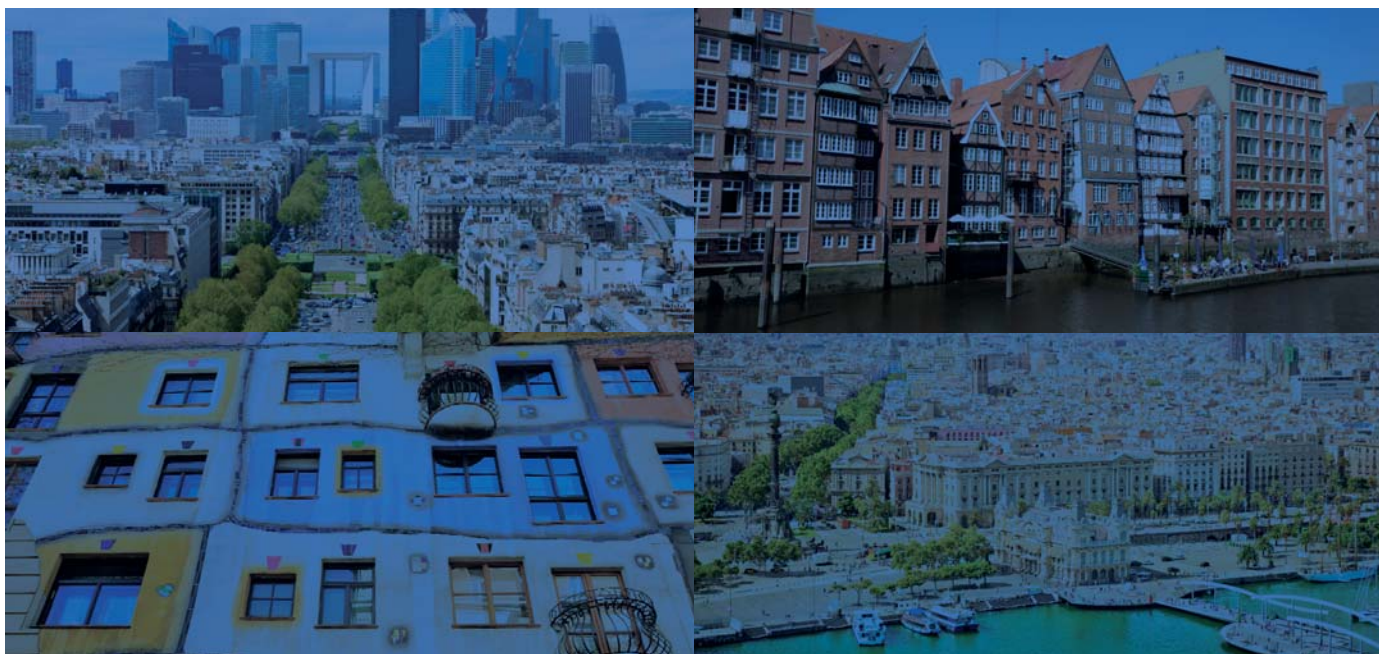




Density: drivers, dividends and debates

Appendix 4 – Other source material and background

Contemporary density – global and regional contexts



**Urban Land
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ULI has been active in Europe since the early 1990s and today we have over 2,200 members across 27 different countries. We have a particularly strong presence in the major European real estate markets of UK, Germany, France and the Netherlands but are also active in emerging markets such as Turkey and Poland.

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- Exploring issues of urbanisation, conservation, regeneration, land use, capital formation, and sustainable development
- Advancing land use policies and design practices that respect the uniqueness of both the built and natural environments
- Sharing knowledge through education, applied research, publishing, and electronic media
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Urban Land Institute

50 Liverpool Street
London
EC2M 7PY
United Kingdom

Tel: +44 (0)20 7487 9570
Email: ulieurope@uli.org
Web: www.europe.uli.org

Appendix 4 – Other source material and background

Contemporary density – global and regional contexts

Figure A1: Comparative levels of urbanisation by continent⁶

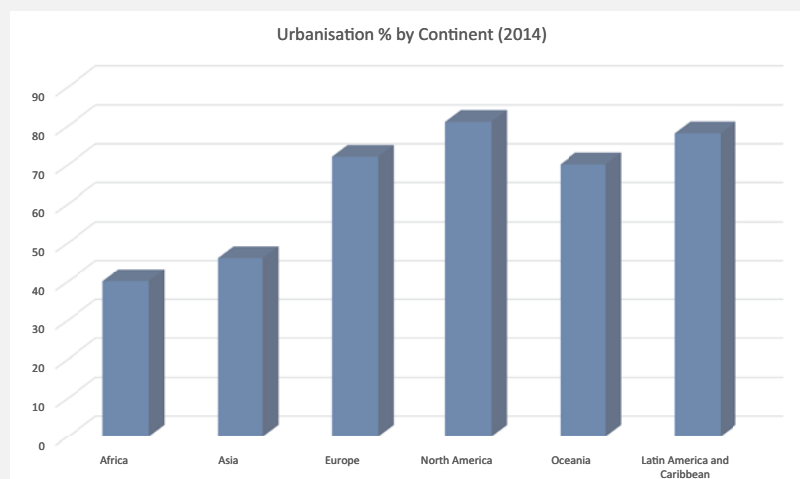


Figure A2: Average density of large cities (populations over 500,000) by continent (January 2015)⁷

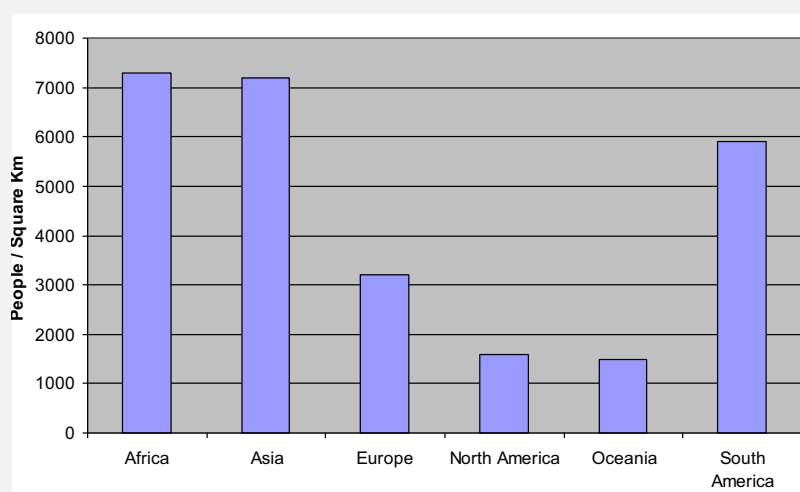
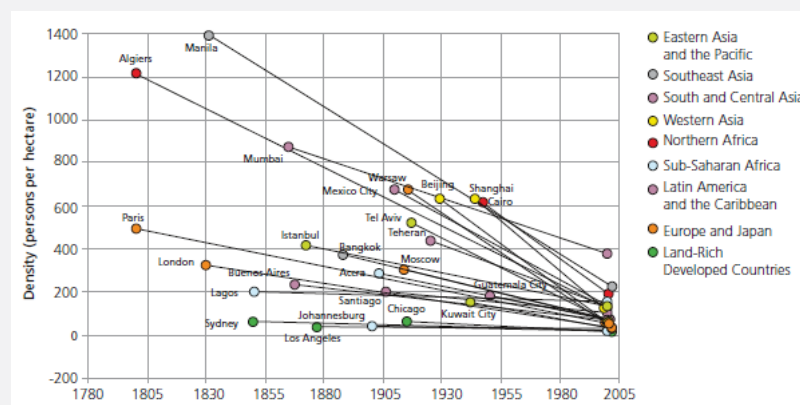


Figure A3: The decline in built up area densities in 25 representative Cities (1800 – 2000)⁸



1. The global context

The world is two thirds of the way through a century long cycle of rapid urbanisation, at the end of which close to 70 percent of people will live in cities.¹

The hallmark of twentieth century urban growth in much of the Western world was to grow outwards: suburbanisation, counter-urbanisation, while an increasing dependence on the motor car and urban sprawl became commonplace. However, in the latest wave of urbanisation, core city areas have become increasingly attractive to both businesses and people, and a degree of re-urbanisation has taken place as people enjoy new ways of living and working at higher densities. In some developed countries a clearer continuous cycle of urbanisation, suburbanisation, metropolitanisation, and re-urbanisation is becoming visible.²

The spatial unevenness of urbanisation rates creates hugely different pressures in different regions, nations and cities. More than a third of total urban growth to 2050 will take place in just three countries: India, China and Nigeria.³ An additional 1.3 billion people will be added to the cities of the developing world by 2030.⁴ Meanwhile in more advanced nations, urbanisation levels are already high, but growth is almost stagnant. Indeed in a handful of countries such as Japan and Russia, many cities are actually getting less populous.⁵ This diversity in world cities makes it difficult to generalise on trends in densification/dispersal. In particular, there is significant variation between densities of the developing and industrialised regions of the world.

2. Regional contexts

We examine the European context in detail below, but in brief, the story of density in other regions of the world can be described as follows:

2.1 North America

North American cities, particularly those in the United States, provide the classic example of low density urban areas, with their expansive suburbs and high levels of automobile dependence. The average density of large cities (of more than 500,000 people) in the United States is lower than any other country at 1,200 people per square km. Large Canadian cities are more dense, with an average density of 2,100 people per square km.⁹

Five most sprawling and most compact large cities (populations of more than 1 million) in USA¹⁰

Most sprawling		Most compact	
Rank	City	Rank	City
1	Houston, Texas	1	New York, New York
2	Richmond, Virginia	2	San Francisco, California
3	Rochester, New York	3	Miami, Florida
4	Birmingham-Hoover, Alabama	4	Santa Ana / Anaheim / Irvine, California
5	Memphis, Tennessee	5	Detroit, Michigan

Mike Batty (2003) of UCL has argued that North American decentralised urban areas can be categorised as one of two types – co-ordinated/planned cities like Portland, or unplanned and un-coordinated cities like Los Angeles or Phoenix.¹¹

In response to concerns about congestion, commuting distances and environmental damage, the smart growth movement, which supports pro-densification policies has become a feature of the urban governance landscape in North America over the last two decades. In the mid-1990s The American Planning Association joined 60 public interest groups across the United States to form Smart Growth America, a nationwide coalition that coordinates efforts to promote smart growth. The US Environmental Protection Agency also awards annual National Smart Growth Awards to encourage anti-sprawl planning.¹²

Urban growth boundaries have been implemented in a number of North American cities in efforts to protect rural land and curb sprawl. Cities with such boundaries include Portland, San Francisco, Boulder, Seattle and San Jose in the United States as well as Toronto, Ottawa, Waterloo and Vancouver in Canada.¹³

2.2 South America

South America, like other developing regions, is home to some of the densest cities in the world. However, urban density has declined and is projected to continue doing so in cities throughout the region, primarily due to expansion of physical urban areas rather than through a decline in the urban populations. Mexico City has experienced de-densification of 60 percent during the last three decades, whilst Rio de Janeiro was three times denser in 1975 than 2010.¹⁴

Outwards expansion in South America has resulted in new mega urban forms, with big cities expanding into adjacent areas and the interconnection of pre-existing towns.¹⁵ Population growth has often resulted in the irregular and unplanned occupation of what can be unsuitable or environmentally sensitive areas in peri-urban areas.

The decline in population densities in most South American cities has been accompanied by diseconomies and inequities in urban growth due to the lack of integrated land use planning or control. The historical problem of income concentration in the region has therefore been aggravated by urban sprawl and the illegal occupation/densification of unsuitable land, where provision of public services has not kept pace with needs for them.¹⁶

2.3 Asia Pacific

The ten most densely populated cities in the world are all located in Asia. Excluding the islands of Hong Kong and Macau, each of the top ten densest cities are situated in the Indian sub-continent. The most densely populated city in the world is Dhaka in Bangladesh, which has an extraordinary population density of 43,500 people per square km.¹⁷ However, Asia Pacific is an extremely varied region, incorporating countries characterised by much lower density urban areas, particularly in Australia and New Zealand.

India

More than half of the world's 50 most densely populated large cities are located in India.¹⁸ Three Indian cities (Mumbai, Kalyan and Vijayawada) have population densities of more than 30,000 people per square km. The rate of urban population growth in India has been prodigious over the past decade – increasing by 32 percent or 91 million people –¹⁹ and has created cities that are both sprawling and high density. Large cities such as Delhi, Bengaluru, Hyderabad and Mumbai for example have expanded about three to four times over the past few decades, and yet still exhibit some of the highest densities in the world.

In general, urban infrastructure has not been able to keep up with the rate of population growth in Indian cities which are plagued by inadequate housing, roads, sewerage, water, roads and public transport and power supplies.²⁰

Furthermore, urbanisation in India is showing no signs of slowing, and it is predicted that Indian cities will have to accommodate at least 10 million more people annually for the next 30 years, posing huge headaches for the nation's urban planners.²¹

China

China's cities, compared to other developing nations in Asia, have a relatively modest average population density of 6,100 people per square km.²² This figure is also slightly skewed upwards by the unusually high density of the island cities of Hong Kong and Macau – two of the most compact cities in the world, due to their limited hinterlands and space for outwards growth.

China's urbanisation over the last three decades has been extremely rapid – with the number of city dwellers

increasing by 500m and total urbanisation rising from 18% to 54% over the period.²³ Growing cities capitalised on the financial opportunities presented by urban land and property development, with the effect that the total urban built-up area has more than quadrupled since the mid-1980s. City planning was marginalised as the pressure for sprawl created by market forces and inter-governmental competition for growth intensified.²⁴ Poorly defined ownership rights of farmers have encouraged the sprawl, as local authorities can expropriate peri-urban rural land for development easily and at little cost.²⁵

Migrants were and are particularly drawn to the larger coastal cities, which are increasingly sprawling, congested and polluted. The number of cars in China has increased more than tenfold in the last decade, to 64m. Average travel speed in Beijing is half that in New York or Singapore.²⁶

A 2014 World Bank report warned that China must plan its huge scale of urbanisation more effectively to ensure environmental sustainability and social inclusion. The Bank highlighted the importance of energy efficiency, clean energy and traffic congestion relief, and estimated that denser cities could save China about \$1.4 trillion in infrastructure spending, and help to conserve the shrinking amount of land that China has to feed its population.²⁷ In the same year as the World Bank report, the Chinese government launched its 'National New-Type Urbanisation Plan' which aims to move 100million more people into China's cities by 2020. The plan envisions a massive building programme of transport networks, urban infrastructure and residential real estate.²⁸

There is some evidence that Chinese cities are starting to tackle sprawl and its associated problems. Many are looking to address congestion – Beijing is considering introducing a congestion zone, whilst eight of the country's largest cities cap the number of new licence-plates they issue. Several cities ban some drivers one day a week.²⁹ Whilst local governments are still incentivised to develop outwards to generate revenues, Central government is concerned about this trend and is beginning to address it.³⁰ There has also been a movement towards Smart City development – as of 2014 the Ministry of Housing and Urban-Rural Development (MOHURD) had approved over 190 cities to be eligible for its Smart City Pilot Program, and sustainability is a growing priority.

Asean

The Asean region boasts some of the world's largest cities, including Jakarta, Tokyo and Metro Manila, and is a region of some diversity in terms of its cities and their densities. It contains, for example, the island city-state of Singapore, with its established, dense urban population. Singapore represents a relatively unique case study on density, owing to its strict housing and land use policies, which ensure optimum resource use within a compact city of definite size. It is explored as an individual case study in **Appendix 3**. In contrast to Singapore, Japanese cities, like their counterparts in the United States and Western Europe, have been characterised by suburbanisation and urban sprawl in

Table: The divergent densities of a selection of major cities in the Asean region³²

City	Population density (people square km)
Bangkok	5,800
Jakarta	9,500
Tokyo	4,400
Singapore	10,900
Manila	15,300

the post War period. A third group of mega cities in the emergent economies of the Philippines, Indonesia and Thailand have medium high densities, and as a result of their high rates of urbanisation are rapidly expanding at their peripheries to become mega regions of considerable size. Metro Manila, Jakarta and Bangkok each expand some 200km beyond their core urban areas.³¹

Oceania

Australia and New Zealand are some of the most highly urbanised nations in the world, with more than 85 percent of their populations living in (mostly coastal) urban areas.³³ Like cities in North America, Australasian urban areas are characterised by sprawling suburbs, and population growth has been absorbed by low density urban expansion.³⁴ Major cities on average have densities of 1,500 people per square km.³⁵

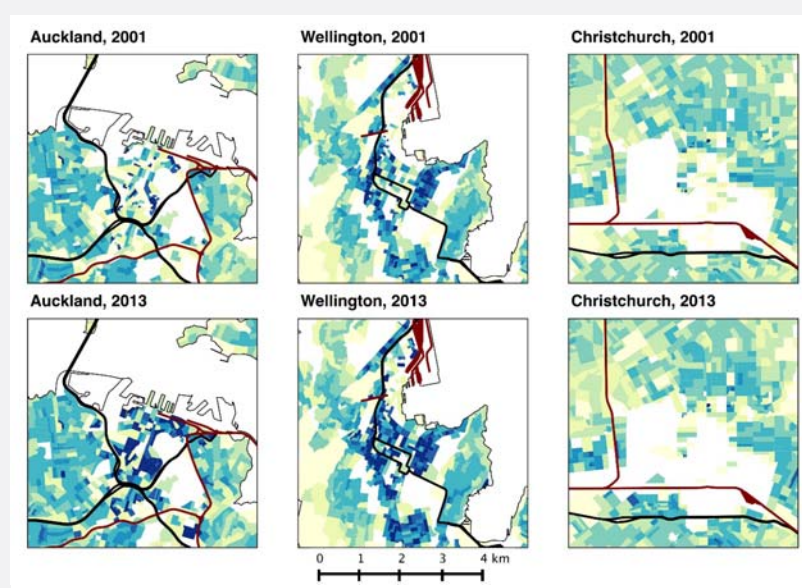
In the new millennium a number of Australasian cities have become increasingly concerned about urban sprawl, its impact upon productivity³⁶, liveability and sustainability. The Australian national urban policy *Our Cities, Our Future* suggests increasing density as a means of 'maximising yields on land use, improving productive capacity, and leveraging investments in infrastructure', and sets an objective of developing more compact mixed use settlements in order to make housing more affordable.

It comments:

"A suitable balance between infill and greenfield development is required. Polycentric development, which aims to create additional centres outside of a city's central business district, is one solution. Creating more compact development around public transport corridors and activity centres is another."

The Australian *Liveable Cities* programme also supports public transport projects which facilitate increased residential density and employment nodes.³⁷ Thinking follows a similar vein in New Zealand where city densities have increased in recent years as a result of infill development and intensification policies. Auckland's population density has increased 33 percent since 2001.³⁸

Figure A4; Increasing densities in New Zealand's cities (2001 – 2013)³⁹



Darker shading shows the densification of New Zealand's largest 3 cities over the 12 year period from 2001 to 2013.

Figure A5: Five most dense African cities (with populations over 500,000)⁴⁴

Rank	City	Density (people square km)
1	Mogadishu, Somalia	23,400
2	Kananga, Congo	21,100
3	Tshikapa, Congo	20,500
4	Kinshasa, Congo	19,900
5	Al Mahallah al Kubra, Egypt	19,400

2.4 Africa

Africa's large cities are, on average, the most dense in the world,⁴⁰ although there is significant variation across the continent. The traditional medinas of North African/Arab cities constitute dense, multifunctional urban neighbourhoods for example,⁴¹ whilst many South African cities are characterised by low density urban sprawl.⁴² Geography and climate play a role in driving density levels – in the semi-arid Sahel region for example, populations cluster by the coast in high density areas. In general, African cities are becoming increasingly sprawling, as rapid urbanisation rates, combined with often expansive hinterlands, weak institutions and a lack of planning have led to sprawl, slums and informal settlements.⁴³

Looking ahead, the population of Africa is expected to quadruple in size by 2100, with an additional three billion people being added to the continent.⁴⁵ With African urbanisation rates being the highest in the world, it is expected that much of this population growth will be absorbed by cities. The limited institutional and infrastructural capacity of many African cities is a cause for real concern in this context, and it is feared that explosive population growth will result in further unplanned sprawl.

Densification projects are visible in some African cities, but often these are private or third sector initiatives rather than public master plans.⁴⁶ One example is the Densification Syndicate, a think tank initiated by the African Centre for Cities, which plans to develop three speculative studios exploring densification options in Cape Town. The syndicate also aims to function as a resource for future densification plans in the city.⁴⁷

2.5 Europe

Europe's largest cities are, on average, sparsely populated by comparison to their developing world counterparts, but significantly more dense than cities in North America or Oceania (see Figures A1 and A2). Just 64 cities host 40 per cent of the continent's population.⁴⁸ In 2015, the European countries with the most densely populated cities were Spain and the UK.⁴⁹

Within each EU Member State, the 2012 Urban Audit found that the highest densities were generally recorded for the capital city-region. There were only five exceptions to this general rule:⁵⁰

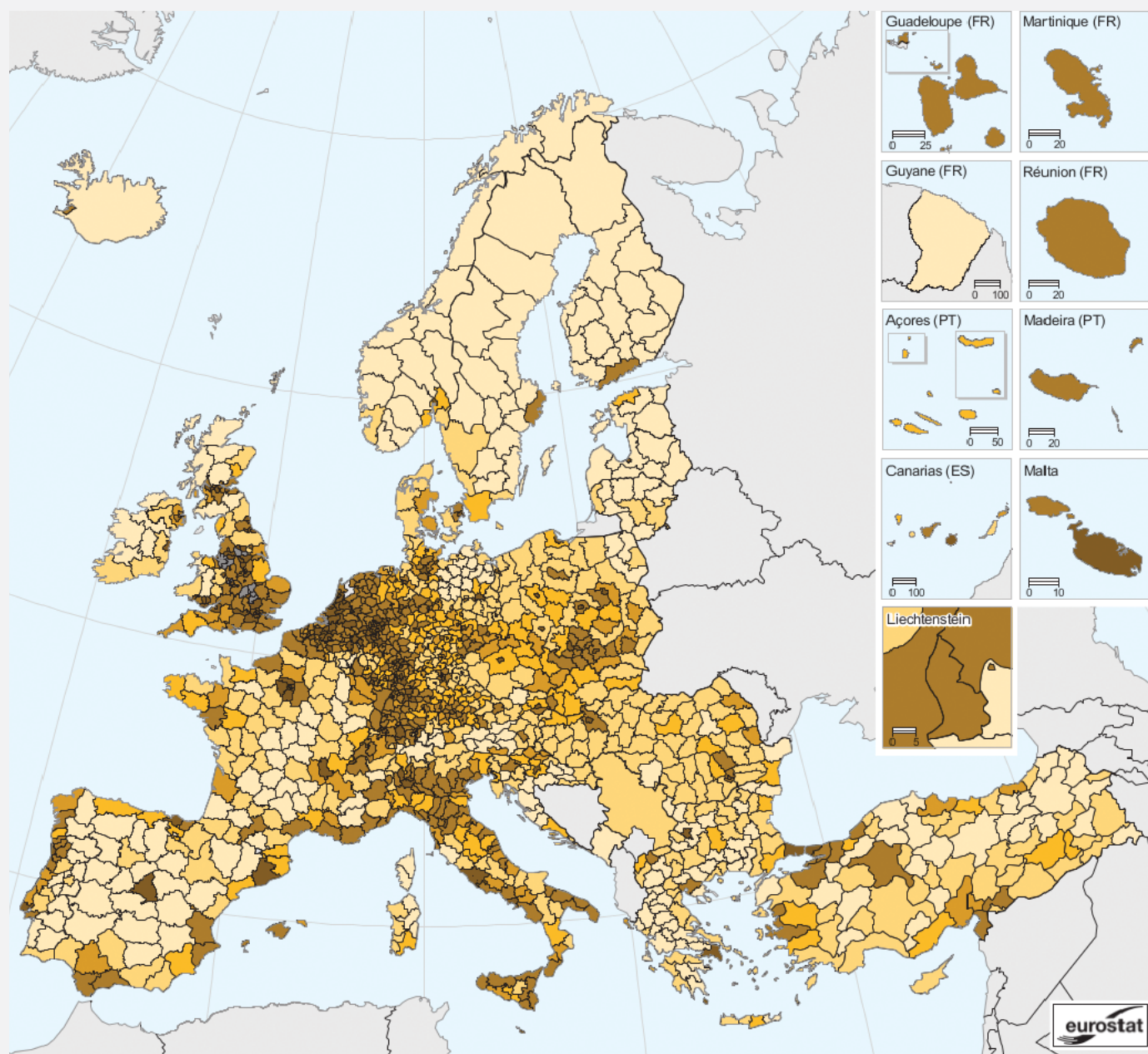
- Germany – where Munich has a higher population density than Berlin;
- Spain – where Melilla and Ceuta have higher densities than Madrid;
- Italy – where Naples, Monza, Milan and Trieste all have higher densities than Rome;
- The Netherlands – where The Hague's greater metropolitan area has a higher density than Greater Amsterdam; and
- Portugal – where Porto's density is higher than that of Lisbon.

The 2012 EU Urban Audit also found that there were just six city regions in the EU where population density within central areas was recorded as over 5,000 inhabitants per square km:⁵¹

Position	City	Density (people square km)
1	Paris	21, 516
2	London	9,843
3	Bucharest	8,090
4	Brussels	7,249
5	Melilla (Spain)	5,611
6	Portsmouth (UK)	5,146

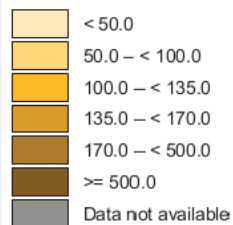
Urban sprawl (and associated lower densities) can also be found across Europe. A report by the European Environment Agency found that sprawl was prevalent in *regions* with high population density and economic activity (Belgium, the Netherlands, southern and western Germany, northern Italy) and/or rapid economic growth (Ireland, Portugal, eastern Germany, the Madrid region). The report found that coastal urban areas are particular 'hotspots' of sprawl.⁵²

Figure A6: Population Density in Europe (2012)⁵³



(inhabitants per km²)

EU-28 = 116.3



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 04/2014



How is Density in Europe Changing?

Europe is experiencing a **significant population shift towards the major cities**. In fact, most cities are growing steadily, especially in the UK, Scandinavia, Spain and Italy (see Figure A7).

Nonetheless, more than a third of European cities are shrinking in terms of population (e.g. Athens, Lisbon, Bratislava, and most cities in Poland and the Baltics) and many others are stagnant.⁵⁴ Despite that

population decline, most urbanised areas continued to grow in terms of area until the financial crisis, especially in Portugal and across Central Europe.⁵⁵

Some growing cities, for example Stockholm, are employing densification policies to absorb their increasing populations.⁵⁶ Since 2008, many shrinking cities have also begun to pursue a strategy of restructuring and densification, whether through inner city projects (e.g. Leipzig), adjusted green belt policy, or infill policies.

Figure A7: Population change in European cities (percentage average annual growth, 2004-2013)⁵⁷

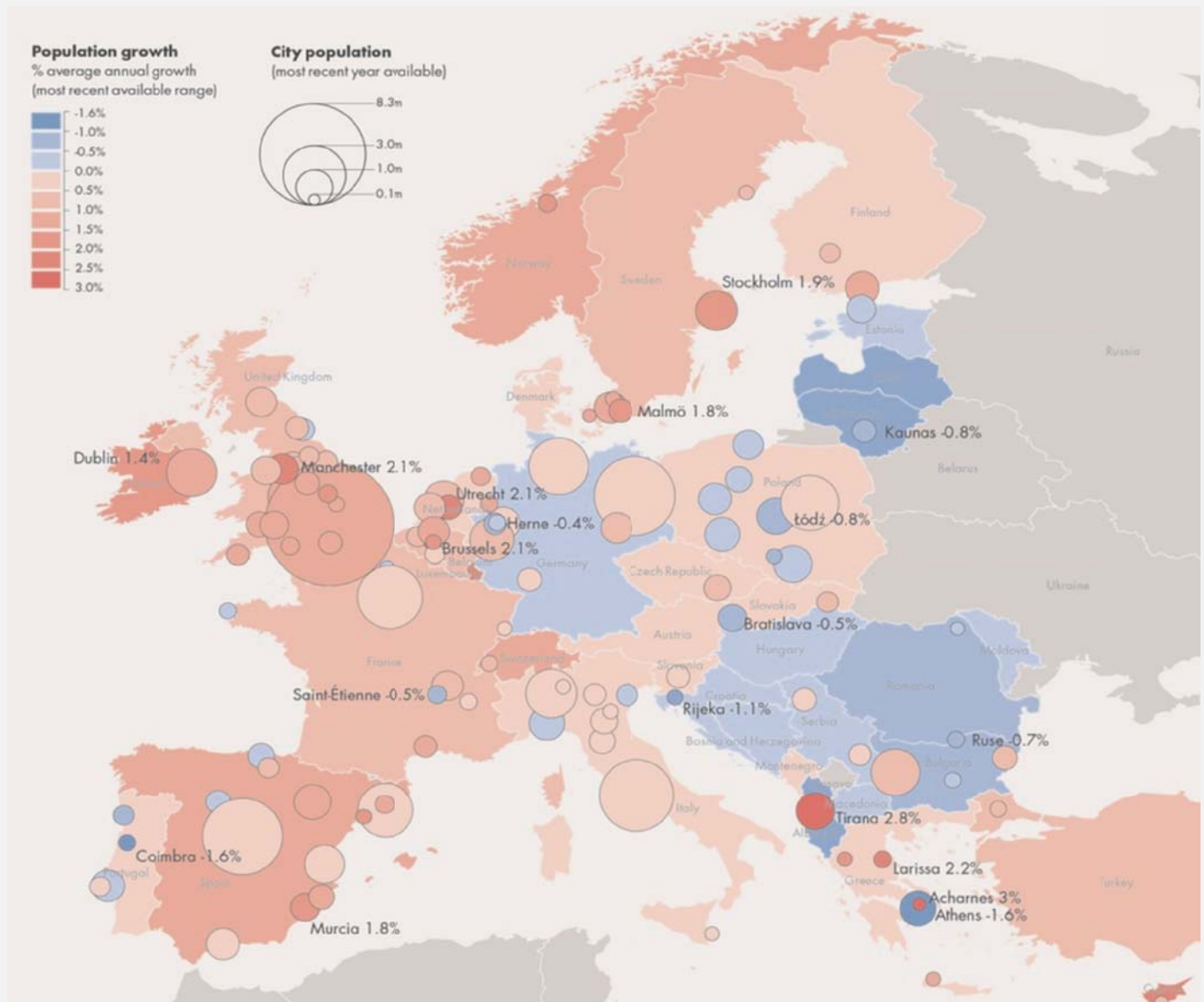
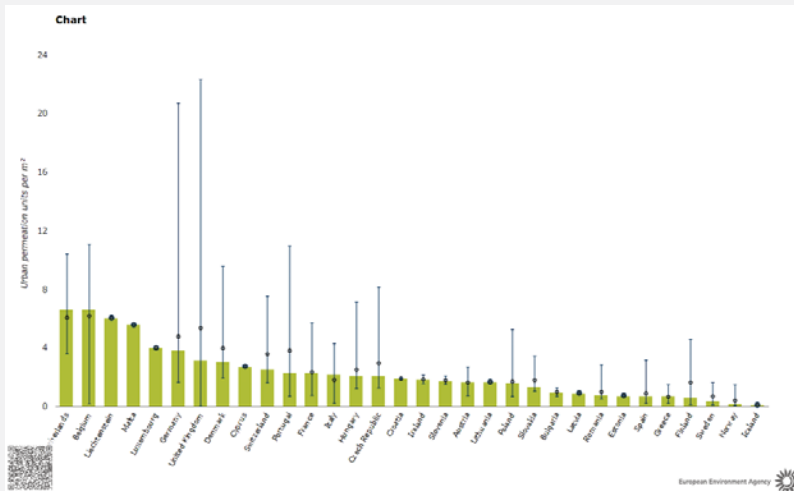
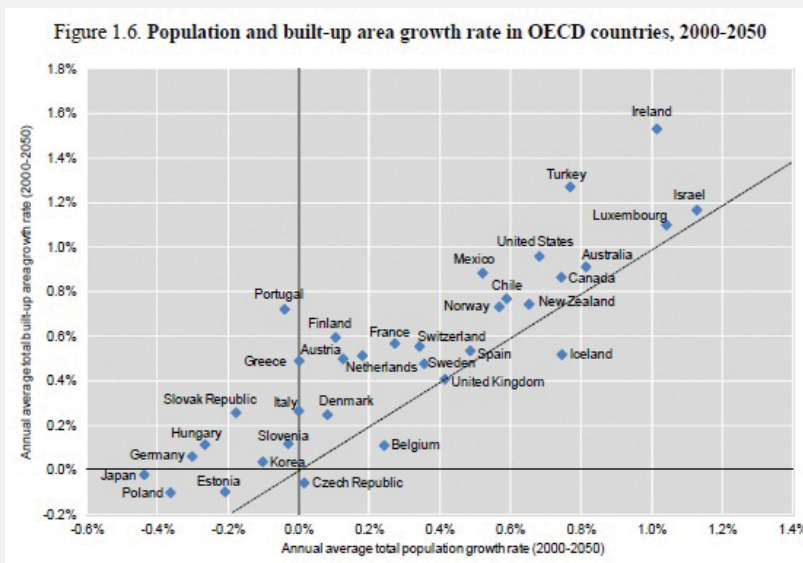


Figure A8: Urban sprawl by country and within countries in the EU (2009 data)⁶³**Figure A9:** Population and built up area growth rate in OECD countries 2000 - 2050⁶⁴

However, the major trend is that growing European cities have become much less compact. Over the past 60 years, European cities have expanded on average by 78 percent, whereas the population has grown by only 33 percent.⁵⁸ The space consumed per person in the cities of Europe during the past 50 years has more than doubled.⁵⁹ Typically European cities are dense (compared to other upper income counterparts) but they are becoming **less dense at their boundaries.**⁶⁰

Of course, there are large differences in the level of sprawl both between and within European countries. Figure A8 demonstrates this – the thin line shows the maximum and minimum level of sprawl within cities⁶¹ in each given country, and the round circle shows the mean level of sprawl/dispersal (The bars show urban permeation units per square metre).⁶² The figure shows that cities in the Netherlands and Belgium show high levels of sprawl/dispersal, whilst there is a lot of variation between German and UK cities' density levels.

Looking to the future, Figure A9 shows that on the whole built up areas in European countries (as well as other OECD countries) are projected to increase in size up to 2050 at a greater rate than populations will increase – in other words they will continue to become less dense. Amongst the European OECD countries, only Estonia and Poland are projected to see their built up areas shrink in the years to 2050, and even then that shrinkage will not be at the same pace as population decline.

3. Density Theory and Literature – An Overview

Since the days of the Industrial Revolution in Europe, urbanists, architects, planners and academics have been split into two camps with regard to density: centrists (in favour of high densities) and decentrists (against). The literature – both historical and contemporary – can also be regarded from this perspective.⁶⁵

The grime, overcrowding, pollution and sickness associated with the crowded cities of the Industrial Revolution in Europe prompted some of the first critical thinking on density. Planners began to consider alternative spatial forms, in the hope of improving the quality of life of the working masses. Ebenezer Howard's *To-morrow: A Peaceful Path to Real Reform* was first published in 1898 and comprised the seminal text in decentrist thinking. Howard envisaged the creation of 'garden cities' – decentralised communities which would accommodate 32,000 people at a density of 25-30 people per square acre, and would eventually be linked together by road and rail to form satellites to major cities. He wrote: '*every man, every woman, every child should have ample space in which to live, to move and to develop*'. Garden cities were realised in the UK in Letchworth and Welwyn in 1903 and 1920 respectively. Howard's principles were later adopted in garden cities in the United States, Australia, Israel and Brazil amongst others.

Shortly afterwards in the United States, Frank Lloyd Wright took decentralist thinking one step further with his vision for a utopian urban form detailed in his 1932 book *The Disappearing City*. Lloyd Wright believed that the motor car and electricity would enable people to spread out from the city, to create a nation of homesteaders, each family living in a home within their own acre plot. Lloyd called his utopia – the ultimate decentrist view – *Broadacre City*.

The pre-war era was not completely dominated by decentrist thinking however. In direct contrast to Lloyd Wright's extreme decentrism was the centric thinking of the Swiss-French architect Le Corbusier. His ideals for the urban form – encapsulated in his *Ville Contemporaine* and *Ville Radieuse* concepts – consisted of high density living with people housed in rows of high rise housing blocks, surrounded by green spaces. Although Le Corbusier's specific town plans were unrealised, they inspired later city plans, most notably in Brasilia and Chandigarh (India).

Following the Second World War, decentrist thinking dominated urban planning in Europe and the United States. This was a time of rapid suburbanisation on both continents. One urbanist who stood against this prevailing mood however was the writer and activist Jane Jacobs. In her book *The Death and Life of Great American Cities* (1961) Jacobs argued for high density living on the grounds that it creates diversity and richness which improves quality of life and creates a sense of community. Jacobs' beliefs were based on the daily life she saw in her own neighbourhood in New York City, and in response to plans by developers, particularly city planner Robert Moses, to build large expressways to facilitate travel to and from suburban areas.

Jacobs argued quite specifically that cities need at least 100 homes per acre to generate enough street traffic to support exciting restaurants and shops. She also argued that 200 homes per acre was a 'danger mark', once neighbourhoods crossed that point, they risked sterile standardisation. As such, Jacobs was anti-high-rise building, believing that they segregated residents from the life of their streets.

High density thinking was also began to gain traction in Europe at a similar time. In the UK, in 1971 the Architectural Review published a vision of the high density city, *Civilia* – a city which would house 250,000 people in a climate controlled environment, with controlled levels of energy consumption.

Around the turn of the new millennium, a clamour of voices argued that the advent of the internet and place less technologies would bring an end to high density living. These thinkers predicted the ‘*death of distance*’ (Cairncross 2001), the ‘*end of geography*’ (O’Brien 1992) and even the ‘*death of cities*’ (Gilder 1995, Kolko 1999).⁶⁶ These predictions are now widely seen as having been mistaken, as the advantages of agglomeration continue to draw more and more people towards city living. Instead, the pendulum of favour has swung back in favour of centric thinking in the new millennium, particularly in response to concerns for the environment and sustainability. Recognition that high density living has the potential to minimise fossil fuel use and pollution, whilst preserving important natural habitats has prompted a new generation of urban thinkers to support compact living. David Owen’s 2009 book *Green Metropolis* is an eloquent example of this fashionable school of thought.⁶⁷

Other contemporary thinkers in favour of density include Edward Glaeser, who argues in his book *The Triumph of the City* (2011) that urban density provides ‘*the clearest path from poverty to prosperity*’. Density, in Glaeser’s thesis, encourages the cross-fertilisation of ideas and ‘*occasionally creates miracles of human creativity*’. Glaeser takes issue with Jacobs’ critique of high rise living, arguing that taller neighbourhoods need not be sterile or isolating, but in fact can help to keep space affordable, ensuring that poorer people and less profitable firms can stay in city centres, promoting their diversity and contributing to their success.

Leo Hollis in *Cities Are Good For You* (2013) argues that density plays an important part in the creation of community. Not only do high densities create networks of weak links, routines and relationships that form communities, Hollis argues, they also ‘*make people behave better*’ – *forcing people to adapt their behaviour, be more open and civil*. Nonetheless, he warns against the once common practice of prescribing ideal population densities, stating “*there is no golden mean of density that produces a well balanced community*”.

4. A Very Brief (Anglo-American) History of Density

Pre-industrial density

In the early days of industrialisation, all but the wealthiest urbanites were limited to travel on foot, and as a result cities grew densely in order to allow factory and office workers to live within walking distance of their jobs. Although prior to the invention of the elevator, buildings were generally no more than four- to five-stories tall, some tenements crowded more than 100,000 people into a square mile of land.⁶⁸ Some modern theories see traditional pre-industrial cities as offering viable models of urban development. These theories conceive of city size being determined by suitable walking distances, urban forms organised in fine grain networks composed of narrower streets and public spaces, and urban life richly intertwined in an organic way across a relatively dense and compact urban fabric.⁶⁹

Industrialisation and density

By fostering mobility, technological progress in the Industrial Revolution allowed for larger cities.⁷⁰ Nonetheless, during early industrial periods, density tended to race ahead of supporting infrastructure, leading to poor public health and living conditions. As a result, planning controls were introduced in many cities, specifying maximum densities. Dealing with density became a priority in architectural and planning practice in order to manage a complex built environment, and to limit the social and hygienic consequences of proximity between people in an industrial city.⁷¹

During the 19th century a predominantly decentralist viewpoint dominated across much of Europe as urban proposals responded to the overcrowded and uninhabitable urban environments of the early industrial periods. Many of the first industrialising nations made purposeful moves towards decentralisation, promoting lower density housing outside the city, for example in the suburbs. In Britain private philanthropic initiatives established new towns such as Port Sunlight (Lever Brothers) Saltaire (Titus Salt) and Bourneville (Cadbury) to provide homes for factory workers away from the disease ridden city centres. At the end of the nineteenth century, in Britain and Sweden, the decentrist Garden Cities movement was supported by the assumption that lower density residential areas would engender a higher quality of life.⁷²

Twentieth century density

Density in the twentieth century was shaped by technological progress. Although Elias Otis invented the safety brake in the 1850s, enabling elevator technology and therefore multi storey buildings, by the twentieth century the decreasing costs of construction materials saw high rise building become widespread. In the United States, a 'height race' fuelled by media and insurance companies, saw skyscrapers become taller and taller in the first part of the century. After World War II, high rise housing became popular urban policy in Europe, representing a quick and economic solution to housing shortages caused by war time bombing.

It was however perhaps the widespread commercialisation and availability of the motor car which had the greatest impact on densities in the industrialised west, enabling people to live further from their places of work. Since the Second World War (and earlier in the United States), rapid urban decentralisation has been a feature of most Western countries. This decentralisation took different forms in different countries – in the US, Japan, Canada and Australia, large scale suburbanisation was dominant, resulting in sprawling and often monotonous environments of homogenous low density housing. Cities such as LA and Atlanta became renowned for their high levels of car dependence and large footprints (see **Appendix 3** Atlanta case study).

In contrast European decentralisation was characterised partly by the sub-urbanisation of towns and cities, but also by the growth of smaller towns and villages down the urban hierarchy – a trend sometimes called counter urbanisation. In Britain, the construction of 'new towns' such as Hemel Hempstead, Warrington and Milton Keynes followed the 1946 New Towns Act, largely to accommodate what were seen as overflow populations from major nearby conurbations. As citizens demanded larger plot sizes with wide roads suitable for the private car, housing estates (built both by local authorities and private developers) sprang up across Europe.

Twenty-first century density

Continuing urbanisation appears to have led to a perception that cities are becoming more dense and overcrowded. However, taking a global level overview, while land use activities in the centre of cities has increased significantly, globally the population density of cities is falling.⁷³ According to the World Bank, a review of 120 cities around the world indicated that urban populations over the past two decades have been growing at more than 1.7 percent per annum, while the population density of cities has been falling by 2.2 percent per annum, with the urban footprint of cities growing at more than 3.3 percent annually.⁷⁴

Of course global overviews mask significant regional and national variations. In the UK for example, whilst urban densities outside London fell by 1 percent during the 1990s, net immigration resulted in an 8 percent increase in London's density during the same period.⁷⁵

Nonetheless, a revitalised appreciation of the vibrancy and convenience of urban living, coupled with environmental concerns, has prompted a degree of re-urbanisation in both Europe and the US. Barcelona is one such city which has densified and re-urbanised. It provides an interesting comparison to Atlanta, which is a city of a similar population but vastly different urban footprint (see **Appendix 3**).

The shift from an industrialised to knowledge based economy offers the potential for greater densification in Europe's cities in the twenty-first century. Knowledge based services require smaller floorspace, are more flexible, and benefit from agglomerations. These ideas and drivers are explored further in our main report.

Although core city living has become fashionable in recent years, burgeoning populations combined with housing shortages are prompting UK policy makers to consider a range of potential solutions. In the Budget 2014 the Government announced that it would support a new Garden City at Ebbsfleet in Kent, for up to 15,000 new homes based on existing brownfield land.⁷⁶

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