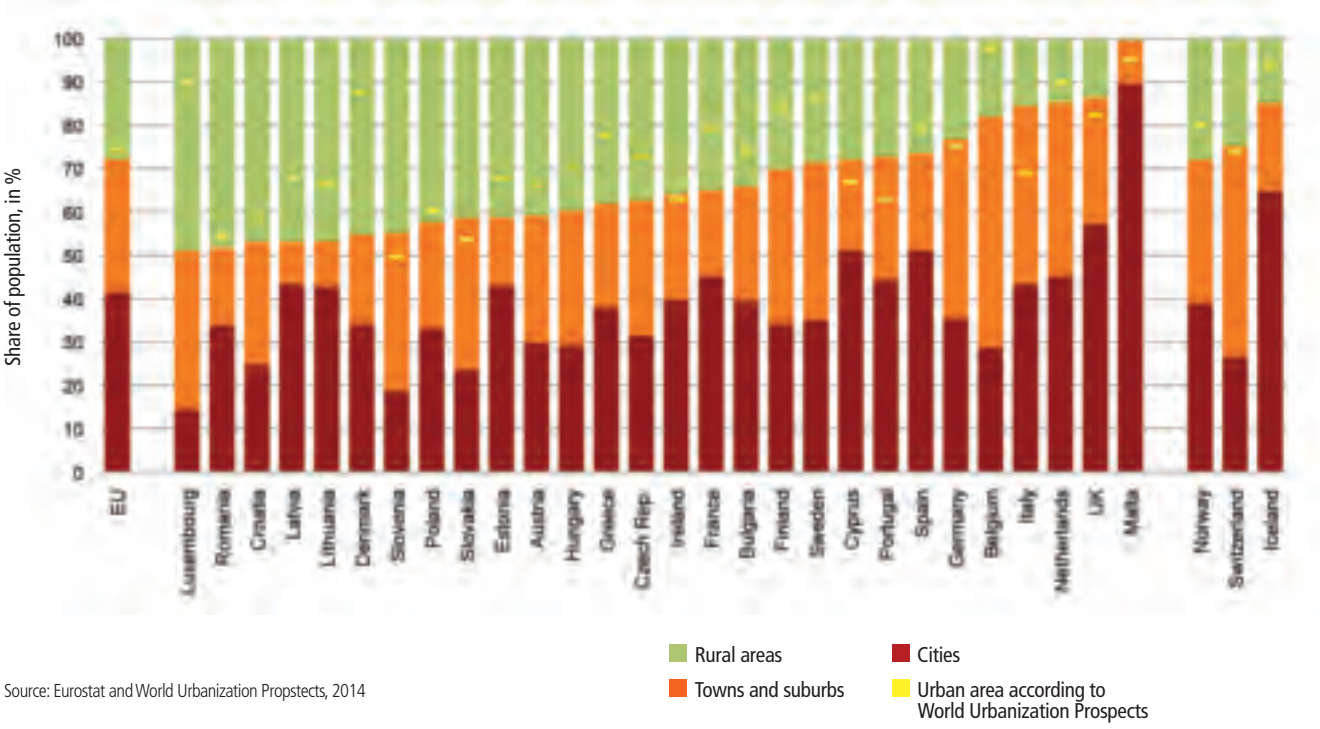
The chapter starts by describing how the degree of urbanisation was developed and applied to Europe. Next it describes the population distribution between the three degrees of urbanisation and how they have changed over time. Although this data is still in an experimental phase and will have to be further investigated and validated, it reveals a very different picture of global urbanisation.

The final sections of this chapter compare the size distribution of cities, their densities and the distance between them in the different major global regions.

1.2. Applying the degree of urbanisation to Europe and the globe

This new definition allows us to see European cities in a new light. Surprisingly, the EU population share in urban areas (72%) is very similar to the share reported

Figure 1.1. **Population by degree of urbanisation per country, 2014**



Source: Eurostat and World Urbanization Propstects, 2014

Surprisingly, the EU population share in urban areas (72%) is very similar to the share reported by the UN Population Division based on national definitions (74%) (Figure 1.1). Due to the variety of national definitions used in the EU, however, the differences for some countries, such as Denmark or Belgium, were considerable (Figure 1.1)

in the World Urbanization Prospects based on national definitions (74%) (Figure 1.1). Due to the variety of national definitions used in the EU, however, the differences for some countries, such as Denmark or Belgium, were considerable (Figure 1.1).

To apply the degree of urbanisation to the globe, two sources of information are needed: a global population grid and a layer with the municipal boundaries. No free global population grid was available, so a new global grid was created and is available as a free download at: http://ghsl.jrc.ec.europa.eu

It is based on two data sources: the Global Human Settlement Layer (GHSL) produced by the European Commission's Joint Research Centre (JRC), which detects buildings using very high resolution satellite imagery and the CIESIN Gridded Population of the World.

As a digital global set of municipal boundaries is not available, only the first step of the degree of urbanisation has been applied. For ease of reading, the remainder of this chapter uses the terms cities, towns and suburbs, and rural areas to refer to the three grid concepts (urban centre, urban cluster and rural grid cells).

1.3. Europe may be less urbanised than other parts of the world

The most authoritative and most cited source of global urbanisation levels is the UN World Urbanization Prospects (WUP). This covers the globe, but is not based on a single definition. For example, the minimum population threshold to be considered as an urban area varies between 200 and 50,000 (UN 2014). As a result, what is classified as urban in one country may become rural in another. It should not come as a surprise that using a single definition based on population grids yields a sometimes radically different picture.

Box 1.1. **Defining cities and urban areas: The degree of urbanisation**

Until 2011, it was difficult to compare cities within Europe. Differences in national definitions meant that even simple indicators such as population size could not be compared. This made it impossible to analyse the performance of cities in a coherent way. It also made it difficult for cities to learn from each other.

The main problem to overcome was that municipalities differed so much in size (area). This had two consequences. First, a city in a very large municipality would have a very low population density. For example, Badajoz in Spain is a city with 150,000 inhabitants, but its population density is only 100 inhabitants per km^2. Second, a city can consist of multiple small municipalities, which makes it difficult to define where the city ends, as is, for instance, the case with many French and Swiss cities.

In the late-2000s, a team of experts from the OECD and different services inside the European Commission got together to resolve this problem. A newly developed, statistical tool, the population grid, divides the entire territory into squares of 1km by 1km and provides the population number inside each square. National statistical institutes can produce this information using the exact location of each household in the population data from their census.

The final method, called degree of urbanisation, was applied in a two-step process: First the grid cells were defined based on density, contiguity and population size. Subsequently, municipalities were defined based on the type of grid cells the majority of their population resides in. Map 1.1 and Map 1.2 demonstrate this for Cork and its surroundings in Ireland.

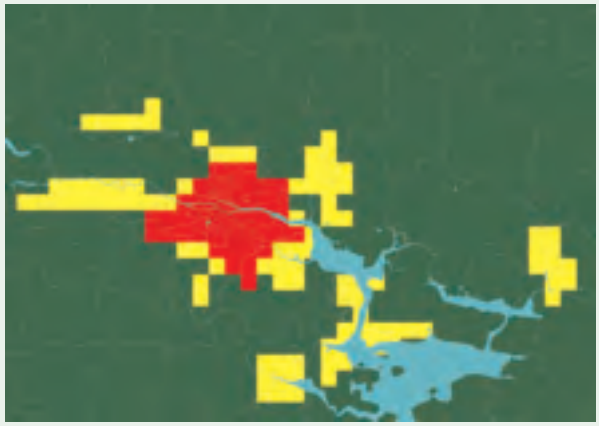
The degree of urbanisation identifies three types of cells using a 1km^2 grid (Map 1.1):

1. An urban centre consists of contiguous grid cells with a density of at least 1,500 inhabitants per km^2 and has at least a total population of 50,000;

2. An urban cluster consists of contiguous grid cells with a density of at least 300 inhabitants per km^2 and at least a total population of 5,000; and

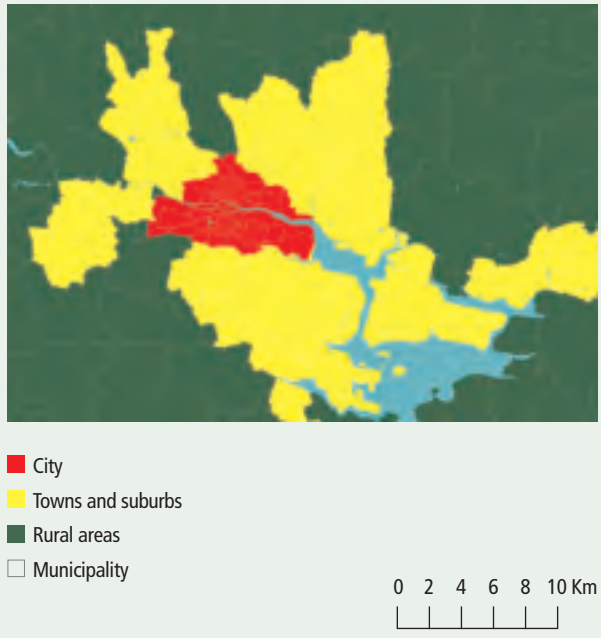
3. Rural grid cells: grid cells outside urban clusters.

Map 1.1. **Urban centre, urban cluster and rural grid cells around Cork, Ireland**

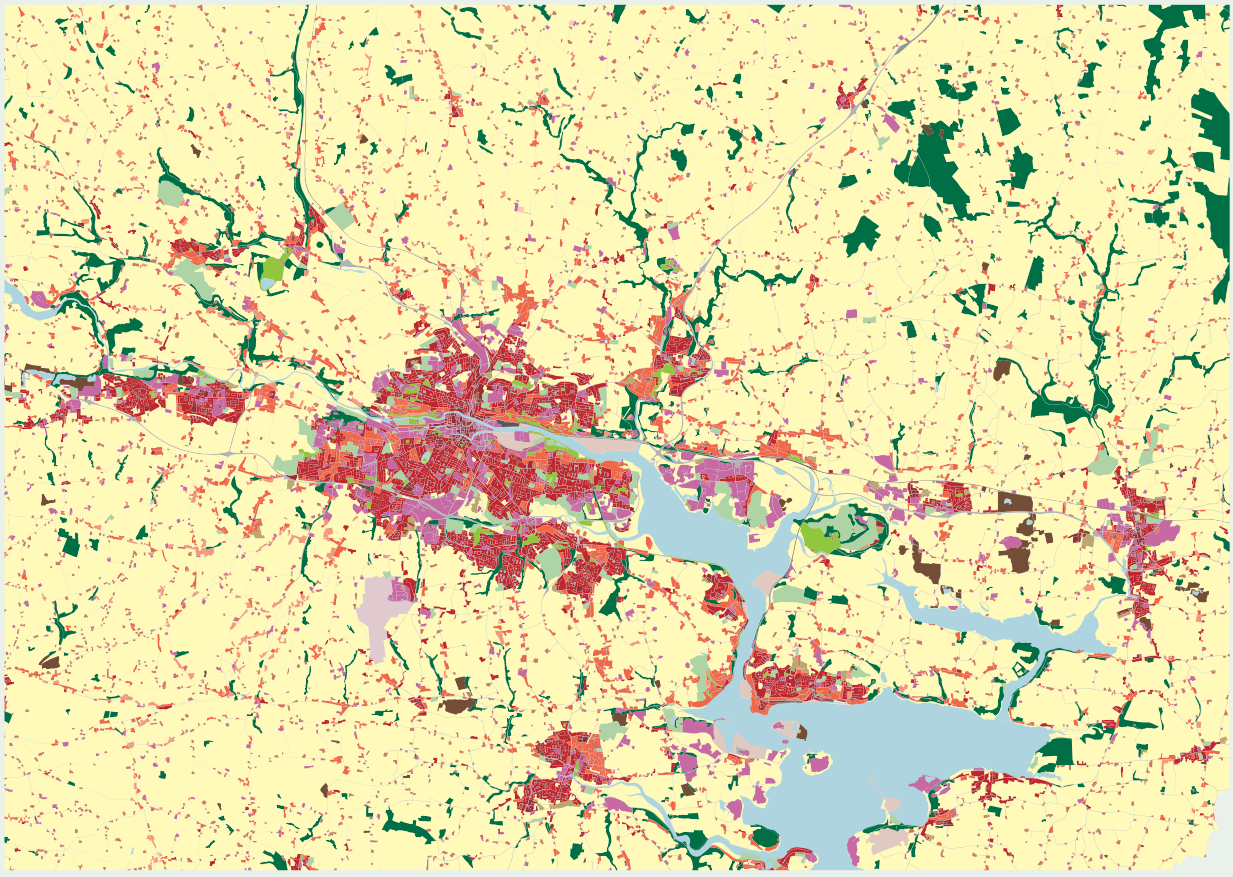


Source: Eurostat

Map 1.2. **City, towns and suburbs, and rural areas around Cork, Ireland**



Map 1.3. **Land use in Cork, 2012**



Source: EU Urban Atlas, 2012

These three types of grid cells are used to classify municipalities (Map 1.2):
1. Cities have the majority of their population in urban centres.
2. Towns and suburbs have the majority of their population in urban clusters but are not cities.
3. Rural areas have the majority of their population in rural grid cells.

Map 1.3. shows the land uses in and around Cork.
Urban areas are defined as cities plus towns and suburbs.
This harmonised definition was agreed with all European national statistical institutes in 2011.
Eurostat, the Statistical Office of the European Union, now publishes over 100 indicators by degree of urbanisation.

Box 1.2. **Reliability of the new global population grid**

The population grid is a new product and its accuracy needs to be further verified. The comparison with the degree of urbanisation based on an official European population grid shows only small discrepancies. In the next few years, the Global Human Settlement Layer and its global population grid will be updated and improved using European Copernicus satellite data.

In parts of the world where population data is less refined, i.e. based on regional data instead of local or census, and where buildings are less easily detected on satellite imagery, the margin of error will be larger. Therefore, the reliability is likely to be higher in North America than in Africa, Asia or Latin America.

As larger settlements are easier to detect on satellite imagery, the uncertainty for large cities is also likely to be smaller.

The JRC has created population grids for 1975, 1990, 2000 and 2015 based on Landsat imagery. The quality of this data, however, is lower the further one goes back in time. Therefore, the margin of error is likely to be higher in 1975 than in 2015. The earliest results should thus be interpreted with caution. Nevertheless, this work represents a major step forward since it is the most comprehensive source of information of this kind in the world, while updates and revisions can be far more frequently undertaken than national censes. They also facilitate more accurate city enumeration across municipal boundaries.

In short, despite the obvious advantages of a unified global definition, this grid is currently most reliable for large cities, for developed countries and for 2015. With the approach being further refined, its definition and higher accuracy can, in time, also be extended to settlements of all sizes worldwide.

Comparing city lists

Applying the degree of urbanisation to this new population grid means that all cities in the world will become defined in an identical manner. As this has not yet been attempted before, it is still difficult to validate this work. A number of worldwide city lists are available, but they neither necessarily claim to capture all cities nor use a single definition.

The overlap between these lists and the city list using the degree of urbanisation proved very high: between 75 and 98% of these points fell within a city (or within 1km from a city). When towns and suburbs were included, the share of matches increased to between 94% and 99%. The city list using the degree of urbanisation, however, identifies quite a few cities over 300,000 and 100,000 inhabitants respectively which do not appear in the World Urbanization Prospects' or Angel's list.

Table 1.1. **Comparison of cities by degree of urbanisation with other city lists**

List	Population threshold	Definition	Number of settlements	Reference year	Matches a city
World Urbanization Prospects	300,000	National	1,692	2014	98%
Shlomo Angel	100,000	Various	4,236	2010	94%
Brinkhoff	50,000	Various	3,254	2016	86%
GRUMP	50,000	Mixed method	9,624	2000	75%
Degree of urbanisation	50,000	Single	13,844	2015	100%

Source: JRC

Contrary to popular perception, this new approach shows that Europe, although highly urbanised, is less urbanised than other parts of the world (Figure 1.2). This preliminary result would need to be confirmed by further investigations. In Europe, 72% of the population lives in urban areas, compared to 85% of the global population. Also, the population share in European cities with at least 50,000 inhabitants is low: 39% compared to 52% globally. North America has a similar share of population in rural areas (27%) as Europe, but a large share lives in cities (47%) compared to Europe (39%).

The UN figures also show high levels of urbanisation in Latin America and Oceania, but Asia and Africa are reported as still well below 50%. The new definition would put Africa at 81% urban and Asia at 89%. Caution

The largest increases in city population were in North America, Oceania and Africa (in descending order) with increases around 15 percentage points

should be taken interpreting these results as they may be less reliable in countries where population data is only available at a regional instead of at a local or neighbourhood level and/or where not all built-up areas were detected (Box 1.2). Other reports, however, have also concluded that Africa and Asia may be considerably more urbanised than their national definitions suggest (World Bank 2009). Overall, the degree of urbanisation puts 85% of the global population in urban areas compared to only 54% in the World Urbanization Prospects.

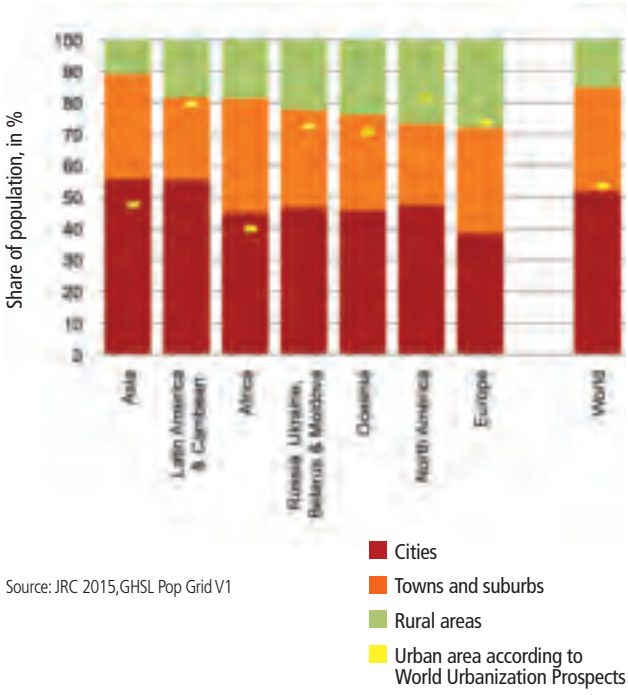
The global share of population in cities increased from 44% in 1975 to 52% in 2015. This is similar to the population changes in urban areas reported in World Urbanization Prospects, although the increase is not as rapid. In part, the slower urbanisation rate may be due to inaccuracies introduced by the lower resolution data for 1975. The largest increases in city population were in North America, Oceania and Africa (in descending order) with increases of around 15 percentage points. In Latin America and the Caribbean and Asia and the Pacific, the population share in cities increased by 9 and 7 percentage points respectively.

Whereas in Europe the urbanisation level has barely changed over the past forty years, it grew in almost all other parts of the world (Figure 1.3).

1.4. European cities are denser than North American cities but less so than cities in emerging economies

The differences in city density between major global regions are considerable (Figure 1.4). The median density in North American cities is only 1,600 residents per km^2, compared to 6,000 in African and Asian cities. European cities, with a density of 3,000 residents per km^2, are almost twice as dense as North American ones. The low densities in North American cities reflect the higher prevalence of suburban living and the predominance of car travel. If Asian and African cities were to follow the North American model, they would occupy four times the amount of land. Following a more European approach would imply using only twice the space.

Figure 1.2. **Population share by degree of urbanisation per major global region, 2015**



Source: JRC 2015,GHSL Pop Grid V1

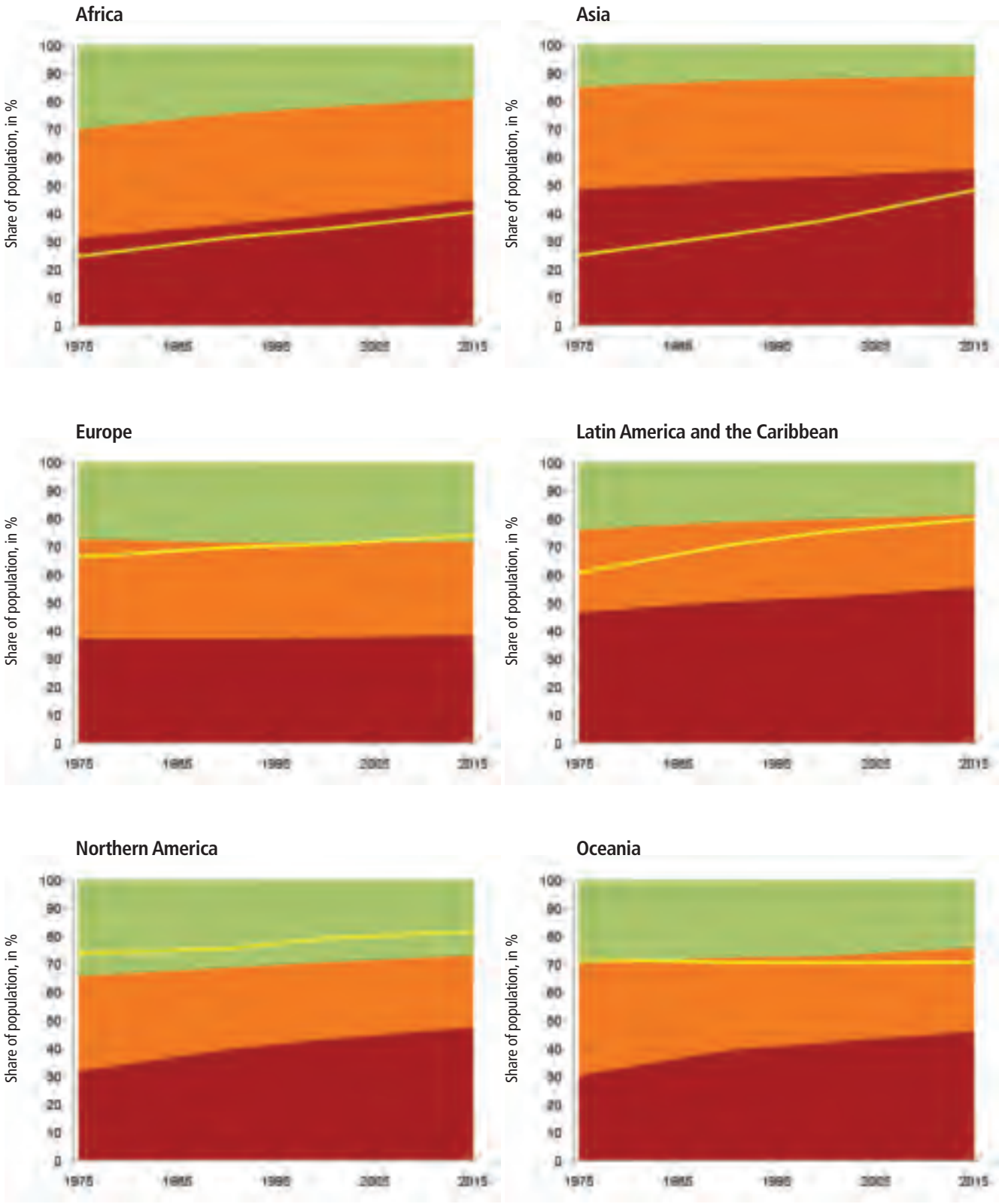
The largest cities tend to be the densest. The differences in Europe and Latin America are big. In Africa and Asia, however, all the cities tend to have a high density.

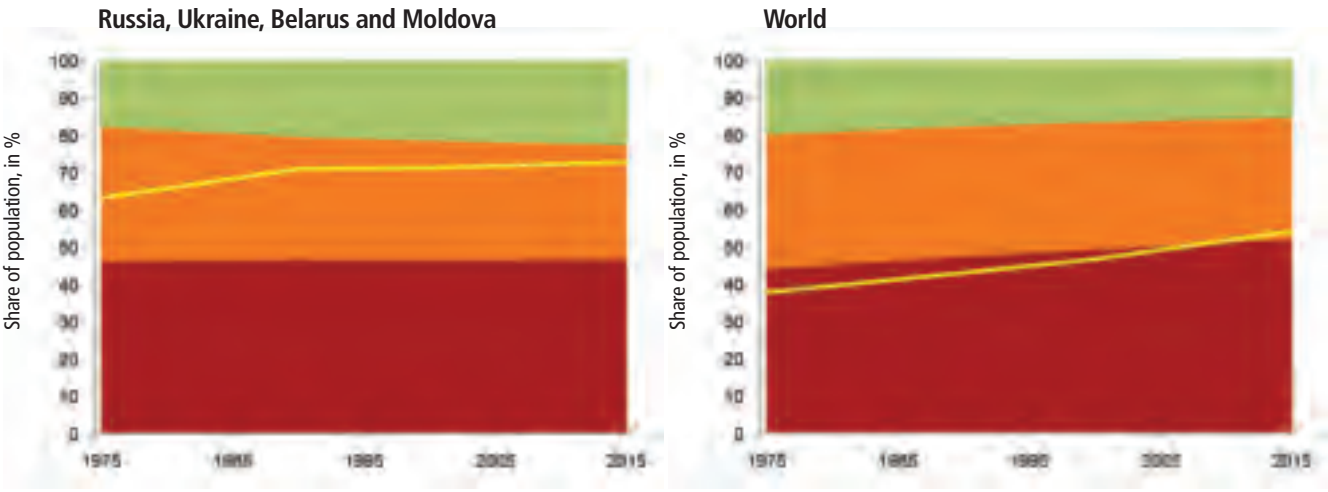
1.5. Europeans tend to live in mid-size cities

Compared to other cities in the world, European city residents are concentrated in cities with populations between 250,000 and 5 million (Figure 1.5). Of the 79 cities of over 5 million inhabitants in the world, only four are in Europe. Only one in seven European city residents lives in such a city, compared to one in four globally. Cities below 250,000 account for a larger share of city residents in Africa (33%) than in Europe (28%) but this share is even lower in North America (17%).

This shows that Europe has both a low share of city residents in large and in small cities compared to the rest of the world. Globally, just under half of all city residents live in cities with less than one million inhabitants. Because these cities are comparatively small, there are far more of them. This analysis identified 500 cities over 1 million and 13,000 with less than one million residents. The small number of large cities and their population sizes give them more name recognition than the many small cities.

Figure 1.3. **Change in population share by degree of urbanisation per major global region, 1975-2015**





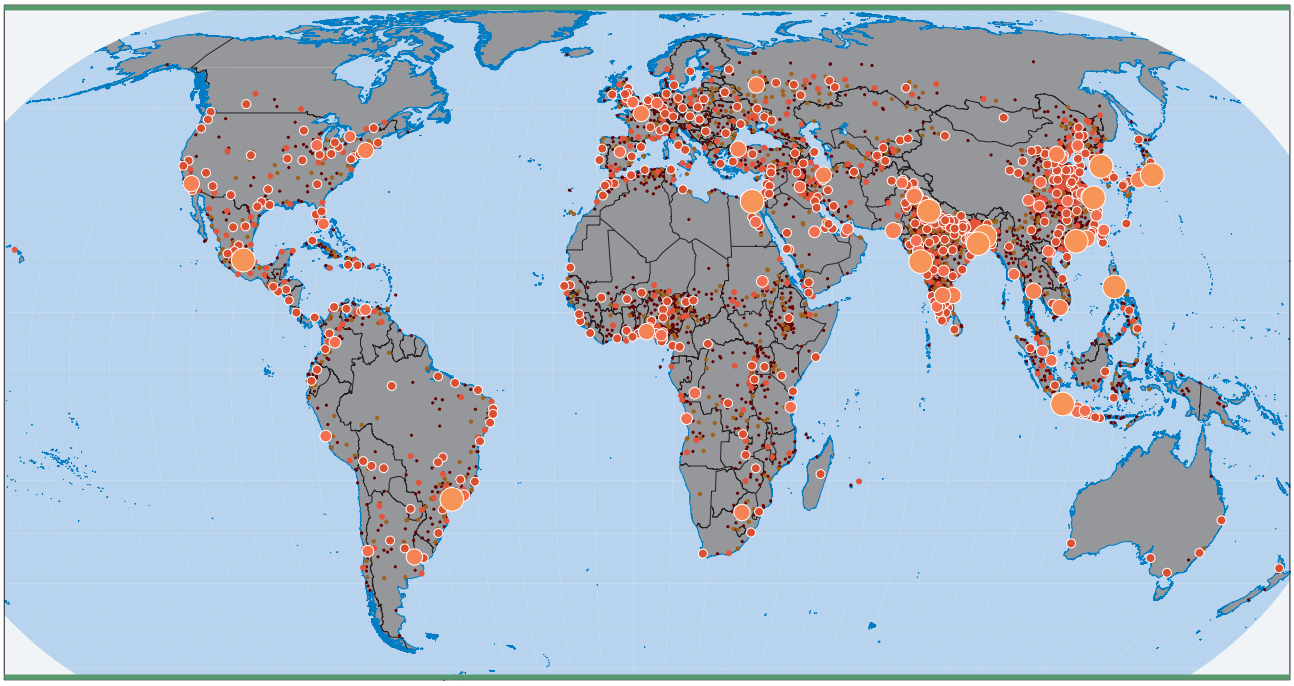
Source: JRC (GHS POP Global Settlement Model) and UN World Urbanization Prospects

US cities are the least dense because they were planned around suburban living and access by car

© Tupungato

London (above) and Paris are the only two European cities over 10 million inhabitants

Map 1.4. **Urban centres in the world by population size, 2015**

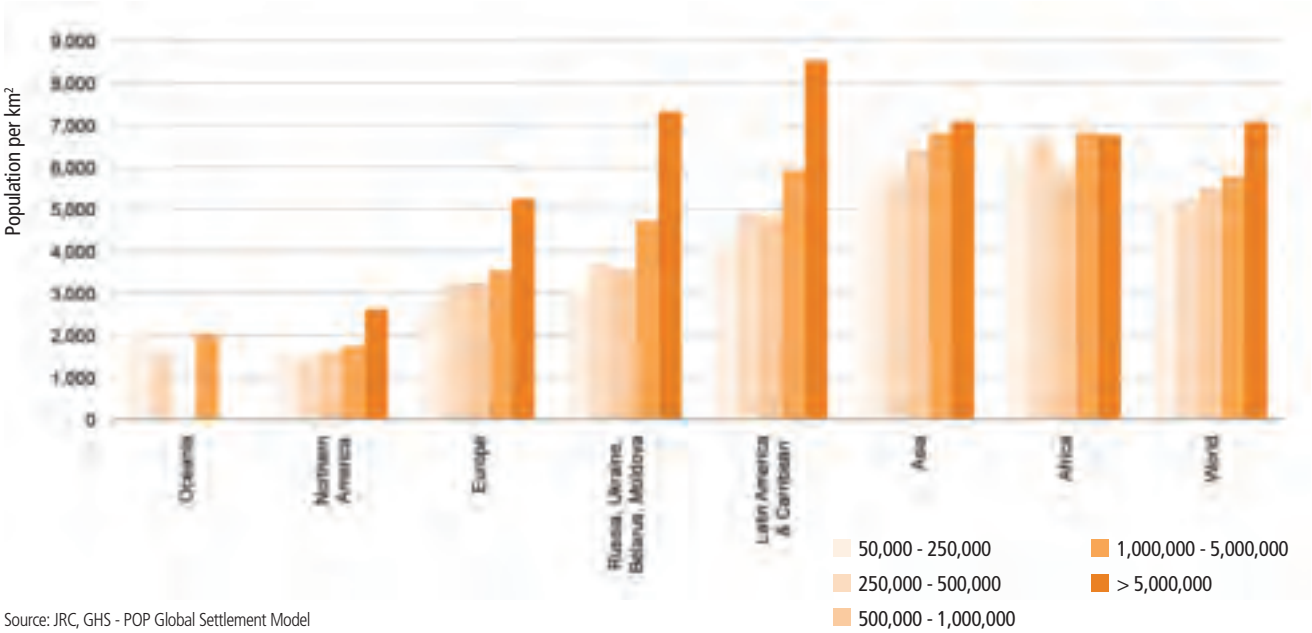


Source : JRC (GHS - POP Global Settlement Model)

Inhabitants

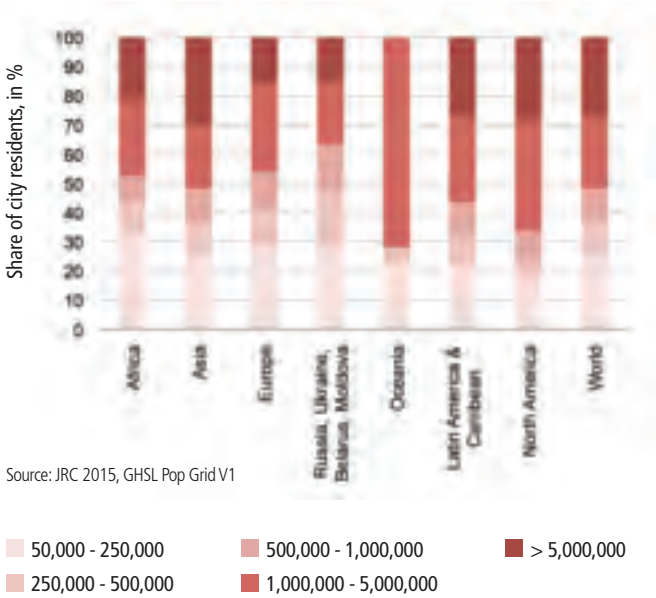
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- 5,000,000 - 10,000,000
- 10,000,000 - 20,000,000
- > 20,000,000

Figure 1.4. **Median population density by city size class per major global region, 2015**



Source: JRC, GHS - POP Global Settlement Model

Figure 1.5. **City population share by city size per major global region, 2015**



Source: JRC 2015, GHSL Pop Grid V1

Table 1.2. **Distance between cities per part of the world, 2015**

Average distance in km	Between all cities	Any city	A city with a population over 1 million residents
Europe	1.730	45	544
Asia	1.773	22	409
North America	2.054	67	257
Russia, Ukraine, Belarus, Moldova	2.679	78	1.131
Oceania	2.743	186	1.814
Africa	2.964	40	300
Latin America & Carribean	3.839	59	282

Source: REGIO calculations and JRC (GSHL Pop GridV1)

1.6. Europe has a denser network of cities

The average distance between all cities in Europe is lower compared to other parts of the world, although similar to that in Asia. Although Europe occupies a small land area, the distance between cities depends as much on the spatial distribution of cities as on the size of the land area. For example, Latin America and the Caribbean have a smaller land area than Asia, but the average distance between its cities is more than double (Table 1.2). The lower distance between cities in Europe is the result of its dense urban network.

The average distance to the closest city is lowest in Asia at only 22 km. In Europe it is 45 km, which is slightly higher than in Africa (40 km) but lower than North America (67 km). The average distance to the closest city with more than one million inhabitants is quite high in Europe (544 km), higher than in North America, Latin America, Africa or Asia (Table 1.2). It implies that cities in other parts of the world are more clustered around large cities, while cities in Europe are more evenly distributed.

1.7 Conclusion

This chapter shows that Europe's cities are distinct from their counterparts in other parts of the world. The share of population in European cities has barely changed in the last fifty years and it is relatively low by global standards. European cities tend to be mid-sized with few cities over one million and only two over 10 million inhabitants.

European cities have lower population densities than Asian cities, but are still more than twice as dense as North American cities. European cities are on average located closer to each other than cities in other parts of the world, but the closest large city is much further away. This is the outcome of Europe's dense network of mid-size cities in general and because they tend to be less clustered around large cities.

European cities are on average located closer to each other than cities in other parts of the world, but the closest large city is much further away. This is the outcome of Europe's dense network of mid-size cities in general and because they tend to be less clustered around large cities

Last but not least, this chapter presented a first test of applying the degree of urbanisation to a new draft global population grid. It shows that this method has promise. In the coming year, the population grid will be improved and this method reapplied. In addition, countries and cities can download this data themselves to judge whether this captures their settlements correctly.

Hong Kong: Asian cities are on average twice as dense as their European counterparts

Chapter 2.
Demographic change

- The EU is urbanising but only slowly. Between 1961 and 1991, the population share of urban areas (cities, towns and suburbs) in the EU-28 increased from 65% to 71%. Between 1991 and 2011, however, this share grew by one percentage point to 72%.

- The population grew twice as fast in capital cities from 2002 to 2012 than in the EU as a whole. This high growth was due to a combination of positive net migration and high natural growth.

- Almost all capital cities have the highest share of foreign-born residents in the country. The share was over 20% in Brussels, London, Luxembourg, Paris, Stockholm and Vienna (2011 data for metro regions).

- The concentration of jobs and higher education institutes in cities attracts more working-age residents. In capitals, 62% of the residents are between 20 and 65, compared to 61% in other cities and 60% outside cities (2011 data for metro regions).

- Cities need to think how to accommodate a growing elderly population. Cities can facilitate active ageing by ensuring that public spaces, transport and buildings are accessible for people with limited mobility.

Population growth between 2002 and 2012 was double in capital metro regions. In Berlin, for example, population grew by 2.3% between 2001 and 2011, while population in Germany declined by 0.3% compared to population growth in the EU in general

Chapter 2.
Demographic change

In eastern Europe, the speed of urbanisation has decreased. For example, the population of Warsaw increased by 16% in the 1960s and 1970s but since then it has increased by only 2% a decade

© Karen Perhus

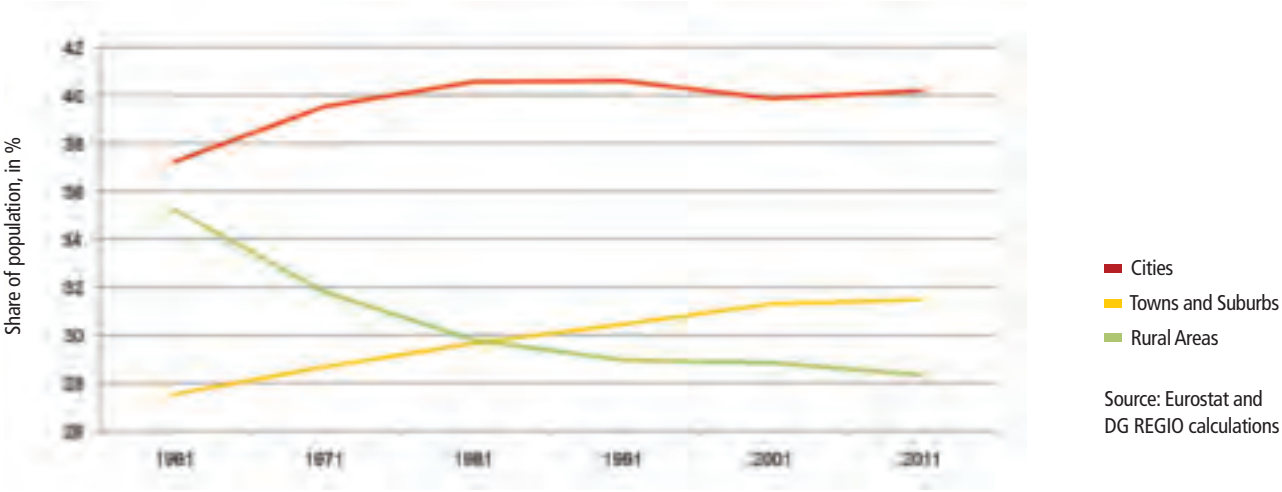
2.1. Introduction

This chapter analyses the shift of population between rural and urban areas in Europe since 1961. It describes how the demographic fortunes of cities have waxed and waned over these past fifty years. It explores the population composition and change of cities by describing the contribution of migration and natural change (births minus deaths) to population change. It examines demographic ageing; the share of working age population in cities; and how they have and will change over time. It also explores foreign-born population, which is more likely to live in (large) cities, especially those born outside the EU. Last but not least, the household composition of cities is analysed.

2.2. The EU is still further urbanising but only slowly

The EU has become more urban over the past fifty years, but the speed of urbanisation has slowed down. Between 1961 and 1991, the population share of urban areas (cities, towns and suburbs) in the EU-28 increased from 65% to 71% (Figure 2.1). However, this share only grew by one percentage point over the past two decades. Cities accounted for 37% of the population in 1961, growing to 40% in 1981 and staying there. Towns and suburbs, on the other hand, consistently increased their population share over these five decades due to a combination of population moving out of the cities into suburbs and from rural areas into towns.

Figure 2.1. **Population by degree of urbanisation in the EU-28, 1961-2011**



The EU-15 was already quite urban in 1961 with 70% of its population living in urban areas (cities, towns and suburbs), compared to only 45% in the EU-13 (Figure 2.2 and Figure 2 3). Although this gap has shrunk, in 2011 the EU-15 was still more urban (75%) than the EU-13 (60%). Since then the EU-15 population share in cities has remained remarkably stable over this period. This implies that almost all of the growth of the population share in urban areas occurred in towns and suburbs.

In the EU-13, the population share in cities increased substantially from 25% in 1961 to 35% in 1991, where it remained until 2011. In contrast, the EU-13 population share in towns and suburbs increased continuously, from 23% to 26%, between 1961 and 1991.

Urbanisation slowed in the 1980s

Poland is good example of urbanisation in the EU-13 over the past fifty years. Initially there was a large reduction in the rural population until the 1990s, with both cities and towns and suburbs gaining population (Figure 2.4). Over the past twenty years, however, as in most EU-13 countries, the speed of urbanisation has decreased in Poland and the population shares remained rather similar.

Spain is quite representative of the EU-15 urbanisation trend. Urbanisation accelerated up until the 1990s, after which the shares have remained relatively stable (Figure 2.5). Austria, on the other hand, is more of an outlier in the EU-15. It has a large and

Figure 2.2. **Population by degree of urbanisation in the EU-15, 1961-2011**

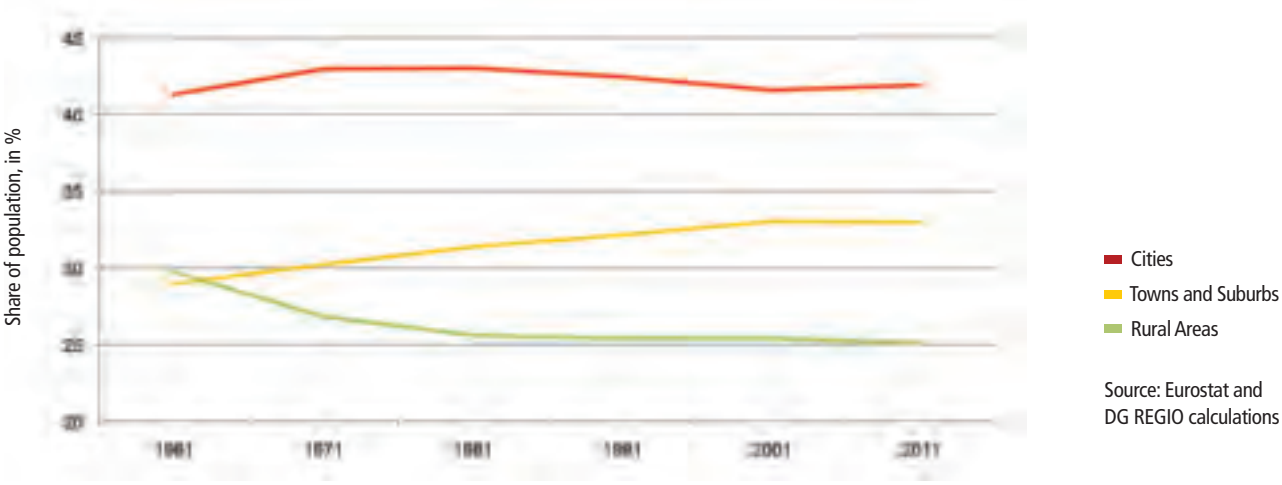
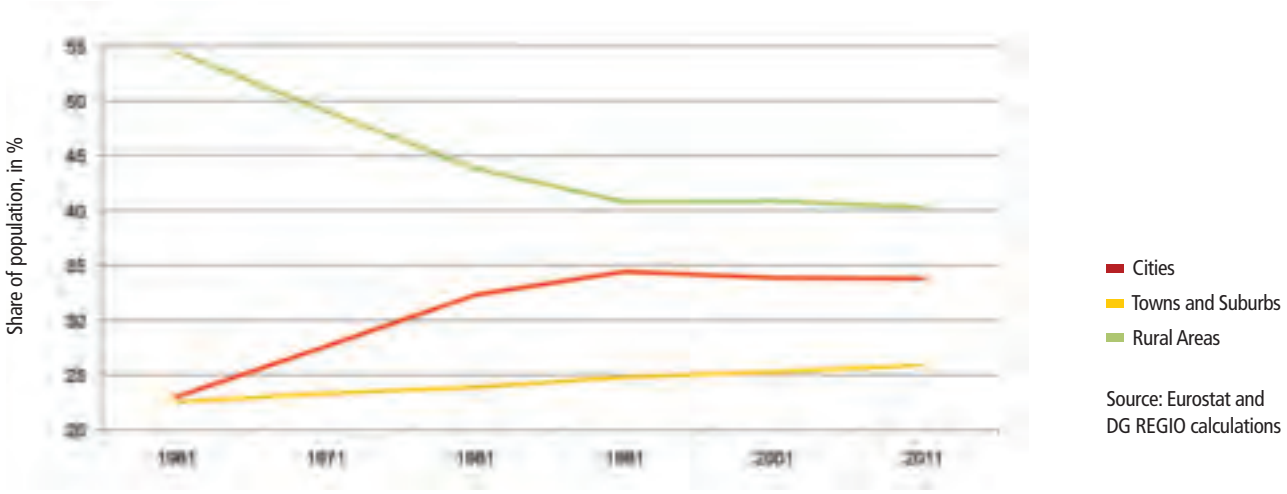


Figure 2.3. **Population by degree of urbanisation in the EU-13, 1961-2011**



Source: Eurostat and DG REGIO calculations

In the 1990s, 40% of the EU-28 cities saw a reduction in their population decline. In the 2000s, cities became more popular and only 30% saw a reduction

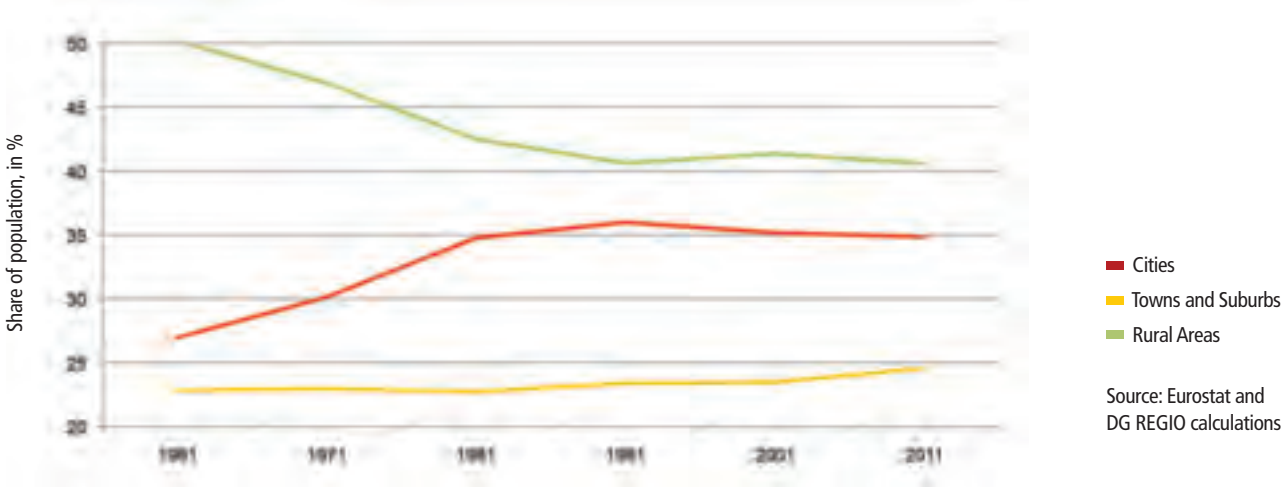
stable share of its population in rural areas, while cities have lost population to towns and suburbs. (Figure 2.6).

Cities become more popular places to live in the 2000s

In the 1990s, 40% of the EU-28 cities saw a reduction in their population decline. In the 2000s, cities became more popular and only 30% saw a reduction (Map 2.2). Between the two decades, 18% of cities switched from decline to growth, while 8% switched the other way. Cities with population decline were mostly located in the EU-13, where 60% of cities lost population, compared to only 20% in the EU-15. In five countries, all cities grew during both decades (Cyprus, Denmark, Finland, Luxembourg & Sweden), while in two countries (Estonia & Latvia) all cities lost population during both decades.

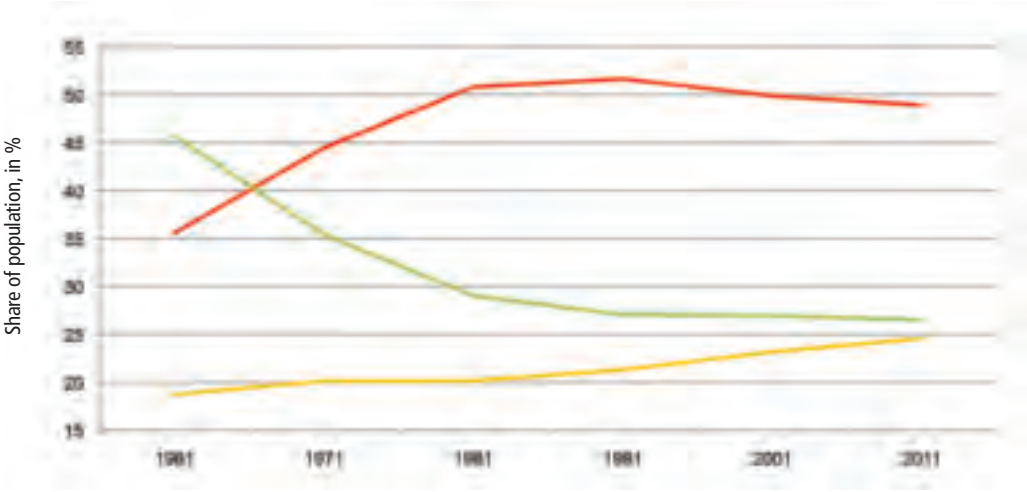
In the 1960s, the average total population growth in Functional Urban Areas (FUAs) was 12% for the EU-15 and 16% for the EU-13 (Figure 2.8). It remained higher

Figure 2.4. **Population by degree of urbanisation in Poland, 1961-2011**



Source: Eurostat and DG REGIO calculations

Figure 2.5. **Population by degree of urbanisation in Spain, 1961-2011**



Source: Eurostat and DG REGIO calculations

in EU-13 than in EU-15 until 1980s, when growth reached its lowest point (4%) in EU-15 FUAs. From then on, average population growth started to increase again in EU-15 (8% in the 2000s), while it continued to shrink in the EU-13 and dropped to 0% in 1990s, before increasing slightly again in the 2000s.

A sharp drop in the share of growing FUAs (from 90% to 48%) in central and eastern Europe was triggered by the process of transition to democracy and a market economy, and led to a simultaneous and substantial negative net migration balance. The share of growing FUAs stabilised in EU13 in the 2000s, but remains more than 30 percentage points lower than in EU-15 (Figure 2.7).

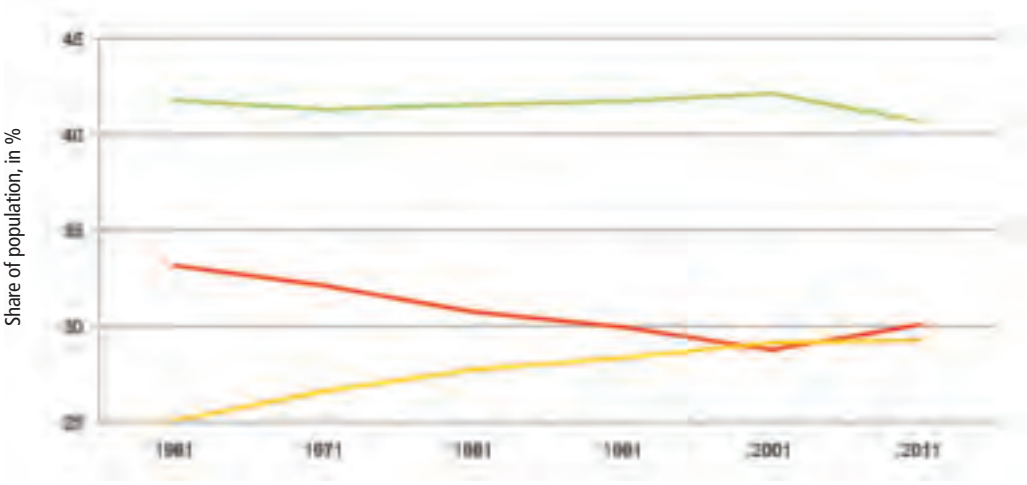
2.3. Cities grow by attracting more working-age and foreign-born residents

Capital cities have the highest population growth

From 2002 to 2012, the total EU-28 population increased by 3% (Table 2.1). Population growth in the capital metro regions was more than double that figure (7%). Other metro regions also grew above average (4%) while non-metro regions grew only slowly (1%). In the EU-13 and EU-15 alike, capital regions recorded the highest population growth. Such aggregate figures, however, mask that population change rates differed widely between the EU-15 and EU-13.

The EU-15 population grew by 5%, while that of the EU-13 declined by 3%. While the capital regions grew in both

Figure 2.6. **Population by degree of urbanisation in Austria, 1961-2011**



Source: Eurostat and DG REGIO calculations

Some cities, such as Sevilla, lost population in the 1990s but experienced population growth in the 2000s

During the last decade, twenty functional urban areas, mostly in Spain, grew by more than 20%. Only the functional urban area of Vidin, Bulgaria lost more than 20% of its population

the EU-15 (8%) and the EU-13 (5%), other metro regions and non-metro regions recorded different dynamics. In the EU-15, they grew by 5% and 3% respectively, while in the EU-13 these regions decreased by -2% and -5%.

During the last decade, the population increased by more than 10% in four EU countries: Spain, Ireland, Luxembourg and Cyprus. A population reduction of more than 10% occurred in Lithuania and Latvia (Figure 2.9). In all countries, except Greece and Ireland, the population change for non-metro regions was slower than the national change.

For the EU as a whole, net migration (2.5%) contributed more to total population change than natural population change (0.7%). This trend is even more pronounced in the EU-15 with a significant positive contribution to population growth of both net migration (3.5%) and natural change (1.3%). Unlike other metro regions and non-metro regions, capital metro regions in the EU-15 have higher natural change (4.9%) than net migration (3.4%).

In the EU-13, on the other hand, natural change is negative (-1.3%) and of a similar magnitude to net migration (-1.4%). Only in capital metro regions of the EU-13 is the impact of migration positive (5%). In short, people in the EU-13 have been moving out of non-metro and other metro regions to capital EU-13

metro regions and to the EU-15. As the out-migrating population tend to be of an (early) working-age, this will also reduce the number of births in these regions in the short and medium-term.

Population projections until 2025 provide a similar picture, albeit with slower dynamics. Natural change at the EU level is expected to become negative (-0.5% compared to 0.7%), but outweighed by positive net migration (+1.9%) from outside the EU. The EU-13 population is expected to decrease by -2.2%, while the EU-15 is expected to grow by 2.3%. (Table 2.2).

Capital metro regions are projected to continue growing by 4% in EU-13 and 6% in EU-15 over the next decade. With the exception of Ireland, Greece and Spain, all capital metro regions are expected to grow faster than their respective national average, (Figure 2.10), implying

Box 2.1. **The EU-OECD functional urban area definition**

Functional urban areas in the EU-OECD definition consist of a city and its commuting zones. They are defined in three steps. The first two steps are also used in the degree of urbanisation (see above).

Step 1: Identify an urban centre

An urban centre consists of contiguous grid cells of one square km with a density of at least 1,500 inhabitants per square km and these contiguous cells have a total population of at least 50,000 inhabitants.

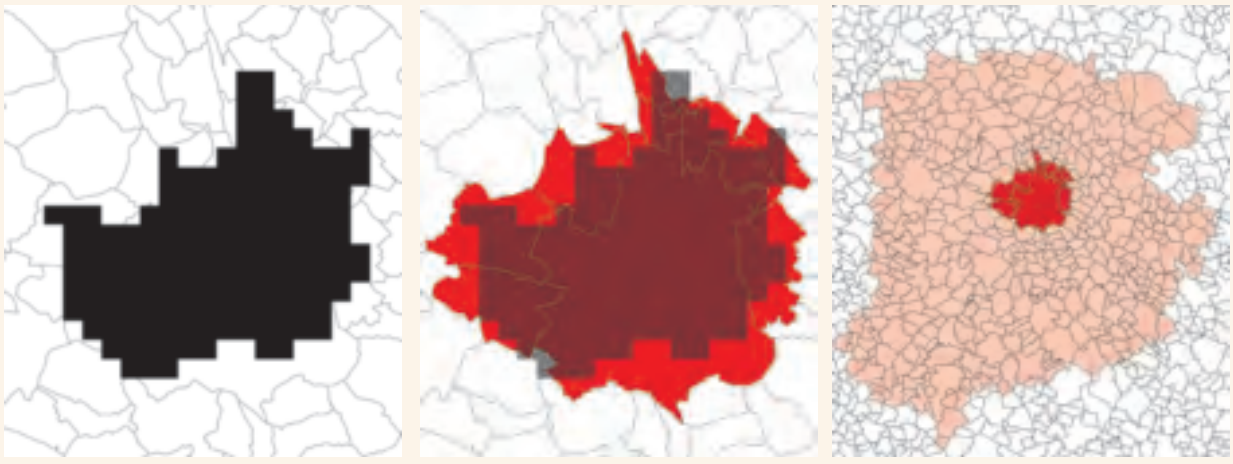
Step 2: Identify the city

A city consists of one or more municipalities that have at least 50% of their population living in an urban centre.

Step 3: Identify the commuting zone

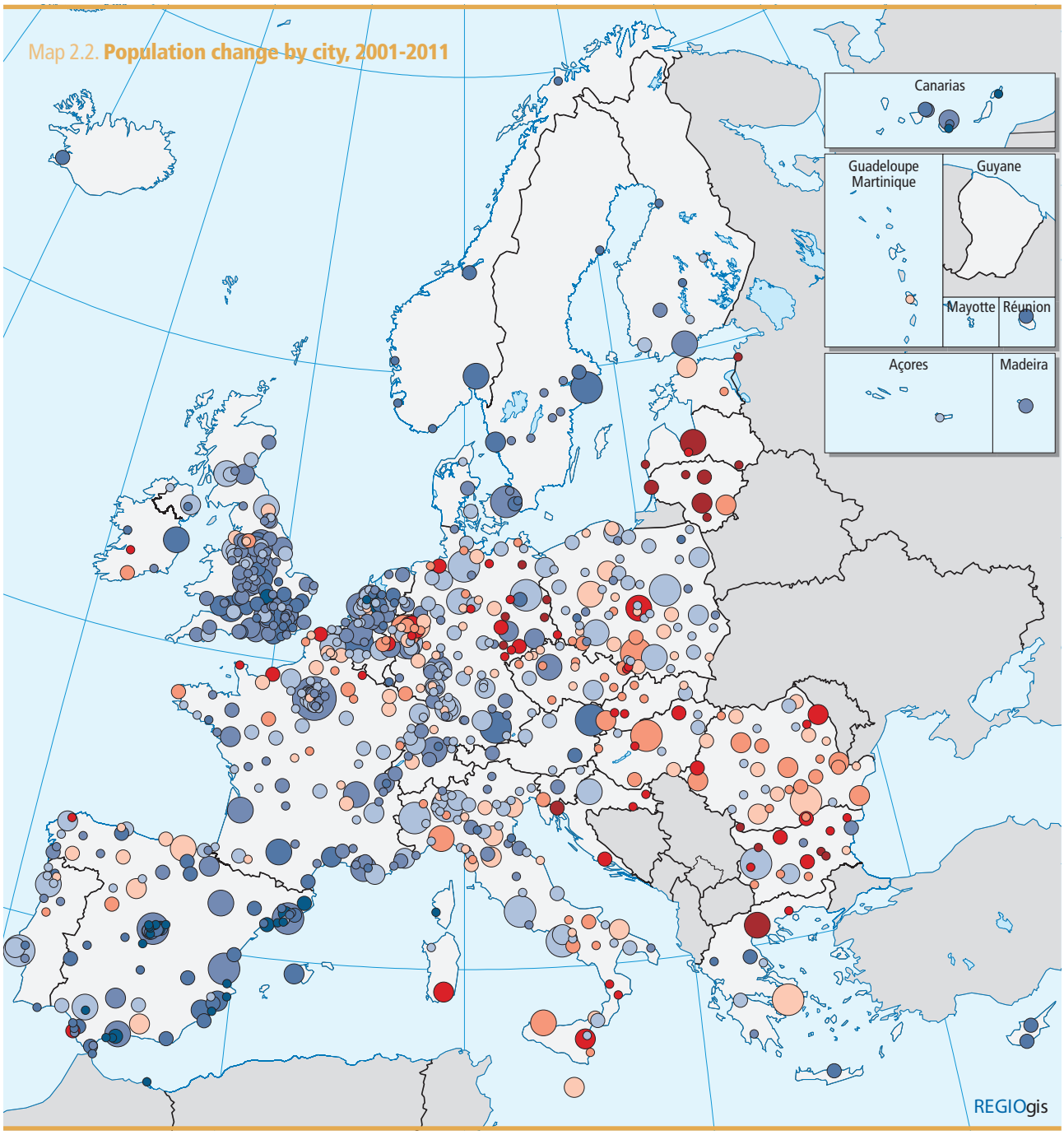
A commuting zone consists of contiguous municipalities where at least 15% of the working residents commute to the city. Municipalities below this threshold but surrounded by municipalities above this threshold are included in the commuting zone. (For more details, see Dijkstra and Poelman 2012 and OECD 2012). Map 2.1 illustrates the three steps in this definition.

Map 2.1. **City and its commuting zone (Toulouse)**



Source: REGIO GIS

Map 2.2. **Population change by city, 2001-2011**



Total change (%)

- < -10
- -10 - -5
- -5 - -2.5
- -2.5 - 0
- 0 - 5
- 5 - 10
- 10 - 20
- >= 20

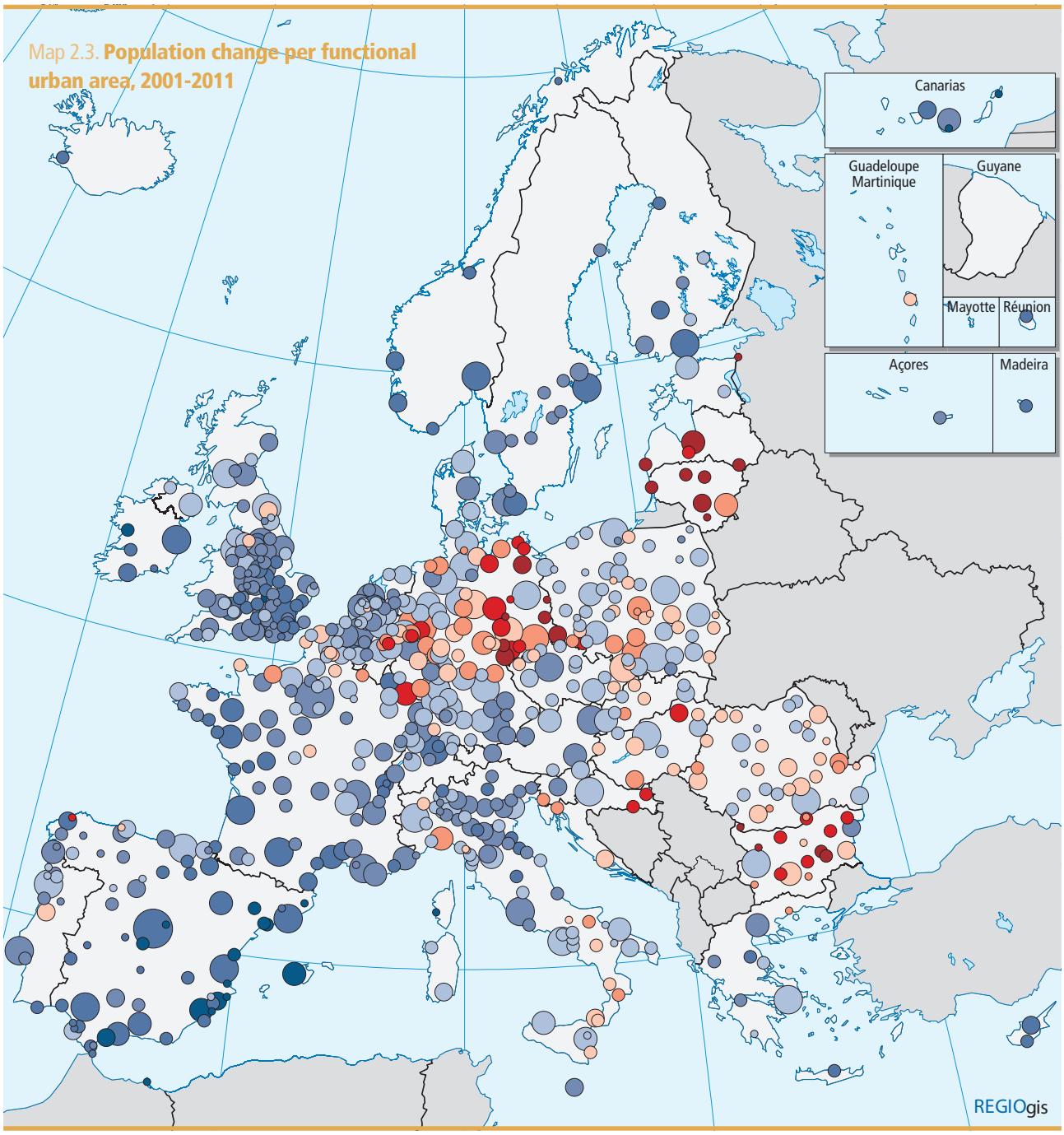
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

0 500 Km

Sources: Eurostat, NSI, DG REGIO

Map 2.3. **Population change per functional urban area, 2001-2011**



Total change (%)

- < -10
- -10 - -5
- -5 - -2.5
- -2.5 - 0
- 0 - 5
- 5 - 10
- 10 - 20
- >= 20

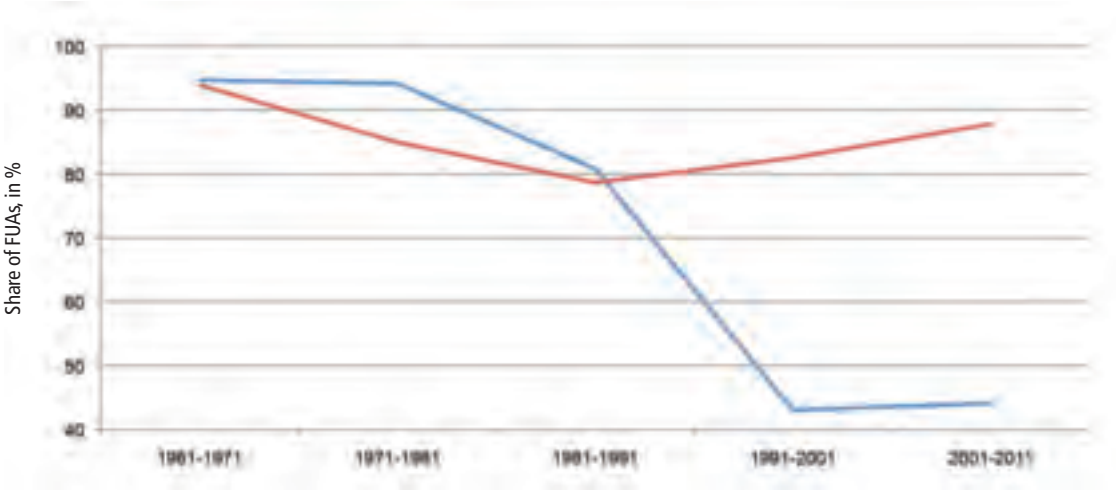
FUA population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

0 500 Km

Sources: Eurostat, NSI, DG REGIO

Figure 2.7. **Share of functional urban areas with an increasing population, 1961-2011**

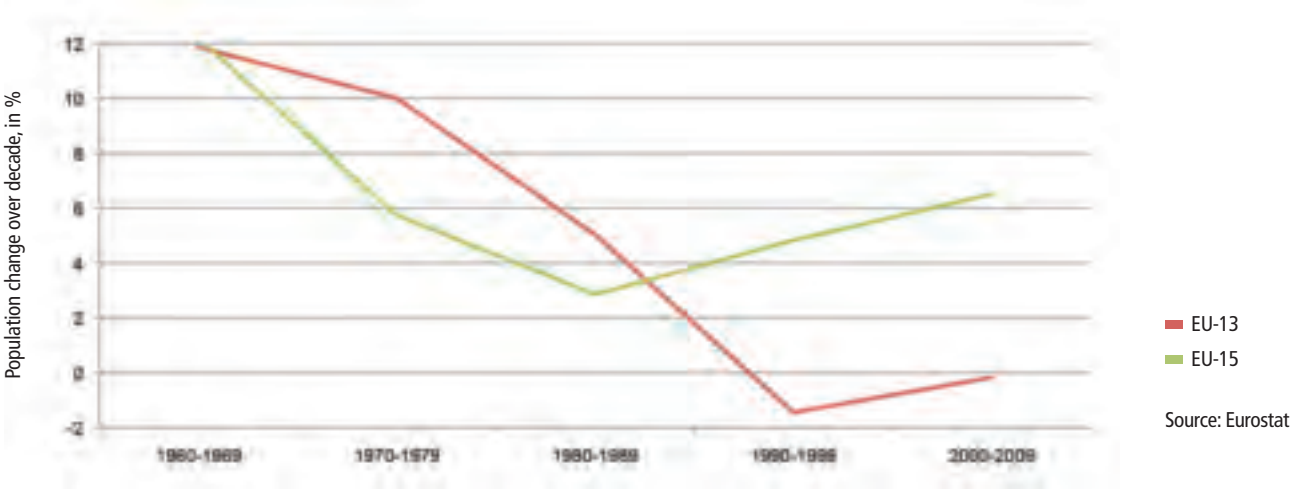


Source: Eurostat

Pazardzhik, Bulgaria. The share of working-age residents born outside the EU in cities in Poland, Bulgaria, Romania and Slovakia is very low

© Antonchalakov

Figure 2.8. **Average population growth in functional urban areas, 1961-2011**



Source: Eurostat

a continuing attraction of capital metro regions relative to other metro regions and non-metro regions.

Cities attract more working-age residents

A high share of working-age population (20-64 years of age) in the city can have a positive economic impact as more people can participate in the labour market.

In 2011, the share of population aged 20-64 was higher in EU-13 (63%) than in EU-15 (60%). Both in the EU-13 and in the EU-15, capital metro regions had a higher share of working-age population than non-metro regions (Table 2.3). The vast majority of capital metro regions had the highest share of working-age population in their country (Figure 2.11). Bucharest, the

A high share of working-age population (20-64 years of age) in the city can have a positive economic impact as more people can participate in the labour market.

Table 2.1. **Total population change by metro region, 2002-2012**

% of total population	Capital Metro Regions	Other Metro Regions	Non-Metro Regions	Total
EU-13				
Total population change	4.5	-1.7	-5.3	**-2.7**
Natural population change	-0.8	-0.7	-1.7	**-1.3**
Net migration	5.2	-1.0	-3.6	**-1.4**
EU-15				
Total population change	8.2	4.8	3.4	**4.8**
Natural population change	4.9	1.2	-0.03	**1.3**
Net migration	3.4	3.7	3.4	**3.5**
EU-28				
Total population change	7.4	3.9	0.9	**3.2**
Natural population change	3.6	0.9	-0.5	**0.7**
Net migration	3.8	3.0	1.4	**2.5**

Source: Eurostat

Box 2.2. **Measuring population change and migration**

This box provides a short explanation of how population change is measured and split into natural change and net migration in this report. Total population change is measured by subtracting the population on 1st of January of the last year from the population on 1st of January of the first year and dividing this by the population on 1st of January of the first year. Total population change can be split into natural change and net migration:

Natural change is the difference between live births and deaths over the period concerned. More births than deaths, means positive natural change (growth), the opposite means negative change (decline).

Net migration is the difference between people moving into a city and people moving out of that city. Since accurate figures on the movement of people are difficult to obtain, net migration is usually estimated as the difference between the total population change and the natural change. Net migration includes the impact of people moving between regions within the same country. Net migration does not capture the size of the flows. If a city has a high in- and outflow, its net migration rate can still be close to zero.

To capture the size of the flow of people, this report uses:

Residents who have moved from a different country during the last year
This measures the share of current residents who have moved from a different (EU or non-EU) country during the previous twelve months. This includes people moving back to their EU country of birth.

To capture the cumulative demographic impact of migration, or the stock of migrants, this report uses the following indicators:

Foreign-born population (according to present time borders)
Residents who were born in a different country than the country they are living in defined using present time borders. This means, for example, that in the Baltic States this also includes people who were born in a different part of the Soviet Union and moved to the Baltic States prior to their independence and remained there after independence.

The foreign-born population can be divided into two sub-groups:

Non-EU-born population
Residents who were born outside the EU-28 borders.

Other-EU born population
Residents who were born in a different EU-28 country.

capital metro region of Romania, had an exceptionally high share of 68%. Only in Poland and Portugal did capital metro regions have lower shares of the working-age population than the national average.

Large western cities have a high share of foreign-born residents

Migration has become an increasingly important issue in the EU. In 2011, the foreign-born population (i.e. born outside the EU-28, see Box 2.2 for definitions) accounted for 10% of the total population in the EU compared to 7% in 2001. About two-thirds of the foreign-born population living in the EU in 2011 was born outside of the EU. Between 2001 and 2011, the share of the other-EU born population increased by 58%, which was a much faster increase than the share of the non-EU born population (32%).

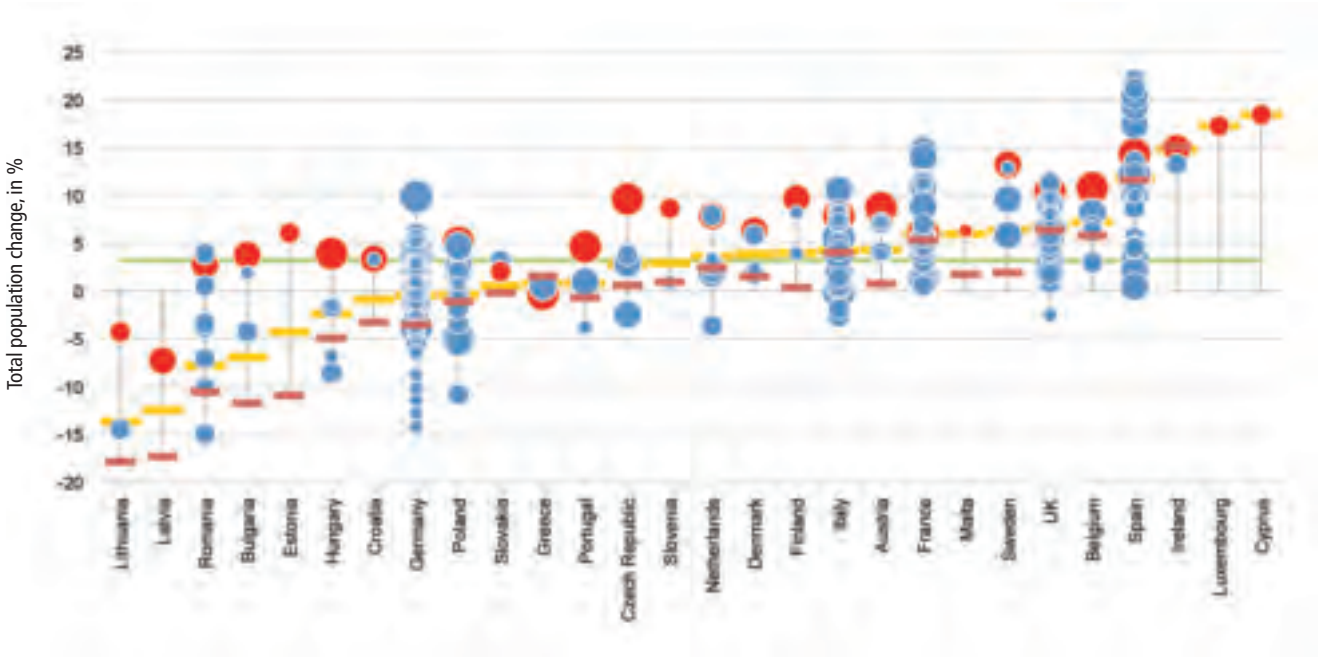
Capital metro regions had the highest shares of foreign-born residents (Table 2.4), with the regions in the EU-15 recording significantly higher shares than their counterparts in the EU-13.

In seven capital metro regions and a few other metro regions, the share of foreign-born was above 20% (Figure

Galway, Ireland, was one of the ten functional urban areas that grew by more than 25% in the 2000s

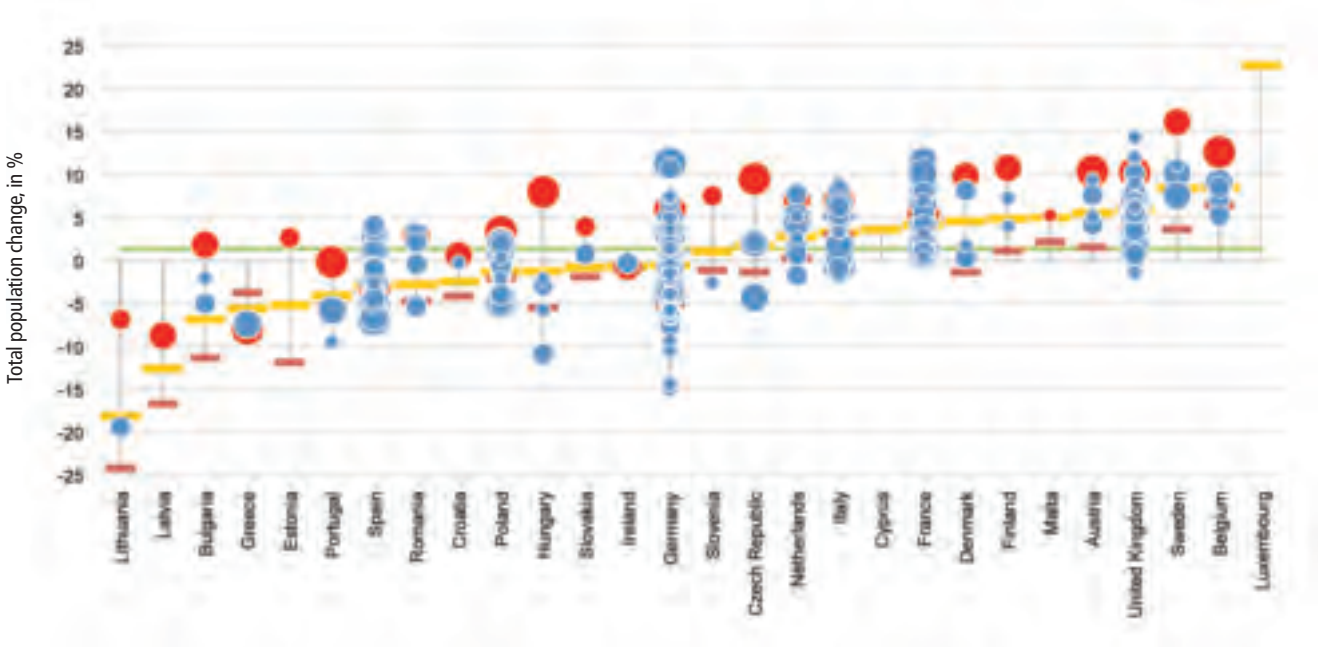
© Ralph Brannan

Figure 2.9. **Total population change by metro region, 2002-2012**



Source: Eurostat

Figure 2.10. **Projected population change by metro region, 2015-2025**



Source: Eurostat

Table 2.2. **Total population change projections by metro region, 2015-2025**

% of total population	Capital Metro Regions	Other Metro Regions	Non-Metro Regions	Total
EU-13				
Total population change	3.8	-1.8	-4.5	-2.2
Natural population change	-0.1	-1.7	-2.8	-2.1
Net migration	4.0	0.1	-1.7	-0.1
EU-15				
Total population change	6.2	2.4	0.6	**2.3**
Natural population change	4.4	-0.1	-1.7	-0.1
Net migration	1.8	2.5	2.3	**2.4**
EU-28				
Total population change	5.7	1.9	-0.8	**1.4**
Natural population change	3.4	-0.3	-2.0	-0.5
Net migration	2.3	2.2	1.2	**1.9**

Source: Eurostat

Most capitals have a lower share of residents of 65 and older than their country does. The share still varies between capitals: Dublin has the lowest share with only 11% and Rome has the highest with 20%. In France, Germany, Italy and the UK, the difference between the city with the lowest and the one With the highest share is 10 percentage points

2.13). However, there were also noticeable differences between regions with the proportion of foreign-born ranging from 5% to over 20% in some countries (UK, Germany, Spain and France). The share of foreign-born was significantly below the EU-28 average of 10% in most central and eastern European countries.

Capital cities are younger and stay younger

In 2015, people over 65 made up 19% of the total EU population, with their share slightly higher in non-metro regions (20%) but significantly lower in capital metro regions (16%).

At national level, countries with the highest share of 65+ in 2012 were Germany, Greece and Italy with more than 20% of their population older than 65. In contrast, countries with the smallest share of 65+ were Cyprus, Ireland, Luxemburg and Slovakia, each with less than 15%. The average share of 65+ in non-metro regions was higher than the national average in all countries, except Poland. The capital metro regions had a lower share of 65+ than the national average in all countries, except Poland and Slovakia (Figure 2.14).

Between 2015 and 2025, the share of people aged 65 and older is projected to increase by three percentage points in the EU. This increase will be higher in EU-13 (5pp) than in EU-15 (3pp). As a result, the share is expected to become very similar in EU-13 (21%) and in EU-15 (22%). In the EU-28, the increase will be stronger in non-metro regions (+4pp) than in other metro regions (+3pp) or in capital metro regions (+2pp). Therefore, the difference in the share of people over 65 between the three types will become even more pronounced.

In most countries, the capital metro region will have the lowest increase in the share of 65+. Only in Greece and Spain is the share expected to increase at a slower pace in the non-metro regions than in the country as a whole.

Despite a younger and less rapidly ageing population, cities are thinking of how to accommodate a growing elderly population. Cities can facilitate active ageing by ensuring that public spaces, public transport and public buildings are easily accessible for people with limited mobility.

Single adults live in cities, while couples tend to live outside cities

One in three households in the EU-28 is a one-person household, a share that has increased since 2001

Table 2.3. **Age structure by type of metro region, 2011**

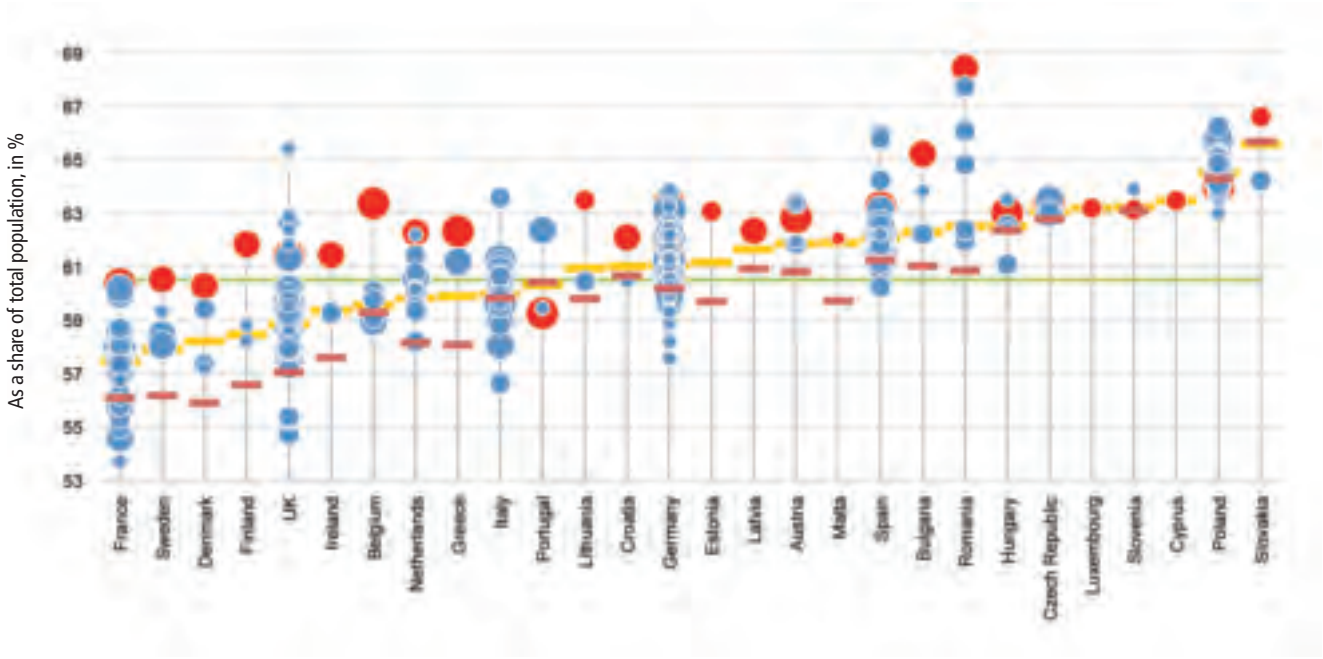
% of total population	Capital Metro Regions	Other Metro Regions	Non-Metro Regions	Total
EU-13				
Population aged 19 or less	19.3	20.0	20.8	**20.3**
Population aged 20 - 64	64.1	64.2	62.6	**63.3**
Population aged 65 or more	16.6	15.9	16.6	**16.4**
EU-15				
Population aged 19 or less	22.5	20.9	20.8	**21.1**
Population aged 20 - 64	61.5	60.0	58.7	**60.0**
Population aged 65 or more	16.1	19.0	20.5	**19.1**
EU-28				
Population aged 19 or less	21.8	20.8	20.8	**21.0**
Population aged 20 - 64	62.1	60.6	60.0	**60.5**
Population aged 65 or more	16.2	18.6	19.4	**18.5**

Source: Eurostat, DG Regio

Sixty-eight percent of Bucharest's population is of working age, which is exceptionally high

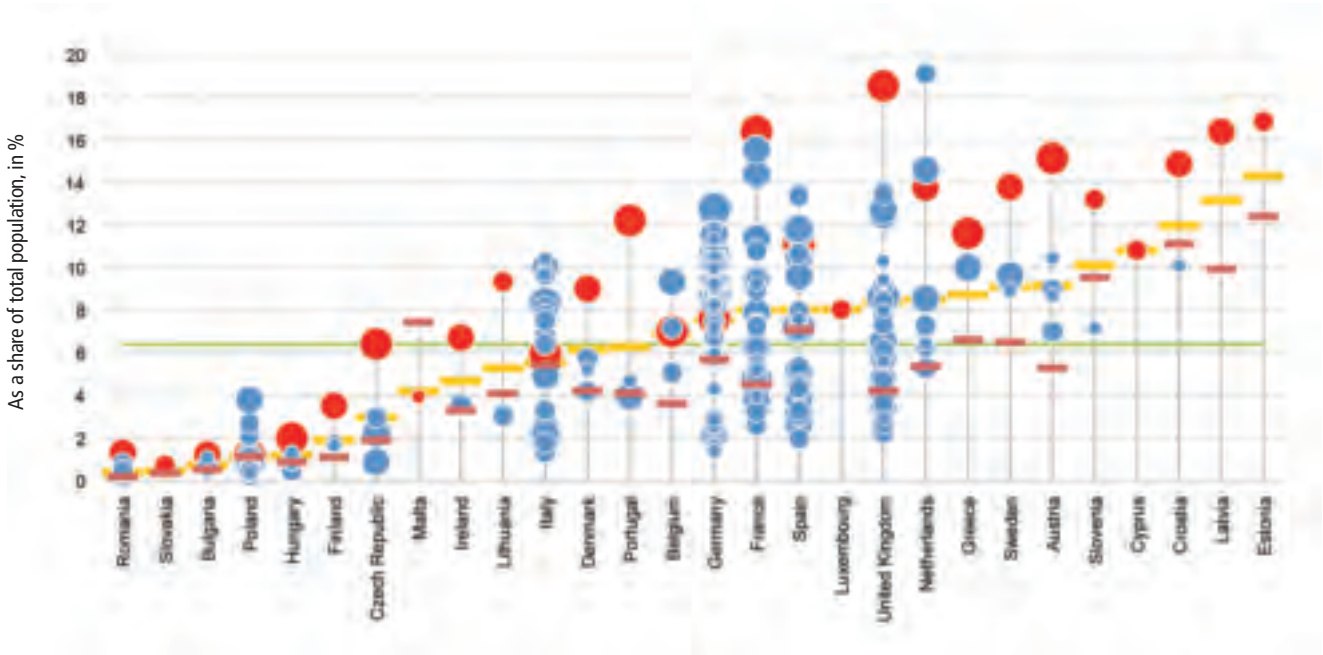
© Constantin Opris

Figure 2.11. **Population aged 20-64 by metro region, 2012**



Source: Eurostat

Figure 2.12. **Non EU-born population by metro region, 2011**



Source: Eurostat

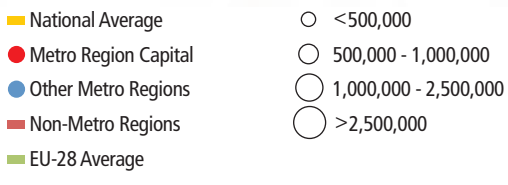
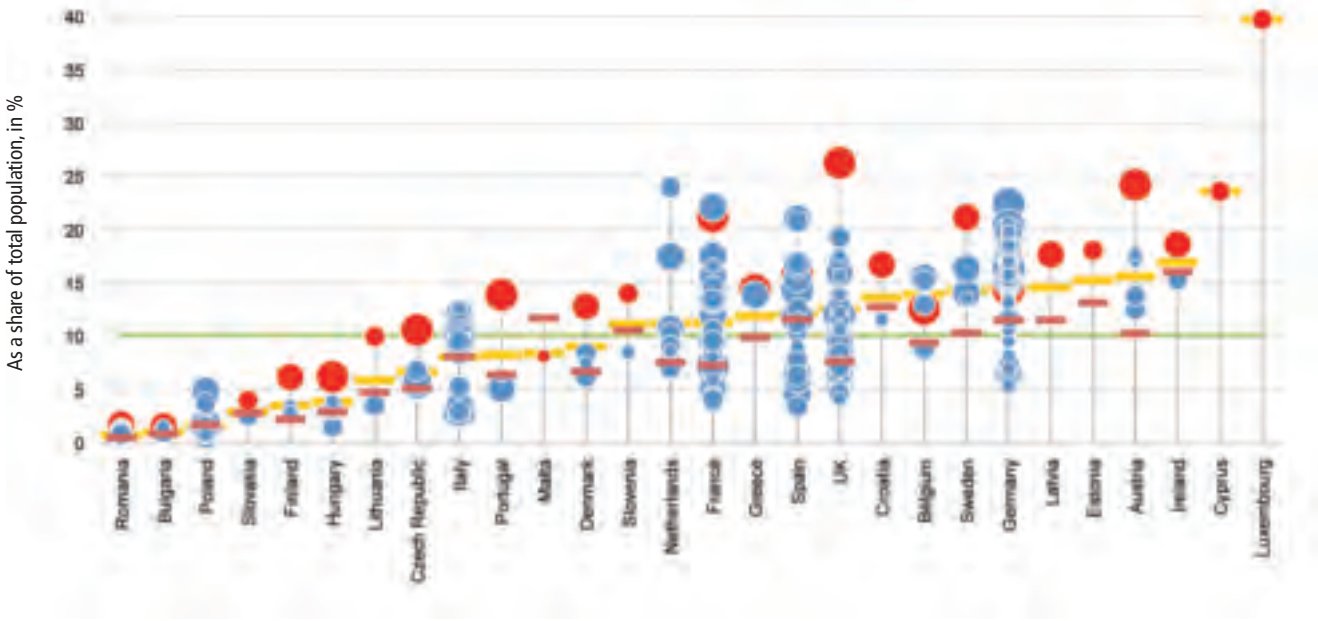
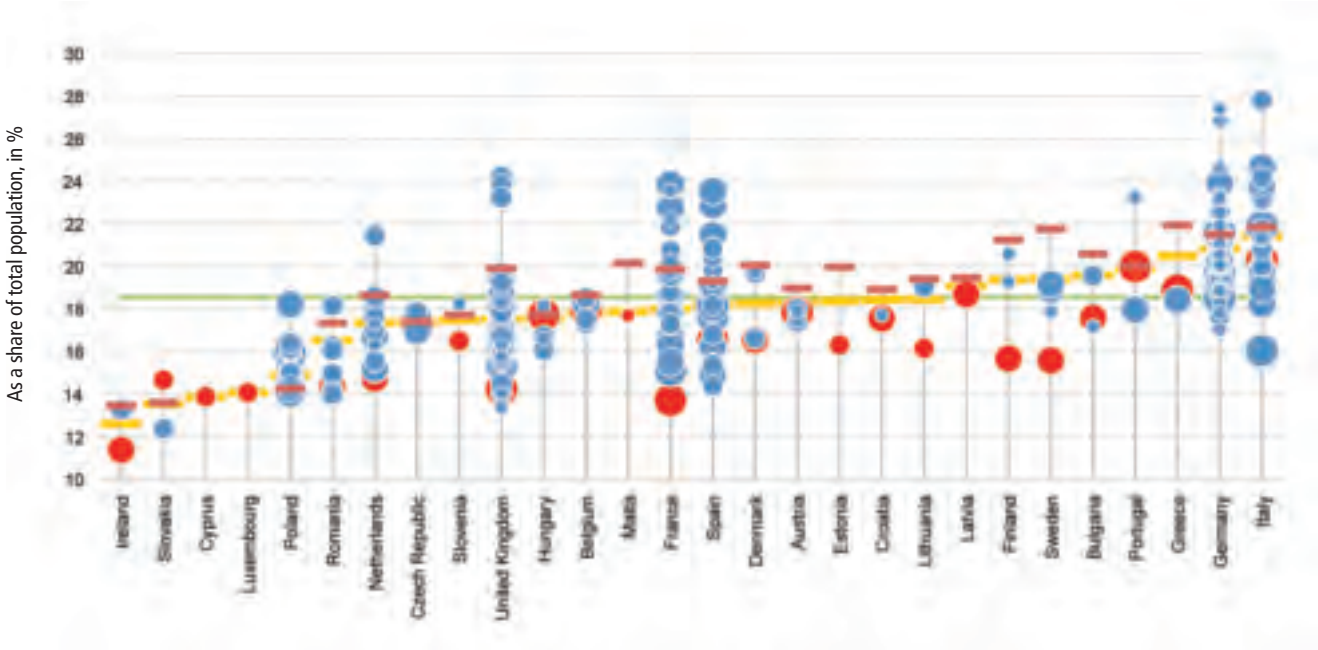


Figure 2.13. **Foreign-born population by metro regions, 2011**



Source: Eurostat

Figure 2.14. **Population 65 and older by metro region, 2012**



Source: Eurostat

Table 2.4. **Foreign-born population and people who moved in the past year by type of metro regions, 2011**

% of total population	Capital Metro Regions	Other Metro Regions	Non-Metro Regions	Total
EU-13				
Total Foreign Born	7.8	2.3	3.0	**3.6**
Non-EU Born	5.4	1.3	1.9	**2.3**
Moved in the past year	0.6	0.3	0.3	**0.3**
EU-15				
Total Foreign Born	19.3	11.7	8.9	**11.9**
Non-EU Born	13.2	7.3	5.1	**7.5**
Moved in the past year	1.2	0.6	0.5	**1.1**
EU-28				
Total Foreign Born	16.7	10.5	7.2	**10.2**
Non-EU Born	11.4	6.6	4.2	**6.4**
Moved in the past year	1.0	0.6	0.5	**0.6**

Source: Eurostat
Note: Moved in the past year: a resident that has moved from a different country in the preceding 12 months

and is likely to continue to increase, among others due to ageing. Households with only one adult are more common in capital metro regions than in other regions, both in EU-13 and in EU-15 countries.

On the other hand, both couples with and without children are most common in non-metro regions in both groups of countries. Overall, EU-13 countries have a significantly higher share of households with children (44%) than EU-15 countries (38%).

2.4. Conclusion

The population in European cities is growing, but this growth has varied over the past 50 years. In the 1960s and 70s, population growth was high in all cities. In the 1980s and 1990s, population growth slowed down and a growing number of cities experienced population decline. In the 2000s, population growth in cities increased again and fewer cities lost population.

Table 2.5. **Change in population 65 and older by type of metro region, 2015-2025**

% of total population	Capital Metro Regions	Other Metro Regions	Non-Metro Regions	Total
EU-13				
2015	16.8	16.2	16.9	**16.7**
2025	19.6	21.2	21.8	**21.2**
Change	2.8	4.9	4.8	**4.5**
EU-15				
2015	16.3	19.4	20.9	**19.4**
2025	18.3	22.2	24.1	**22.3**
Change	2.0	2.8	3.2	**2.8**
EU-28				
2015	16.4	19.0	19.8	**18.9**
2025	18.6	22.1	23.5	**22.0**
Change	2.2	3.1	3.7	**3.2**

Source: Eurostat

The democratic and economic transition of central and eastern Europe had a strong impact on population change. Whereas in the 1980s, nine out of ten cities were growing, in the 1990s and the 2000s half of the cities in central and eastern Europe lost population.

Capital cities have been growing faster mainly through positive net migration. Migration to cities, however, is selective. Cities tend to have a higher share of working-age population and a lower share of people 65 and above and this is particularly pronounced in capital cities. Moreover, migrants from other EU countries and especially from outside the EU are more likely to live in (large) cities. As a result, in several cities more than 20% of the population is born in a different EU country or outside the EU.

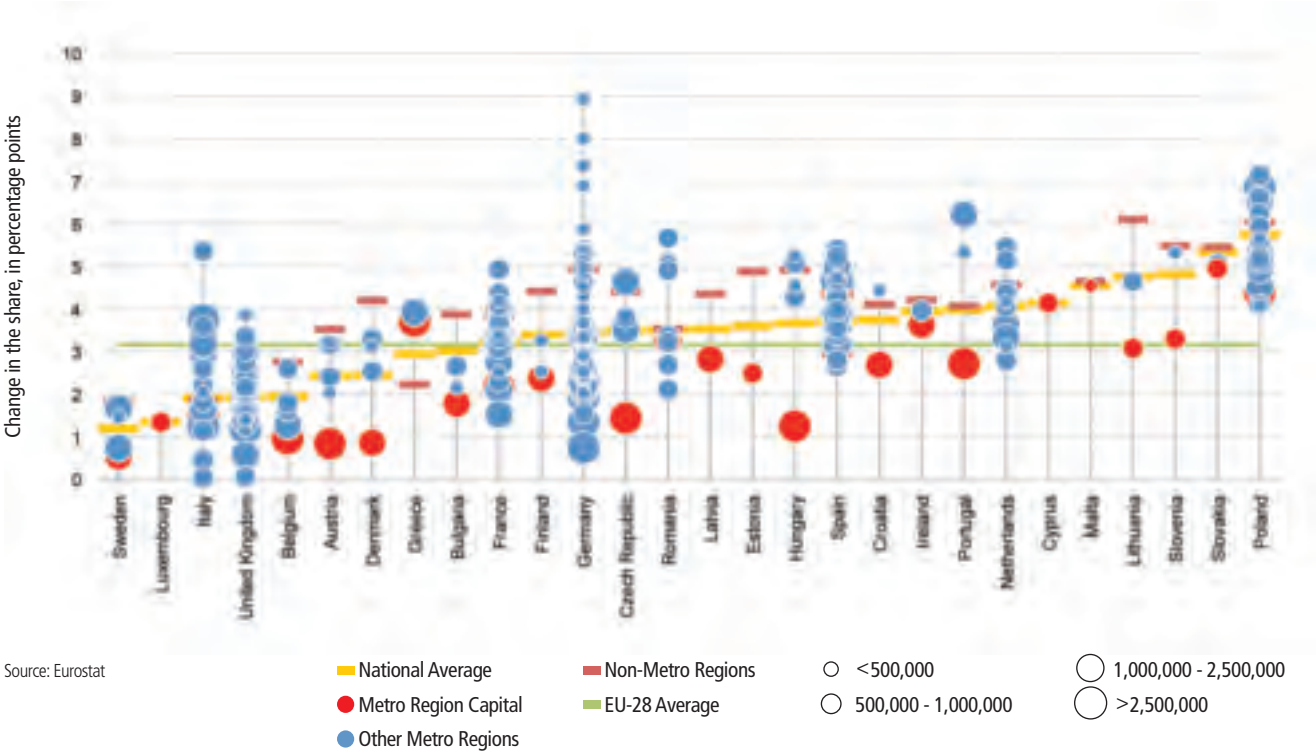
Projections show that cities, and especially capital cities, will continue to grow with higher levels of migration and natural change, while the rest of the EU will start to lose population.

All EU countries are affected by ageing due to increasing life expectancy and lower fertility rates. Cities, however, have a younger population and are projected to have smaller increases in the population over 65 than areas outside cities. Again, capital cities tend to have some of the lowest shares of population over 65 and some of the lowest increases in that share over the next decade.

Projections show that cities, and especially capital cities, will continue to grow with higher levels of migration and natural change, while the rest of the EU will start to lose population

Cities can facilitate active ageing by ensuring that public spaces, transport and buildings are accessible for people with limited mobility © Kre_geg

Figure 2.15. **Change in the share of people 65 and older by metro region, 2015-2025**



Source: Eurostat

Table 2.6. **Household Structure by metro regions, 2011**

% of total population	Capital Metro Regions	Other Metro Regions	Non-Metro Regions	Total
EU-13				
Couples with children	28.9	32.4	33	**32**
Single adults with children	12.8	12.8	12	**12.4**
Couples without children	18.7	19.1	20	**19.3**
Single adults without children	32.4	27.1	26.1	**27.6**
Other	7.2	8.6	8.9	**8.7**
EU-15				
Couples with children	27.4	27.8	30.5	**28.7**
Single adults with children	10.3	9	8.8	**9.1**
Couples without children	22.1	25.6	26.3	**25.3**
Single adults without children	34	33.2	30.5	**32.3**
Other	6.2	4.4	3.9	**4.6**
EU-28				
Couples with children	27.8	28.3	31.1	**29.4**
Single adults with children	10.9	9.5	9.6	**9.8**
Couples without children	21.3	24.8	24.6	**24.1**
Single adults without children	33.6	32.5	29.4	**31.4**
Other	6.4	4.9	5.3	**5.3**

Source: Eurostat

Chapter 3.
Urban economic development

- Cities and especially larger and capital cities tend to have a more highly educated population, more innovation and higher productivity. This has allowed cities to produce 68% of GDP with 62% of jobs and 59% of the EU population.

- Cities benefit from agglomeration economies. The concentration, people and firms allows a better matching between labour supply and demand; better sharing of inputs in the production process; and better learning through the exchange of knowledge and ideas.

- Agglomeration benefits tend to increase with city size, but cities may also benefit from proximity to other cities if there are good connections between them.

- Most EU cities have good market access through road, rail, air and broadband. Completing the trans-European transport network, however, will significantly improve access for many cities in eastern EU countries where motorways are rare and rail services tend to be slow.

- Since 2000, GDP in EU cities grew 50 percent faster than in other areas and employment in cities increased by 7%, while it did not grow in other areas.

- GDP per head grew fastest in low-income cities, through high productivity growth based on catching-up. The second highest growth rate was in very high-income cities, which further increased their already high productivity and added more jobs than residents.

- Middle-income cities grew more slowly than the EU as a whole and risk falling into the middle-income trap. In this trap, they face stiff competition from lower-cost locations but lack the means to move into higher value-added activities.

Antwerp, Belgium. Metro regions generated 68% of GDP in the EU in 2013


WEST-HINDER

Chapter 3.
Urban economic development

The Sorbonne, Paris. In EU capital metro regions, 41% of the population has a tertiary education. In the Paris metro region the share was 44%

3.1. Introduction

This chapter describes the economic performance of European cities since 2000 and the underlying key factors, ranging from education, innovation and employment to market access, agglomeration economies and specialisation. In this chapter the term 'city' is used interchangeably with metro region, which is defined by a functional urban area (city plus commuting zone) of at least 250,000 inhabitants. This is the scale at which critical interactions in land and labour markets occur and reflect effective economic borders. The EU has 271 metro regions which, in 2013, held 59% of the population, 62% of all employment and generated 68% of GDP (in purchasing power standards or PPS) highlighting their important role as centres of population, economic activity and employment.

The second part of this chapter takes a closer look at income levels, showing that some European cities may face the risk of a so-called 'middle-income trap', i.e. a situation where a middle-income city's economy does not grow fast enough to catch up with the group of high-income cities. This lack of convergence may be preceded by a period of high growth (catching up), but it can also be part of a longer period of low growth. Joining the high-income cities requires many changes in the economy and its labour force, higher investments, a shift to higher value-added activities, more innovation, a better educated labour force and a better business environment. If a city does not succeed in addressing these challenges, its income growth risks being too low to catch up with the group of high-income cities.

Box 3.1. **Boosting employment with the European Structural and Investment Funds**

The European Structural and Investment Funds support active labour market policy measures, including improved access to the labour market, support to labour market institutions, and worker mobility. They focus on the target groups which are most in need of support, for example the long-term unemployed and inactive, or unemployed young people and older workers. Investment in employment will also aim to reconcile work and private life, promote equality between women and men, as well as promoting active and healthy ageing and will support job creation by boosting self-employment, entrepreneurship and business creation opportunities, including for micro and small enterprises. This support for employment is expected to:

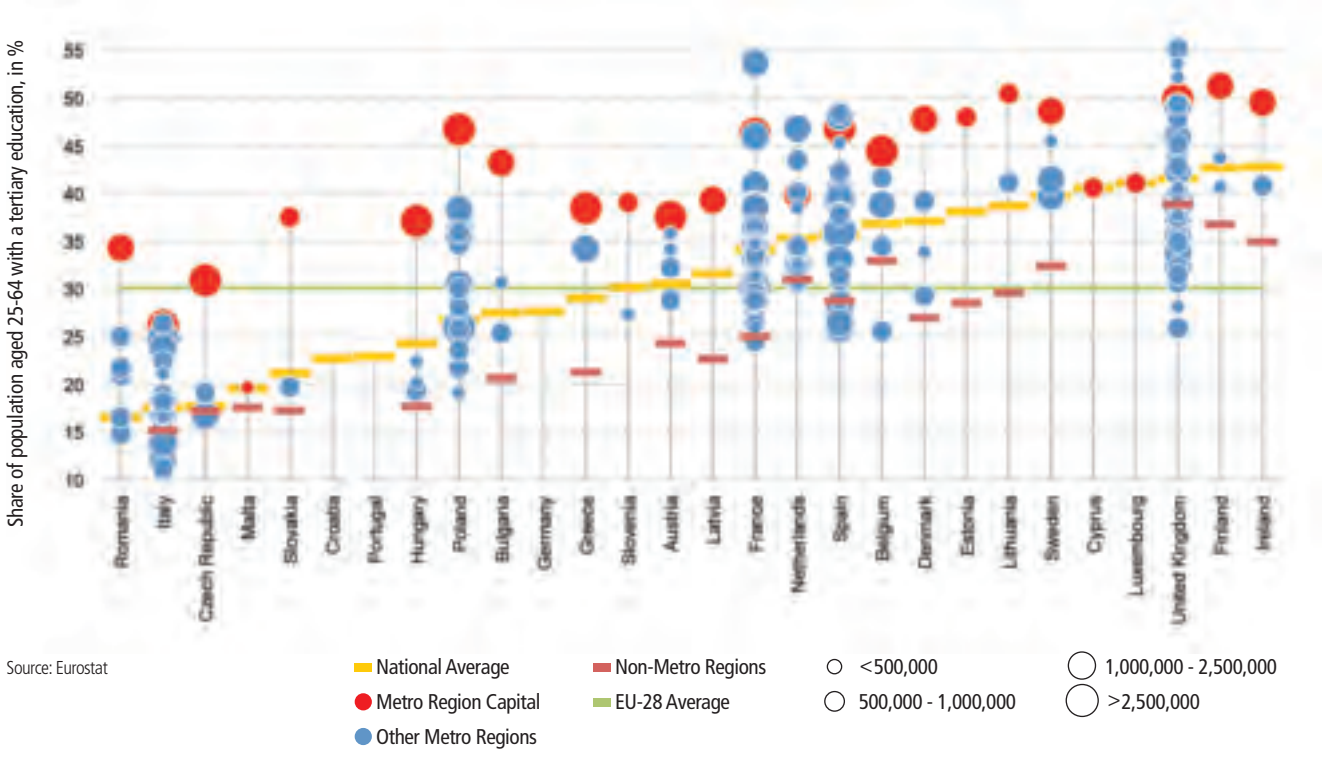
- improve the job finding chances of 10 million unemployed people;
- ensure that 2.1 million people are in employment, including self-employment (due to support from the European Social Fund); and
- help 237,700 people take part in local mobility initiatives or joint employment and training initiatives across borders.

3.2. Cities have more university graduates and higher employment rates

Cities and especially larger cities tend to have a more highly educated population than other territories (Figure 3.1). Demand for highly skilled labour attracts educated people from different parts of a country. The presence of higher education institutions makes it easier for residents to obtain a tertiary degree and find a job matching those skills. In the EU, around 30% of the population aged 25-64 has a completed tertiary education. In metro regions, this is slightly higher at 32% and it is 41% in capital metro regions.

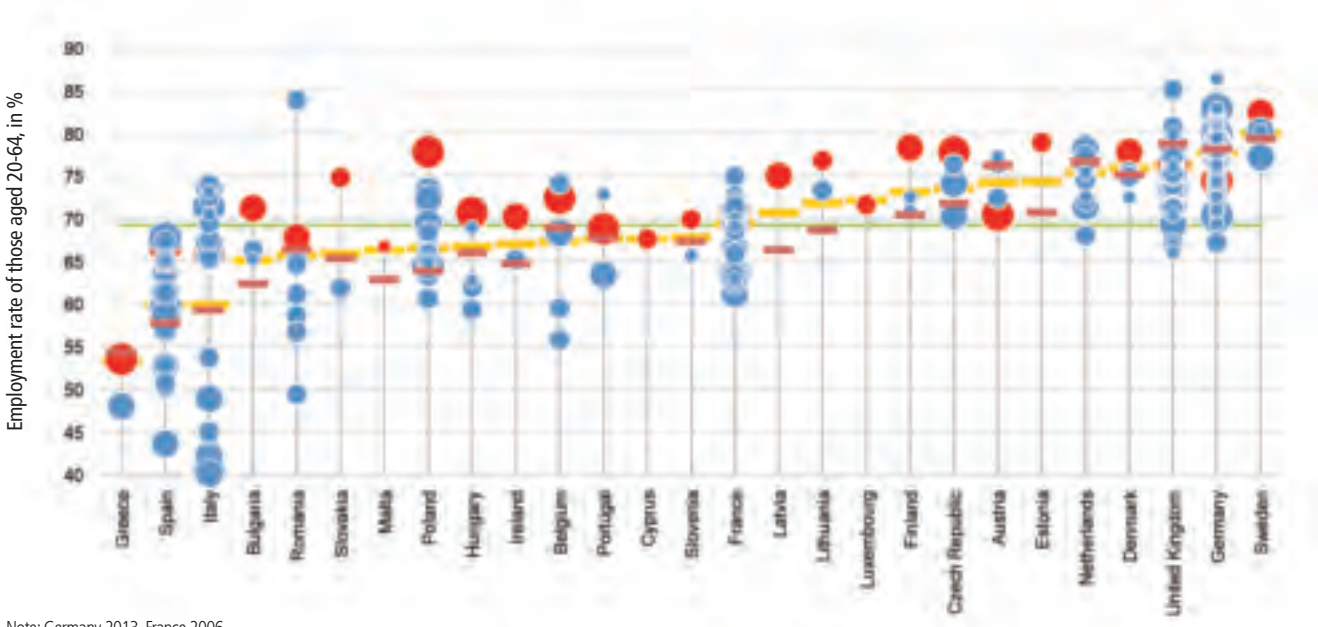
Although many cities benefit from high employment rates (Figure 3.2), a number of cities in Greece, Italy, Romania and Spain had employment rates of less than 50% in 2014. Increasing these rates to the EU average

Figure 3.1. **Tertiary education per metro region, 2014**



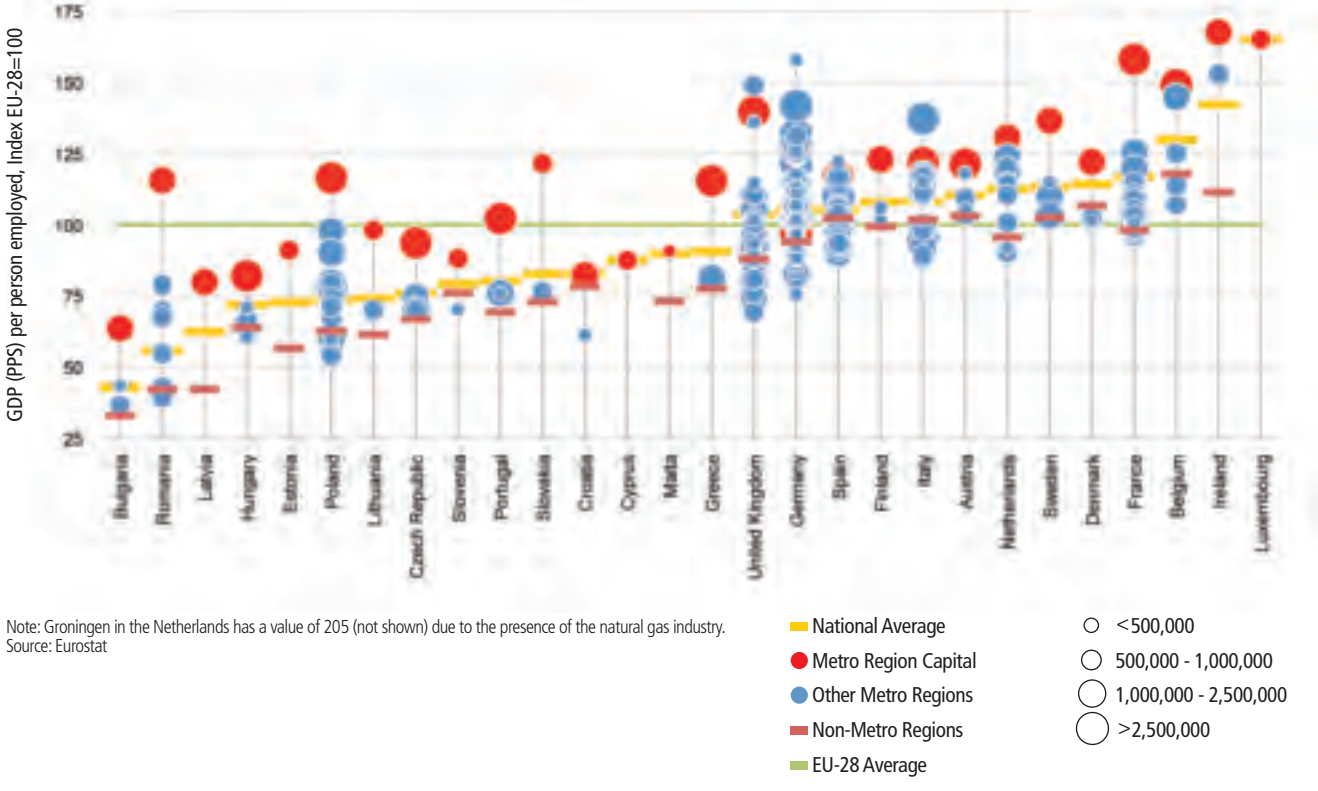
Source: Eurostat

Figure 3.2. **Employment rate per metro region, 2014**



Note: Germany 2013, France 2006
Missing: Croatia
Source: Eurostat

Figure 3.3. **Productivity per metro region, 2013**



Note: Groningen in the Netherlands has a value of 205 (not shown) due to the presence of the natural gas industry.
Source: Eurostat

of 70% would have a significant impact on economic growth and household incomes.

In all EU countries, the productivity of metro regions is on average higher than that of non-metro regions. Furthermore, large cities tend to be more productive than smaller cities. In all countries, except Germany, the capital has a higher productivity than the country as a whole (Figure 3.3).

3.3. Cities boost productivity in multiple ways

Several factors can boost urban productivity: human capital, the quality of the business environment, entrepreneurship, quality of institutions, market access, access to capital, costs of land and labour, as well as research and innovation. Some of them are reinforced by agglomeration economies.

This report cannot cover all the above factors; this section touches on innovation, high-growth firms, agglomeration economies and borrowed size. A subsequent section addresses market access.

High growth firms and innovation are concentrated in cities

High-growth firms can provide important contributions to job creation and economic growth. The number of high-growth firms per capita is typically higher in metro regions than in non-metro regions, and in most cases it is highest in the capital metro region (Figure 3.4).

Cities are not the only places where innovation occurs, but they offer an environment, which is particularly conducive to the introduction of new ideas, products and processes. A vast body of literature enumerates factors explaining why cities are often more innovative than other regions, such as the presence of a creative and skilled workforce, a wide diversity of stakeholders, the fact that specialised clusters are more frequently located in cities, the presence of universities and research institutions, or a mindset open to change.

The innovative capacity of cities is underlined by the number of patents per inhabitant. This is in general higher in capitals and large cities than in non-metro regions (Figure 3.5). Some metro regions, however, score well below the national average. This, for example, is the case in France, Germany, Italy, Spain and the United Kingdom, suggesting that the spatial structure of innovation is more complex in advanced economies.

Matching, sharing and learning increase productivity

Cities benefit from agglomeration economies through two related but distinct channels. The first is related

Several factors can boost urban productivity: human capital, the quality of the business environment, entrepreneurship, quality of institutions, market access, access to capital, costs of land and labour, as well as research and innovation

Box 3.2. European Capitals of Culture

The European Capitals of Culture initiative started in 1985. So far more than 50 cities have been awarded this title for a calendar year. During this year, these cities organise a series of cultural events, which encourages residents to participate more in cultural activities and attracts other people to visit the city.

Being a European Capital of Culture can also boost the long-term socioeconomic development of cities. For instance, each euro of public money invested in Lille (France) within the framework of its European Capital of Culture 2004 title is estimated to have generated 8 euros for the local economy. Marseille-Provence 2013 (France) attracted a record number of 11 million individual visits. Pécs 2010 (Hungary) experienced a 27 % increase in overnight stays, which rose to 124,000 during its year as European Capital of Culture.

In 2016, there are two capitals of culture. Donostia-San Sebastián in Spain will focus on better ways of living together through art and culture, promoting stronger ties with the rest of Europe and fostering innovation in the cultural sector. Wrocław in Poland has the motto "Spaces for Beauty" and will offer more than one thousand cultural events during the year. Its programme is based on metamorphosis and diversity, drawing on the city's unique history of transformation.

For more information: https://ec.europa.eu/programmes/creative-europe/actions/capitals-culture_en

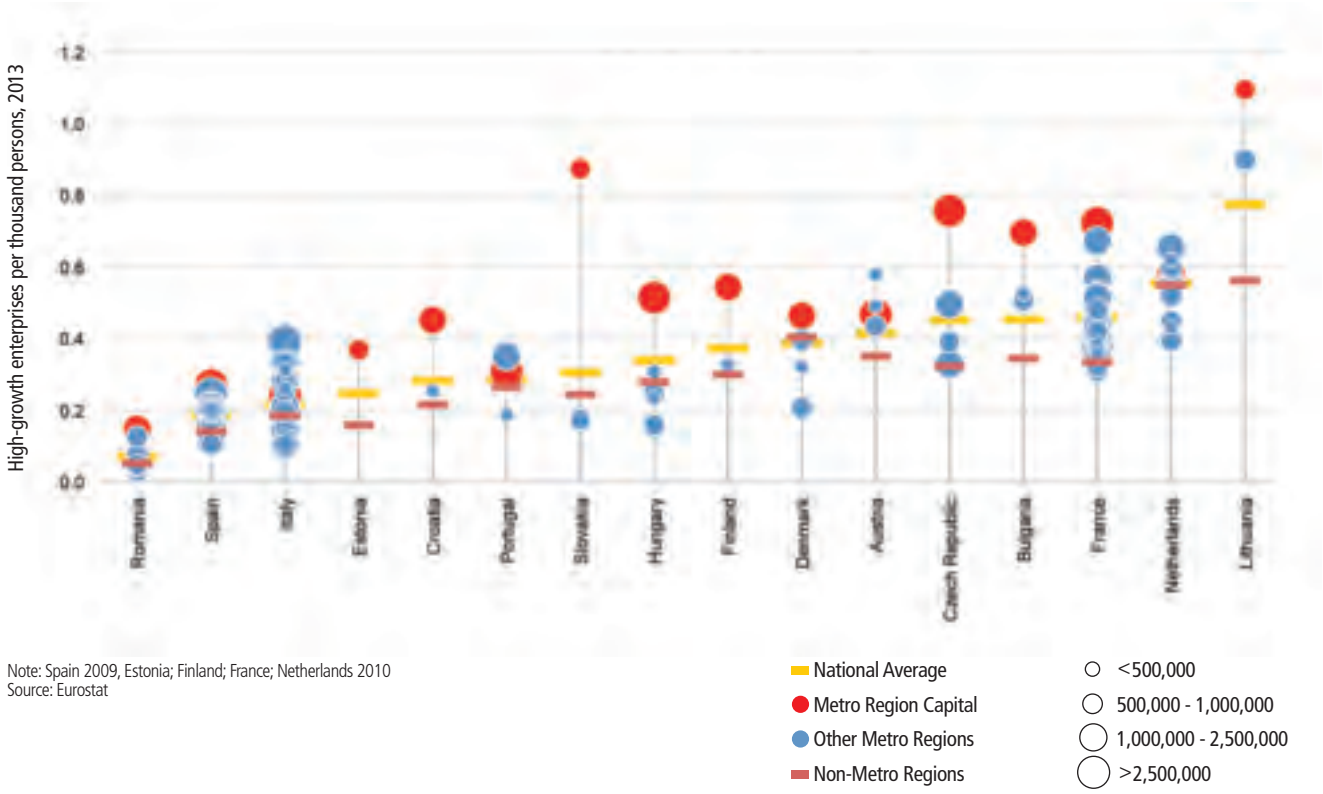
to the size of the city, also known as 'urbanisation economies'. Urbanisation economies arise when the size of the city leads to higher productivity. It is estimated that a doubling in city size increases productivity by 2 to 5% (OECD, 2015). The second channel is related to the size of an economic sector or cluster, also known as 'localisation economies' or specialisation. This allows smaller cities to reach high productivity levels by hosting small but globally competitive clusters.

The three main sources of agglomeration economies are often described as matching, sharing and learning (Puga, 2010). Firstly, larger local labour markets lead to better matches between labour demand and supply. The larger a city, the more potential jobs across a range of skill levels are available to a worker without the need to move. Similarly, larger cities offer a larger pool of potential job candidates across a range of skill levels. Therefore, in larger cities workers usually find a job that is a better match to their particular skills and qualifications. Furthermore, larger cities allow for greater specialisation and a greater division of labour which raises productivity. Smaller cities with a highly specialised economy also benefit from better matching because their demand attracts the specific labour skills required.

Secondly, larger cities allow for better sharing of inputs in the production process such as infrastructure. Airports or railways require a fixed minimum up-front investment independent of the actual number of users. Thus, the costs per user will be lower if more users share that infrastructure. Similarly, firms in the same sector, both in large cities (and smaller but specialised cities) benefit from sharing common suppliers. Since larger suppliers can operate more efficiently, this lowers input costs and increases the availability of specialised inputs.

As a European Capital of Culture, Pecs in Hungary experienced a 27% increase in overnight stays in 2010

Figure 3.4. **High-growth enterprises by metro region, 2013**



Note: Spain 2009, Estonia; Finland; France; Netherlands 2010
Source: Eurostat

Agglomeration effects have a strong impact on wages, both directly through the salaries paid to the workers in these sectors and indirectly through the quantity and quality of the additional employment they induce, for supplier chains and for the home-serving market

Thirdly, people that live and work in close proximity can learn more easily from each other than people at greater distances. Larger cities therefore usually produce more ideas and innovations than smaller ones due to the larger number of people who work there. These ideas tend to increase productivity and spread first within the city before they reach other parts of the country. Furthermore, when more people with different ideas work close to one another, it becomes more likely that they combine these ideas to create innovations that can also increase productivity.

Depending on the type of economic activity, different forms of agglomeration economies exist. Some forms are very local and appear to have effects only within a few hundred metres of a cluster of firms or people. Others have a wider geographic reach and can increase productivity at significantly greater distances. For many types of agglomeration economies, the total number of firms or people in the economic cluster matters as does their proximity or density.

Agglomeration effects have a strong impact on wages, both directly through the salaries paid to the workers in these sectors and indirectly through the quantity and quality of the additional employment they induce, for supplier chains and for the home-serving market. The indirect impacts or multiplier effects are extremely varied and depend on the economic sector. Current estimates are that old manufacturing industries generate about two indirect jobs for every additional core job, while new economy sectors can generate up to

Box 3.3. **Smart specialisation and smart cities**

The Smart Specialisation approach combines industrial, educational and innovation policies to help regions and cities identify and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantages.

The objective of Smart Specialisation Strategies promoted by the Cohesion Policy is to set priorities at national and regional or city level to build competitive advantage by developing and matching research and innovation with business needs, to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts.

http://s3platform.jrc.ec.europa.eu/home

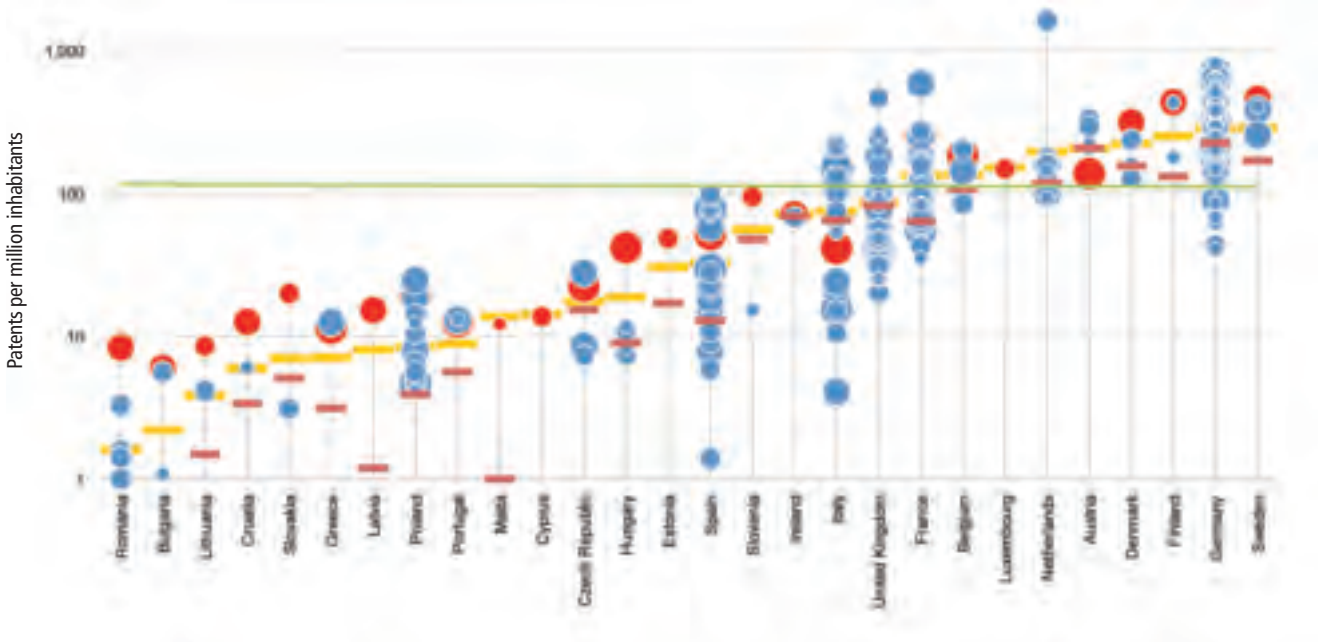
There is a strong link between Smart Specialisation and cities. Cities host an important share of R&D activities and educational institutions. They play a major role in building up the competitiveness of their region and country. The EU's Smart Cities and Communities Innovation Partnership COM(2012)4701 tackles some common challenges affecting cities. Its goal is to exploit the untapped innovation potential and to catalyse commercial deployment of smart city solutions in the key economic (and most risky) areas of energy, transport and mobility, and ICT.

five such jobs (Moretti, 2012). These differences open up major (and often cumulative) wedges in income, as well as in population and migration dynamics.

Cities close to other cities may benefit from 'borrowed size'

Compared to other parts of the world, Europe has a smaller share of its population in very large cities. Given that urbanisation economies increase with city size, this could imply lower productivity in Europe. European cities, however, tend to be close to each other and well connected. Most studies agree that the productivity of a city is higher if it is close to another city–a phenomenon known as 'borrowed size'. A recent OECD study demonstrated productivity enhancing effects of greater population numbers for distances

Figure 3.5. **Patents by metro region, 2009-2010**



Note: Galati (0) and Constanta (0.4) are not shown on chart.
Source: Eurostat

Box 3.4. **Cohesion policy invests in the economic development of cities**

Cohesion Policy supports small and medium-sized enterprises (SMEs) in becoming more innovative and competitive and to create new and lasting employment. It also invests in research and information and communication technology (ICT) and helps people set up their own business.

In the period 2007- 2013, Cohesion Policy dedicated EUR 106 billion to productive investments (RTD, innovation, ICT, business support, tourism, culture) with a direct impact on economic development. Within cities, the main focus was on research and innovation and business support.

Table 3.1. **Cohesion Policy productive investments by metro region, 2007-2013**

	Annual expenditure per capita, 2007-2013, Euro,				
	RTD, innovation, ICT	Business support	Tourism, culture	Total	Expenditure EUR total (billions)
Capital metro	12.2	11.7	2.4	**26.3**	14,931
Other metro	10.6	13.9	3.3	**27.9**	41,846
Non-metro	8.9	19.3	5.5	**33.7**	49,342

Raising the competitiveness bar in the Central Baltic region

The Development of Innovative Business Models for Ensuring Competitiveness (INNOREG) project has boosted both Estonia's and Finland's scientific capabilities by introducing new business models and encouraging cross-border collaboration.

With EUR 2.5 million financing from EU Cohesion Policy, the project was implemented in various cities. A fully automated robotic system or FMS (flexible manufacturing system) was installed in the Mechatronicum Innovation Centre in Tallinn. Meanwhile, to ensure high-quality products, a measurement and control centre was set up in Turku which offers high-tech companies assistance in their production process. Overall, collaboration between companies, scientific institutions and academia across the region was encouraged through networking activities.

Various training courses in mechatronics were also organised for interested parties, while a development plan – "The capability and competitiveness of the mechatronics field in the North-Estonia and South-Finland region" – mapped out the mechanical engineering and mechatronics landscape.

of up to 300 kilometres (OECD, 2015). However, the magnitude of these effects is generally smaller than the magnitude of urbanisation economies.

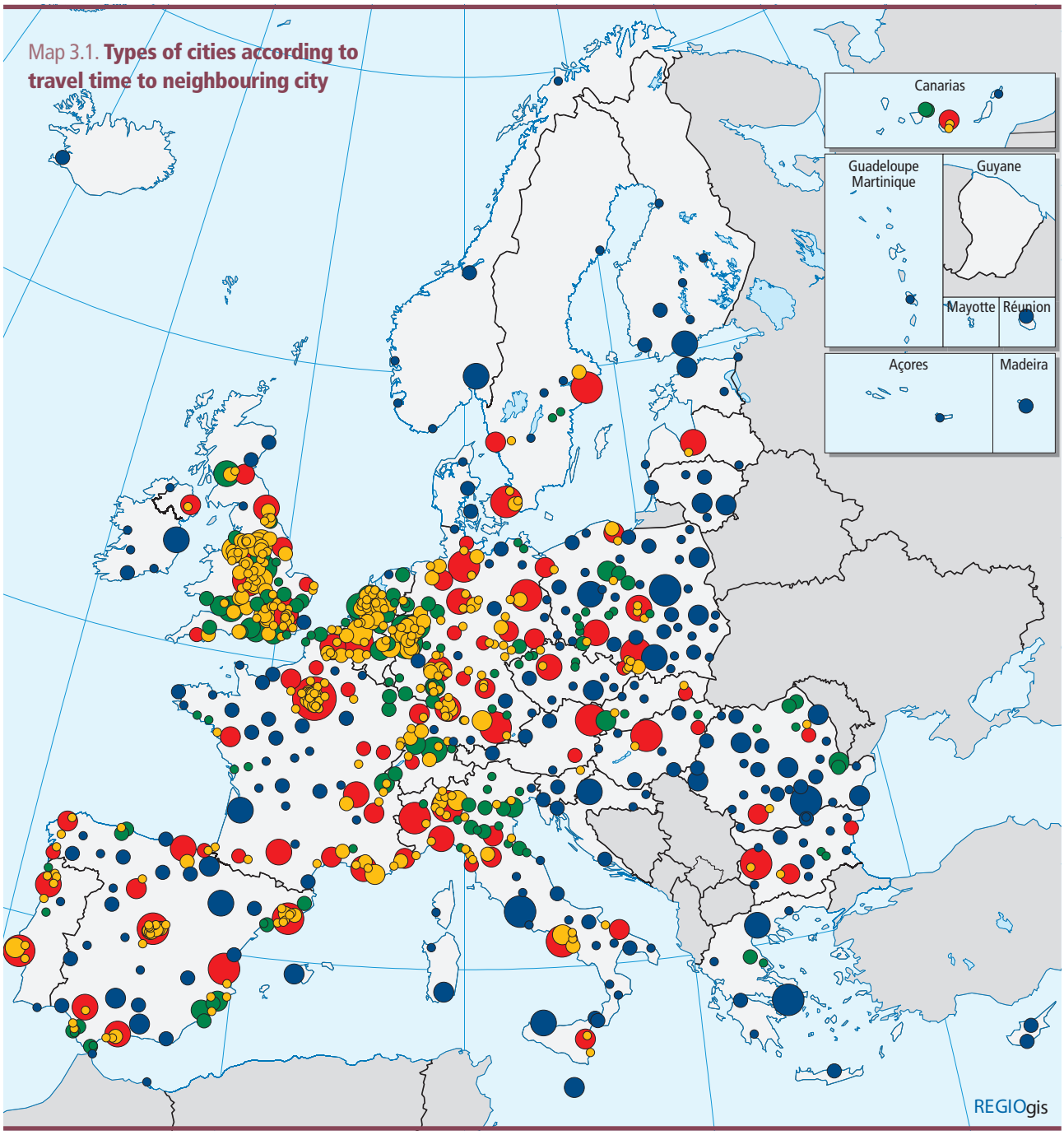
Many cities in Europe are located close to one another, defined as 'at a travel time of less than 45 minutes by road' (Map 3.1). This feature applies in particular to cities located in the core of Europe. The situation is different for cities located in the periphery. In some cases, for example in Nordic countries, cities may be located far apart. In other cases, deficiencies in the road network may increase driving time between nearby cities, for example in Poland and Romania. Against this background, it can be assumed that the 'borrowed size' effect works for many European cities but not for all of them.

3.4. Improving market access does not always generate growth

Transport infrastructure investments are widely used to promote economic development but their real impact on the economy is more complex and hard to predict. In some cases, the projections of transport demand have proved to be too optimistic. In Europe, several heavily underutilised highways, airports and high-speed rail lines demonstrate this optimism bias (Flyvbjerg 2003). In certain cases, actual use turned out to be so low that the airport or high-speed rail line had to be closed down.

Even for projects where demand projections are more accurate, the impact can be difficult to predict.

Map 3.1. **Types of cities according to travel time to neighbouring city**



Type of city

- Regional centre without cities nearby
- Main centre with smaller cities nearby
- City close to a larger centre
- City close to a city of a similar size
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Cities nearby: at less than 45 minutes by road.
Sources: Eurostat, EuroGeographics, TomTom, DG REGIO

0 500 Km

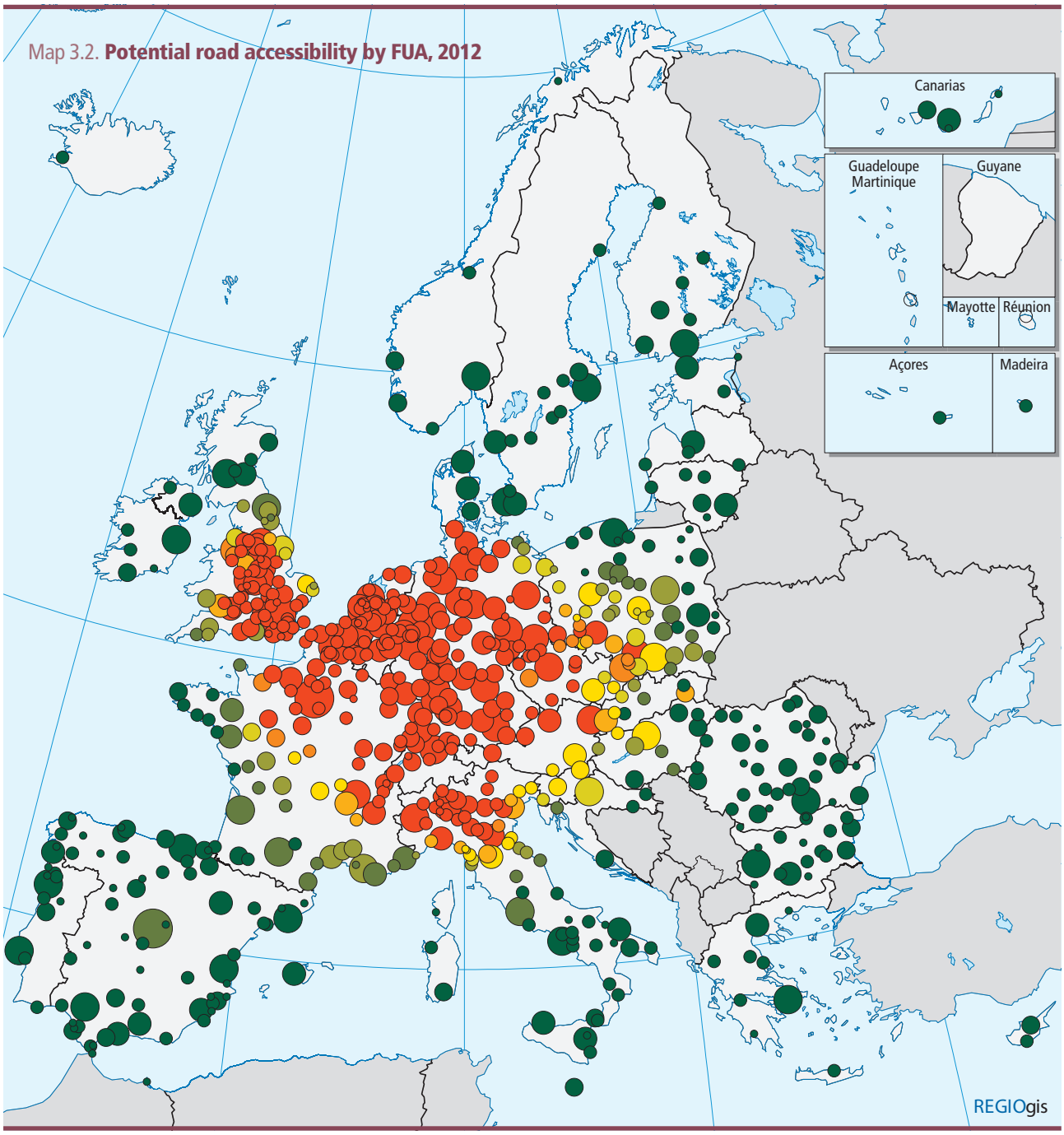
In principle, lowering of transport costs should boost trade and economic growth. New economic geography, however, warns that improving the transport connections between two cities may not necessarily help both cities, even if improving overall productivity levels. For example, if a city with less productive firms is connected to a city with more productive firms, the more productive firms can capture the market of the other city, leading to a reduction of economic activity in one city in favour of the other. This underlines the importance of promoting productivity growth by improving human capital, innovation and the business environment.

Reducing transport costs increases the market a firm can serve. The need for a larger market, however, depends on the type of firm. The non-tradable sector primarily serves the local market. Within the tradable sector, products or services can be targeting a regional, national or even global market. This means that some firms will require better global connections, while others will only benefit from national or regional improvements. Depending on the product or service, market access may require the movement of goods, people or merely of data online. As a result, firms look for locations with favourable connections whether freight, or passenger transport, or high-speed broadband connections.

Regional market access by road is mainly determined by population distribution. A remote city will always have a small market, even with large road investments. As a result, transport investments, especially in areas with a mature network, cannot radically alter market access. Potential road accessibility is highest in the cities in the centre of Europe (see Map 3.2). Some of the larger cities in less centrally located countries still have high accessibility, including Barcelona, Budapest,

Tallinn has benefited from financing from the EU Cohesion Policy to develop its scientific facilities including an innovation centre with automated manufacturing © Scanrail

Map 3.2. **Potential road accessibility by FUA, 2012**



Accessible population

- < 15,000,000
- 15,000,000 - 17,500,000
- 17,500,000 - 19,500,000
- 19,500,000 - 21,000,000
- 21,000,000 - 22,000,000
- 22,000,000 - 23,000,000
- 23,000,000 - 24,000,000
- >= 24,000,000
- No data

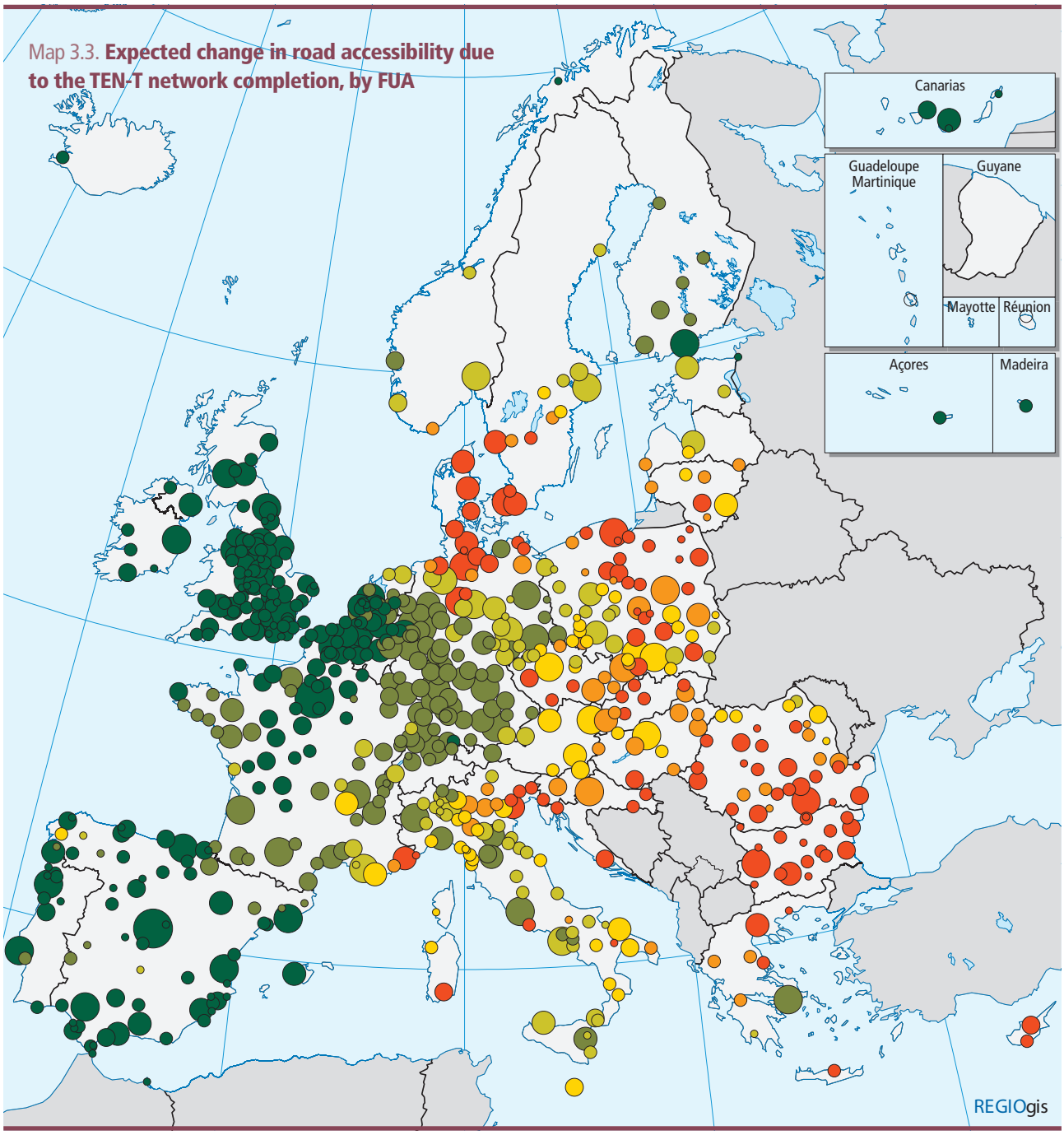
FUA population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Medium distance decay function.
Source: JRC, DG REGIO

0 500 Km

Map 3.3. **Expected change in road accessibility due to the TEN-T network completion, by FUA**



Change in accessibility (%)

- <5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- >= 25
- No data

FUA population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Medium distance decay function.
Sources: DG MOVE, TomTom, DG JRC

0 500 Km

Madrid, Rome and Warsaw. Cities at the edge of Europe have lower potential road accessibility but this has not stopped cities like Dublin, Edinburgh, Helsinki, Oslo or Stockholm from reaching very high levels of GDP per head.

Cities in central and eastern EU countries, however, are not yet connected by a mature road network and will only have better market access after the completion of the Trans-European Transport Network (Map 3.3).

The speed and frequency of trains is also much lower in central and eastern EU countries (Poelman et al. 2016). Although some countries, such as the Czech Republic and Hungary, may have a dense rail network (Map 3.4), the frequency and speed of the service on many of these lines makes it difficult to offer an attractive alternative to travel by car.

Potential rail accessibility is very high in the cities in and around the highly urbanised areas of the UK, the Netherlands, Belgium, northern France and the Rhine-Ruhr area in Germany. This is due to the combination of high-population concentrations, a dense rail network, high-speed rail connections and relatively high frequencies. Relatively high accessibility ranges further to the cities in the west and east of France, substantial parts of Germany, the north of Italy and some of the larger centres in Spain. Somewhat lower values are found in Austria and Switzerland, reflecting the limitations due to the mountainous environment. Still lower values are observed in more peripheral western parts of the EU (Ireland, Portugal and Spain) and in northern Europe, where there are longer distances between cities and relatively low-population densities. In most of the eastern part of the EU, city accessibility is much weaker, mainly due to low frequencies and slow speeds.

By 2050, the EU intends to complete a European high-speed rail network. By that time, rail, both high and normal speed, should capture at least 50% of all medium-distance passenger transport (COM(2011)144). This will require substantial investments, especially in countries where the network is not very dense and the service tends to be slow and infrequent (Map 3.4).

By 2050, the EU intends to complete a European high-speed rail network. By that time, rail, both high and normal speed, should capture at least 50% of all medium-distance passenger transport

Access to passenger flights is highly skewed ranging from more than 3000 flights a day for London and its surrounding cities, to cities without any flights within 90 minutes driving time in eastern Poland and Romania. Improvements in the road network in Poland and Romania may allow several of these cities to access existing airports within 90 minutes driving time. The many business parks close to airports also indicate that such kind of access is also highly valued by firms.

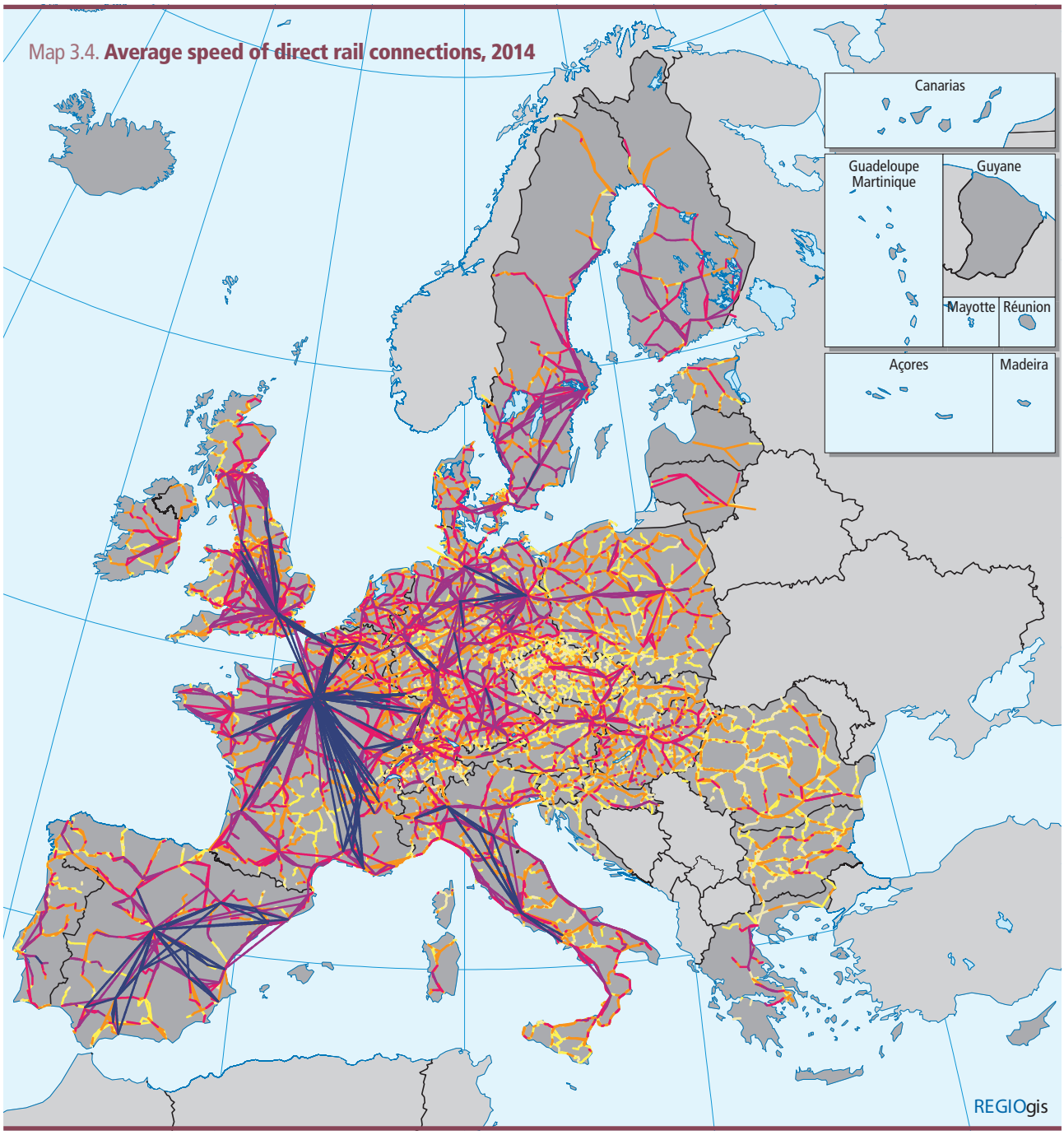
Telecommunication is a key factor of competitiveness and growth. Effective and wide communication networks have become a major aspect of the business environment and companies' development can no longer do without a modern ICT infrastructure. Cities in Europe are generally well endowed with ICT infrastructure compared to rural areas. However, some EU countries have substantial room for improvement. Broadband coverage has significantly increased in the EU over the last decade. Almost 100% of households now have access to at least one fixed broadband network. The difference between cities and rural areas is much wider, however, in terms of Next Generation Access (NGA), which provides speeds of at least 24 Mbit/s (Figure 3.6). In 2014, 75% of EU households in urban areas had NGA coverage against only 25% in rural areas. However, while urban areas in a number of Member States have full or near full NGA coverage, it remains below 50% in the urban areas of Italy, Greece and France.

Some Member States have progressed rapidly with their NGA coverage, such as Croatia which, between 2012 and 2014, increased its urban NGA coverage from 25 to 71%. Others have achieved modest improvements, such as Poland whose NGA coverage increased from 56 to 59% between 2012 and 2014.

3.5. Urban economic growth by city-income levels

Although city size has an impact on productivity levels, there remains an unexplained variation among cities. This variation and how a city can transition between different levels of development are the focus of the following sections. There are two key questions to be answered: (1) How can high-income cities maintain their advantage? (2) How can lower-income cities transition to a higher-income level?

Map 3.4. **Average speed of direct rail connections, 2014**



km/h

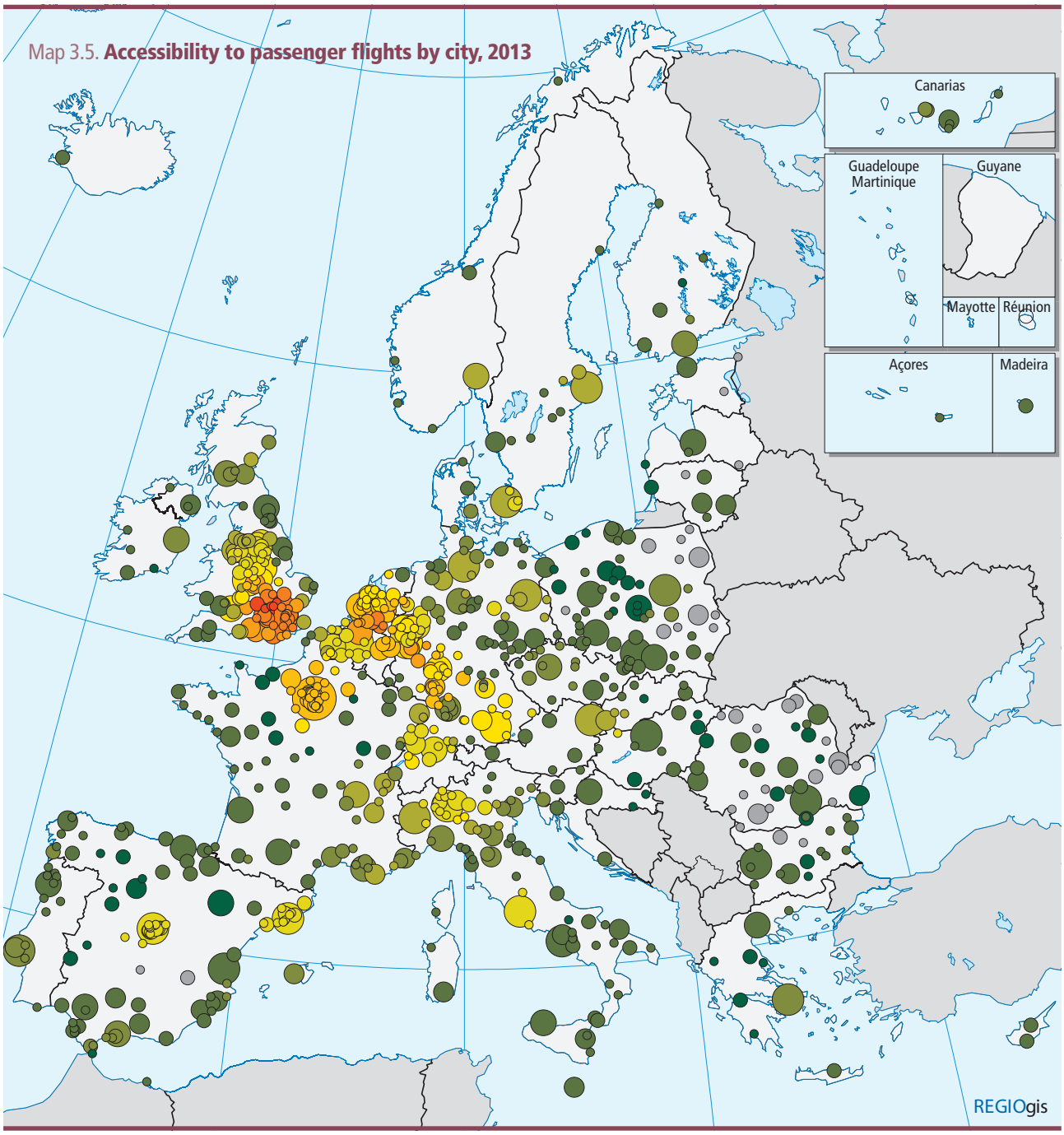
- <= 40.0
- 40.1 - 60.0
- 60.1 - 80.0
- 80.1 - 100.0
- 100.1 - 150.0
- > 150.0
- No data or incomplete data

Speed calculated along straight lines representing the connection between two subsequent stops. All direct train trips between geolocated stations, starting between 6:00 and 20:00 on 02/10/2014 (EE, IE: 2013; EL, Corsica, Northern Ireland: 2015).

Sources: UIC, www.peatus.ee, National Transport Authority Ireland, TrainOSE Greece, Chemins de Fer de la Corse, Translink, Northern Ireland Railways, EuroGeographics, OpenStreetMap, TomTom, RRG, DG REGIO

0 500 Km

Map 3.5. **Accessibility to passenger flights by city, 2013**



Accessible population

- Travel time >90'
- 1 - 10
- 11 - 250
- 251 - 500
- 501 - 750
- 751 - 1000
- 1001 - 1500
- 1501 - 2000
- 2001 - 2500
- 2501 - 3000
- > 3000
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Population-weighted average number of passenger flights per day, accessible within 90 minutes of travel by road.

Sources: Eurostat, TomTom, EuroGeographics, REGIO-GIS

0 500 Km

Cities at the edge of Europe such as Helsinki have lower road accessibility but this has not stopped them from reaching high levels of GDP per head © Scanrail

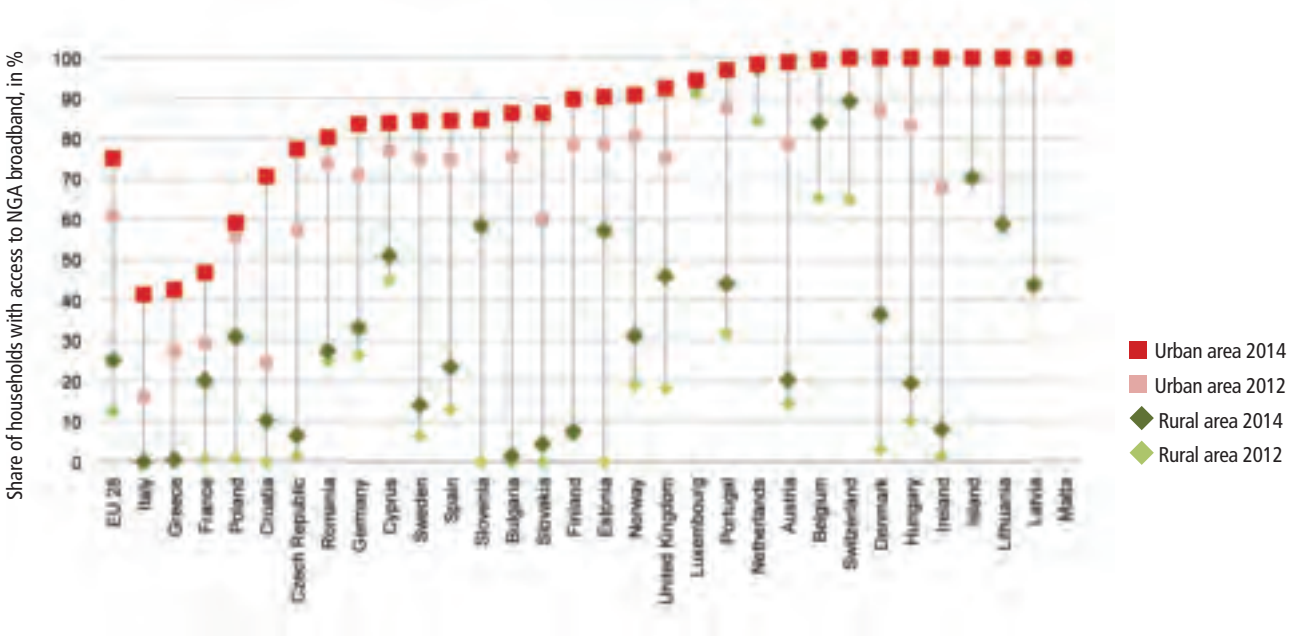
Urban economies at similar per capita income levels share many key attributes, including their levels of education, science and technology endowments, infrastructure quality and institutional quality. Conversely, between economies with different income levels these attributes tend to differ significantly. Cities can therefore be grouped into 'development clubs'.

The concept of development clubs can be used to describe and analyse changes because the motors of change differ from one club to another. A very high-income economy, for example, has high wages and high employment rates, whereas a low-income economy will have low wages and/or low employment rates. The high-income economy must resist cost competition from below by continuing to innovate or capture innovative, high-wage sectors. The low-income economy can offer low-cost land and labour to capture activities susceptible to re-location in search of cost reductions. Each club, therefore, has specific needs and challenges related to its starting point and its medium-term prospects.

Grouping urban economies into clubs or income groups can generate insights into their development and prospects. It avoids treating all cities in the same way or focusing only on a few case studies. It thus sheds light on the dynamics of a large, differentiated economy-wide division of labour with each club influencing the other through competition for specialisations and the sorting of factors (capital, labour, firms, technology) among them.

For the purpose of this analysis, cities have been classified into four income groups according to their level of GDP per head (in PPS) in 2013 (Table 3.2 and Map 3.6).

Figure 3.6. **Next Generation Access coverage in urban and rural areas, end of 2014**



Source: European Commission, 2014, Broadband lines in the EU, Communications Committee Working Document.

Table 3.2. **GDP per head thresholds per development club or income group, 2013**

Development club or income group	GDP per head (PPS) relative to the EU average	Number of cities	Average population size
Very high-income (VH)	>150% of the EU average	25	2,400,000
High-income (H)	between 150% and 120%	50	1,134,000
Medium-income (M)	between 120% and 75%	148	933,000
Low-income (L)	less than 75%	48	901,000

Source: Eurostat and DG REGIO calculations

The economy of each city is shaped in part by being in the EU but also strongly by its national economy

Europe is not a fully integrated market yet. Labour mobility between countries is lower than in a more integrated economy like that of the USA. Language barriers are high. Institutions and business environments are also different. All these factors continue to generate strong differences in average skill levels, technological and scientific capacities, and employment rates between countries. Thus, the economy of each city is shaped in part by being in the EU but also strongly by its national economy. Therefore, European cities are first analysed relative to EU benchmarks and next within their national context.

3.6. Jobs and people are shifting to high-income cities

Higher-income cities attract more people

Although economic growth and population change are entwined, the average population size in the four income groups is not all that different (Table 3.2). Although population size plays an important role in the success of the two largest European cities, Paris

and London, other factors contribute to successful economic development as well. If we exclude London and Paris from the analysis, the average size in each of the four income groups defined above varies between 1.4 million (in the very high-income group) and 0.9 million (in the low-income group) with some variation within each group.

Figure 3.7 shows that population growth differs more by income group than population size does. Population growth is above the EU average in all but the low-income cities. The higher the income, the higher the population growth. In other words, people are attracted to wealthy cities in Europe.

Although the average population change in low-income cities is low, it does vary with outliers that range from high growth to rapid population reductions (Map 3.7). For example, six Spanish cities (Alicante, Cádiz, Granada, Málaga, Murcia and Sevilla) experienced growth over 10%, while four cities declined by more than 10% (Galati and Craiova in Romania, Kaunas in Lithuania and Opole in Poland).

The net migration rate is higher in high- and medium-income cities than in very high-income cities. This may in part be due to the higher housing costs in very high-income cities. Natural population change is much higher in very high-income cities, almost six times the EU average. On the other hand, it is only slightly higher than the EU average in high- and medium-income cities, and close to zero in low-income cities.

In low-income cities, population growth is close to zero. As a result their GDP per head growth is higher than that in other income groups. Low-income cities as a group, however, did not create any additional jobs over this period, although the jobs are likely to have become better paid. This, in combination with their low-income level, may explain the low net-migration rate for these cities.

The latest population projections suggest that in the next decade natural population change will be negative in low- and medium-income cities, while very high-income cities will retain strong natural population growth. Net migration is also expected to become negative in the low-income cities, whereas the net-migration rate of the high- and very high-income cities is estimated to be double the EU average.

Overall, GDP growth between 2000 and 2013 was strongest in the very high- and high-income cities (Table 3.3), but offset by substantial population growth. As a result, GDP per head growth was highest in the low-income cities, which experienced, on average, almost no population change. Within each group, however, there is substantial variation with some high-income cities with low population growth as, for example, in some German cities and several low-income cities with high population growth, i.e. some Spanish cities.

A closer look at the low-income cities reveals three distinct sub-groups. The largest group has high GDP growth and low or negative population change. These cities are almost exclusively located in central and eastern EU countries, reflecting the ongoing catching-up process. The second sub-group recorded slightly higher population growth, but low GDP growth. These are located in Spain. And, finally, there is a small group of low-income cities with both low GDP and low or negative population growth. These cities are found in Greece, Hungary, Italy, Portugal and Spain.

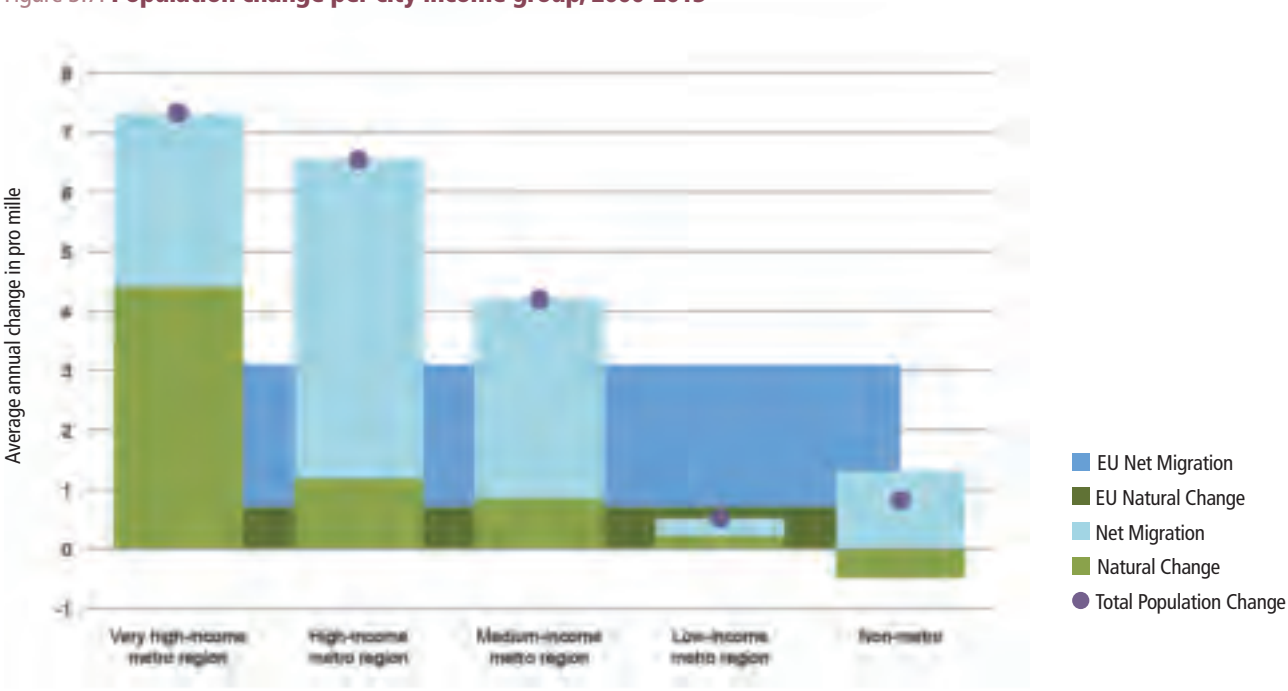
Box 3.5. What is urban economic development?

Following Bartik (2012), this report distinguishes growth from development. A city experiences economic development when people's income increases. A city experiences economic growth if the output of its economy increases. If economic growth is slower than population growth, incomes are likely to decline and inequalities may increase. Growth that increases inequality may benefit certain groups, but the longer-term test of development is whether per capita income grows in a way that spreads opportunity and is reasonably sustainable over the long-run.

A city's development policy is judged successful if it raises real per capita income in the city. Household income varies strongly with other characteristics of an economy, including specialisation, education, science and technology capacity, and the wages in core sectors. In addition, national and local characteristics of the labour market and the quality of institutions can have a big impact on per capita income and its distribution.

In this report, GDP per head is used as a proxy for per capita income, as disposable household income data is not available at the city level. As a result, a few differences between GDP per head and income per capita should be kept in mind. Some of the wealth generated in a city will go to shareholders who may live in other parts of the country or world. Taxes also redistribute wealth geographically within a country, often from rich regions to poor, but not exclusively. Last but not least, average GDP does not capture the distribution of income within a city.

Figure 3.7. **Population change per city income group, 2000-2013**



Source: Eurostat and DG REGIO calculations

Table 3.3. **Population, GDP and employment change per city income, 2000-2013**

Metro region by income level	Population	GDP	GDP per head	Employment
Very-high	0.7	1.6	0.9	0.8
High	0.6	1.3	0.7	0.9
Medium	0.4	1.1	0.7	0.4
Low	0.2	1.3	1.1	0.0
All Metro	**0.5**	**1.3**	**0.9**	**0.6**
Non-metro	**0.1**	**0.9**	**0.8**	**0.0**
EU	**0.3**	**1.2**	**0.9**	**0.3**

Source: Eurostat

To summarise, high- and very high-income cities attract people, whereas low-income cities tend to see their population decline to negative net migration.

High-income cities have higher employment rates and employment growth

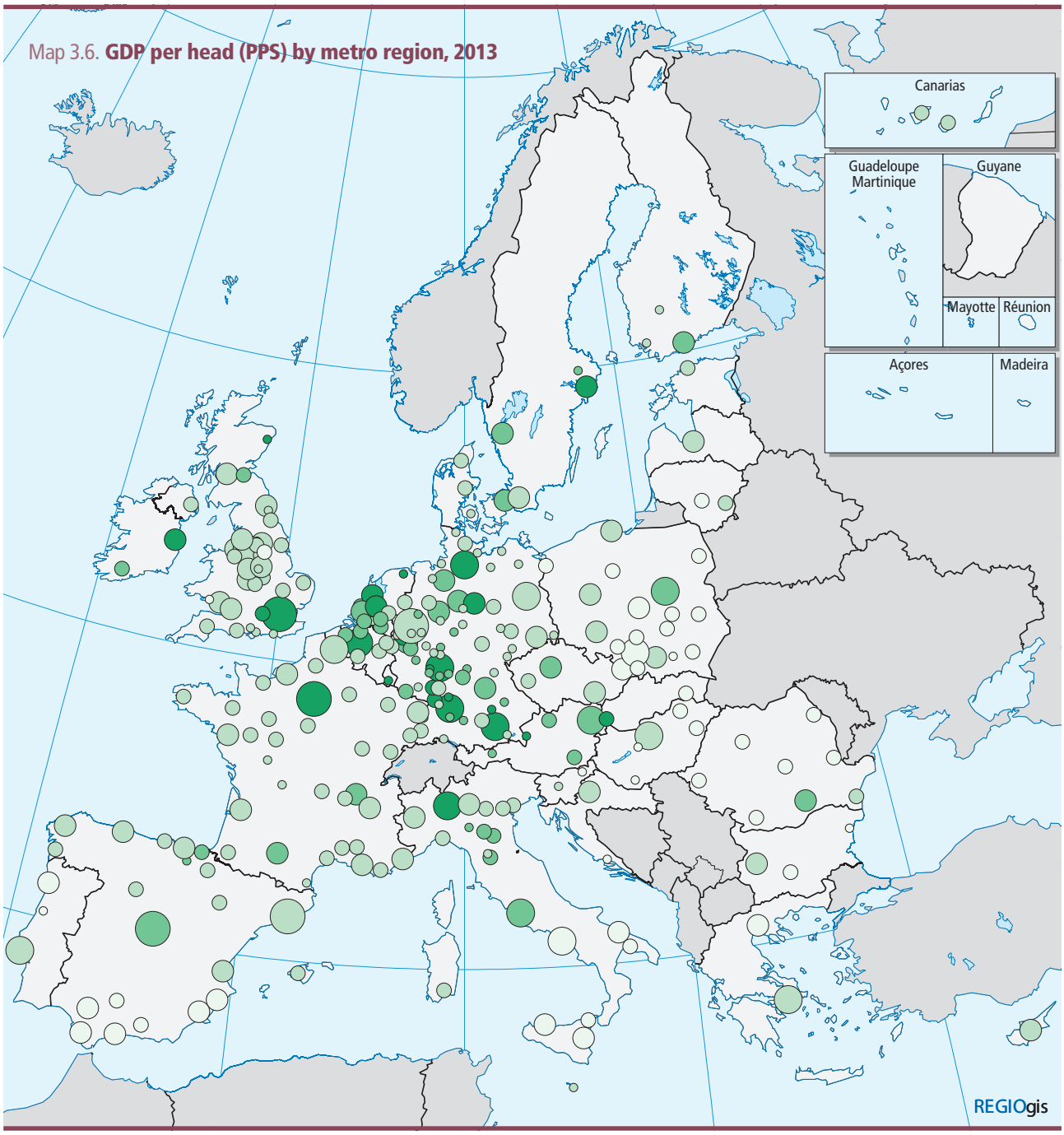
Employment growth was higher in the (very) high-income cities than in the medium- and low-income cities in 2000-2013 (Table 3.3). In fact, employment in low-income cities (-0.01%) and outside cities (-0.04%) even declined during this period. Accordingly, (very) high-income cities have high employment rates and low unemployment rates (Table 3.4). Low-income cities, on the other hand, have low employment rates and an unemployment rate 50% above the EU average. Nevertheless, total employment in EU cities increased by 8% over this period, compared to a decline of 0.4% in non-metro regions.

The picture that emerges is that cities with high incomes and employment growth tend to attract working age people. This would support the hypothesis that people follow jobs and not vice versa; although the analysis is far from conclusive.

Economic growth per head favours both low- and very high-income cities

As we have seen above, GDP growth per head is highest in low-income cities, indicating a catching-up process as predicted by classical economic theory. Most of the low-income cities are located in the EU-13. The few low-income cities located in the EU-15 saw their economies shrink relative to their population. Productivity growth is typically the main source of catching up and this is confirmed for the low-income cities. Their growth is driven purely by productivity growth (defined as GDP per person employed), while employment declined relative to population (Figure 3.8). The next highest

Map 3.6. **GDP per head (PPS) by metro region, 2013**



Index (EU28 = 100)

- < 75 (low-income regions)
- 75 - 120 (medium-income regions)
- 120 - 150 (high-income regions)
- >= 150 (very high-income regions)

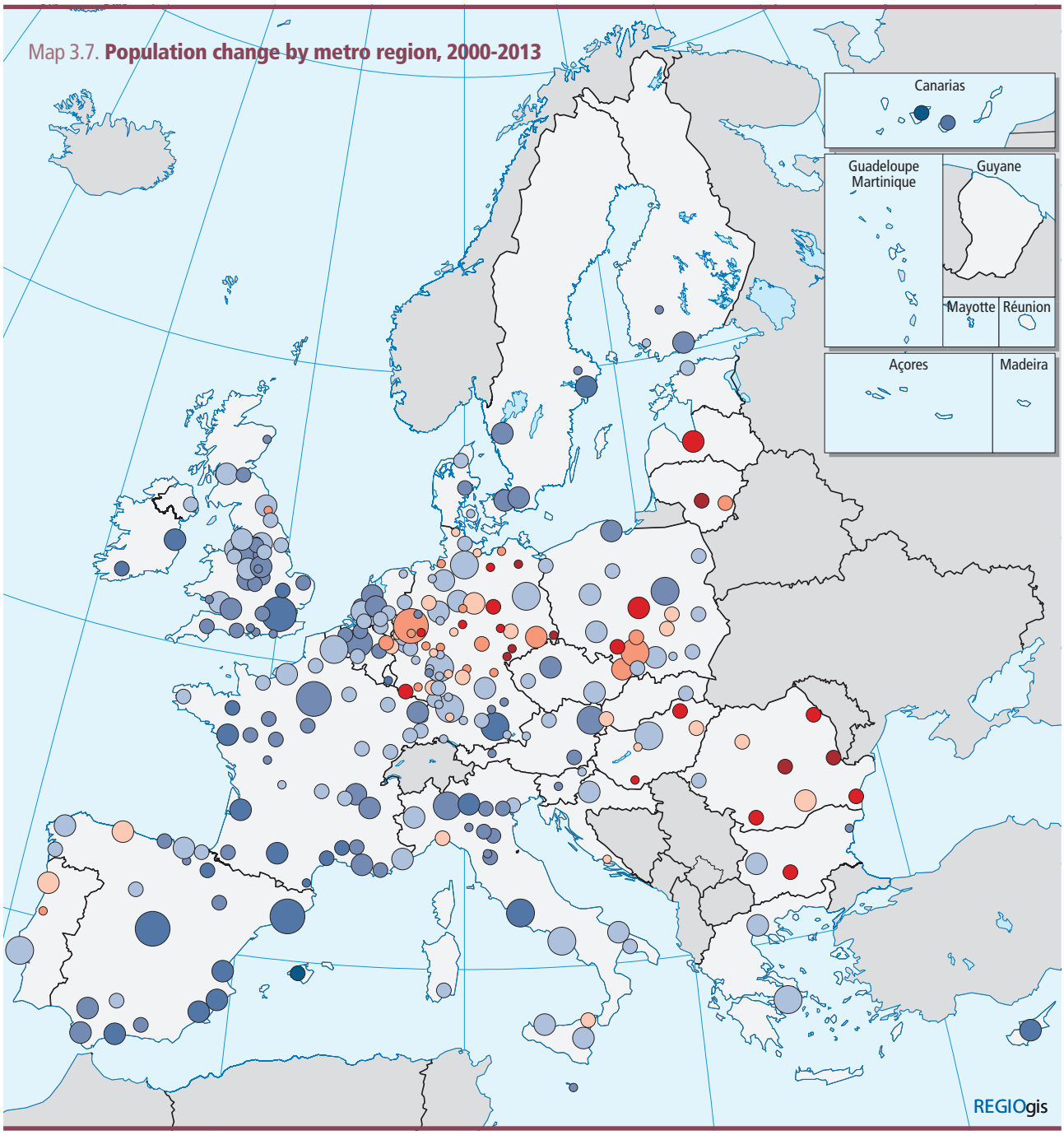
Metro region population

- <500,000
- 500,000 - 1,000,000
- 1,000,000 - 2,500,000
- 2,500,000 - 5,000,000
- > 5,000,000

Sources: Eurostat, DG REGIO

0 500 Km

Map 3.7. **Population change by metro region, 2000-2013**



Annual average % change

- < -1
- -1 - -0.5
- -0.5 - -0.25
- -0.25 - 0
- 0 - 0.5
- 0.5 - 1
- 1 - 2
- >= 2

Metro region population

- <500,000
- 500,000 - 1,000,000
- 1,000,000 - 2,500,000
- 2,500,000 - 5,000,000
- > 5,000,000

Sources: Eurostat, DG REGIO

0 500 Km

group in terms of economic growth is the very high-income cities, suggesting an opposite dynamic of reinforcing their structural strengths by continuously attracting high-income-generating activities. In other words, whereas the low-income cities are moving closer to the economic 'frontier', very high-income cities are moving this frontier as demonstrated by their high productivity growth (Figure 3.8) and their high number of patents manifesting their innovativeness (Figure 3.4).

Manufacturing provides employment in high- and low-income cities

Economic specialisation differs across income levels because cities have different comparative advantages that lead to a geographical division of labour between different kinds of economies according to their endowments of labour, capital and other factors. This pattern of comparative advantages leads to inter-industry trade between economies at different levels of development and specialisation. Moreover, as transport and communication costs have declined, it has become feasible to divide industries into different phases and locate the different phases in different places. This leads to intra-industry trade between economies at different levels of development. Finally, industries can be divided into the part that is clustered or agglomerated, and the phases or parts that can be geographically dispersed. As a result, in the 21st century we no longer see simple or clear distinctions between economies by the industries they contain, but more subtle and hard-to-measure patterns of economic difference.

To get a good picture of these differences, a fine decomposition of industries is needed to show the types of jobs or tasks they perform, and to distinguish clusters from more dispersed activities. However, the only data which are available are employment shares in manufacturing (Table 3.4). They show that very high-income cities have the lowest share of employment in manufacturing (11%), while the low-income cities have the highest share (18.7%), a share similar to that of the non-metro regions (19.3%). All four groups have witnessed a reduction of more than 3 percentage points between 2000 and 2013.

In 2014, 75% of EU households in urban areas had access to Next Generation Access broadband

Table 3.4. **Employment and unemployment rates, patents and industrial employment per metro region by income level**

Metro region by income level	Employment rate (20-64) 2014 in %	Unemployment rate (20-64) 2014 in %	Patents per million inhabitants (Avg. 2009-10)	Employment in industry 2013, as share of total in %	Change in industrial employment share 2000-2013, in %
Very-high	77	6	241	11	-3,4
High	75	7	202	14	-3,1
Medium	71	10	104	15	-4,1
Low	61	15	11	19	-3,4
All Metro	**71**	**9**	**137**	**14**	**-3,7**
Non-metro	**68**	**11**	**72**	19	**-3,4**
EU	**69**	**10**	**112**	**16**	**-3,6**

Source: Eurostat and DG REGIO calculations

This reflects competition from emerging economies and non-metro regions for the less skilled and less innovative (more cost-sensitive) manufacturing.

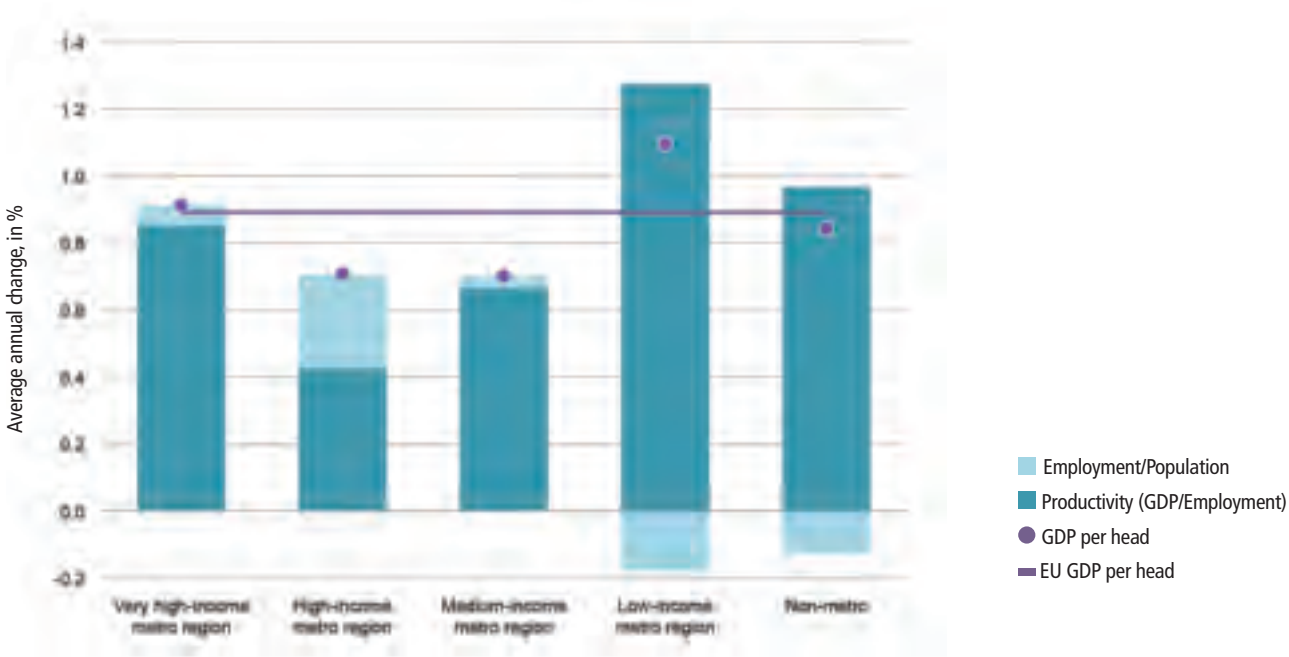
Very high-income cities are less tied to their country's economy

Benchmarking a city's GDP per head to its country's GDP per head shows that all very high-income cities also have a (very) high income relative to their country (Map 3.8). The GDP of the very high-income cities also tends to grow faster than national GDP, implying that they may be more connected to the global economy and less tied to the country's economy.

In contrast, the high-income cities, on the other hand, do not perform as well. Only one in three has an income that is also high relative to national income. Warsaw and Bucharest are the two outliers with an income of more than double the national income.

Four out of five medium-income cities also have a medium income relative to national income. Positive

Figure 3.8. **GDP per head growth per metro region by income level, 2000-2013**



Source: Eurostat and DG REGIO calculations

Sofia's GDP grew by 6.6% a year between 2000 and 2013, the highest growth of any EU metro region

exceptions are for example Budapest, Poznań and Sofia with an income at least 50% higher than national income. Only two out of five low-income cities had an income 25% below the national average.

A closer look at city performance shows that in several countries, especially in central and eastern EU countries, the capital city has a far higher income and productivity than the second-tier cities. For example, GDP per head in Bratislava, Bucharest, Budapest, Paris and Sofia is more than 50% higher than that of the country. Improving the performance of second-tier cities would have a big impact on the national economies.

3.7. Conclusion

Many European cities outperform their country in terms of productivity, employment, education and innovation. Since 2000, employment in cities grew by 7%, while it declined in the rest of the EU. GDP generated in cities grew almost 50% faster than elsewhere.

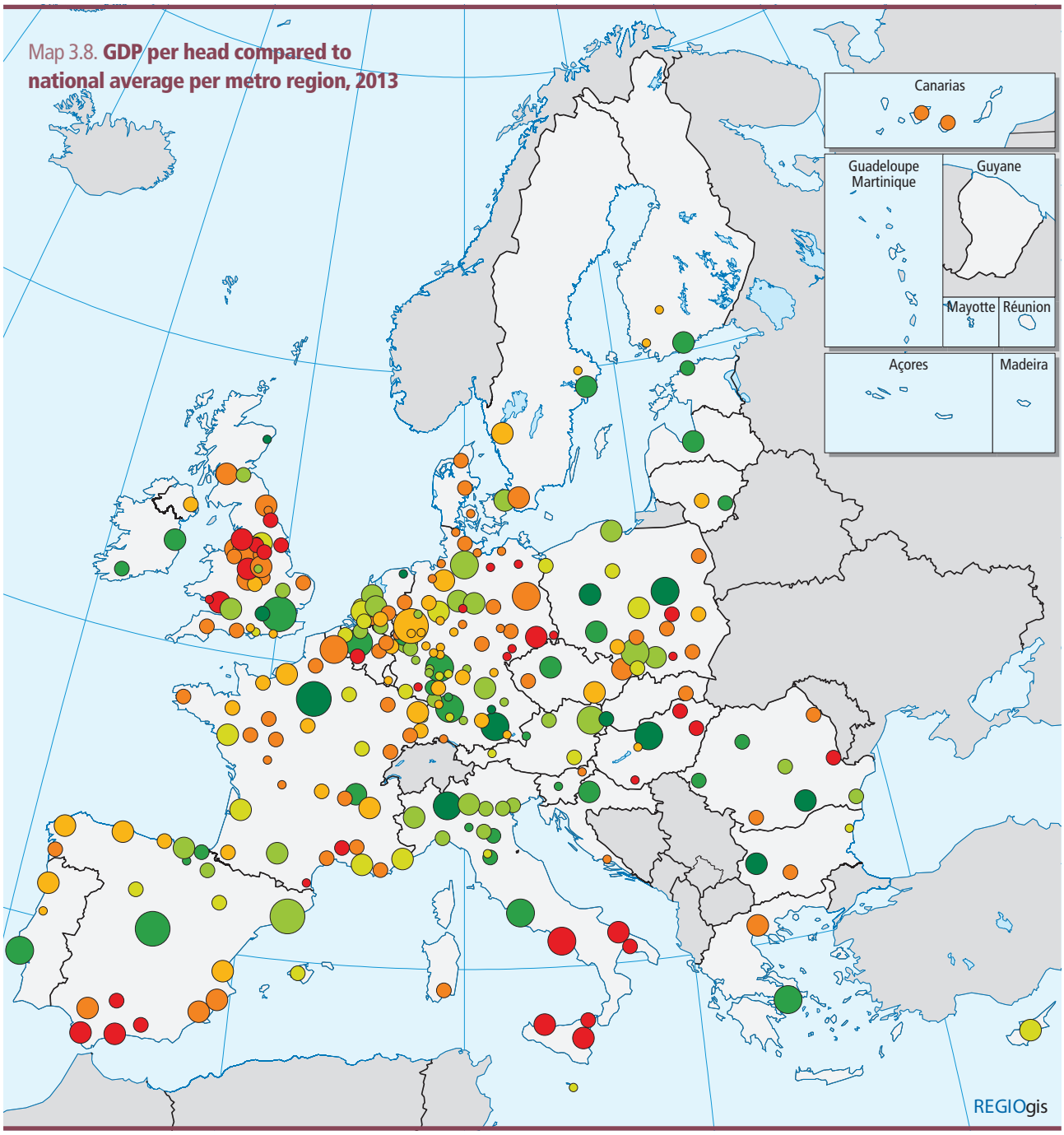
As a result, cities help their national economy become more knowledge-based and competitive. However, there are also cities that do less well, especially those that struggle simultaneously with a legacy of de-industrialisation, lack of innovation capacity and population decline.

Low-income cities need to better mobilise their natural advantages, making their labour and land available at low cost and high efficiency. Success depends on their market access, the quality of their infrastructure, their administrations and business environment, and the skill set of their labour force.

Low-income cities tend to lose talent and youth to higher-income cities, generating a negative demographic dynamic. If their populations age due to out-migration of the young, they will face a long-term decline in their working-age population. To avoid that this trend turns into a vicious cycle, low-income cities need to transition quickly to the middle-income group.

Medium-income cities risk falling into the 'middle-income trap.' As productivity and wages grow, they become less attractive for labour-intensive or low-skill activities. To become attractive for higher value-added activities, these cities have to improve the quality of their institutions and business ecosystems, upgrade the network infrastructures, and critically, become more innovative and improve the skill set of the labour force through better education. Moving up the value chain

Map 3.8. **GDP per head compared to national average per metro region, 2013**



Index, MS = 100

- < 75
- 75 - 90
- 90 - 100
- 100 - 110
- 110 - 125
- 125 - 150
- >= 150

Metro region population

- <500,000
- 500,000 - 1,000,000
- 1,000,000 - 2,500,000
- 2,500,000 - 5,000,000
- > 5,000,000

Sources: Eurostat, DG REGIO

0 500 Km

Box 3.6. **Agglomeration economies and diseconomies**

Large cities boost the economic performance of their country due to the presence of agglomeration economies. However, there are also economic costs associated with people living in large cities and at high densities. Costs of living tend to be higher because the costs of housing and office space increase with city size. Congestion reduces life satisfaction and economic productivity because of the time that workers spend stuck in traffic. Air pollution decreases the health of the population, which – in addition to being undesirable in its own right – translates into higher health care costs and economic losses due to missed days of work.

Agglomeration costs are easier to address for governments than agglomeration economies because their causes and consequences are better understood. Furthermore, the mechanisms behind agglomeration costs fall more directly within the domain of public policy than those behind agglomeration economies. Congestion and pollution levels, for example, are a direct consequence of transport, spatial planning and land use policies. Housing costs are largely determined by land use and building code regulations. Pollution levels can be directly influenced by environmental regulations.

Reducing agglomeration costs has not only economic benefits as most agglomeration costs affect economic performance and well-being at the same time. By reducing them, policy makers can contribute to a better economic performance of cities and to a better quality of life of their residents. Thus, whereas further increasing agglomeration economies is a desirable goal, reducing agglomeration costs appears to be a more attainable goal that offers greater benefits in the short and medium term.

Avoiding unnecessary limits on the growth of cities and reducing the costs of agglomeration is particularly relevant for large and rapidly growing cities. Cities that have managed their traffic, housing and air quality well are less affected by agglomeration costs, as are cities with population reductions or economic decline.

requires much higher investment per worker than in the early stages of development, because it requires a more skilled labour force and the introduction of new business models at the company level.

High-income cities tend to be more vulnerable than very high-income cities because their comparative advantages often overlap with medium-income cities. They are also vulnerable to standardisation of the products they produce (product cycles, maturity), which often allows industries to move to locations with lower costs and less-skilled labour. The impact of this trend depends on the capacity of the high-income cities' firms to generate innovations within their areas of economic specialisation and to expand into high value-added economic activities related to their specialisation.

Very high-income cities must maintain their specialisation in high-wage activities in the face of a changing global landscape of comparative advantages. Specifically, they must cope with two challenges. One is that the activities that are high-wage at one moment in time tend progressively to become more widespread and more routine. This allows the entry of imitators with lower wages. A second is that when innovative sectors mature, they tend to spread geographically so that the initially leading region no longer has a lock on them. The richest cities can therefore only maintain their comparative advantages by continuing to push the boundaries of innovation and technology in their areas of activity.

The key sources of urban economic development are likely to be different in each income group as they face different challenges. Although there are a few common drivers of economic development, transitioning between income groups cannot be achieved with a 'one-size-fits-all' strategy

This chapter showed that the key sources of urban economic development are likely to be different in each income group as they face different challenges. Although there are a few common drivers of economic development (good institutions, infrastructure and education), transitioning between income groups cannot be achieved with a 'one-size-fits-all' strategy. As a result, policies promoting urban economic development should be differentiated. All cities are in a dynamic process of dealing with the challenges that result from their position in the constantly changing, economy-wide division of tasks and specialisations.

Chapter 4.
The inclusive city

- City residents tend to be satisfied with the life they lead and, in many cases, city residents are more satisfied than their country as a whole.

- The economic crisis has increased poverty and social exclusion rates in most cities. In Belgian, Estonian, Greek, Portuguese and Spanish cities, the rate increased by 5 percentage points or more between 2009 and 2014.

- Housing in cities tends to be smaller and more expensive than in other parts of the country. As a result, more city households live in crowded conditions and a higher share pays at least 40% of their income to cover housing costs. High housing costs increase poverty and discourage people from moving to a city.

- Cities host the majority of non-EU born residents. Despite the employment opportunities in cities, non-EU born residents have significantly lower employment rates than those born in the same country. In contrast, city residents born in a different EU country tend to have higher employment rates.

- Cities are centres of education and have fewer early school leavers. More city residents participate in education or training and more of those aged 30-34 will finish their tertiary education.

Graz is one of 16 cities where over 95% of residents declared themselves satisfied with their quality of life in a 2015 survey

Chapter 4.
The inclusive city

Oslo. Only 8 percent of city residents feel insecure in Norway

4.1. Introduction

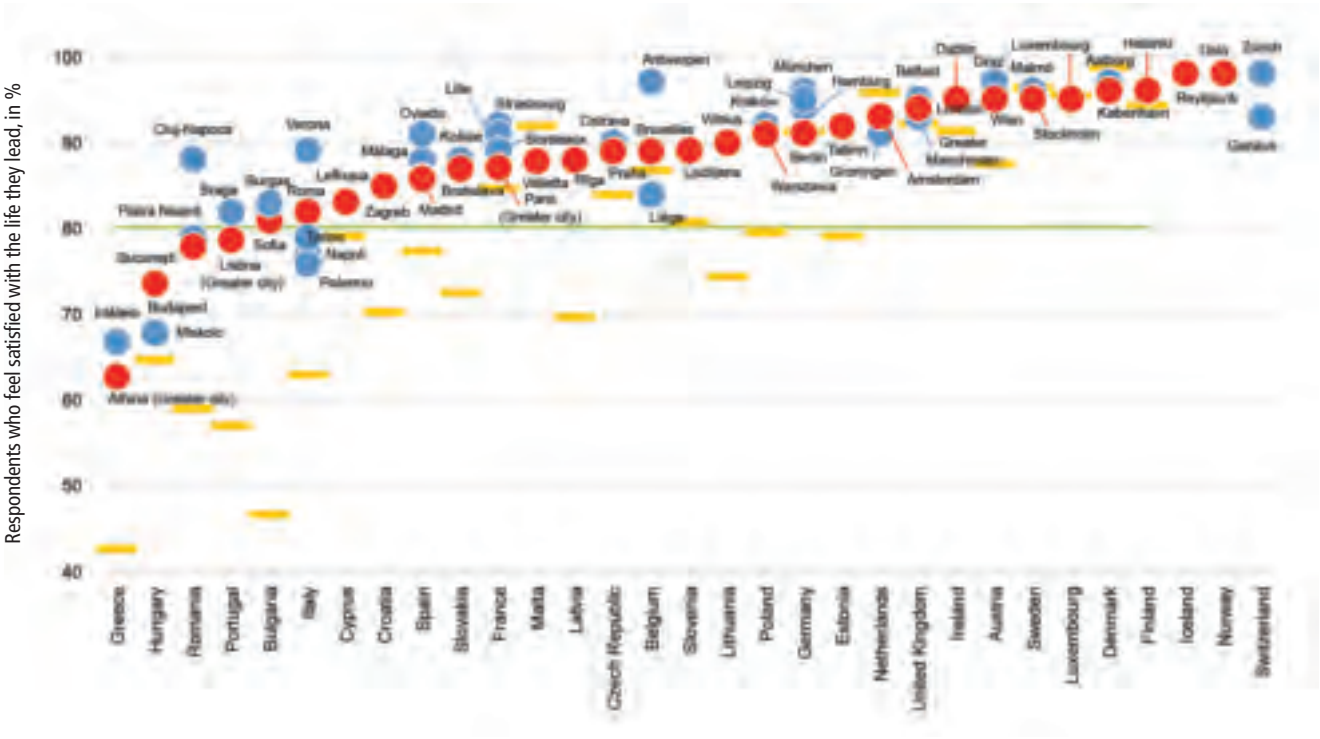
This chapter analyses the quality of life in European cities and how inclusive they are. It describes life satisfaction, perceptions of insecurity and homicide rates. It assesses the incidence of poverty and social exclusion and the impact of the economic crisis which still lingers in a number of countries.

The next section focuses on housing and the affordability and crowding issues. It also touches on matters concerning informal settlements, homelessness and segregation. The section also describes the impact of migrants on EU cities and their integration into the labour market. Finally, the chapter investigates the performance of cities in terms of education and employment as well as poverty reduction.

4.2. Many European cities offer a high quality of life

Many European cities score well in global quality of life rankings. For example, in a 2015 Quality of Living Survey (Mercer) seven out of the top-ten best performing cities were located in Europe. The survey ranked 223 cities

Figure 4.1. **Life satisfaction in European cities and countries, 2015**



Source: Quality of Life Survey, Eurobarometer 419

In most countries the life satisfaction in cities is higher than in the country as a whole

based on 39 criteria, including education, health care, culture, environment, public transport and access to goods and services. There were, however, significant variations between western European and eastern European cities, with the former scoring on average much better than the latter. Such a ranking, however, may not reflect the concerns of an average city resident, as it is not designed to capture the concerns of all residents and is more focused on issues relevant for the employees of multinationals.

A recent survey of the European Commission confirms that the life satisfaction of people living in European cities is high. In 2015, the survey showed that in most cities, over 80% of residents were satisfied with their life. In sixteen cities, the share was even over 95%, including Antwerp, Belfast, Graz, Munich, Zurich and all the Nordic cities in the survey. The survey also revealed that in many countries the life satisfaction in cities is higher than in the country as a whole.

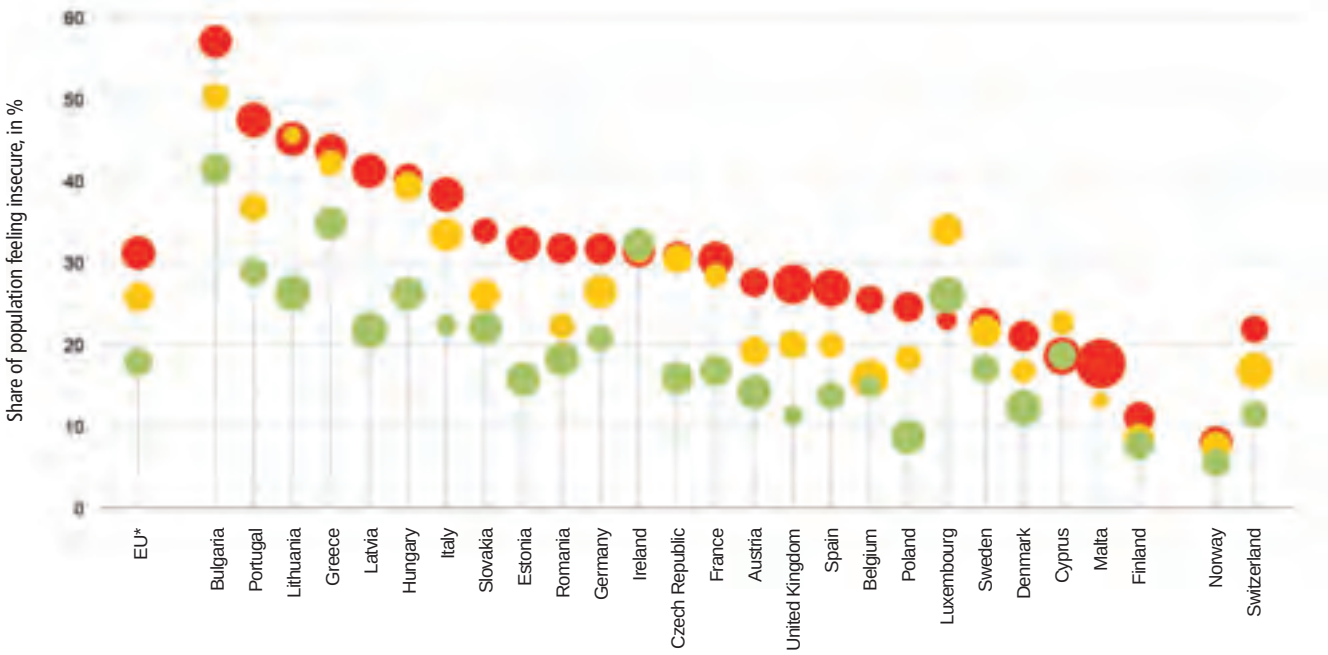
4.3. From a global perspective, European cities are safe

Homicide rates in Europe are low. In 2014, there was one homicide per 100,000 inhabitants in the EU, compared to 4.5 in the USA. In addition, the EU homicide rate has dropped by 40% since 2002.

In all, but the Baltic States, the homicide rate is below 2 per 100,000 and in half of EU countries the rate is below 1. In three out of four European capital cities, the average annual homicide rate in 2011-2013 was below 2 per 100,000 inhabitants. In 2014, no city in the USA with a population over 500,000 had a homicide rate below 2 per 100,000.

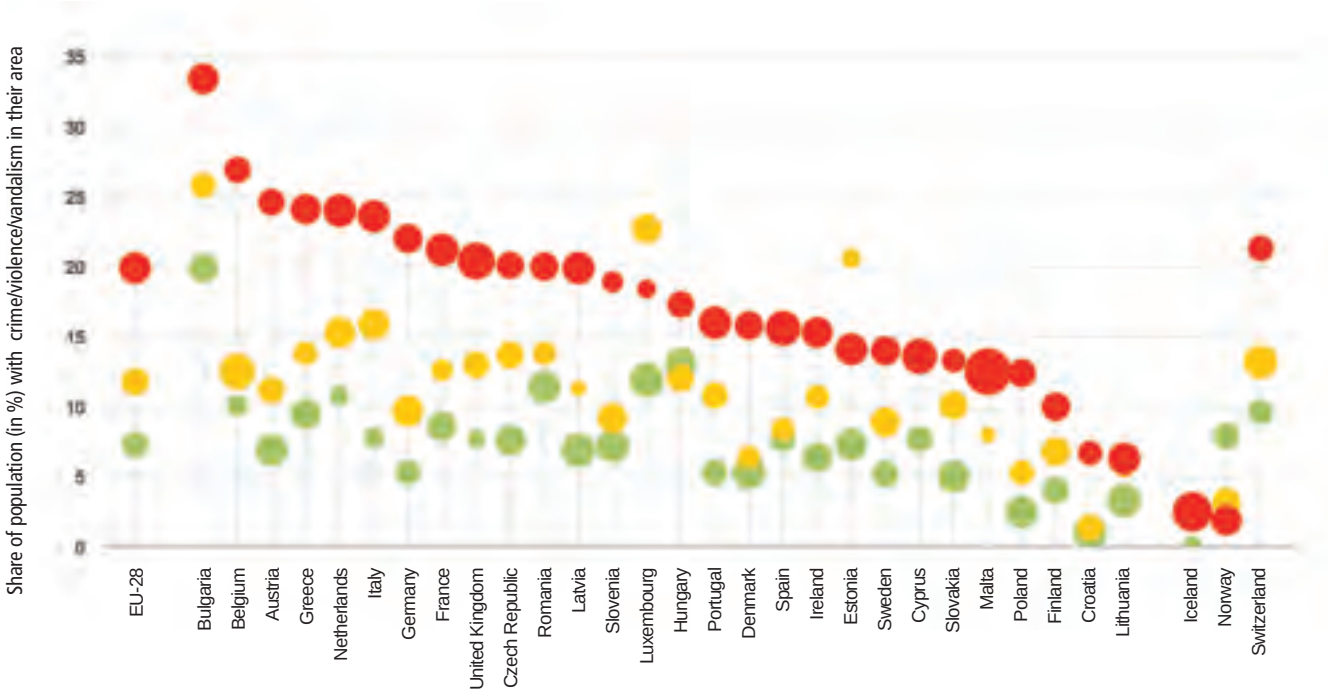
On average 31% of the people living in European cities feel physically insecure after dark in their neighbourhood, as compared to only 18% of those living in rural areas (Figure 4.2). This pattern is true for almost all countries. But the differences between countries seem to have a bigger impact on this indicator than

Figure 4.2. **Feeling physically insecure by degree of urbanisation, 2013**



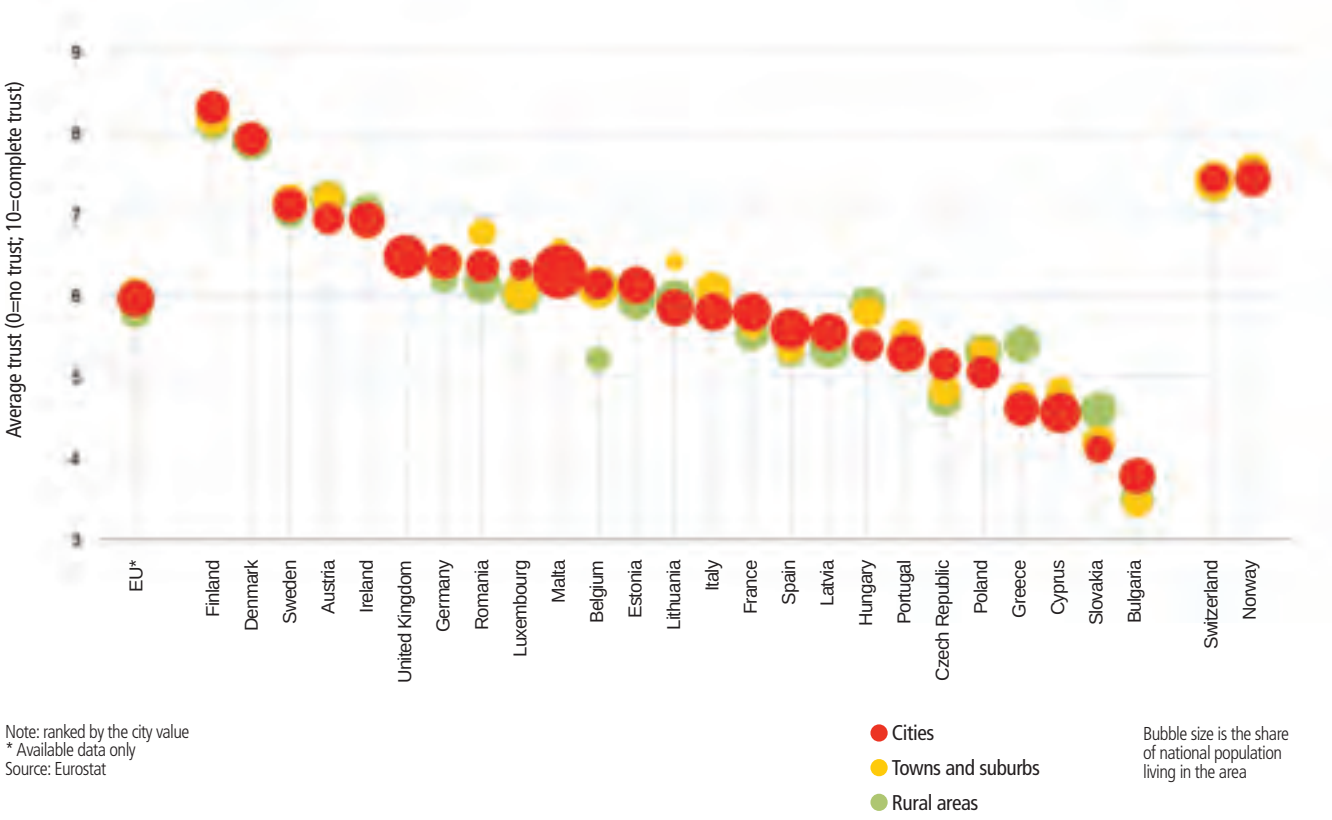
Note: ranked by the city value. | *Available data only | Source: Eurostat

Figure 4.3. **Living in an area with crime, violence or vandalism by degree of urbanisation, 2014**



Note: ranked by the city value
Source: Eurostat

Figure 4.4. **Trust in the police by degree of urbanisation, 2013**



Note: ranked by the city value
* Available data only
Source: Eurostat

the division between city vs rural area. In Bulgaria, for example, 57% feel insecure in cities compared to 41% in rural areas. In Norway, on the other hand, only 8% feel insecure in cities, compared to 6% in rural areas.

In Europe, city dwellers are three times more likely to live in an area with problems related to crime, violence and vandalism (Figure 4.3) than those living in rural areas. One in three people living in Bulgarian cities live in such an area, compared to less than one in twenty in the cities of Norway and Iceland. In all countries except Norway, a higher share of urban residents lives in an area with crime, violence and vandalism problems than in rural areas. The difference between cities and rural areas was particularly large in Austria, Belgium, Germany, Italy and Greece.

Public trust in the police is important because it will influence the willingness of the public to cooperate with them. The degree of urbanisation seems not to affect the level of trust in the police in the three different areas (Figure 4.4). There is, however, a strong variability among countries, with average trust in the police ranging from 8.2 (out of 10) in Finland to 3.6 in Bulgaria. Confidence is above the EU average in most northern European countries but below the EU average in southern and central eastern countries. Police are most trusted in Austria, Denmark, Norway, Sweden and Switzerland, while Cyprus, Greece and Slovakia are at the other end of the scale. Belgium and Greece stand out for the gap between confidence levels in the city compared to rural areas. In Belgium trust in the police is notably higher in cities than in rural areas, while the contrary is true in Greece.

4.4. The economic crisis has increased poverty and social exclusion in cities

The Europe 2020 strategy for smart, sustainable and inclusive growth aims at reducing the number of people 'at risk of poverty or social exclusion' by at least 20 million. With 40% of the population living in cities, this goal can only be met if poverty and social exclusion are reduced in cities as well. The share of people at risk

Box 4.1. **Terrorism in European cities**

Several European cities have been targeted by terrorists, with Paris in 2015 and Brussels in 2016 suffering the most recent attacks.

Recent terrorist attacks have heightened public security and safety concerns. Governments are reviewing and revising their intelligence activities to better prevent such acts. Completely preventing urban terrorism, however, is impossible. Individual targets can be made more secure, but it is impossible to secure all of them. The indiscriminate nature of the attacks makes them hard to prevent.

In Europe, 715 people lost their lives to terror-related incidents between 1995 and 2014 (START 2015). The recent terrorist attacks in Paris and Brussels added another 160 victims. The total number of homicides, excluding terrorist ones, over the same period was twenty times higher. The total number of traffic fatalities over this period was over 916,000. In other words, the risk of becoming a traffic fatality was more than a thousand times higher than becoming a terrorism victim over this period.

of poverty or social exclusion accounts for people who are in severe material deprivation (absolute poverty), relative poverty and/or live in a household where in the past twelve months the adults did not work or worked very little (Box 4.2). In 2016, country-specific recommendations adopted by the EU council focused on the reduction of poverty and social exclusion, encouraging Member States to fill gaps in their social safety nets and combine traditional income support programmes with activation measures.

Cities in Bulgaria and Romania had the highest rates of severe material deprivation in the EU (26% and 22% in 2014). (Figure 4.5) Their rural areas are even worse off. In a majority of EU countries, severe material deprivation afflicts less than 10% of the city residents. Cities in some countries, however, have higher rates than rural areas. In Austria, Belgium, Ireland, Portugal and the UK, severe material deprivation is substantially higher in cities than in rural areas.

Since the crisis in 2008, severe material deprivation has increased in cities in Cyprus, Greece, Hungary and Malta. In other EU countries, severe material deprivation in cities dropped, including in Bulgaria, Poland and Romania.

Within the EU, the at-risk-of-poverty rate is lower in cities than in rural areas, a pattern which is particularly pronounced in the central-eastern and southern EU countries. There are a few exceptions where the at-risk-of-poverty rate is higher in cities than in rural areas, including Austria, Belgium, Denmark, Germany and the UK (Figure 4.6). This generalisation hides a more complex situation since the at-risk-of-poverty rate does not take into account the difference in cost of living between cities, towns and suburbs, and rural areas. If it did, more countries may have higher poverty rates in cities.

On the other hand, the share of people in households with very low work intensity is higher in cities than in rural areas. This is surprising, as so many jobs are concentrated in cities. It may be explained through factors such as skills mismatches. Overall, very low work intensity is a greater issue in the EU-15 than in the EU-13 countries while the economic crisis has contributed to a rise of this phenomenon. Between 2008 and 2014, very low work intensity increased substantially in the cities of Belgium, Greece, Ireland, Portugal and Spain. Only the cities in Poland and Romania reduced very low work intensity.

The economic crisis had led to an increase in poverty and exclusion in many countries. The largest increase happened in the cities of Belgium, Estonia, Greece, Portugal and Spain

Overall the risk of poverty or social exclusion is slightly higher in rural areas than in cities and slightly lower in towns and suburbs (Figure 4.8). In individual countries, the differences are notable. In Bulgaria and Romania, cities have much lower rates than rural areas. On the other hand, in Austria, Belgium, Denmark, Germany, the Netherlands and the United Kingdom, cities perform worse in this respect than rural areas or towns and suburbs.

The economic crisis had led to an increase in poverty and exclusion in many countries. The largest increase happened in the cities of in the cities of Belgium, Estonia, Greece, Ireland, Portugal and Spain. Only a limited number of cities in Bulgaria, Latvia, Poland and Slovakia were able to reduce their population's risk of poverty or social exclusion between 2009 and 2014.

Cities are hubs for cultural, educational, health and social infrastructures. Managing these in an inclusive manner can help people escape poverty and

An informal settlement in Varna. Cities in Bulgaria had the highest rates of severe material deprivation in the EU at 26%

Slovakia is one of the countries with the lowest level of trust for the police

© Janusz Pieńkowski

Box 4 .2. **What does it mean to be 'at risk of poverty or social exclusion' (AROPE)?**

People are considered to be at risk of poverty or social exclusion if they experience one or more of the following three conditions:

- Being severely materially deprived–with living conditions constrained by a lack of resources as measured in terms of being deprived of four of nine items: unable to afford 1) to pay rent/mortgage or utility bills on time; 2) to keep their home adequately warm; 3) to face unexpected expenses; 4) to eat meat, fish or a protein equivalent every second day; 5) a one week holiday away from home; 6) a car, 7) a washing machine, 8) a colour TV or 9) a telephone (including mobile phone). This indicator captures absolute poverty in some degree and is measured in the same way in all Member States.

- Living in a jobless household or household with very low work intensity–where on average those of working-age (18–59) worked less than 20% of their potential total working hours over the past year, either because of not being employed or working part-time rather than full-time (students are excluded from the calculation).

- Being at risk of poverty–living in a household with an 'equivalised disposable income' (equivalised means adjusted for the size and composition of households) below the at-risk-of-poverty threshold, set at 60% of the national median equivalised disposable income. This is a measure of relative poverty.

The total number of people at risk of poverty or social exclusion is less than the sum of the numbers in each category, as many fall into more than one of these categories.

Box 4.3. **Reducing poverty and social exclusion with the European Structural and Investment Funds**

The European Structural and Investment Funds support for social inclusion focuses on supporting those at risk of poverty or social exclusion, and improving health care systems and long-term care services. These investments aim to ensure the accessibility and effectiveness of social and health services and to promote Roma inclusion.

The following results are expected:

- 2.6 million inactive people will be provided with personalised services and guidance, targeted and tailored training and validation of acquired competences and skills among others.
- 2 to 2.5 million disadvantaged people will benefit from individual support, counselling, guidance, access to general and vocational education and training, access to health and social services and child care and internet services.
- 42 million people will benefit from improved health services, including investment in eHealth.

Approximately EUR 21 billion of the European Social Fund in the programming period 2014-2020 will be used to promote social inclusion and combat poverty. This will also support investments in active inclusion, Roma inclusion, access to affordable, sustainable and high-quality services, including health care and social services, and social entrepreneurship. The EUR 4.5 billion European Regional Development Funds investments, which are planned for social infrastructure, will include support targeting community-based social services for vulnerable groups (disabled, children, the elderly, and mental health patients).

The urban sustainable development goal of the UN includes the target of ensuring access for all citizens to adequate, safe and affordable housing and basic services by 2030. Although housing in European cities does not represent the same type of problems as cities in some developing countries, problems of crowding and affordability remain

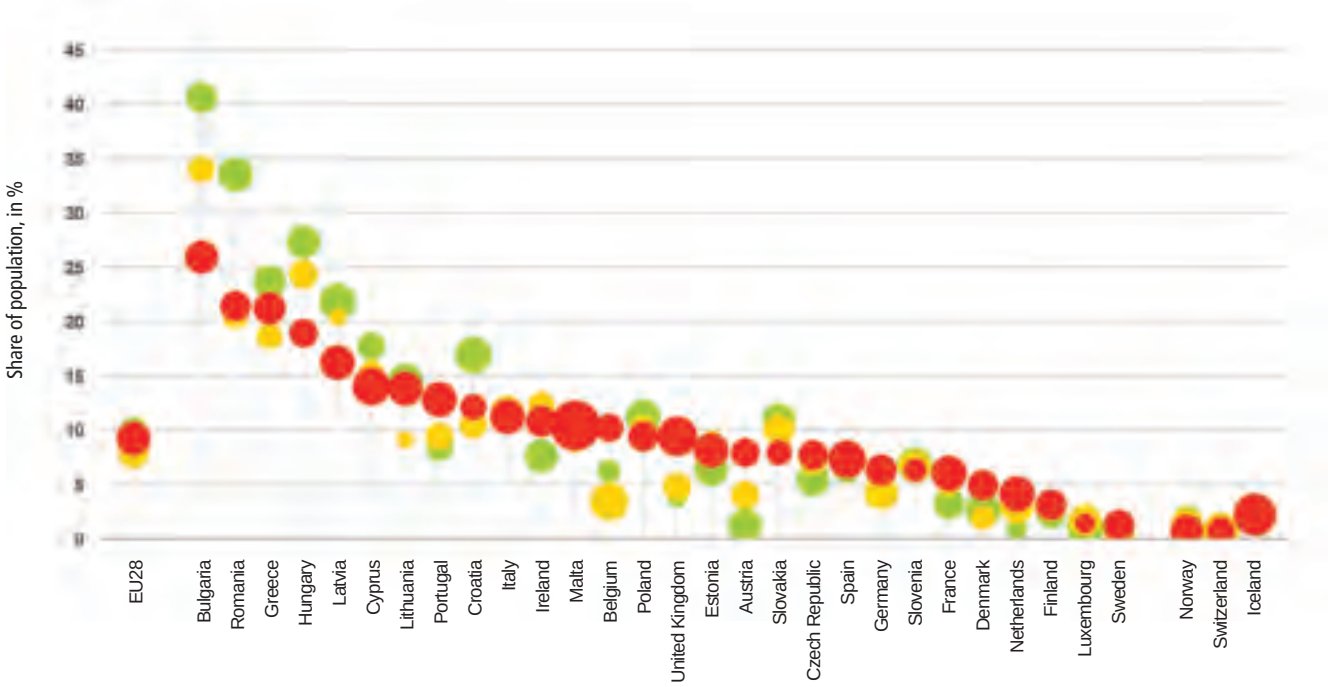
social exclusion. Tailored participation programmes for children and youth; affordable day care and high-quality pre-school; affordable and accessible sports and recreation facilities, as well as mentor programmes for children living under difficult circumstances are some of the ways in which cities can become more inclusive.

From 2007 to 2013, the European Regional Development Fund invested about EUR 21 billion in EU Cohesion Policy measures to promote social inclusion and equal opportunity by improving active participation and employability; combating poverty and discrimination; enhancing access to affordable health care and social services; and promoting social entrepreneurship. For educational, health and social (childcare, housing) infrastructure about EUR 8 billion was allocated to metro regions. The European Social Fund invested another EUR 78 billion in education, employment and social inclusion measures over the same period. However, there are no data available in which type of regions these funds were spent.

4.5. The quantity, quality and affordability of housing are a concern in many cities

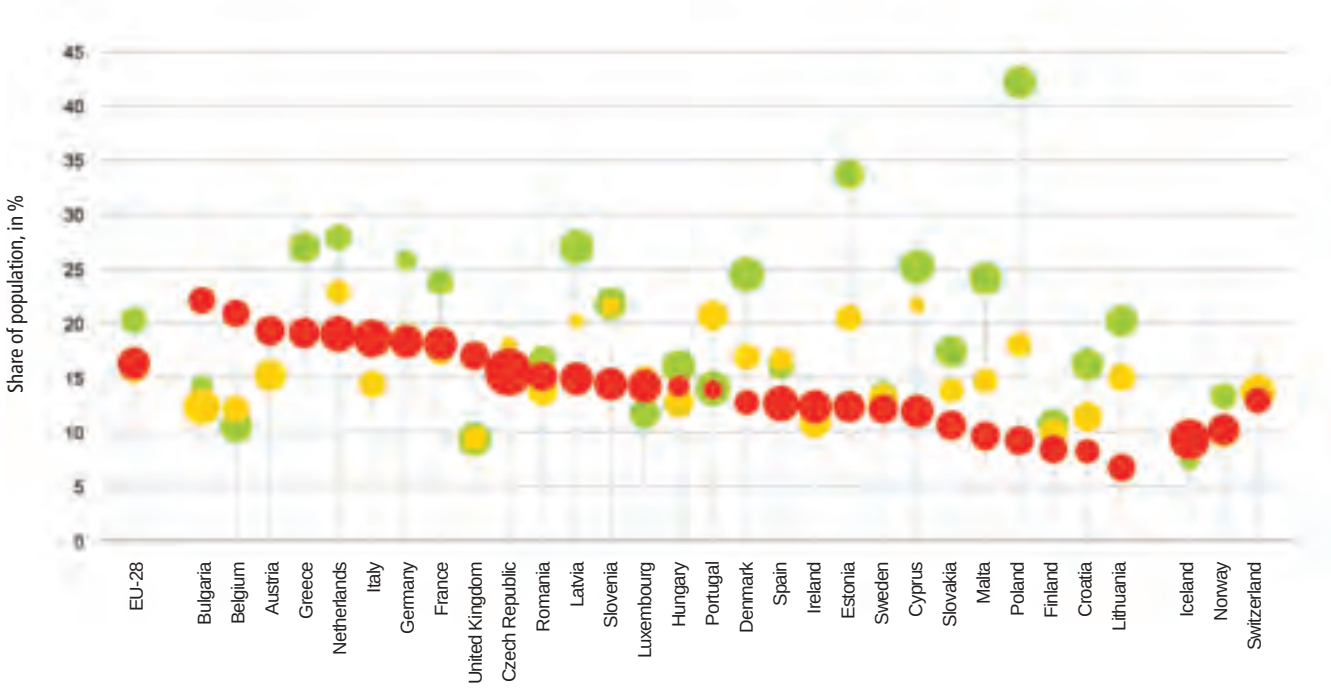
The urban sustainable development goal of the UN includes the target of ensuring access for all citizens to adequate, safe and affordable housing and basic services by 2030. Although housing in European cities does not represent the same type of problems as cities in some developing countries, problems of crowding and affordability remain.

Figure 4.5. **Severe material deprivation by degree of urbanisation, 2014**



Note: ranked by the city value | Source: Eurostat

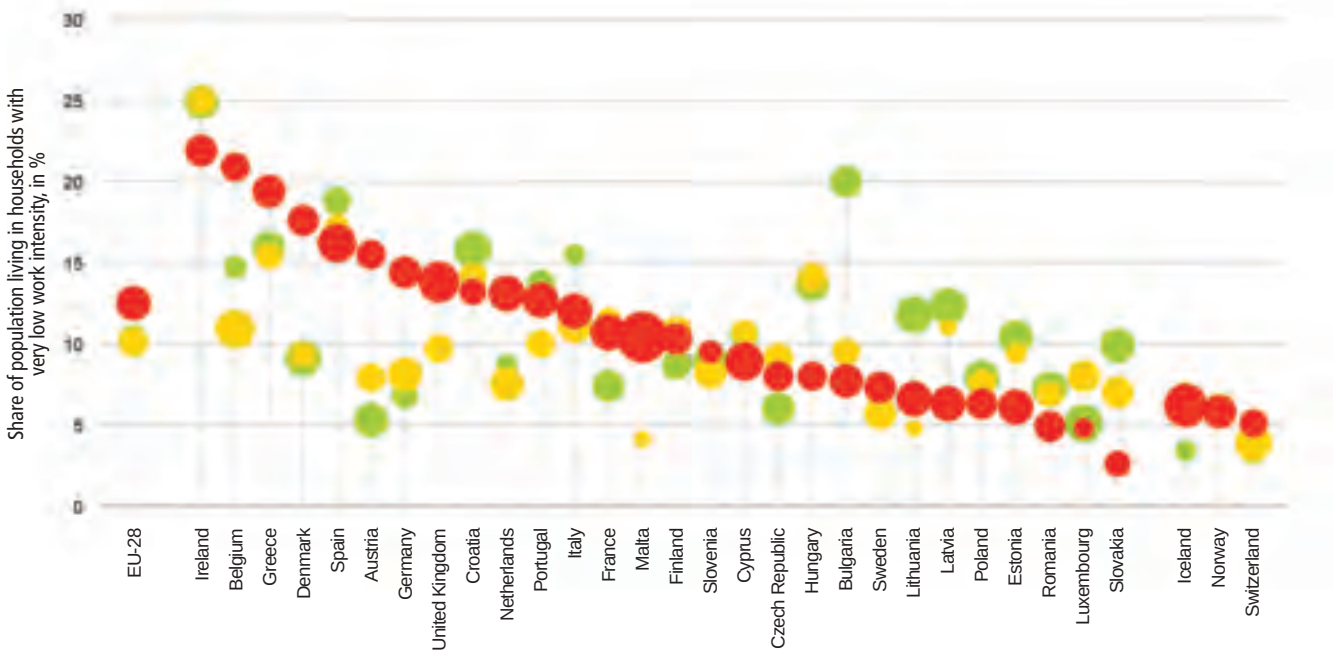
Figure 4.6. **At risk of poverty by degree of urbanisation, 2014**



Note: ranked by the city value
Source: Eurostat

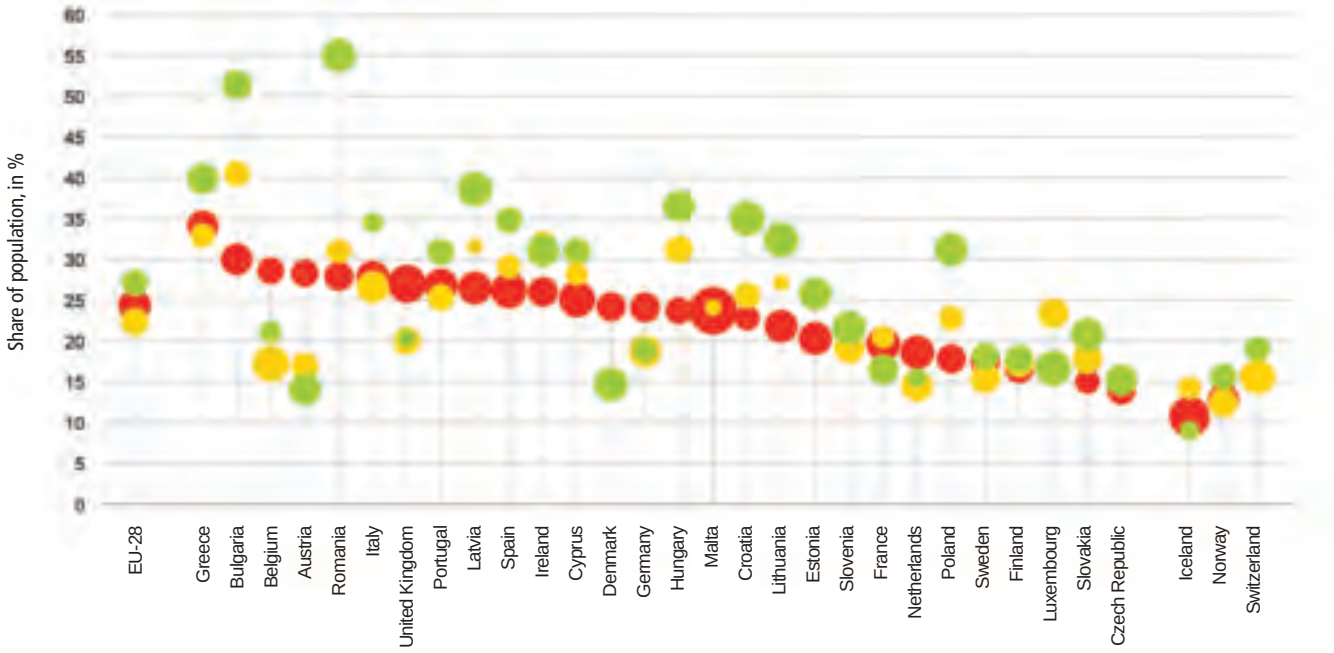
Bubble size is the share of national population living in the area

Figure 4.7. **Very low work intensity by degree of urbanisation, 2014**



Note: ranked by the city value | Source: Eurostat

Figure 4.8. **Risk of poverty or social exclusion, by degree of urbanisation, 2014**



Note: Countries ranked by the city value
Source: Eurostat

In 2015, in two out of three European cities the majority of the residents thought it was not easy to find a good house at a reasonable price in their city (Figure 4.9). In twelve cities, almost everybody thought it was not easy. Clearly the cost, quality and availability of housing are major concerns in many cities in Europe. In most countries, the capital city has the worst problems in this regard.

Overcrowding is most prevalent in cities in central and eastern EU countries with shares over 40% and even 50% of people in Romania and Bulgaria (see Figure 4.10) living in overcrowded dwellings. Cities in the EU-15 countries typically have considerably lower overcrowding rates (mostly below 15%) with the notable exceptions of Austria, Greece and Italy. Overcrowding rates are generally higher in cities than in the remainder of the country but national features and specificities, including the overall level of economic development, seem to have a larger impact on overcrowding than the distinction between urban and rural areas.

In cities, more people have a housing cost burden of more than 40% of their disposable income. In the EU, 13% of city dwellers face a high housing cost burden compared to 10% in rural areas (see Figure 4.11). But here too, national differences show a wider spread and are in excess of 5 percentage points in Austria, Belgium, the Czech Republic, Denmark and Germany.

In Greece, the share of population with a housing cost burden is very high, in part due to the income drop since the crisis. In 2014, about 43% of people living in Greek cities had a high housing cost burden, compared to 26% in 2008.

Box 4.4. **EU Cohesion Policy and the Roma**

The Roma people are Europe's largest ethnic minority. Of an estimated 10-12 million Roma in the whole of Europe, some six million live in the EU, most of them EU citizens. Many Roma in the EU are victims of prejudice and social exclusion, despite the fact that EU countries have banned discrimination.

The EU has long stressed the need for better Roma integration. In 2011, the European Commission published the results of a survey on the situation of Roma people in 11 European countries, showing large disparities between Roma and non-Roma (FRA and UNPD, 2012) with regard to education, housing, healthcare and employment. In 2011, the European Commission adopted a Communication pushing for the development of national strategies for Roma integration detailing concrete policies and measures. Each country produced a Roma strategy or a set of integrated policy measures that were assessed by the European Commission in a Communication adopted in 2012. The European Council adopted a recommendation on effective Roma integration measures in December 2013.

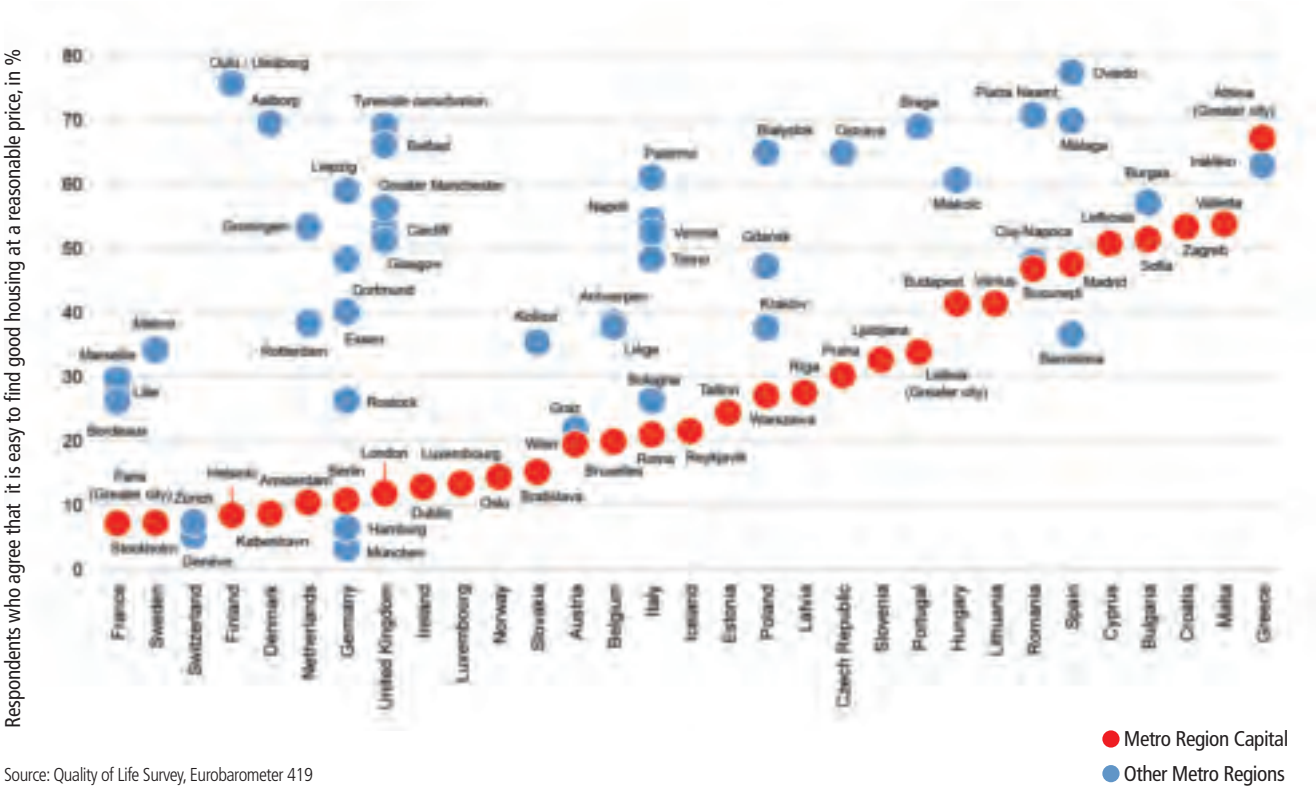
Progress in effectively integrating the Roma people is regularly assessed on the basis of information provided by each country, international organisations, NGOs and the EU Fundamental Rights Agency (FRA). A 2015 Communication of the European Commission identified improvements on aligning National Roma Integration Strategies with EU funding instruments. The Roma Decade published in 2015 with a Roma Inclusion Index and data across the Decade countries suggests a worsening of the situation of Roma and a widening of the gap for the Roma in regard to poverty, particularly the risk of poverty (Roma Inclusion Index 2015).

A wide range of measures closely related to Roma integration can be financed through EU Cohesion Policy, such as infrastructure investments for health care, education, social services and housing, and investments in human capital. The ESF for 2014-2020 contains a dedicated investment priority on the socio-economic integration of marginalised communities such as the Roma which amounts to EUR 1.5 billion in 12 EU Member States (AT, BE, BG, CZ, ES, FR, GR, HU, PL, RO, SK). The importance of actions at local level, in cities, has been highlighted by the European Commission and World Bank report on *Improving the Living Conditions of Roma.* The European Commission and the Council of Europe established the ROMACT programme aimed at building capacity locally for project design and for access to EU Funds in five EU Member States with a high percentage of Roma people. (Romact 2015)

Setting up in business programme

One example of the projects supported by Cohesion Policy is the *Kiútprogram* self-employment and microcredit programme, managed by the Polgár Foundation for Equal Opportunities (Hungary). It aims to help Roma people to get out of the 'black economy' and start up their own businesses. It offers start-up money and provides advice on administrative, financial and business matters. The programme also encourages its clients to play an active part in local public affairs.

Figure 4.9. **Good housing at a reasonable price per city, 2015**



Source: Quality of Life Survey, Eurobarometer 419

Most EU city residents rent their accommodation (see Figure 4.12). At the EU level, the share of tenants is twice as high in cities (45%) as in rural areas (23%). In every country, except Ireland, the share of tenants is higher in cities than in other areas. Some countries show wide differences between cities and rural areas with more than 65% of city residents renting their housing in Austria, Germany and Switzerland, compared to less than 40% in their rural areas.

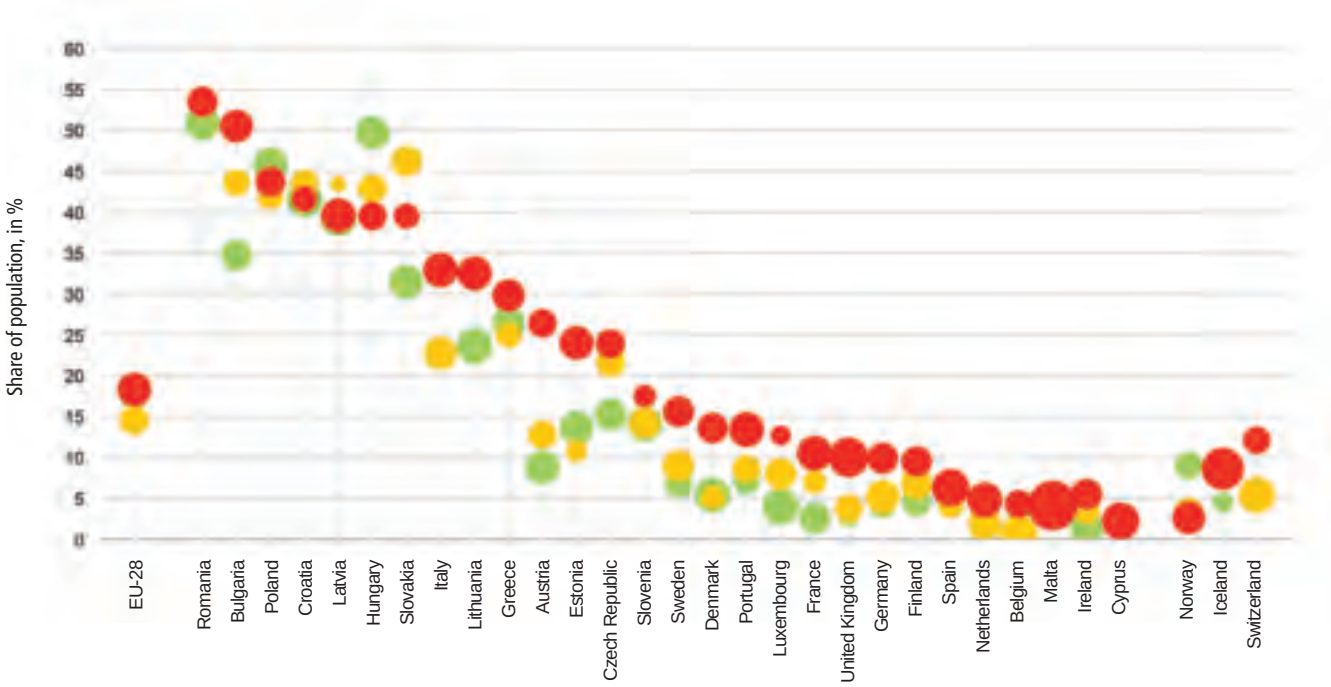
The higher prevalence of tenants in cities is linked to a larger demand for more short-term living arrangements. For example, many people move to a city to obtain a degree or start a new job, not knowing how long they will stay in that city. The higher prevalence of tenants in cities is further linked to the often higher costs of purchasing property in a city compared to rural areas.

Problems of overcrowding and affordability tend to get worse if a city goes through rapid population and/or income growth. In contrast, for cities with a rapidly declining population, the problems of overcrowding and affordability are likely to become less pronounced, albeit that in cases of sustained decline the property market may have difficulty adjusting. This can lead to high vacancy rates, abandoned properties and negative equity (a mortgage debt exceeding the execution or market value of the property). The incidence of negative equity has also risen in many EU countries with property values declining following the crisis.

To address the problem of vacant real estate, a wide range of projects within Europe have turned to temporary use. Especially where temporary uses are connected to the local community, they may have positive effects on the living environment and, if not halting a decrease of popularity of certain areas, at least improving the living conditions of its residents in some of its public space.

Cities can influence their housing market by ensuring that planning does not unduly hinder housing construction. Cities can improve neighbourhoods by creating and maintaining safe, attractive and inclusive public spaces and ensuring equal access to high-quality public services. In large cities, access to affordable public transport is particularly important to ensure poor residents can reach jobs and services.

Figure 4.10. **Residential overcrowding by degree of urbanisation, 2014**



Note: ranked by the city value
Source: EU

Problems of overcrowding and affordability tend to get worse if a city goes through rapid population and/or income growth

4.6. The impact of migration on European cities

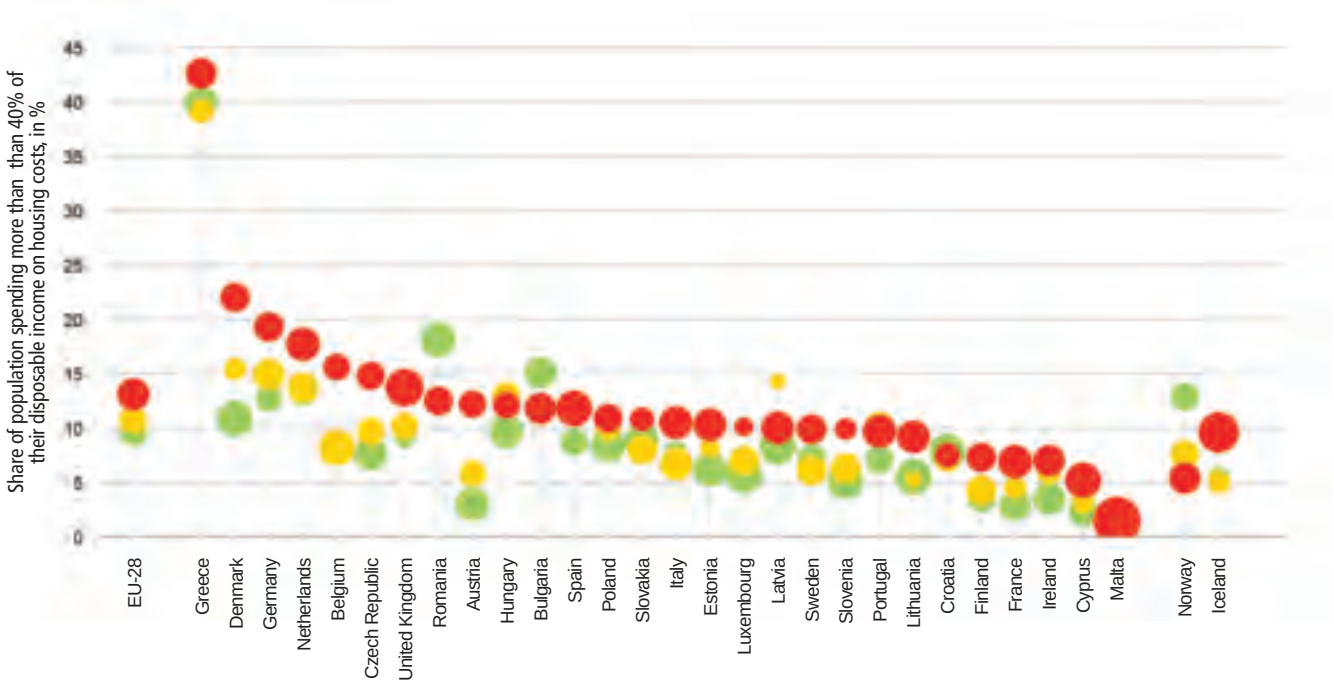
The biggest source of population growth in European cities is migration from other parts of the country, from other EU countries and from outside the EU. Between 2002 and 2012, net migration was higher than natural change in seven out of ten cities. Many cities only grow because migration compensates for a slow negative natural change. Migration from other (both EU and non-EU) countries has led to a large share of foreign-born residents in some European cities. In Rotterdam, for example, first and second generation migrants are in the majority. In others, like Brussels and Luxembourg for instance, the majority is foreign born.

The distribution of non-EU migrants is far from geographically dispersed. Their share of working-age population in cities is double that of towns and suburbs which, in turn, is double that of rural areas (see Figure 4.14). Within the EU, the cities in North-West Europe have a much higher share of working-age population born outside the EU than their East European counterparts: 20% in Austria, Belgium and Sweden, and over 15% in France, the Netherlands and the UK. On the other hand, cities in Bulgaria, Poland, Romania and Slovakia have a very low share of working-age residents born outside the EU.

Working-age residents born in a different EU country are far less concentrated in cities than those born outside the EU (see Figure 4.15). Nevertheless, similar to non-EU born migrants, in most countries, the cities, as compared to towns, suburbs and rural areas, attract more working-age residents born in a different EU country. In Italy, Portugal and Spain, however, rural areas, towns and suburbs attract a higher share, probably due in part to people taking early retirement and moving to a sunnier and less expensive location as well as people working in the tourism industry.

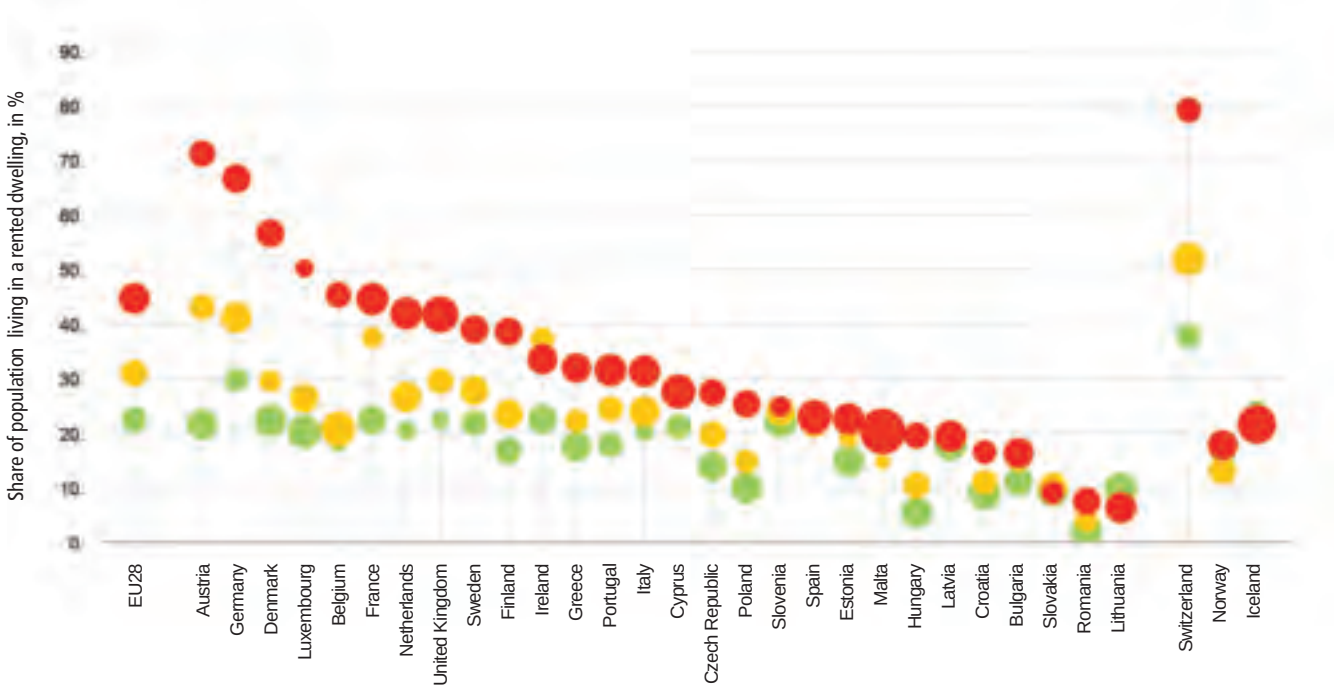
Cities in Austria, Belgium, Cyprus and Ireland have a share over 12% of working-age population born in a different EU country, while the cities of Denmark,

Figure 4.11. **Housing cost overburden by degree of urbanisation, 2014**



Note: ranked by the city value | Source: EU

Figure 4.12. **Tenants by degree of urbanisation, 2014**



Note: ranked by the city value
Source: EU

Box 4.5. **Europe not yet free of informal settlements**

The examples of France, Italy, Portugal and Spain

Obtaining reliable figures on people living in informal settlements is difficult. Data is often not available. People living in informal settlements may avoid interacting with local authorities for fear of eviction or extradition. As a result, numbers may be underestimated and trend analysis becomes particularly challenging.

In Italy, more than 70,000 families were living in 'a shack, caravan, tent or similar building' in 2011, which is a significant increase compared to the 23,336 families in 2001. In Rome, approximately 4,000 people live in shacks or small tent cities on the riverbanks. Another 2,500 families live in 55 squatted buildings and more than 7,000 Roma or Sinti live in seven 'equipped villages', 14 'tolerated camps' and 80 informal settlements.

In 2015, the French administration estimated that around 19,600 people live in more than 570 informal settlements in precarious conditions without access to medical or social services. In the Paris region, a little over 6,000 live in 155 informal settlements with most of the residents coming from eastern Europe.

According to the Rehousing and Social Integration Institute (IRIS), around 11,000 people lived in 2014 in informal settlements in Madrid, Spain. (IRIS)

Portugal has substantially reduced the population in shacks or other sub-standard dwellings. The 2011 census identified 6,612 shacks or other sub-standard dwellings nationwide. During the 1980s, the Lisbon and Porto metropolitan areas alone had more than 50,000 such dwellings with 200,000 inhabitants.

People born within the EU can more easily move around than people born outside, as they have the right to work in all EU countries. This right also makes it easier for them to move abroad for short periods and gain work experience in multiple countries

Germany, Sweden and the UK have a share around 7%. In the remaining countries the share in cities is below 5%, with the figures especially small in the central and eastern Member States.

Overall, city residents born outside the EU have a significantly lower employment rate (60%) than people born in the same country (70%) or people born in a different EU country (73%) (see Figure 4.16). This pattern, however, is far from uniform across countries. In Belgian and German cities, the employment gap (between residents born outside the EU and those born in the country of residence) is 20 percentage points, double the EU average. Also in Austrian, Dutch and Nordic cities the gap is more than 15 percentage points. In part, this is due their lower level of educational attainment. Overall, 36% of residents born outside the EU aged 25-64 had not completed their secondary education, compared to only 22% for those born in their country of residence.

People born outside the EU face multiple challenges in entering the labour market including, but not limited to, speaking the local language or having the right qualifications and having them recognised. A recent report (OECD/EU 2015) showed that third country nationals (EU residents with a non-EU citizenship) with a higher education had lower employment rates than their EU-peers, while this was not the case for third-country nationals with low levels of educational attainment.

Within the EU overall, city residents born in a different EU country have an employment rate three percentage points higher than those born in the same country. This trend differs from country to country but in most cases the differences tend to be small.

People born within the EU can more easily move around than people born outside, as they have the right to work in all EU countries. This right also makes it easier for them to move abroad for short periods and gain work experience in multiple countries.

While some cities experience a 'brain-drain' of young and entrepreneurial people, others see many young EU-citizens arriving and trying to find a job in the arrival city. While most studies point to the rather

A housing protest in Mulhouse, France. In cities, 13% of people have a housing cost burden of more than 40 percent of their disposable income (2014 data) © Neydtstock

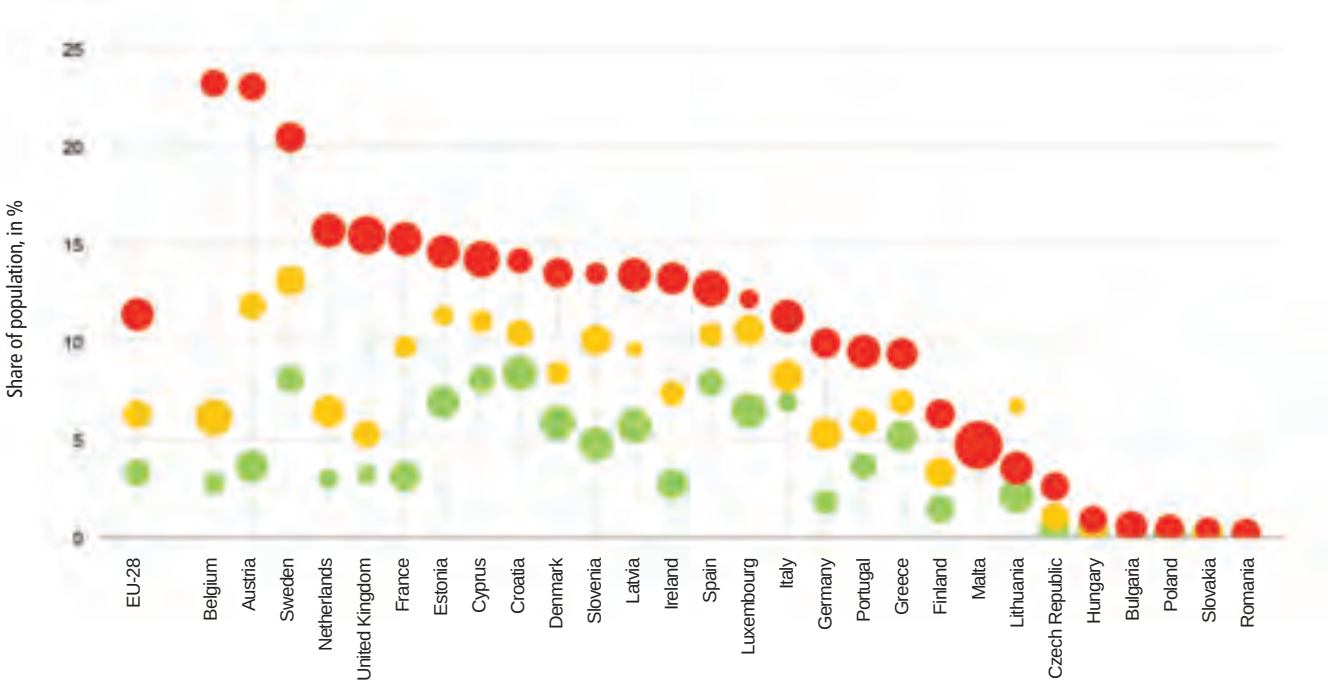
limited impact of migration on wages and employment rates, this may be different at the local level or for some specific categories of the population. For instance, those with limited labour skills may be particularly affected by the arrival of newcomers, either because the latter are better skilled or willing to work for lower wages or accept less favourable working conditions. Tighter housing markets may lead to displacement where rents increase due to the additional demand of newcomers. Migration can therefore challenge the degree of inclusiveness of cities both for those who have lived there for a long time and for new arrivals.

4.7. Cities are leading the way in education

Tertiary education can help people to find a job, increase productivity and boost civic participation. To promote tertiary education, the Europe 2020 Strategy set a target of at least 40% of people aged 30-34 completing the third level of education. In 2014, cities in all but Italy and Malta had reached this target, but towns and suburbs and especially rural areas lag behind.

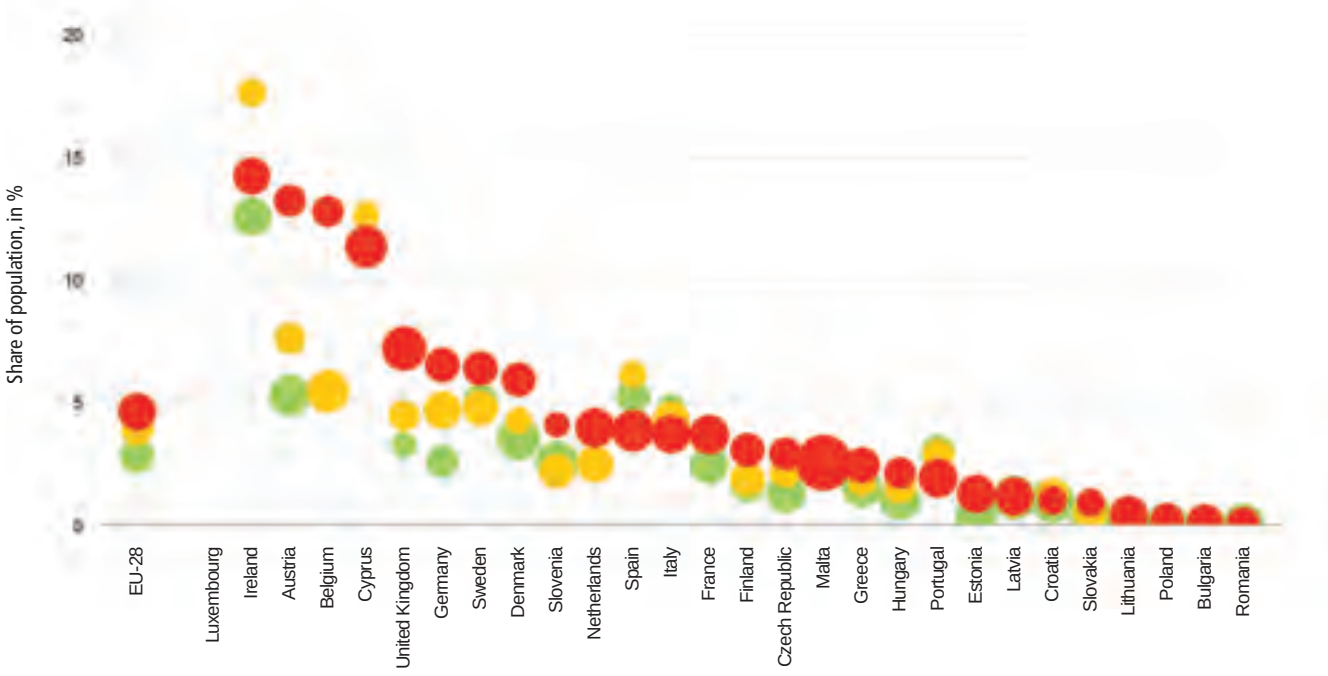
In the EU-28, the share of people aged 30-34 with a tertiary education is 47% in cities, 33% in towns and suburbs, and 27% in rural areas (see Figure 4.8). But in Bulgaria, Hungary, Lithuania, Luxembourg,

Figure 4.14. **Working age population born outside the EU by degree of urbanisation, 2014**



Note: Countries ranked by the city value | Data for Germany is by citizenship. | Source: Eurostat

Figure 4.15. **Working age population born in a different EU country by degree of urbanisation, 2014**

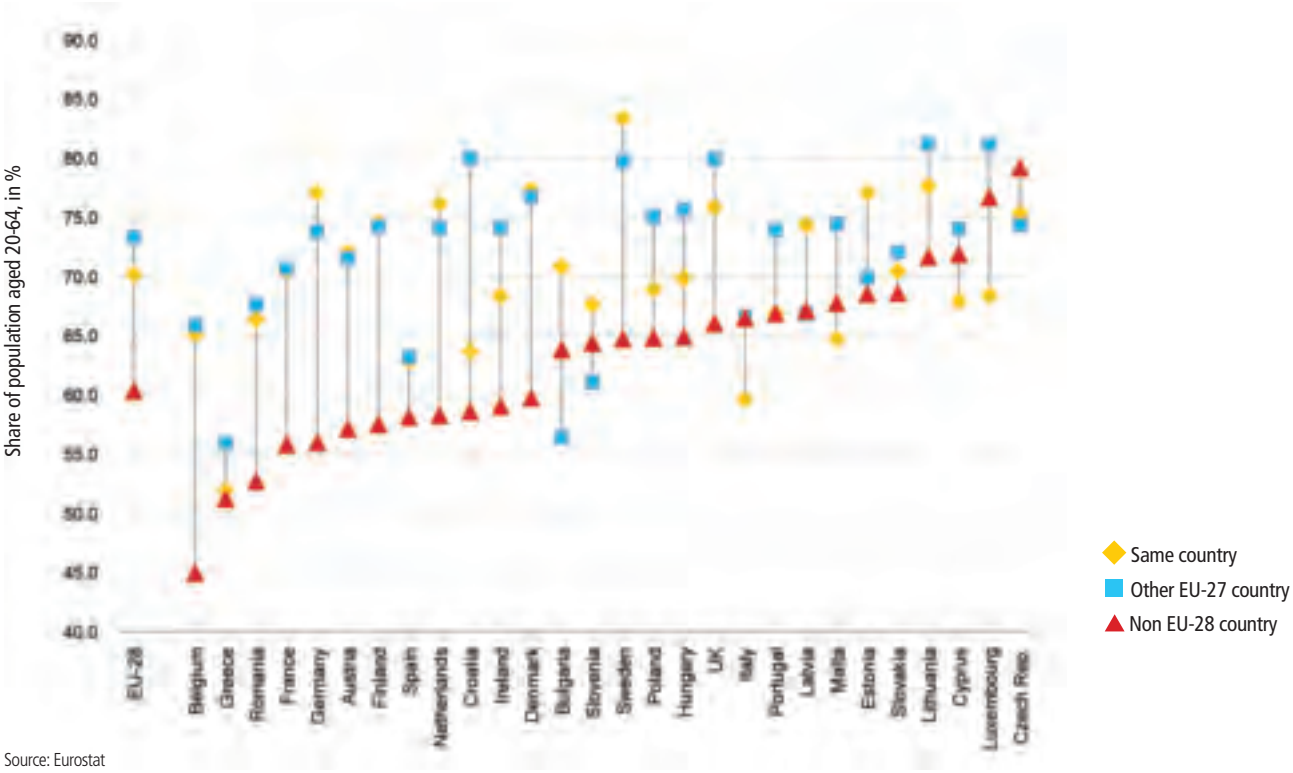


Note: Countries ranked by the city value
Data for Germany is by citizenship.
Values for Luxemburg are 63% in the city, 38% in towns and suburbs and 49% in rural areas.
Source: Eurostat

Cities | Towns and suburbs | Rural areas

Bubble size is the share of national population living in the area

Figure 4.16. **Employment rate by country of birth in cities per country, 2014**



Source: Eurostat

The European Social Fund for 2014-2020 contains a dedicated investment priority for the integration of marginalised communities such as the Roma

Box 4.6. **Homelessness in selected European cities**

In several large and small European cities homelessness has been rising, notably in the wake of the economic crises. Although, the homelessness statistics are not comparable due to the variations in definitions and methodologies, they still give an indication of the scope of the problem.

In **London,** 18.650 people were statutorily homeless in 2015, an increase of 9% compared to 2014.

In **Dublin** the number of homelessness service users in the first quarter of 2016 was 3777, a 50% increase compared to the first quarter of 2014. People remain for longer periods in emergency accommodation in part due to a lack of affordable housing.

In **Copenhagen,** there were 1,581 homeless people in 2013, up 6% compared to 2009.

In **Paris,** 28,800 people were homeless in 2012, an increase of 81% since 2001.

This is just a snapshot of the reality of urban homelessness in the European Union. It shows clearly that homelessness in most of these cities is increasing.

Housing first: a new approach to homelessness

A new approach to address this problem is the Housing First initiative which provides permanent housing to homeless people together with tailored support for reintegration which has been piloted in many cities around the world. Dozens of cities in EU countries are experimenting with or scaling up Housing First (www.housingfirstguide.eu/).

To support the exchange of information on local homelessness strategies, the European Federation of Homelessness NGOs (FEANTSA) set up HABITACT, a transnational forum comprising more than 80 cities.

Cities have already reached the Europe 2020 target of at least 40% of people aged 30-34 completing tertiary education

Romania and Slovakia the difference between cities and rural areas is over 25 percentage points. All EU countries have made progress towards the Europe 2020 Strategy target since 2010, except Finland where the rate is already 45%. The increase in cities between 2010 and 2014 (plus 9 percentage points) was twice as big as in rural areas (plus 4 percentage points). The higher share of tertiary-educated people aged 30-34 in cities is linked to the presence of higher education institutions and jobs that require higher education. Also city dwellers aged 25-64 are more likely to have a tertiary education.

Participation rates of adults in training or education differ substantially among countries, ranging from 37% in Danish cities to less than 2% in Romanian cities (see Figure 4.18). The highest rates are found in the Nordic countries and Switzerland; the lowest ones in Bulgaria, Croatia, Greece, Hungary, Malta and Romania, whose cities all have rates of below 5%. Within countries, the rate is always highest in cities.

EU countries aim to reach the adult learning benchmark of at least 15% of the population aged 25-64 participating in training or education by 2020. In nine EU countries (Austria, Denmark, Estonia, Finland, France, the Netherlands, Sweden, Switzerland and the UK) cities had already reached this target by 2014. Although the overall trend is positive with small increases in most EU countries since 2008, the trend would have to accelerate substantially to reach the target by 2020.

Early school leavers

The Europe 2020 Strategy aims to reduce the share of early school leavers to 10% or less. Member States have adopted and implemented comprehensive strategies to reach this target. More recently the Youth Guarantee has also helped. Its aim is that all people under 25 who leave formal education or become unemployed receive

within four months an offer of a job, apprenticeship, traineeship or continued education. At the EU level, the share of early school leavers is higher in rural areas (12.4%) than in towns and suburbs (11.9%) or cities (10%). In some countries, the difference between rural areas and the cities is much bigger. For example, Estonia, Bulgaria, Greece, Hungary, Iceland and Romania feature a gap of between 10 and 26 percentage points (Figure 4.19). In contrast, cities in Austria, Belgium, Germany, Luxembourg and Slovenia have a higher share, which may be linked to pockets of concentrated socio-economic deprivation where schools may be less able to retain students.

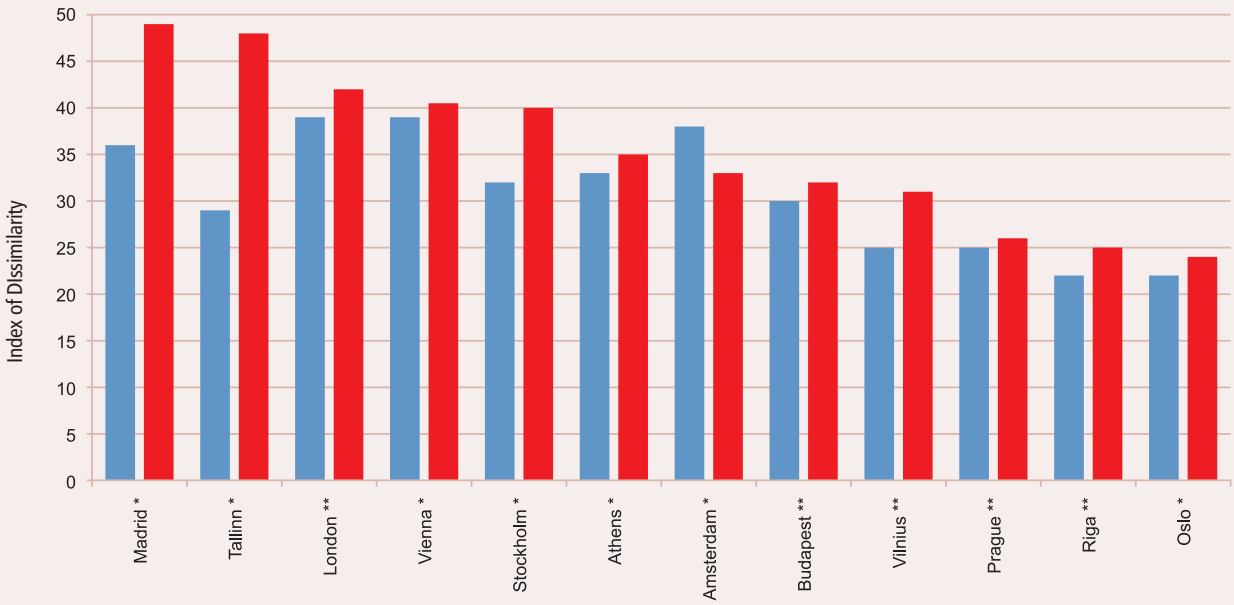
The share of early school leavers has been dropping in all countries, with particularly steep reductions in Greece, Portugal and Spain. In these three countries, the high unemployment rates due to the crisis may have encouraged more students to finish their secondary education.

4.8. Cities are performing well in terms of the Europe 2020 targets

The Europe 2020 Strategy, adopted in 2010, promotes smart, inclusive and sustainable growth in the EU. It has five headline targets linked to climate and energy, innovation, employment, education and poverty reduction. The progress to the EU level targets for employment (75%), education (less than 10% early school leavers and more than 40% aged 30-34 with a tertiary education) and poverty and social exclusion reduction (a reduction by 20 million) can be monitored annually by degree of urbanisation per country. To analyse the performance of cities, the distances to these targets have been used to create a single composite indicator that tracks progress (Figure 4.20) (Dijkstra et al 2015). A score of 100 means that all targets have been reached, the area furthest removed from these targets scores 0. The cities in Luxembourg, Sweden and the

Homelessness has risen 6 percent in four years in Copenhagen (2009-2013)

Figure 4.13. **Index of dissimilarity**



* metropolitan region
** city proper
Source: Tammaru et al. 2016

The 'Dissimilarity Index' is used to measure segregation by income, job and employment status. It measures the share of population that would have to move to obtain a perfectly equal distribution across neighbourhoods of the different socio-economic characteristics.

A general conclusion from the study is that spatial inequality follows socio-economic inequality, but typically with a time lag since it takes time for increasing socio-economic inequality to translate into the physical structure of cities.

The two most important causes of socio-economic segregation are income inequality and the concentration of cheap housing in specific neighbourhoods. European welfare systems help reduce income inequality, but the reduction of social housing units implies a greater concentration of the lowest income groups in the remaining units.

A general conclusion from the study is that spatial inequality follows socio-economic inequality, but typically with a time lag since it takes time for increasing socio-economic inequality to translate into the physical structure of cities

To address urban segregation, a mix of neighbourhood interventions and poverty reduction policies is required. In some neighbourhoods, dwellings and infrastructure may need to be upgraded or replaced and access to jobs and services improved. Ensuring a more varied mix in size, quality and tenure type of housing may allow people to stay in the neighbourhood as their incomes change and/or their household composition changes, which would help to reduce socio-economic segregation.

Urban segregation is growing in eleven out of twelve European capitals

A recent study of twelve EU capitals (Tammaru et al. 2016) found that socio-economic segregation increased in most of them between 2001 and 2011 (Figure 4.13).

Increasing urban segregation is a concern as it can lead to social instability. Despite the growing socio-economic segregation levels in European cities, they are still relatively low compared to those in, for instance, North America or Asia.

Box 4.7. **EU policies and migration**

The Asylum, Migration and Integration Fund (AMIF) is the main financial instrument of the EU to promote efficient management of migration flows as well as the development and implementation of a common Union approach to asylum and immigration. Actions to be funded through this instrument include the improvement of accommodation and reception services for asylum seekers, support to legal migration, as well as training and assistance for non-EU nationals.

Cohesion policy complements the AMIF by focusing investments on the long-term social inclusion of migrants and their integration into the labour market.

The European Social Fund (ESF) can support a wide range of activities to help asylum seekers integrate into the labour market. For example, it can provide funding for training, language courses, counselling, coaching and vocational training. With a few exceptions in some Member States, the ESF can only support asylum seekers who already have access to the labour market. Member States are required to grant such access at the latest nine months after the asylum seeker has applied for international protection. However some Member States grant earlier or even immediate access to the labour market once the asylum seeker applies for international protection. If the latter is the case, they will immediately benefit from ESF support. Furthermore, in case the national legislation provides that asylum seekers have access to vocational training, these asylum seekers are also eligible. Finally, minor children of asylum seekers or asylum seekers who are minor are eligible for ESF support under the ESF investment priorities on education which address minors. Besides providing individual support to asylum seekers, refugees and their families, the ESF can also support anti-discrimination initiatives and NGOs that are dealing with the influx. ESF can reinforce the administrative capacity of public administrations, including child protection systems.

The Asylum, Migration and Integration Fund (AMIF) is the main financial instrument of the EU to promote efficient management of migration flows as well as the development and implementation of a common Union approach to asylum and immigration. Actions to be funded through this instrument include the improvement of accommodation and reception services for asylum seekers, support to legal migration, as well as training and assistance for non-EU nationals

The European Regional Development Fund (ERDF) can support the integration of migrants and asylum seekers through investments in social, health, education, housing and childcare infrastructure, deprived urban areas and business start-ups. The ERDF may also support, in exceptional circumstances and on a case-by-case basis, emergency measures that complement support coming from the Asylum Migration and Integration Fund (AMIF). Support could include building or extending reception centres and shelters or reinforcing capacity at reception services, infrastructural development in hotspots, mobile hospitals as well as sanitation and water supply.

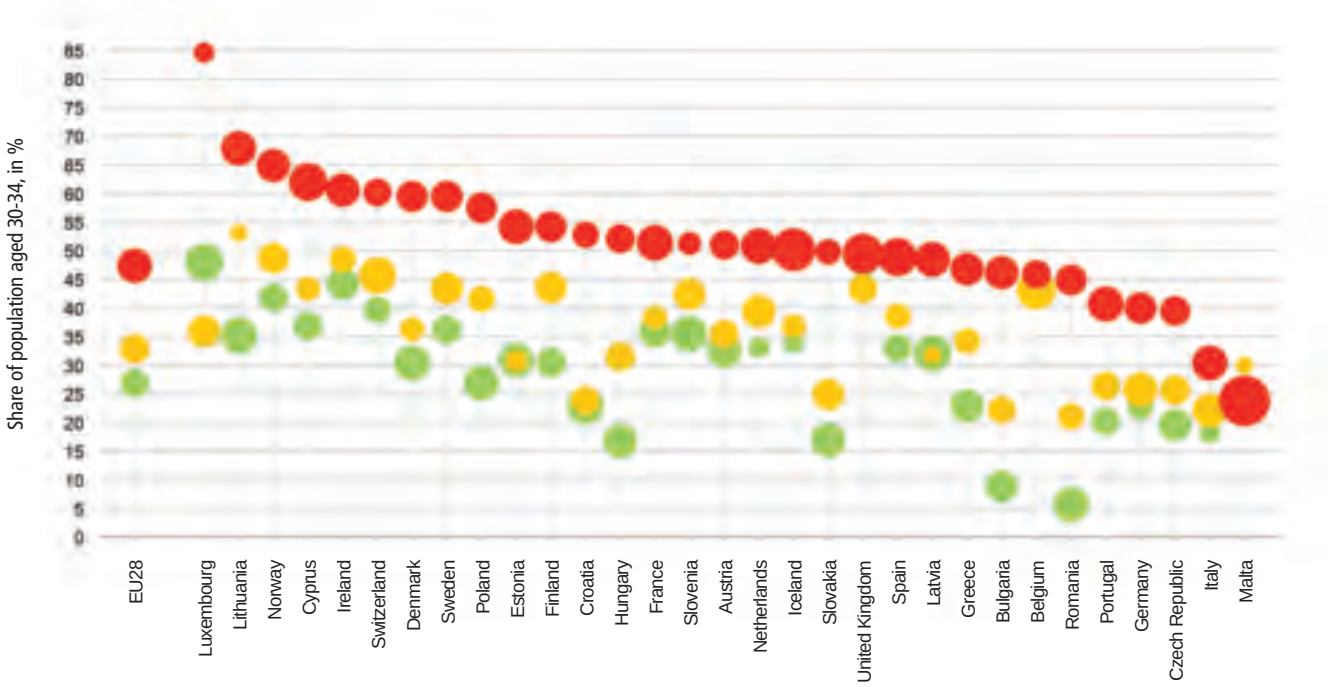
A project financed under AMIF aims to provide support for around 1,120 asylum seekers in Hamburg (Germany). The asylum seekers, including unaccompanied minors, are given assistance on basic knowledge of German language and guidance on culture and social environment. The project also involves volunteers from the local community and from refugee groups. On top of this, a manual is developed in view of improving the initial orientation arrangements for all asylum seekers in Hamburg.

A local integration support centre helped more than 1,000 migrants in Portugal by providing social and legal assistance, as well as contacts and information to gain access to employment. The ESF contributed almost EUR 400,000 to the project between 2012 and 2014.

The ESF-funded *Lotsendienst* (Pilot service) for migrants in Brandenburg, Germany, advised some 1,400 migrants interested in setting up their own businesses. Of these, 735 did just that after individual coaching. They were also supported by business start-up pilot schemes during their first year of operation.

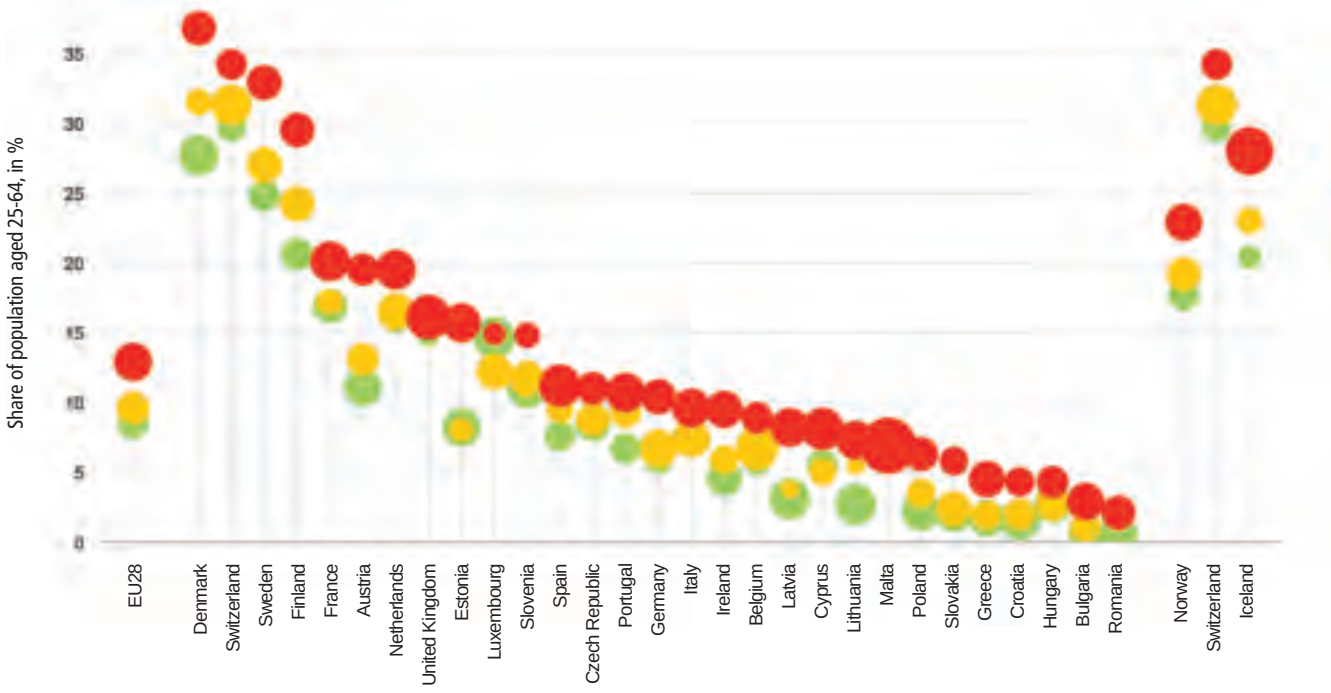
The *Sicurezza* programme in Italy has financed some 100 projects that established centres for legal migrants in the four regions covered by the programme: Calabria, Campania, Puglia and Sicily. The ERDF allocation for the programme is EUR 79 million. The investment helped build temporary accommodation, language labs, and recreational and sport spaces for migrants. Health care services and psychological support were also provided through local health centres.

Figure 4.17. **People aged 30-34 with a tertiary education by degree of urbanisation, 2014**



Note: ranked by the city value | Source: Eurostat

Figure 4.18. **Participation in education or training by degree of urbanisation, 2014**

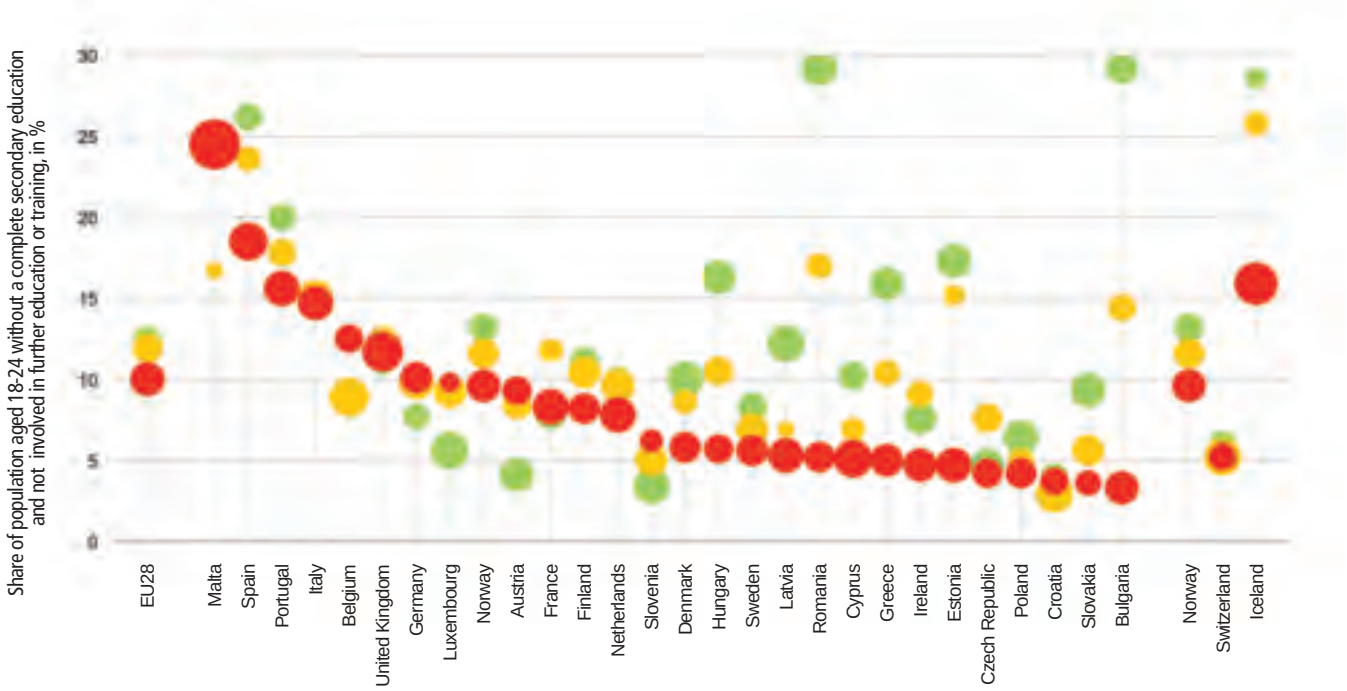


Note: ranked by the city value
Source: Eurostat

Cities Towns and suburbs Rural areas

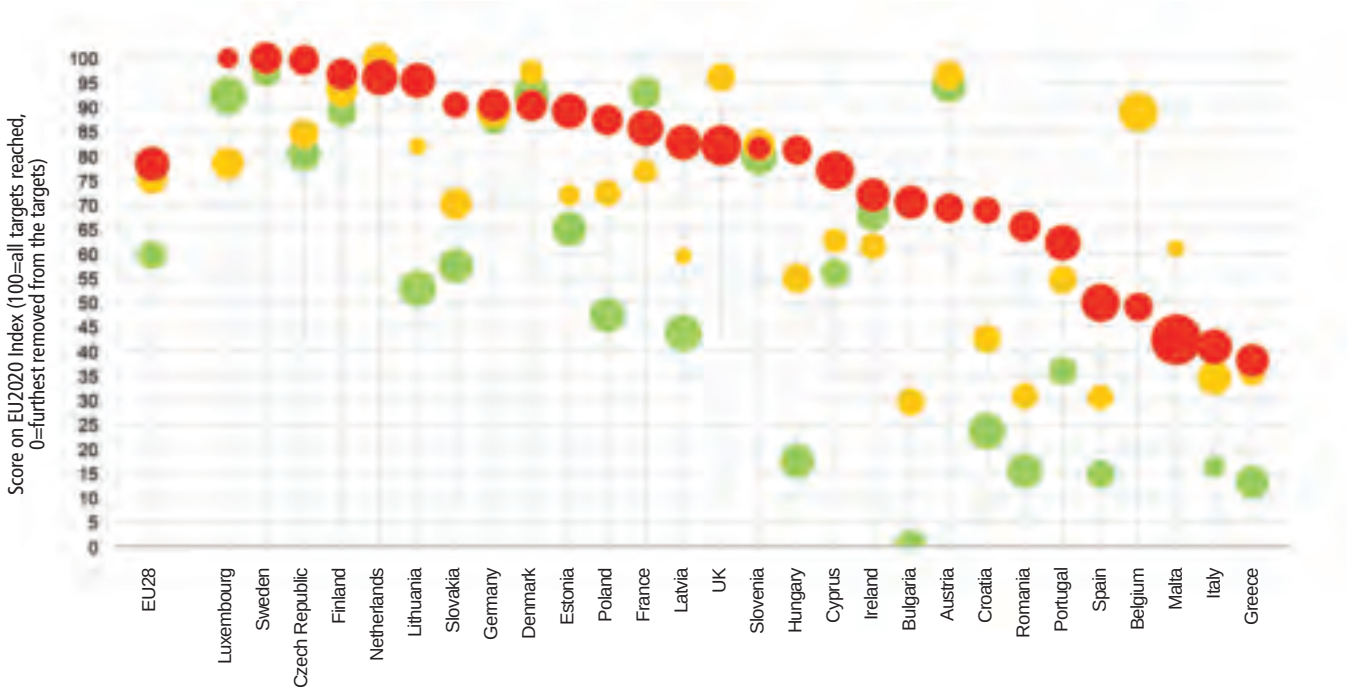
Bubble size is the share of national population living in the area

Figure 4.19. **Early school leavers by degree of urbanisation, 2014**



Note: ranked by the city value | Source: Eurostat

Figure 4.20. **The Europe 2020 index by degree of urbanisation**

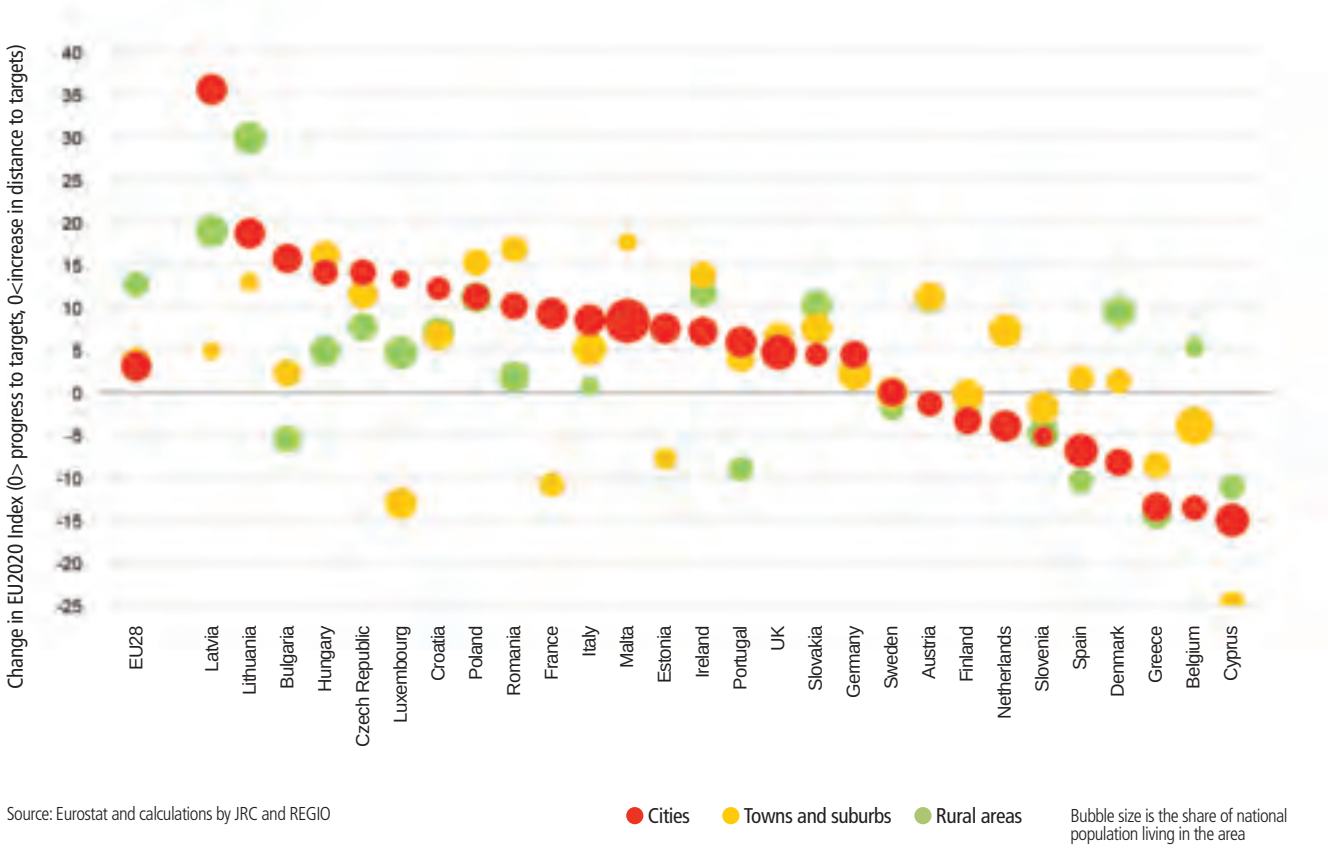


Source: Eurostat and calculations by JRC and REGIO

Cities Towns and suburbs Rural areas

Bubble size is the share of national population living in the area

Figure 4.21. **Change in the EU2020 Index by degree of urbanisation, 2010-2014**



Source: Eurostat and calculations by JRC and REGIO

European cities harbour a number of paradoxes: they are relatively safe but many people feel insecure. Housing in cities is smaller but more expensive. Cities have many job opportunities but unemployment and low work intensity rates are high in many cities. Cities are more productive but poverty rates are higher in cities in some of the most productive countries

Czech Republic have reached the target in 2014. Many other cities are close to reaching these targets and in most countries are closer than rural areas, which are lagging. That is particularly so in the central-eastern EU countries with the exception of Slovenia.

Progress since 2010 has been uneven with improvements in most cities but deterioration in the cities of nine EU countries (Figure 4.21). Progress to the education targets is encouraging but the economic crisis has made it harder to reach the employment and poverty reduction targets. The overall progress between 2010 and 2014 for cities was only 3 index points. To reach the targets, another 22 points would be needed over the next six years. Rural areas made more progress during this period with an increase of 13 index points, but these areas need another 40 points to reach the target.

4.9. Conclusion

European cities harbour a number of paradoxes: they are relatively safe but many people feel insecure. Housing in cities is smaller but more expensive. Cities have many job opportunities but unemployment and low work intensity rates are high in many cities. Cities are more productive but poverty rates are higher in cities in some of the most productive countries.

Homicides have dropped by 40% in the EU and tend to be very low in virtually all cities if compared with the rates of cities worldwide. Nevertheless, many city dwellers live in an area with problems related to crime, violence and vandalism. Many also feel physically insecure in their neighbourhood after dark. These feelings of insecurity, however, are not inevitable. In some countries, only 10% of city dwellers feel insecure, demonstrating that cities can become safe and secure environments.

Housing in cities tends to be more expensive and more households have to pay a high share of their income to cover housing costs. High housing costs are a contributing factor to homelessness and people living in informal housing. High housing costs also discourage people from moving to a city. As a result, cities faced with problems of housing affordability may want to facilitate the construction of more (affordable) housing.

Cities host a large share of residents born outside the EU. In many cases, such residents experience difficulties integrating into the labour market. Cities can help migrants and other marginalised groups by providing training and counselling, supporting job searches, helping them to set up their own businesses and other modalities to address poverty.

European cities are centres of education, which can help people to find a job and boost productivity. To support this process, cities can play an important role in promoting links between schools, universities and local firms to ensure that the skills and necessary training can be provided locally.

Cities are in the vanguard of the Europe 2020 strategy. They are closer to reaching the employment, education and poverty reduction targets than towns and suburbs and rural areas. The crisis, however, has pushed up poverty rates and reduced employment rates.

The European 2020 Strategy aims to reduce the share of early school leavers to 10% or less

Chapter 5.
Making urban mobility greener and safer

- The European Union has agreed to reduce greenhouse gas emissions by 40 per cent by 2030 as compared to 1990. Greenhouse gas emissions from cars have only recently started to decline and technological improvements alone are unlikely to secure the agreed reductions. National and city authorities can play a crucial role by facilitating walking, cycling and public transport.

- Reducing urban congestion through demand management, by for example congestion pricing, and promoting low-carbon mobility can improve accessibility and agglomeration benefits while reducing pollution and energy use.

- EU Cohesion Policy will invest more than EUR 77 billion in projects such as building an integrated public transport hub, new trams, new metro lines and infrastructure improvements for pedestrians and cyclists.

- The price and availability of parking, which is usually determined by local governments, is crucial in a traveller's decision whether to drive, take public transport, cycle or walk.

- To compete with the car, public transport needs to be fast, frequent and easily accessible. This may require action to ensure that buses and trams are not hindered by congestion. Cities can promote denser (re-)development close to high-frequency public transport stops.

- Walking and cycling are important transport modes in European cities. Some cities have been extremely successful in promoting these modes with more than half the trips made on foot or by bike. Many other cities can boost walking and cycling by making such trips more attractive and convenient and by improving traffic safety.

- The EU aims to reduce traffic fatalities by 50% by 2020 relative to 2010. This would save 15,000 lives annually. The 50% reduction corresponds to a fatality rate of less than 3.1 fatalities per 100,000 inhabitants. In 2013, only the Netherlands, Sweden and the UK were below this rate.

The annual cost of congestion in the EU has been estimated at EUR 100 billion or 1% of EU GDP

Chapter 5.
Making urban mobility greener and safer

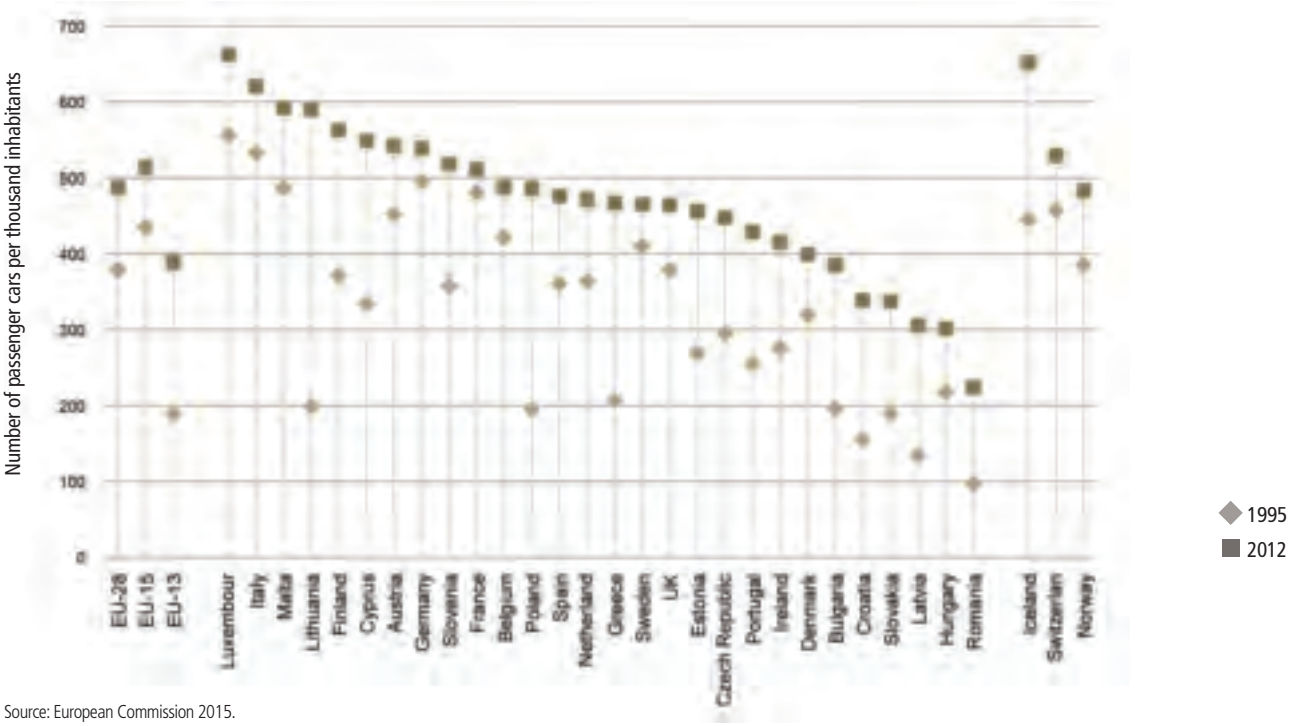
In student towns like Oxford, UK, car ownership is significantly lower than the national average © Sampete

5.1. Introduction

The EU is committed to reducing greenhouse gas (GHG) emissions and improving road safety. To reach these objectives, cities play an essential role. The ambitious EU 2030 target of reducing GHG emissions by 40% relative to 1990 implies that urban mobility emissions will have to be significantly reduced. Reaching these goals will not only require technology that makes motorised vehicles more energy-efficient but also a shift to low(er)-carbon mobility modes, such as walking, cycling and urban public transport (ORNL 2015; USDOT 2015). The EU further aims to reduce traffic fatalities by 20% by 2020 relative to 2010. These two goals are intertwined and can reinforce each other. For example, making urban traffic safer can encourage more people to walk or cycle which, in turn, will reduce GHG emissions.

This chapter first discusses how car use and its GHG emissions have evolved over the past twenty years. Then it explores how car use can be made more efficient and less frequent through a range of measures. The following section shows how low-carbon transport modes are performing in cities. The final section examines traffic safety and how that can be further improved.

Figure 5.1. **Passenger cars per capita by country, 1995-2012**



Source: European Commission 2015.

In all countries, car travel has increased over the past twenty years. Several cities, however, have reduced the share of car travel by facilitating low-carbon mobility and discouraging car travel

5.2. Car use has grown but people in cities use other modes more

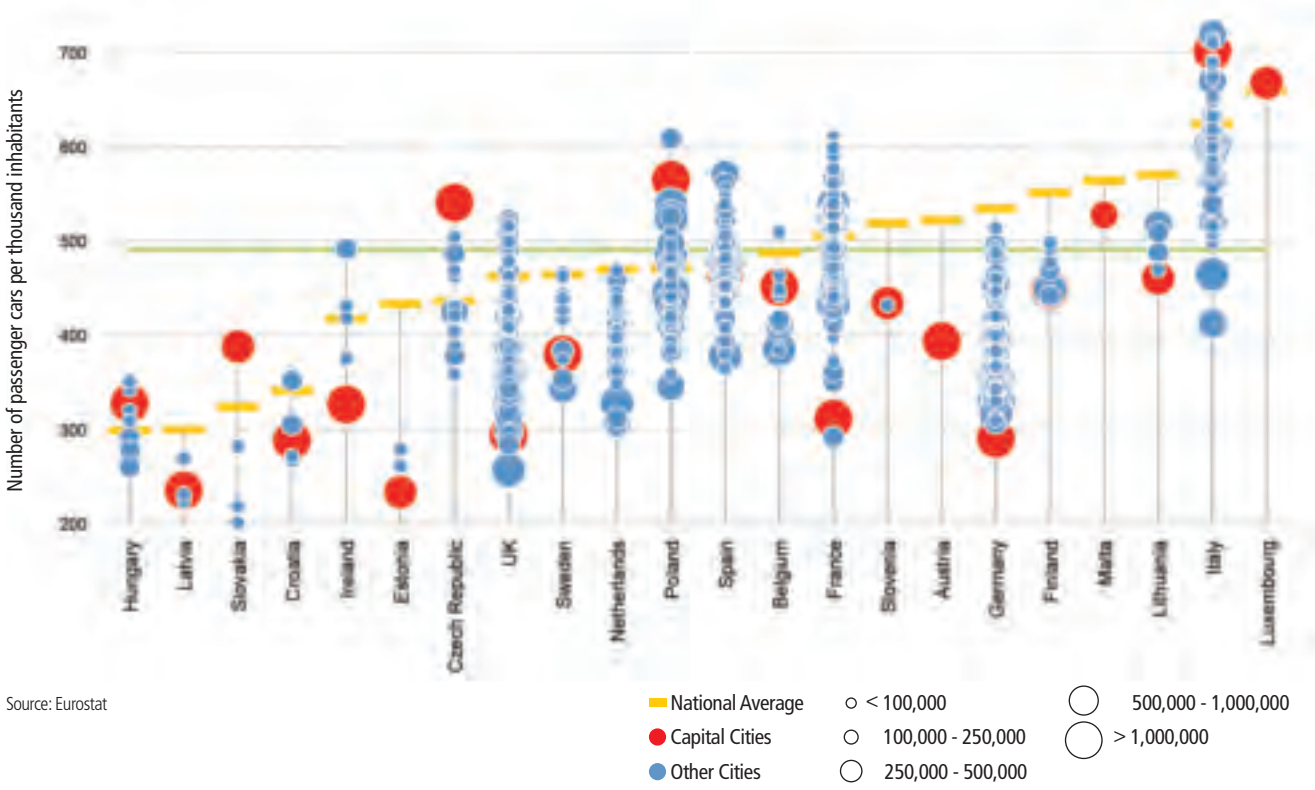
Between 1995 and 2012, the rate of car ownership per 1,000 inhabitants rose in all countries in Europe. It increased by 18% in the EU-15 to 500 and doubled in the EU-13 to 400 per 1,000 inhabitants (see Figure 5.1). Seven EU-13 countries (Cyprus, the Czech Republic, Estonia, Lithuania, Malta, Poland and Slovenia) now have higher motorisation rates than Denmark which is the EU-15 country with the lowest motorisation rate.

Car ownership at the city level (see Figure 5.2) varies significantly. In the largest cities, car ownership rates can be as much as 40% lower than the national average. This is the case in Amsterdam, Berlin, London and Paris. However, there are some notable exceptions such as Bratislava, Budapest, Prague, Rome and Warsaw, where higher incomes lead to a higher car ownership rate than the country as whole. In smaller cities, car ownership tends to be higher than in larger ones and sometimes reaches or exceeds the national rate. In student towns, however, car ownership is often significantly lower than the national average, as is the case in Groningen, Leiden, Oxford and Cambridge.

One reason for lower car ownership in cities may be the growing popularity of car-sharing schemes. Although not as widespread as bike sharing, it is available in a rising number of European cities. Car sharing makes it easier for households to live without owning a car (or have one instead of two cars). Car sharing can reduce the number of cars in a city and the pressure on parking. Most of these systems work with dedicated parking places but some cities are now experimenting with an app-based system where cars can be parked in non-dedicated places as well.

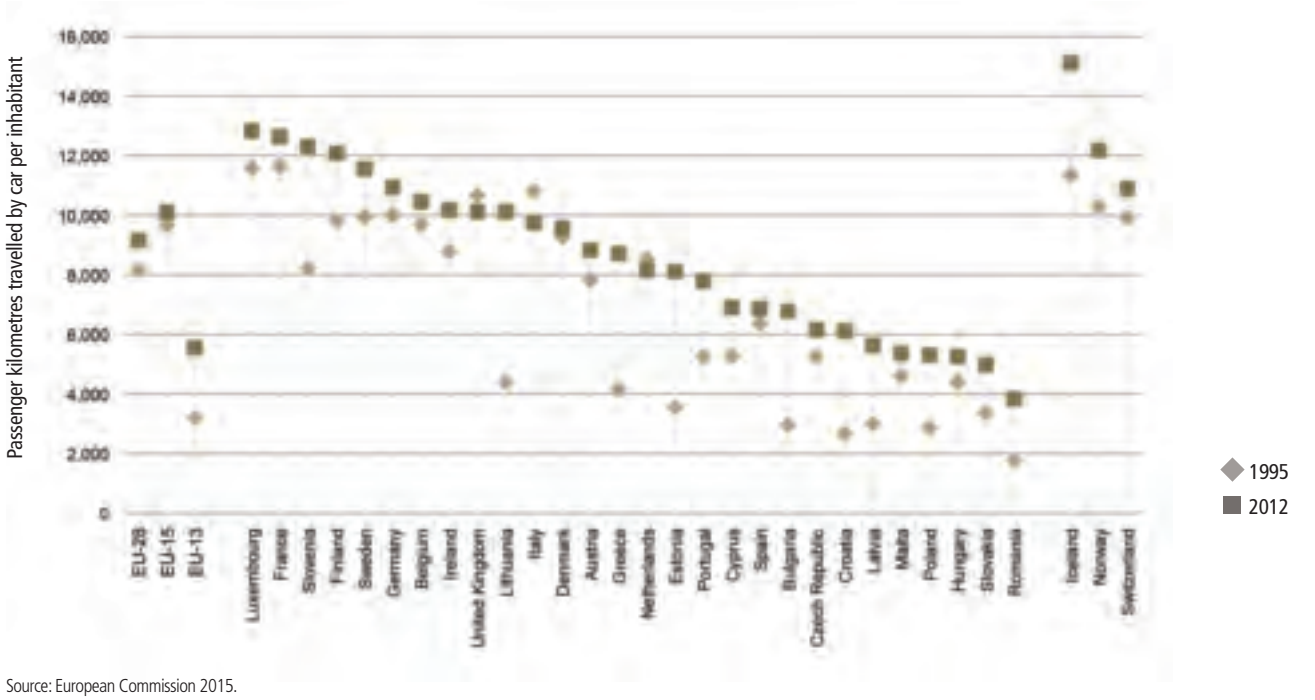
In 2012, the EU-15 passenger km of car use per capita was almost twice that of the EU-13 (see Figure 5.3), but this gap has been shrinking rapidly. In the EU-13, it increased 75% between 1995 and 2012, compared

Figure 5.2. **Passenger cars per city, 2011**



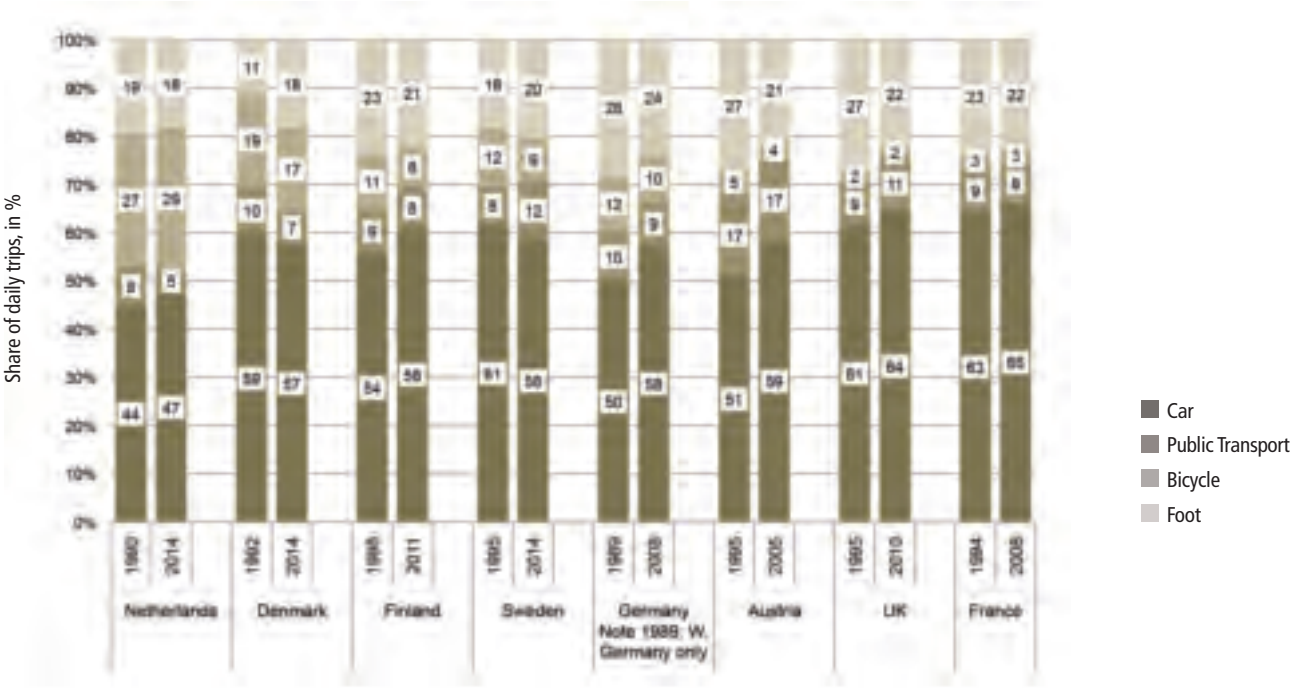
Source: Eurostat

Figure 5.3. **Passenger kilometres by car per country, 1995-2012**



Source: European Commission 2015.

Figure 5.4. **Trips by mode of transport, selected countries, 1990-2014**



Sources: National Ministries of Transport and Statistical Institutes
Note: Figures not fully comparable as survey methodologies differ to some extent

to only 5% in the EU-15. It actually declined in Italy, the Netherlands and the UK.

Of the eight European countries for which travel data time series are available (Figure 5.4), six show an increasing car share of daily trips (Austria, Finland, France, Germany, Sweden and the UK), while it declined in two (Denmark and Sweden). In all of these eight countries private cars account for the largest share of any mode by far, with the share ranging from 47 to 65%. In six of these eight countries, walking accounts for the second-highest share of trips. The highest bike share of trips can be found in Netherlands with 29% in 2014. Cycling only accounts for about a tenth of all trips in Finland, Germany and Sweden. Austria has the highest share of trips by public transport (17% in both 1995 and 2005), compared to shares of about 10% in most of the other seven countries.

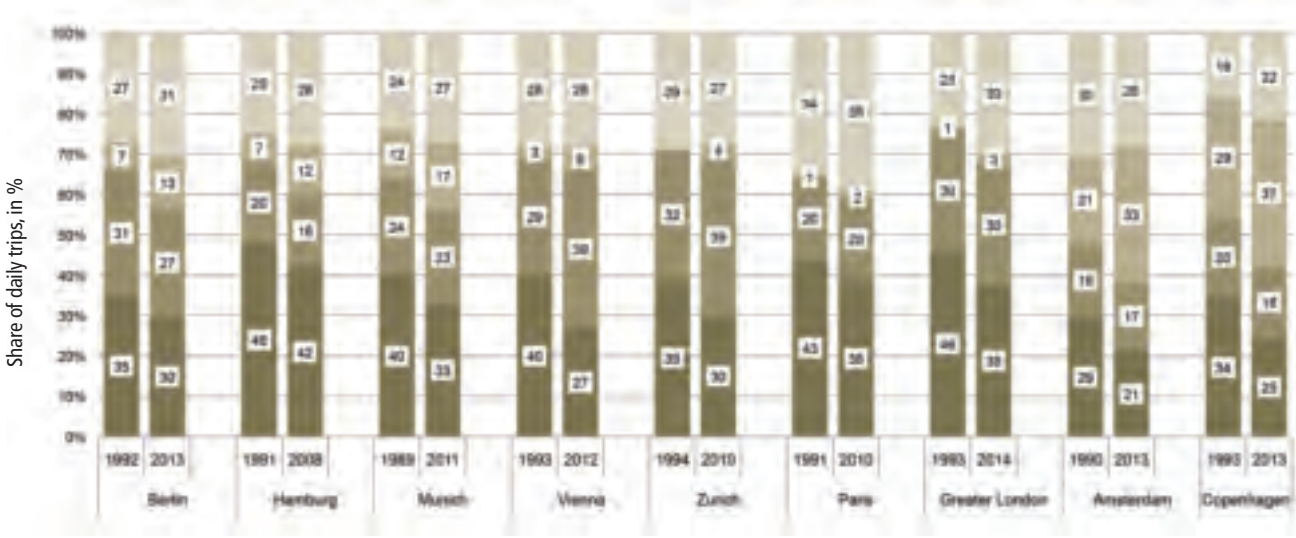
City-level data are available for Amsterdam, Berlin, Copenhagen, Hamburg, Greater London, Munich, Greater Paris, Stockholm and Vienna (mostly limited to trips by city residents and excluding those by suburban residents and visitors). Contrary to the national level, city data (Figure 5.5) show a significant decline in the share of car trips. These declines range from 13 percentage points in Vienna (40 to 27%) to five percentage points in Berlin (35 to 30%). In towns, suburbs and rural areas, survey data tend to show higher car use, primarily due to longer trip distances and the lack of convenient public transport options.

A recent survey of residents of 75 EU cities explored which mode of transport people use most often on a typical day. As this survey does not cover the commuting zone, it does not include people working in the city, but living outside the city. In only five out of the 75 cities, did the majority use the car most frequently. In most cities, the share was below 30% (see Figure 5.6). Capital cities typically had the lowest share of residents using the car. The variation between the cities is stark: from more than 70% in Lefkosia to less than 10% in Paris.

5.3. Increasing car use limits the impact of technological improvements

Since 1990, motorisation levels and car use have risen throughout the EU, and for the few countries with data available over time (all in EU-15), the car share of trips has

Figure 5.5. **Daily trips by mode of transport in selected European Cities, 1990-2014**



Sources: City authorities and National Statistical Institutes.
Note Zurich: 1994 walk/bike combined

The EU country with the highest share of trips by bicycle is the Netherlands at 29% (2014 study)

been rising. None of the EU-13 countries have such time-series data but their sharply rising rates of motorisation and car use suggest correspondingly large increases in the car share of trips. For the high-income countries of the EU-15 which already had high rates of motorisation and car use in 1990, recent increases have been much smaller, suggesting a levelling off in future years. For lower-income countries (both in the EU-15 and EU-13) with lower levels of motorisation and car use, increases are likely to continue in the future but at a less significant rate.

The EU's goal is to reduce GHG emissions from transport by 60% by 2050 relative to 1990 (COM (2011)144). Emissions from passenger cars, however, only dropped by an estimated 5% between 2000 and 2013 (see Figure 5.7). This reduction was supported by energy efficiency improvements of cars, which led to a drop of 9% reduction in energy use per vehicle km travelled. Vehicle km travelled however increased by 7%. This analysis (EEA TERM 2015) assumes that biofuels are carbon neutral, which leads to an estimated further reduction of CO_2 emissions by cars of 3.5%. This reduction in emissions is not sufficient to reach the 2050 target. This implies that

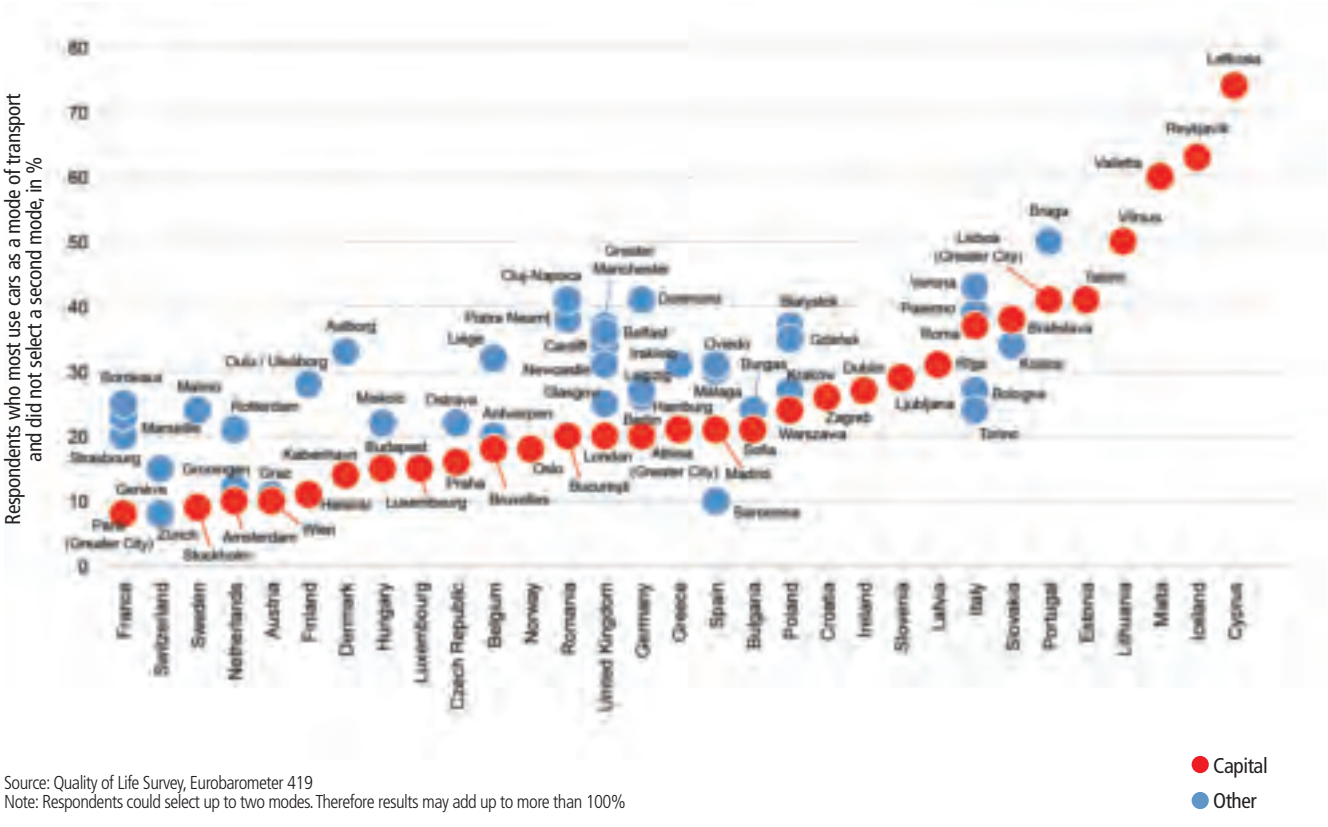
The EU's goal is to reduce GHG emissions from transport by 60% by 2050 relative to 1990. Emissions from passenger cars, however, only dropped by an estimated 5% between 2000 and 2013

reducing GHG emissions from passenger cars is unlikely to be achieved by technological improvements alone and may have to be combined with strategies to reduce car use.

5.4. Making car use more efficient and less frequent

A cost-effective and politically popular way to reduce the adverse social and environmental impacts of motor vehicle use is technological improvements in the vehicles themselves. Some of these have evolved naturally; others were enforced through regulation at the national and especially the EU level. Progressively stricter Euro I through Euro VI emission standards of the EU have regulated

Figure 5.6. **Car use in European cities, 2015**



Source: Quality of Life Survey, Eurobarometer 419
Note: Respondents could select up to two modes. Therefore results may add up to more than 100%

Box 5.1. **The urban dimension of EU transport policy**

The need for more sustainable and integrative planning processes as a way of dealing with the complexity of urban mobility has been widely recognised. New approaches to urban mobility planning are emerging as local authorities seek to develop strategies that can stimulate a shift towards cleaner and more sustainable transport modes.

The European Commission is promoting sustainable urban mobility and increased use of clean and energy-efficient vehicles through a number of initiatives:

The SUMP concept
The 2013 Urban Mobility Package sets out a concept for Sustainable Urban Mobility Plans (SUMPs) that has emerged from a broad exchange between stakeholders and planning experts across the European Union. The concept describes the main features of a modern and sustainable urban mobility and transport plan.

EU action on SUMPs
The European Platform on Sustainable Urban Mobility Plans supports the transition towards competitive and resource-efficient mobility systems in European cities by:

- Supporting the further development of the Sustainable Urban Mobility Plan (SUMP) concept and the tools required for its successful application by local planning authorities;
- Providing the Mobility Plans portal to disseminate relevant information, publications and tools; and
- Facilitating co-ordination and co-operation across the different EU-supported actions through a Co-ordinating Group.

In addition to the European Platform on Sustainable Urban Mobility Plans, the European Commission offers support to European cities to tackle urban mobility challenges by:

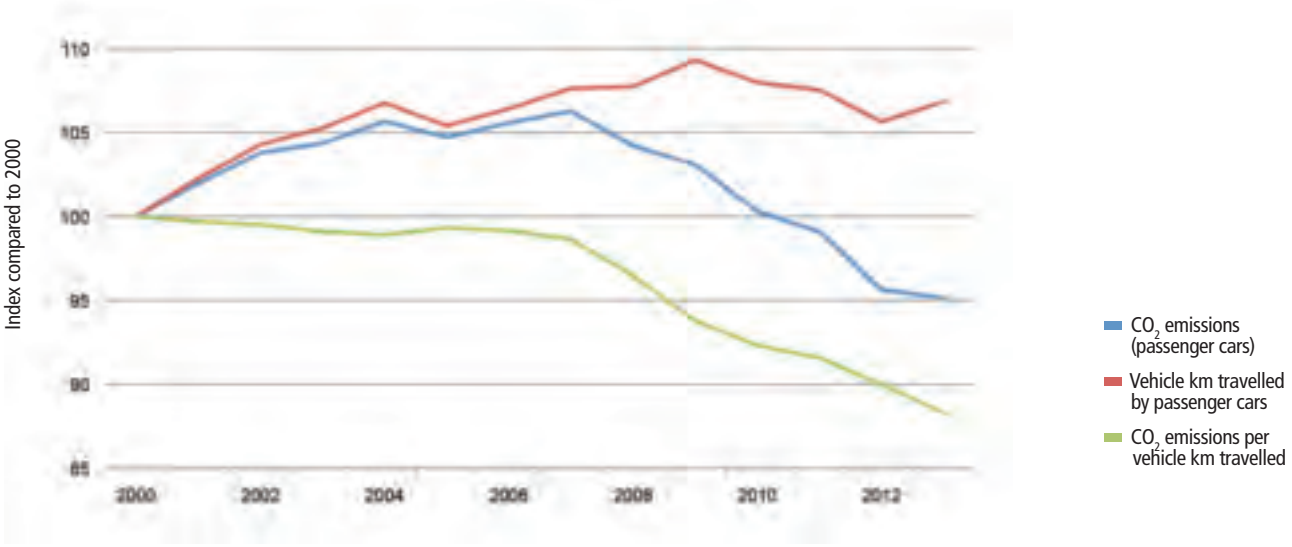
- Supporting exchange and capacity building on sustainable urban development through, among others, the European URBACT programme;
- Improving the quality and availability of data and statistics for urban transport systems, operations and decision-making at local, regional, national and EU level; and
- Providing financial support for urban mobility projects through EU Cohesion Policy (see also box 5.4), Horizon 2020, the Connecting Europe Facility, as well as other financial instruments.

Intelligent Transport Systems for Urban Areas
The European Commission is working with Member States to deploy Intelligent Transport Systems (ITS), which are vital to increasing safety and tackling emission and congestion problems. ITS supports urban policy goals in areas such as travel information, traffic demand management, smart ticketing and urban logistics.

CIVITAS
The CIVITAS Initiative helps cities across Europe implement and test innovative and integrated strategies that address energy, transport and environmental objectives. Almost 60 European cities have been co-funded by the European Commission to implement innovative measures in clean urban transport; an investment amounting to well over EUR 300 million. The larger CIVITAS Forum Network comprises almost 200 cities that are committed to implementing and integrating sustainable urban mobility measures.

Intelligent Energy Europe programme (STEER)
Activities funded by the transport strand of the Intelligent Energy Europe programme (STEER) promote more sustainable energy use in transport (i.e. increased energy efficiency, new and renewable fuel sources, and the take-up of alternatively propelled vehicles).

Figure 5.7. **CO_2 emissions from passenger cars, 2000-2013**



Source: EEA

The main operating costs of a car are fuel and parking. Local governments generally determine the availability and price of parking, while national governments set the fuel tax and the EU sets the minimum fuel tax

maximum allowable levels of particulate matter, carbon monoxide, nitrogen oxides, and hydrocarbons per vehicle km. EU standards have required manufacturers to produce successively less-polluting vehicles.

In Europe, car purchase and ownership taxes are set at the national level and favour less polluting and more fuel-efficient cars. Some EU countries offer tax discounts for electric and hybrid cars or cars with small engine capacity and high fuel efficiency. National governments also encourage smaller, less polluting cars through annual vehicle registration fees that vary by size of engine, fuel type, tailpipe emissions and other criteria.

The main operating costs of a car are fuel and parking. Local governments generally determine the availability and price of parking, while national governments set the fuel tax and the EU sets the minimum fuel tax. In 2013, fuel tax varied from EUR 0.36 (Romania) to EUR 0.75 per litre (the Netherlands) (EEA 2016). Fuel taxes in the EU are much higher than in the USA or Canada and have been shown to stimulate demand for fuel-efficient cars. The tax regimes in several countries, however, favour the provision of company cars to employees, creating an incentive for more car use (see below).

Cities usually determine the price per hour of on-street parking and public off-street parking in garages or lots. The price and availability of parking is crucial to a traveller's decision on whether to drive, take public transport, cycle or walk (Shoup 2011). Amsterdam's parking policy is a good example. It is based on concentric circles around the centre with parking prices per hour varying from EUR 5 in the centre to EUR 1.30 outside the Amsterdam ring road (City of Amsterdam, 2016). Getting the parking policy right reduces congestion, reduces time spent looking for parking space and improves accessibility.

Addressing urban road congestion

Traffic congestion is perhaps the most visible urban transport problem, experienced by many travellers on a daily basis. One estimate puts the annual cost of congestion in the EU at EUR 100 billion or 1% of the EU GDP. Even a small reduction in car travel time during peak hours would result in significant time and energy savings and reduce air pollution. To capture congestion in functional urban areas with at least 250,000 inhabitants, the share of the road network that is congested was measured (see Map 5.1). It shows that in

Box 5.2. **Congestion pricing**

As the flows in a transport network increase, the point will be reached where crowding reduces average speeds. This is congestion. Congestion represents a 'market failure' because an important aspect of it is neither reflected in prices nor in costs paid by individual transport users. If we imagine an additional road user choosing to travel just at the point where congestion sets in, all traffic on that route slows below the engineering optimal speed.

But the additional traveller will not pay the cost of the fractional slowing down inflicted on all other road users. The additional user may impose an extra time for a given journey of 10 seconds because the trip has triggered congestion. But if the road is being used by 1,000 other people at the same time, the extra costs will be inflicted on all those road users. The extra 10 seconds becomes an extra 2 hours 40 minutes and 50 seconds summed across all road users.

Since this external cost it is not priced, users of transport systems will not take it into account when deciding to make a journey. This provides a powerful argument for pricing congestion, which is an application of the EU recommendation to use the 'polluter pays' principle. If the congestion price is set at the appropriate level, people, when deciding to travel, will take account of any system-wide congestion costs their journey inflicts. They may choose other modes or they may adjust their journey times to minimise what they pay and so reduce congestion for all users of the transport network.

Congestion pricing should not be confused with road pricing, which is used to raise funds to pay for roads or other transport infrastructure. Implementing an effective congestion pricing scheme faces multiple obstacles. Many drivers may be concerned that, although they will have to pay the costs, the benefits may not materialise. Businesses may be able to pass on the costs to their clients and for some professions, like plumbers or electricians, congestion pricing could lead to net gains as they spend more time working and less time driving.

Despite concerns, congestion pricing remains a policy option which could improve urban transport networks' efficiency, and – by reducing the costs of urban size – could increase agglomeration economy benefits.

Few EU cities have implemented congestion pricing to deter car travel into the city centre. The most extensive systems have been put in place in London and Stockholm, but there are also smaller-scale congestion charging schemes in Durham in the UK, Valetta in Malta and Milan in Italy (EPOMM 2015).

ten cities more than 20% of the network was congested during peak hours in 2014. Large cities and capital cities are often particularly afflicted by congestion.

This indicator defines congestion as based on the extra time needed to drive as compared to travel time without congestion. This assumes that the travel time without congestion is in a sense optimal, or at least comparable. Given the wide differences in length, capacity and quality of road networks between EU cities, it is questionable whether the travel time without congestion in a city such as Sofia is truly comparable with that in Brussels or London.

Low levels of congestion may lead to longer travel times driving

Another consideration is that the absence of congestion does not guarantee that people will spend less time travelling. Research in the USA (Levine 2012) shows that travel time to work in congested cities is lower than in cities with less congestion because destinations are more spread out. If congestion is lowered without increasing the costs of mobility, for example by building more roads and not by introducing congestion pricing, people and firms are likely to move to cheaper and more distant locations. In other words, they will increase home-work travel distance and time.

5.5. Promoting low-carbon modes

This section examines measures cities have implemented to increase low-carbon mobility modes. These local measures work best when accompanied by national or EU policies that require technological change to make cars less polluting and more energy efficient.

Most studies show that public transport, walking and cycling must be integrated to provide feasible, convenient alternatives to car use. Without this integration, it will be difficult to persuade car owners to use these alternative modes (Buehler and Pucher 2011; Pucher and Buehler 2008). Thus, public transport, walking and cycling should not be viewed in isolation but as a system of integrated modes.

Notwithstanding their interdependence, there are policies specifically targeted at each of these three modes. Examined below are the most important policies implemented in EU cities to promote public transport, walking and cycling.

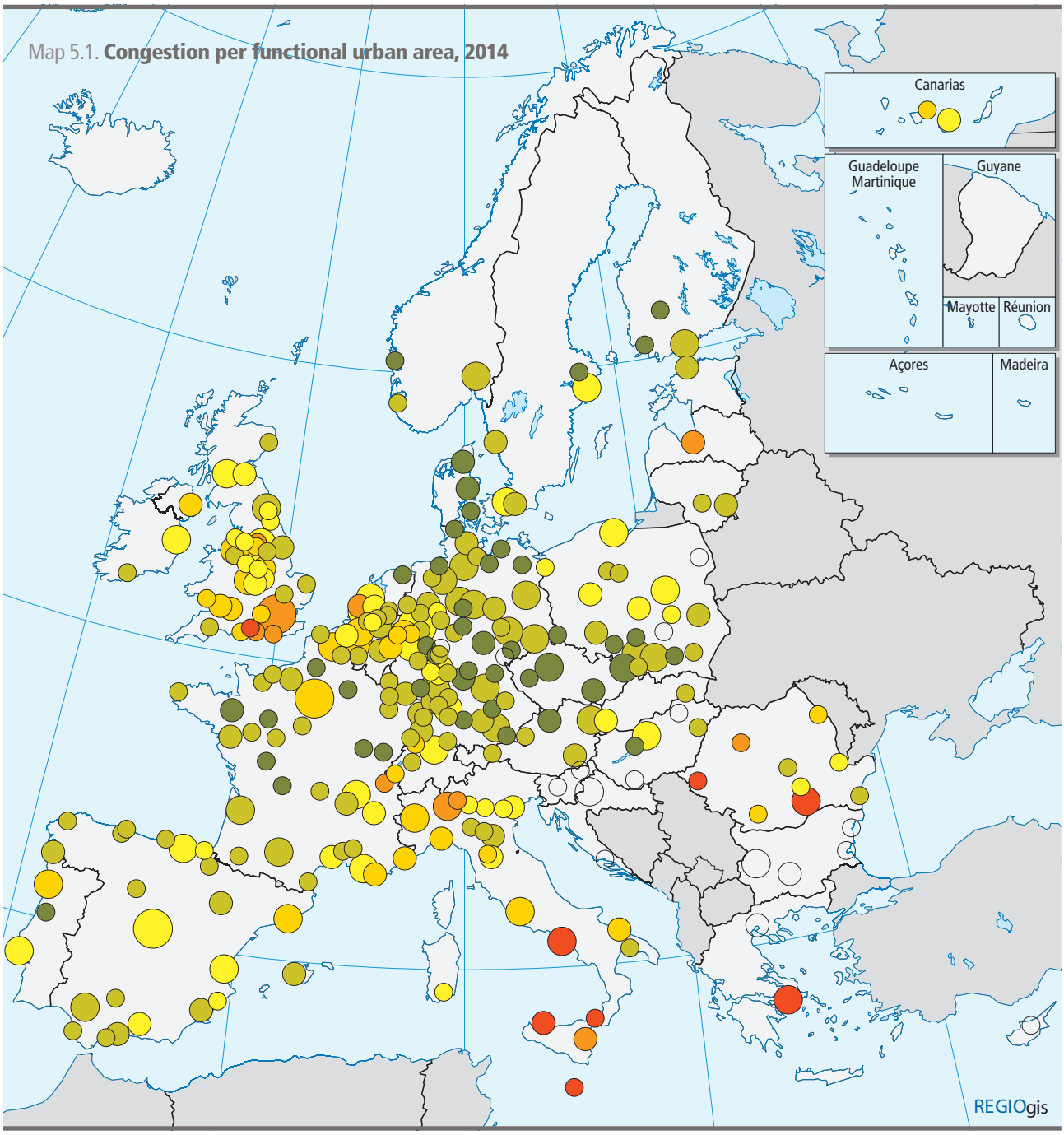
Improving public transport

Public transport usually serves as the backbone of low-carbon transport systems, as it typically covers the entire metropolitan area and is a unifying element for linking shorter trips made by walking and cycling. Life without a car is difficult without a good public transport system for making trips that are too long to be done on foot or by bike. Moreover, rail transport, in particular, fosters compact, mixed-use development around stations, thus generating trips short enough for walking or cycling.

Public transport is popular in many European cities (see Figure 5.8). In almost all the cities surveyed, at least 20% of the residents rely on public transport, and for 21 cities it was the main mode for more than half of the residents. City size, the quality and frequency

London introduced congestion charging in 2003 and during Mayor Khan's term of office, an Ultra Low Emissions Zone will be brought in to control exhaust emissions © Chris Beckett

Map 5.1. **Congestion per functional urban area, 2014**



% of the network length that is congested

- < 4
- 4 - 8
- 8 - 12
- 12 - 16
- 16 - 20
- >= 20
- No data

FUA population

- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Only the road network with functional road class 0-5 and with speed profiles available was used.

FUAs with fewer than 250,000 inhabitants were excluded.

Congested was defined as a delay of more than 30 seconds per km during the one-hour peak period compared to free-flow speed.

0 500 Km

Sources: TomTom, JRC

Box 5.3. **Mobility budget**

Many employers financially support the travel expenses of their employees, in part because of the favourable tax treatment it offers. For example, in many EU countries companies pay less tax on the provision of company cars to employees than on their wages. This system is based on a reimbursement of incurred expenses, thus the higher the expenses the higher the support. This means people who drive to work and/or commute longer distances receive the highest subsidies while people walking or cycling get nothing or far less.

A mobility budget can remove this distortion and create a level playing field whereby all modes receive the same support. Tax policies can treat this budget in the same way as a company car. A mobility budget is a fixed monthly budget that an employee can use to pay for all travel costs, regardless of the mode of travel used. If, by the end of the month, the budget is not completely spent, the employee is allowed to keep the money. If an employee uses a low-cost mode, i.e. by using a bike or short public transport trip, he or she will save money. This simple but powerful financial incentive stimulates employees to travel in a more sustainable way. Tests with this approach in two Dutch companies have shown that it can reduce GHG emission by 19% within one year and reduce commuting by car from 70% to 30% (EPOMM 2012).

Mobility budgets can also reduce congestion and provide employees with more flexibility and financial benefits if they opt for a low-cost mode. For employers it provides benefits too as it makes the management of the mobility budget easy and predictable and it may also reduce real estate costs by reducing demand for parking facilities.

Two factors are key to making mobility budgets a success. The fiscal system should treat the mobility budget in the same way as company cars or public transport reimbursements. Without this equal treatment, firms would be financially penalised for employees shifting from car travel to a different mode. Employees should have good options to travel to work by public transport, cycling, walking or carpooling, otherwise it is unlikely that a modal shift will occur.

Improvements in the quantity and quality of public transport services combined with low fares have led to considerable growth in public transport use in western EU cities over the past few decades

of public transport, together with road congestion all help to boost the use of public transport.

In almost all large western EU cities, the coordination of public transport services has improved across types of public transport, operators and different parts of the metropolitan area. That included the introduction of integrated fares, ticketing, routes and schedules, which greatly improves the convenience of public transport. The first fully integrated public transport system was the *Verkehrsverbund* established in Hamburg in 1967 and between 1970 and 2000, most large cities developed similar regional public transport systems with coordinated services and fares to improve the quality of service.

In addition, public transport services have been greatly expanded and modernised. Almost all rolling stock has been replaced with modern, state-of-the-art equipment. Rail infrastructure has also been improved, including modernised stations, tracks, tunnels and guidance systems. Metro and light rail systems have also been expanded throughout Europe while express bus systems have been implemented in many large cities. In most western EU cities, services have increased in terms of frequency and geographic coverage. Many cities have improved services by extending rail systems and by providing exclusive rights of way and bus-only lanes, grade-separated tram tracks, and traffic signal priority for buses and trams.

Improvements in the quantity and quality of public transport services combined with low fares have led to considerable growth in public transport use in western EU cities over the past few decades: a 39% increase in passenger kilometres for metro and tram, 11% for bus, and 38% for rail (EU 2015). Statistics for EU-13 are only available from 1995, but show far less favourable trends: an increase of 13% for tram and metro but a decrease of bus (-7%) and rail (-67%). However, this may

Cracow has remodelled its main station with Cohesion Policy investments of EUR 14 million

© Dimaberkut

Box 5.4. **Cohesion Policy promotes sustainable transport**

Promoting sustainable transport and removing bottlenecks in the transport network are important priorities for EU Cohesion Policy. In the 2007-2013 period, Cohesion Policy invested EUR 82 billion in these domains, roughly a quarter of Cohesion Policy expenditure. These investments promote sustainable transport networks, particularly in urban areas. This included public transport investments, mobility plans, increasing safety at road junctions and promoting active mobility through cycle lanes and pedestrian tracks. Cohesion Policy transport investments have a strong link with the Trans-European Networks for Transport (TEN-T) programme. Half of the 3,875 km of new roads constructed and half of the 3,482 km of railroad, newly built or reconstructed with the help of Cohesion Policy, were part of the TEN-T.

Cohesion Policy funding financed the majority of transport investment in Hungary (49%), Lithuania (54%) and Slovakia (45%).
In the period 2014-2020, EU Cohesion Policy will invest EUR 77 billion in the trans-European transport network, connections to this network, low-carbon transport systems and urban transport.

Cohesion policy metro regions focused more on public transport and multimodal mobility

Road and rail accounted for over 90% of Cohesion Policy transport investments in the period 2007-2013. In metro regions, however, road investments per capita were half that of non-metro regions (Table 5.1). Rail investments per capita in metro regions were only slightly lower. The investments in public and multimodal transport were much higher.

Table 5.1. **ERDF+CF expenditure per person per year in EUR per transport mode, EU-28, 2007-2013**

Euro per person and per year		Road	Rail	Water	Public Transport	Multimodal	Air	Bicycle	Smart
EU-28	Capital Metro	8.9	6.6	0.5	1.3	2.2	0.3	0.1	0.1
	Other Metro	10.3	6.0	1.3	0.9	0.4	0.8	0.1	0.2
	Non-Metro	21.4	8.2	1.2	0.4	0.5	0.4	0.3	0.1
	Total	**14.7**	**7.0**	**1.1**	**0.8**	**0.7**	**0.6**	**0.2**	**0.2**

Source: DG REGIO own elaboration

New trams for Košice, Slovakia, 2007-13

Thanks to EU Cohesion Policy funding of EUR 38 million, the city of Košice was able to buy 33 new trams, which will be used on the busiest lines. The new trams can accommodate a significantly higher number of passengers thus contributing to a reduction in GHG emissions and traffic congestion.

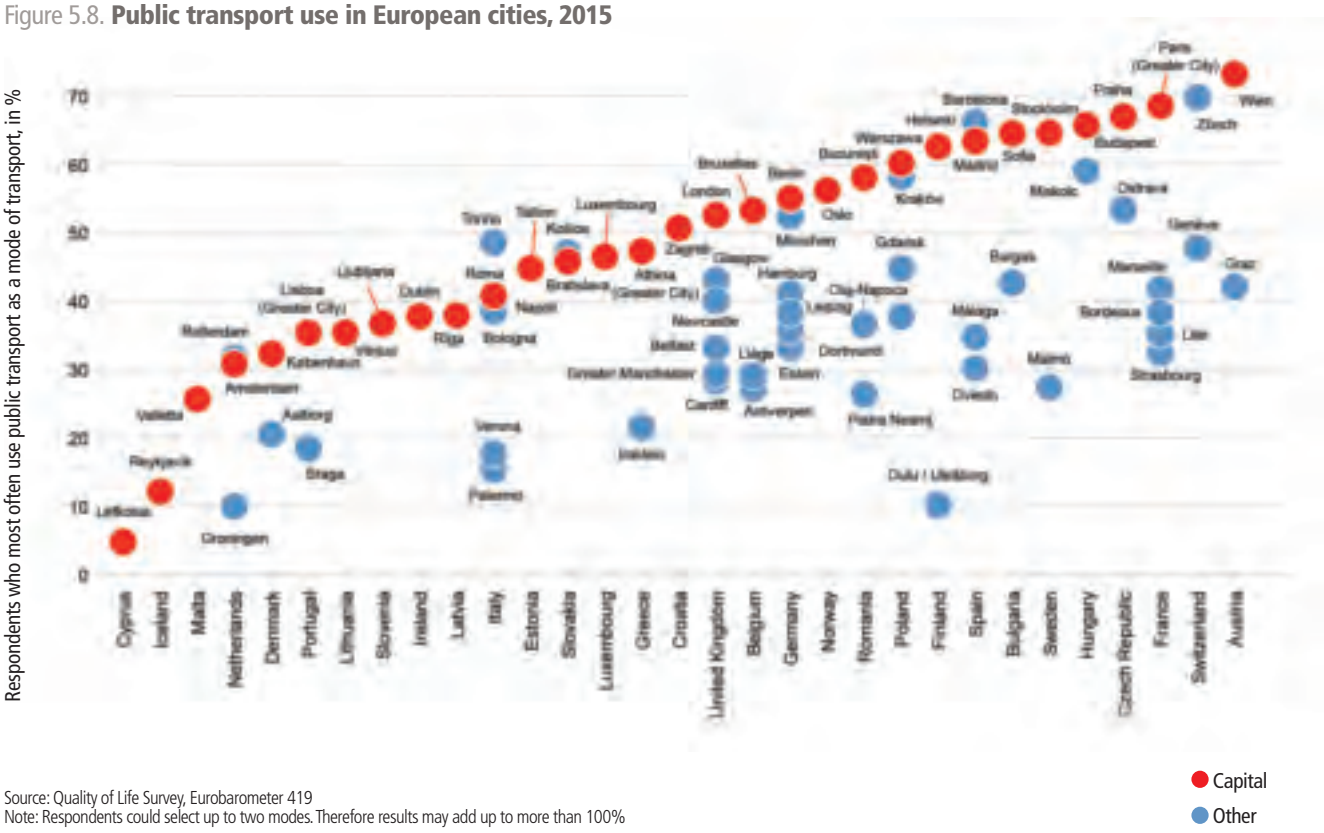
Integrated public transport hub at Cracow main railway station, Poland, 2007-13

The city of Cracow has remodelled its main railway station thanks to Cohesion Policy investments to make it easier for passengers to switch between suburban rail and urban public transport. The contribution to this project was EUR 14 million.

Enhancing regional mobility and multi-modal transport connections of Athens, Greece, 2014-20

From 2014-2020, EU Cohesion Policy will play an important role in improving the urban sustainable mobility network of Athens by enhancing the position of the port of Piraeus in the cruise ships system in the Mediterranean Sea, by extending tram lines and completing road connections to the TEN-T network.

Figure 5.8. **Public transport use in European cities, 2015**



Source: Quality of Life Survey, Eurobarometer 419
Note: Respondents could select up to two modes. Therefore results may add up to more than 100%

only be temporary trend as in some EU-13 cities public transport has started to recover. Prague, capital of the Czech Republic, has greatly expanded and improved its public transport services over the past two decades, yielding rising passenger volumes and stabilising the public transport mode share of trips.

Measuring access to public transport

Public transport varies from city to city across the EU in terms of the scale and frequency of service. A new study (Poelman and Dijkstra, 2015) compares access to public transport taking into account the location of public transport stops, the frequency of departures at each stop, the distribution of population and the extent of the urban centre. This type of analysis can help cities to benchmark themselves with other cities of a similar size.

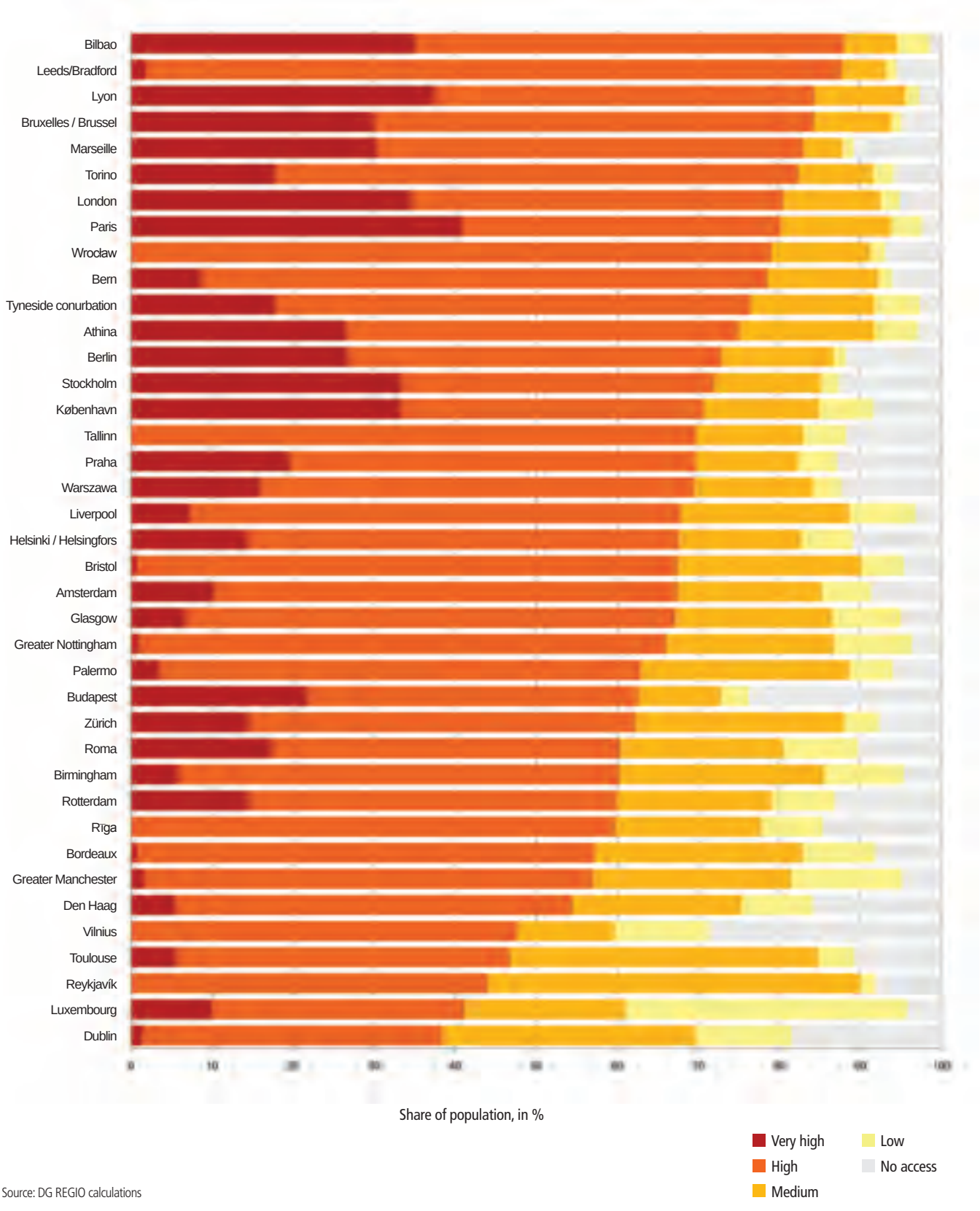
The analysis distinguishes five levels of access:

- **No access:** people cannot easily walk to a public transport stop, in other words it takes more than 5 minutes to reach a bus or tram stop and more than 10 minutes to reach a metro or train station.

Access to public transport tends to be better in large cities but wide variations remain among cities

- **Low access:** people can easily walk to a public transport stop with less than four departures an hour.
- **Medium access:** people can easily walk to a public transport stop with between four and ten departures an hour.
- **High access:** people can easily walk to a bus or tram stop with more than 10 departures an hour OR a metro or train station with more than 10 departures an hour (but not both).
- **Very high access:** people can easily walk to a bus or tram stop with more than 10 departures an hour AND a metro or train station with more than 10 departures an hour.

Figure 5.9. **Access to public transport in capital cities and large cities, 2014**



Source: DG REGIO calculations

Access to public transport tends to be better in large cities but wide variations remain among cities. The share of population with (very) high access varies from 38% in Dublin to 88% in Leeds-Bradford and Bilbao. The share with no access also varies from only 1% in Bilbao to 29% in Vilnius and 24% in Budapest (Figure 5.9).

Making walking more attractive

The only city where walking is the main mode of transport for the majority of residents is Paris (see Figure 5.10). Nevertheless, in two out of three cities, at least 25% of the population walk most places.

Many European cities have increased the number of pedestrian zones and implemented measures of traffic calming in the centre and residential areas. Vienna, for example, has one of the oldest car-free pedestrian zones, established in 1974 and tripled its area from 1990 to 2015 to include most of the historic city core.

While pedestrian zones tend to be most important in the commercial or historical cores of cities, traffic calming has become increasingly important in residential areas. This involves not only a 30 kilometres per hour speed limit on all motorised traffic but also the partial redesign of streets to reduce motor vehicle speeds. Over half of the residential streets are traffic calmed in most Austrian and German cities: 85% in Munich, 78% in Berlin and 75% in Vienna. Many EU cities have also been experimenting with 'shared streets,' which generally have a much lower speed limit and give pedestrians and cyclists the legal right to use the entire width of the street.

Boosting cycling

Many EU cities have been expanding their bicycling networks (Pucher and Buehler 2008, 2012). Since the 1990s, Berlin, Hamburg, London, Munich, Paris and Vienna have added hundreds of kilometres of bike routes or lanes. A significant number of cities have also improved their bike infrastructure through path widening, better paving, improved maintenance and better roadway markings, while expanding and improving the supply, quality and security of bike parking (Pucher and Buehler 2012).

Many European cities have increased the number of pedestrian zones and implemented measures of traffic calming in the centre and residential areas. Vienna, for example, has one of the oldest car-free pedestrian zones, established in 1974 and tripled its area from 1990 to 2015 to include most of the historic city core

Urban cycling in Mediterranean countries is generally much lower than in northern Europe. There are however, exceptions such as Bolzano (29%), Ravenna (15%), Thessaloniki (10%) and Ljubljana (10%).

Box 5.5. **Vienna's Verkehrsverbund Ost-Region**

Vienna's regional public transport system VOR (Verkehrsverbund Ost-Region) was founded in 1984. Between 1990 and 2012, VOR increased total place km of service per year (including seating capacity and standing room) by 74%. The Vienna metro system had grown to 80 km by 2015 with further expansion underway. The service area of VOR also expanded and, on a per-capita basis, service supplied rose by 46% through more routes, higher frequencies, more connections and larger geographic coverage.

Throughout the EU, cities have introduced discounted monthly, annual, and semester tickets for regular users. Most systems offer unified ticketing and fare structures, they are generally zone-based, with shorter trips costing less than longer trips, but with fares depending on distance travelled and not on the type of public transport.

In Vienna, the entire city (excluding suburbs) comprises one zone and, in 2015, the cost of a monthly ticket with unlimited travel within the central zone was only EUR 50. Similar to other public transport systems in the EU, there is a further discount for annual tickets, in Vienna which have cost only EUR 365 (one euro per day) since 2011. Seniors, school students and university students get an even lower rate (VOR 2015).

Source: Buehler and Pucher, 2016; Buehler, Zimmerman, Lukacs, 2015.

Box 5.6. **Transport policies in Prague, Czech Republic**

From 1990 to 2000, car ownership in Prague almost doubled from 276 to 525 per 1,000 inhabitants while vehicle km of car use rose from 7.7 million to 16.6 million on an average weekday. Simultaneously, public transport use fell from 1,319 to 1,033 million passenger trips per year, leading to serious road congestion, illegal parking of cars, rising traffic injuries, and worsening noise and air pollution.

Consequently, the City of Prague undertook a range of policy measures such as parking management with preference for neighbourhood residents, while increasing parking prices and limiting parking time. In addition, Prague expanded its pedestrian zone in the city centre and restricted many streets to local traffic.

Improvements in public transport focused on expanding and modernising the metro, tram and bus systems, and integrating fares, ticketing, routes and coordination among 17 different public transport operators throughout Greater Prague. From 1990 to 2014, Prague's metro grew from 39 to 59 kilometres (km) and the tram network from 130 to 143 km. The bus service network was expanded with suburban routes growing from 607 to 2,258 route km. For all types of public transport combined, both in Prague and its suburbs, the network services rose from 153 million in 2010 to 208 million km in 2014.

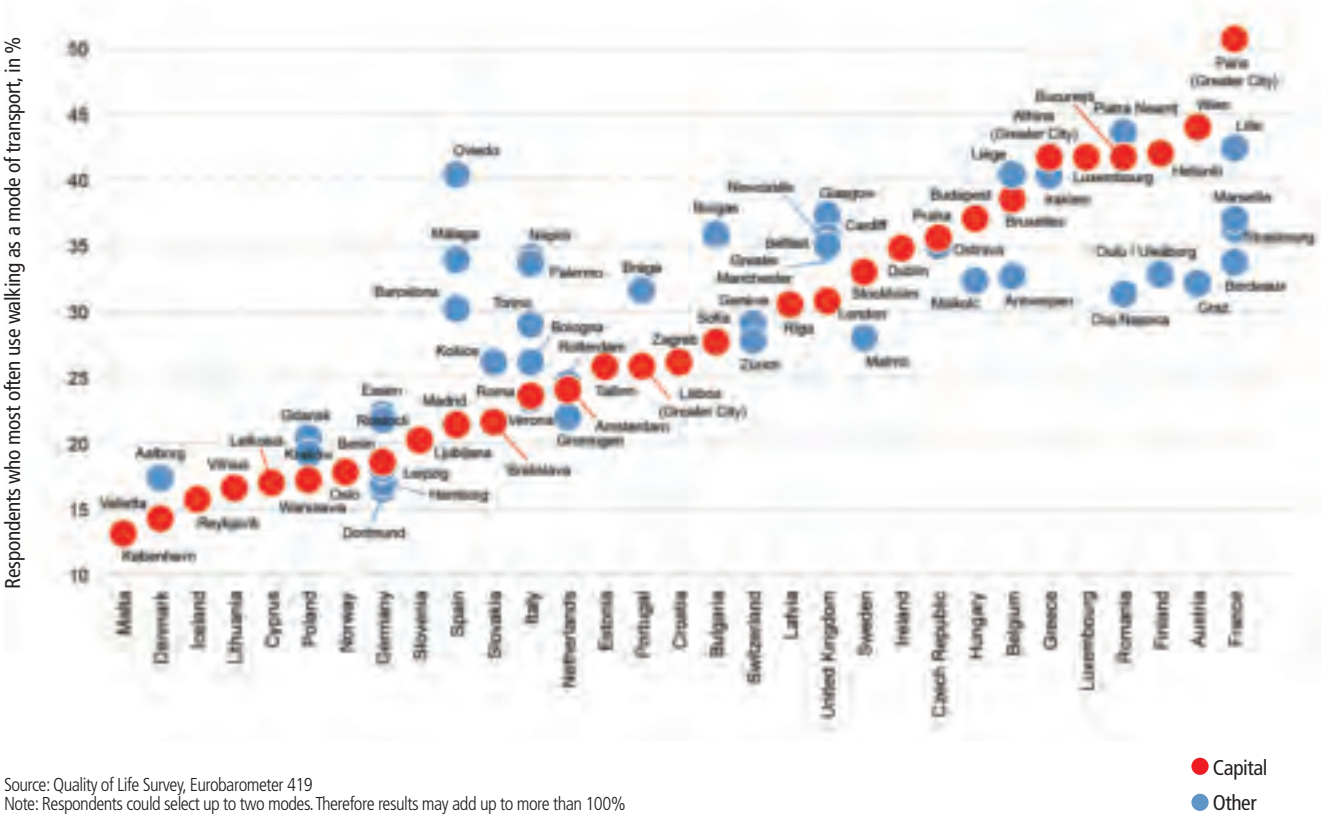
The outcome has been a public transport ridership growth from 1,033 million trips in 2000 to 1,297 million in 2014.

Prague has also succeeded in improving traffic safety, reducing traffic fatalities from 94 in 1990 to 20 in 2014 while serious traffic injuries fell from 369 to 206.

In cooperation with the EU, Prague has undertaken two major projects to reduce congestion and improve safety. As part of the EU's Cohesion Policy, Prague received EUR 20 million in funding to improve its road traffic management system, mainly through the establishment of a centralised traffic control centre which provides information on congestion and accidents both to traffic controllers and drivers. The same programme provided Prague with EUR 18 million to improve road safety through advanced information technology.

Prague has yielded rising passenger volumes by greatly improving public transport including modernising the metro

Figure 5.10. **Walking in European cities, 2015**



Source: Quality of Life Survey, Eurobarometer 419
Note: Respondents could select up to two modes. Therefore results may add up to more than 100%

A recent survey showed that in half of the cities surveyed, cycling did not reach more than a 10% modal share, in fourteen it reached a share of more than 25% and in three (Amsterdam, Copenhagen and Groningen) the share was even over 50%

A recent survey showed that in half of the cities surveyed, cycling did not reach more than a 10% modal share, in fourteen it reached a share of more than 25% and in three (Amsterdam, Copenhagen and Groningen) the share was even over 50%. This shows that cycling with the right environment can reach a high modal share.

Mixing modes

Almost every major European city has some sort of regional, multi-modal public transport agency. The widespread *Verkehrsbünde* in Austria, Germany and Switzerland offer good examples of the full integration of public transport routes, schedules and fares within metropolitan regions (Buehler and Pucher, 2011, 2012). Uniform fare structures and ticketing have been an important aspect of that coordination, since they enable passengers to transfer freely among different public transport modes, different parts of the region, and different public transport firms within the service area. Moreover, transfers between different bus and rail lines are facilitated by coordinated schedules that minimise waiting time.

Expanded and improved bike parking at rail stations and bus stops has promoted bike use for getting to and from public transport. Often bikes are also allowed on trains, but only during non-peak hours and sometimes at a special charge.

The promotion of bike-and-ride has complemented the policy of building park-and-ride lots to enable passengers to access public transport by car. Such lots

Cycling's modal share is over 50 percent in only three EU cities: Amsterdam (above), Copenhagen and Groningen © Tonyv3112

Box 5.7. **Urban public bike-sharing programmes**

The number of public bike-share schemes has grown rapidly over the past ten years with at least 230 cities with such a scheme in Europe (http://www.bikesharingmap.com/).

Public bike-share schemes allow people to pick up a bicycle or e-bike, use it for a short period and return it. They offer a low-cost, flexible transport option particularly adapted to cities given the usually short distances travelled. In most systems, riders can pick up a bicycle locked to a well-marked bike rack or electronic docking station and return it to any station within the system. Most schemes offer the first 30 minutes for free and operate 24/7 year round. Access requires a daily, weekly, monthly or annual membership fee.

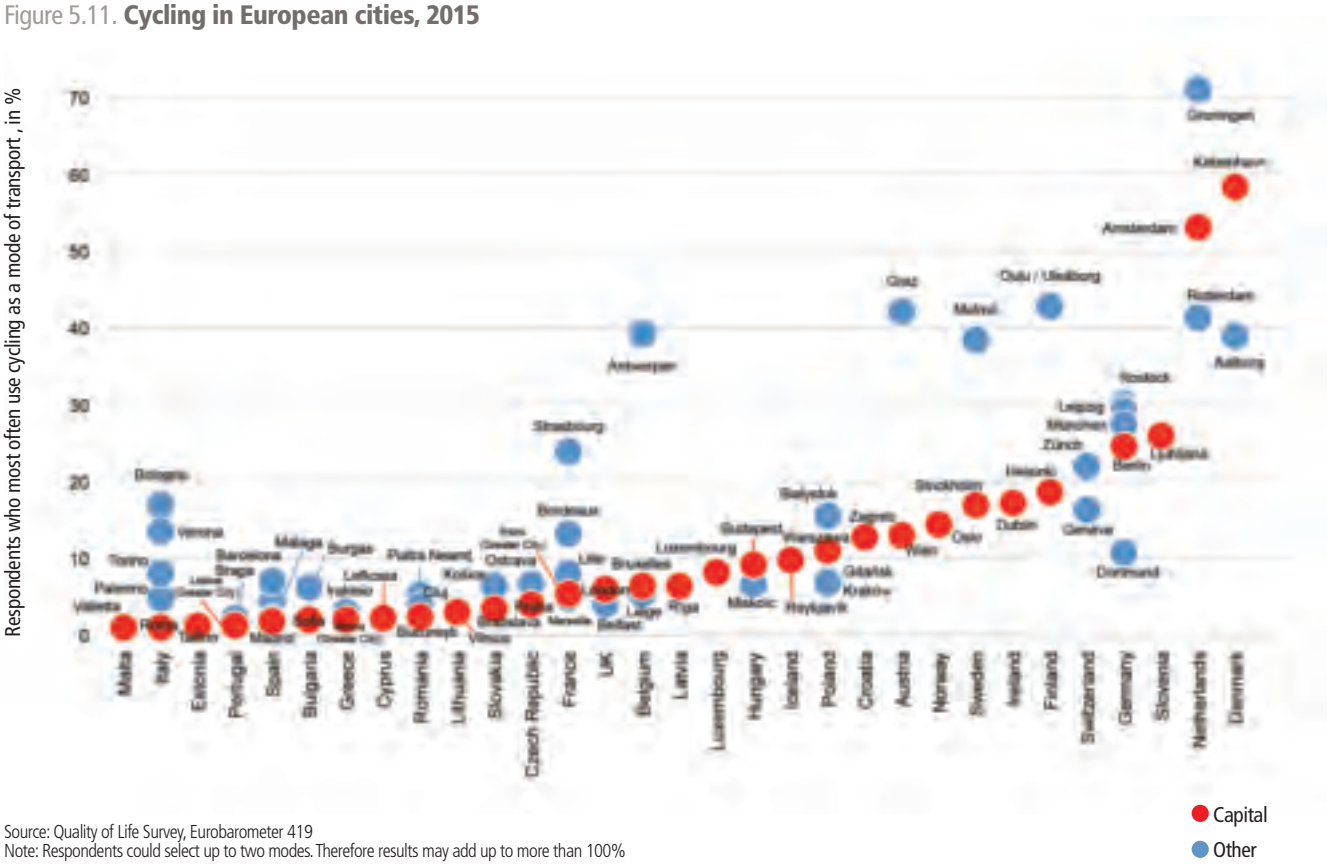
Most people use a public bike to replace a trip by public transport or walking. However, some replace car trips. A study of 2014 carried out in Barcelona, Berlin, Brussels, Lyon, London, Paris and Stuttgart showed that private motorisation was reduced by a bicycle share scheme.

The key success factors of a public bike-share scheme are not limited to the scheme itself but to a wider, integrated transport policy. It requires:

- A sufficient network size and density with stations at strategic locations;
- Simple design, handling and registration modalities, but also good design of bicycles and stations;
- Good cycling infrastructure with high levels of road safety; and
- Links to the public transport system.

Lyon, France was the first city in the world to introduce a cycle-share scheme in 2005. There are now over 250 such schemes worldwide

Figure 5.11. **Cycling in European cities, 2015**



Source: Quality of Life Survey, Eurobarometer 419
Note: Respondents could select up to two modes. Therefore results may add up to more than 100%

The EU has set the goal of reducing road fatalities by half by 2020 compared to 2010, which would save 15,000 lives annually

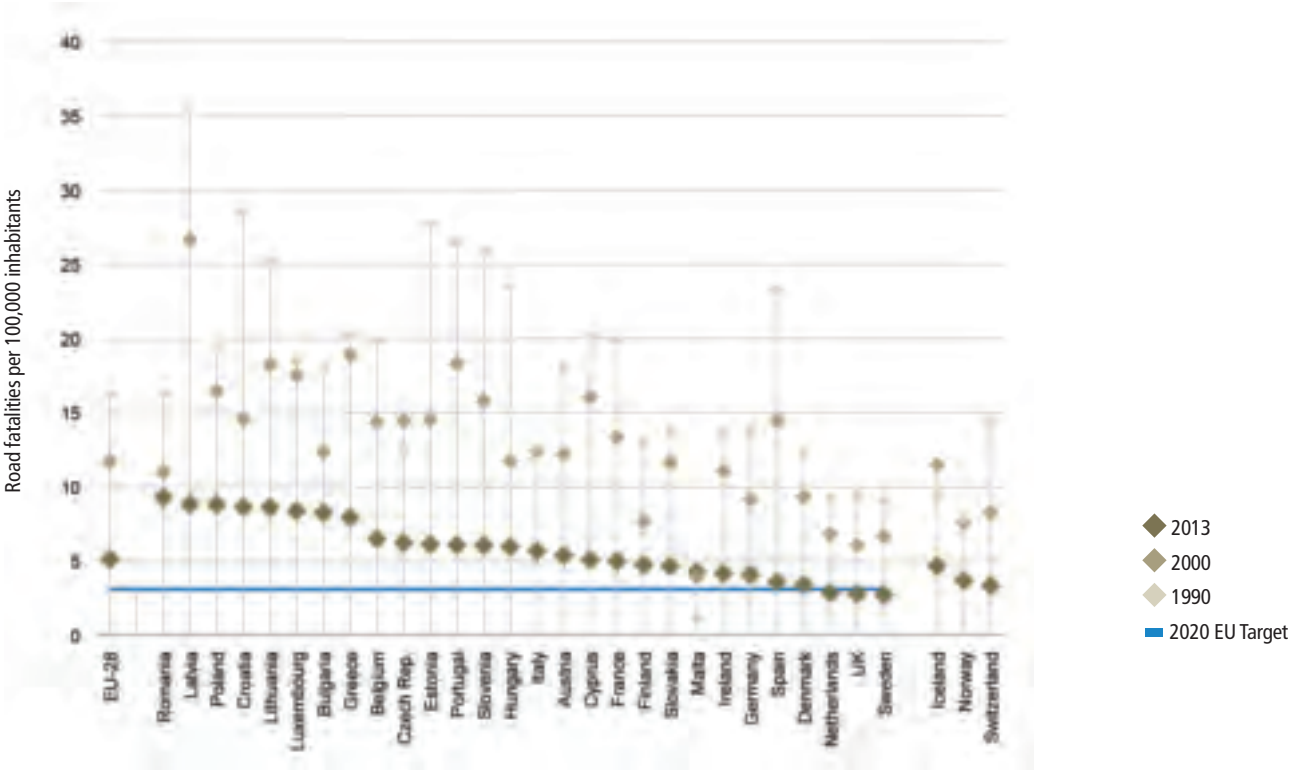
have usually been in outlying portions of cities or in their suburbs, where development density is so low that the car is the only realistic way to access rail stations.

5.6. **Some cities have the safest traffic in the world but others need to catch up**

The EU has set the goal of reducing road fatalities by half by 2020 compared to 2010, which would save 15,000 lives annually. This goal translates into a road fatality rate of 3.1 per 100,000 inhabitants. In 2013, only the Netherlands, Sweden and the UK had reached this goal (Figure 5.12). Within the EU, the fatality rates ranged from 2.7 in Sweden to 9.3 in Romania. However, all countries have succeeded in improving traffic safety. The most important reduction from 1990 to 2013 took place in Spain (-85%), but thirteen countries reduced their fatality rate by more than 70% over this period. Only five countries (Belgium, Croatia, Lithuania, Luxembourg and Poland) had a fatality rate that was double the EU 2020 target and did not reduce this quickly enough between 2010 and 2013 to reach this target.

Compared to their national average, cities score much better in terms of traffic safety with almost all of them recording lower fatality rates. About half the cities have a road fatality rate of less than 3.1 per 100,000 inhabitants (see Map 5.2). Also from a global perspective, European cities have high levels of traffic safety, especially in north-western European cities (see Map 5.2). As a comparison, rates in US cities (metropolitan statistical areas) ranged from 4 to 35 fatalities per 100,000 inhabitants in 2008-2012 (USDOT 2016).

Figure 5.12. **Road traffic fatality rate per country, 1990-2013**



Sources: DG MOVE and EUROSTAT.

Nonetheless, there is still potential for further improving traffic safety especially in the cities of eastern and some parts of southern Europe (see Map 5.2).

5.7. **Conclusion**

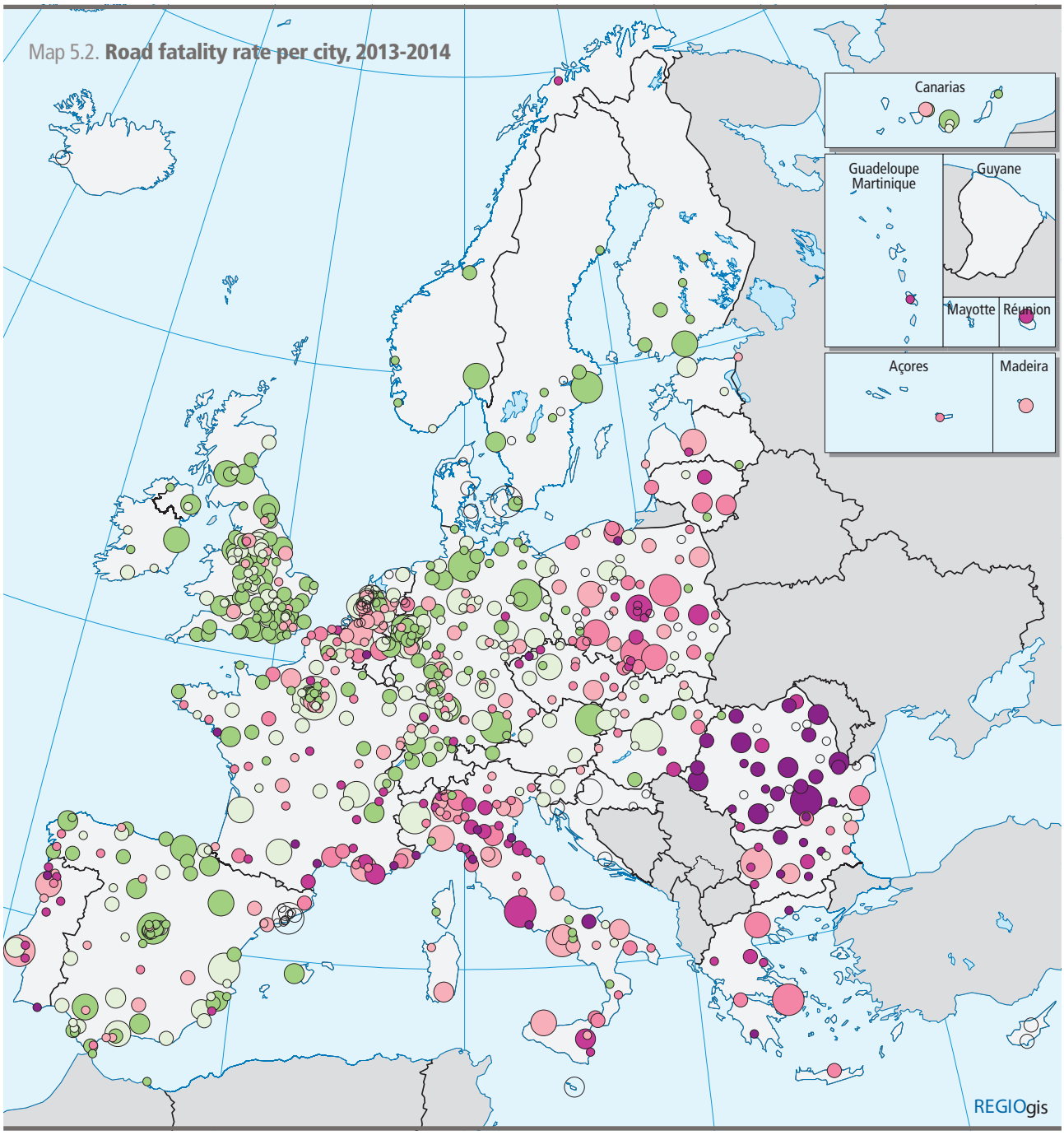
The EU has set ambitious greenhouse gas (GHG) emission reduction goals for 2030, including for transport. To reach these goals, technological progress alone is unlikely to be sufficient as increased car use has limited the impact of greater fuel efficiency.

Fortunately, cities have a natural advantage when it comes to promoting low-carbon mobility. Their density and mixed use ensure that many destinations can easily be reached on foot, by bike or using public transport. As a result, most cities have car-ownership levels lower than the national average. However, these benefits do not occur automatically.

Congestion reduces the accessibility of cities, increases energy use and pollutes the air. Addressing this problem can improve mobility for all transport modes, but there is no single solution that magically will alleviate congestion. Cities can implement a clear parking policy that encourages people to use other modes to go to the city centre. Congestion charging can improve mobility as some cities have shown. Tax incentives can also play a role, for example, a mobility budget that provides all employees with the same level of financial support regardless of the transport mode they use to get to work. The key to success, however, is the quality of the alternatives. Without attractive and competitive options, a shift away from the car towards low-carbon modes will be difficult to achieve.

Public transport should be fast, frequent and easily accessible to compete with the car. This may require action to ensure that buses and trams are not stuck in traffic jams. Several cities have been very successful in persuading more people to use public transport. Bicycle-sharing and car-sharing schemes can make it easier for people to switch modes and are likely to reduce energy use. To encourage people to walk and cycle, these modes should be safe, fast and convenient. Although road safety tends to be higher in cities, some cities still have fatality rates that are three or four times higher than those of the cities in the Netherlands, Sweden and the UK.

Map 5.2. **Road fatality rate per city, 2013-2014**



Road fatality rate per 100,000 inhabitants

- < 2.0
- 2.0 - 3.1
- 3.1 - 4.5
- 4.5 - 6.0
- 6.0 - 9.0
- >= 9.0
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

The EU objective for 2020 is a rate below 3.1.

AT: 2013; BG, LV, NL: 2012-2013;

FR: 2012; IT, PL, PT, SK, NO: 2011-2012;

IE, EL: 2011; CZ, SE: 2010-2011; RO: 2008

Source: Eurostat

0 500 Km

Chapter 6.
Resource-efficient cities

- Cities use far less land per capita than towns and suburbs or rural areas. As a result, population growth in cities will place much lower demands on land than in towns and suburbs and rural areas. Cities also require fewer local roads per capita which means lower costs for roads and utility lines construction and maintenance.

- The indicator on land use in Goal 11 of the United Nations Sustainable Development Goals compares population change to land use change. In all the cities with a shrinking population, land use per capita increased between 2006 and 2012. In 60% of cities with a growing population, however, land use per capita dropped. Looking at changes in the city and the commuting zone (FUA) shows that in 40% of the FUAs with a growing population, land use per capita declined.

- In dense and mixed-use neighbourhoods, many destinations will be within easy walking or cycling distance. Providing public transport to such neighbourhoods is more efficient as fewer stops are needed and the network does not have to be as long.

- The indicator on open space in Goal 11 of the United Nations Sustainable Development Goals does not take into account the geographic spacing of green spaces. Therefore, this chapter suggests two new indicators: 'median size of green areas that can be reached within a 10-minute walk' and 'share of population without green space within a 10-minute walk.'

A recycling truck in Barcelona
© Iakov Filimonov


RESTA
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Chapter 6.
Resource-efficient cities

Most Mediterranean cities use very little land per person. Malaga, for example, only uses 89 m^2 of land per inhabitant, less than half the EU city average © Arenaphotouk

6.1. Introduction

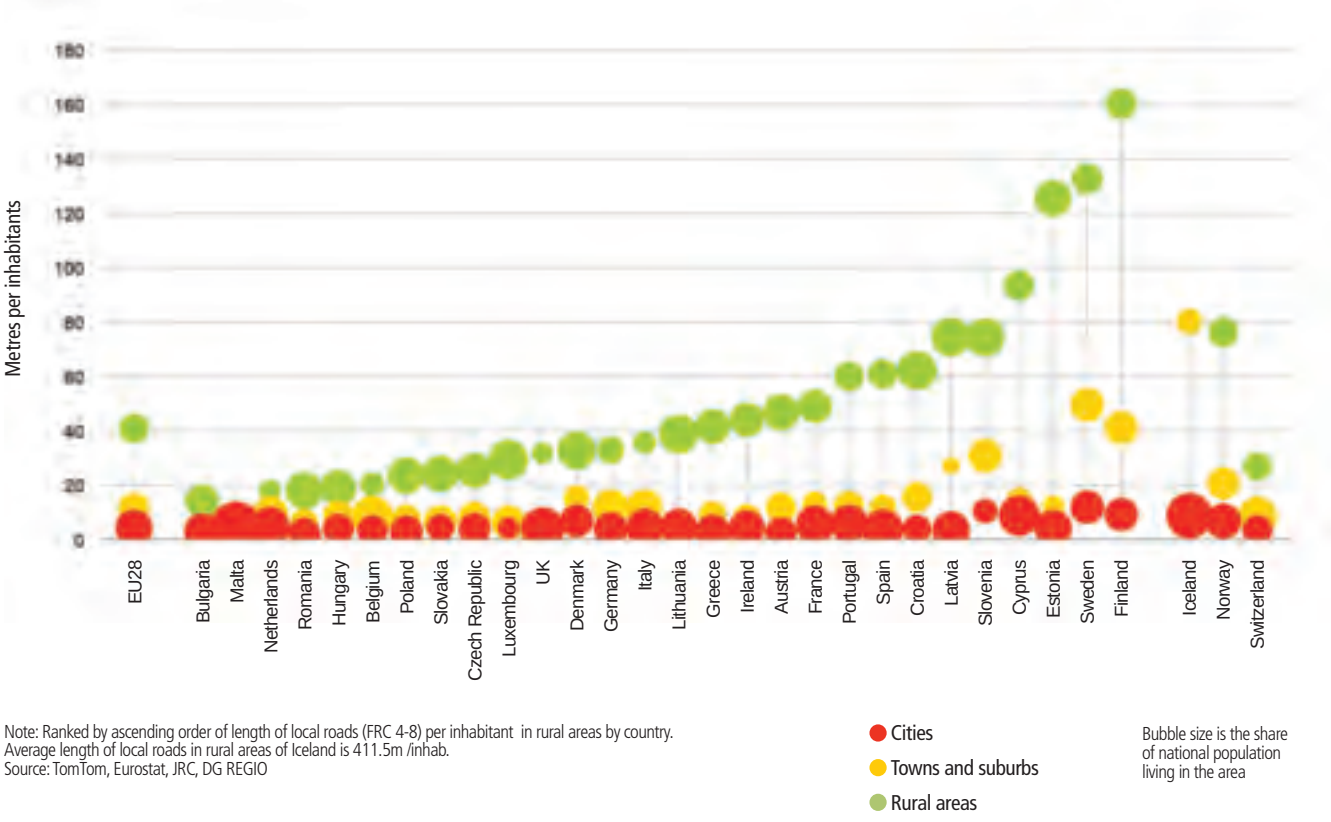
Cities have a poor environmental reputation. As they often suffer from a concentration of pollution, it is easy to jump to the conclusion that cities must be bad for the environment and the climate. Cities, however, can be very resource efficient. For example, one study found that the generation of environmental pollution and waste is lower per capita in cities in developed countries than in rural areas (Dodman 2009).

This chapter describes a few areas where cities offer such efficiency. It describes the need for local roads and utility lines in cities. It investigates land use per capita and how that has changed over time. The next section shows how densities change within a city and how urban form can make it easier to provide public transport. The final sections analyse access to green space in cities and identify cities where a significant share of the population lacks such access.

6.2. Cities have fewer roads and use less land

Cities are more resource efficient as compared to suburbs, towns and rural areas in two ways. They require fewer roads and less land per resident. The

Figure 6.1. **Road infrastructure per inhabitant, 2015**



Note: Ranked by ascending order of length of local roads (FRC 4-8) per inhabitant in rural areas by country.
Average length of local roads in rural areas of Iceland is 411.5m /inhab.
Source: TomTom, Eurostat, JRC, DG REGIO

scale of the difference is significant. Even after excluding major roads, which are generally used for international and interregional travel, rural areas have more than ten times the local road length per resident than cities (Figure 6.1). Utility lines for electricity, water, gas, phone and Internet are usually built alongside these roads. Therefore, if the road network is longer, the utility lines will be longer too, with commensurate increases in their construction and maintenance costs.

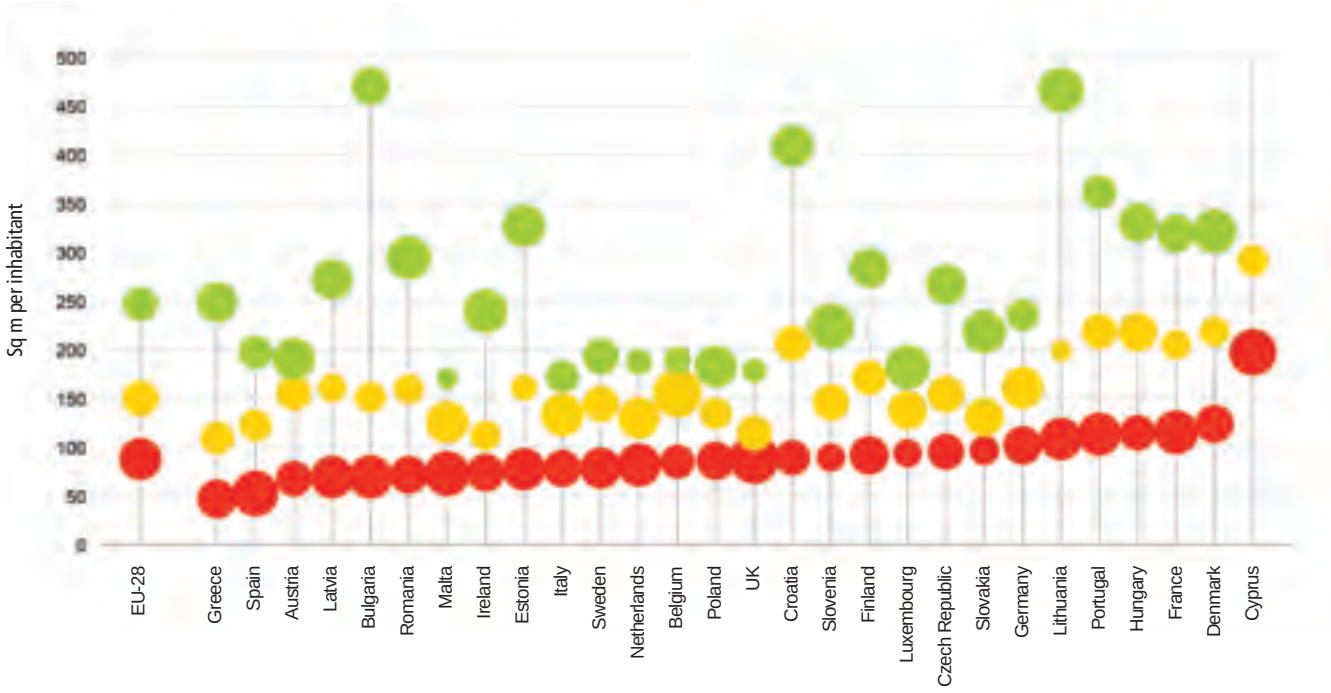
Although cities are typically highly built-up, they use relatively little land per resident. Per resident, buildings occupy four times as much land in rural areas than in cities. This difference is in part because most factories and farms are located outside cities. The other part of the difference is explained by vertical living, working and shopping. An office tower uses land far more efficiently than a horizontal office park. A five-storey building can accommodate more people than a one- or two-storey single-family dwelling. Dwellings also tend to be smaller in large cities because housing is more expensive there. All these factors contribute to the land use efficiency of cities.

Whereas on average cities use less land, a substantial amount of variation remains between countries and cities. Large cities tend to use land more efficiently (Map 6.1). Larger cities tend to be denser with more tall buildings than smaller cities. Cities in southern and central-eastern EU countries tend to use less land per inhabitant than most cities in, for instance, France and Germany.

6.3. Some cities are reducing their land use per inhabitant

Goal 11 of the United Nations Sustainable Development Goals includes target 11.3 on land use and population change. It stipulates: By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries. This target is linked to two indicators. The first one is 'Ratio of land consumption rate to population growth rate'. This ratio will increase if urban land use grows faster than population (extensification) and will be smaller if urban land grows more slowly than population (intensification).

Figure 6.2. **Built-up area by degree of urbanisation, 2012**



Note: Value for rural areas in Cyprus is 764 m²/inhabitant
Source: JRC ESM and REGIO calculations

Secondly, the data needed to calculate this indicator can also be used to estimate the amount of urban land per resident, which can be labelled 'land use efficiency indicator'. In Europe, the large cities and the cities in southern and central-eastern EU countries tend to use less land per inhabitant.

Monitoring how this indicator changes over time indicates whether cities are intensifying or extensifying their land use. Map 6.3 shows that 36% of cities (out of 322 cities with available data) increased their land use efficiency in the period 2006-2012 (highlighted as green circles). A closer look reveals that in cities where population has declined over the same period, land use efficiency also dropped. Even if no new buildings were constructed in such a city, its efficiency would drop due to population decline. Of the cities with population growth, 60% increased their land use efficiency between 2006 and 2012.

Measuring this change at the level of functional urban areas (FUAs) shows that 27% (of the 238 FUAs with data available) have increased their land use efficiency. In 40% of the FUAs with a growing population, land use efficiency increased.

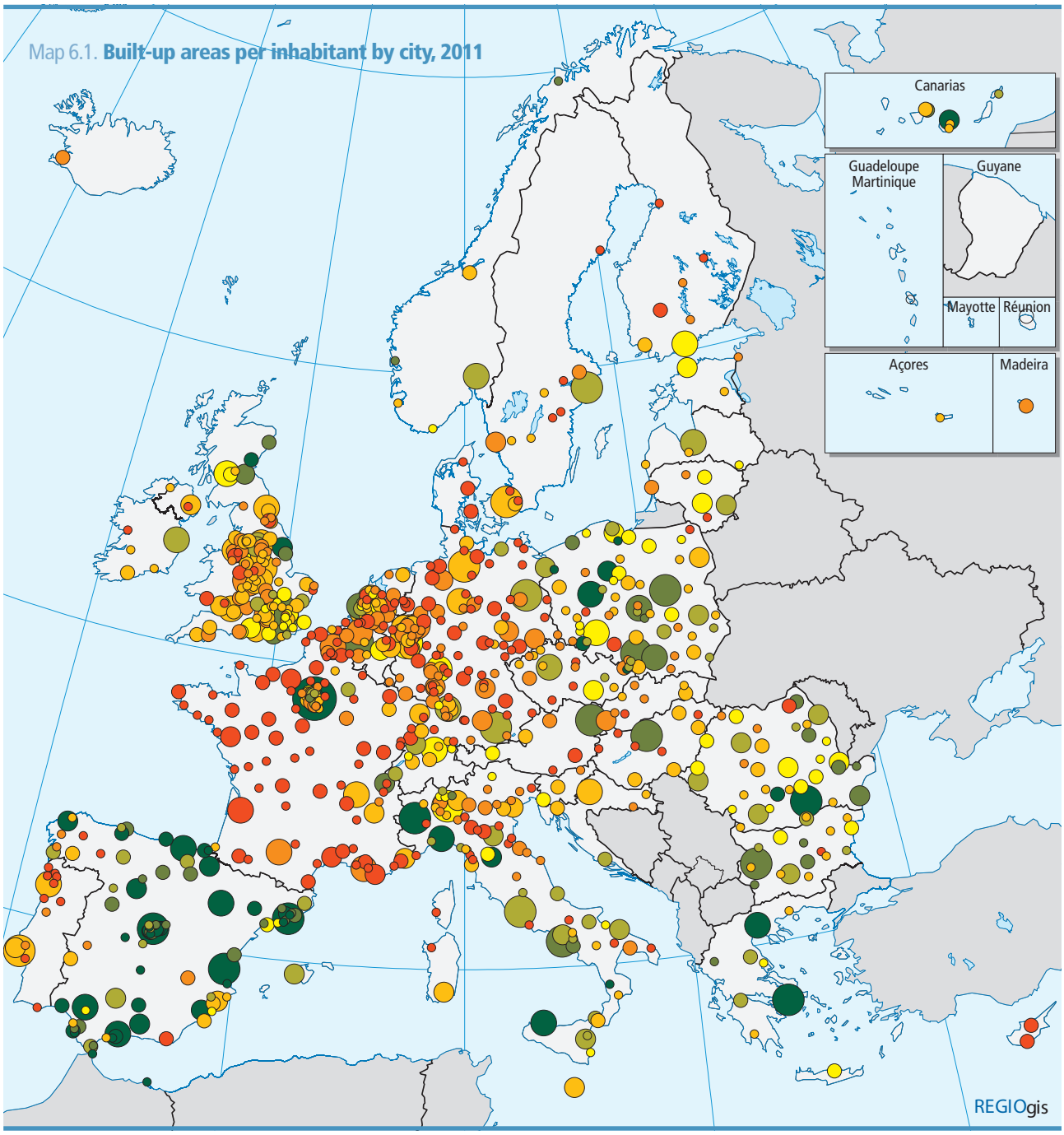
If the boundary of any city were expanded to include a large agricultural or natural area, the overall population density of the city would drop but its weighted density would not

6.4. Dense neighbourhoods are more efficient

Land use is closely linked to the density of a city. Population density, however, is a tricky indicator that is easily distorted by large uninhabited areas inside the city boundary. Therefore, this report uses 'weighted population density' that calculates the density of each 1 km² grid cell in a city and takes the population weighted average of these cells. It can be understood as the average neighbourhood population density. If the boundary of any city were expanded to include a large agricultural or natural area, the overall population density of the city would drop but its weighted density would not.

The results show a close link with the built-up area per resident. Cities with a high-weighted density

Map 6.1. **Built-up areas per inhabitant by city, 2011**



m²/inh.

- < 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 100
- 100 - 120
- > 120
- No data

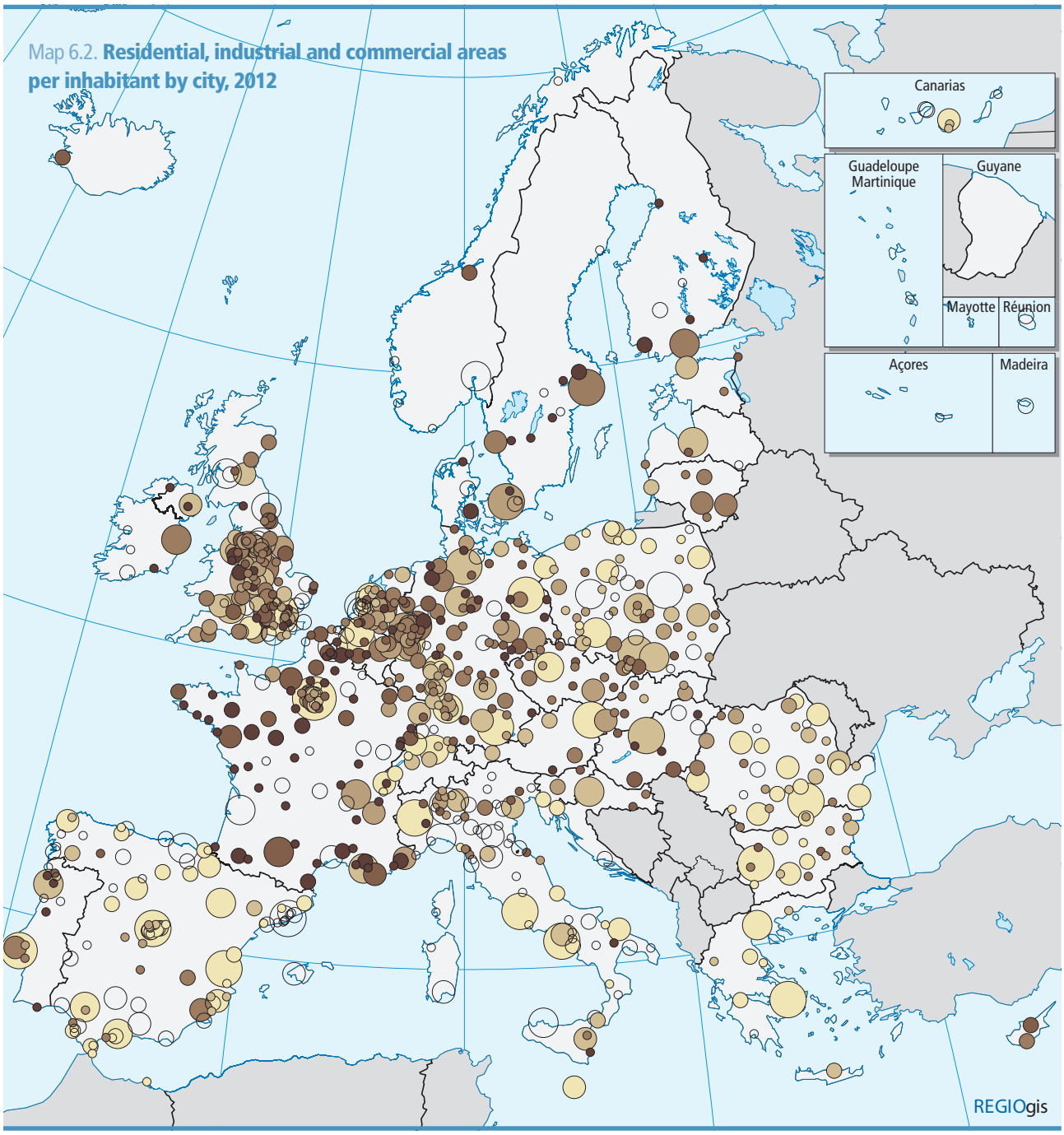
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Sources: JRC (ESM 2016), Eurostat (GEOSTAT), DG REGIO

0 500 Km

Map 6.2. **Residential, industrial and commercial areas per inhabitant by city, 2012**



m²/inh.

- < 140
- 140 - 175
- 175 - 200
- 200 - 250
- 250 - 300
- > 300
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Residential, industrial, commercial, public and private built-up areas.
Sources: Copernicus Urban Atlas, Eurostat, DG REGIO

0 500 Km

Denser cities like Paris have lower GHG emissions compared to less dense cities

In cities where the population declined in the period 2006-2012, land use efficiency also dropped

tend to use less land. Weighted density is very high in Spanish cities (Map 6.4), more than 12,000 inhabitants per square km. Also other cities in southern and central-eastern EU countries tend to have higher weighted densities. In north-western Europe, weighted densities are lower, except in large cities. Dense urban development is linked to lower energy use and carbon emissions per capita and generally lower demand for resources compared with less dense cities (Beatley, 2003, p. 250). In large cities, weighted density is higher close to the city centre (Figure 6.3). In the first five km from the city centre, densities range from around 12,000 residents/km^2 in Berlin, London, Rome and Warsaw to between 25,000 and 32,000 residents/km^2 in Athens, Madrid and Paris. At a distance of 20 km from the centre, however, densities drop below 5,000 in all these cities except Madrid. London has a much lower population density than Paris in the first 10 km from the centre, but beyond 10 km their densities are very similar again.

In capital cities with a FUA of between two and three million inhabitants, densities are lower and drop off faster (Figure 6.4). Bucharest, Budapest, Brussels and Vienna all have a density above 15,000 within the first 5 km. Amsterdam, Lisbon, Prague and Stockholm are less dense in their centre, reaching over 10,000. Beyond 10 km, the density drops below 5,000, with the exception of Lisbon, which is more constrained by its location on the coast.

An analysis of 44 European cities showed that denser cities have lower GHG emissions compared to less dense cities (Baur et al. 2015). While this may show that urban living can offer more efficient energy provision and consumption practices, this is by no means guaranteed.

Box 6.1. **How to measure land use changes in cities**

Land use in cities can be monitored in three ways:

1. Building footprints measure land covered by buildings. The built-up areas shown in this chapter are estimates of the building footprints. These do not include gardens, the transport network or open and green spaces.

2. Residential, industrial and commercial areas capture the buildings plus their surroundings. For example, a residential area includes the houses and their gardens. This does not include the transport network or open and green spaces.

3. A city footprint includes all the land inside the boundary of the area identified as a city. It includes gardens, the transport network and open and green spaces within the area defined as urban or suburban.

For example, the SDG-Goal 11 Monitoring Framework (UN-HABITAT 2016) proposes the following: 'The urban agglomeration includes urban (built-up density above 50 percent) and suburban areas (built-up density between 50 to 10 percent). The urban agglomeration should exclude areas below a minimum built-up density of 10 percent that are considered as rural areas.'

The amount of built-up areas detected depends on the exact definition of built-up and the resolution at which it is measured. In addition, if the classification is done based on satellite imagery, it also varies by type of sensor, sensor resolution and detection methods used. As a result, the same agglomeration could have a different amount of built-up depending on the data sources and methods used.

This report recommends using residential, industrial and commercial areas since that avoids including open space and transport networks as the city footprint does. It also avoids a too narrow focus on buildings. Building footprint data may give the impression that the remaining land can be used for development, while this is usually not the case for the gardens and areas immediately surrounding existing buildings.

This report uses the city boundaries and the city plus its commuting zone boundaries to monitor land use changes. Globally, commuting zones are more difficult to define due to the absence of data. The first chapter shows how the degree of urbanisation can be used as a global, people-based definition of cities. In addition, adjacent suburbs and towns could be added to a city as an approximation of a functional urban area or urban agglomeration. The European Urban Atlas provides reliable, comparable, high-resolution land use maps for all European cities and their commuting zones for the reference years 2006 and 2012. Satellite imagery is used in combination with in-situ data to create detailed land use maps that allow comparisons not only between cities in different countries but also over time. This data is available for visualisation and free download from: http://land.copernicus.eu/local/urban-atlas.

Further interventions and adaptations are required to ensure that cities generate energy savings.

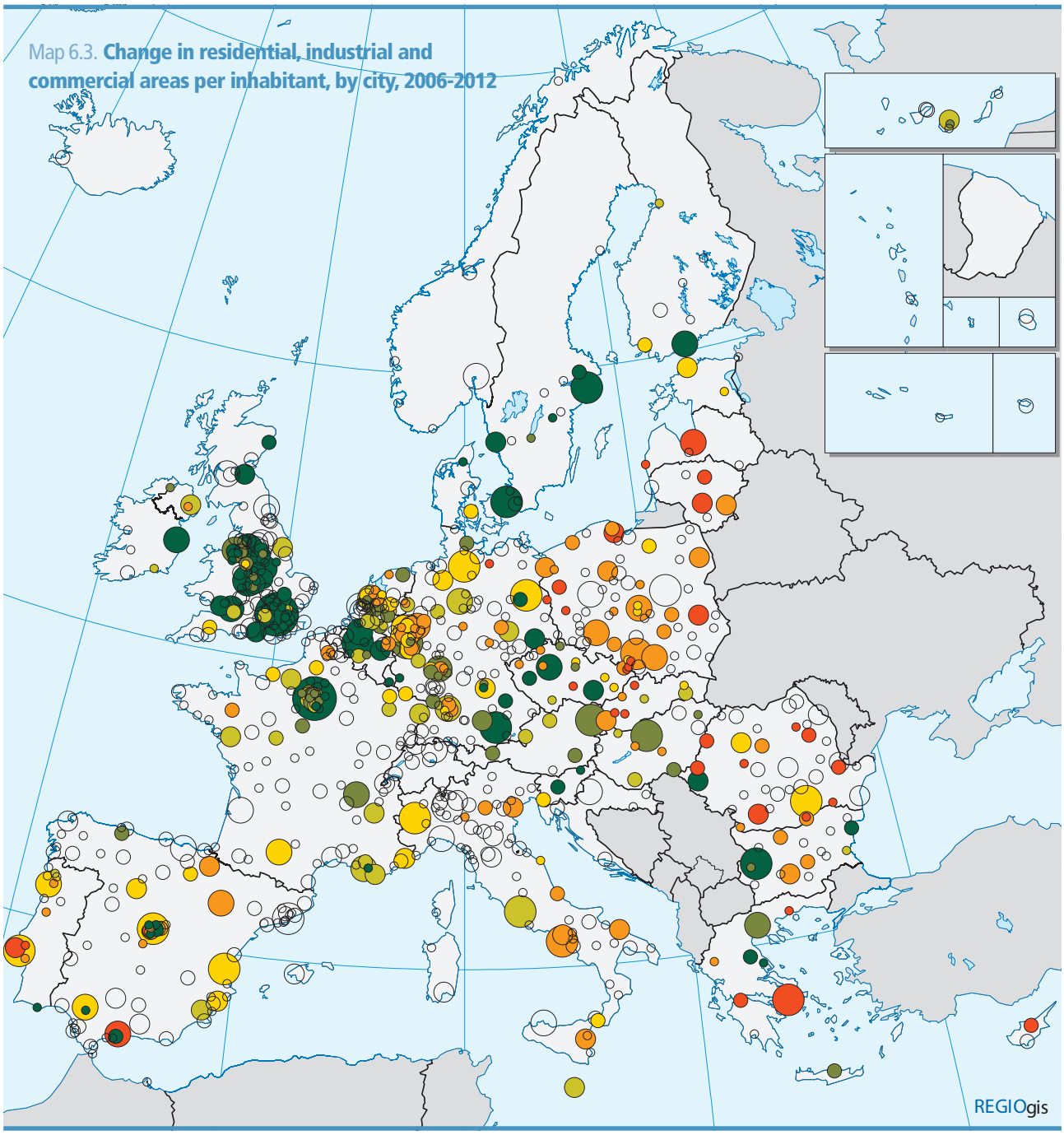
6.5. Urban form can make walking, cycling and public transport more attractive

The effect of the urban form on transport demand is still being debated (see also Chapter 5). On the one hand, some argue that denser cities allow for shorter trips, more walking and cycling and more efficient public transport. On the other hand, others argue that public transport can also be provided efficiently in low-density cities and that long-distance commuting is also increasing in dense cities.

The effect of city size is also not yet fully understood. Do smaller cities lead to shorter trips and thus lower energy use for mobility or does the smaller size lead to less public transport and more car travel? More and better data is needed to disentangle the impact of size and density from other factors such as income, public transport quality and the shift in people's preferences between modes.

Although this report cannot answer these questions, it presents a new index to assess to what extent a functional urban area can provide public transport in an efficient manner. The index captures how many public transport stops are needed to provide access to 80% of the population of a city and its commuting zone and how far apart these stops are located (JRC 2015). If access can be provided with only a small number of stops and these stops are close to one another, it is more efficient. The more stops needed and the greater the total distance between stops, the less efficient it is.

Map 6.3. **Change in residential, industrial and commercial areas per inhabitant, by city, 2006-2012**



m²/inh.

- < -2
- -2 - 0
- 0 - 2
- 2 - 4
- 4 - 8
- >= 8
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Residential, industrial, commercial, public and private built-up areas.
Sources: Copernicus Urban Atlas, Eurostat, DG REGIO

0 500 Km

Prague was one of the highest scoring capitals in the EU in terms of the median green surface area that can be reached within 10 minutes

Box 6.2. **How to measure urban sprawl in Europe**

Urban sprawl is typically defined as 'low-density development that follows a linear, scattered or leapfrogging pattern'.

In 2006, the European Environment Agency (EEA) published its first urban sprawl report. It underlined that sprawling cities demand more energy, require more transport infrastructure and utility lines, and consume larger amounts of land. This damages the natural environment and increases greenhouse gas emissions. Among the consequences are climate change and increased air and noise pollution.

In a similar way to the proposed UN Sustainable Development Goal indicator on land use and population change, this report measures urban sprawl by comparing land-use conversion to population growth. If population growth was faster than land use growth, densities drop and sprawl increases. Although this approach captures density changes, it does not capture starting level. It also does not capture scattered or leapfrogging development.

This report uses two main sources of information: Moland, for city specific analysis and CORINE for pan-European analysis. The latter posed a number of methodological obstacles since it maps urban fabric only if it is at 50% built-up and at least 25 hectares. As a result, low-density and scattered developments are difficult to identify using this source.

Therefore, two new data sources, used in this report, were created. The first is the European Urban Atlas, which maps low-density residential fabric (down to less than 10% built-up) and uses a much finer resolution (0.25 hectares). The second is the European Settlement Map or ESM. This is a higher resolution European version of the Global Human Settlement Layer (see Chapter 1). ESM detects buildings at a starting resolution of 2.5m.

In 2016, the EEA, together with the Swiss Federal Office for the Environment (FOEN), published a new report on urban sprawl that includes a number of innovations. Through the use of a population grid and data on artificially sealed areas, a more detailed picture of land use per capita was possible. In addition, a new method was applied to capture leapfrogging development. This method, however, focused primarily on the visible or aesthetic impact of sprawl within a short radius of 2 kilometres (km). As many trips are longer than 2 km, such an analysis cannot capture the impact of sprawl on increased energy consumption for transport.

The FUAs that can provide public transport efficiently are located in Bulgaria, Greece, Lithuania, Romania and Spain (Map 6.5). Many FUAs in Croatia, Italy, the Netherlands and the UK can also provide public transport efficiently. In contrast, the majority of FUAs in Belgium, Denmark, France, Germany and Poland require more public transport stops with more distance between them.

6.6. Some cities lack sufficient access to green areas

The United Nations urban Sustainable Development Goal also includes an indicator on open space: Share of the built-up area of a city that is open space for public use for all, by sex, age and persons with disabilities. This indicator presents, however, a number of challenges. First of all, it does not take into account the geographic distribution of these spaces. For example, a city with a large park in an affluent neighbourhood can have the same indicator value as a city with many small parks distributed across the entire city. Secondly, the indicator will also be influenced by the boundary and including or excluding a neighbouring forest will have a major impact on the share.

A city with a large park in an affluent neighbourhood can have the same indicator value as a city with many small parks distributed across the entire city

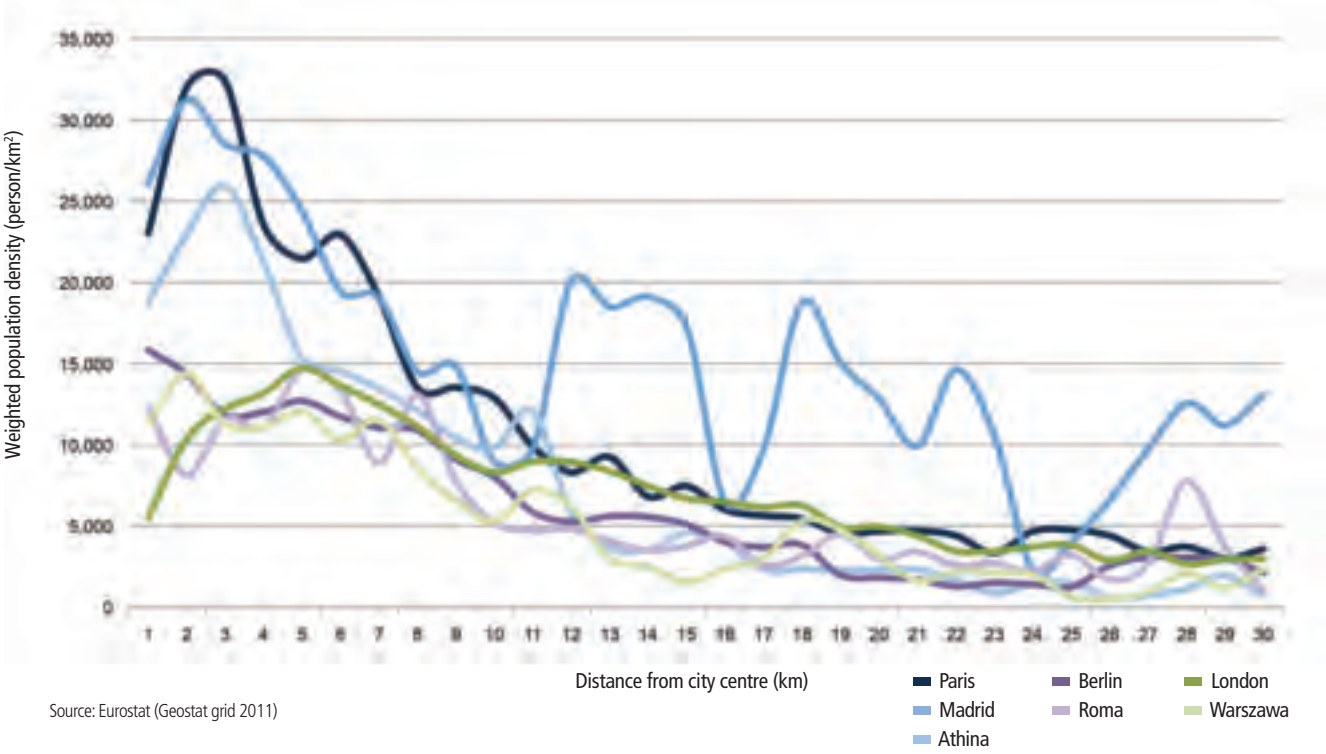
This report presents two new indicators that measure access to green space and that take into account the spatial distribution of parks and people:

1. The median size of green urban areas that can be reached within a 10-minute walk (Poelman 2016); and

2. The share of population without a green area within a 10-minute walk.

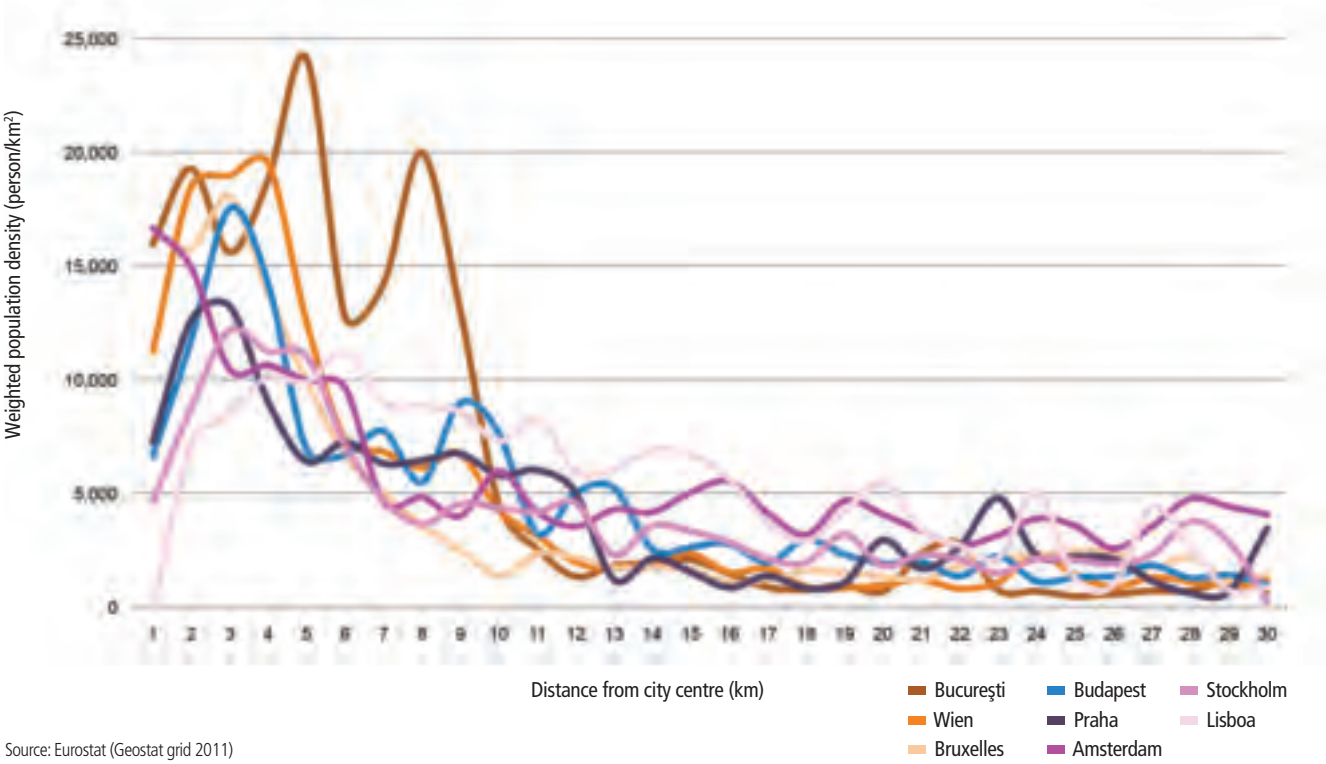
These indicators rely on data from the Copernicus Urban Atlas, which defines green urban areas as 'public green areas for predominantly recreational use such as gardens, zoos, parks, or suburban natural areas that have become and are managed as urban parks'. This atlas also captures relatively small green urban areas

Figure 6.3. **Population density in EU capitals by distance from the city centre (FUA> 3 million), 2011**



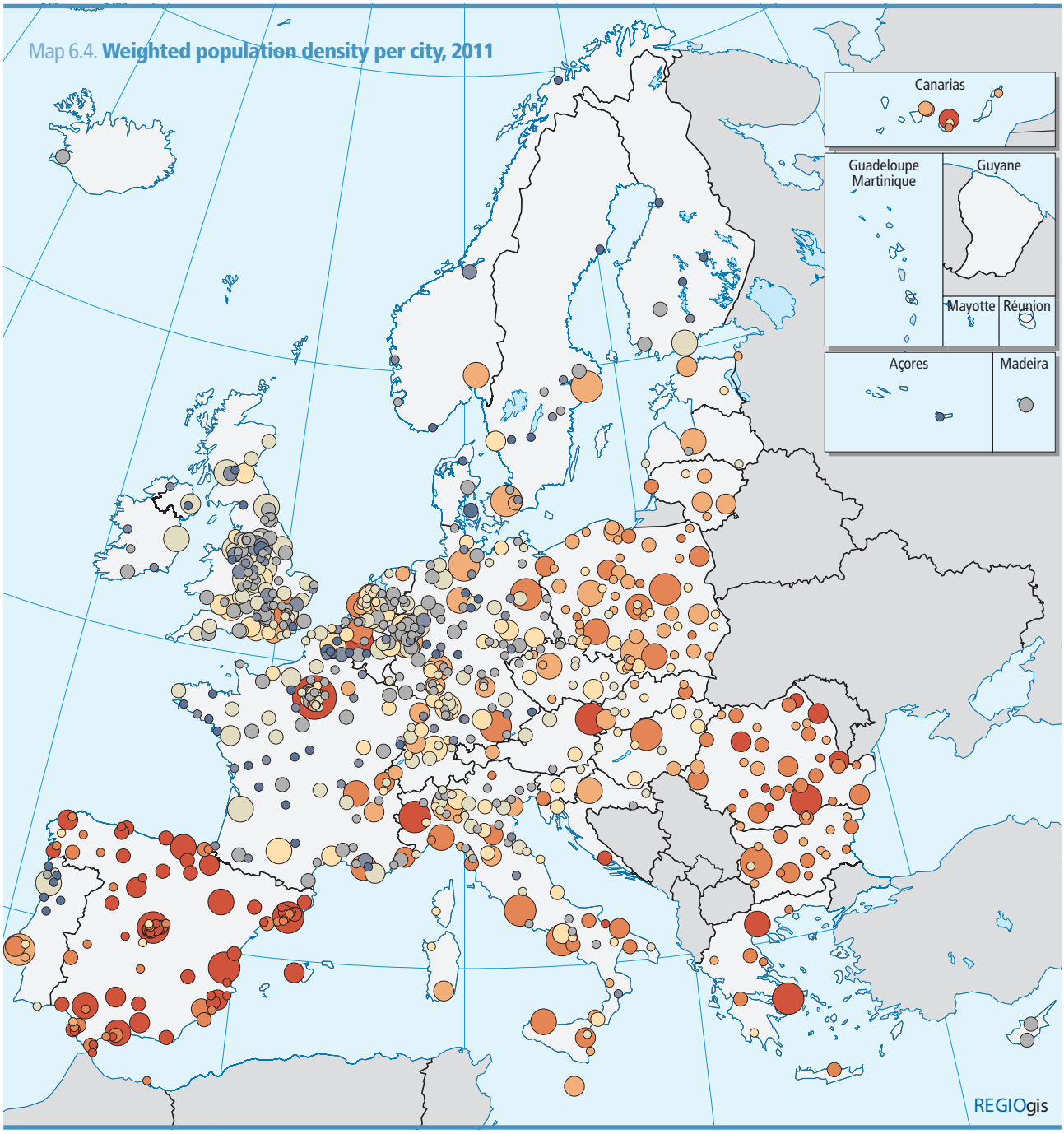
Source: Eurostat (Geostat grid 2011)

Figure 6.4. **Population density in EU capitals by distance from the city centre (FUA 2-3 million), 2011**



Source: Eurostat (Geostat grid 2011)

Map 6.4. **Weighted population density per city, 2011**



Inhabitants/km²

- < 2500
- 2500 - 3000
- 3000 - 4000
- 4000 - 5000
- 5000 - 6000
- 6000 - 8000
- 8000 - 12000
- >= 12000
- No data

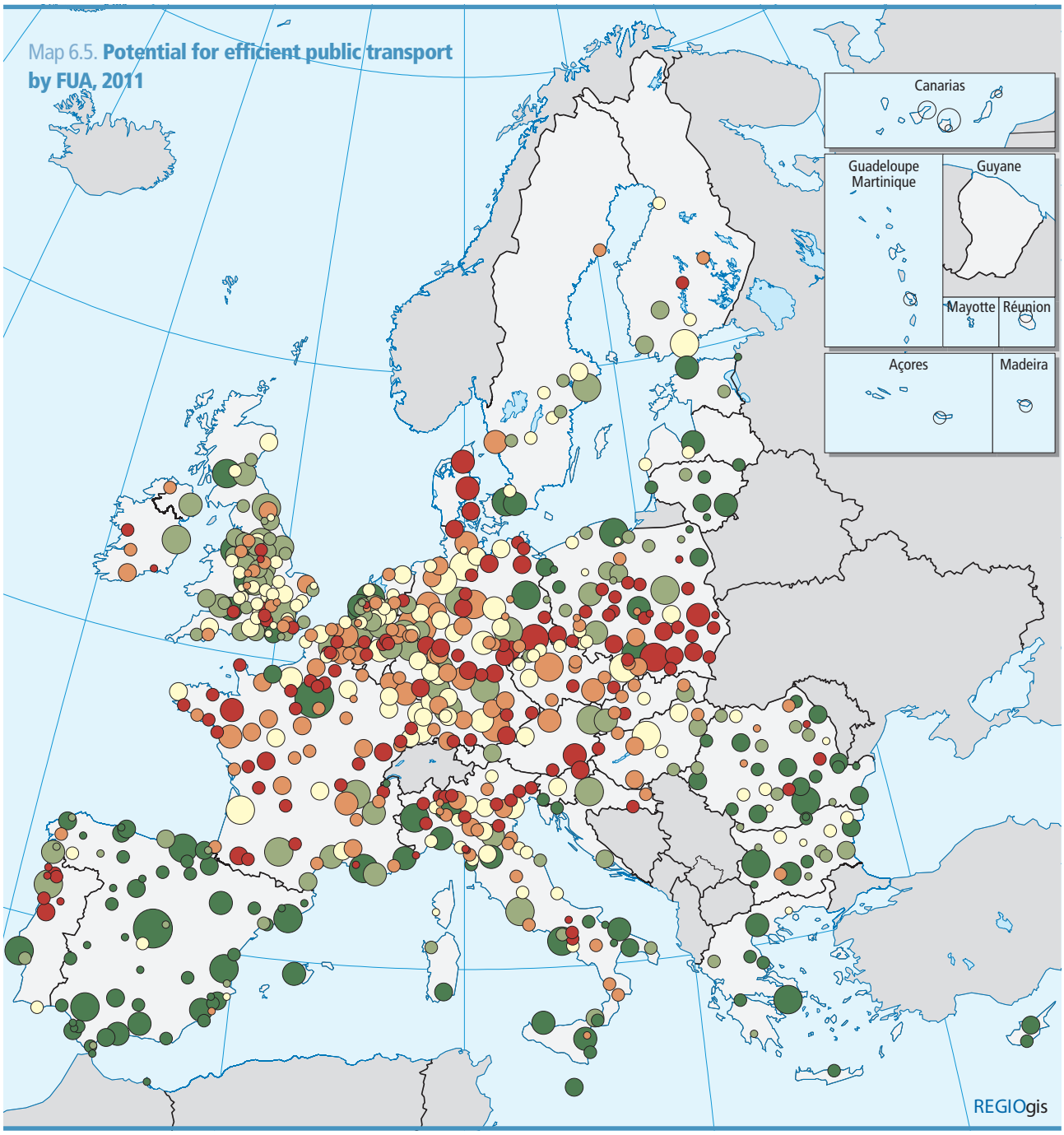
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Population-weighted average of population density at the level of 1 km² grid cells.
Sources: Eurostat, DG REGIO

0 500 Km

Map 6.5. **Potential for efficient public transport by FUA, 2011**



Urban form efficiency

- Very low
- Low
- Moderate
- High
- Very high
- No data

FUA population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Sources: JRC H08 (LUISA 2015), Eurostat GEOSTAT 2011 grid

0 500 Km

While Brasov, Romania, has a very high share of green areas, more than 40% of its population cannot access them within walking distance © Draghicich

In a few dozen cities, more than 20% of the population are without green spaces in their neighbourhood, including several cities in Bulgaria and Romania

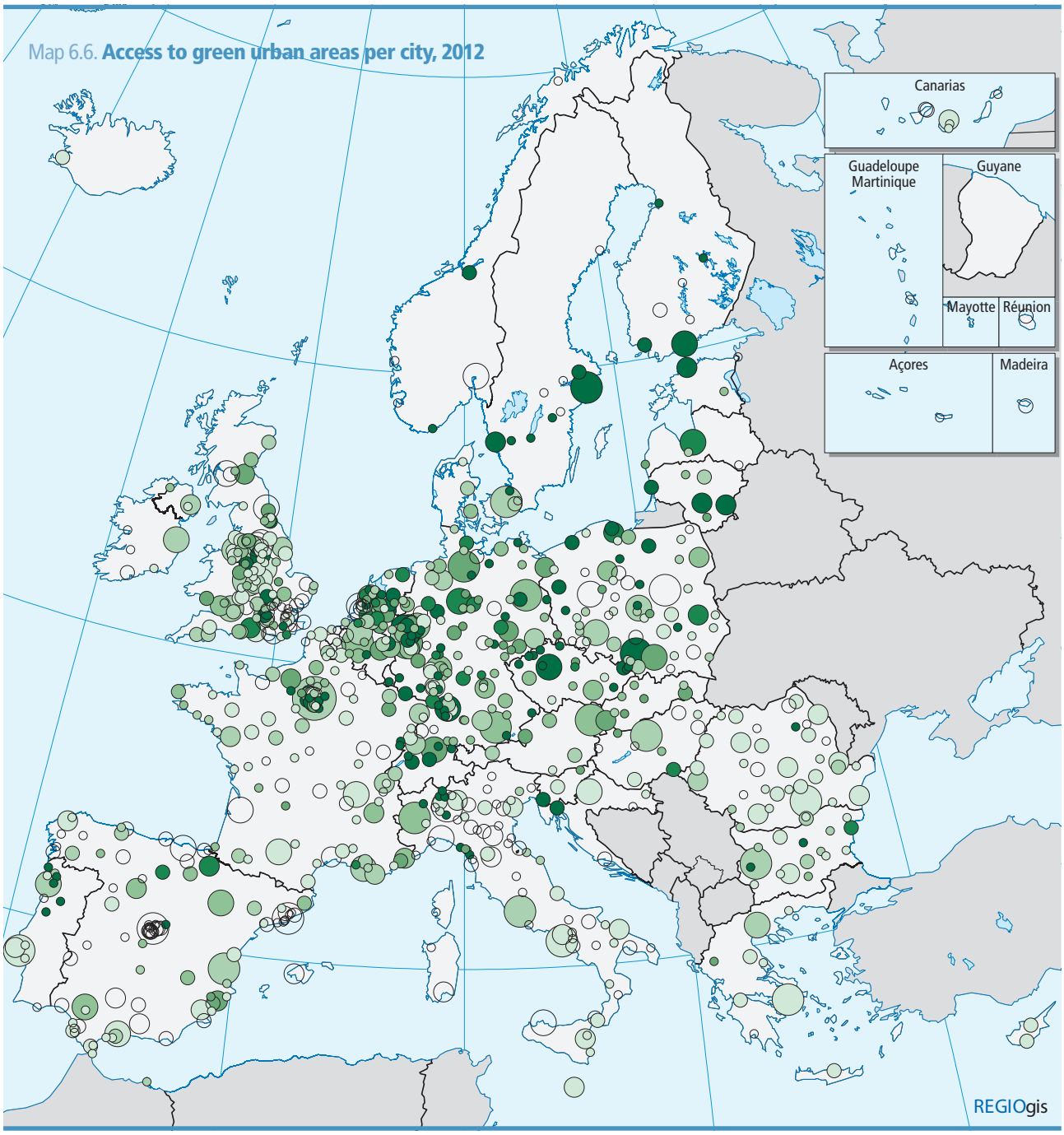
as the minimum mapping unit of 0.25 hectares (ha). The population-weighted median surface of green areas that can be reached within 10 minutes walking was calculated for almost 400 European cities (Map 6.6). The results demonstrate a substantial diversity in the proximity of green urban areas that exists both in bigger and smaller cities. Among capital cities with more than one million inhabitants, values vary between less than 15 hectares in cities like Bucharest, Budapest, Paris, Rome and Sofia, and more than 50 hectares in Prague and Stockholm.

Some differences between countries can be observed. Cities, for which data are available, have high values in Germany, the Czech Republic, Sweden and Switzerland, while in Bulgaria, Romania and the UK they have rather low averages. High scores were also recorded in many of the smaller cities in the Netherlands.

In a few dozen cities, more than 20% of the population are without green spaces in their neighbourhood, including several cities in Bulgaria and Romania. In a quarter of the cities, less than 2% of the population do not have green areas within walking distance. Some of the larger cities in this group are Essen, Prague, Torino and Stockholm.

The three indicators are only weakly correlated (Figure 6.5). This implies that both the share of population without access to urban green and the median size of accessible urban green provide different perspectives and that the share of green (or open) space is not a good approximation of the other two indicators.

Map 6.6. **Access to green urban areas per city, 2012**



Hectares

- <10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 25 - 30
- >= 30

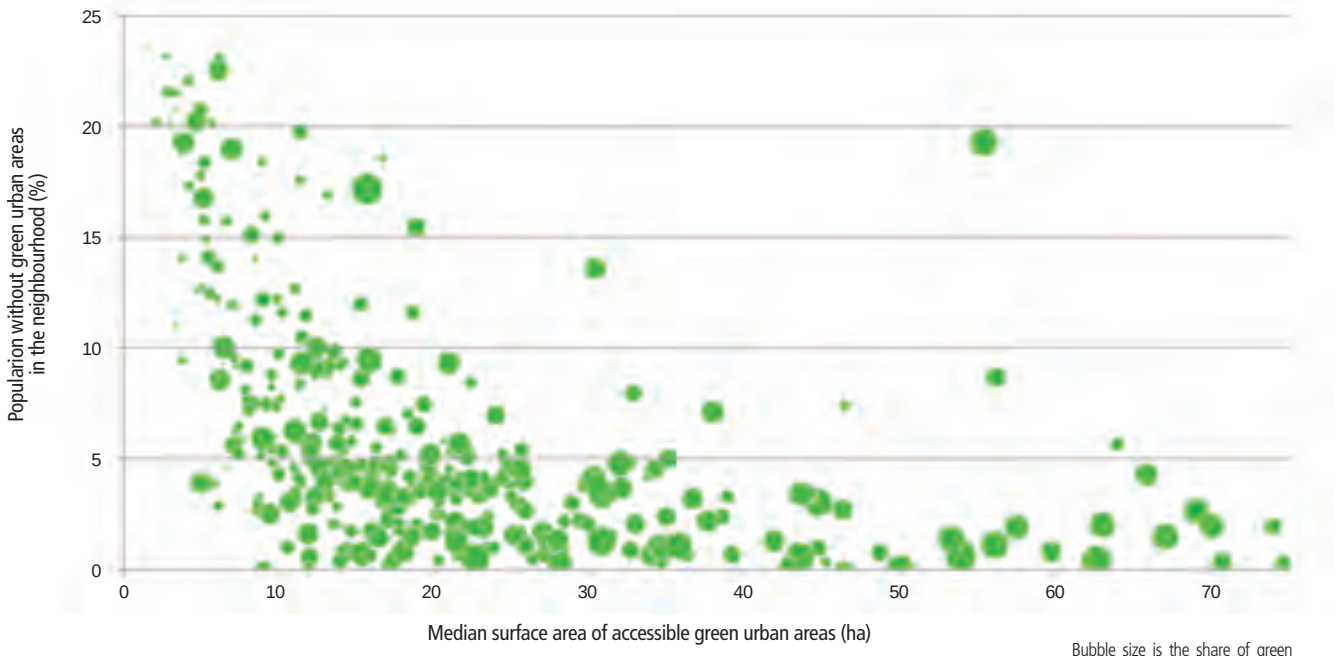
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Population-weighted median area of green urban areas and forests that can be reached within a ten-minute walk.
Sources: Copernicus Urban Atlas, NSIs, TomTom, REGIO-GIS

0 500 Km

Figure 6.5. **Proximity of green areas, population without green areas nearby and share of green areas in the total land area per city, 2012**



Source: Copernicus Urban Atlas, NSIs,TomTom, REGIO-GIS

Bubble size is the share of green urban areas in total land area (%)

Some cities with a relatively modest share of green surface area still guarantee good proximity to such spaces. For example, the share of green areas in Southampton is 13% while 98% of its population finds some green areas within walking distance. The median surface of nearby green areas is a decent 28 hectares. Cities with a similar share of green surface can have very different levels of green area proximity. This is the case for Torino and Prague, where the share of green areas is 18% and 19% of total land area, resulting in a green areas' proximity of 17 hectares in Torino but up to a very high 54 hectares in Prague. In Stockholm, more than half of the land area is green (56%), almost everybody finds some green areas within walking distance (99.6%) and the median surface of these areas is high (63 hectares). Brasov (Romania) also shows a very high share of green areas (41%) but this does not translate into a good accessibility. More than 40% of the population lacks green areas within walking distance.

6.7. Conclusion

Cities, due to their higher densities, have a much smaller local road network per capita than rural areas, which is likely to translate not only into lower costs to install and maintain these roads but also the associated utility lines.

Cities also use far less land for buildings than rural areas. Although a part of this difference is because factories and farms are mostly located outside cities, it is also due to more vertically arranged living, working and shopping. This translates into significantly higher land use efficiency. Between 2006 and 2012, however, land use efficiency decreased in most cities. In part this lower efficiency is due to population decline in a number of cities. The majority of cities with a growing population increased their land use efficiency between 2006 and 2012.

The higher land use efficiency of cities is linked to higher neighbourhood densities and having more destinations within walking or cycling distances. Denser neighbourhoods also mean that it is easier to provide public transport as fewer stops are needed and the overall network can be shorter.

European cities tend to be green with small and large parks distributed across the entire city. Nevertheless, in some cities a significant share of the population lives more than a ten-minute walk away from a green area.

In summary, higher neighbourhood densities are conducive to less congestion and pollution as well as more efficient use of land and services.

Chapter 7.
Urban environment and climate change

- Despite some progress, air pollution in many European cities still remains a health risk and does not comply with EU air quality directives. A further reduction in air pollution levels requires action at multiple levels of government but cities can play an important role.

- Climate change adaptation and mitigation have become a central concern of many cities. A 2014 survey of 200 European cities showed that 65% of these had a mitigation plan in place. There was, however, a wide variation among countries with, for instance, 93% of all UK cities having a climate action plan compared to just 43% of all French cities.

- The mayors of 300 EU cities have signed the Covenant of Mayors, pledging to reduce their greenhouse gas (GHG) emissions by at least 20% by 2020. Many other mayors have also signed the covenant, including some from outside the EU.

- European cities are seeking to reduce both energy consumption and GHG emissions by supporting better thermal insulation of buildings, using more efficient lighting technologies and promoting new low-energy buildings. But more will be needed to meet the ambitious EU goal of cutting GHG emissions by 80% by 2050.

- Many cities are testing new nature-based solutions to adapt to climate change. Such solutions often also support additional goals, such as reducing GHG emissions, pollution or flood risks. For example, green roofs can help reduce the impact of heat waves and they can catch run-off water and reduce the need for cooling. Trees can reduce the heat island effect and reduce air pollution.

Amsterdam ArenA's Utility Hub initiative is part of a project in the Zuidoost area of the city to move towards shared use of energy resources and infrastructure


PERRY

Chapter 7.
Urban environment and climate change

Between 2007 and 2013, Cohesion Policy contributed directly to a reduction in the share of municipal sold waste sent to landfills

7.1. Introduction

The concentration of people and activity in cities often generate high levels of local pollution with impacts on air, water and waste. Yet it is exactly this concentration that provides opportunities to reduce such impacts.

The biggest challenges faced by European cities, however, are no longer local but global. Addressing climate change requires that all cities reduce their greenhouse gas (GHG) emissions and many mayors have already pledged to do so. Cities are also increasingly aware of the need to adapt to climate change. One promising area is the growing interest in nature-based solutions, creatively using green areas or water bodies to respond to a range of issues from flood risks and heatwaves, to energy consumption and the promotion of health and well-being.

This chapter first assesses the local challenges of air pollution and waste and waste water management before turning to the global challenge of climate change.

7.2. Many cities still face high levels of air pollution

In the EU, water pollution has been reduced but air pollution remains a serious risk to human

Box 7.1. **EU Cohesion Policy invests in the environment and climate change adaptation**

EU Cohesion Policy supports the implementation of EU environmental directives, which carry a wide range of benefits for cities. Moreover, the policy supports risk prevention efforts to adapt to present and future impacts of climate change, especially in cities. It supports adaptation measures by promoting ecosystem-based approaches, developing new infrastructures or retrofitting existing ones. In the period 2007-2013, Cohesion Policy invested almost EUR 63 billion in these areas.

Cohesion policy invests in metropolitan areas

Between 2007-13, Cohesion Policy investments in climate change adaptation were highest in capital metro regions and other metro regions. (Table 7.1). Waste and water treatment management and environmental protection were important areas of investment with higher investments per person in the non-metro regions.

Table 7.1. **ERDF+CF expenditure per environmental category, 2007-2013**

Euros per person and per year		Climate change adaptation	Air quality	Waste & water management	Environmental protection	Energy, efficiency & renewables	Total
EU-28	Capital Metro	8.9	6.6	0.5	1.3	2.2	0.3
	Other Metro	10.3	6.0	1.3	0.9	0.4	0.8
	Non-Metro	21.4	8.2	1.2	0.4	0.5	0.4
	Total	**14.7**	**7.0**	**1.1**	**0.8**	**0.7**	**0.6**

Source: DG REGIO own elaboration

Cohesion policy has a strong impact on the environmental dimension of cities

Over the same 2007-2013 period, Cohesion Policy contributed directly to meeting EU requirements and targets, e.g. through the closure of landfills that do not meet EU standards, the reduction in the share of waste and the amount of biodegradable municipal solid waste sent to landfills, the increase in the separate collection of recyclable waste, and the increase in the rate of recycling (especially in Croatia, the Czech Republic, Hungary, Lithuania and Slovenia).

Cohesion Policy also improved drinking water for more than four million people and improved wastewater treatment for over seven million. Through these investments, the share of municipal solid waste sent to landfills dropped from 90% to 53% in Poland; from 80% to 70% in Bulgaria, while in Slovenia recycling nearly doubled to more than 40%.

health, especially in cities, to ecosystems and to the environment (EEA SOER 2015). Four out of five people in the EU described air pollution as an important problem in cities (Special Eurobarometer 406). Indeed, air pollution levels remain problematic and exceed EU standards in many cities. Moreover, ozone, methane and particulates also contribute to global warming.

The emission of some air pollutants has declined substantially over the past decade, reducing exposure to such substances as sulphur dioxide, carbon monoxide and lead. The share of urban population exposed to sulphur dioxide in excess of the EU limit has decreased in recent decades and is now below 0.5%. Exposure of the urban population to concentrations above the EU carbon monoxide and lead limits is localised, and infrequent, and limited to a few areas near roads or industrial sites.

Particulates can have negative health impacts. Target values for annual concentrations of particulate matter are exceeded all over Europe, especially in Bulgarian, Italian and Polish cities (Map 7.1). In 2013, the PM_{10} daily limit was exceeded in cities in 22 of the 28 Member States. In 2013, 9% of the city population in the EU-28 was exposed to levels above the EU target value for $PM_{2.5}$ and approximately 87% to concentrations exceeding WHO guidelines; again with higher values

in cities in Bulgaria, Italy and Poland (Map 7.2). Due to non-compliance with the related EU directives, there were 36 ongoing air quality infringements in 2015.

Another substance associated with adverse health impacts is nitrogen dioxide (NO_2). Road transport is the highest contributor especially urban and suburban traffic. The annual limit of the Air Quality Directive for nitrogen dioxide (40 μg/m³) was exceeded in several European cities, notably in Germany, Italy and the UK (Map 7.3). In 2013, about 9% of the EU-28 urban population was exposed to nitrogen dioxide above the annual limit.

Elevated levels of ozone (O_3) can cause respiratory health problems and lung diseases. The Air Quality Directive sets a maximum daily 8-hour mean threshold not to be exceeded on more than 25 days per year. In 2013, 15% of the EU population living in cities was exposed to concentrations above this threshold. Using the WHO guideline value, 98% of that population was exposed to unhealthy concentrations.

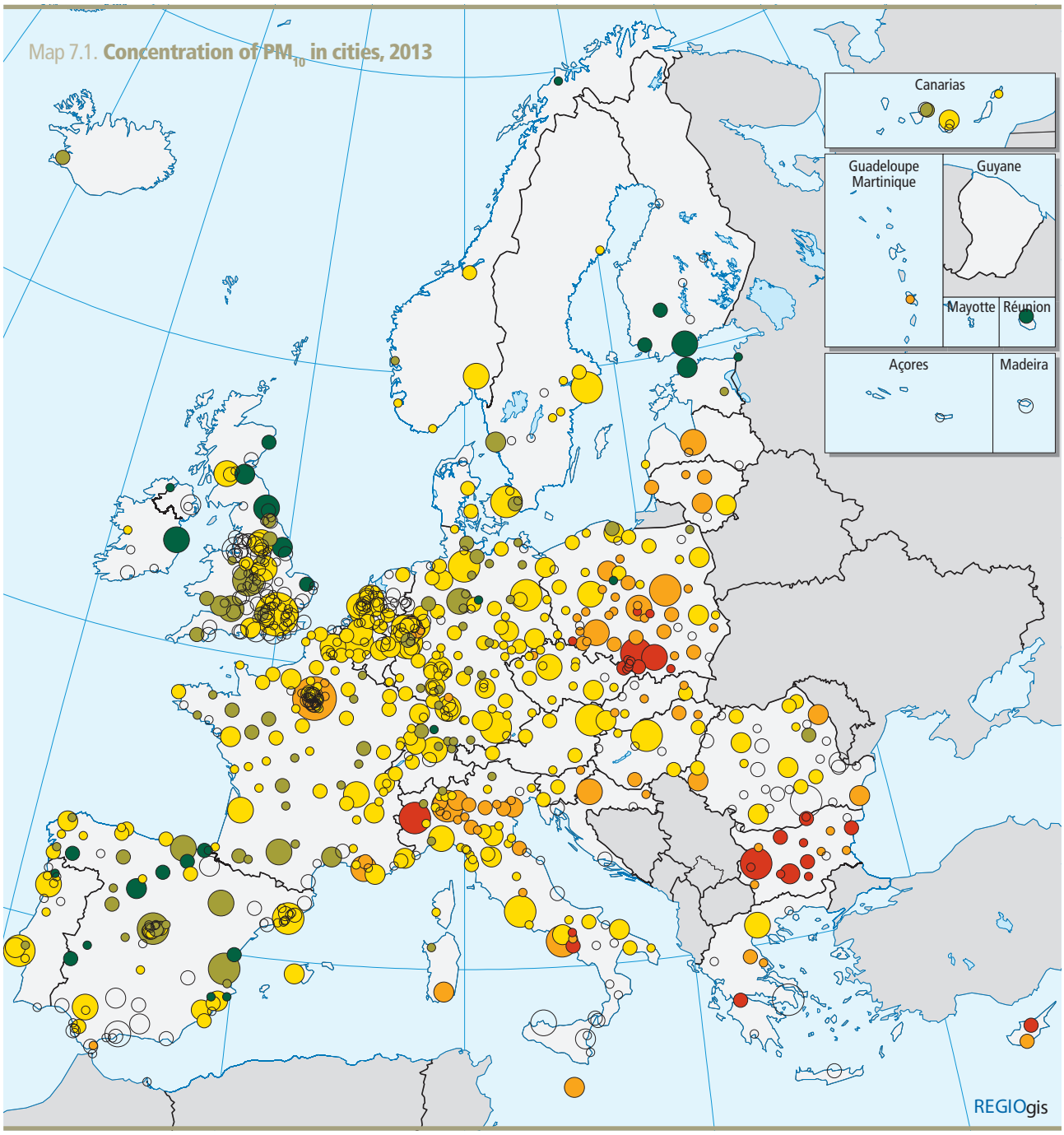
High concentrations of ozone occur mostly in southern areas of the EU, notably in Northern Italy and Greece, but the threshold was also exceeded for more than 25 days annually in the Czech Republic, Hungary and Slovakia (Map 7.4). In Pecs and Padova, the EU daily limit was breached more than 90 times during 2012. Given that the formation of O_3 requires sunlight and increases with altitude, higher concentrations are registered in some Mediterranean countries and, in contrast to other pollutants, in rural areas.

In Europe, road transport, shipping, energy generation, industry, heating, agriculture and waste are the main sources of air pollution. In 2013, road transport was the largest source of nitrogen oxide emissions (46% of EU emissions). It also contributed significantly to particulate matter emissions (13%

Elevated levels of ozone (O_3) can cause respiratory health problems and lung diseases. The Air Quality Directive sets a maximum daily 8-hour mean threshold not to be exceeded on more than 25 days per year

During 2012, the EU daily limit for ozone was breached 90 times in Padova, Italy. As the formation of ozone requires sunlight and increases with altitude, Mediterranean cities are more vulnerable

Map 7.1. **Concentration of PM_{10} in cities, 2013**



Annual average concentration (µg/m³)

- <15
- 15 - 20
- 20 - 30
- 30 - 40
- >= 50
- No data

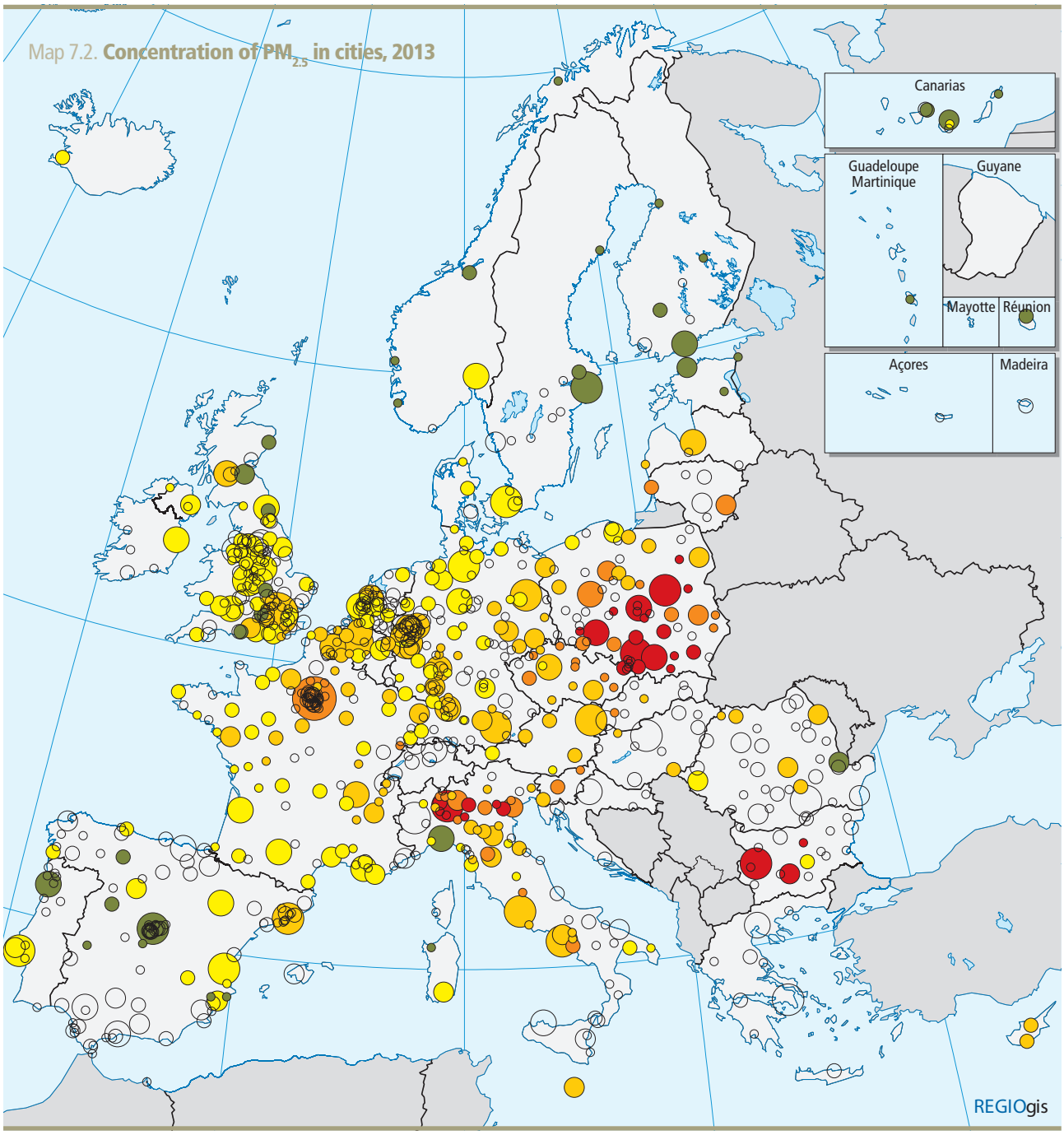
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Average recorded by measuring stations within city boundaries.
WHO guideline: < 20 µg/m³
EU limit value: 40 µg/m³
Sources: EEA, DG REGIO

0 500 Km

Map 7.2. **Concentration of $PM_{2.5}$ in cities, 2013**



Annual average concentration (µg/m³)

- <10
- 10 - 15
- 15 - 20
- 20 - 25
- >= 25
- No data

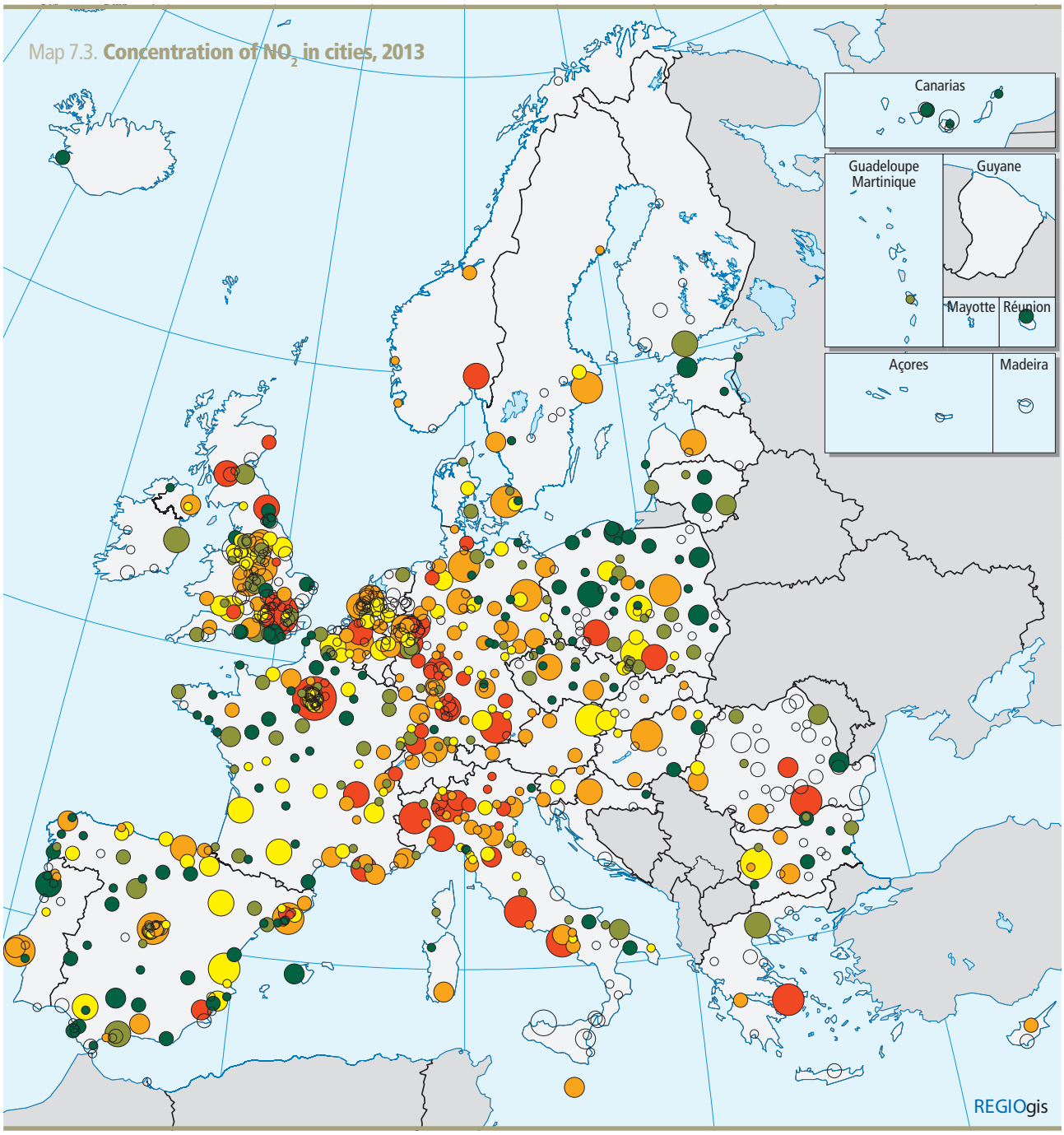
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Average recorded by measuring stations within city boundaries.
WHO guideline: < 10 µg/m³
EU limit value: 25 µg/m³
Sources: EEA, DG REGIO

0 500 Km

Map 7.3. **Concentration of NO_2 in cities, 2013**



Annual average concentration (µg/m³)

- <20
- 20 - 25
- 25 - 30
- 30 - 40
- >= 40
- No data

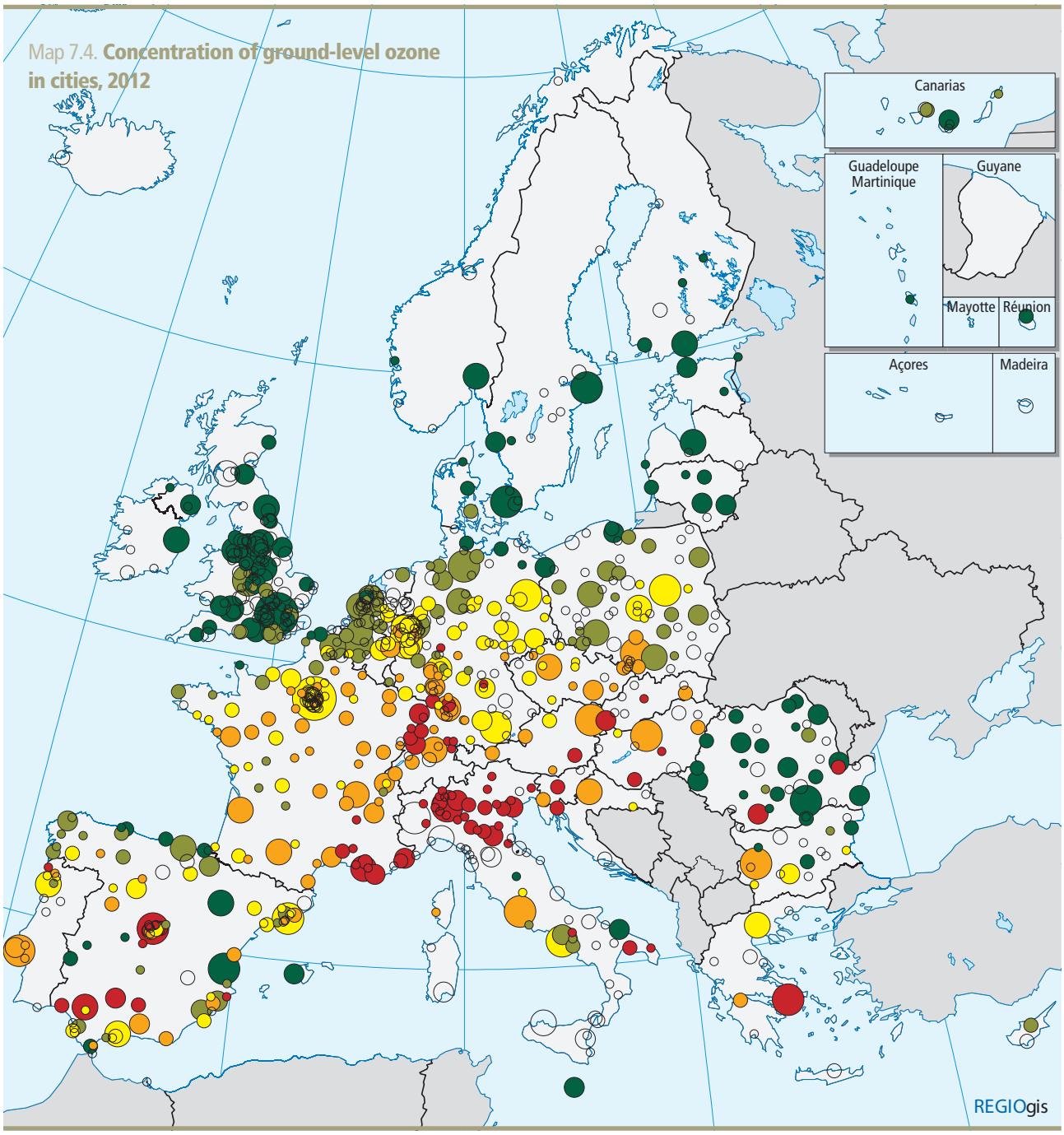
Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Average recorded by measuring stations within city boundaries.
WHO guideline and EU limit value: 40 µg/m³
Sources: EEA, DG REGIO

0 500 Km

Map 7.4. **Concentration of ground-level ozone in cities, 2012**



Number of days with more than120 µg/m³

- <10
- 10 - 15
- 15 - 20
- 20 - 25
- >= 25
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- > 5,000,000

Average recorded by measuring stations within city boundaries.
EU target value of 120 µg/m³ should not be exceeded more than 25 days per year (averaged over 3 years).
Sources: EEA, DG REGIO

0 500 Km

Germany has the highest rate for recycling with over 60% of household waste either composted or recycled © Paul Prescott

The main source of PM_x emissions, however, is fuel combustion for heating by households, businesses and institutions contributing 43% and 58% of primary PM_{10} and $PM_{2.5}$ emissions

of PM_{10} and 15% of $PM_{2.5}$). As a result, many EU cities specifically restrict central city motor vehicle access based on vehicle-emission levels. Indeed, almost 200 cities in Denmark, Germany, Italy, the Netherlands, Sweden and the UK have low-emission or environmental zones where only low-emission vehicles with windshield permits are allowed.

In 2010, international shipping within European seas contributed an estimated additional 15% of the total $PM_{2.5}$ emissions and an additional 50% of total NO_x in the EU-28. The main source of PM_x emissions, however, is fuel combustion for heating by households, businesses and institutions contributing 43% and 58% of primary PM_{10} and $PM_{2.5}$ emissions. Agriculture is the main source of NH_3 emissions (93%), which is an important PM_x precursor gas, and the third most important source of PM_{10} primary emissions (14%).

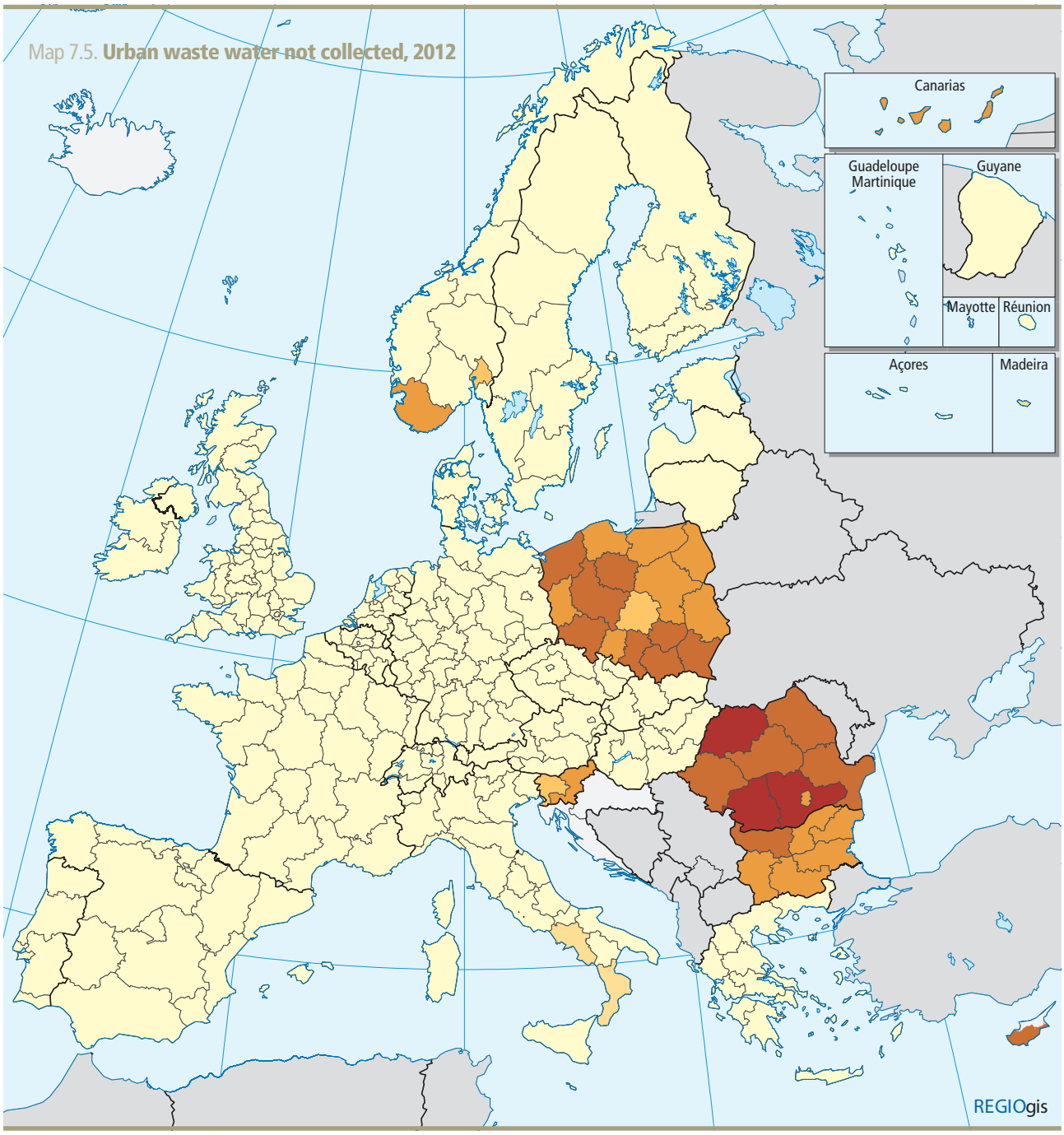
Many of these sources cross local administrative boundaries and even national boundaries, which limits the extent to which local action alone can reduce these concentrations. A recent study (Thunis et al., 2015) analysed three case studies (Benelux, South Poland and the Po Palley) and concluded that regional action in the long term could reduce air pollution by between 20% (Benelux) and 60% (South Poland and the Po Valley).

Only action at multiple levels of government can fix air pollution

In economic terms, pollution is a market failure. This is why individual action cannot resolve it. Individuals may take account of the impact on their own health, but they will not (or inadequately) take into account the impact on others.

Pollution tends to increase with city size. Therefore, effective policies are both necessary and relevant for cities. Since pollutants tend to spread beyond their

Map 7.5. **Urban waste water not collected, 2012**



% of generated load

- <2.5
- 2.5 - 5.0
- 5.0 - 10.0
- 10.0 - 25.0
- 25.0 - 50.0
- >50.0
- No data

CY, LT, HU, NO: 2011
Not collected by collecting systems nor treated by individual or other appropriate systems.
Sources: EEA, OpenStreetMap, DG REGIO

0 500 Km

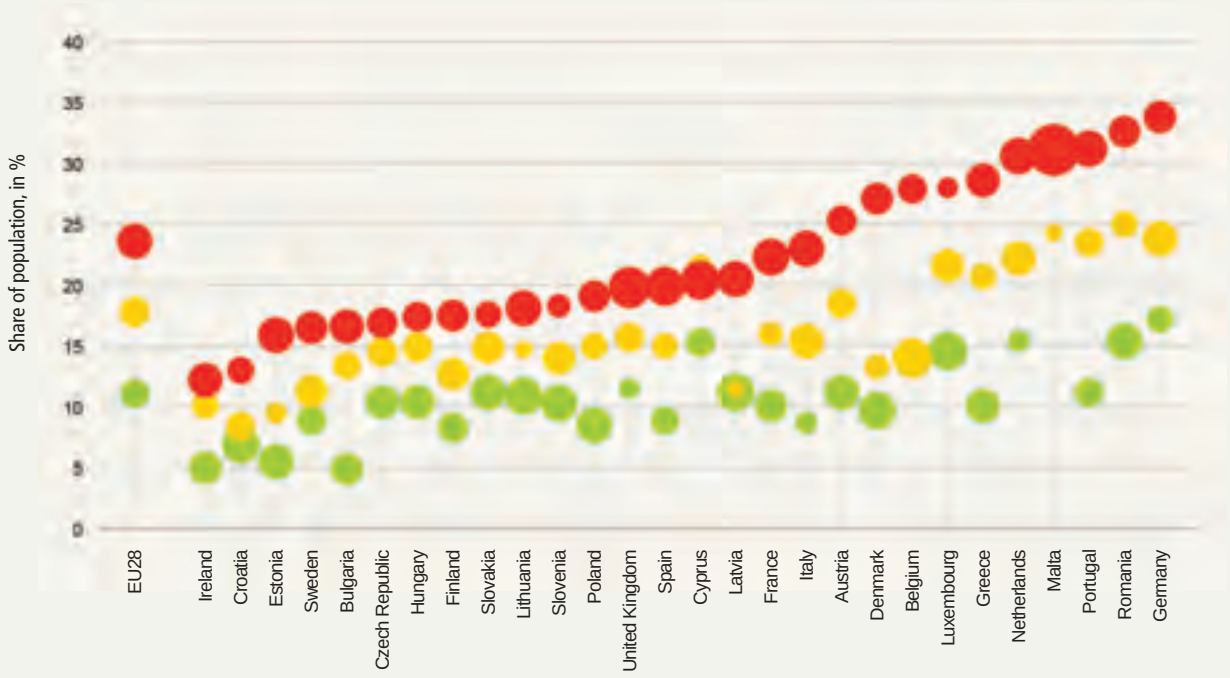
Box 7.2. **The urban dimension of the EU environmental policy**

Many EU environmental laws and other initiatives exist to protect and improve the quality of the urban environment. For instance, EU legislation on air quality, a significant urban concern, establishes targets and limits values for different pollutants. There are also action plans to reduce people's exposure to noise and to protect quiet areas, while legislation on waste management and urban waste water treatment has helped reduce cities' impact on the wider environment.

Some EU Member States still have to make significant investments to ensure that urban waste water is collected through the sewage system and treated in compliance with the EU directive (Map 7.5). Through the European Green Capital and the European Green Leaf initiatives, cities are allowed to showcase their environmental performance.

Noise pollution is a problem with a clear urban dimension. In cities, almost one in four suffer from too much noise compared to only one in ten in rural areas (see Figure 7.1)

Figure 7.1. **Too much noise from neighbours or outside by degree of urbanisation, 2014**



Note: ranked by ascending order of percentage of population facing the problem of noise, who live in cities.
Source: Eurostat

LIFE, the European Union's environmental funding instrument

The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental policy and legislation by co-financing pilot or demonstration projects with European added value. Since its inception in 1992, LIFE has co-financed more than 3,000 projects across the EU, contributing approximately EUR 2.2 billion to the protection of the environment. The LIFE Programme co-funds projects on air quality and emissions and projects to improve the urban environment.

source and jurisdictional boundaries, the geographical implementation of policy is also important.

Although cities can cope with localised issues such as domestic fuel burning or industrial discharges, current pollution problems are less amenable to local action alone. To be effective policy has to involve coordinated action at the city, regional, national and supra-national levels. New regulations to change the technology of motor engines or agriculture, or to control or ban toxic chemical discharges can only be effectively imposed by a government representing a large market.

7.3. Cities need to reduce resource consumption and waste

While efforts to tackle climate change and wider environmental risks have gathered momentum, existing patterns of resource use and consumption also require attention. Within the EU, emphasis has been put on the development of a circular economy, which seeks to retain value through the lifecycle of a product or service and to continue to extract this value through re-use and recycling. By its very nature, a circular economy exceeds municipal boundaries. Yet cities can play an important role, for example by promoting local production for local consumption.

Municipal waste generation per capita in Europe dropped from 521 kilograms (kg) to 474 kg between 2000 and 2014. But the amounts vary between countries with higher values in most EU-15 countries and lower ones in the EU-13 (EEA 2015, SOER 2015), and between cities. In some cities municipal waste per capita exceeds 575 kg while others produce less than 350 kg (Map 7.6).

The Waste Framework Directive (EEA 2015, SOER 2015) sets a recycling target to reduce 50% of household waste made of paper, metal, plastic and glass by 2020. The EU reached a recycling or composting rate (which also includes other materials) of 43% in 2014, compared to 31% in 2004. Large differences in performance were recorded amongst countries (Figure 7.2). Austria, Belgium, Germany, the Netherlands and Switzerland recycled or composted more than half of their municipal waste in 2014. The highest increase between 2004 and 2014 took place in Iceland, Italy, Lithuania and Poland (+25 percentage points).

In countries with high municipal-waste recycling rates, landfilling declines much faster than the growth in recycling, as waste management strategies usually move from landfill towards a combination of recycling and incineration and, in some cases, also mechanical-biological treatment.

Box 7.3. **The EU action plan for the circular economy and cities**

This EU action plan aims to promote innovative and more efficient ways of producing and consuming. It includes actions to reduce food waste to meet the global Sustainable Development Goal of halving food waste by 2030; a strategy on plastics linked to the Sustainable Development Goal to significantly reduce marine litter; and actions linked to water reuse. It sets a target of recycling 75% of municipal waste and reducing landfill to a maximum of 10% of all waste by 2030.

The annual climate summit at its 21st session of the Conference of Parties (COP21) in Paris in 2015 underlined the importance of limiting global temperature rise to within 1.5 degrees Celsius

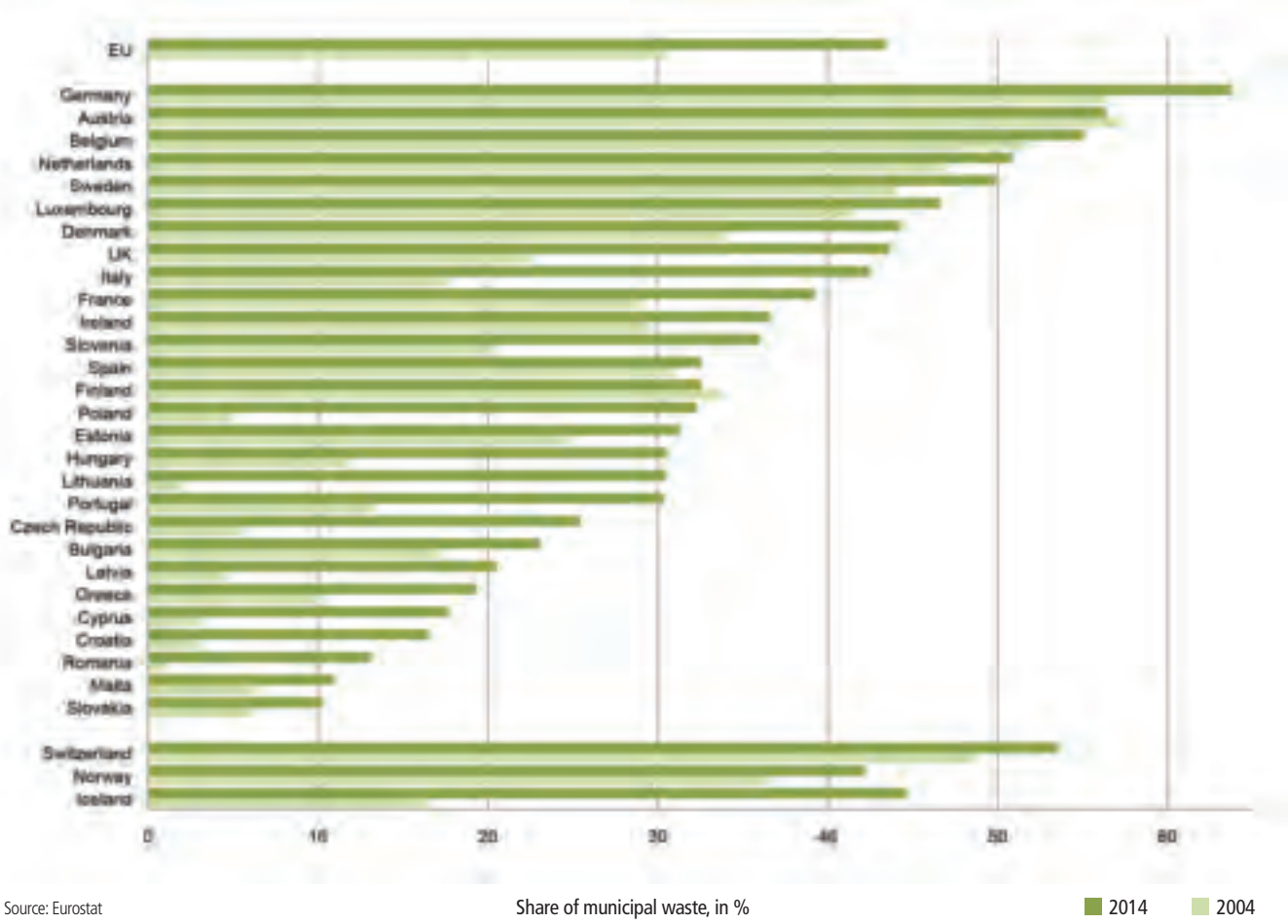
7.4. Cities are increasingly focusing on climate change

Between 1990 and 2014, greenhouse gas (GHG) emissions in the EU-28 decreased by 24% (EEA 2016). Although this trend is encouraging, significant challenges remain, particularly if Europe is to achieve its long-term target of 'living well within the limits of the planet' and reduce emissions by between 80 and 95% by 2050.

The annual climate summit at its 21st session of the Conference of Parties (COP21) in Paris in 2015 underlined the importance of limiting global temperature rise to within 1.5 degrees Celsius. Yet it is clear that without more concerted action the world is not on course to meet this target.

Cities have come to occupy an important role in the global response to climate change. At COP21, more than 400 mayors came together for the Climate Summit for Local Leaders. It was the largest climate-oriented gathering of mayors to date, providing a forum for discussion on climate targets. It signalled a

Figure 7.2. **Recycling or composting of municipal waste per country, 2004-2014**



Source: Eurostat

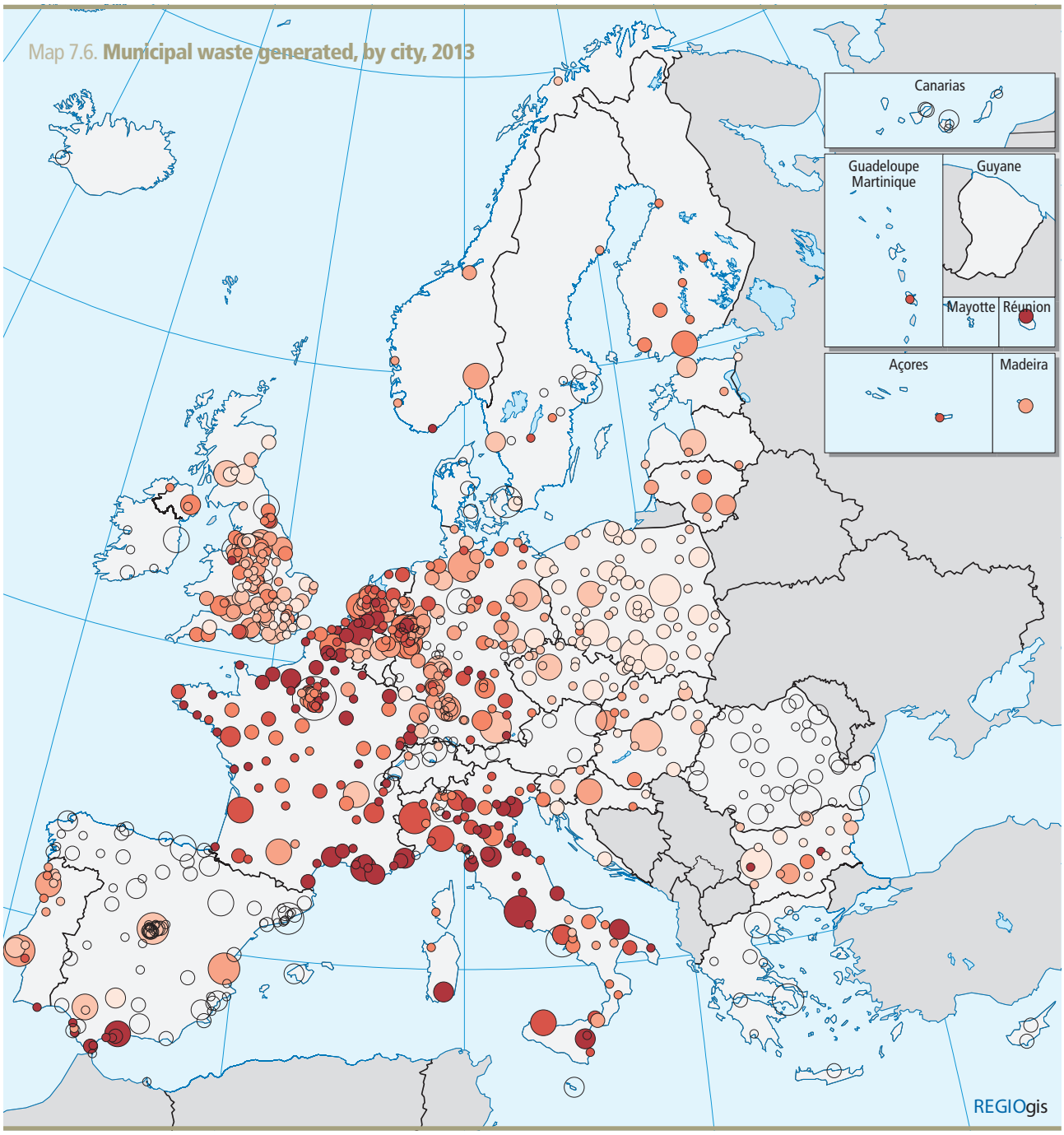
new era in climate action. Historically, discussions on climate policy have largely portrayed cities as major polluters and areas of intensive resource consumption. The inclusion of cities at COP21 demonstrated that there is now widespread recognition of cities as global problem-solvers.

Through establishing transnational networks such as the Covenant of Mayors (see Box 7.4) and the C40 network of the world's megacities committed to reducing GHG emissions (which includes the European cities Athens, Barcelona, Berlin, Copenhagen, London, Madrid, Milan and Warsaw among others), cities play an active role in discussing and addressing climate change-related issues.

European cities are among the leaders in the field of addressing climate change, with many being early adopters of climate goals and policies. A recent survey of 200 European cities showed that 65% have at least a mitigation plan. However, there was significant variation across Europe. While in some countries almost all cities have a climate change plan (e.g. 93% of the sampled UK cities) cities in other countries are less prepared (e.g. only 43% of the sampled French cities) (Reckien et al. 2014). The survey also found that climate adaptation planning is not as advanced as mitigation planning. In the sample, the uptake of adaptation planning varied considerably with the UK (80% of 30 cities), Finland (50% of four) and Germany (33% of 40 cities) having the highest share of cities with adaptation plans. Overall, only 25% of the 200 cities sampled had both adaptation and mitigation plans in place and had set quantitative targets for emissions reductions (Reckien et al. 2014). For more information on urban adaptation to climate change see the new EEA report (EEA 2016).

The survey also found that mitigation measures tend to be concentrated in particular sectors and focus

Map 7.6. **Municipal waste generated, by city, 2013**



Kg / inhabitant

- < 350
- 350 - 425
- 425 - 475
- 475 - 525
- 525 - 575
- >= 575
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Domestic and commercial waste.
BE, CH: 2011-2013; PL, SK: 2012;
IT: 2011-2012;
CZ, FR, FI, SE, NO: 2011; ES: 2010-2012.
Source: Eurostat

0 500 Km

Refurbishments funded by the European Regional Development Fund are being carried out for buildings in Sofia with the lowest energy efficiency

© Dimitrina Lavchieva

on technological fixes rather than systemic changes such as efforts to tackle demand for energy and resources, a finding that reflects a long-term trend in this arena (Bulkeley and Kern 2006; Castan Broto and Bulkeley 2014; Reckien et al. 2014).

The expected contribution of cities to reaching the global climate change targets is considered to be substantial. By conservative estimates, cities are estimated to be able to deliver up to half of the emissions reductions pledged by non-state actors for 2020 (Ecofys 2015).

Urban development and the built environment

In Europe, 40% of total energy use and 36% of carbon dioxide emissions come from the construction sector (Lewis et al. 2013), most of which is concentrated in urban areas. The built environment has therefore become a key target for interventions to manage resource use, energy security and climate change in cities.

In its roadmap for moving to a competitive low-carbon economy by 2050, the European Commission put forward an emissions reduction target for the building sector of between 88 and 91% by 2050 compared to 1990 levels (Lewis et al. 2013: 7). To promote energy performance in buildings, the European Union adopted the Energy Performance of Buildings Directive in 2002 (recast in 2010 as Directive 2010/31/EU), which led to the implementation of national Energy Performance Certificates (EPCs) for residential and commercial buildings. In 2009, EPCs became mandatory for letting or selling properties.

Municipal governments have a variety of powers in relation to urban development and the built environment.

Box 7.4. **The Covenant of Mayors for Climate and Energy**

In April 2013, the European Commission adopted an EU strategy on adaptation to climate change, which includes the mainstreaming of climate change into EU sector policies and funds, including marine and inland waterways, forestry, agriculture, biodiversity, infrastructure and buildings, but also migration and social issues. One of the priorities of the EU Adaptation Strategy is to support adaptation in cities, through the Covenant of Mayors initiative.

The EU also addresses knowledge gaps through research and the European climate adaptation platform (Climate-ADAPT). This platform, launched in March 2012, provides resources to support adaptation policy and decision making, such as a tool kit for adaptation planning; a 'projects and case studies' database; and information on adaptation action at all administrative levels.

Stakeholders from the local, regional and national level are encouraged to participate in the development and implementation of the EU Adaptation Strategy. The EU is also providing guidelines on integrating climate into policies and investments and on how to use EU funding for climate change adaptation. The EU Adaptation Strategy may be reviewed in 2018 with a view to strengthening it, if needed, in the light of the relevant international processes and in particular the implications of the Paris Agreement.

Cities unite for energy and climate action

The Covenant of Mayors and Mayors Adapt initiatives involve more than 6,000 local and regional authorities inside and outside the EU voluntarily committing to take climate action (as of 1/6/2016).

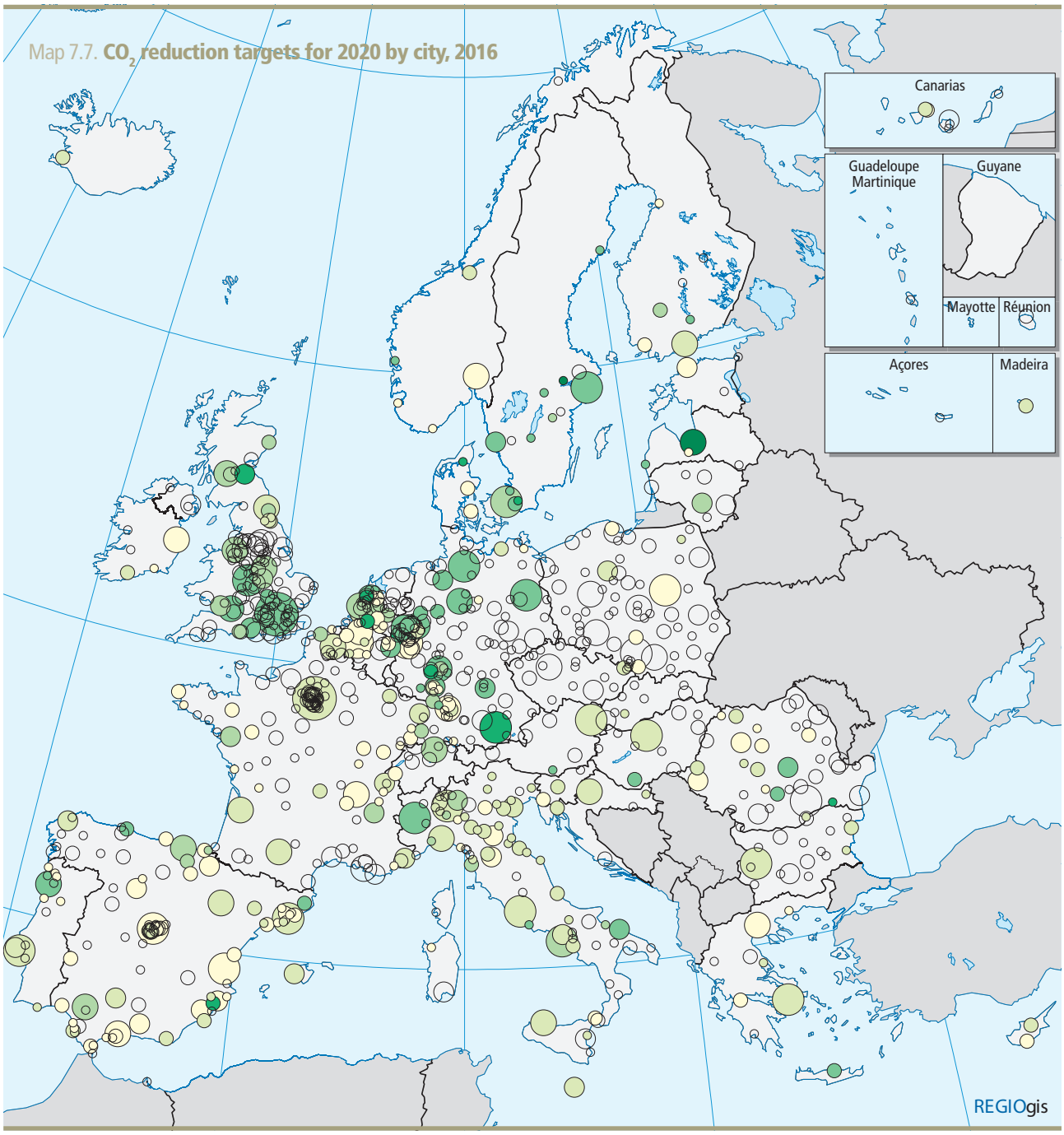
The Covenant of Mayors was launched by the Commission in 2008. Its signatories aim to reduce their GHG emissions by 20% by 2020. Map 7.7 shows the almost 300 EU cities that have signed the covenant so far and their CO_2 reduction targets. In addition, many local authorities outside cities also signed this Covenant. The signatory municipalities are required to develop a Sustainable Energy Action Plan with participation from public and private actors, which is subject to regular monitoring and evaluation by the Joint Research Centre. More than 5,400 plans have been submitted so far. The Mayors Adapt is the Commission's initiative that informs, mobilises and supports local authorities to adapt infrastructure and policies to climate impacts.

In 2015, the Commission launched a new integrated Covenant of Mayors for climate and energy, building on the experience of the Covenant of Mayors and Mayors Adapt. It sets a 40% CO_2 reduction target by 2030 and a commitment to make each local authority's territory resilient and adapted to the unavoidable impacts of climate change.

Funding for adaptation and mitigation

At least 20% of the EU budget for 2014-2020 will be spent on climate action. Adaptation requirements are included in all relevant EU funding streams of which many specifically encourage local authorities to integrate adaption needs into their policy planning and implementation.

Map 7.7. **CO_2 reduction targets for 2020 by city, 2016**



Reduction target (%)

- <20
- 20 - 25
- 25 - 30
- 30 - 40
- 40 - 50
- >= 50
- No data

Urban centre population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Reduction targets set by Covenant of Mayors signatories (as of 01/06/2016) located in cities. In most cases the reduction target refers to the absolute value of CO_2 emissions; in others it refers to per capita reduction .
Source: Covenant of Mayors Office, JRC, DG REGIO

0 500 Km

Besides implementing regulatory standards, developing land and providing housing, urban interventions in the built environment cover three different strands: a) creation of new urban districts or 'eco-cities' for maximising density and minimising energy use; b) renovation of existing buildings to improve their energy performance; and c) attempts to change how people use energy within the built environment.

Eco-city development

The emergence of the 'eco-city' concept can be traced back to the 1980s but began in earnest in the late 2000s. It gained momentum through the work of transnational municipal networks (Joss 2009) and became integrated in mainstream urban development to address urban environmental footprints. At the heart has been a series of sustainable urban development frameworks seeking to guide and standardise development practice (Joss 2015: 206).

Today, many development and regeneration projects in urban districts bear the hallmarks of eco-city principles. In Copenhagen, for example, the Nordhaven development is one of the largest low-carbon eco-city projects in Europe, consciously positioned as 'the model sustainable city of the future' (Blok 2012: 2237). Similar development projects can be found in Hamburg, London, Paris or Vienna.

Housing renovation and retrofitting

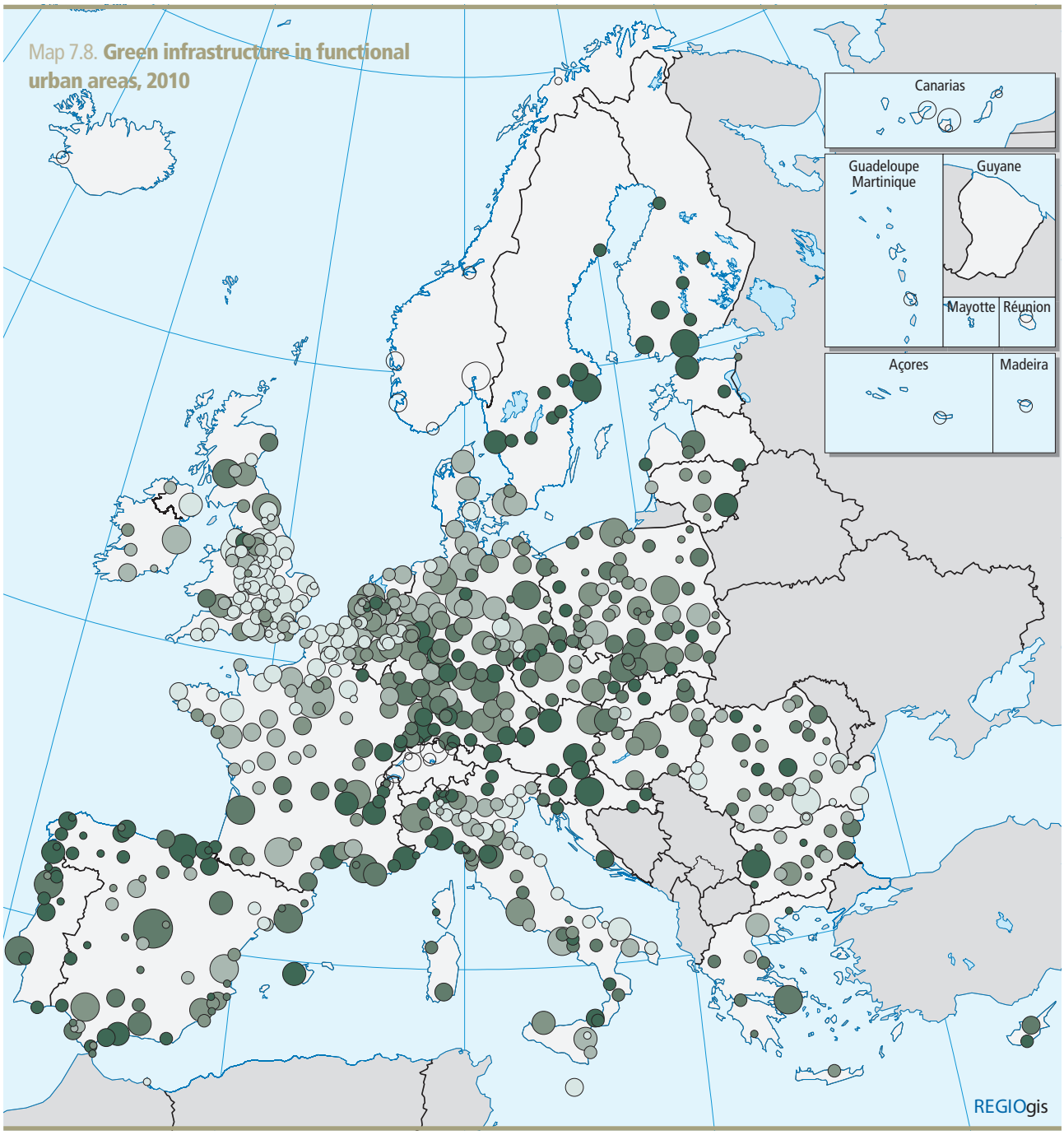
Renovating or retrofitting buildings to improve their energy and water efficiency is central to reducing resource use. Analysis suggests that energy-related renovation is not commonly undertaken, however. Especially in urban neighbourhoods with mixed-rental and owner-occupied housing, energy retrofitting is

Box 7.5. **Connecting cities for green and blue infrastructure: the GRaBS network**

The network 'Green and Blue Space adaptation for urban areas and eco towns' consists of 14 cities and regions of Europe. Climate change adaptation is the primary driver for the network that aims to develop mixed-use infrastructure and to put in place blue and green infrastructure. It also promotes the exchange of good practices and has developed climate change vulnerability assessment tools (Smith 2010). This network has been co-funded by the EU.

At the 21st session of the Conference of Parties in Paris in December 2015, a special Climate Summit for Local Leaders underlined the importance of cities in combatting climate change

Map 7.8. **Green infrastructure in functional urban areas, 2010**



% of total land area

- <17.18
- 17.18 - 29.25
- 29.25 - 42.36
- 42.36 - 57.87
- >= 57.87
- No data

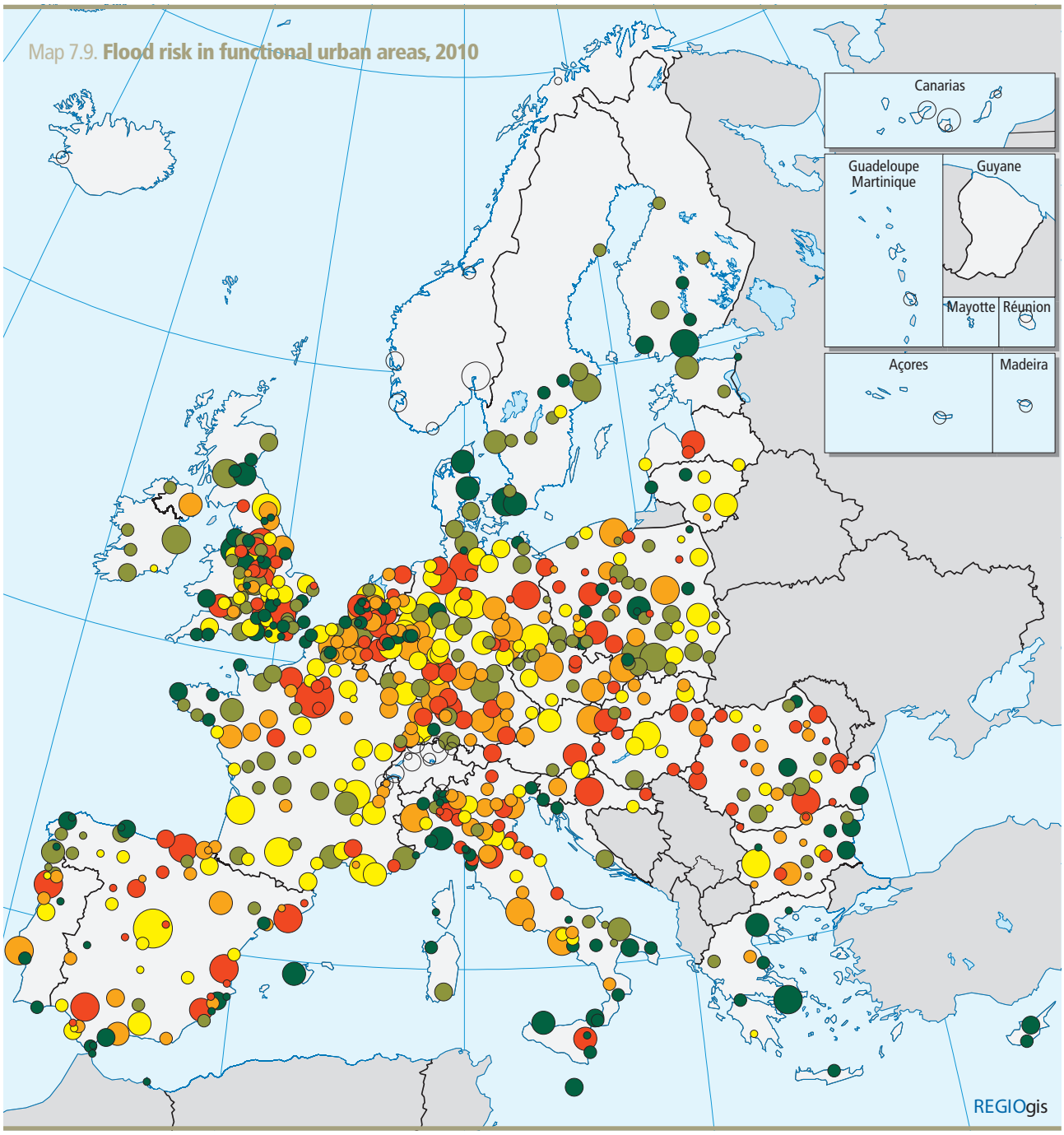
FUA population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Source: JRC H08, LUISA 2015

0 500 Km

Map 7.9. **Flood risk in functional urban areas, 2010**



Flood risk index

- <10
- 10 - 15
- 15 - 20
- 20 - 25
- >= 25
- No data

FUA population

- <100,000
- 100,000 - 250,000
- 250,000 - 500,000
- 500,000 - 1,000,000
- 1,000,000 - 5,000,000
- >= 5,000,000

Source: JRC H08, LUISA 2015

0 500 Km

Munich has used an energy benchmark for every single property to determine the energy-saving measures which should be applied © Annemario

progressing slowly despite subsidies and fiscal incentives. Key challenges are: a) a lack of knowledge about the schemes available and their complexity; b) the costs of large-scale retrofitting; and, c) in rental housing, the fact that the landlord must pay for retrofitting while the tenant benefits from reduced energy bills (Ruelle & Teller 2015: 1).

Many municipalities have become active in energy-saving renovation, particularly in the social housing sector where such interventions are primarily targeted at reducing energy poverty and vulnerability. A survey of privately owned, multi-storey blocks in Vilnius has revealed that renovation could improve energy efficiency by up to 50%. In Sofia, refurbishments funded by the European Regional Development Fund are being carried out in districts with the lowest energy efficiency. These include adding insulation, improved district heating connections and smart building management systems.

Interventions in privately owned housing have proven more complex. The Brussels Green Loan scheme, launched in 2008 with the intention of creating 500 loans annually for energy renovations, disbursed only 523 loans between 2008 and 2013. Alternative schemes beyond direct financial interventions such as the promotion of energy renovation services and works were also less successful than anticipated (Ruelle & Teller 2015: 4).

An example of an effective measure is the Energy Saving Concept (ESK2000) which has been applied to more than the 50% of Munich's building stock. It identifies an energy benchmark for every single property to determine which energy saving measures should be applied (JRC -EUR 27526 EN: 2015).

Changing consumption behaviour

Studies confirm that heating consumption can vary by a factor of two to three depending on user behaviour. This means that user behaviour is as important as actual building physics when it comes to energy consumption for heating (Gram-Hansen 2013:455). National campaigns, such as those in Austria (*Klimaactiv*), France (*j'éco-rénove, j'économise*) Finland (Motiva platform) and Latvia (*Let's live warmer*), can change behaviour. Some municipalities, businesses and community organisations, however, also encourage households to reduce consumption. In Zaragoza, Spain, substantial

Table 7.2. **Modes of Governing Environment and Climate Change in Urban Arenas**

Mode of Governing	Policies and mechanisms	Advantages	Limitations
Municipal self-governing	Management of local authority estate. Procurement. Demonstration projects.	Under the direct control of the municipality; can provide quick, measurable and cost-effective action; can be used to demonstrate leadership and commitment.	Addresses only a small proportion of resource flows, GHG emissions or vulnerable locations/communities. May be limited to those that can provide a financial return within (short) time horizons of electoral and budget cycles.
Municipal provision	Developing low-carbon and resilient infrastructure systems, goods and services, e.g. solar energy, SUDS.	Has potential to address significant sources of emissions and widespread vulnerability. Could also improve access and affordability of basic services.	Capacity limited by a lack of finances, creditworthiness and dependency on the terms and conditions of capital loans. Municipalities may lack remit for providing energy, water, waste and transport services.
Municipal regulation	Financial instruments (e.g. taxes, subsidies). Land-use planning, codes, standards etc.	Provide the basis for transparent and effective policy. May yield additional revenue, which can be invested in additional actions.	Difficult to implement because of concerns about their impact on particular sectors or individuals. Challenging to apply retrospectively (e.g. to existing buildings). Where there is limited capacity, regulations can be difficult to monitor and enforce.
Municipal enabling	Information and awareness raising. Incentives and rewards. Partnerships.	Enabling measures can require relatively little financial or political investment. Cities benefit from the resources and capacities of a range of other urban actors. Through involving a range of different partners they may increase the democratic mandate for action planning.	Dependent on the goodwill and voluntary actions of businesses and communities which may not be forthcoming. Attributing the impact of such measures is often impossible and it may be difficult to evaluate their cost-effectiveness.
Public-private partnerships	Developing low carbon and resilient infrastructures, services and goods.	Given the fragmented nature of urban infrastructures and service provision, a partnership mode is often required for effective action. They may provide direct benefits, for example in terms of resources, knowledge and the pooling of different strengths.	Require capacity (e.g. in terms of co-ordination) and can be fragile in the face of competing interests. Partnerships can be exclusive, and serve the interests of dominant groups within society while excluding the needs of the poorest or marginal. Partnerships also raise questions about the legitimacy and transparency of decision-making, and the extent to which decision-making is open and democratic.
Voluntary	Soft regulation. Incentives. Demonstration.	Direct actions undertaken by private and civil society actors can reach beyond direct municipal influence. Scope for synergy with other goals may provide incentives to pursue action and opportunities for addressing other urban challenges.	Frequently small scale. Limited means to assess contributions or for organisations to account for their actions. May shift accountability from actors with official responsibilities to those who have little in the way of power or resources.
Mobilisation	Information and awareness raising. Incentives. Partnerships.	Actions undertaken by private and civil society actors to mobilise others to address climate change. Offer potential to reach sources of resource use, GHG emissions and vulnerability beyond the reach of municipal authorities. Can create broad-based political and social support for urban action.	As with enabling, mobilisation efforts may be hampered by the challenges of engaging others in action. The mandate of non-state actors to call on others to act and the extent to which they can be held accountable for doing so can be questioned. Such efforts may serve to promote particular responses which accord with dominant social interests, perpetuating existing inequalities.

Source: Adapted from Bulkeley 2013

water savings resulted from behavioural change through awareness-raising campaigns. The city also introduced a more equitable and demand-responsive tariff structure through subsidies to vulnerable households, as well as water bill discounts for consumers reducing their annual consumption by 10% or more, and penalties for excessively high consumption.

Urban infrastructure: From grey to green and blue

The development of urban infrastructure has traditionally been dominated by so-called 'grey' solutions, e.g. roads, power grids, piped sewer and water systems. Yet such approaches are increasingly seen as limited in their capacity to adjust efficiently and in an ecologically sensitive manner to changing climate and urban environments.

Many European cities have therefore started to invest in green or blue infrastructure by expanding nature-based solutions or ecological systems to enhance urban resilience. Green infrastructure includes green roofs, city parks, street trees, as well as forest and natural reserves that are used to address water run-off, air pollution or heat island effects. Blue infrastructure includes wetlands, streams, ponds, ditches and pools to address flooding or facilitate water purification. However, the share of urban green and blue infrastructure varies significantly across Europe (Map 7.8).

Studies show that green infrastructure can contribute to reducing the impacts of climate change by, for example, reducing heat stress, improving air quality and decreasing flood risks

Studies show that green infrastructure can positively contribute to reducing the impacts of climate change by, for example, reducing heat stress, improving air quality and decreasing flood risks. Most EU countries have one or more cities faced with high flood risk (Map 7.9) but this risk varies substantially between cities.

One of the cities active in this area is Malmö in Sweden, which has developed a surface-level storm water system, green rooftops, green walls and improved green spaces which create cooling effects, reduce flooding and recharge ground water (EEA2011).

7.5. Cities as laboratories for new policies

Cities differ in their intervention capacities (see also Chapter 8: Urban Governance). Municipal authorities have significant, though highly differentiated powers to govern the domains of land-use planning, energy provision, transport, waste and water services. Other authorities operating at the regional, national and international scale are also important in regulating the urban environment. For example, the introduction of a succession of EU Directives intended to divert waste from landfills and encourage recycling and reuse, has reshaped waste collection in many cities. In Lund, Sweden, for example, food waste is now collected to produce biogas fuel for the municipal bus fleet. In the UK, municipal governments and their partners now regularly collect garden waste to produce compost for urban parks or public use.

Cities are host to multiple actors ranging from utility companies, urban developers and financial institutions to community groups, environmental organisations and research institutes. City authorities therefore need to act within complex and dynamic multilevel governance landscapes involving actors who operate at different levels and domains, as well as across the remit of public and private authority. This is summarised in Table 7.2 which outlines the different modes of governance that have emerged to respond to environmental issues and climate change in cities and assesses their potential and limitations.

As cities seek to respond to climate change and other environmental concerns, a new trend is emerging. Rather than being driven primarily by urban planning, responses are increasingly characterised by emphasis on experimentation, innovation and 'learning by doing' at small scale and with the ambition to scale up successful interventions over time.

The trend towards greater decentralisation (see Chapter 8) has supported this shift towards experimentation, as has the growing focus on partnership and participation. Local authorities also use more project-based funding to pursue long-term goals, as some have seen their budgets shrink.

Technological innovation: Smarter cities

One of the key initiatives through which European cities are developing technical innovation for addressing matters of climate change is through 'smart city' and 'smart urbanism' initiatives.

The European Commission has, for example, set up the European Innovation Partnership for Smart Cities

and Communities which seeks to combine Information and Communication Technologies (ICT) with energy and transport management to provide innovative solutions to the major environmental, societal and health challenges facing European cities today. The partnership brings together cities, industry and residents to improve urban life through more sustainable integrated solutions. It has a particular focus on meeting Europe's goals for climate change and energy, as well as creating a platform where cities can set out their commitments, form coalitions and exchange knowledge.

Several smart city initiatives target energy consumption and renewable energy generation. The Danish Kalundborg Smart City project promotes public-private coalitions for the development of data models supporting low-carbon energy initiatives and closed-loop resource integration. Similarly, the Amsterdam Smart City project consolidates the work of over 80 industrial and academic partners, testing new technologies aimed at involving the city's inhabitants in the creation of a low-carbon city. The project includes smartphone apps for promoting public awareness on energy, pilot implementation of district heating systems, development and testing of electric vehicles and grid integration technologies.

An important way in which smart city initiatives are developing potential capacity for urban sustainability, carbon reduction and energy monitoring, is through the use of urban environmental sensors. Urban sensors, owned by local authorities and residents alike, are transforming how the public interacts with the city's resource flows and its infrastructure. The emerging technologies illustrate how urban environmental risks like air quality, carbon dioxide emissions, heat stress, and waste are becoming subject to micro-spatial monitoring.

Social innovation: urban living laboratories for sustainability

Social innovation also plays an increasing role in how European cities are advancing new ways of achieving urban sustainability and responding to climate change. The emphasis here is less on technological advances but on new ways of organising society around a shared vision of sustainability.

Urban laboratories test different approaches to promote low-carbon and more sustainable ways of living. In 2012, the University of Manchester, for example, launched its University Living Lab initiative to transform its campus into an active site for applied teaching and production of sustainability science. It resulted in establishing the Corridor Manchester, a public-private initiative involving Manchester City Council in developing an innovation district at the heart of the city.

7.6. Conclusion

This chapter has shown that, despite some progress, many European cities need to further reduce air pollution to protect the health of their residents and to comply with EU directives. Municipal waste production has been reducing and recycling has increased but many cities may need to do more to reach the EU recycling target by 2020.

The Amsterdam Smart City project consolidates the work of over 80 industrial and academic partners, testing new technologies aimed at the creation of a low-carbon city

Climate change has now moved to the forefront of urban priorities. The density of cities can generate a number of energy savings: from switching to low-carbon transport modes, to district heating, to living, working and playing in bigger, taller or adjacent buildings that are more efficient to heat and cool. Cities are reducing energy consumption and greenhouse gas (GHG) emissions by providing better insulation, more efficient lighting and new low-energy buildings. But more action will be needed to meet the ambitious goals set by the European Union for 2030.

A more recent field action is climate change adaptation with many cities using nature-based solutions to address this threat. Some of these actions can also support other goals by reducing GHG emissions, pollution or flood risk. For example, green roofs can reduce the risks of heat waves, catch run-off water and reduce the need for cooling. Trees can reduce the heat island effect and reduce air pollution. More experimentation in this area can lead to more efficient action.

European cities are rising to meet these diverse challenges. As this chapter has shown the environmental issues facing cities vary widely. This also means that cities will have to create their own mix of policies and investments to find the best response to their individual situation.

Manchester University has set up a Living Lab on campus for applied teaching and sustainability science

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Chapter 8.
Urban governance

- In most European countries, local governments, including cities, play a greater policy role than regions do.
- The autonomy of local authorities and the average municipal population size have grown over the past two decades. Still, significant differences remain between countries, with some local authorities having very little autonomy and a population of only a few thousand inhabitants.
- Local government is responsible for almost half of total public investment. After the economic crisis, however, total public investment dropped as did the share managed by local governments.
- Over the past twenty years, Cohesion Policy has helped to increase public investment including investment by local authorities in many of the central and eastern EU countries.
- Due to population growth and better transport connections and communication, the impact of a city extends far beyond its municipal borders. This means that urban governance needs to shift to a metropolitan scale to match labour and housing markets.
- To ensure effective urban governance, countries and cities are experimenting with metropolitan governments and inter-municipal authorities. Cities need sufficient autonomy and resources, a clearly identified decision-making process, support from residents and possibly, a directly elected mayor.

Lyon has a metropolitan government serving 59 municipalities with strong fiscal autonomy and power sharing among mayors

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Gothenburg issued two green bonds in 2013 and 2014. The share of bonds in Sweden in total local debt increased from 18 to 34% between 2009 and 2014 © Mikhail Markovskiy

8.1. Introduction

This chapter describes how the role of local authorities has changed over time. It measures how local autonomy has increased and whether regional or local authorities have the most autonomy.

It describes the financial role of local authorities: How much do local authorities spend and invest and where do they get their revenue from? The impact of the crisis on financial flows is assessed with a focus on the countries most affected.

Next, it explores trust in local government, the perception of corruption, and the quality of a number of local public services.

The final section shows how countries are responding to the growing influence of cities beyond their municipal borders. It explains that policies can become more effective if they are designed for functional urban areas, i.e. cities plus their surrounding commuting zones. Moving policies to this functional level, however, is not an easy task that can be rapidly accomplished.

8.2. Local autonomy has grown, but differences remain

To measure the degree of EU local authorities' autonomy, a Local Autonomy Index has been developed. This weighted index, created especially for this report, explores the extent of municipal autonomy in political and budgetary matters. As such, it measures the degree of decentralisation in European countries.

The index is based on eleven variables, grouped into seven dimensions, of which the first four are given more weight:

1. **Legal autonomy**–the legal position of municipalities within the state;

2. **Vertical influence**–the degree to which they can influence political decisions at higher levels;

3. **Organisational autonomy**–the extent to which local authorities are able to decide aspects of their political system and their own administration;

4. **Policy scope**–the range of functions or tasks in which municipalities are effectively involved in the delivery of services, be it through their own financial resources and/or through their own staff;

5. **Central or regional control**–the importance given to the municipalities within the state and the extent to which municipalities are controlled by higher levels of the state;

6. **Effective political discretion**–the range of tasks over which local government has a say and whether it enjoys a general competence clause; and

7. **Financial autonomy**–the extent to which municipalities can influence their own budget.

The index indicates that the degree of autonomy of local governments in European countries has increased since 1990. There are, however, significant differences in the degree of autonomy across European nations.

The Nordic countries Denmark, Finland, Iceland, Norway and Sweden provide their municipalities with high levels of autonomy, as do Germany, Poland and Switzerland (see Figure 8.1). In contrast, Cyprus, Ireland and Malta have municipalities with low degrees of autonomy.

Increases in local autonomy occurred especially between 1990 and 2000, notably in the post-transition new democracies of central and eastern Europe and with particularly substantial autonomy increases in Bulgaria, Poland, Romania and Slovenia. Across the EU-15 countries local autonomy only increased slightly but is still higher than in the EU-13.

Box 8.1. Cities are playing a growing role in EU Cohesion Policy

Cohesion Policy has experimented with several ways of engaging with cities, starting with the Urban Pilot Projects in the 1990s and the URBAN I and II Community Initiatives in the 1990s and 2000s. URBACT, set up in the early 2000s, seeks to enable cities to work together, learn from each other and identify good practices. The current URBACT III programme has a budget of EUR 96 million for the period 2014-2020.

During the 2007-2013 period, URBACT encouraged regional programmes to involve cities in their programmes, which more than half of the programmes did. The European Commission in co-operation with the European Investment Bank and the Council of Europe Development Bank set up the 'Joint European Support for Sustainable Investment in City Areas programme' (JESSICA). It supports urban development and regeneration with equity, loans and guarantees and has been implemented in 23 EU countries.

To strengthen the role of cities in Cohesion Policy, the 2014-2020 period introduced: (1) ring-fenced funding for investment in cities, managed directly by cities; (2) integrated Territorial Investments' for easier combining financial support from different funds and programmes supporting development strategies targeted at functional urban areas (FUA) through 'Integrated Territorial Investments'; (3) the establishment of an Urban Development Network to help cities with the implementation of their Cohesion Policy-funded actions; and (4) Urban Innovative Actions.

Metropolitan governance and Cohesion Policy

Several EU countries, including Croatia, the Czech Republic, Italy, Poland and Romania, have promoted co-operation at the functional urban area level in the context of the implementation of ring-fenced funding for cities. Poland, for example, used more than EUR 3 billion to support the integrated development of the metropolitan areas of its 16 regional capital cities.

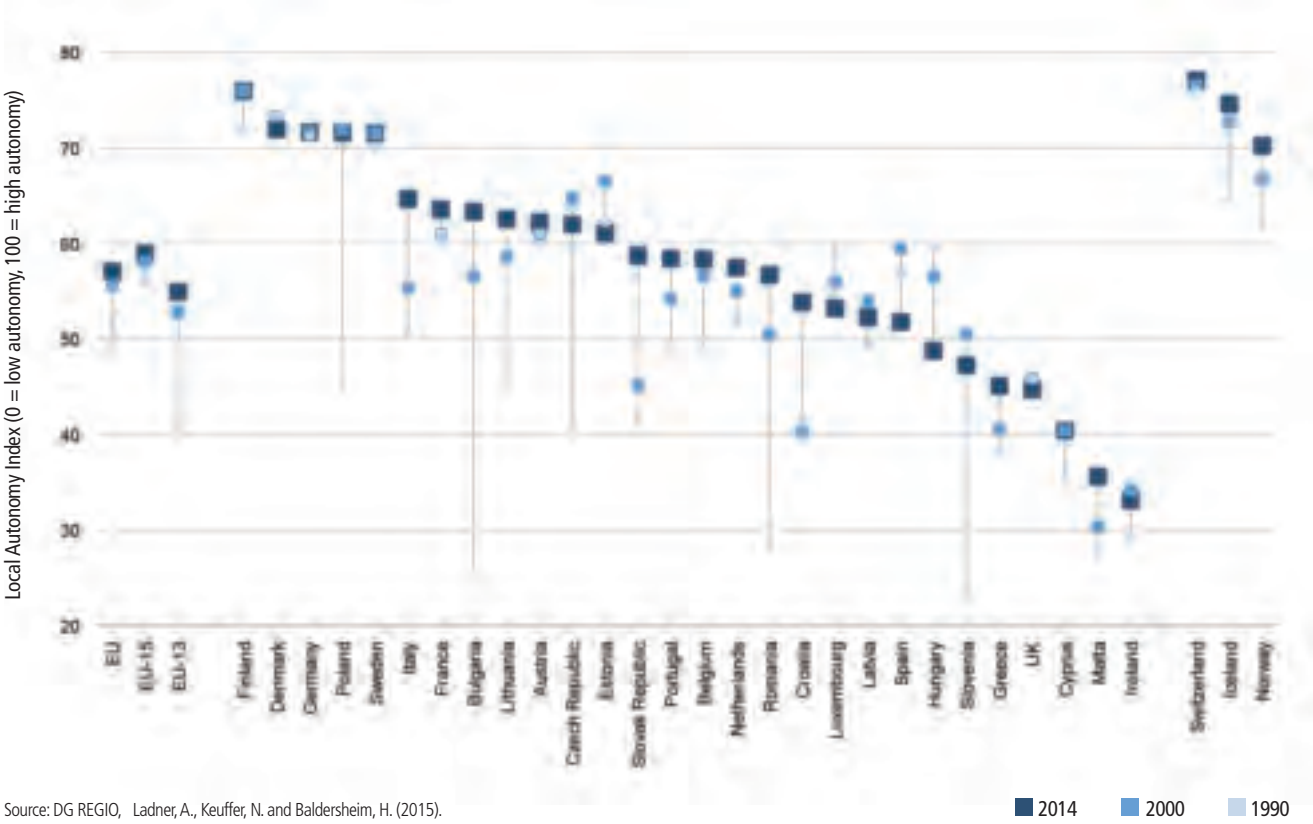
Urban Innovative Actions

Urban Innovative Actions is a new programme under the Cohesion Policy encouraging cities to experiment with new solutions to emerging challenges.

The total budget for Urban Innovative Actions is EUR 371 million over the period 2014-2020. Projects will be selected through calls for proposals and can last up to three years. The selection criteria are: innovativeness and quality of the project, partnership, measurability of the results, and replicability of the process and solutions.

The first call for Urban Innovative Actions proposals was launched in 2015 and focused on four themes: energy transition, urban poverty (with a focus on deprived urban neighbourhoods), inclusion of migrants and refugees, as well as jobs and skills in the local economy.

Figure 8.1. **Local autonomy, by country, 1990-2014**



Source: DG REGIO, Ladner, A., Keuffer, N. and Baldersheim, H. (2015).

In most European countries, local authorities have more autonomy than their regions (see Figure 8.2). Only in Belgium, Germany, Italy and Spain - countries with a strong regional governance dimension - is the degree of regional self-rule higher than the local one. Under the regionalised State in Italy and Spain, where the emergence of multilevel governance is the most important recent change in subnational governance systems, local authorities clearly remain an important policy level.

Many countries have merged municipalities

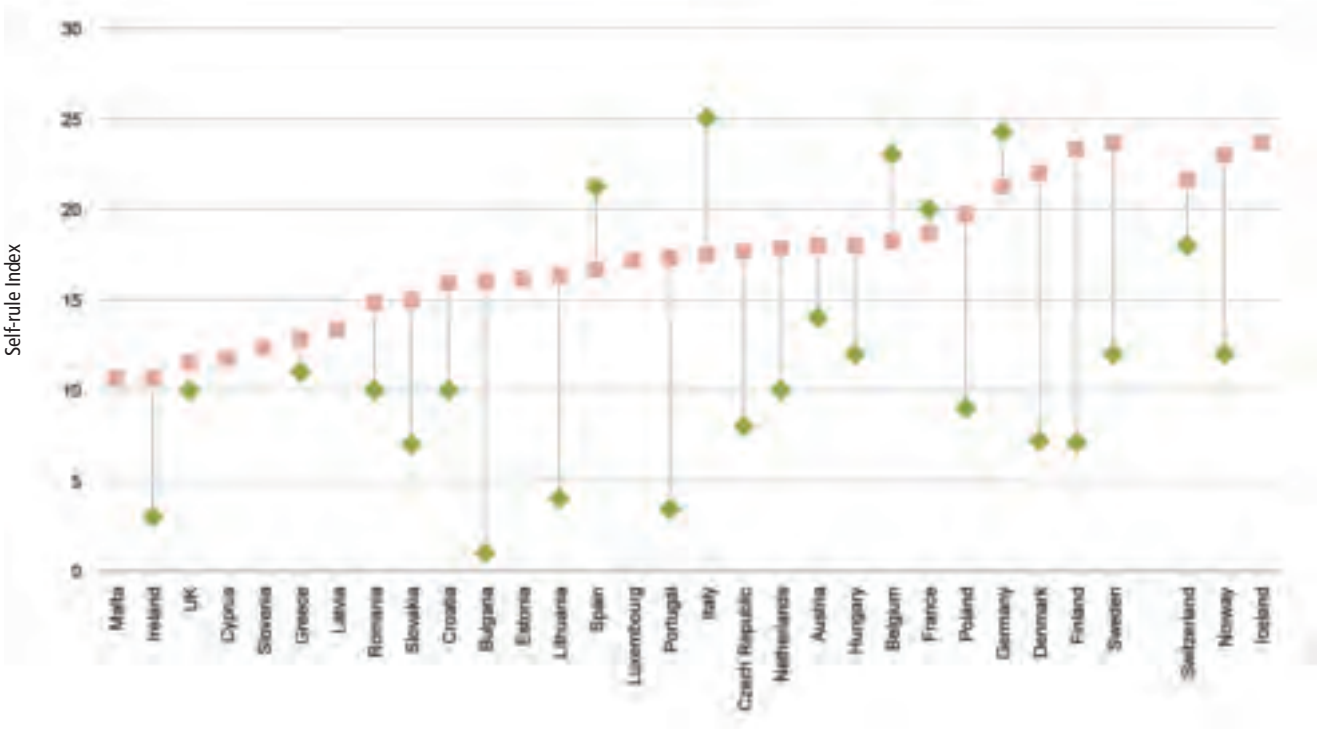
In the early 1990s, Europe had a total of about 97,500 municipalities. By 2014, that number had declined to about 92,000 –a reduction of just over 5% over 25 years. Not all countries, however, reduced their number of municipalities. Although some countries with already quite large municipalities merged more, for example the UK, others such as the Czech Republic further reduced the size of their already small municipalities (see Figure 8.3). As a result, the average population per municipality in 2014 varied between 150,000 in the UK and Ireland to only 1,700 in the Czech Republic - almost 100 times smaller.

In the early 1990s, Europe had a total of about 97,500 municipalities. By 2014, that number had declined to about 92,000–a reduction of just over 5% over 25 years

The largest reduction in the number of municipalities occurred in Greece (-94%), Latvia (-80%), Ireland (-73%), Iceland (-65%) and Denmark (-64%). Switzerland reduced its municipalities by 15% but nevertheless still has small municipalities with on average only 3,500 inhabitants.

In other countries the number of municipalities rose with the largest increases in the Czech Republic (+50%), Croatia (+226%) and Slovenia (+260%). Following their independence in 1991, both Croatia and Slovenia set up new territorial divisions, which led to relatively large numbers of small municipalities.

Figure 8.2. **Local and regional self-rule per country, 2010**



Source: DG REGIO, Hooghe, Liesbet, Marks, G., Schakel, A. (2010) and Ladner, A., Keuffer, N. and Baldersheim, H. (2015)

Budapest has 23 district governments each of which is responsible for important policy areas such as education, health and housing

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Opponents of merging municipalities fear that fewer but larger municipalities will generate costs without leading to efficiency gains and that the local government will become less close to the public

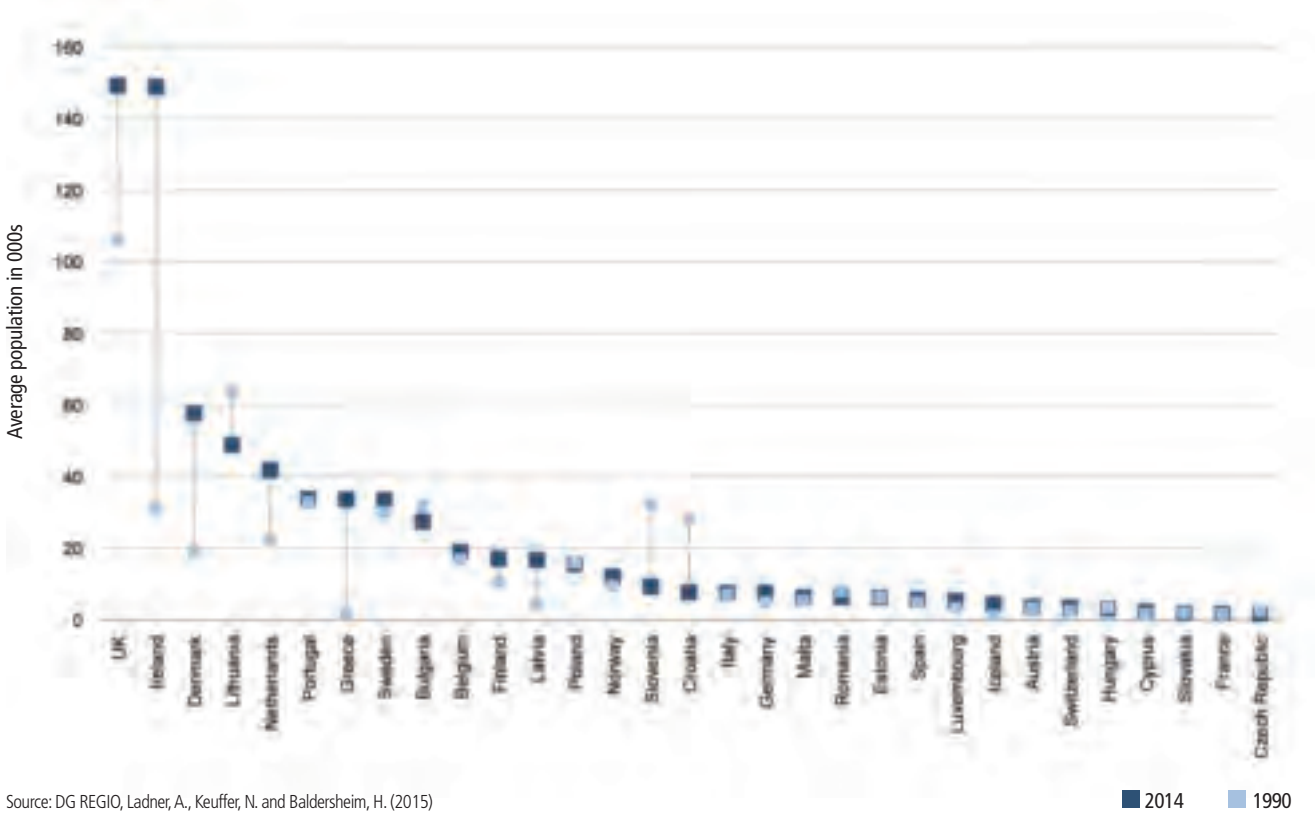
The population size of a municipality and the degree of local autonomy, are not necessarily linked. France has many small municipalities but ranks fairly high in the Local Autonomy Index. Some countries with low levels of municipal autonomy have reduced their number of municipalities but this had little impact on local autonomy. The number of Greek municipalities was reduced from 5,775 to 1,033 in 1998 and further to 325 in 2011 but, there too, without significant change in autonomy levels.

Whether there is a need to establish a certain minimum municipal population remains a matter of debate. Opponents of merging municipalities fear that fewer but larger municipalities will generate costs without leading to efficiency gains and that the local government will become less close to the public. Proponents argue that small municipalities are less able to provide cost-efficient services and that a certain size and competition is needed to create and maintain a vigorous local democracy.

Most municipal leaders are elected indirectly

Two different systems for the election of municipal executives exist in Europe. Most common is indirect election whereby the municipal council is directly elected by the voters in the constituency but the municipal executive is chosen by the municipal council from among its members (see Box 8.2). In contrast, in countries with direct elections the council and the executive are both chosen by the general voting public. Direct election applies to most eastern Europe countries (Hungary, Poland, Romania, Slovakia and Slovenia) and a few western ones (Italy, most of the German and Austrian *Länder,* as well as a few UK districts).

Figure 8.3. **Average population per municipality by country, 1990 and 2000**



Source: DG REGIO, Ladner, A., Keuffer, N. and Baldersheim, H. (2015)

Box 8.2. **Direct or indirect election of mayors**

Indirect election: The Netherlands, Spain and the UK

The Netherlands

Dutch municipalities are administered by local councils which serve as the deliberative body. Councillors are directly elected for a four-year mandate. The executive body of the municipality consists of the College of the Mayor and Aldermen whose size varies according to each municipality. Aldermen are elected from among the council members for a four-year term. The mayor is appointed by the central government after a proposal by the local council. The mayor *(burgemeester)* chairs both the municipal council and the College of the Mayor and Aldermen. The mayor does not vote in the council but votes in the College of Aldermen where he or she has a deciding vote.

Spain

Spanish municipalities are administered by a local council *(Pleno)* composed of directly elected members for a four-year term. The executive body is the local government council *(Junta)* which is composed of councillors appointed by the mayor. The mayor *(Alcade)* is the head of the local government council and is elected by the other members of the local council.

United Kingdom (England)

The Local Government Act of 2000 gave all local governments the possibility to opt for direct election of their executives, although only 16 out of 326 decided to do so. Today, Leicester, Liverpool and Salford are the largest single municipalities with a directly elected mayor. Greater London, which consists of 32 municipalities (boroughs) and the City of London, has had a directly elected mayor since 2000. Other municipalities are run by a local council whose members are directly elected for a four-year mandate. The council elects from among its members a council leader who is the executive, also for a four-year term. In many municipalities, the council can further elect a mayor who has only ceremonial functions and (usually) a one-year mandate.

Direct election: Italy

In 1993, a law was passed to introduce the direct election of mayors for Italian municipalities with more than 15,000 inhabitants. Before that, mayors were indirectly elected by and from among the municipal council members. Since many Italian municipal councils were based on unstable party coalitions, the position of the mayor was fragile because the executive would have to resign whenever the coalition collapsed. Thus in 1993, new legislation introduced a strict separation between the executive and the council, while shifting more powers to the mayor's office. The mayor now appoints a deputy who cannot simultaneously serve as a municipal council member. If the deputy chosen is a council member, he or she must resign from the council before taking up the deputation. A politically stronger mayoral function has thus been established with positive impacts on municipal policy and decision-making capacities.

The mode of election of municipal executives, along with the nature of their relationships with the municipal councils, is an indicator of the leadership type. Supporters of direct mayoral elections argue that it strongly increases both the executive's political legitimacy and capacity to act. This is especially the case when the mayor's office is politically separated from the municipal council and in cases where the municipal council has weak powers (Box 8.2).

Many large municipalities have a lower tier of government

Many larger European municipalities have sub-municipal units of government to better manage policy sectors at the very local level and/or to bring its interactions closer to the people. This is the case in Amsterdam, Bratislava, Budapest, Copenhagen, Lyon, Madrid, Riga, Rome and Warsaw, among others. Such sub-municipal units carry various names: *distritos* in Madrid, *municipi* in Rome or *sectors* in Zagreb. Whether created through national or local legislation, they generally correspond to historic governance units albeit with different functions today.

The status and powers of such sub-municipal units vary greatly from one city to the other. Most are weak but in Amsterdam, Budapest and Copenhagen, for instance, they are powerful (see Box 8.3). In most other cities, including Madrid, Riga and Warsaw, such bodies are without significant powers, responsibilities or resources of their own. They are typically chaired by

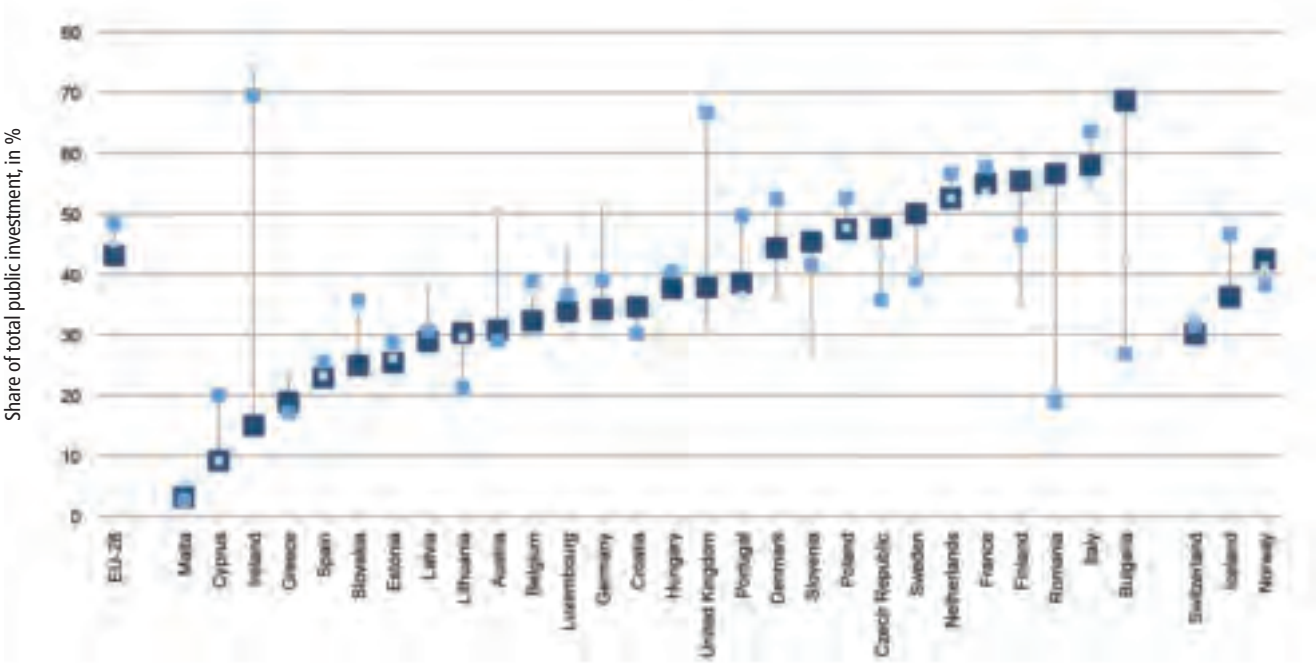
Stuttgart was the first EU urban agglomeration to establish an elected metropolitan government in 1994 © Salih Külcü

Box 8.3. **Strong sub-municipal units: Budapest and Rome**

Budapest, a city of 1.7 million people, is divided into 23 districts each run by a directly elected mayor and council. These districts have the same status and rights as any other local government in Hungary and there is no hierarchy between city and district government. Districts are responsible for important service and policy sectors such as basic health, education or housing. They have their own budget and can levy some local taxes.

The municipality of Rome, with 2.9 million inhabitants, is divided into 15 districts *(municipi)* each with its own directly elected council and an indirectly elected mayor. Their competences have significantly increased over the past decades with the adjunction of economic development and private housing as new responsibilities besides social affairs, education, parks and local police. Their budget is allocated by the city administration but they have autonomy over its use.

Figure 8.4. **Public investment by local governments by country, 1995-2015**

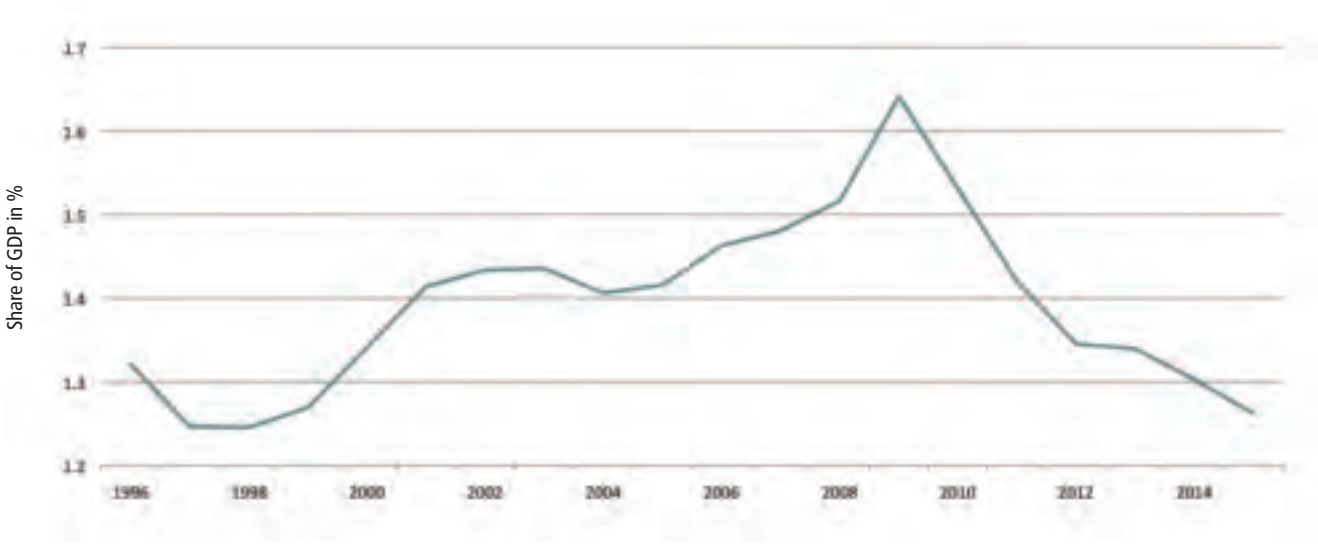


Note: 1995 = EU-27; Switzerland 2015 = 2014
Source: Eurostat

one of the municipal councillors while in Bratislava, Lyon, Marseille and Prague, they are administered by elected councils. But even in such cases their powers remain weak and the resources allocated by the municipal council are small.

In cities where sub-municipal bodies are strong, they are generally administered by directly elected councils and sometimes even have directly elected presidents (also called mayor). They are responsible for important domains, including basic health, education, economic development or planning. Their budgets are relatively significant and in some cases they have their own resources through certain local taxes they are allowed to levy. Although supplementary grants or subsidies are derived from higher municipal and governmental tiers, they are fairly strong basic units of local democracy. To avoid that decisions of sub-municipal bodies interfere with policies decided at the city and functional urban area level, these bodies focus primarily on neighbourhood issues.

Figure 8.5. **Local public investment relative to GDP in the EU, 1996-2015**



Source: Eurostat, Note: 1996-2001 is EU-27

8.3. Many local authorities play a key role in public investment, expenditure and some even in tax collection

Local governments manage a large share of public investment

As a whole, EU local governments manage 43% of total public investment; a share that increased until the 2008/9 crisis after which it dropped sharply (Figure 8.4). The local share of public investment, however, differs widely among countries, with local investment less than 20% of total public investment in Cyprus, Greece, Ireland and Malta and over 55% in Bulgaria, Italy and Romania (see Figure 8.4). Over the past twenty years, this share has increased substantially in Bulgaria, Romania and Slovenia, largely due to Cohesion Policy, as well as in Finland. In some countries, local authorities now manage a smaller share of public investment than in the past. The largest drops occurred in Austria, Germany and Ireland. In the UK, this share first increased to one of the highest but subsequently dropped below the EU average.

The crisis has strongly affected local investment with steep declines since 2010. Overall, local investment (as a share of GDP) sharply fell from its peak of 1.64% in 2009 to 1.3% in 2014 (see Figure 8.5). Over the 2009-14 period it only increased in six EU countries: Bulgaria, Denmark, Finland, Hungary, Slovenia and Sweden. Elsewhere, the decrease has been strong and especially so in Ireland, Italy, Portugal and Spain (Allain-Dupré, 2015).

The crisis has strongly affected local investment with steep declines since 2010. Overall, local investment sharply fell from its peak of 1.6% in 2009 to 1.3% in 2014 (see Figure 8.5)

The scale of public investment by local governments varies widely between countries. In Bulgaria local public investments account for 4.3% of GDP compared to 0.1% in Malta and 0.2% in Cyprus. The changes over time are also large, especially in countries affected by the crisis. Local public investment in central and eastern EU countries has, however, generally increased as a share of GDP since 2005. In some cases, the increases were very large. In Bulgaria and Romania, for example, the share increased by 2.4 and 3.3 percentage points respectively between 2005 and 2015. This increase is in large part due to investments co-financed by Cohesion Policy.

Reductions in public investment by local governments are explained by the fact that in EU countries current expenditure (particularly for social benefits) has grown more rapidly than revenues and consequently reduced the fiscal space left for investments. With the subsequent austerity measures, large cities have been particularly hit. Severe cuts

in investment have been reported by large local authorities (OECD CoR survey). Austerity measures notably affected scheduled large-scale projects, but also on-going infrastructure maintenance.

One would have expected that the decline in traditional sources of financing (e.g. grants from central governments) would have entailed a diversification of funding through recourse to borrowing and a search for private investment money, especially given the historically low interest rates. This, however, is not the conclusion one can draw from existing data. Rather, recourse to borrowing actually seems to have declined. According to an OECD-CoR survey, 39% of local authorities have reported a reduction or stagnation in borrowing for investments since 2010 and only 12% stated an increase. As a whole, in 2014, local debt accounted for only 6% of the public debt.

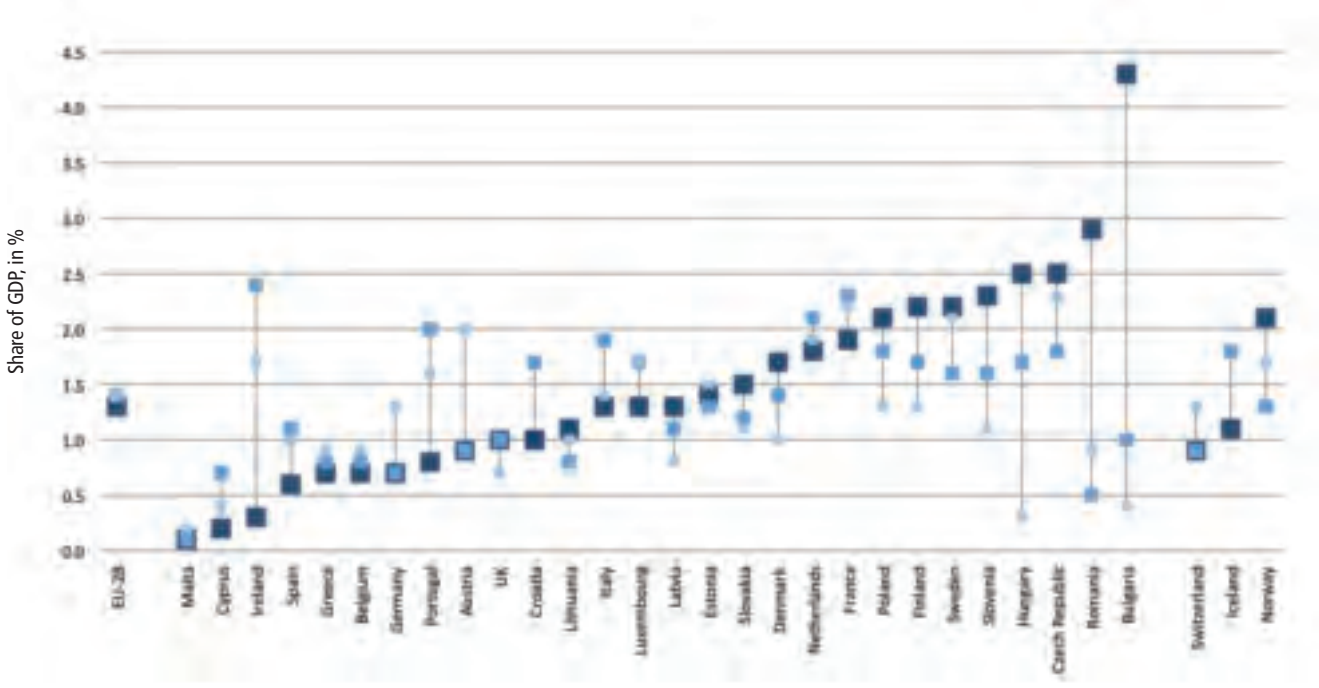
Basically, the sources of municipal investment funding have not significantly changed, although there is some variation among countries. For instance, while the largest share of local government debt comes by far from bank loans (92% in 2014), France and Sweden saw a significant increase in the number of municipal bonds issued, which is the second most important source of municipal investment funding. Between 2009 and 2014, the share of bonds in total local debt increased by 16 points from 18 to 34% in Sweden. In contrast, among Croatian, Hungarian and Romanian municipalities, recourse to bonds decreased.

The search for private funding has not changed significantly. Only seven per cent of local authorities reported increased private funding for infrastructure investment since 2010, mostly for metropolitan areas and regions.

Local government expenditure has grown over the past decades but the crisis took its toll

Whereas the share of local government spending in the EU had grown steadily since the late-1990s, a significant decline set in from 2009 onwards, accounting for just 11% of the total GDP and 23% of total government expenditure in 2015 (see Figure 8.7 and Figure 8.8). The significant decrease in central government transfers in many countries, largely due to austerity measures, has strongly affected local authorities especially those more dependent on transfers, as in Hungary, the Netherlands and the UK, for instance.

Figure 8.6. **Local public investment relative to GDP by country, 1995-2015**

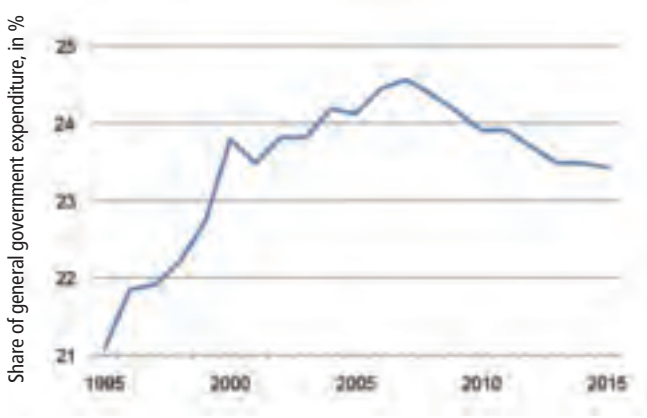


Note: 1995 = EU-27; Switzerland 2015 = 2014; Hungary 1995=1996
Source: Eurostat

Figure 8.7. **Local government expenditure relative to GDP in the EU, 1995-2015**

Note: EU-27 changes to EU-28 in 2001
Source: Eurostat

Figure 8.8. **Local government expenditure relative to total government expenditure in the EU, 1995-2015**



Note: EU-27 changes to EU-28 in 2001
Source: Eurostat

Local authority expenditure as a share of both national GDP and total public spending can help to assess their role in policy implementation. A high share of GDP and public spending indicates that local authorities are important actors in the production of policy outputs and services delivery

Transfers account for half the revenue of most local authorities but they vary substantially between countries

Local authorities derive revenues from three principal sources: a) transfers from higher government levels; b) local taxes; and c) fares and fees from services provided. For the EU as a whole, the 2013 distribution was: 48% from transfers, 36% from local taxes, 13% from tariffs and fees and 3% from others sources (OECD, 2015). Some cities own and manage services such as public transport, drinking water supply or waste disposal which allow them to cross-subsidise loss-making services or to use income from profitable services to invest in other areas.

The distribution of these revenue sources differs greatly among countries, but if one considers the importance of locally controlled sources of revenue (local taxes, tariffs and fees), three broad categories can be distinguished (see Figure 8.9): low, moderate and high financial autonomy.

- Low financial autonomy: countries where local authorities derive fewer than 25% of their total revenues from locally controlled sources. This group covers six countries: Bulgaria, Estonia, Lithuania, Malta, the Netherlands and Romania.

- Moderate financial autonomy: countries where local authorities obtain between 25% and 50% of their total revenue from locally controlled sources. This group includes twelve countries from across Europe.

- High financial autonomy: countries where local authorities derive more than 50% of their total revenues from locally controlled sources. This is the case in 13 countries, mostly in EU-15.

Local authority expenditure as a share of both national GDP and total public spending can help to assess their role in policy implementation. A high share of GDP and public spending indicates that local authorities are important actors in the production of policy outputs and services delivery. For the EU-28 countries, the average is 11% of the national GDP and 23% of national public spending. On the basis of both

the share in GDP and in public spending, four types of countries can be distinguished (see Figure 8.10).

- **Type 1:** Low share of GDP (less than 10%) and public spending (less than 20%). In these 13 countries, municipalities play a minor role in the provision of services and policy outputs.

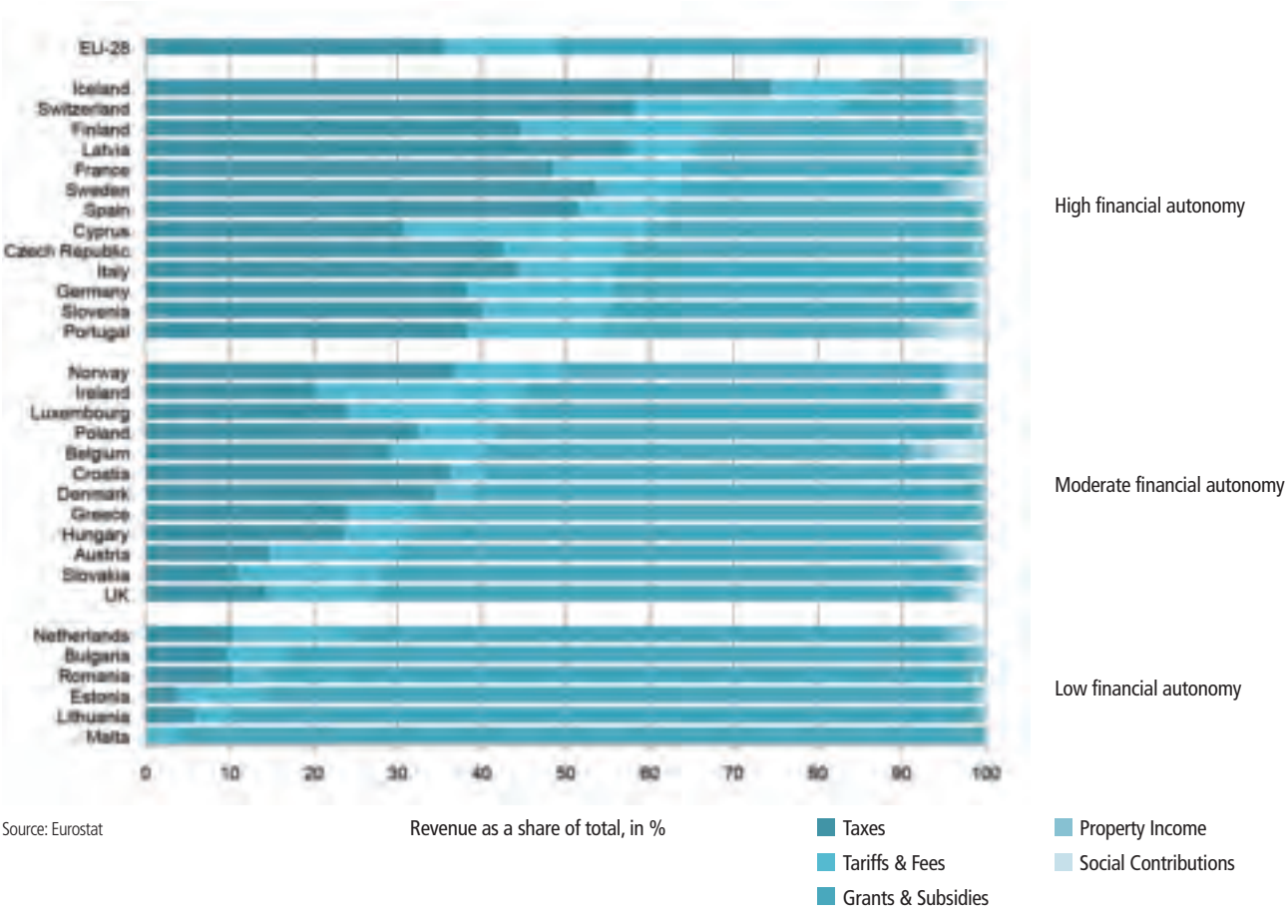
- **Type 2:** Medium share of GDP (between 10 and 20%) and public spending (between 20 and 40%). In these ten countries municipalities are significant players in policy implementation and public service provision.

- **Type 3:** High shares of GDP (more than 20%) and public spending (more than 40%). The three Nordic EU countries make up this type: Denmark, Finland and Sweden, where, municipalities are important players in policy implementation and the delivery of services.

- **Type 4:** A low share of GDP (less than 10%) and a medium share of public spending (over 20%). Countries of this type are Estonia, Latvia, Lithuania, Romania and Switzerland. In these five countries, local authorities are minor players in policy implementation and the delivery of services but their role is nevertheless more significant than in type 1 countries.

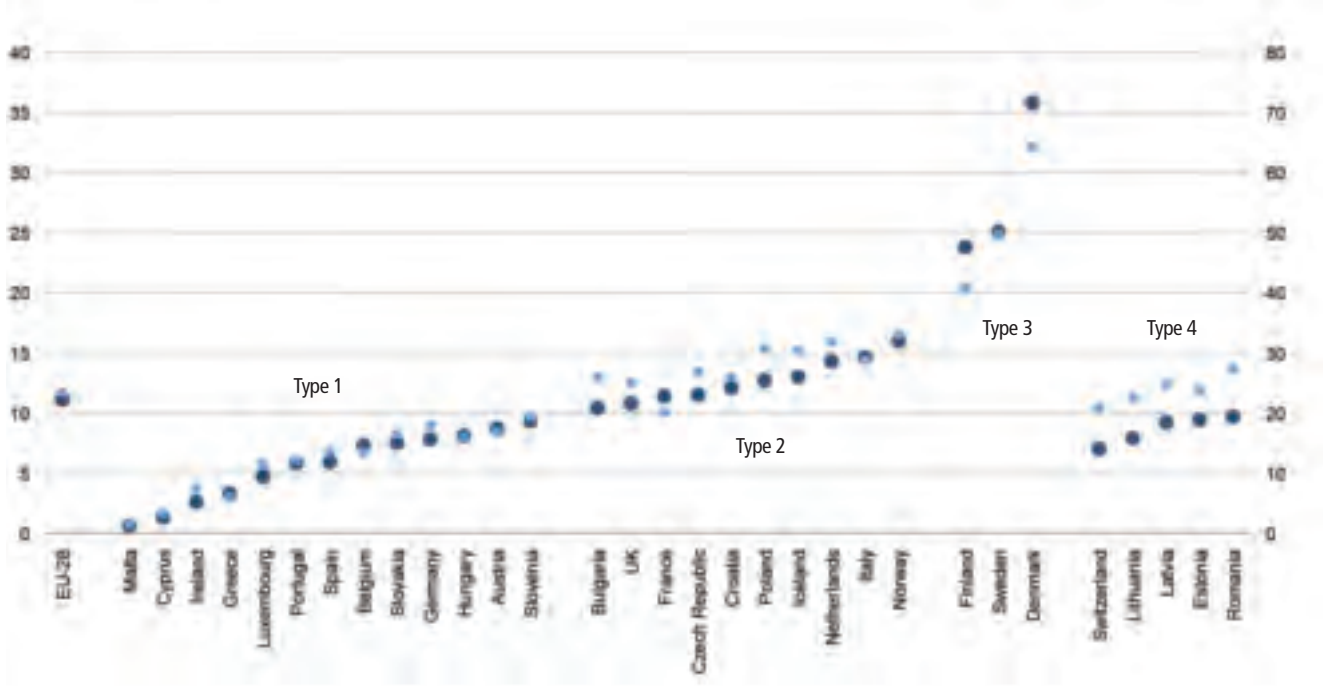
Where freedom of spending is concerned the European diversity is even greater. Spending freedom is a significant indicator of municipal financial autonomy and depends on two elements: a) the percentage of locally controlled revenues (taxes and fees) out of the total revenue; and b) the degree of flexibility in using transfers from higher levels of government. It is obvious that a high share of locally controlled revenues and high flexibility in using financial transfers indicates a high degree of financial autonomy. This is the case for cities in Finland, France

Figure 8.9. **Local government revenue by source per country, 2014**



Source: Eurostat

Figure 8.10. **Local government expenditure by country, 2015**



Source: Eurostat

● Left-hand axis: As a share of GDP, in % ■ Right-hand axis: As a share of public expenditure, in %

and Sweden. By contrast, the lower the share of locally controlled revenues and the lower the flexibility in using financial transfers, the lower the degree of financial autonomy, as in municipalities in Austria, Germany, Hungary, the Netherlands, Romania and the United Kingdom.

8.4. Trust in local governments is high but not in all cities

Data about popular perception of city governance is rarely available and is difficult to assess in comparative terms. However, drawing from various Quality of Life in European Cities surveys carried out for the European Commission, as well as information from the World Justice Project, some observations can be made regarding the trust people have in their local authorities and the quality of urban services provided.

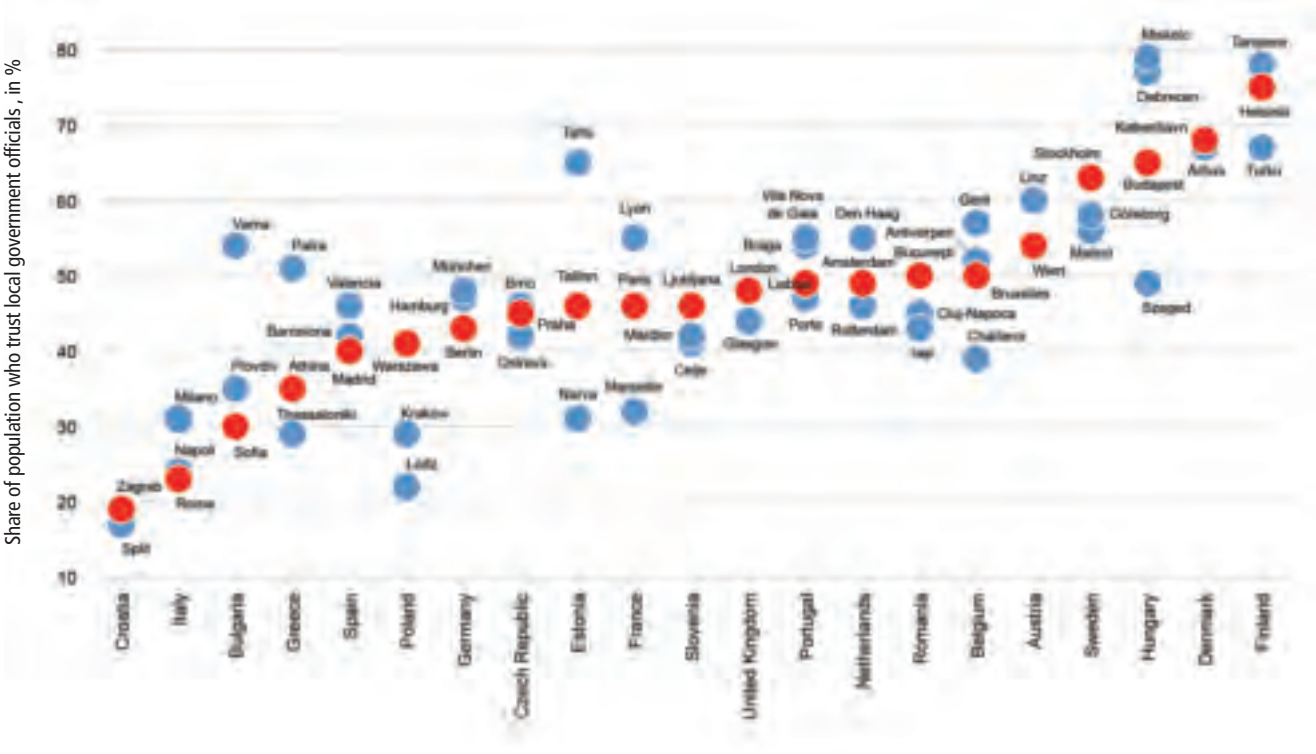
In general, Europeans trust their local governments more than their national governments. According to the above surveys, three categories of countries and cities emerge (Figure 8.11). The first concerns countries in which trust in local government administration is high, with above 60% of those interviewed giving a positive answer. Scandinavian countries and Hungary are good illustrations. The second concerns countries where positive answers ranged between 40 and 60%: France, Germany, Romania and the UK are examples. In the third group, trust is low with fewer than 35% of those interviewed trusting their local authority, e.g. Bulgaria, Italy and Poland.

Almost the same outcomes apply to the perception people have of corruption among local authorities (Figure 8.12). Countries in which residents trust their local governments are also countries where people believe these authorities are not corrupt (for example in the Scandinavian countries) while in a large part of eastern Europe and in Italy, local authorities are perceived as prone to corruption. These findings are corroborated by the Quality of Life in European Cities survey of 2015.

However, national averages hide significant disparities and not all cities are alike in how their performance is perceived by their residents. For instance, Marseille stands out among other French cities with a low 30% trust score and a high 40% score for perceived corrupted practices. In contrast, Warsaw (40% positive answers) or Miskolc (80% positive answers) stand out positively in their respective countries.

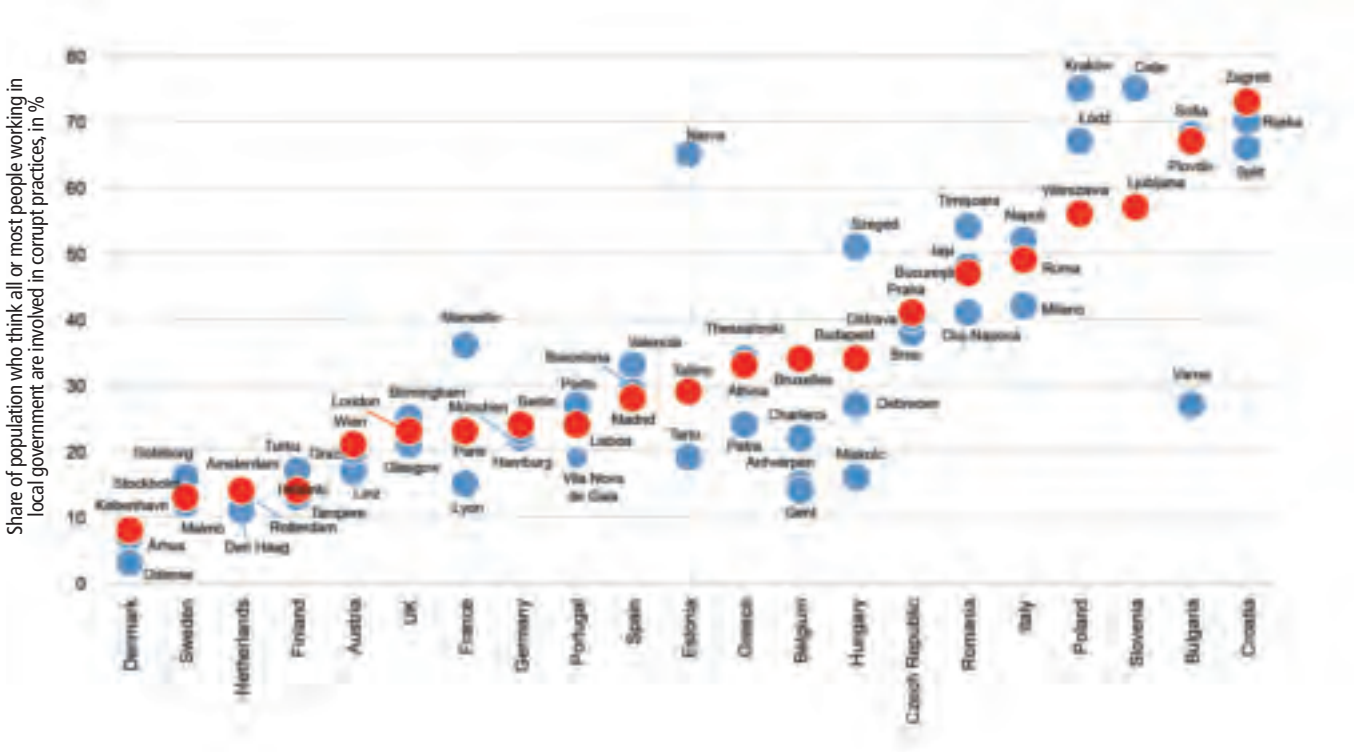
Marseille stands out among French cities for its low score (30%) for trust in the local government © Javarman

Figure 8.11. **Trust in local government officials in selected cities, 2012-2014**



Source: World Justice Project & JRC Calculations

Figure 8.12. **Perceived corrupt practices in local government, in selected cities, 2012-2014**



Source: World Justice Project & JRC Calculations

Assessing the quality of services and the efficiency of local administration is not an easy task considering cities' diversity in responsibilities and financial means. While in some countries many urban services are delivered by national governments (France and Hungary, for instance), in others (the UK and the Nordic countries) these services are provided by local authorities or the private sector. Nevertheless, basic services are more likely to involve municipal responsibility (local public transport, street cleaning, public space) and some observations can be made.

In the case of public transport, 75% of the respondents were satisfied with the quality of service in half of the cities surveyed. This is particularly the case in Helsinki, Vienna and Zurich that all scored a satisfaction rate exceeding 90%. In contrast, the Italian cities Naples, Palermo and Rome ranked particularly low with more than 60% of people dissatisfied about their public transport (see Figure 8.13).

The same applies to the perception of the condition of streets and buildings. In 33 cities, satisfaction exceeded 70% and scores were especially high in Helsinki, Stockholm, Vienna and Zurich. Naples, Palermo and Rome, once more, ranked very low with more than 75% dissatisfied.

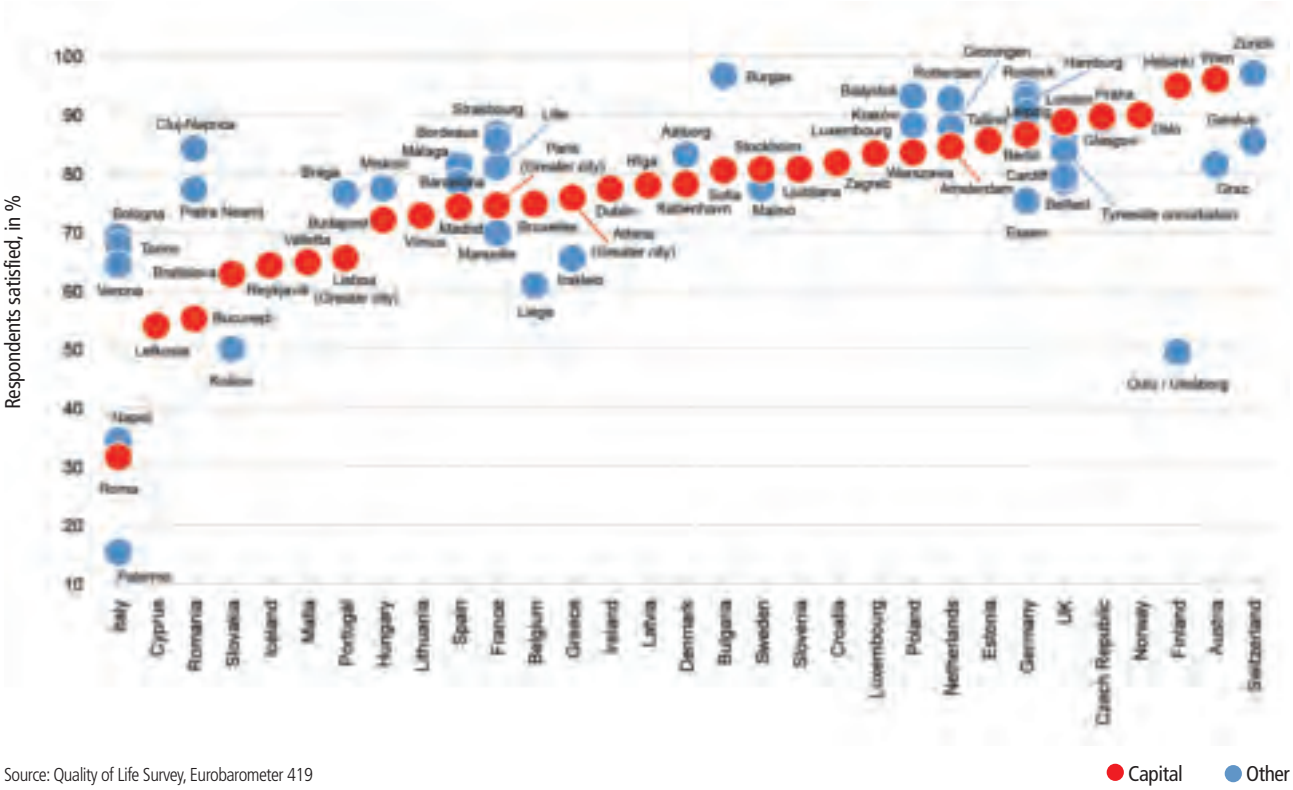
More or less the same applies to public spaces (markets, squares, pedestrian areas). Over 70% of the population of 67 cities was satisfied but dissatisfaction was high in Athens, Naples and Palermo (over 50%).

Finally, the perceived efficiency of city administrations in helping their residents presented contrasting views. While in 50 cities the administration was seen as efficient–Aalborg, Belfast and Zurich, for example, rank very high with over 70% of the population satisfied–Berlin, Bratislava, Naples, Palermo and Rome scored rather poorly (Figure 8.14).

8.5. Governing the city in the 21st century

In many European countries, municipal borders were set in 19th or 20th century. The daily patterns of human activities, however, have evolved and geographically expanded over time due to population growth, economic development, improved transport connections and communication technologies (OECD, 2015a). Therefore, today's administrative urban boundaries rarely

Figure 8.13. **Satisfaction with public transport, in selected cities, 2015**

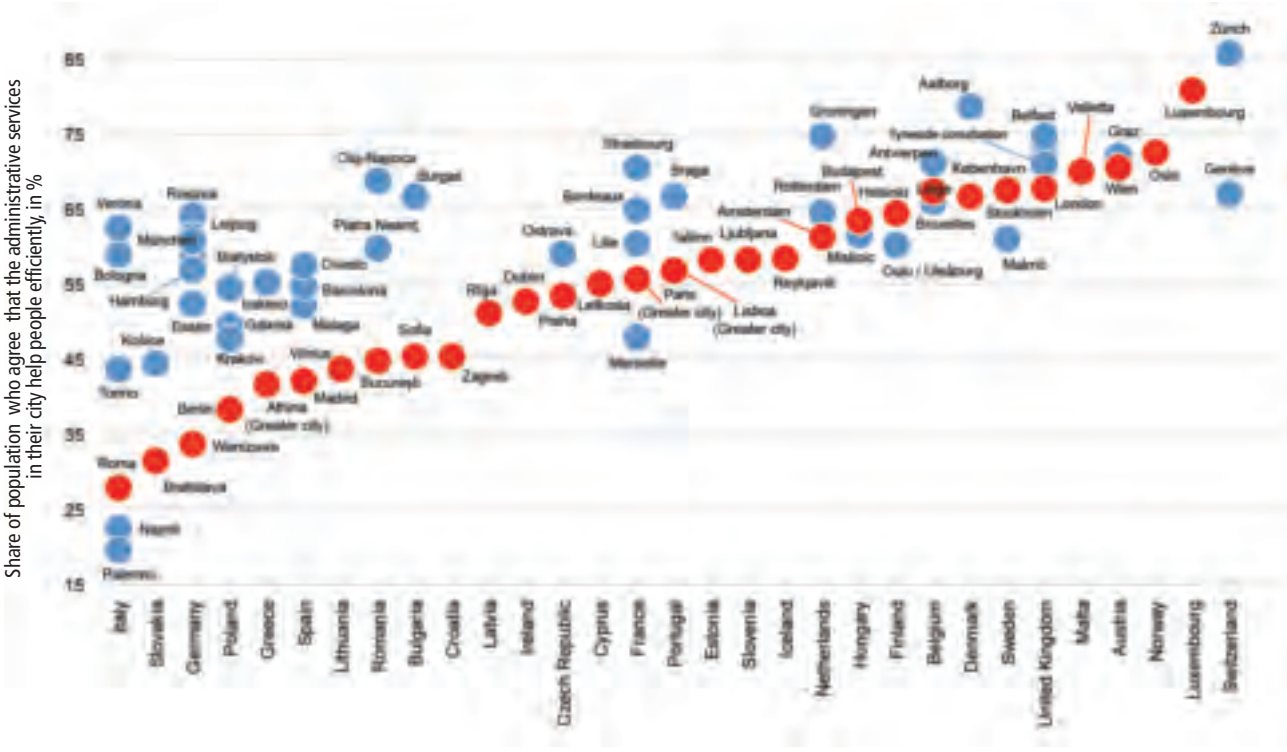


Source: Quality of Life Survey, Eurobarometer 419

Ninety percent of Vienna's residents are satisfied with their public transport system

© Tupungato

Figure 8.14. **Efficiency of public administration, in selected cities, 2015**



Source: Quality of Life Survey, Eurobarometer 419

Provision of policies and services should be undertaken at the right geographic scale because not every public service is best provided by individual municipalities and not every urban policy serves residents best if restricted to the municipal area

correspond to the actual urban fabric or the functional relations between people and activities over space.

Urban governance works better at a functional scale

Addressing mismatches between administrative and functional boundaries is necessary for economic, social and political reasons. Provision of policies and services should be undertaken at the right geographic scale because not every public service is best provided by individual municipalities and not every urban policy serves residents best if restricted to the municipal area. In many cases, it is both more practical and cost-efficient to organise service provision jointly for multiple municipalities. Policies like environmental protection, economic development or promoting social cohesion are better implemented at larger scales to allow for internalising the costs and benefits and to take advantage of economies of scale (Cheshire, 2015).

Global competition between cities often also demands up-scaling of governance to a larger geographic level, e.g. the metropolitan area or the functional urban area, to strengthen competitive advantages and to produce collective action and cooperation.

The importance of metropolitan and functional urban areas for national economies but also the co-existence of different governance levels calls for coordination and cooperation among public authorities. Multilevel governance has increased in Europe, albeit with significant differences and degrees of success depending on national and local contexts. Generally speaking, multilevel governance involves the State, regional governments (where they exist), local

authorities and, in some instances, the EU (Grisel et al, 2011). Multilevel governance has been formalised through various legal and financial instruments such as agglomeration contracts in France or negotiated programming in Italy. In policy sectors such as transport, it has been institutionalised through ad hoc bodies, as is the case for the public transport federations in Germany.

Municipal governance fragmentation

Addressing municipal governance fragmentation across European cities is a key challenge. Municipal fragmentation is the rule in most European urban areas and notably so in the larger cities (see Table 8.1), although the degree of fragmentation varies greatly among and within countries and cities. The OECD has developed an index to measure the degree of governance fragmentation of a metropolitan area. It is based on the number of municipalities for each 100,000 inhabitants. The smaller the index, the less fragmented the metropolitan area.

Many attempts have been made around the world to plan and manage metropolitan areas with a supra-municipal body. These approaches struggle if the underlying uncertainties in legal and spatial definition are not resolved. In addition, the autonomy overlaps and authority gaps that inevitably arise within multi-municipal urban entities make it difficult to clearly attribute specific public functions.

Friction in metropolitan governance is common because of the sheer multiplicity of stakeholders, their divergent levels of power and their sometimes conflicting agendas. This makes the delivery of coordinated area-wide governance, infrastructure and services difficult. Metropolitan governance that clearly identifies the responsibility and tasks of the different partners tends to work more smoothly.

Many countries around the world have experimented with ideas on how best to plan and govern urban structures that encompass several municipalities by drawing from different government traditions, constitutional frameworks and policy cultures. These experiments in Europe range from soft coordination to setting up a distinct metropolitan government.

Table 8.1. **Fragmentation Index, selected European metropolitan areas**

Metropolitan area	Population (thousands)	Number of municipalities	Average population per municipality	Fragmentation index
Prague	1,910	435	4,044	24.72
Bordeaux	1,175	243	4,413	22.66
Nantes	910	108	7,712	12.97
Budapest	2,879	183	15,402	6.49
Liege	740	45	15,850	6.31
Bilbao	1,013	57	17,240	5.8
Stuttgart	1,965	95	20,460	4.89
Hannover	1,217	55	22,330	4.48
Valencia	1,688	56	26,470	3.78
Florence	732	24	29,750	3.36
Naples	3,570	116	30,480	3.28
Antwerp	1,081	32	32,079	3.12
Copenhagen	2,025	57	34,310	2.91
Amsterdam	2,452	57	39,510	2.51
Katowice	2,589	60	44,468	2.25
Malmö	0,676	14	45,530	2.2
Utrecht	0,754	14	48,708	2.05
Lodz	0,939	17	55,265	1.75
Leicester	0,692	4	158,092	0.63
Manchester	1,935	10	176,890	0.57

Source: OECD metropolitan data base

Coordination through a lightly institutionalised platform for information sharing and consultation can relatively easy be set up but they typically lack enforcement tools and the relationships with other levels of government and the public influence tends to remain minimal.

An elected metropolitan government separated from the local authorities signals a commitment to making this level an important actor, but the extent of its responsibilities and financial capacity will influence both its effectiveness and its credibility.

A halfway option between soft coordination and a metropolitan government is an inter-municipal authority. Such an entity can be set up for a single-purpose, for example waste management. They typically aim at sharing costs and responsibilities across member municipalities, sometimes with participation by other levels of government and sectoral organisations.

An inter-municipal authority can also be created for multiple purposes. In such cases, they are often set up as a federation of municipalities with an inter-municipal council representing the member municipalities, either appointed by the municipalities or directly elected. Their power largely depends on the degree of transfer of competences, budget and staff by municipalities (OECD 2015, Lefèvre 2008).

The advantages and disadvantages of each approach depend on how it is organised and implemented. Within each approach there is a lot of variation in terms of legal status, power, budget and staff. Coordination arrangements are the most common because they are the least binding.

Many large urban areas in Europe, including national capitals, have inter-municipal authorities but these authorities vary greatly in terms of political capacity (budget, staff, responsibilities and legal status). Most of them are multi-purpose and responsible for

Box 8.4. **The Katowice Upper-Silesia Authority**

The Silesian Metropolis, formally the Metropolitan Association of Upper Silesia (MAUS), was formed in 2007 in Katowice and was the first of its kind in Poland. It is a voluntary cooperation association covering a cluster of 14 municipalities with a combined population exceeding two million. Katowice is the largest with 312,000 people but eight others have more than 100,000 inhabitants.

The Silesian Metropolis Authority is run by a council of seven mayors elected by a metropolitan council representing the 14 municipalities, each of them with two deputies while Katowice, being the largest, has three.

Its responsibilities are few and limited: fostering cooperation among its members and preparing a development strategy (a strategy document for 2025 was approved in 2009). The approval of the Metropolitan Act in October 2015, however, has not significantly changed the governance and responsibilities of the Silesian Metropolis Authority. Statutory powers remain limited to fostering sectoral cooperation between its members in development strategy and labour market policies, although municipalities can choose to delegate some tasks (notably in the fields of water, sewerage, energy and waste). The metropolitan association has a budget of about EUR 50 million based on a small percentage of personal income tax generated at the regional level and some budgetary subsidies.

More recently, a Silesian Charter of Public Services has been signed that allows, among others, for the establishment of an integrated fare system for the public transport network within the metropolitan area.

***Area Metropolitana de Barcelona* (AMB): a powerful authority**

The AMB was created in 2011 as a public authority established by a law through the Catalan Parliament. It covers 36 municipalities with a combined population exceeding 3.2 million. With 1.6 million inhabitants, the Municipality of Barcelona is by far the largest–about half of the metropolitan area's population.

The AMB is run by a metropolitan council of 90 members representing all 36 municipalities according to their population size. The president of the AMB is elected by the metropolitan council from among its members. The mayor of Barcelona is the 2016 AMB President.

The responsibilities of the AMB are extensive. It has taken over the competencies of three joint-authorities responsible for public transport, environment and planning that had been set up in 1987. In addition, it covers several key responsibilities such as strategic planning, economic development, social housing, solid and liquid waste management, sewerage, public spaces (including beaches) and social cohesion matters.

The AMB budget is a significant EUR 663 million, derived from a metropolitan tax (EUR 100 million), other local taxes (EUR 162 million) such as a waste tax, and transfers (EUR 352 million) from the member municipalities and other entities. The AMB employs about 500 persons.

Box 8.5. **Verband Regio Stuttgart: Political legitimacy but limited powers and constrained resources**

The Verband Regio Stuttgart was established in 1994 by a law of the *Land* of Baden Wurttemberg. The metropolitan area has a combined population of 2.7 million in its 179 constituent municipalities and five districts *(Kreise)*. Stuttgart, the main city and capital of the *Land,* has some 600,000 inhabitants.

The Verband is a supra-municipal local government run by a parliament of 91 members directly elected for a period of five years. Its president, chosen by the parliament, has an honorary function. The legal representative of the Verband is the regional director, appointed for six years.

The Verband is responsible for public transport, metropolitan planning, business development and part of the waste management. On a voluntary basis, it is also active in sports and culture. As it is the transport authority for the whole metropolitan area, public transport is by far its main responsibility. It has a budget of about EUR 300 million, 85% of which is dedicated to public transport. The Verband's revenue comes from taxes and grants provided by the member municipalities, the *Kreise,* the *Land* and the federal government.

Promoting effective metropolitan government requires its recognition by residents and local actors and that it has the appropriate financial and human resources to execute complex tasks. An important element in that recognition is the political status of the metropolitan executive and assembly

several policy sectors such as strategic planning, spatial planning and public transport. In some metropolitan areas (Lisbon and Porto, for instance), they also coordinate municipal policies. However, such bodies are generally weak in terms of budget, staff and legal power and rarely cover the whole functional area.

On the other hand, a few strong inter-municipal authorities, including Barcelona, Manchester and almost all French urban agglomerations are responsible for an array of policy sectors. They have a relatively large budget (in France many control a budget larger than that of the central city) and significant numbers of staff (a few thousand for the largest French urban areas).

The examples of Katowice and Barcelona (Box 8.4) offer illustrations of the large spectrum and variety of multi-purpose inter-municipal authorities.

An elected metropolitan government

In the EU, there are only five elected metropolitan governments: Stuttgart (established in 1994), Hannover (1998), London (1999), Copenhagen (2007) and Lyon (2015). These bodies do not cover the entire functional urban area and have only few responsibilities apart from the Lyon Métropole (strategic planning, health, public transport) as well as constrained budgets. The Verband Regio Stuttgart is a good illustration (Box 8.5).

Effective metropolitan governance requires sufficient powers, financial autonomy and leadership

Promoting effective metropolitan government requires its recognition by residents and local actors and that it has the appropriate financial and human resources to execute complex tasks. An important element in that recognition is the political status of the metropolitan executive and assembly. For decades, this matter has been on the agenda of national governments (notably France, Italy and the Netherlands) and has also been pushed by the national associations of local authorities.

Direct election, it is argued, would strengthen their political status. First, it will make the metropolitan body more visible to the public as well as local and external actors. People will know who is in charge of policy decisions. Second, it will make these bodies more democratic and accountable to the public. Third, direct election increases the representativeness of metropolitan bodies by making them the 'voice' of the metropolitan area – a strong argument used in favour of establishment of the Mayor of London who is very much seen as the 'Voice of London'. Finally, direct election facilitates stronger leadership as it increases the political capacity to act.

Opponents of direct election, on the other hand, argue that a metropolitan authority reduces the

Box 8.6. **The UK City Deals**

In 2010, the British Government launched a policy of authority and financial devolution for several cities and city-regions. These 'City Deals' started in 2012 following the adoption of the Local Democracy, Economic and Construction Act 2009.

The deal between the State and cities gives cities and city-regions more freedom and power in using State funding to foster economic growth. These deals focus on policy sectors like economic development, business support, skills development and infrastructure promotion (notably public transport and rail networks). Transfer of power and funding will occur through strengthening the governance of cities and city-regions through a "Combined Authorities" approach.

Combined Authorities are city-region-wide governments, established by local authorities or by the State, with devolved powers and resources for economic development, urban regeneration and transport. The Government negotiates deals with the local authorities for establishing combined authorities in the largest English urban areas. The first was constituted in Greater Manchester in 2011; others are now being established in Liverpool, Newcastle-Durham and Sheffield. Under some of these Combined Authorities, the new governance structure also implies direct election of a metropolitan mayor. Therefore, Combined Authorities are also known as Mayoral Combined Authorities.

Source: Sandford, 2016

Newcastle: the UK is setting up new combined authorities in the largest urban areas including for Newcastle-Durham with direct election of a mayor © David Shaun Dodds

political legitimacy of municipal mayors–the elected officials to whom people feel much closer and whose empowerment would better reflect democratic choice.

The notion of directly elected metropolitan executives and assemblies is gaining momentum in France, Italy and the UK. In France, the 2014 Metropolitan Act prescribes direct election of metropolitan assemblies in 2020, the year of the next local elections. In Italy, the Local Government Act of 2014 set up metropolitan authorities in the country's 10 largest urban areas. It enables direct election of metropolitan mayors in the Milan, Naples and Rome metropolitan areas which have already inscribed this election modality into their new statutes (Box 8.2).

In the UK, the so called 'Devolution Deals' or 'City Deals' between the State and several local authorities have established direct election of metropolitan mayors as part of the agreement (see Box 8.6). This is notably the case in the Greater Liverpool, Manchester, Newcastle-Durham and Sheffield areas where direct metropolitan elections are planned as early as 2017.

A second critical element in promoting metropolitan governance is acquiring active support by local governments because without that policy- and decision-making cannot be effective

A second critical element in promoting metropolitan governance is acquiring active support by local governments because without that, policy- and decision-making cannot be effective. Several initiatives by State and local authorities have been established to achieve just that. In France, Italy and the UK, some local governments have introduced organisational innovations aimed at fostering dialogue, developing trust and promoting cooperation among local authorities. Metropolitan conferences, political trade-offs and gentlemen's agreements have all been tried with some success.

In several European urban areas (Florence, Île de France, Manchester, Marseille, Turin, Zurich), metropolitan conferences have been set up by municipalities. They are explorative but formalised arenas of dialogue and exchange between voluntarily participating municipalities. To legitimise these arenas, several of these conferences have adopted a "one-person, one-vote" system under which mayors are equals regardless of the population size of the municipality. As an example, in the Île de France Metropolitan Conference, the Mayor of Paris has the same power as the mayors of small municipalities.

Building dialogue and trust can further be facilitated through political trade-offs and gentlemen's agreements as shown in the Grand Lyon area in France. Up to 2015, the Grand Lyon metropolitan council was composed of representatives from member municipalities based on municipal population size. The City of Lyon, being the largest municipality, held the largest number of seats but this was considered to hamper cooperation. The Mayor of Lyon therefore proposed to transfer seats to other suburban towns and extended vice-chairmanships to several mayors belonging to the opposition. This has facilitated dialogue, helped build trust and, today, Lyon is known for its ability to reach consensus and compromise and for effective policy making at the metropolitan level.

Likewise in London, relationships between the Greater London Authority (GLA) and local governments of the 32 boroughs have much improved since 2008, especially after the signing of the London City Charter in 2010. This Charter is an agreement between the Greater London Authority and the Association of London Boroughs under which all local authorities

Box 8.7. The Greater Paris Metropolitan area

The *Métropole du Grand Paris* (MGP) was established by the Metropolitan Act of January 2014. It covers the core area of the Île de France region and comprises seven million inhabitants. The Act was envisaged to become effective in in January 2016 and its planned agenda (indicated in the Metropolitan Act) is now being implemented. However, this required significant mediation between local authorities and the State by the metropolitan *mission de prefiguration.* The negotiated outcome was a less powerful MGP for now, with fewer resources, but with a potential increase in both power and resources over the years to come.

The MGP, with its budget of EUR 85 million, is responsible for strategic and spatial planning, economic development, social housing, and environment protection. It is run by a directly elected metropolitan council, chosen in January 2016, with its president elected from among the council members.

have agreed to cooperate on the basis of mutual respect, subsidiarity and maximum cooperation. The London City Charter also established new cooperation between the GLA, the 32 boroughs and the City Corporation. A new body, the London Congress has been created and brings together the 32 boroughs leaders and the Mayor of London. This new political structure is assisted by five technical bodies in such areas as housing, waste and recycling, crime reduction, health and economic development. These bodies group together local authorities, economic players and experts.

Some European national governments contribute to promoting dialogue and cooperation among local authorities by setting up ad hoc policy programmes or by assisting local governments in building metropolitan governance bodies.

In Romania, the national Growth Pole Programme was launched in 2008 seeking to stimulate cooperation between local governments through the demarcation of growth poles. Seven growth poles have been selected, each comprising a core city (the actual growth pole) and its area of influence. Each growth pole area must draw up its own Integrated Urban Development Plan (IUDP). To facilitate IUDP preparation, national government regulation prescribes the establishment of Inter-community Development Associations. These voluntary local authority associations comprise 15 to 24 municipalities. They are managed by a council composed of the mayors of the member municipalities over which the mayor of the core city presides. The growth pole development policy is now being implemented. Although some associations do not yet cover their entire functional area, this is a significant step towards metropolitan bodies.

Box 8.8. **The financial resources of Lyon and Porto (AMP)**

Métropole de Lyon

Population 1.3 million people, 59 municipalities. Responsible for economic development, planning, transport, water and sewerage, culture, social cohesion, social housing and urban development.

Personnel: about 8,000

Operating budget: EUR 1,346 million derived from:
- Local revenues: EUR 721.5 million (54%)
- State transfers: EUR 422.3 million (31%)
- Fares and fees: EUR 157.7 million (12%)
- Other: EUR 44.2 million (3%)

Capital budget: EUR 537.2 million for 2014.

Area Metropolitana do Porto

Population 1.7 million, 17 municipalities. Responsible for: strategic planning and coordination of municipal policies.

Personnel: 55

Operating budget: about EUR 3 million (2014)
- Transfers from municipalities: EUR 1.1 million (36%)
- Transfers from the State: EUR 1.9 million(64%)

Metropolitan fiscal autonomy

Supporters of more financial resources for metropolitan bodies argue that this would augment their capacity to act. The debate is mostly about increasing fiscal autonomy as that would allow for more stable and secure revenue flows, better control over financial resources and, by extension, less dependence on transfers from the State. In addition, the proponents claim that increased fiscal autonomy would render metropolitan bodies more accountable because citizen-voters can better connect policies with the taxes they pay.

Most inter- or supra-municipal metropolitan bodies, however, have weak financial capacity. Important exceptions are Barcelona and a number of large French cities, which have a long history of municipal cooperation and metropolitan governance bodies. The actual powers of these supra-metropolitan bodies have gradually increased over time.

An upturn in metropolitan bodies' resources is gaining momentum. In the UK, for instance, City Deals for metropolitan areas (Liverpool, Manchester, Newcastle-Durham and Sheffield) include more powers by the Mayoral Combined Authorities to levy taxes (including a council tax and a levy on municipalities), an additional business tax and retention of a small share of the national business tax. The Mayoral Combined Authorities now can also borrow more easily and have access to a specific investment fund. Combined, these financial tools will not only increase these metropolitan bodies' resources but also increase their financial autonomy.

Claims for fiscal and financial autonomy have also been advocated by the London Finance Commission,

Box 8.9. ***Conseil de développement de Lyon Métropole***

Lyon has been at the forefront of the establishment of development councils in France. The Lyon development council was established both to promote dialogue among metropolitan civil society groups and as an interface between civil society and the Greater Lyon Metropolitan Authority. Its role further includes guiding the metropolitan authority in strategy and policy development for responding to societal transformations.

The council comprises 208 members: 30 represent business and professional associations; 30 are from education, research and culture; 36 members are from social affairs, solidarity and environment; and 45 represent neighbourhood councils and other local bodies. The remaining 67 members include 45 citizens drawn from an open list of applicants based on their diversity and motivation and 22 are proposed by the chair of the council and appointed by the President of the metropolitan authority.

The development council has a President, a board and a plenary assembly that operate through three commissions: Solidarity and social cohesion; Urban development, mobility and environment; and Economic development. The council publishes several reports each year. In 2015, it launched a new project, the *'Grand Rendez Vous'*, a one-year cycle of debates and exchanges on four major issues (the green and circular economy, cultural and creative activities, digital technology and daily life and the economy of aging well). The project has produced working groups, conferences and a final event.

The development council has produced tangible results. Some of its planning, mobility, social cohesion and economic development proposals have been integrated into existing plans. It has played a significant role in pushing the implementation of "integrated policies" in new planning tools (notably the integration of housing and mobility-specific issues into the general metropolitan plan).

Increased fiscal autonomy would render metropolitan bodies more accountable because citizen-voters can better connect policies with the taxes they pay

set up by the Mayor of London in 2012. Compared to some other cities around the world, the Greater London Authority has comparative weak financial and fiscal autonomy. The commission therefore recommended fiscal devolution and more borrowing flexibility. The arrangement proposed is 'fiscally neutral' for the State because any funds obtained would be deducted from State transfers to London.

The two examples of Lyon Métropole and the Metropolitan Authority of Porto (see Box 8.8) show an example of how different the financial and fiscal autonomy of metropolitan governance bodies can be.

8.6. Involving residents and stakeholders can improve urban policies

Stakeholder and public participation can provide complementary knowledge, expertise and financial resources to make urban policies more informed and effective, while rendering local governments more democratic, legitimate and accountable.

Involving stakeholders

Stakeholder involvement and participation depends on the political culture of a country and the relationships between the private/economic and public/political sectors. In some European countries, the role and place of the private sector in policy and decision-making is more common than in countries where the public sector remains dominant and where involvement of the private sector is less developed.

In the British case, public-private partnerships are a standard within urban policies with a strong role for the business sector. Civil society stakeholders are also notably present in social and educational programs. Over the past decades, the British government has legitimised the involvement of stakeholders and, in some cases, stakeholders (especially from the private sector) have run bodies in charge of elaborating and implementing urban programmes. This was earlier the case with the Regional Development Agencies and, today, continues with the new Local Enterprise Partnerships found in almost all British urban areas.

Whereas the United Kingdom may be somewhat of an exception in the European context with its strong legitimacy of private sector participation in decision making, involvement of stakeholders in national and local urban policies occurs elsewhere in Europe too. Examples vary from ad-hoc (Hungary, Stockholm) to institutionalised consultative bodies (France) and comprehensive inclusion (Madrid).

Box 8.10. **Stakeholder involvement in strategic planning: Turin**

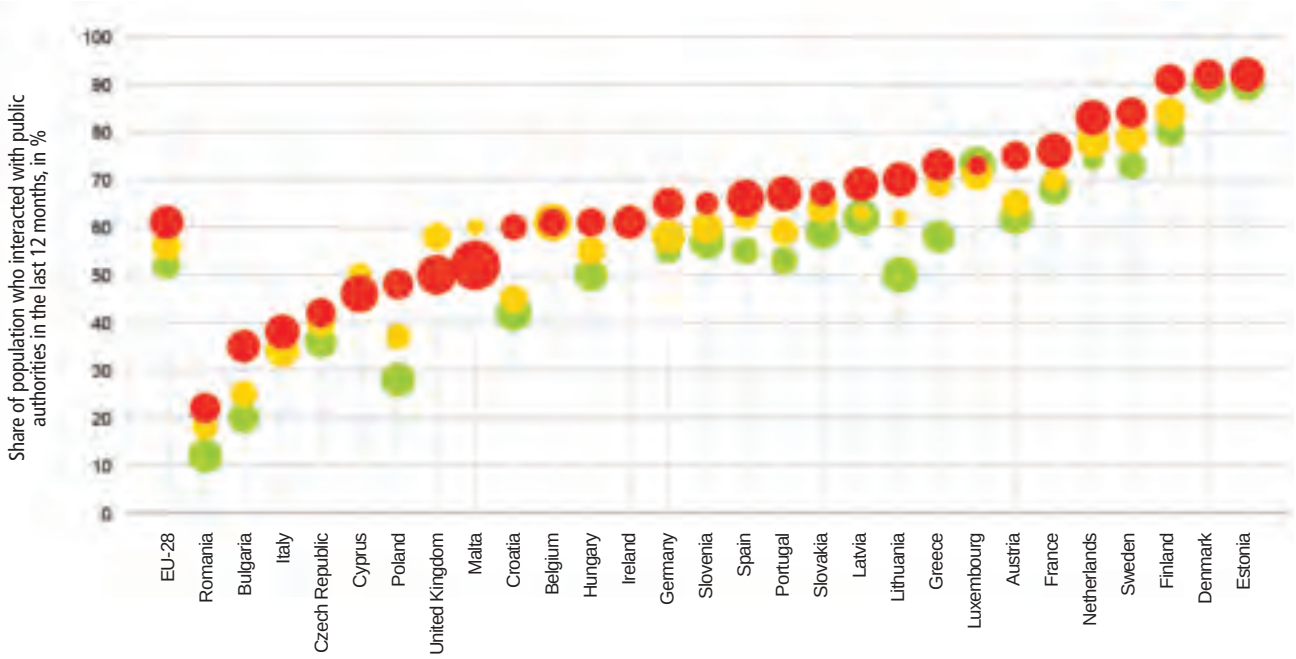
In Turin, a procedure similar to Barcelona was followed although stakeholder involvement remained limited to the core city. Both the first (2000) and subsequent strategic plans (2006) were the result of strong mobilisation of economic, social, political and cultural entities who became signatories to a 'pact for the strategic plan' and who legitimised both process and the outcome document.

This process started in the mid-1990s when an ad-hoc body, *Torino Internazionale,* was established: a light structure of about 15 people directly connected with the Mayor of Turin who acts as the executive of the plan. The board consists of the major stakeholders and decision-makers from the Turin municipality, the province, the Chamber of Commerce, banking foundations, academia and others. *Torino Internazionale* was mandated to guide the participatory processes for the strategic plans to a successful conclusion through mobilisation of the population as well as stakeholder commitment to the plans' implementation. This has been achieved through a series of joint meetings, events and workshops, further facilitated by *Torino Internazionale's* non-bureaucratic character and focus on linking the stakeholders with the decision makers.

The strong stakeholder involvement and the establishment of *Torino Internazionale* as the operational agency for strategic planning have assisted with strategic plans and the channelling of priorities into policies.

In the 1990s, Turin introduced a multi-stakeholder body to provide input on its strategic planning

Figure 8.15. **Online interaction with public authorities, by degree of urbanisation, 2015**



Note: ranked by ascending use of the Internet for e-governance purposes in the cities
Source: Eurostat

Hungary, Poland and Slovakia have also tried to involve stakeholders (NGOs, firms, residents) in urban programmes and projects under EU funding requirements. This is for instance the case in several Hungarian urban regeneration projects where participation has been a key element of their success.

In France, stakeholder involvement has been institutionalised for all large urban areas through the establishment of *conseils de développement* (development councils) created under the National Planning Act of 1999. These consultative councils are mandatory for all area-wide joint authorities and must involve civil society (cultural groups, academia, third sector etc.) as well as business. They are mandated to assist in the elaboration of strategic plans or projects. Despite being mandatory, their composition and tasks have been left open-ended. Consequently, they provide a diversity of experience in innovation and involvement of civil society (Box 8.9).

More and more European metropolitan areas have developed strategic approaches for participatory governance over the past two decades. Two initiatives stand out for their role of stakeholder involvement in the success of their urban strategies: Barcelona and Turin. Barcelona's first two strategic plans were used to mobilise civil society around the city's development. Approved by an assembly of stakeholders and guided by the municipality with co-elaboration involving many local institutions, the strategic plans became more informed, democratic and legitimate through a plethora of workshops, forums and conferences. For Turin's experiences see Box 8.10.

Involving residents

Residents can either be involved directly or indirectly in urban governance. Direct involvement usually occurs through referenda and other modes directly requesting public opinion, while indirect participation depends on representative institutions and bodies such as neighbourhood councils. In some cases, residents can participate through ad hoc consultative bodies established for a single urban development project.

The nature and the degree of public involvement depend greatly on the domestic political culture and the importance tendered to participation. Public involvement appears to have made progress over the last decade. One

significant evolution has been the recent introduction of e-government practices in many cities on the grounds that it is more efficient and transparent besides providing more opportunities for direct interactions. Indeed, as shown in Figure 8.15, compared with inhabitants of rural areas, towns and suburbs, city dwellers interact more frequently with their local authorities through the Internet (Eurostat, 2015).

Almost all European countries have legal provisions for direct involvement of citizens at the local level through referenda. Some do this explicitly in their constitution (Belgium, Bulgaria, France, Germany, Hungary, Poland and Slovakia), others do so through legislation (Italy and the UK). The binding nature of such referenda varies greatly, however. In Denmark, Estonia, Finland, Italy, Spain and Sweden, referenda are consultative or advisory, whereas in Bulgaria, Hungary and Poland referenda are binding. In the Czech Republic, France and Slovakia they can be either but to be binding a referendum must comply with criteria like a minimum voter turnout and achieving a qualified majority. In the Czech Republic, for instance, a referendum is only binding if the outcome has a majority vote with a minimum voter turnout of 35% (Vojtechova, 2009).

Many countries and municipalities have set up bodies for involving residents. New permanent institutions like neighbourhood councils have been established either by national law or municipal decision. The former, for instance, is the case in France with the Act on Local Democracy of 2002 that made establishment of neighbourhood councils mandatory for all municipalities exceeding 80,000 inhabitants. In other European cities (such as Tower Hamlets - a municipality in Greater London, Berlin and Venice among others), municipalities have voluntarily opted for neighbourhood councils. In Berlin, for instance, such councils are part of the municipal programme on neighbourhood management established in the framework of the national Social City Initiative.

Some other European municipalities have founded committees or councils to involve segments of the urban population who do not have *de jure* citizen voting rights. This is the case in Paris where youth councils at the municipal and arrondissement levels were established in 2001. Some Italian cities have established councils of migrants.

Others have established ad-hoc bodies to involve citizens and inhabitants, like Stuttgart where the metropolitan authority, the Verband Regio Stuttgart, set up arrangements to 'anchor metropolitan awareness in the population of the city-region' such as meetings of young people, women, religious groupings as well as a general metropolitan forum.

As cities grew and extended their reach with the help of better transport and communication, their municipal borders became far too small. The benefit of matching the governance level with the scale at which labour markets, transport and housing markets interact provides for higher efficiency of urban development policies

8.7. Conclusion

In four out of five European countries, local authorities are the most important sub-national government level. In addition, local authorities govern increasingly larger populations and have become more autonomous over the last two decades. Nevertheless, big differences remain, with some local authorities with very little autonomy and many with tiny populations.

After a long period of an increasing role of local authorities in public expenditure and investment, the economic crisis has led to a drop especially in public investment by local authorities. Cohesion Policy has helped to increase public investments including those by local authorities in many of the central and eastern EU countries.

As cities grew and extended their reach with the help of better transport and communication, their municipal borders became far too small. The benefit of matching the governance level with the scale at which labour markets, transport and housing markets interact provides for higher efficiency of urban development policies. As a result, more and more countries and cities are experimenting with different forms of inter-municipal authorities and metropolitan governments.

This process, however, is far from unfolding smoothly and there are many obstacles along the way. Key to effective metropolitan governance is sufficient autonomy and resources, a clearly identified decision making process, support from the residents and, possibly, a directly elected mayor.

Cities like Venice have set up neighbourhood councils which give residents a role in urban planning

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