



SCOTLAND'S URBAN
A·G·E

Aberdeen, Glasgow & Edinburgh
in the Century of the City


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SCOTLAND'S URBAN AGE

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 Burness Paull

GLASGOW
URBAN LAB
THE GLASGOW
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Scotland's Urban Age: Aberdeen, Glasgow and Edinburgh in the Century of the City...

... documents research into the future of Scotland's principal cities in the context of international trends identified by the United Nations.

Chapter 1 (*Scotland in the Urban Age*) reviews research undertaken by the Glasgow Urban Laboratory for the United Nations and introduces the concepts of the *century of the city* and the *supercities* of the north.

Chapter 2 (*The Urban Century and the New Urban Agenda*) explores major trends in demography, migration and digital development and introduces the paradigm shift from the *industrial city* to the *knowledge city*.

Chapter 3 (*Urban Systems – hierarchies and challenges*) examines the concentrating effects of ubiquitous air travel and the internet, reflects on urban systems in North America and Europe within a series of international trends and considers effects on city agglomeration and the emergence of the *supercity* with characteristics of *urban concentration*, *urban shrinking* and *urban sprawl* and responses that include *the compact city*, *the resilient city* and *the competitive city*.

Chapter 4 (*The Knowledge City, Pathways to Transition and Scotland's Urban System*) describes the emergence of the knowledge city in the 21st century, considers trajectories of city change in the UK and the nature of Scotland's urban system.

Chapter 5 (*Understanding the AGE Cities*) takes an in-depth look at Scotland's three principal cities (Aberdeen, Glasgow and Edinburgh, the capital), considers commonality and divergence between them and their ability to deal with global trends by looking at a wide range of issues including economy, living and place.

Chapter 6 (*Towards a New Urban Agenda for Scotland*) introduces a number of thoughts about the future competitiveness of Scotland's cities.

The research *Headlines* are set out in summary form in Chapter 7.

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ABBREVIATIONS

AI	Artificial Intelligence
AGE	Aberdeen, Glasgow Edinburgh
BRIC	Brazil, Russia, India and China (the 'supergroup' of developing countries –O'Neill)
CIS	Commonwealth of Independent States (formed on the dissolution of the former Soviet Union in 1991)
DG Regio	EU Directorate General for Regional and Urban Policy
EFTA	European Free Trade Association
EU	European Union
GDP	Gross domestic product
GVA	Gross value added
ICT	Information and communications technology
IoT	Internet of things
MINT	Mexico, Indonesia, Nigeria and Turkey particularly well placed to exploit a geo-political location between developed and developing markets(O'Neill)
NESTA	UK Innovation Foundation formerly National Endowment for Science Technology and the Arts
OECD	Organisation for Economic Cooperation and Development
ONE	Opportunity North East
PUA	Primary Urban Area
R&D	Research and development
UK	United Kingdom of Great Britain & Northern Ireland
UNECE	United Nations Economic Commission for Europe
UN	United Nations
US	United States

SCOTLAND'S URBAN AGE



Scotland

in

The Urban Age



I: INTRODUCTION – SCOTLAND IN THE URBAN AGE

This is the 'century of the city'. As the 21st century progresses, urban dwellers will exceed rural dwellers and the ratio of urban to rural populations is predicted to move to 70:30 by mid-century. In the developed world, this ratio has already been exceeded with greater than 80% of people living in cities in North America and in excess of 75% in Europe. Other continents are expected to catch up rapidly. The process of urbanisation involves a complex and sometimes contradictory combination of concentration, agglomeration and sprawl.

The world is expected to reach 'peak population' of around 10 billion by mid-century. Population growth is expected to create significant pressure on the carrying capacity of certain regions in terms of climate and environment. As a consequence, stresses are expected in temperate regions from immigration that will be offset to some extent by internal demographic trends characterised by ageing populations and falling birth rates.

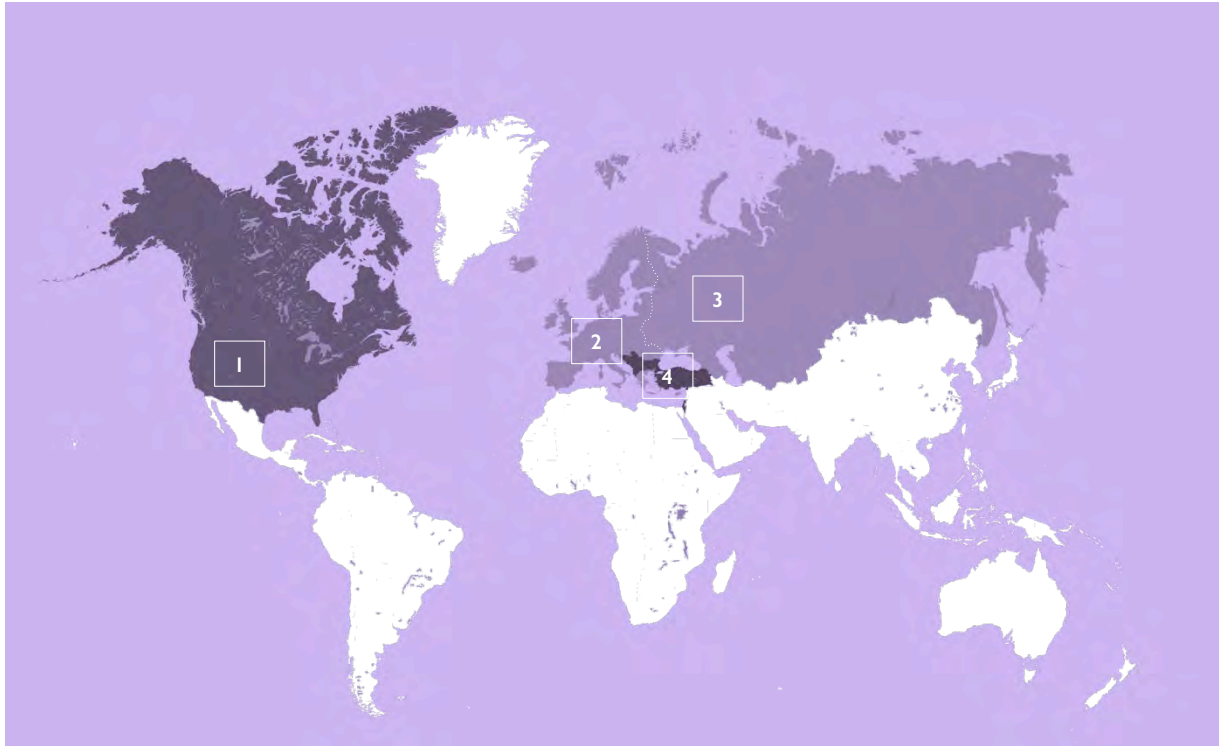
The 'Urban Age' is a major programme of research undertaken by the London School of Economics that explores the nature of increased urbanisation around the globe.¹ The work concentrates on global world cities and the emerging megacities of the east and south. It also examines the phenomenon of informal settlement experienced in developing and converging economies, notably 'BRIC' and 'MINT' countries.²

In 2015/16, the United Nations undertook research into the trends and patterns of urbanisation over the 20 years leading up to Habitat III, the international and inter-governmental conference that published as its outcome the 'New Urban Agenda'.³ Research undertaken for the UNECE (United Nations Economic Commission for Europe) found that the pattern of urbanisation was different for this region of 56 member states (comprising North American, Europe, Russia and former CIS countries, the Balkans, Israel and Turkey) as compared to the other four UN 'regions'.⁴ This report examines the implications of these trends for Scotland and its three principal cities of Aberdeen, Glasgow and Edinburgh – Scotland's own Urban AGE.

In Europe, urban hierarchies are historic systems that emerged, as we know them today in the 19th century. These are not fixed and continued to evolve throughout the 20th century and take different forms. In the late 20th and early 21st century the UK economy is dominated by London, a world city, that together with Los Angeles, Moscow and Istanbul and (perhaps) Paris is one of a very few megacities in the UNECE. Together with the South East of England, London accounts for almost 40% of UK GDP.⁵ The implications of a London-centric UK economy are much debated not least whether the success of this megacity confer benefits on the whole of the UK (for example, tax revenues) or sucks life out other UK cities.

The UNECE research concentrated on trends and patterns of urbanisation in the 'developed north' and describes the emergence of 'supercities' defined as clusters of successful and competitive cities with a population of 20–50 million within a region that spans a geographical area between 200 and 500 miles across.⁶ (Figure 1-1: the Member States of the UNECE). Supercities as metropolitan regions where a cluster of cities and research centres are connected through dense business, intellectual and creative networks accessible to one another by air or high-speed rail. Aspects of this phenomenon have been observed by geographers and economists for some time and referred to as agglomeration economies or conurbations. By contrast the supercity looks at these issues in the 21st century and has introduced one significant and additional criterion: supercities are at the forefront of the knowledge revolution.

In contrast to national economies dominated by a single megacity, supercities operate as an urban system and a balancing mechanism, allowing urban centres within the cluster to 'borrow scale' from each other. Even relatively small cities can develop smart specialisations and cultivate global connections; large metropolitan areas and megacities are a resource that the whole cluster can share. In this context the UK and Ireland has a highly interconnected group of principal and



1: NORTH AMERICA

USA
CANADA

2: WESTERN & CENTRAL EUROPE

EU	EFTA
Austria	Iceland
Belgium	Liechtenstein
Bulgaria	Norway
Croatia	Switzerland

Non-EU COUNTRIES

Cyprus
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Ireland
Italy
Latvia
Lithuania
Luxembourg
Malta
Netherlands
Poland
Portugal
Romania
Slovakia
Spain
Sweden
UK

3: RUSSIA, EASTERN EUROPE
& CENTRAL ASIA

Armenia
Azerbaijan
Belarus
Georgia
Kazakhstan
Kyrgyzstan
Republic of Moldova
Russian Federation
Tajikistan
Turkmenistan
Ukraine
Uzbekistan

4: SOUTH EAST EUROPE

Albania
Bosnia & Herzegovina
Israel
Montenegro
Serbia
Former Yugoslav Republic of Macedonia
Turkey

Figure I-1: The member states of the United Nations Economic Commission for Europe (UNECE)

secondary knowledge-based cities with a population of around 50-60 million and a sizeable domestic single market.⁷

The Scottish Government has stated that our cities are “centres of knowledge, innovation and culture” and, by working together, they can build on these strengths to “develop internationally investible propositions based on skills in science, technology, innovation and creativity.”⁸ *Scotland's Urban Age* considers the performance and prospects of Scotland's three principal cities, Aberdeen, Glasgow and Edinburgh – the nation's capital – in the context of business, creative, visitor, student and cultural economies; connectivity; and, natural and built capital.

Scotland is an urban society: nearly 70% of the population lives in the city regions of Aberdeen, Glasgow and Edinburgh.⁹ These cities and city regions account for a disproportionate share of total employment, jobs in the Scottish Government's growth sectors, and employment in knowledge-intensive business services (KIBS). They are more youthful than the rest of Scotland, they have a high proportion of student residents and they are much more ethnically diverse. *Scotland's Urban Age* considers the fitness of Scotland's principal cities to perform in a post-Brexit UK-Irish Supercity within emerging global trends including automation, AI, 'fintech' and 'greentech' where 63% of Scotland's exports are currently to the rest of the UK and 37% are to the EU and the rest of the world.¹⁰

For Scotland to hold its position in a putative UK-Irish supercity system and participate in international economies, the three principal cities, their city-regions and the supporting urban system need to be efficient, competitive, leading-edge and probably deliver a step-change in performance. This has led to *Scotland's Urban Age*, the research project commissioned by Burness Paull working in partnership with the Glasgow Urban Laboratory at the Glasgow School of Art, to enquire into UN research and the *New Urban Agenda* and explore what these might mean for the principal cities of Scotland.

Chapter 2 reflects on international trends in the cities of the developed north identified in the research undertaken for Habitat III leading to the publication of the *New Urban Agenda* including ageing, low-fertility, automation and migration,¹¹ and highlights the fundamental change that is evident in our cities and the widespread trends that look set to continue for the foreseeable future. Perhaps the clearest finding of the research was the evident paradigm shift in the developed north from the *industrial city* to the *knowledge city* and the challenges and opportunities this stimulates in an era when climate change and its consequences are also prevalent in urban thinking across the globe.¹²

Chapter 3 then looks at the cities of the north, their systems and hierarchies, and explores some of the propositions introduced here concluding with a commentary on the challenges of transition from *industrial city* to *knowledge city*. Chapter 4 discusses Scotland's urban system and Chapter 5 takes a closer look at the performance of Scotland's three principal cities: Aberdeen, Glasgow and Edinburgh. Finally, Chapter 6 steps back from the detailed analysis to review and reflect on what has been found and what this means for the three cities and for Scotland as a whole. Chapter 7 summarises the headlines of the research findings and Annex 1 provides a note on methodology and in particular looks at the different ways that cities are measured in terms of their performance.

Scotland's Urban Age is intended to:

- set the international context for cities in the 21st century;
- build a picture of the dynamics of Scotland's urban system;
- explore the relationships between the principal cities, their city-regions and Scotland's other urban centres;
- discuss how they relate to the supercities described in the UN Habitat III report;
- consider whether the British Isles functions as a supercity and discuss what this means for Scotland.

The report presents evidence showing the specialised strengths of the three cities and their connections, through business links and research, to global knowledge networks and transport connections. Supercities offer the benefits of scale and the advantage of proximity, but research evidence shows that smaller and geographically isolated cities can also thrive. Size matters, but it is not a fixed, linear relationship between size and prosperity.

This document sets out to review the nature, character and performance of Aberdeen, Glasgow and Edinburgh individually and as a group of cities in Scotland, their fitness to participate within their immediate city systems (in Scotland, the UK and Europe) and the challenges and opportunities they have in the age of the knowledge city. The intention is not to produce a league table of Scotland's cities but to present evidence of the opportunities that Aberdeen, Glasgow and Edinburgh have to maximise Scotland's competitive urban profile in the UK, Europe and internationally.

SCOTLAND'S
URBAN AGE

2

The Urban Century
and

The New Urban Agenda



2: THE URBAN CENTURY AND THE 'NEW URBAN AGENDA'

By 2050, almost three quarters of the world's population will live in urban areas. This will be the 'Century of the City'.¹³ The trend towards increasing urbanisation is evident across the entire globe, albeit with the character, nature and pace of this change varying between developed and developing regions.

Globally, more people now live in urban areas than in rural ones. In 1950, the figure was 30%. By 2050, it is projected to be at least 66%. But this change is not spread evenly across the world. The most urbanised region of the world is North America, with 82% living in urban areas in 2014. Europe is close to this at 72%. But both are in contrast with Africa at 40%. The rural population of the world has grown slowly since 1950 and is expected to peak at just over 3 billion, whereas the urban population has grown rapidly over the same time period increasing from 746 million to 3.9 billion in 2014.¹⁴ Continuing population growth and urbanisation are projected to add 2.5 billion people to the world's urban population, although little of this growth will take place within the UNECE region. Nearly 90% of it will be concentrated in Asia and Africa.¹⁵ This chapter examines global trends that have emerged from UN research and introduces the forces impacting on cities in the 21st century.¹⁶

Demographic Trends

The countries of Western and Eastern Europe and North America are experiencing very low population growth compared to other regions in the world, such as Africa and Asia. A rapidly ageing population (due to a combination of low fertility rates and increased life expectancy) is most prominent in Europe, but is prevalent in almost all UNECE countries, and will be a major challenge in the coming decades. Among the world's countries that are shrinking or are projected to lose substantial parts of their population in the coming 20 years, almost all are situated in the UNECE region. The trends are caused by a combination of low fertility and/or outmigration in some countries, and lower life expectancy in others.

Population ageing is usually defined as a shift in the composition of the population towards the older generations and is a consequence of decreases in fertility and increases in life expectancy. Ageing is normally measured by the proportion of the population aged 60 or 65 years and older. In the last two decades, the ageing population in the countries of the north has grown relatively slowly, at 2.3% annually, reaching 14.1% in 2010. However, it is expected to grow faster in the coming decades to reach approximately 20% by 2030 and 26% by 2050 (Figure 2-1: Ageing of the population in the countries of the UNECE).¹⁷

Ageing has a direct impact on cities, as it changes the demands made on the infrastructure (notably the transportation system) and social services (healthcare, risk of social isolation). Simultaneously it leads to shrinking tax revenue from local and national taxation as older people live on less and pay less tax once they retire.¹⁸ In turn, demographic ageing is paralleled by a relative decrease in the active labour force, further lessening the tax take and putting pressure on housing accessibility and affordability. This poses potential problems for all segments of the population, either through an increased need for social housing or because older cohorts of the population remain longer in larger housing units.¹⁹

The increasing percentage of older people in the population creates a further challenge for public transportation in cities in terms of adaptation and frequency. A diminishing local revenue base, concessionary travel for older people, and lower densities caused by urban sprawl may put pressure on affordable public transport for all segments of the population and may, in turn, undermine the core aim of sustainability.²⁰

The need to ensure the accessibility of public space by all becomes obvious in this context. Therefore, it is important that local governments and the private sector are prepared for the population's ageing, and adjust to it. Increased walkability of cities allows for greater mobility of

older and vulnerable people, and for all age groups in the city. Equally, increased levels of walking and active travel have had an important health dividend, as active populations are healthier than excessively sedentary ones. In many parts of the north, cities and local communities have developed innovative mechanisms related to housing and social relations to respond to these challenges.²¹

Ageing is more prominent in Europe than in most other continents of the world. Since the 1960s, Europe has experienced lower birth rates, coupled with increased life expectancy, both of which lead to older populations. Both trends are here to stay. According to all contemporary projections, replacement rates are declining – i.e. birth rates will remain lower than death rates, even allowing for the effects of ageing.²² The European population has grown by only 5% from 1996 to 2015, although the age structure of the population varies across cities in Europe. Most capitals attract a younger population than the national average – Copenhagen, Helsinki, Dublin, and Edinburgh. However, there are exceptions, such as Lisbon, Warsaw and Bratislava. In 2012, the majority of the cities with an age-dependency ratio of 35% or more were located in Italy and Germany. These two countries together had over 100 cities in this category.²³

In North America, recent and predicted demographic changes make responding to the needs of the ageing population an increasingly important issue, as the number and proportion of over-65s has dramatically increased. Between 2002 and 2012, the number of Americans in this category increased by 21% (7.6 million people).²⁴ By 2040, projections indicate that this will double, and account for 20% of the population.²⁵

With the large increase in this part of the population, the need for age-friendly housing is growing, as the overwhelming majority of older adults prefer to 'age in place'. This allows older people to stay in their homes and communities with an active lifestyle, avoiding an institutional life for as long as possible. In addition to ageing, there is a general trend towards the individualisation of lifestyle which, in combination with lower birth rates and resultant smaller families, has led to a requirement for greater living space per person.

Many governments have programmes that aim to increase the supply of housing available to low-income senior citizens and provide services that allow them to stay in their homes for longer.²⁶ The concentration of populations in many principal cities that benefit from international migration adds to a cosmopolitan character and diversity. However, a rapid influx of poorer migrant workers into some major cities can produce negative reactions and associated social tensions. These issues are playing out now in the US and in the UK and are evident in the forces behind Brexit.

The Challenges and Opportunities of Migration

In the last few years, international migration flows have risen to levels unprecedented since World War II. Both internal and international migration has substantially increased throughout the countries of the UNECE due to globalisation, increased inequalities within and between countries, the discontinuation of population movement control in many Eastern countries, and the introduction of free movement in the EU.

Increased population mobility leads to higher urban polarisation, as best-performing cities or neighbourhoods tend to attract population growth, youth and economic activities, leaving other areas in a state of economic stagnation and demographic shrinkage that, in turn, reduces opportunities for positive social interaction and cohesion. Another effect of increased migration is that many cities face the challenge of managing growing social and cultural diversity. While increased diversity presents many positive sides, it challenges the local identity and the social consensus on the urban development model to be followed.²⁷

Europe has become a continent of immigration. The main migration flows have been from south to north and from east to west, both within Europe and for migrants moving from non-EU countries. In 2014, over 50 million extra-Europeans resided in the EU, of which 33.5 million were born outside of the EU, and 17.9 million were born in a different EU Member State from the one where

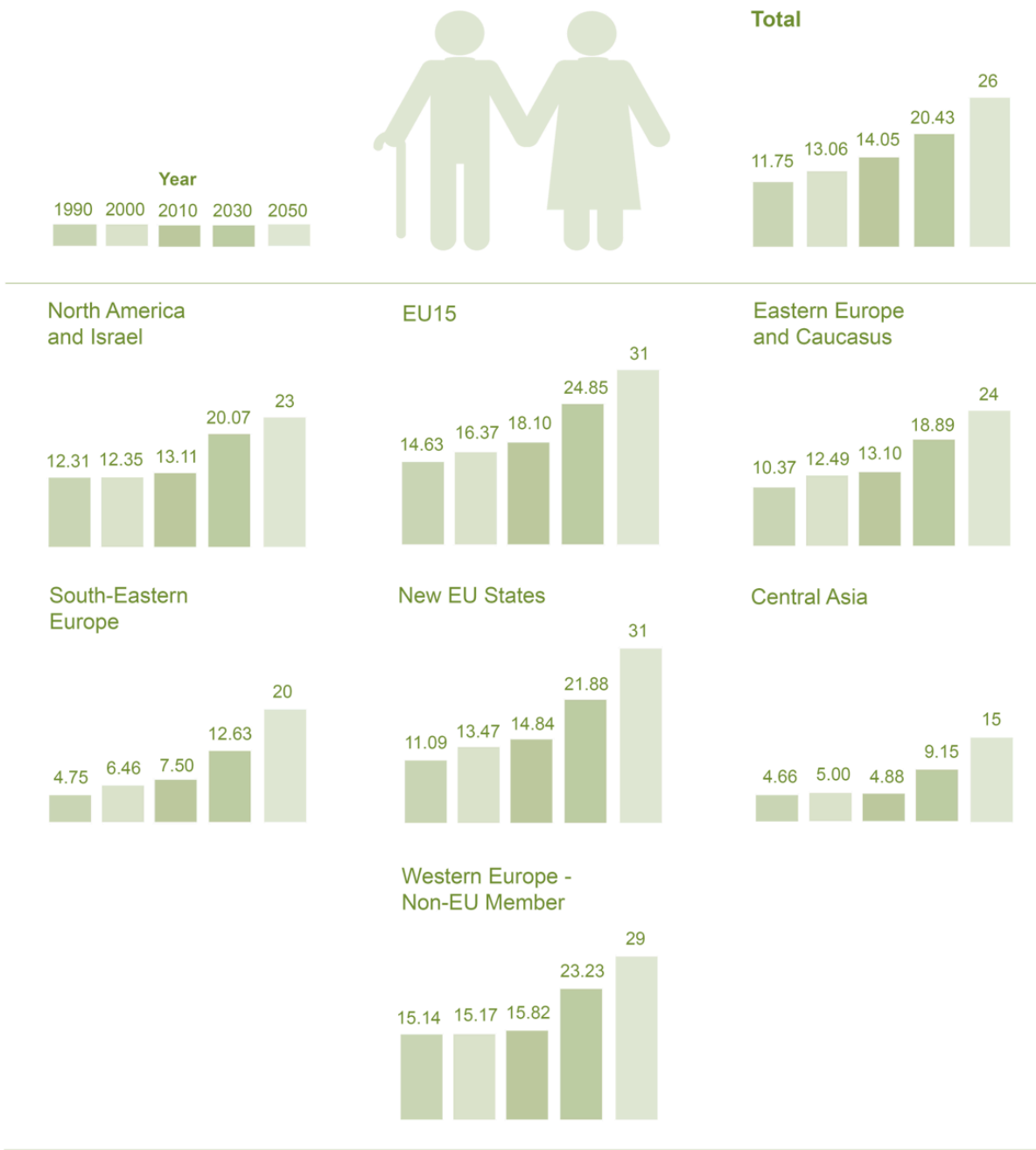


Figure 2-1: Ageing of the population in the countries of the UNECE (% over 60 years)

they were resident. These trends are projected to persist and increase. The total net immigration for the UNECE region is estimated to increase by 20 million in the period 2010-2030.²⁸

Local authorities are often an important official contact point of immigrants. While cities do not have a say on national or European migration regulations and general social and age-related policies, some cities have done better than others to successfully integrate migrants. Examples include a cultural festival to raise awareness and strengthen intercultural coexistence in Bilbao, a one-stop-shop for immigrant entrepreneurs, offering business counselling in many languages in Vienna, and a project on mayoral leadership to bring together religious communities together to create a forum for dialogue and community mediation in Marseille.²⁹ (Figure 2-2: Bilbao, Vienna and Marseilles have introduced programmes to promote social cohesion) The crises in the Balkans in the 1990s caused the movement of about 4 million people to Germany, Switzerland and Austria. Between 2001 and 2008, the level of net immigration in the EU was even higher than that in the US – traditionally a country of immigration.³⁰

'The World Migration Report 2015: Migrants and Cities, New Partnerships to Manage Mobility' is the eighth report from the International Organisation for Migration (IOM) and it focuses on how migration and migrants are shaping cities and how the life of migrants is shaped by cities, their people, organizations and rules. Given that the number of people living in cities will almost double to some 6.4 billion by 2050, the world will, in effect, turn into a global city. Human mobility and migration play an important part in this but are substantially misunderstood or misrepresented in the debate on urbanisation and city development. The UN is active in promoting these issues as part of the discussion around the *New Urban Agenda* that has arisen from the Habitat III conference in 2016. The IOM's report advocates that migration needs to be a factor considered alongside climate change, population growth, demographic change and economic and environmental crises in shaping sustainable cities of the future.³¹ These issues are known to and recognised by the Scottish Government as being critical to issues including the growth potential of the Scottish economy and the provision of services.³²

The Digital Revolution

The digital economy now drives many and various aspects of the world economy, including banking, retail, energy, transportation, education, publishing, media and health. Information and Communication Technologies (ICTs) are transforming the ways social interactions and personal relationships are conducted, with fixed, mobile and broadcast networks converging, and devices and objects increasingly interconnected. Broadband markets are expanding, with an increase in wireless broadband subscriptions – reaching close to one billion in the OECD area – resulting in a decrease in fixed telephony.³³

The expansion of the digital economy has acted as a significant driver of economic growth in recent years expanding quickly and transforming society as a whole.³⁴ It permeates the entire economy, including retail (e-commerce), transportation (automated vehicles), education (online courses), health (electronic records and personalised medicine), social interactions and personal relationships (social networks). ICTs are integral to professional and personal life; individuals, businesses and governments are increasingly inter-connected through a host of devices at home and at work, in public spaces and on the move. These exchanges are routed through millions of individual networks, ranging from residential consumer networks to networks that span the globe. The convergence of fixed, mobile and broadcast networks, along with the combined use of machine-to-machine communication, the 'cloud', data analytics, sensors, actuators and people, is paving the way for machine learning, remote control, and autonomous machines and systems. Devices and objects are becoming increasingly interconnected, leading to convergence between ICTs and the economy on a grand scale.

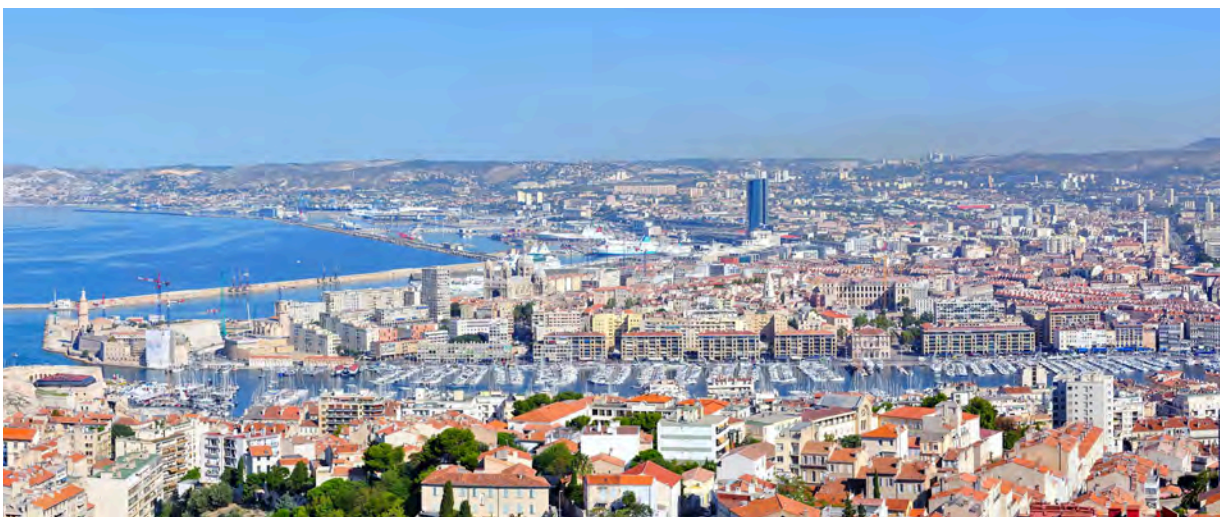
Up-to-date, accurate and easy-to-find geo-referenced environmental information can also empower public officials, entrepreneurs, workers, and consumers to take informed decisions that impact on the urban environment and their personal well-being. While e-Government, Open Data, and other similar initiatives have set a trend towards greater openness with information, there remain



Bilbao



Vienna



Marseilles

Figure 2-2: Bilbao, Vienna & Marseilles have introduced policies to promote social cohesion

challenges with effective public access to environmental information that may still undermine the protection of the environment and hamper the sustainable development of urban areas.

Cities are well placed to maximize the opportunities of the digital economy, and these economies of scale also reinforce the trend towards urban concentration as described by the UN.³⁵ Furthermore, with manufacturing now largely located in other continents, European cities are particularly well placed to combine the effects of proximity, higher education and innovation to accelerate growth in the knowledge economy through the digital revolution. The clusters of digital start-up companies in Silicon Valley, London, Stockholm, Stuttgart, Edinburgh and many other European cities are exploring new business models based on collaborative production methods, such as crowdfunding platforms, and the 'sharing economy' that challenge the existing regulation of established markets and may, in time, require balanced policy responses to enable innovation on one hand while protecting the public interest on the other.³⁶

Many cities are adopting digital strategies, recognising that government can act as catalysts for the digital economy. This is noticeable in the case of Open Data initiatives, where the public sector can stimulate data-driven innovation by opening up public sector information, including different types of data, and by providing easy access to environmental information for all stakeholders. E-Government initiatives are also used to stimulate the adoption of a wide range of applications needed for e-health and e-commerce. Governments are relying on digital technologies to move from a citizen-centred to a citizen-driven approach, and aim to achieve public sector transformation through the use of ICTs to make this shift, implying that the public and businesses determine their own needs and address them in partnership with public authorities.

The Internet of Things and Artificial Intelligence (AI)

While use of the Internet as a digital platform has enabled the creation of the sharing economy, the ability to connect any smart device or object to any other is enabling the 'Internet of Things'. This is having a profound impact on multiple sectors of the economy and urban life, including industrial automation, energy provision and transportation. The 'Internet of Things' consists of a series of components of equal importance – machine-to-machine communication, cloud computing, 'Big Data' analysis, and sensors and actuators. Their combination, however, engenders machine learning, remote control, and eventually autonomous machines and systems, which will learn to adapt and optimise themselves.

The Internet of Things also enables governments to manage public spaces in more efficient, more effective or different ways. Remotely monitoring traffic lights or water systems allows them to optimise traffic flows or to better understand flooding risks. It also allows them to achieve policy goals in new ways. For example, reducing congestion using road pricing, calculated on time of day and distance travelled, is possible via GPS and mobile communication, but more difficult to achieve through conventional means. Similarly, smart energy meters lead to more decentralised energy markets and higher consumer awareness of energy use. Analysts and governments have high expectations of e-Health devices that will allow remote monitoring of patients at home or at work. Although a number of such devices are available on the market, adoption is relatively slow – a situation that appears to be due not to a lack of research or government commitment, but rather to difficulties in implementation that are yet to be overcome.³⁷

The Trends in Summary

This review of global forces and their likely impact on cities supports two overall conclusions. The first is that trends in urbanisation and migration are reinforcing and accelerating one another, creating ever greater but differing pressures between the most successful regions compared to dispersed and isolated smaller cities. The second is that there is a fundamental paradigm shift from the industrial to the knowledge city within the context of global forces that include an ageing population, reducing fertility in the developed world, a complementary increase in migration and the wholesale onslaught of automation and artificial intelligence.

Figure 2-3: **The Industrial City:** The industrial economy reshaped cities and regions through development and redevelopment, to produce lifestyles and forms that differed from agrarian and mercantile economies. Manufacturing reorganized access to materials and markets, created and controlled transport networks, attracted large numbers of workers to cities, and set up rigid routines of work reflected in the patterns of spatial and social organization.

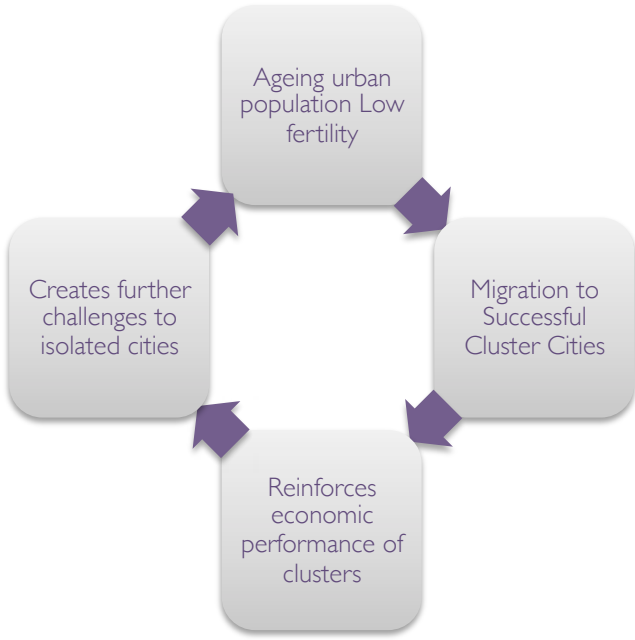
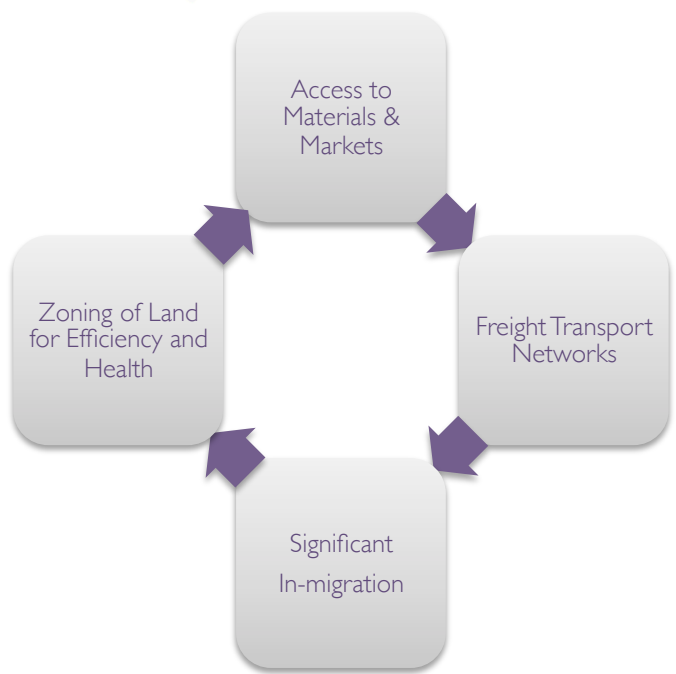
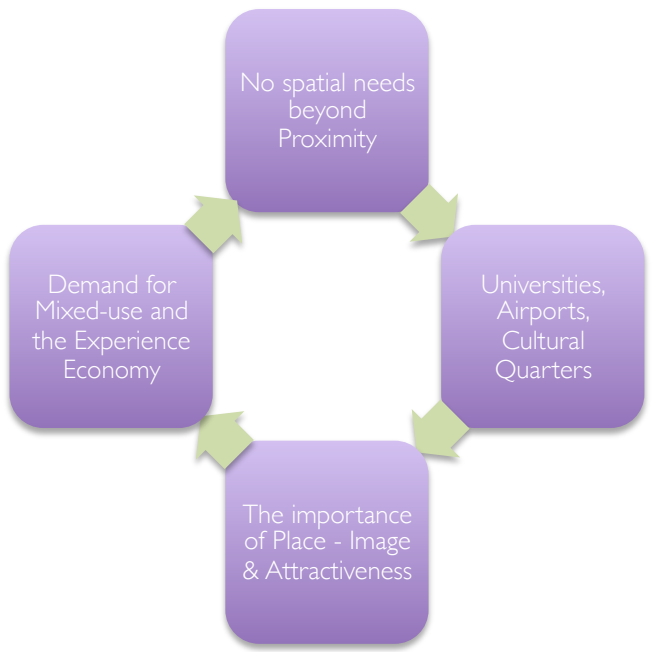


Figure 2-4: **The Demographic Cycle:** The ageing population creates economic opportunities for migrants in successful city clusters. This creates further challenges for isolated cities, where lack of economic opportunity means they are less attractive to migrants. This also leads to the attrition of the economically active indigenous population who seek employment in the successful city clusters

Figure 2-5: **The Knowledge City:** The knowledge economy has new conditions of economic production, social requirements and cultural institutions. Knowledge as a productive capacity has no spatial requirements beyond clusters around universities, science parks and cultural quarters. This encourages the dynamics of agglomeration economies, and has led to the re-emergence of 'place' – the city of streets, squares, stations and neighbourhoods, supported by an 'experience economy' of cafes, restaurants, cinemas, galleries, cultural venues and shopping centres.



Figures 2-3 to 2-5: Industrial, Demographic and Knowledge City Cycles

Figures 2-3 to 2-5 (the industrial city, the demographic cycle and the knowledge city). summarise these trends from the last 20 years.

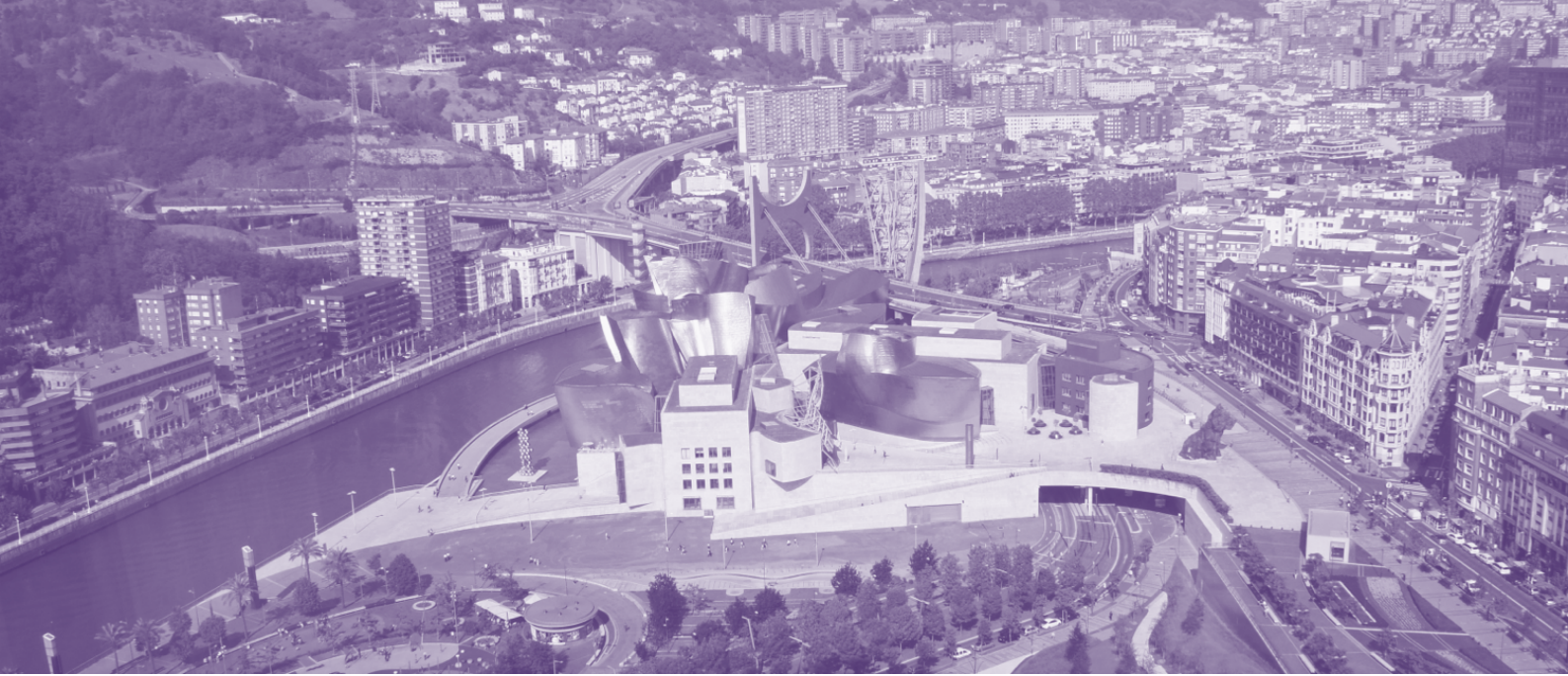
Following Habitat III, UN-Habitat published the *New Urban Agenda* that built on the research undertaken within the UNECE, other regional commissions as well as a wide range of partners and international networks of cities and member states. The aim of the *New Urban Agenda* is to work towards the 'Inclusive City' as a place that is just, pluralist, sustainable and productive where everyone, including the vulnerable, can contribute productively and enjoy the benefits of urban life.

As globalisation continues, diversity will become more, rather than less, important. And the successful governance of diversity will distinguish the most accomplished and creative cities from the rest.³⁸ In some respects the Paris Accord on Climate Change has been a game changer in city development worldwide and the principal instruments that have been developed in the wake of this Accord and Habitat III – the 17 'Strategic Development Goals' (SDGs), 'Transforming our World: the 2030 Agenda of Sustainable Development' and 'The New Urban Agenda' – have been accepted by 195 countries and form the focus of city development from the supra-national to the local level. The Scottish Government has been to the forefront in adopting the SDGs and integrating these into strategies and business management of the departments of government in Scotland.³⁹

SCOTLAND'S
URBAN AGE

3

Urban Systems –
Hierarchies
And
Challenges



3: URBAN SYSTEMS – HIERARCHIES & CHALLENGES

Urbanisation is a complex process that has unfolded in a variety of forms over the centuries. It has happened in different ways and at different scales. Much, although not all, of the UNECE area might be described as an advanced and developed urban system, whereas urbanisation in, for example, China, East Asia and sub-Saharan Africa has been compressed into a few decades and is still progressing at an explosive rate and scale. This chapter examines urban systems and hierarchies within these overarching trends.

The Cities of the North

By 2030, the world is projected to have over 40 mega-cities.⁴⁰ If the metropolitan region is added to the core city population, the developed north (excluding Japan and China) has few of these, Los Angeles, London, Moscow and Istanbul – and perhaps New York, Chicago, and Paris. These mega-cities sit at the top of the global urban hierarchy – they are world cities and world famous, but they are relatively few in number. In the region of the globe covered by the UN's Economic Commission for Europe (UNECE), there are some 263 cities with a population of between 500,000 and 10 million – Scotland has one (Figure 3-1: Urban Centres in the world by population size, 2015).⁴¹ Almost half of the population of this region lives in relatively small cities of under 500,000. In this respect, Scotland is representative of urban systems in the Global North.

Many medium-sized cities are growing rapidly into urban agglomerations, but others are shrinking as a consequence of changing economies and demographics. Some of the biggest challenges for the cities of the developed north, lie not with the cities at the top of the urban hierarchy that are generally faring well in terms of economic performance and population influx, but with smaller cities that are struggling to maintain current population levels. The UK and Scotland are not immune to these effects.

In the 'Century of the City' in the Global North, there are large, medium-sized and small cities.⁴² There are, however, other revealing strands to the urban story, and these concern urban concentration, density and growth or decline.

In the northern hemisphere, the 'jet age' (the era of ubiquitous air travel) has combined with the 'net age' (the era of the Internet) to create a tendency towards urban concentration.⁴³ Since the time of the earliest cities in Mesopotamia, people have been prepared to travel for up to one or even two hours each day to get to work.⁴⁴ But, as the technology of mobility has improved, the distance people cover in one hour has greatly increased – today it is around 500 km by air. Every day, the greatest number of return flights to and from any destination is around this distance – up and down the Eastern and Western seaboard of the US, between Moscow and St. Petersburg, among the central capitals of Europe, and among the cities of the UK and Ireland predominantly, but not exclusively, to and from London (Figure 3-2: The concentration of global air travel).

Some of the biggest and most successful cities of the world are part of regional concentrations. This has given an impetus to the growth of cities within close proximity to one another that has led to the formation of massive urban agglomerations, or 'supercities', of 20, 30, and, in the US, 50 million people.⁴⁵

In 2013, the population of the US was just under 320 million. Canada was just a little more than 10% of this, at 35.5 million. Yet both countries have over 80% of their people living in cities.^{46, 47} The population of the US is predicted to grow by 80 million by 2050, and 75% of these new citizens will live in cities.^{48, 49} In the US, the New York-Newark area is the nation's most populous metropolitan area, with over 18 million residents. Los Angeles-Long Beach-Anaheim is the second most populous (12.15 million), followed by the Chicago area (8.60 million).⁵⁰ However, much of the growth occurring in urban areas does not take place strictly within city limits, and regional partnerships and bodies of governance are, therefore, extremely important for managing the consequences of urban agglomeration.

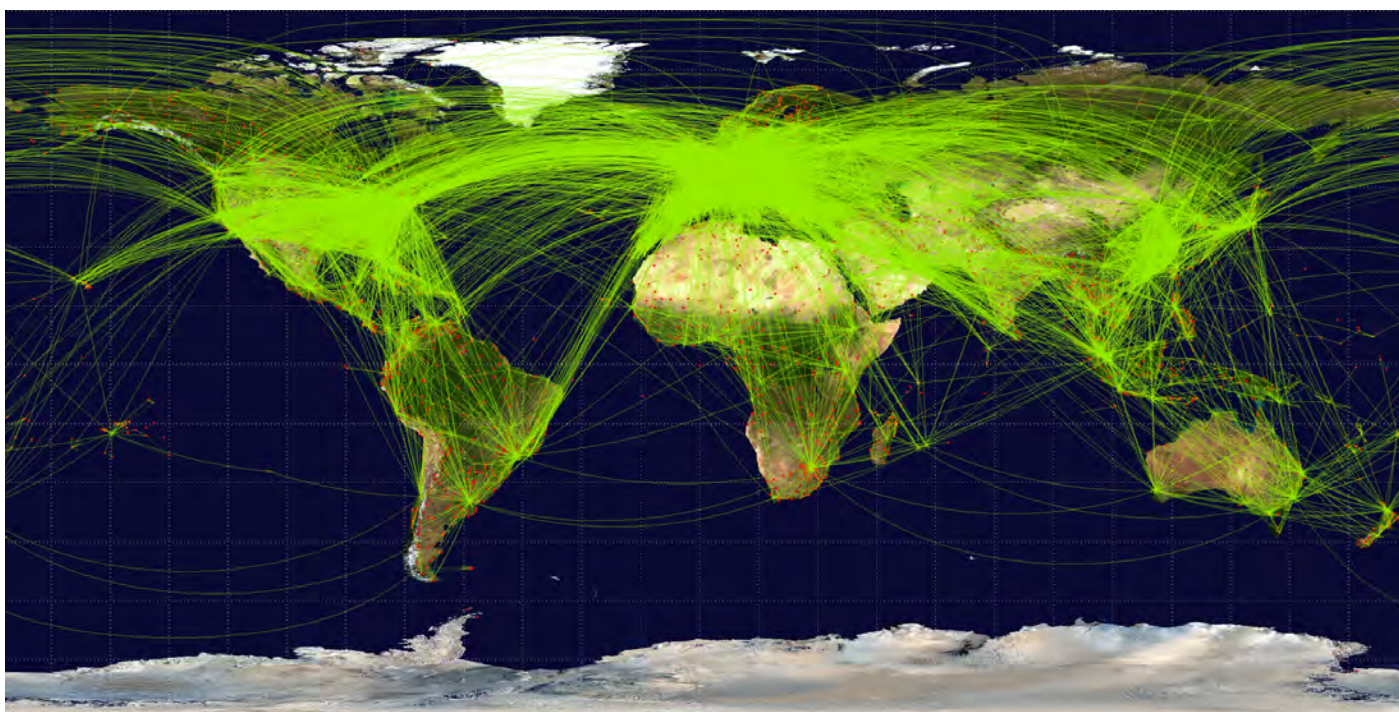
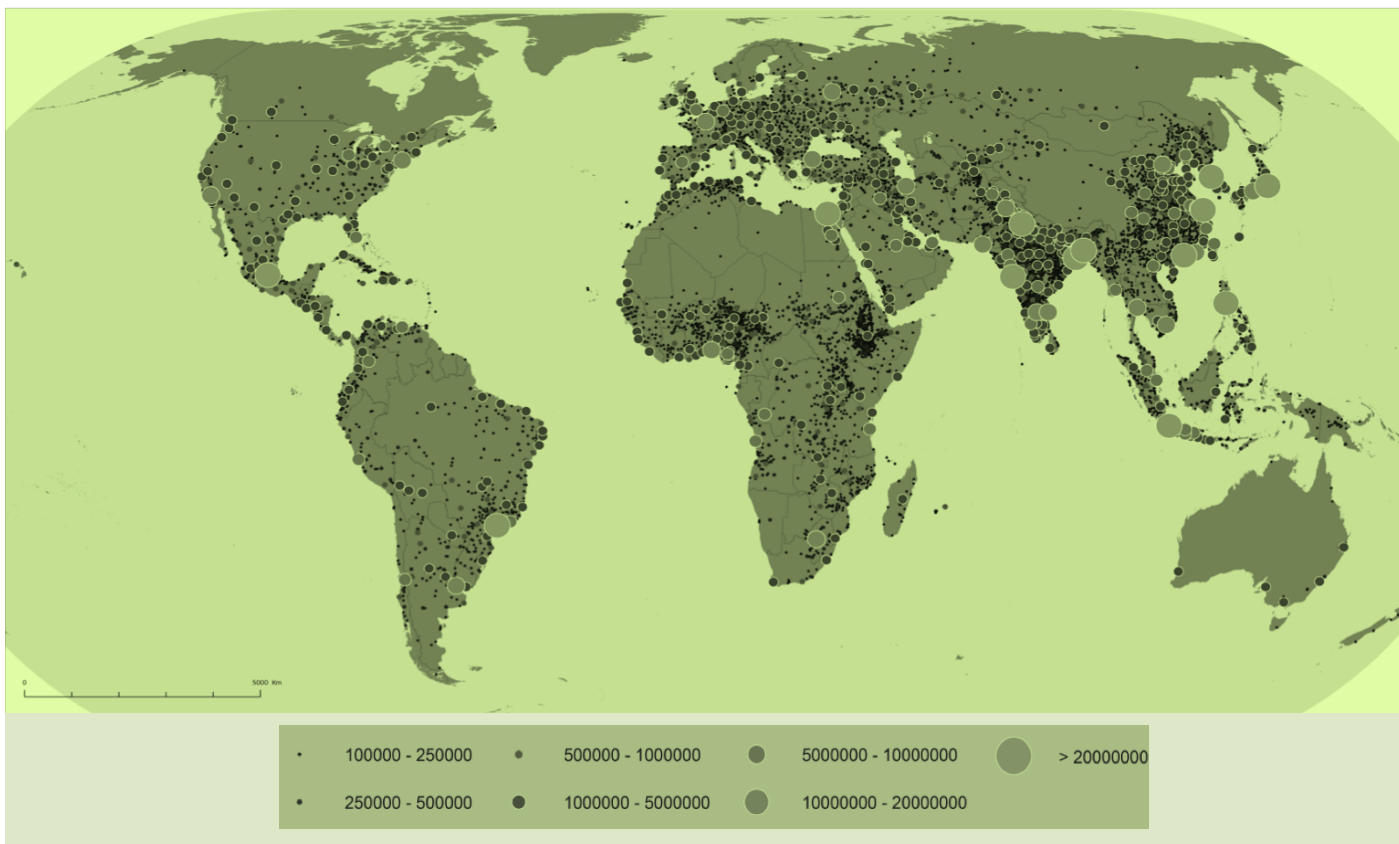


Figure 3-1: Urban Centres in the world by population size, 2015 – ABOVE
Figure 3-2: The concentration of global air travel – BELOW

In the US and Canada, there is a trend towards the megalopolis or supercity, where metropolitan areas are in the process of agglomerating into multi-metropolitan megacities. The most well known is 'BosWash'⁵¹, the region extending from Boston south along the Atlantic seaboard to Washington, D.C., and embracing the cities of New York, Philadelphia and Baltimore, with a population of around 50 million (some 16% of the population) on less than 2% of the landmass of the US (Figure 3-3: the emerging megaregions of North America).

By 2010, three urban agglomerations were home to approximately one third of US residents: the Boston-Washington corridor; the urban region from Chicago to Pittsburgh along the Great Lakes and the Ohio River; and the California coastal development stretching from San Francisco to San Diego. However, other agglomerations, unknown in the 1960s and 1970s, have become prominent, such as the Texas agglomeration of Houston, Dallas-Fort Worth, San Antonio, and Austin.^{52, 53}

There are marked differences between the livability and sustainability of these different agglomerations in North America. The New York agglomeration is more sustainable in the sense of energy use per capita and higher use of mass public transport, but affordability and the cost of living are much higher than in urban agglomerations, such as that in Texas. This highlights the challenge of choice for working families who could afford a much higher standard of living but a less sustainable lifestyle in Texas than they could aspire to in New York.⁵⁴

The experience of the large cities of North America is in distinct contrast to smaller ones. Not all US cities are growing. Many smaller metropolitan areas – 277 with less than 500,000 residents – are experiencing rapid decline. This has contributed to structural shifts in regional economies that accelerated through the economic recession of 2008-2011.⁵⁵ These economic forces have changed the map of poverty in the US that, for several decades, had been focused on inner urban poverty and deprivation that was seen in sharp contrast with suburban and out-of-town affluence. The economic recession changed that paradigm and brought about a new condition of suburban poverty.^{56,57}

In Europe, the proportion of the population living in urban areas has stabilised at around 72%, with a rate of urbanisation that is lower than 0.5% per year on average.⁵⁸ The average population density in Europe (EU28) is about 116 inhabitants per square kilometre.⁵⁹ This population is not, however, evenly distributed across the territory. Higher concentrations are found along what has been described as the 'blue' or 'dynamic banana'⁶⁰, an area that stretches from North West England to Northern Italy, with high concentrations of people, money and industry – a burgeoning super-city region evocative of those in North America (Figure 3-4: Degree of urbanisation in Europe).

An alternative spatial vision to the 'blue banana' (which portrays Europe as having a core and a periphery) is the 'bunch of grapes'. This reflects a more open, diversified and polycentric Europe, based on the promotion of secondary cities and city-regions, more decentralized, with strong networks, and support to less developed regions. These concepts are the ones that are put forward in the European Spatial Development Perspective.⁶¹

It is informative to reflect on European cities in the context of urban agglomeration and the emerging concept of the supercity driven by the emergence of the knowledge economy and the paradigm shift from the industrial to the knowledge city. The UK has a population of 66.5 million with over 60% living in cities of over 100,000 (Figure 3-5: the UK & Ireland – interconnected city-system).⁶²

Urban Systems

In the UK and Western Europe, new urban hierarchies emerged during the industrial era. These hierarchies were not fixed: they evolved throughout the 20th century and continue to change today. In the UK, smaller industrial cities, ports and seaside resorts declined in status and economic prosperity. Regional and national capitals, historic university cities, New Towns and growth zones thrived. In England, these trends manifest themselves in a marked, but by no means definitive, north-south divide.

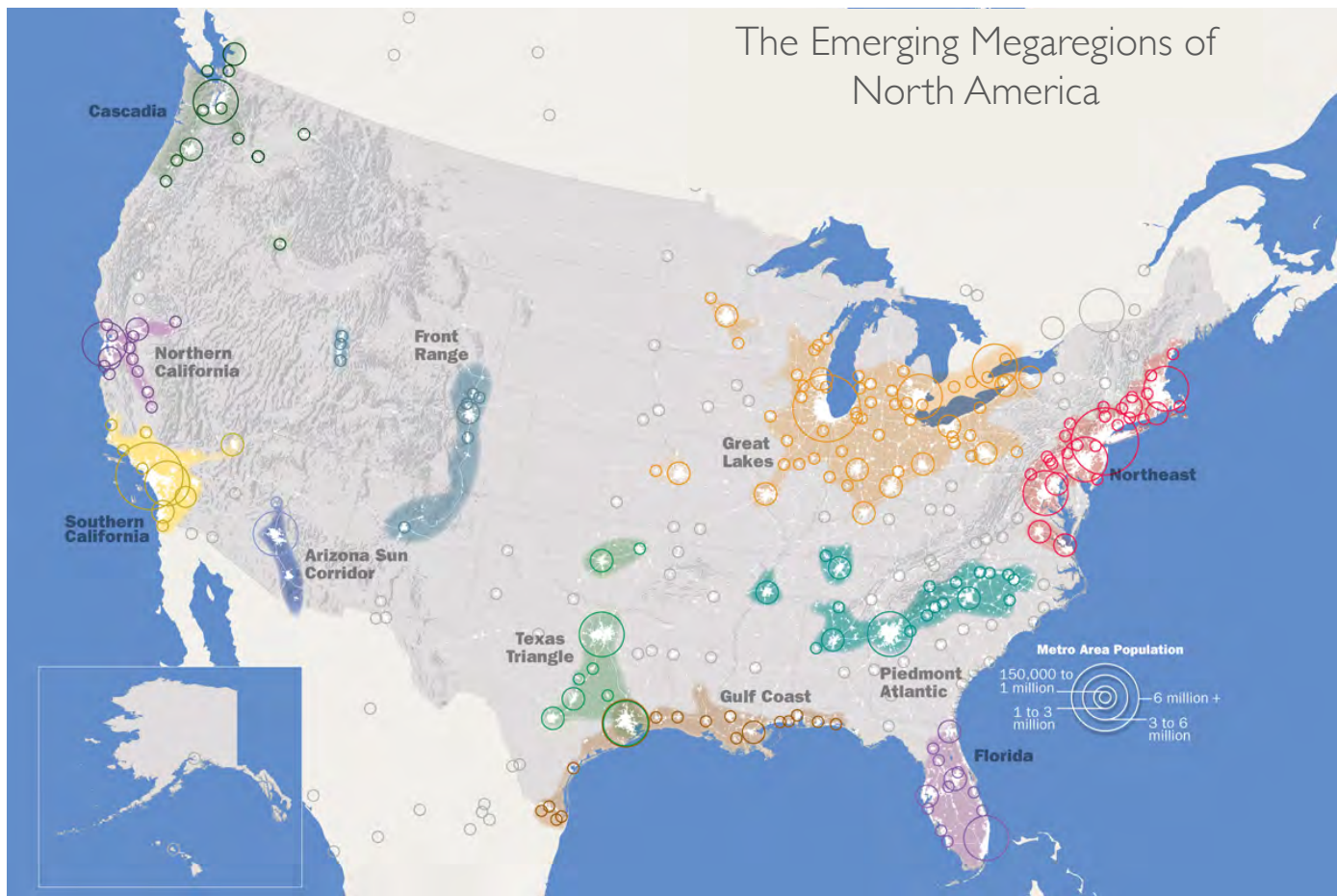
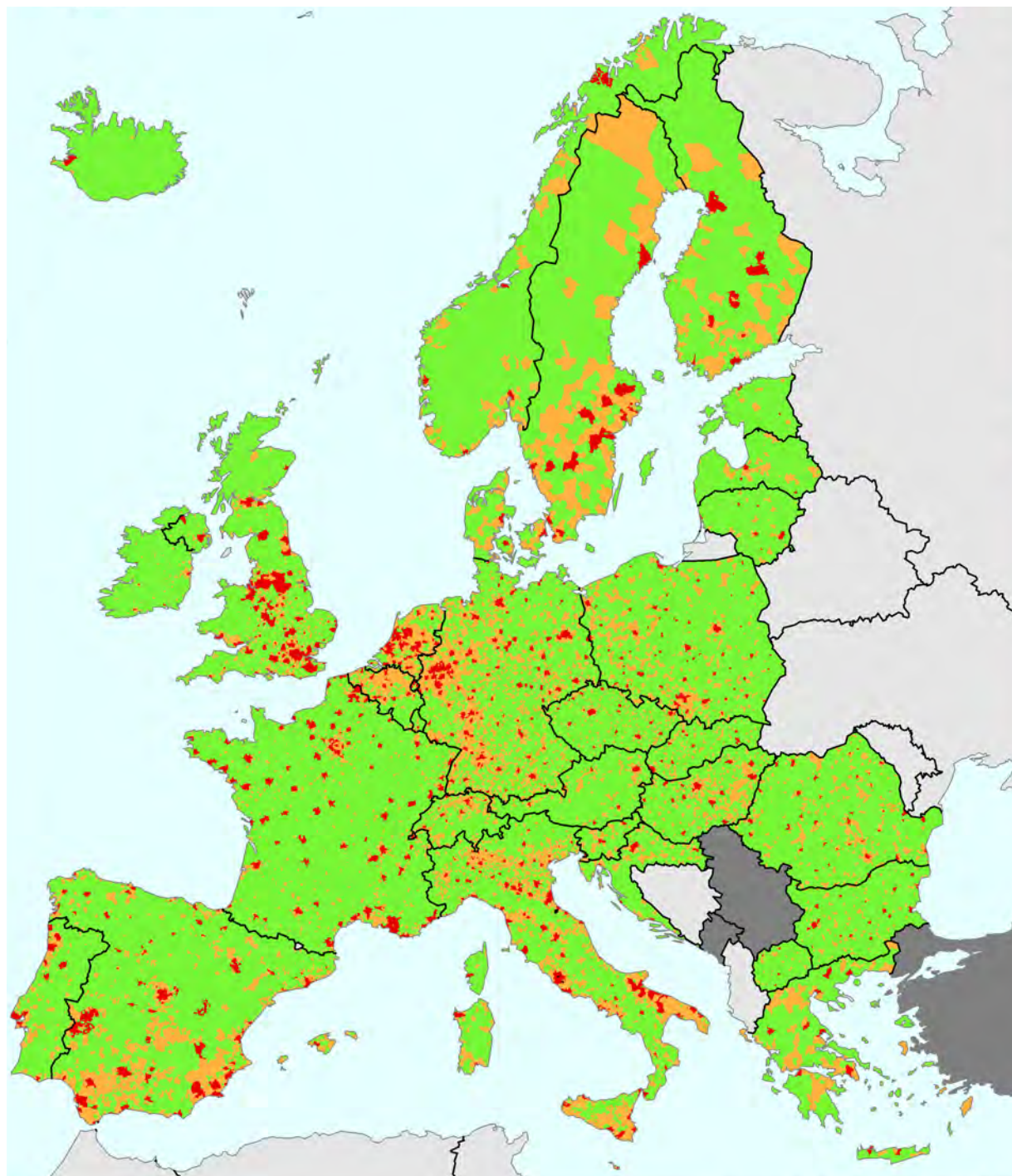


Figure 3-3: The Emerging Megaregions of North America



Administrative boundaries: © UN-FAO © Turkstat Cartography: Eurostat – GISCO, 05/2017



- Cities**
(Densely populated areas: >50% of population in urban centres)

- Towns and suburbs**
(Intermediate density areas: <50% rural : <50% urban)

- Rural**
(Thinly populated areas: >50% rural)

- Data not available**

Figure 3-4: Degree of urbanisation in Europe

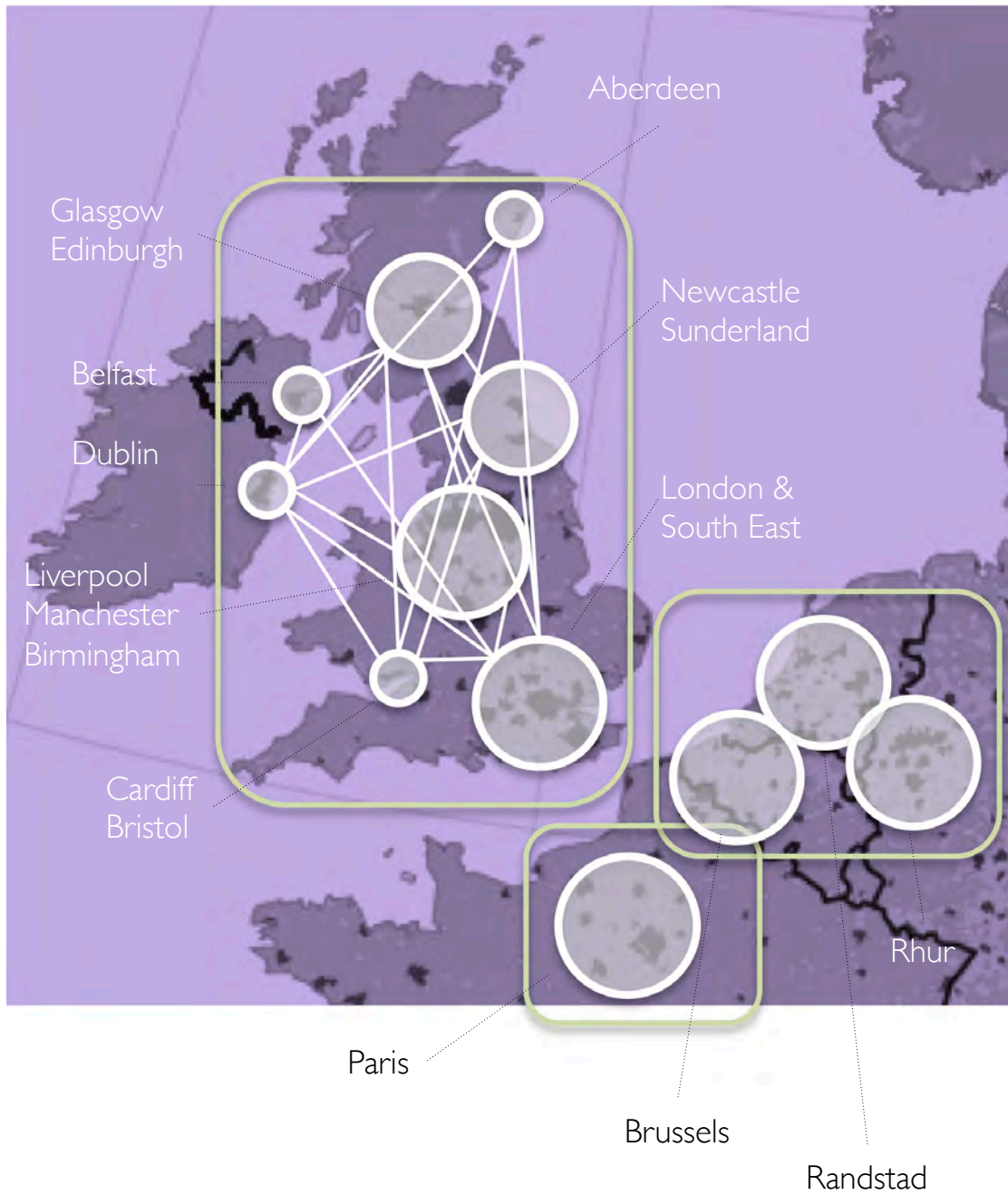


Figure 3-5: UK & Ireland – interconnected city system

The defining feature of the UK's urban system is, of course, the dominant role of London, one of the first world cities and a great global player. Together with the South East region London is on track to account for 40% of UK GDP in the next 5 years. In 2016, half of all GB property investment was concentrated in London (Figure 3-6: Regional shares of commercial property investment volumes 2016 and Figure 3-7: Projected Share of the UK's GDP in 2022). Many of the growth leaders identified in the UK Government's Foresight Programme research are in the South East of England.⁶³ Places like Crawley, Reading and Aldershot, are, in effect, now part of London whose travel-to-work areas extends into the "greater South East", where growth hotspots in Milton Keynes, Peterborough, Bournemouth and others reflect the sphere of influence of the megacity.

The urban hierarchy of France presents some similarities, although urbanisation happened later than in Britain and has been accelerating in recent years. Paris is another world city and, together with the Île de France, has established a dominant position although unlike London, probably not a megacity. But other regions (the Atlantic Arc, South Mediterranean and Rhône Valley) have grown strongly while some of the former industrial heartlands have struggled to adapt. The cohesion of the urban hierarchy in France has been greatly assisted by the far-sighted and oft quoted rail investment programme by SNCF – the TGV.⁶⁴

Germany, by contrast, has a highly distributed urban system, reflecting its political history: the late arrival of a national state, the effects of partition, and the country's federal structure. Berlin is the largest city and the capital, but much smaller than London or Paris and a less than stellar economic performer in the German context; however, some of the state capitals (notably, Frankfurt, Munich, Cologne and Hamburg) are all globally connected major economic players. In the 'Endless City' Dieter Läßle argues that, while the world's attention has been on the reunification of Berlin, "the real transformation in Germany was the rise and rise of Munich". In Germany like every other advanced economy "high-skill cities prosper; low-skill ones stagnate or decline". Even if we discount the special case of shrinking cities in the former East Germany there is a marked contrast in the performance of the former industrial cities in the Ruhr region and the "dynamic service metropolises" such as Munich and Frankfurt.⁶⁵ The LSE study cites research which shows that "the German urban system is highly open and connected to both the European and global networks of cities". There are strong connections with London, Paris and New York, but also Hong Kong, Beijing, Shanghai and Tokyo.

The UK and Germany represent two very different models of urbanisation. Britain's urban hierarchy is dominated by London, which is one of a relatively small number of undisputed global cities. The second tier of UK cities – Birmingham, Manchester, Glasgow and Leeds – has significant economic players, but they are a long way from London literally and metaphorically. There have been significant shifts within the urban hierarchy over the last century in the 'industrial – post-industrial – knowledge' transition with some smaller cities performing well as a consequence of being largely free of post-industrial legacy (Edinburgh and Bristol) and some whose significant post-industrial legacy detracts from their evident transformation (Glasgow and Liverpool). In the industrial to knowledge transition however, there is variation within these groupings and is analogous to the differences between speed, velocity and acceleration: speed has no direction while velocity does. Running at 20 mph is speed. Running north at 20 mph is velocity. Acceleration is the rate of change in velocity. Although it is simplistic to translate such terms into city economics and development, it is nevertheless valuable to consider not only how fast an economy is working (its speed), but also the direction of travel of the economy (velocity) and how quickly the change in direction of travel is being affected. Although simplistic this is informative in examining UK cities effecting the industrial – post-industrial – knowledge transition and especially the differences between and within the groups epitomised by Edinburgh, Bristol and Cambridge on one hand and Glasgow, Manchester and Newcastle on the other.

In Germany (where the absence of a global city has been seen by some politicians and commentators as a cause for concern) a different model has emerged: a spatially distributed network of large cities characterised by "*increasing specialisation...in particular clusters of knowledge-*

SCOTLAND'S URBAN AGE

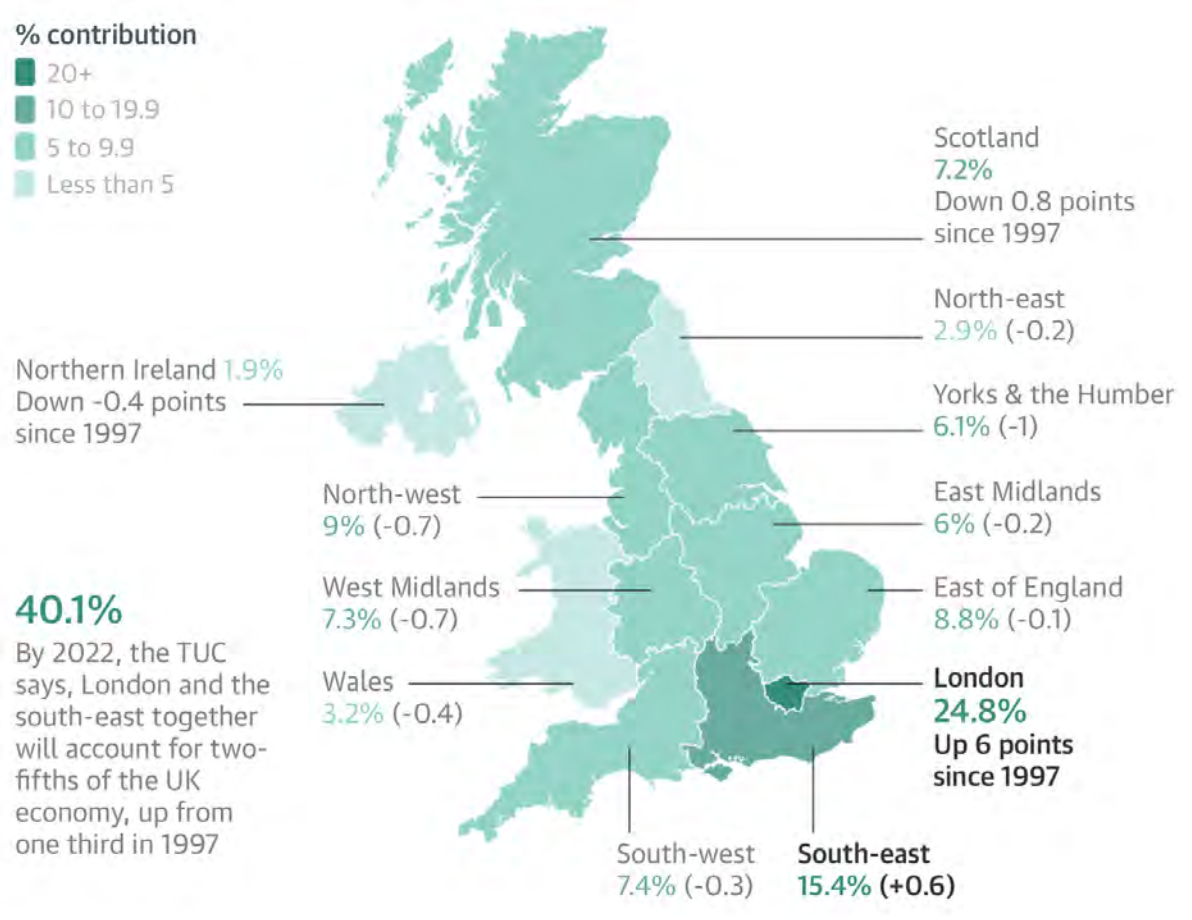
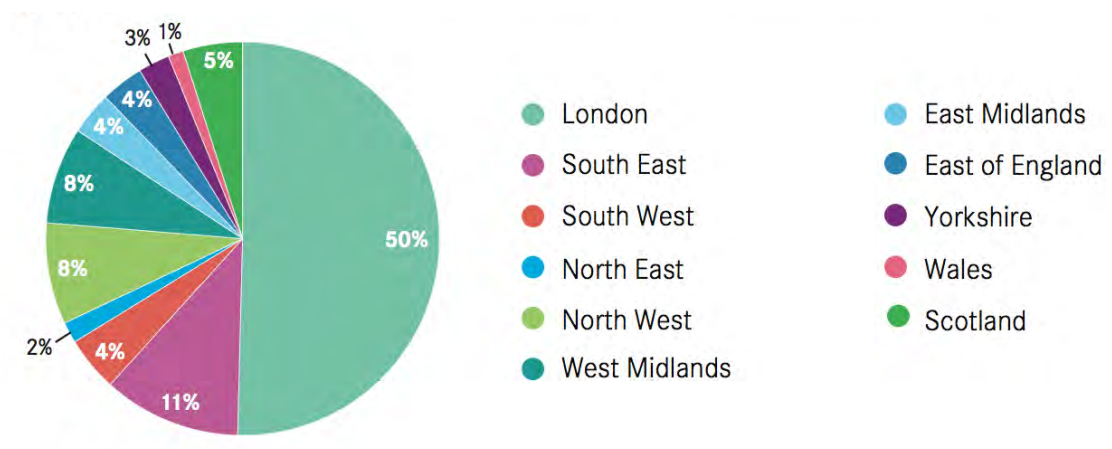


Figure 3-6: Regional shares of commercial property investment volumes 2016 – ABOVE
 Figure 3-7: Projected Share of the UK's GDP in 2022 – BELOW

and culture-based services and a complementary division of labour'. In his contribution to the LSE's Endless City report, Läßle argues that:

"[t]he multiple levels of integration of the German metropolitan system result in a high capacity for performance and innovation, but also a great flexibility and adaptability...[it] could prove to be a valid alternative to the highly centralised model of the global city of the future".⁶⁶

Conurbations and Supercities

The tendency for neighbouring cities to coalesce into larger conurbations is, of course, nothing new. The process, already well advanced in 19th century Britain, may take a variety of forms. In the Leeds-Bradford conurbation, two large cities expanded and grew together; Glasgow has subsumed neighbouring Paisley and the towns of Lanarkshire; the Black Country extends west of Birmingham into an area that includes Smethwick, Dudley, Walsall and Wolverhampton; Manchester now includes Oldham, Bury, Rochdale, Salford and Stockport. Although the towns, sometimes quite significant, within these conurbations retain and celebrate their identities, they are all to a significant extent a part of the conurbation of the largest player whether Glasgow, Manchester or Birmingham – and it must be remembered – London. In their industrial heyday these conurbations were often characterised by a well-defined division of labour, with smaller centres playing specialised roles in the supply chain, while the large cities dominated trade, commerce, civic and cultural life. Historically, conurbations were the spatial manifestation of the themes of concentration, agglomeration and sprawl which continue to dominate the academic and policy discourse around urbanisation.

The concept of the supercity can be seen as a knowledge age version of industrial era conurbations, but supercities represent a step-change in scale and they are in some important respects a qualitatively different phenomenon.

Supercities are regions – which may span national boundaries – where there is a cluster of metropolitan areas (including megacities and conurbations) and assets including research universities, transnational corporations and cultural institutions that are connected through dense business, intellectual and creative networks and international transportation hubs. The UNECE concludes that this model is most prevalent in the 'developed north', and Richard Florida argues that supercities (which he calls mega-regions) are *"the key economic units in the world economy. The world's 40 largest megaregions produce more than two-thirds of its economic output and account for nine in ten of its technological innovations"*, even though they are home to less than a fifth of the world's population.⁶⁷

Supercities may span very large areas with huge populations of between 20 and 50+ million. For example, the Boston-Washington supercity in the US extends 450 miles along the seaboard, includes the great cities of New York, Washington, Boston, Philadelphia and Baltimore, has 56 million residents, accounts for just 2% of the land area of the US, but 18% of the population and 22% of economic output estimated by Florida to be some \$3.75 trillion in output, making it larger than Germany and the 4th largest economy in the world, after the US, China and Japan. The fundamental difference between Boston-Washington and a putative UK supercity is that the national capital (Washington), the pre-eminent economic powerhouse (New York) and the premier knowledge city (Boston-Cambridge) are separate cities. In the UK, they are conjoined in one – London.

Supercities represent concentrations of economic, research, cultural and political power, and of population but, unlike conurbations, they are not characterised by continuous development. In parts of the supercity settlements merge into one another, but there are still discrete and distinctive cities and towns, tracts of low-density suburban development and even rural areas although urban coalescence and sprawl remains a constant threat. They work as economic entities because all the component parts of the mega-region are connected to one another by air and high-speed rail. This enables supercities to operate as a balancing mechanism, allowing individual urban centres within

the cluster to “borrow scale” from each other. Even relatively small cities can develop smart specialisations and cultivate global connections; large metropolitan areas and megacities are a resource the whole cluster can share. In this way, according to the OECD, agglomeration benefits are not only experienced within cities, but also between connected cities. Especially in Europe, cities “benefit from the agglomeration economies of their neighbours.”

Understanding urban concentration and sprawl is integral to the European Union's centre and periphery model of the European territory. One influential study identified a densely urbanised corridor extending from Birmingham/London to Turin/Milan, the so-called “blue banana”.⁶⁸ Developed to capture the geography of advanced manufacturing in Europe, the blue banana has been overtaken by events: manufacturing has migrated to Central Europe, while the economies of the North and West are increasingly based on tradeable services. It may be more useful to focus on other putative super-cities such as the Randstad (Amsterdam-Rotterdam-Utrecht) in the Netherlands and the Rhine-Ruhr (Cologne-Dusseldorf-Essen-Dortmund) in Germany. There is also a growing interest in cross-border urban cooperation, for example, the Aachen Technology Region that encourages business and technology connections between Germany, Belgium and the Netherlands.

Recent research comparing the Randstad (and the Rhine-Ruhr) with England's Northern Powerhouse region shows that the Dutch and German exemplars perform much better in terms of productivity and contribution to the economy. The population of the Randstad area a relatively modest (7 million) compared to the Northern Powerhouse (over 15 million), but it has a higher ratio of jobs to residents, and 20% higher per capita output.⁶⁹ The research offers a cautionary note: the success of the Randstad as a driver of growth and prosperity in the Netherlands appears to be attributable largely to the strong performance of the key cities in the region; there is not much evidence of a “supercity premium”. The Randstad and the Rhine-Ruhr succeed by concentrating economic activity in cities, but there are only limited governance structures at the supercity level and the volume and speed of travel is no greater than in the north of England.

The Processes of City Development

The proportion of the population living in cities is greatest in the UNECE area with a diversity of urban systems. There is a relatively small number of megacities including London, New York, Los Angeles, Moscow and Istanbul. These megacities, which may extend into a regional hinterland, have populations in excess of 10 million. But the UNECE area also includes more than 250 cities with a population in excess of 500,000, while almost half the population lives in small and medium-sized cities. Scotland, with one medium sized city (Glasgow) and three other cities of more than 100,000 (Edinburgh, Aberdeen and Dundee) is therefore typical of many urban systems in the global north.

Not all cities experience growth. Shrinking cities (those that experience a loss of population) is an issue in the UNECE region. It currently occurs mainly in smaller cities in Eastern Europe and, in remoter parts of the United States.⁷⁰ It is estimated that 40% of European cities with a population of 200,000 or more have lost some of their population.⁷¹ Shrinking cities face declining tax revenues, rising unemployment, outward migration of the working-age population, surplus land and buildings, and an oversized physical infrastructure. However, statistics can sometimes be deceptive, for example when the urban core loses population because residents move to the suburbs. In this case, the urban area as a whole is not necessarily shrinking.

A further common urban phenomenon concerns sprawl. Urban sprawl brings with it many problems, notably sealing of the ground surface, as more and more agricultural or natural land is covered with buildings, streets, and other infrastructure, often as a consequence of weak planning and enforcement systems. Sprawl can exacerbate the challenges involved in providing services to a diminished population that is spread over a large area.⁷² Sprawl also affects growing cities, particularly in those located in tight clusters where the risk of coalescence is brought about by expansion and development at the edges of cities.

Figure 3-8: **Urban Concentration:** The winners in the trend towards urbanisation have been the cities able to maximize the opportunities offered by the knowledge economy and the digital revolution through higher education and proximity to similar cities. Short-range transportation has reinforced the links between, and the critical mass of, these city clusters, to the detriment of more isolated cities.

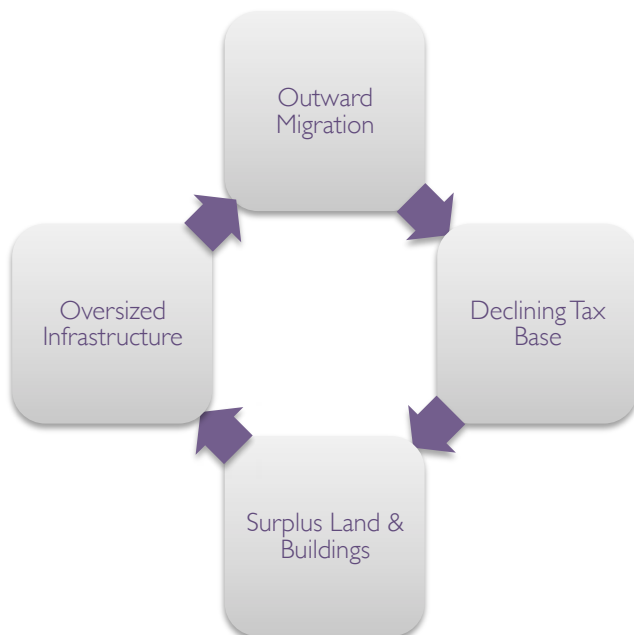
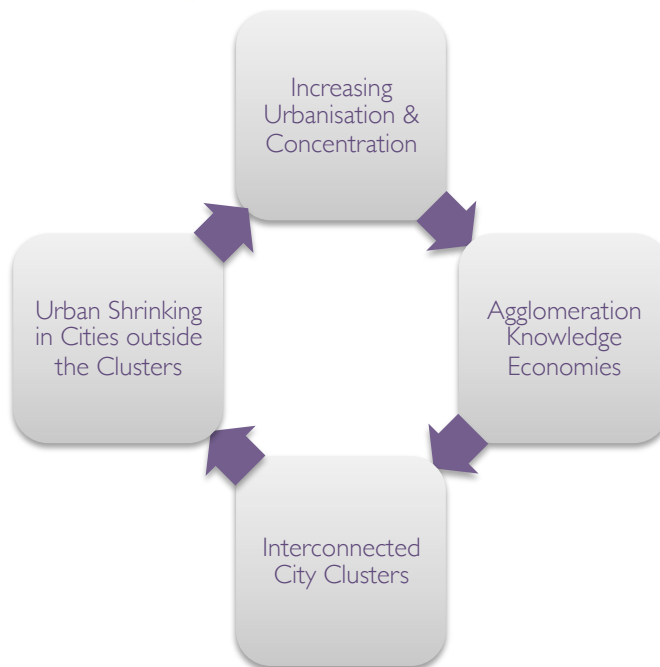
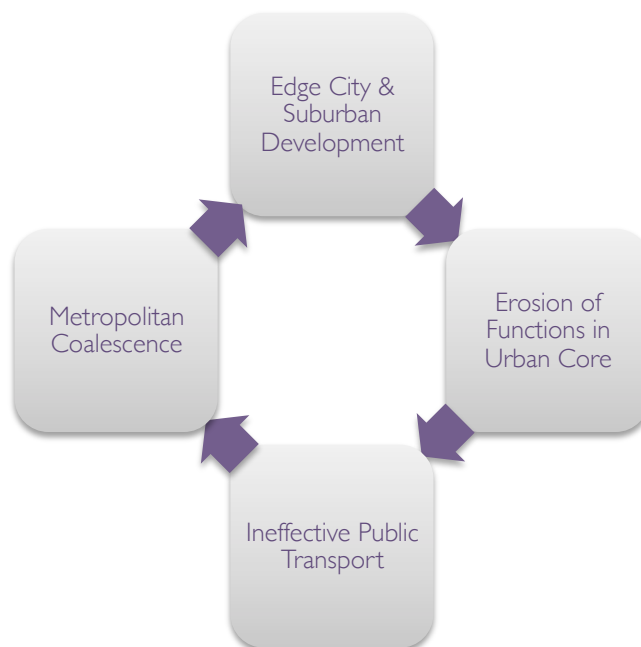


Figure 3-9: **The Shrinking City:** Outmigration from cities leads to a reduction in the city's tax base. This, in turn, causes vacancies in land and buildings, and leads to infrastructure beyond the city's ability to sustain it.

Figure 3-10: **The Sprawling City:** Demand for new forms of development at the edge of the city competes with functions at the urban core. This, in turn, results in a dysfunctional transport system dependent on the car and, when cities are located close to one another, causes merging of the urban areas.



Figures 3-8 to 3-10: Urban Concentration, Shrinking and Sprawling City Cycles

In the context of urban sprawl, the calculation of the change in land usage per capita over time is an important indicator of land-use efficiency and a vital input for the spatial planning process. UN-Habitat is currently collecting information on this issue for 200 cities worldwide for three points in time –1990, 2000, and 2015. For cities within the UNECE region an analysis has shown that land usage per capita has increased by nearly 35% between 1990 and 2015 and is nearly three times greater than the average for Africa and Asia cities.⁷³

The most important trends in urbanisation affecting the cities of the north are urban concentration, sprawl and shrinking. Concentration and sprawl affect the most successful city-regions, whereas shrinking and sprawl can affect remoter, isolated and less successful cities.

The trend towards urban concentration is most prevalent in North America, where over 70% of the total population is concentrated into some 10 'supercity' regions. These are predominantly on the eastern and western seaboard, the southern boundary of the Great Lakes Basin, and the Florida coast. In Russia and the CIS, there is a similar phenomenon, with a substantial part of the population concentrated in clusters of cities that extend east from St. Petersburg and Minsk through Moscow on a northern alignment to Ekaterinburg, Astana, Omsk and Novosibirsk and on a southern alignment to Rostov, Tbilisi, Baku, Tashkent and Almaty. Many of these cities are located along the basin of the Volga-Don River system.

In Europe, too, there is a concentration of cities along the curved region (the 'dynamic banana') that extends from central England through London, the Randstad, the Paris basin, and the Ruhrgebiet, into the principal cities of Switzerland and into Milan and Turin in northern Italy. The concentration in Europe is somewhat less extensive, however, given the regional policy that has been promoted by the European Commission and national governments to ensure a more dispersed distribution of population.

Beyond these principal urban clusters, there are smaller and remoter cities that fare less well. They are less attractive to incoming migrants because they lack the economic advantages and opportunities prevalent in the super-city clusters, and they also face the double jeopardy of losing their young economically active population to the successful urban clusters. The dynamics of ageing and migration fuel this disparity, as do the effects of the knowledge economy and the digital revolution (Figures 3-8: Urban Concentration, Figure 3-9: The Shrinking City and Figure 3-10: The Sprawling City).

The way that cities are planned and developed, and how housing, urban mobility, traffic, and public transport are coordinated, are critical factors in securing healthy environments, sustainable growth and a good quality of life for citizens. An integrated planning approach is to ensure that these different facets of the city proceed in balance.

Recent narratives in city developments have described 'sustainable' and 'smart' cities largely as concepts to secure the conservation of environmental assets with implementation of technical systems, and connecting and making technology accessible including the monitor of energy, transport waste and water systems, as well as providing information to citizens in order to make more environmentally-friendly choices. Sustainable urban development is also about social inclusion and has wider implications: for gender equality; adequate and affordable housing; and public health and well-being. These challenges are enormous, and call for a coordinated, integrated approach. At its heart, the New Urban Agenda published following Habitat III in 2016, strives to achieve the 'Inclusive City'.

A number of concepts have been developed to address the trends described here and the challenges they present to politicians, urban economists and city planners. Prominent amongst these is the 'compact city' concept. As developed by the EU, the OECD and others, the compact city is characterised by: dense, proximate development patterns; urban areas linked by integrated public transport systems; and high accessibility between residential areas and local services and jobs all contributing to lower emissions in pursuit of climate change objectives.⁷⁴ The compact city

concept has evolved and enlarged its scope from a simple urban containment policy for protecting the natural environment and agriculture from urban development to embrace a wide array of goals, including energy-saving, quality of life and liveability. It has come to represent a multidimensional policy supporting a wide range of urban sustainability goals and achieving urban sustainability in accordance with the UN's Strategic Development Goals UN SDGs.⁷⁵ Recent research by the OECD has shown that strategies based on the compact city concept can also be used to contribute to economic growth. The compact city concept therefore has economic potential as well as environmental benefit and a well-considered response to the economic and social demands from the knowledge economy of the 21st century. As economic growth and reducing CO₂ emissions are central to national policy agendas, it is crucial for policymakers at the national level to understand the potential of compact city policies and include them, as appropriate, in national urban policies.⁷⁶ City planning strategies based on the compact city concept can help promote shorter intra-urban distances, less car dependency can help to reduce energy consumption and CO₂ emissions. Compact cities also conserve farmland and natural biodiversity around urban areas that would otherwise be irretrievably lost in turn creating opportunities for urban-rural linkages and the creation of sustainable urban food systems.

The compact city concept, however, requires further refinement to support public engagement in urban development as well as a better understanding of the need for integration of planning policies. Capacity-building in the public and private spheres dealing with land use management and urban planning is essential to achieve the outcomes described above and concern remains about potential adverse effects from higher densities as a result of traffic congestion, air pollution, urban heat islands, high energy demands and housing affordability, all of which affect quality of life and wellbeing. There is also some concern that compact cities may be more vulnerable to natural disasters, such as earthquakes, flooding and fires.

These concerns have stimulated the development of further concepts in city development expressed as the 'resilient city' and the 'competitive city'. The resilient city promotes leadership and effective management to empower communities and stakeholders to become involved in long term integrated planning to ensure that basic needs, livelihoods and public services are safeguarded. The resilient city therefore promotes cohesive and engaged communities working with city authorities to balance economic growth and the conservation of natural and heritage assets.

The competitive city provides a complement to the resilient city taking the same leadership in governance and engagement and directing these to the agglomeration of skills and productivity, decisiveness in planning and infrastructure and a consensus in culture and livability

Put together these three emerging concepts – the compact city, the resilient city and the competitive city can help support the aim to achieve sustainable, inclusive and green growth. The core benefit of this approach supports the capacity to integrate urban policy goals, such as economic viability, environment and sustainability, and social equity, and to balance them with the needs of surrounding rural areas linking these priorities, rather than addressing them in separate, even mutually exclusive, ways.⁷⁷

The Trends in Summary

There has been a trend towards increased urbanisation throughout the developed countries of the north since 1996.⁷⁸ This is particularly marked in North America, with both the US and Canada having more than 80% of their population living in cities. The figures are less marked in Europe (EU and EFTA) at 77%, and in Russia and the former CIS countries. There is a trend towards urban concentration, where a very substantial part of the urban population is concentrated into clusters of successful cities. The trends in urbanisation and migration are reinforcing and accelerating one another, creating ever greater but differing pressures between the most successful supercity regions compared to dispersed and isolated smaller cities. Figure 3-11 (The Compact City); Figure 3-12 (The Resilient City) and Figure 3-13 (The Competitive City) – together with Figures 3-8 to 3-10 – summarise these trends graphically.

Figure 3-11: **The Compact City** – A Virtuous Urban Cycle: Knowledge economies based in-part around universities leads to an effective labour market that in turn supports a dense form of development with a range of employment, residential, cultural and retail uses. This form and mix supports an integrated and effective public transport system and the efficient delivery of public services.

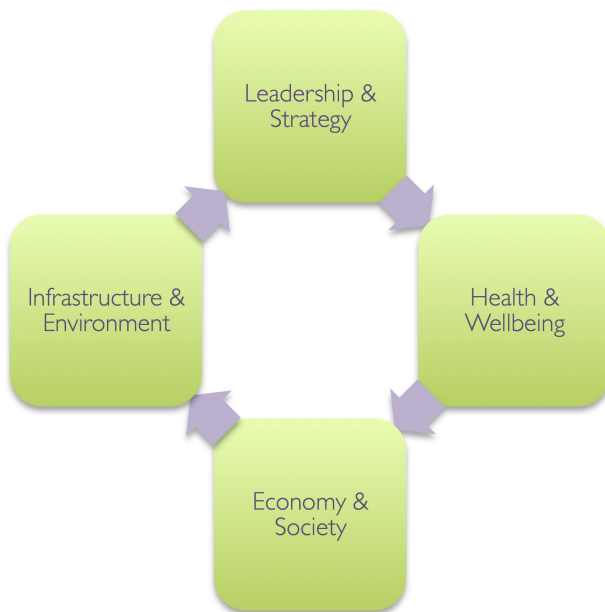
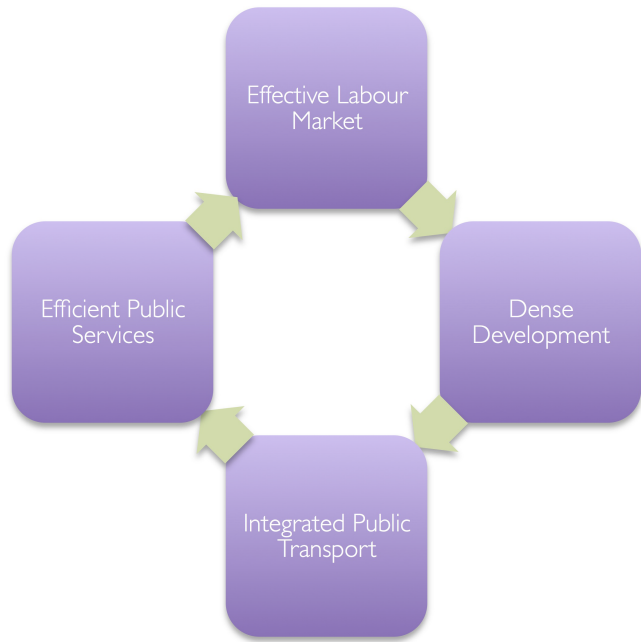
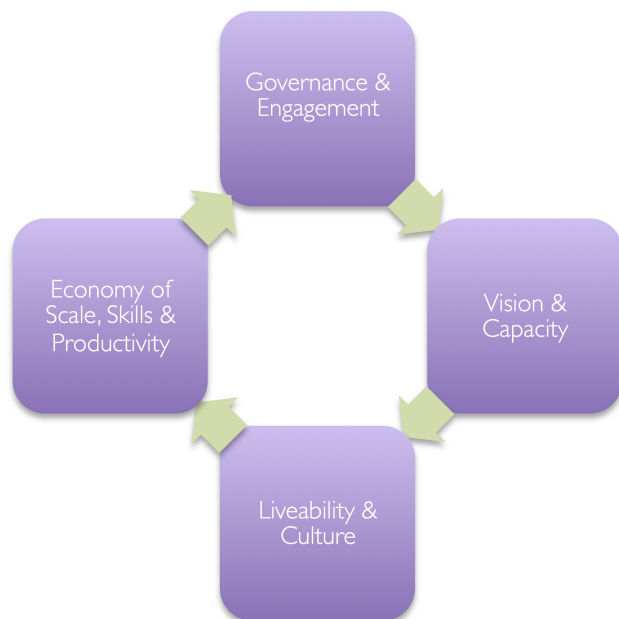


Figure 3-12: **The Resilient City** – A Virtuous Urban Cycle: The resilient city promotes leadership & effective management, empowers stakeholders and fosters long term & integrated planning. It meets basic needs, supports livelihood & employment and ensures public services. The resilient city promotes cohesive & engaged communities and fosters economic prosperity while enhancing natural & man-made asset, assuring continuity of critical service and providing mobility and communications.

Figure 3-13: **The Competitive City** – A Virtuous Urban Cycle: Leadership in governance and engagement, agglomeration of skills and productivity, decisiveness in planning and infrastructure, consensus in culture and liveability.



Figures 3-11 to 3-13: Compact, Resilient and Competitive City Cycles

Conclusions

This is the century of the city and the process of urbanisation is complex and varied, reflecting the history, attributes and adaptability of different places. The size of city does matter, but this does not mean that big cities will necessarily thrive, nor that smaller cities cannot prosper. On the contrary, many of the UK's growth leaders in the past 30 years have been small cities, albeit that many of them are within London's sphere of influence. The number of megacities is still relatively small, especially in the developed north, but there are hundreds of large and medium-sized cities in Europe alone.

The urban hierarchy is constantly shifting. Some broad patterns emerge from this process: certain types of city are more likely to struggle and others are better equipped to succeed; there is a discernible north-south divide in the UK; some places find themselves trapped in a cycle of decline while others have reinvented themselves (sometimes more than once) for the knowledge age.

Some national urban systems, including the UK's, are dominated by hugely powerful global cities. When this happens, the urban hierarchy tends to become more stretched and gap between the winners and losers may grow. Germany, by contrast, has a highly distributed urban system with a number of large cities performing complementary, specialised roles.

In the US, a small number of supercities (or mega-regions) account for a disproportionate share of jobs, output and, especially, innovation. The supercity is a useful term to describe the relative concentration of population, jobs, economic assets and amenities in these very large and populous regions, but the way in which they operate is still not entirely clear. The example of the Randstad in the Netherlands suggests that the critical success factor is still the economic dynamism of the major cities themselves rather than the relationships between them. The US supercities contain highly successful, fast-growing cities but also struggling 'rustbelt' communities.

Research over many years has highlighted the importance for cities of establishing global networks of knowledge, skills and expertise. These networks are overlaid on traditional national and regional hierarchies, and they help smaller cities in particular to establish sustainable niche roles in the global knowledge economy.

If the UK is to perform as a supercity, it needs to make more concerted efforts to learn from the more distributed nature of other supercities where the cities outside of London rather than being subsumed by it, function as part of a system that shares the economy of scale of the whole. Successive British Governments have tried to move public sector jobs out of London with mixed success.⁷⁹ There is, however, a recent market driven action emerging among agile young knowledge workers to move out of London with nearly 100,000 making the change in 2017.⁸⁰ Whether this represents a trend or not is still too early to judge, but as we will see in the next chapter these are the types of people and jobs that will be essential if Scotland's AGE cities are to prosper in the 21st century.

The 21st century will be the Century of the City and for the forces of urban concentration, sprawl and shrinking to be addressed effectively, strategies based on Compact, Resilient and Competitive Cities are needed in order to deliver on the promise of the New Urban Agenda.⁸¹

SCOTLAND'S
URBAN AGE

4

The Knowledge City
Pathways to Transition
and
Scotland's Urban System



4: THE KNOWLEDGE CITY, PATHWAYS TO TRANSITION & SCOTLAND'S URBAN SYSTEM

The introductory chapters have reviewed international trends and challenges that will influence urban society in the coming years and decades. This chapter considers the consequences of these for the city together with the challenges involved in the transition from industrial city to knowledge city and what might be inferred for Scotland's cities and urban system.

The Emergence of the Knowledge City

The knowledge economy is reshaping cities and regions in several major waves of development and redevelopment, producing its own space that differs greatly from mercantile economies. The manufacturing economy reorganised access to raw materials and markets, created and controlled transport networks, attracted large numbers of workers to cities, and set up rigid routines of work, all reflected in the patterns of spatial and social organisation. The knowledge economy is exerting its own spatial requirements, through reshaping industrial towns and cities with new forms that suit the new conditions of economic production, social requirements and cultural institutions.⁸² The spatial expressions of the knowledge economy are likely to be the model for cities and urban areas for the foreseeable future.

The knowledge economy has changed the nature of products that we need. The emergence of knowledge itself as a productive capacity and output has no particular spatial requirements other than the proximity for those engaged in its production. This is changing the nature of sites for production and consumption in cities, where new clusters of activity are formed, while others are dismissed or dispersed. The new spaces of production are the spaces of knowledge: universities, science parks and cultural quarters, which co-exist with the new spaces of consumption and new patterns of social inequality.⁸³

The knowledge economy has altered the dynamics of urban economics, encouraged the growth of agglomeration economies, and increased the importance of spaces for encounter and their role in innovation on the campuses of 'Silicon Valley' and 'Silicon Alley' in the US, 'Silicon Fen' in Cambridgeshire and 'Silicon Roundabout' in London and 'Silicon Glen' in Scotland now increasingly focused on the city centres of Edinburgh, Glasgow, Aberdeen and Dundee (Figure 4-1: Regional innovation hubs – Europe and North America).⁸⁴ These are recently established economic clusters, formed by individuals and firms in universities, science and technology parks, creative economy clusters, and office clusters. The clustering of knowledge enterprise around centres of education and research is reinforcing urban concentration as described by the UN and considered in the previous chapter.⁸⁵ Whether these respond to the needs of the knowledge economy, the demands of society or the demands of the development industry – or all three – is unclear, but many are located in or on the edge of city centres and around airports and have, in this way, fragmented urban space and contributed to the effects of sprawl internationally and in Scotland.⁸⁶

An early conclusion in the early years of the knowledge economy was that 'place' was no longer of importance: all the citizen required was a good cable connection to bring the entire globe within easy reach. The consequence of this 'death of distance' was said to be that the city of streets, squares, stations, shops and restaurants would be replaced by a 'city of bits', a virtual city with a street pattern consisting of digital information highways.⁸⁷ In fact, the converse has proven to be the case. New ideas and innovative solutions come into being through intensive communication and exchange of knowledge with others. The proximity of people is very important. It makes as much sense for knowledge workers to call into a colleague's office than to work via email on a new project with an unknown person on the other side of the world.⁸⁸ In fact people do both, but the creative development still happens to a large extent through face-to-face contact.

People still desire physical contact with others, not only in their work but also in their free time. And cities, with an 'experience economy' of cafes, restaurants, cinemas, galleries, venues and shopping centres, offer all these services on demand. This is the underlying reason why innovative

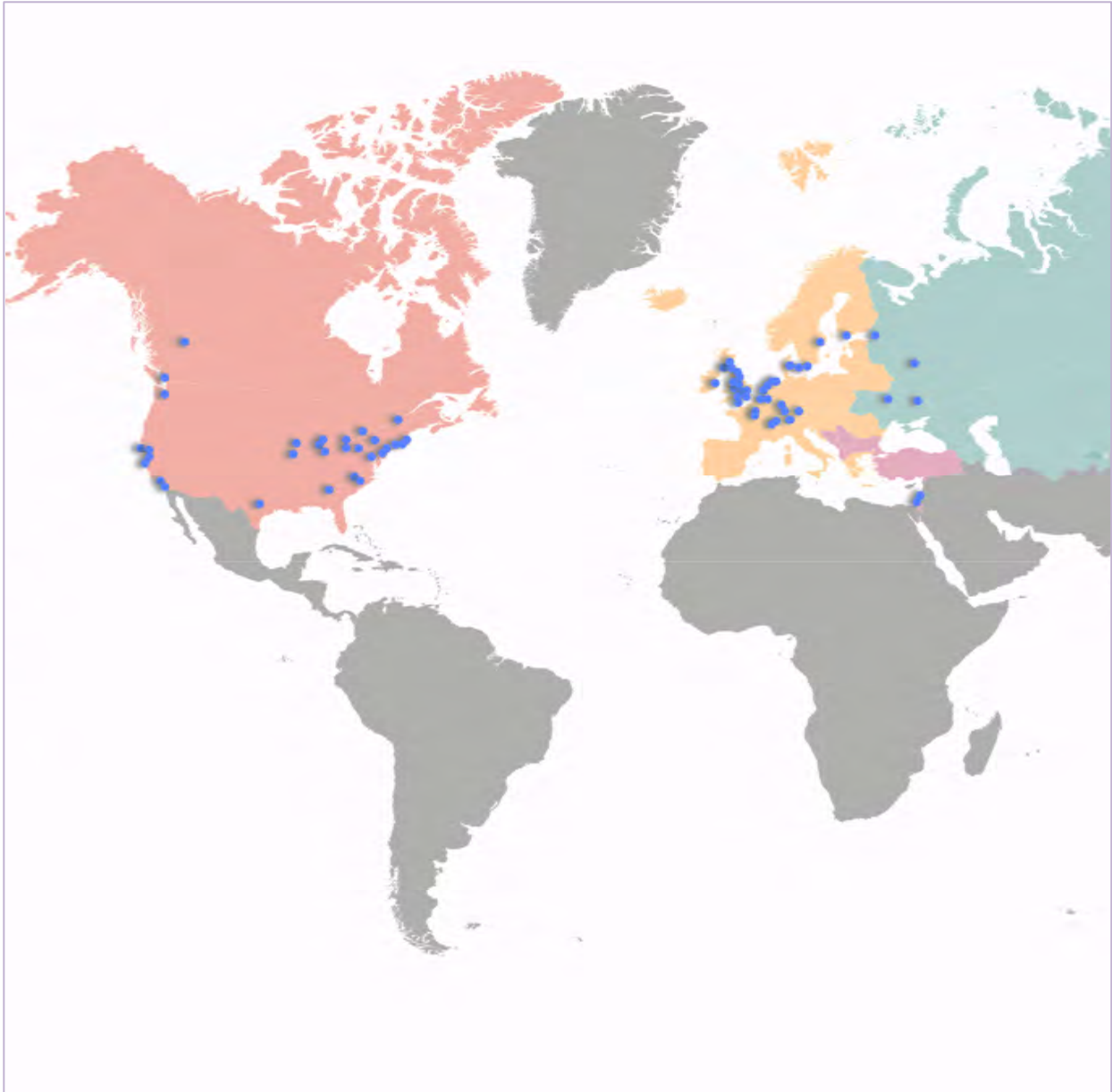


Figure 4-1: Regional innovation hubs Europe and North America

cities such as Stockholm, Barcelona, Munich, Toulouse, Dublin and Eindhoven have blossomed in the knowledge economy.⁸⁹ These forces are equally driving Scotland's principal cities – Edinburgh, Glasgow, Aberdeen and, increasingly, Dundee (Figure 4-2: Stockholm, Eindhoven and Dublin – internationally recognised as 'innovation cities').

Knowledge development, globalisation and 'authentic' towns and cities are mutually supportive. As the knowledge economy takes hold, the cities that are able to adapt to the new economic requirements will also be able to capitalise on their local distinctiveness, as localisation (the increasing importance of city distinctiveness, authenticity and identity) becomes as important as the processes of globalisation.⁹⁰ The emergence of the knowledge economy has revealed an apparent contradiction between cities and globalisation as a 'global-local paradox': in a world that is becoming increasingly more integrated, cities must rely more on their specific local characteristics and identity – expressed by some as 'authenticity'. These unique characteristics help to determine what a city or major town excels in, and the ways in which it can distinguish itself in competition with other cities. The knowledge economy and the related global-local paradox mean that cities, as in the past, compete for the favours of inhabitants, companies and visitors. Every city derives benefits by drawing in knowledge workers and knowledge-intensive activities and, as a result, gains competitive advantage.

In prosperous regions of the EU, the form and structure of cities have come to resemble one another more and more over time. Convergence of this nature has consequences: it means that other factors, such as the city's 'image' or 'reputation', can be decisive in decisions taken by companies or individuals looking for a place to settle or to visit – consider, for example, the frenzied activity and competition in the US to secure the second global headquarters of Amazon.⁹¹ In order to maintain and increase their attractiveness to knowledge workers and other target groups, cities must reflect on what sort of profile they should have, and many have developed a competitiveness strategy as a consequence. Thus inter-city competition for knowledge and innovation requires cities to become 'creative'.

The essence of creativity is the capacity to think up original solutions to day-to-day problems and challenges, and the cities that have been successful in exploiting this quality through economic development are those with access to leading academic institutions within an urban concentration that demonstrate the qualities of diversity and flexibility. Innovation is a key long-term driver of competitiveness and productivity. Universities are central to 'innovation ecosystems' – the networks of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies.

Due to the effect of agglomeration within metropolitan regions, these networks result in higher economic productivity. Universities also spur stronger economic growth through fostering innovation in several ways, including research partnerships with businesses, technology transfer, spin-off companies, and the entrepreneurial pursuits of students, graduates and faculty. In the UK, many venture capital firms have close links with technology transfer units at universities. The availability of finance, particularly private equity and venture capital, is crucial, and finance will follow the locational decisions of people and firms with the most promising and lucrative ideas. Importantly, universities often have deep historic links with their cities, whereas other resources for economic growth – such as residents, workers, firms and investors – are more mobile. However, in attracting people, businesses and investment, cities benefit from strong universities, and universities benefit when their metropolitan economy prospers and offers an attractive quality of life.⁹²

Trajectories of City Change in the UK

The changing fortunes of British cities have been studied extensively in recent years, notably by the Centre for Cities and the UK Government's Foresight Programme.⁹³

A report by the Centre for Cities, analysed the trajectories of change in British cities since 1901.⁹⁴ It confirms that "*History matters...[and a] city's economic past has a profound influence on the future*". But economic success in the past is not of itself sufficient and not all cities with a similar historic



Stockholm



Eindhoven



Dublin

Figure 4-2: Stockholm, Eindhoven and Dublin – internationally recognised as ‘innovation cities’

legacy will necessarily follow the same path as “[s]ome cities were able to better adapt to the changing economy; other cities fell into spirals of decline”.

‘Cities Outlook’ identifies four explanatory factors in shaping cities’ economic fortunes:⁹⁵

- Location and transport
Traditional location factors such as access to raw materials or a power source no longer apply. Investment in transport infrastructure for the movement of people and goods is important, but it needs to be targeted on areas of growth potential.
- Specialisation vs diversity
Cities with a diverse economy serving a range of markets are less exposed to risk than high specialised urban economies, and larger cities tend to be more diverse and therefore better insulated from economic shocks.
- Firm structure and supply chains
Cities with many small firms are better able to adapt and respond to change than those depending on a small number of very large firms; business networking and interaction. A systematic commitment to innovation and R&D is also key.
- Skills
Skill levels are the most reliable predictor of economic performance. Firms, industries and cities with more highly skilled workforces prove to be more adaptable.

A report for the UK Government’s Foresight Programme from 2014 charts the long-term trends that, between 1800 and 2000, took Britain from industrialisation, through industrial restructuring to post-industrialisation, and plots the impacts on city economies:⁹⁶

“Since the late-1970s, and in common with other Western nations, the UK has been undergoing a fundamental transition to a ‘post-industrial’, information-based, service economy... The UK’s cities, like those in other advanced economies, have lost their traditional role as powerhouses of manufacturing activity, and their prosperity now and into the future will depend on finding a new role in this latest phase in the evolution of capitalism.”

The report authors analysed the average annual growth rates of 63 cities between 1981 and 2011, tracking change through the peak period of de-industrialisation.⁹⁷ The growth leaders in this period were not necessarily the big cities, but included New Towns, designated growth areas and cities around London. London ranked 11th, Aberdeen (reflecting the oil boom) 12th, Edinburgh 26th, Glasgow 47th and Dundee 59th.

Individual cities of all sizes will experience different trajectories of growth and decline, measured in changes in population, economic output and household income. The relationship between cities in a region, nation or cross-border territory changes over time, resulting in a shifting urban system and evolving urban hierarchies. The relationship between neighbouring or, at least, easily accessible cities is only part of the story: the most successful and prosperous elite global cities (of all sizes) depend as much on their relationships with each other as they do with their near-neighbours. The networks of connections that drive the global economy are overlaid on the traditional regional hierarchies, although the latter are still important. The regional supply chains that sustained the manufacturing economy (and hundreds of industrial towns) are being superseded by global knowledge networks of specialised skills and expertise. That is one of the reasons why fast, and preferably direct, flight connections between the nodes of the global networks are so important.⁹⁸ It is also why fast, direct intra-regional mobility systems are also of paramount importance to sustain the links between these global cities and their regional neighbours whilst avoiding sprawl.

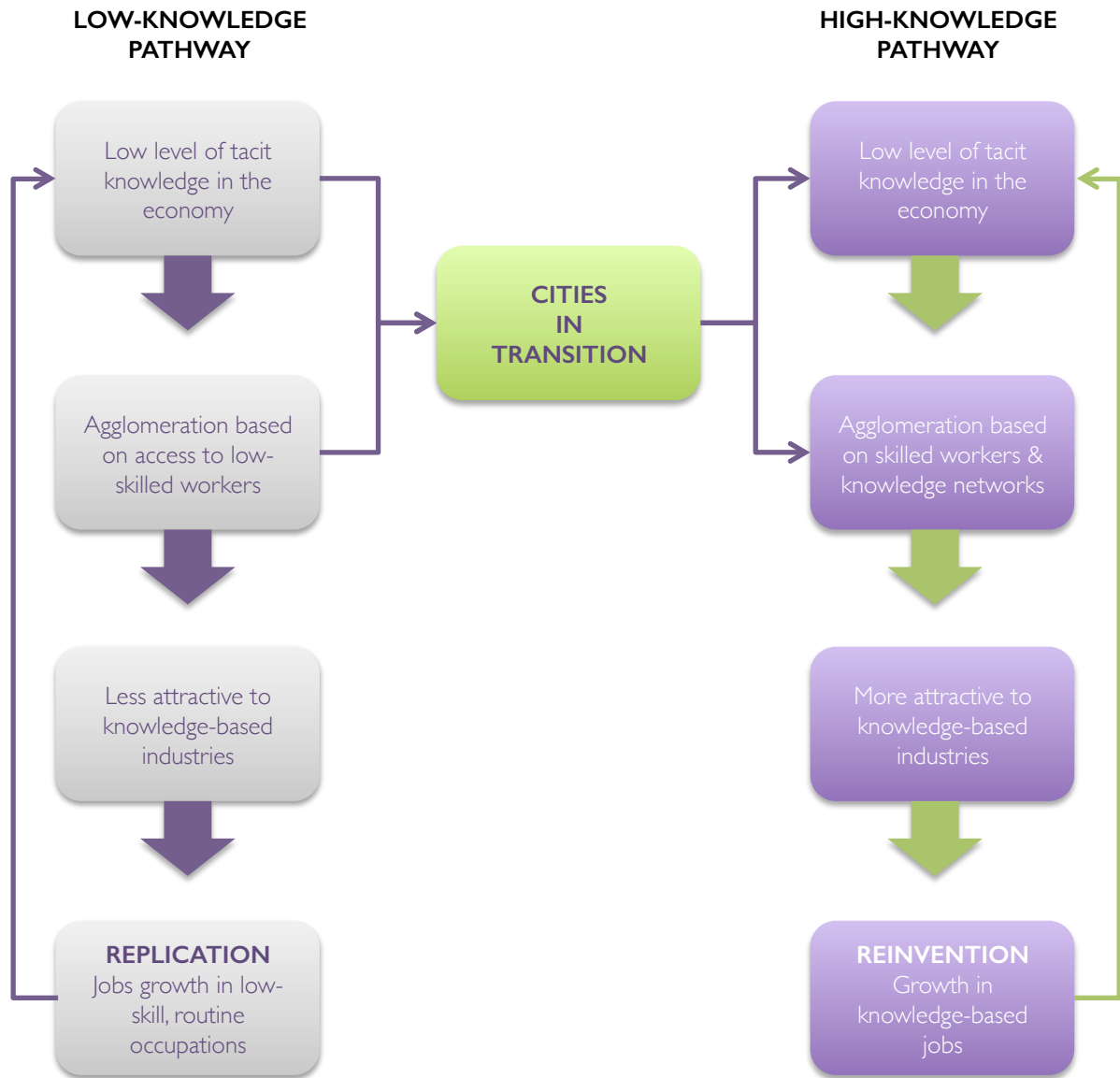


Figure 4-3: Development Pathways: Replicator and Reinventor Cities

It is clear however, from the trends considered in Chapters 2 and 3 and further described here, that the transition from industrial to post-industrial cities is only half of the story in city transitioning in the contemporary era. In a further report, the Centre for Cities clearly stresses that the factors identified above are the drivers of city economies today: *"it is now proximity to knowledge rather than proximity to resources that is the primary driver of city growth"*.⁹⁹

'A Century of Cities' classifies British cities as either 'replicators' or 'reinventors'. The star performers – which include London, Edinburgh, Bristol, Cambridge and a number of cities in the greater south east of England – have reinvented themselves as knowledge-based economies based on global businesses, skilled workers, strong links with universities and research establishments and other factors. Most had a relatively low dependency on manufacturing, mining and other staple industries in the late 19th and early 20th centuries. By contrast, the 'replicators' (mostly in the English north and midlands) tended to be highly dependent on traditional industries that have contracted sharply or disappeared entirely. They found themselves locked in a cycle of decline, replacing employment in declining industries with a new generation of routine, low-skill, low-wage jobs in call centres and logistics. The resulting development pathways are summarised in Figure 4-3 (Development Pathways: Replicator and Reinventor Cities).¹⁰⁰ An interesting question to consider is whether cities can cross from the path of 'replicator' to 'reinventor'.

Historical, structural and geographical factors exert a powerful influence on the fortunes of cities, but this does not mean that their fate is predetermined. The research literature highlights Boston, Munich and Eindhoven as examples of cities which, faced with huge challenges, have reinvented themselves as dynamic, knowledge-based economies. In the UK, Glasgow, Leeds and Manchester are well advanced in this progression, but although progress is good, the process is still incomplete and all three cities remain dogged by the spectre of long-term industrial decline.

The European model of the city aspires towards a dispersed polycentric network of medium-sized, human-scale and compact settlements that are culturally diverse, socially inclusive, environmentally friendly, economically vital, and peacefully and democratically governed, while providing high-quality public spaces, public services and carbon-free mobility solutions. The fundamental principle underlying this model is a concern to take account of all aspects of sustainable development in an integrated manner, often described as the compact city model introduced in Chapter 3.¹⁰¹ Yet, reality on the ground shows that, in spite of this effort, challenges of urban poverty and social polarisation persist in large metropolitan areas where an ageing demographic structure and cultural diversity still feeds suburbanisation, sprawl and, in some cases, shrinking of cities.

Scotland's Urban System

In 2014, the Scottish Government estimated that some 70% of Scotland's people live in towns and cities of 10,000 or more. This is comparable with the UK as a whole and with other developed economies in Europe.¹⁰² Scotland's towns and cities flourished during the era of industrialisation, but manufacturing is now a smaller part of the economy.¹⁰³ Today, the rise of the knowledge economy, built on a digital revolution based on the Internet, fast computers and networking, is bringing about massive opportunities and challenges for Scotland's towns and cities.¹⁰⁴

Scotland has had bustling and elegant cities for centuries (Figure 4-4: The AGE Cities: Aberdeen, Glasgow, Edinburgh). Both Glasgow and Edinburgh, in particular, have been extensively documented and admired over the years:

"Glasgow is, indeed, a very fine city; the four principal streets are the fairest for breadth, and the finest built that I have ever seen in one city together ... 'tis the ... best built city in Britain (... London excepted)".¹⁰⁵

And Edinburgh: *"is the dream of great genius."*¹⁰⁶

This early urbanity had its foundations in the Royal and Ancient burghs of David I that, influenced by the Bastide towns of the low countries and France gave the characteristic aesthetic of the



Aberdeen



Glasgow



Edinburgh

Figure 4-4: The AGE Cities: Aberdeen, Glasgow, Edinburgh

medieval 'fish-bone' urban pattern. An urban form that remains at the heart of much of urban Scotland today – authentic and distinctive.¹⁰⁷

For the purposes of this work however, it can be suggested that Scotland's Urban Age in the industrial era began in 1786 with the innovative and experimental settlement of New Lanark under the entrepreneurial leadership of David Dale and Robert Owen and a UNESCO World Heritage Site.¹⁰⁸ Thus began Scotland's industrial or modern age. The idealism and formality of New Lanark was soon lost in the explosive speculation of the nineteenth century. Scotland's industrial expansion reached its zenith in first half of the 20th century with Glasgow as the second city of Empire destined "to become a great European city until the project was cancelled in 1910".¹⁰⁹

In the years following World War II, Scotland's urbanity faltered and became characterised by industrial dereliction and modernist post war reconstruction – challenges felt most acutely in Glasgow – which threatened the patrimony for several decades. A turning point came however as the 1960s gave way to the 1970s with the formation of the Scottish Development Agency, the GEAR Project in Glasgow with Glasgow and Scotland playing a leading role and the development of what was to become the regeneration industry.

Scotland is fortunate that its principal cities have a familial likeness, different from the rest of the UK and with a distinctive and fine local aesthetic born out of the medieval Scottish Burgh with a coherence of townscape and public realm, and a local distinctiveness derived from topography, materiality and climate. As Scotland turned the corner of regeneration and renaissance at the twilight of the 20th century and the start of the 21st, the principal cities were able to build on this common elegant European urban form whilst retaining distinctive differences. From the *Granite City* of the northeast, the largely extant Victorian *Dear Green Place* of the west and – in the *Athens of the North* – a classical city in the east the equal of anything in the UK and Europe. Scotland's principal cities have an inherited form highly suited to the requirements of the 21st century knowledge city with a cultural and creative offer to match.

Scotland's cities are an integral part of the UK's urban hierarchy. Most of the numerous comparative studies of UK cities published in recent years include Glasgow, Edinburgh, Aberdeen and (in some cases) Dundee. According to the UK Foresight Programme, in the period since 1981, Aberdeen has achieved the fastest average annual growth in output of any city outside the south of England, Edinburgh has been one of the best-performing medium-sized cities and Glasgow and Dundee can point to a trajectory of transformation while continuing to combat a legacy of de-industrialisation.¹¹⁰

Scotland's status as a devolved nation within the UK adds another dimension to this analysis. While the economy continues to be closely connected to the rest of the UK, which is easily its largest export market, Scotland's parliamentary system and its separate legal, educational, administrative and cultural systems create a 'Scottish difference' which is reflected in the role and status of the major cities and especially the capital, Edinburgh.

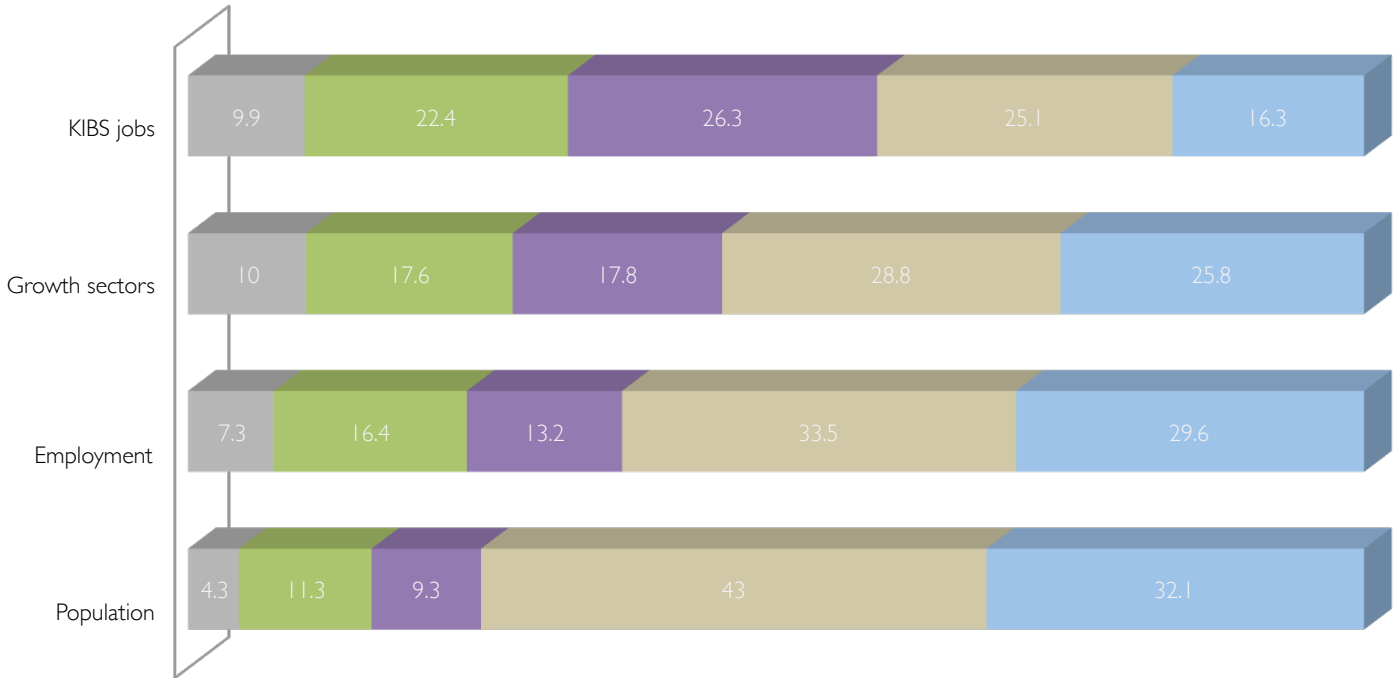
The following chapter focuses on Scotland's three biggest cities, Aberdeen, Glasgow and Edinburgh and their city-regions using the acronym 'the AGE cities' in acknowledgement that globally this is 'the Urban Age'.¹¹¹ In an introduction to that more detailed analysis, this chapter concludes by reflecting on the roles of the AGE cities and the relationships between them, together with the four smaller Scottish cities of Dundee, Inverness, Perth and Stirling.

The three AGE cities account for 25% of the population of Scotland with a further 43% living in their city regions (Figure 4-5: the economic power of the AGE cities). They contribute a disproportionate share of jobs and output, especially in the Scottish Government's designated growth sectors and in knowledge-intensive services.

A report by the Fraser of Allander Institute from 2015 states that Scotland's cities "dominate...[the] economic landscape" and reaffirms their key role "in determining the current and future size, scope and competitiveness of the Scottish economy":

The power of the AGE cities

■ Aberdeen ■ Glasgow ■ Edinburgh ■ City regions ■ Rest of Scotland



The cities of Aberdeen, Glasgow and Edinburgh account for 25% of the population of Scotland with almost 45% more living in the three city regions and they have a younger age profile than the rest of the country .

They contribute a disproportionate share of jobs and output, especially in the Scottish Government's designated growth sectors, knowledge-intensive services and high-productivity, export-orientated sectors.

They are home to most of Scotland's leading universities and colleges, and they account for two-thirds of business R&D expenditure.

Figure 4-5: The economic power of the AGE cities

"They are home to the majority of Scotland's population, education and employment opportunities, as well as hosting social and cultural amenities that attract and support a skilled labour force".¹¹²

The report highlights the contribution of Scotland's cities in terms of:

- *demography*: they account for an increasing share of Scotland's population and they have a younger age profile than the rest of the country;
- *economy*: they account for 60% of Scotland's GVA and 54% of employment, with a disproportionate share of high-productivity, export-orientated sectors; and
- *innovation, research and development*: Scotland's cities are home to most of its universities and colleges, and they account for two-thirds of business R&D expenditure.

Cities act as "*hubs of economic activity*", creating "*spillover effects for neighbouring areas*", including increased consumption and tax revenues. City (and City Region) Deals will improve transport infrastructure in the city regions, "*[g]etting workers to their jobs more efficiently, reducing travel times, getting products to markets quicker and more cheaply*".¹¹³

There has been a renewed policy focus on cities since 2011, when the Scottish Government published its first Agenda for Cities. A refreshed version was published in 2016, setting out a vision of "*a Scotland where our cities and their regions power Scotland's economy for the benefit of all*".¹¹⁴ The Agenda is positioned within the context of Scotland's Economic Strategy, with a particular focus on four themes: internationalisation, investment, innovation and inclusive growth. Businesses are concentrated in Scotland's cities and they provide "*a dynamic environment for knowledge-sharing and innovation*". The Agenda emphasises the importance of developing the city regions as "*functional economic geographies*", and of promoting collaboration and partnership.

The rollout of City Region Deals, which started in 2014, is now well advanced and proposals have been agreed for Edinburgh & South East Scotland, Glasgow, Aberdeen, Inverness & Highland and Stirling & Clackmannanshire. City Region Deals are being developed for and the Tay Cities, as well as Growth Deals for Ayrshire and for the Borderlands that embraces Dumfries and Galloway, Carlisle, Northumberland and Cumbria.¹¹⁵

The Scottish Cities Alliance

The Scottish Cities Alliance was established in 2011, as "*a unique collaboration between Scotland's seven cities and the Scottish Government, to bring investment and jobs to our cities and to deliver economic growth*". The Government acknowledges that there will always be competition between the cities, but argues that the Alliance provides advocacy, lobbying and expertise and encourages collaboration around infrastructure, smart cities and the low carbon agenda.¹¹⁶

The high profile now accorded to Scotland's cities in planning, economic development and other spheres is undoubtedly welcome, but it is not clear whether the measures and policies now in place will be sufficient to supercharge the performance of the AGE cities and promote the New Urban Agenda in Scotland. Furthermore, the Cities Alliance is wholly insufficient in terms of explaining and advancing Scotland's urban system and the significance of places not designated as cities such as Paisley and Falkirk-Grangemouth.

The Fraser of Allander report makes the case for "*placing our trust in our cities*", by providing them with "*the tools to support job creation [and]...[t]argeting investment in our transport infrastructure*". The report concludes that policymakers "*could go much further to increase city autonomy as a means to spur Scotland's wider – and more inclusive – economic development*".¹¹⁷

A paper by Professor Greg Clark reaches a similar conclusion. Clark sets out an ambitious agenda for Glasgow, which would build a "*managed metropolis*" through a combination of "*population growth, densification, the innovation and new manufacturing economy, traded urban services...the*

SCOTLAND'S URBAN AGE

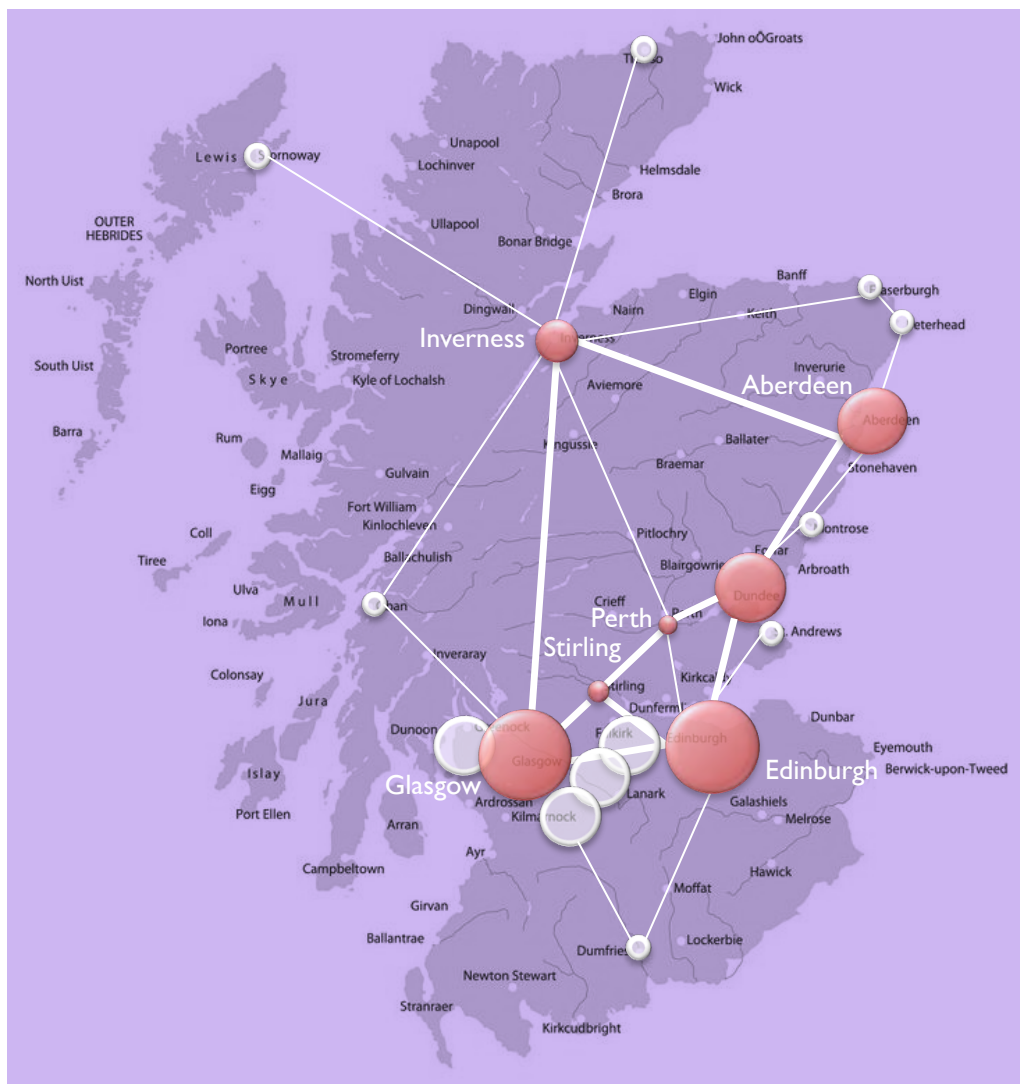


Figure 4-6: Scotland's Urban System – the seven cities coloured

metropolitan area, smarter systems for investment and management, and becoming a more integrated part of a UK and NW Europe system of cities".¹¹⁸

This is a level of ambition not yet reflected in current policies, and Clark states that achieving it will require *"a New Deal for Glasgow"*. The Glasgow city-region needs the freedom and capacity *"to invest, to promote enterprise and to manage its own future"*. The Glasgow City Region Deal is welcome, but it is only a start. Clark argues that it should be treated as the platform for a more ambitious agenda which would scale up investment in infrastructure, especially public transport, strengthen the innovation system and make Glasgow one of a generation of *"new world cities"*.

In Clark's words, Glasgow must *"escape from parochial localism"* and learn *"to grow, adapt and densify in ways that do not simply increase sprawl, congestion, inflation or income segregation"*. Clark cites Auckland, Santiago de Chile, Oslo and Toronto as potential models, cities that have acquired the *"tools and tactics"* to become managed metropolii capable of grasping and exploiting their opportunities to become true knowledge cities in the terms introduced at the start of this chapter.¹¹⁹

The stated aspirations of Scotland's Agenda for Cities are more modest, although it does focus on building on the strengths of the cities as *"centres of knowledge, innovation and culture"* in order to *"develop internationally investible propositions based on skills in science, technology, innovation and creativity"*. All seven Scottish cities have specific strengths and attributes, but this policy prescription misses out tracts of urban Scotland and is only realistically applicable to the AGE cities and, up to a point, Dundee (Figures 4-6: Scotland's Urban System; Figure 4-7: Scotland's City Regions).

The characteristics of the AGE cities are described more fully in the following chapter and the relationship between Aberdeen, Glasgow and Edinburgh and their respective city-regions has been analysed in terms of travel-to-work areas and property markets. Higher order economic activities, universities and other key assets are clustered in the cities themselves, with the wider regions providing commuter housing and local services, as well as some significant business locations in the principal towns.

Future analysis of the economic relationships between the AGE cities and the city-regions would be worthwhile as there are no readily available secondary sources. However, research commissioned by the Northern Way in 2009 provides a useful proxy. It examined the economic relationships between the five biggest cities in the north of England, and between those cities and nearby towns, focusing on the labour market, firm relationships and supply linkages.

The Northern Way report concluded that *"[s]trengthening the economic links between places has the potential to contribute to sustainable economic growth, higher individual prosperity, the attraction and retention of higher skilled workers and the reduction of deprivation"* and that some places have more complementary economic relationships than others: with skills a key factor, as well as transport links, sectoral specialisation, the 'pull' of major cities and quality of place. Generally, labour market links are a stronger driver of relationships between places than links between firm where global networks have increasingly superseded local and regional supply chains. The analysis revealed a diversity of urban systems at the city-region scale that can be monocentric, polycentric or bipolar.¹²⁰

As discussed in Chapter 3, the evidence from recent comparative research is that, compared to high-performance European supercities (Randstad and the Rhine-Ruhr region), the cities of the north of England (and, by extension, Central Scotland) are underpowered and unproductive. The structure of the urban system, which is typically the legacy of history, appears to be less important than the performance and competitiveness of the principal cities in the region. On this basis, maximising the performance of Scotland's international cities – Aberdeen, Glasgow and Edinburgh – would appear to be a top priority, and the most effective way to drive sustainable, inclusive growth.

¹²¹

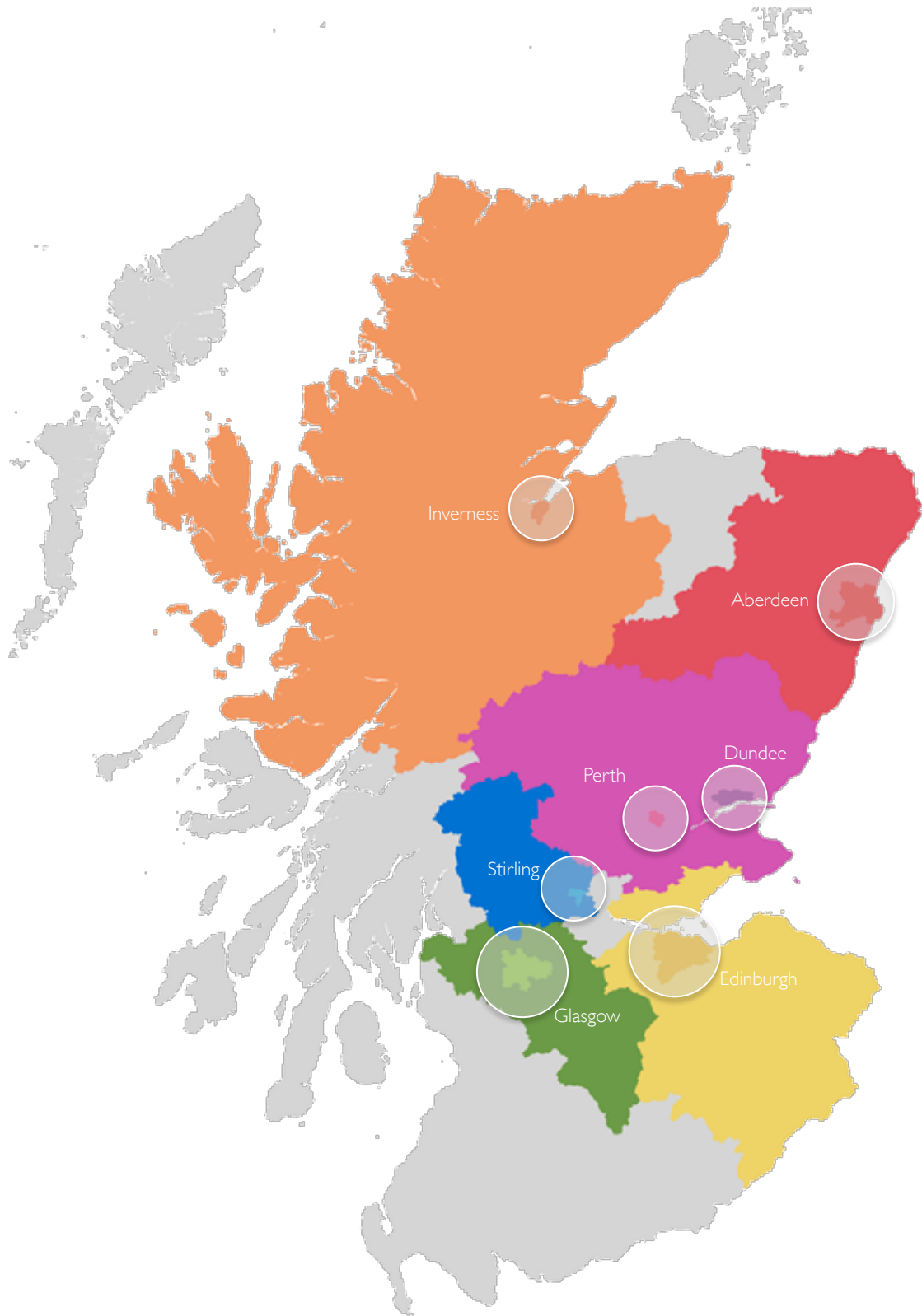


Figure 4-7: Scotland's City Regions

Conclusions

The defining characteristics of the Scottish urban system can be summarised as follows:

- it is geographically distributed across Scotland and there is no dominant, global city however the Central Belt with Glasgow and Edinburgh represents a concentration of urban Scotland in one inter-connected region;
- the AGE cities – Aberdeen, Glasgow and Edinburgh – form the top tier of the urban hierarchy and are easily the most important players, although Dundee also has some specialist strengths;
- the second tier of the hierarchy comprises the three small cities (Inverness, Perth and Stirling) and large towns such as Paisley and Falkirk/Grangemouth;
- economically, the AGE cities have distinctive, differentiated and complementary roles which are described in more detail in Chapter 5;
- Glasgow and Edinburgh are only 45 miles apart and their travel-to-work areas overlap and subsume Stirling, although their respective commuter zones are generally self-contained; Aberdeen is more isolated, and a long distance from Scotland's other large cities which places more emphasis on the quality and efficacy of Scotland's mobility system;
- Scotland's devolved status and its geographical location create a degree of separation from the rest of the UK, but;
- England is easily Scotland's largest export market, and the AGE cities still operate in the context of London's dominant role.

Scotland's principal cities, however exhibit clear evidence of the knowledge city paradigm introduced at the beginning of this chapter – prominent universities, high quality of place, prominent cultural institutions, a high quality of life and an experience economy. These qualities together with processes of transition that are already well advanced, means that Scotland's AGE cities are well placed to grasp the opportunities available to knowledge cities in the 21st century. In order to consider how they may do so however, it is first necessary to understand the characteristics and performance of the AGE cities in more detail.

SCOTLAND'S
URBAN AGE

5

Understanding
the

AGE Cities



5: UNDERSTANDING THE 'AGE' CITIES

This chapter draws on official statistics, market intelligence and secondary sources to consider the condition and prospects of the AGE cities, individually and collectively. The story these data tell is revealing but partial and this quantitative approach is complemented by an informed assessment from the authors first hand experience of qualitative factors including place quality, image and reputation, quality of life, governance and leadership.

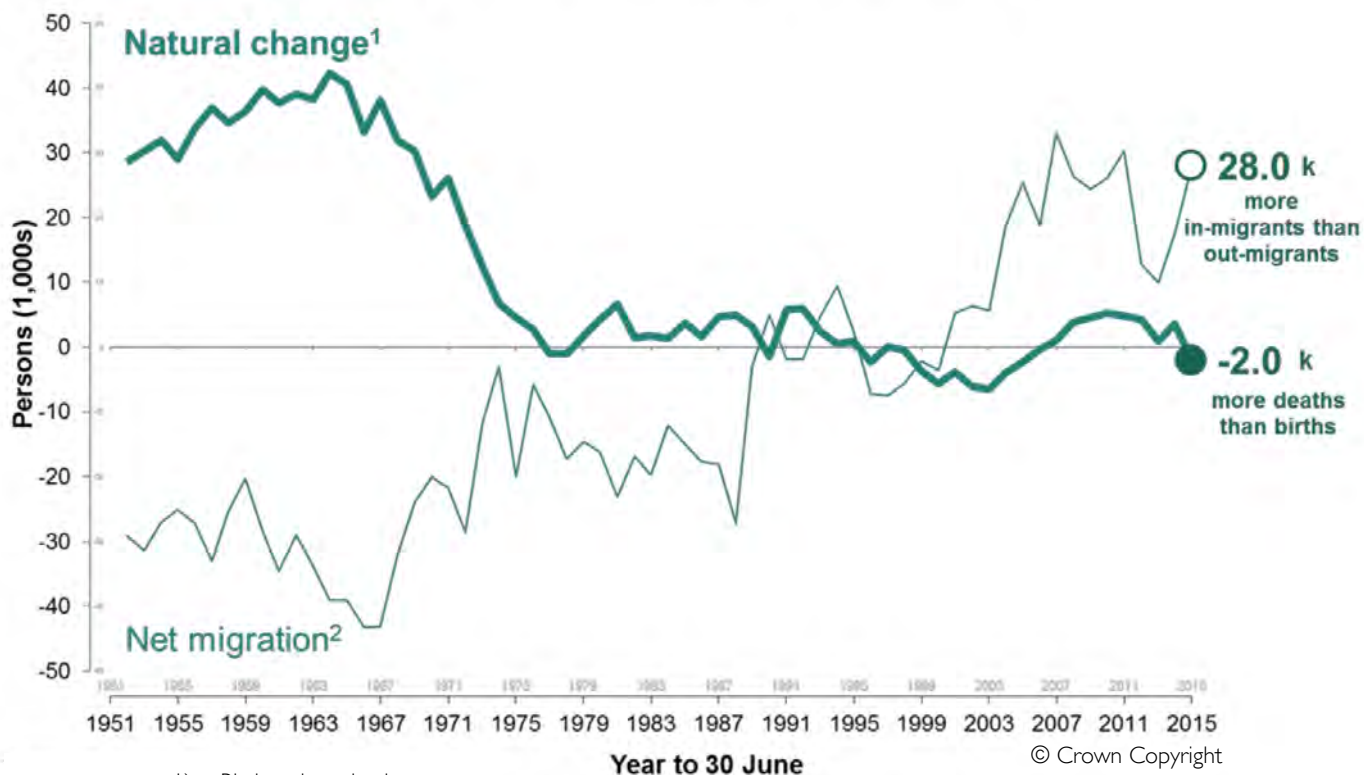
The comparative analysis that follows needs to be treated with some circumspection, city rankings at a point in time are informative, but it is equally important to understand recent trends and the direction of travel. In headline terms, Aberdeen has performed extremely well economically over the past 30 years as a small city with a high-productivity, high-wage, high-skill global economy. But the narrative in recent years has been dominated by the collapse in the price of oil and its impact on a city economy over-dependent on a single industry. Aberdeen undoubtedly faces big challenges in the next 10-20 years. Glasgow, by contrast, has achieved a turnaround after decades in decline and is now, to quote Professor Greg Clark, “a hugely improved city” which has “weathered the crisis of de-industrialisation...[and] become more economically and socially diverse and resilient, more attractive and liveable, more confident and forward looking” with a prominent media cluster underpinning its reputation for creativity.¹²² But it is still working through the legacy of de-industrialisation: under-employment, low skills and under-achievement in schools. Low life expectancy and persistent poverty co-exist with the new global city and push it down the city rankings, especially with its boundaries so tightly drawn. Edinburgh continues to enjoy the economic benefit of its capital status, increasing since the establishment of the Scottish Parliament. Recent research by the German think tank Institut der deutschen Wirtschaft shows “the benefit of capital status for countries and small states in Europe to be somewhere between 5% and 15% of GDP per capita” and the city has a growing reputation for business start-ups. Edinburgh is 2nd (after Leeds) and Glasgow 7th (after Manchester) as centres for the digital economy outside of London.¹²³

Demographic Trends

The population of Scotland increased slowly in the latter part of the 20th century, with increased life expectancy largely offset by low fertility and a steady flow of out-migration, predominantly to the rest of the UK. Modest growth of 1.3% between 1991 and 2001 was consistent with the long-term trend, but the following decade saw more rapid growth. The population of Scotland increased by 4.6% between 2001 and 2011, and by a further 1.5% by 2015. Over the whole period (1991-2015) Scotland's population increased by 377,000 (up 7.5%). With natural change (birth minus deaths) remaining close to zero, immigration was the principal source of growth, especially post-2001 (Figure 5-1: Natural Change and Migration in Scotland 1951-2015).

The AGE cities had an aggregate population of 1.336 million in 2015, some 24.9% of the Scottish total.¹²⁴ Glasgow had a population of 606,000, Edinburgh 499,000 and Aberdeen 230,000. In the period 1991-2015 the population of Edinburgh increased by 19.1%, Aberdeen grew by 12.4% and Glasgow was in effect unchanged. Together, the AGE cities grew by 8.6%, but whereas the population of Aberdeen and Edinburgh increased more rapidly than the rest of Scotland, Glasgow was static. The city regions, which encompass 16 Council areas including the 3 big cities, have an aggregate population of 3.649 million which is two-thirds the population of Scotland (67.9%). Again, population change between 1991 and 2015 reveals notable regional variations: Aberdeen city region rose by 17.2%, Edinburgh city region up 15.3%, while the Glasgow city-region grew by just 1.1%. Population growth in Edinburgh outpaced the wider city region, but the opposite was the case in the Aberdeen city region (Figure 5-2: Population change in the AGE cities, AGE City Regions and Scotland).

There is a significant dichotomy in Scotland's population growth between east and west. Taken together, Aberdeen and Edinburgh added 105,000 residents between 1991 and 2015, while Glasgow stood still. Glasgow lost population between 1991 and 2001, a continuation of a long-term trend, but these losses were reversed after 2001. At the city region-level, Aberdeen and



- 1) Births minus deaths
- 2) Inward minus outward migration

	Population (000)				Change 1991-2015
	1991	2001	2011	2015	
Scotland	4998.6	5062.0	5295.4	5370.0	+377.4 (+7.5%)
Aberdeen	204.9	212.1	222.8	230.4	+25.5 (+12.4%)
Glasgow	606.7	577.9	593.2	606.3	-0.4 (-0.1%)
Edinburgh	418.7	448.6	476.6	498.8	+80.1 (+19.1%)
AGE cities total	1230.3	1238.6	1292.6	1335.5	+105.2 (+8.6%)
Aberdeen City Region	420.3	439.0	475.8	492.4	+72.1 (+17.2%)
Glasgow City Region	1784.7	1749.2	1787.4	1804.4	+19.7 (+1.1%)
Edinburgh City Region	1170.9	1234.5	1313.7	1350.0	+179.1 (+15.3%)
AGE city regions total	3375.9	3422.7	3576.9	3646.8	+270.9 (+8.0%)

Figure 5-1: Natural Change and Migration in Scotland 1951-2015 – ABOVE

Figure 5-2: Population change in the AGE cities, AGE City Regions and Scotland – BELOW

Edinburgh gained 250,000 people between 1991 and 2015 while Glasgow added 20,000 (Figure 5-3: Shifting east: Population 1991-2015, AGE cities, AGE city regions and Scotland). There were significant variations in population figures at the sub-regional level where population growth was most rapid in the immediate commuter areas around the main cities notably in East and West Lothian, Aberdeenshire, East Renfrewshire and South Lanarkshire – the latter two offset by population decline in Inverclyde and West Dunbartonshire.¹²⁵

Analysis of the 2011 Census provides further insights into the distinctive characteristics of the AGE cities and the city-regions. The data in Figure 5-4 (AGE cities and city regions 2011: key demographic indicators) show the AGE cities and the city-regions excluding the cities. The demographic characteristics of the suburban hinterlands mirror Scotland as a whole. For example, over 23% of the Scottish population and the city regions is aged 60 or over whereas the figure for the cities is under 20%. The difference between the larger proportion of older people in Scotland and the regions (one quarter) and the lower figure in the cities (one fifth) is most likely due to the draw of the major universities and their significant student populations and to some extent to higher youth profiles in the cities employment bases. However skills, qualifications and ethnicity are equally important.

The AGE cities are a magnet for immigrants, skilled workers and students. Students like city life: 15% of the working age population of the AGE cities are students, compared with under 10% in Scotland and 7% in the suburban city regions. National and ethnic diversity are features of city life, and they are a reliable indicator of the economic and cultural vitality of successful cities in the knowledge age, a measure of their attractiveness and the opportunities they offer. In the cities of Aberdeen, Glasgow and Edinburgh, 15.8% of the population in 2011 was of non-white, non-UK/Irish ethnic origin, compared with 6.2% of the Scottish population and 4.5% in the city regions excluding the cities. In the three principal cities, 32.9% of the working age population is educated to at least degree level, compared with 26.1% in Scotland and 23.4% in the suburban city regions. There are marked differences between the cities in this regard: Edinburgh residents are more likely to be graduates than people living in the city region commuter zone, but there is only a narrow gap between Aberdeen and Glasgow and their respective city-regions. These figures reflect Edinburgh's capital status and its enduring appeal for high earners and skilled workers. Half of Edinburgh's employed residents (50%) work in managerial, professional and technical occupations, compared with a Scottish average of under 40%.

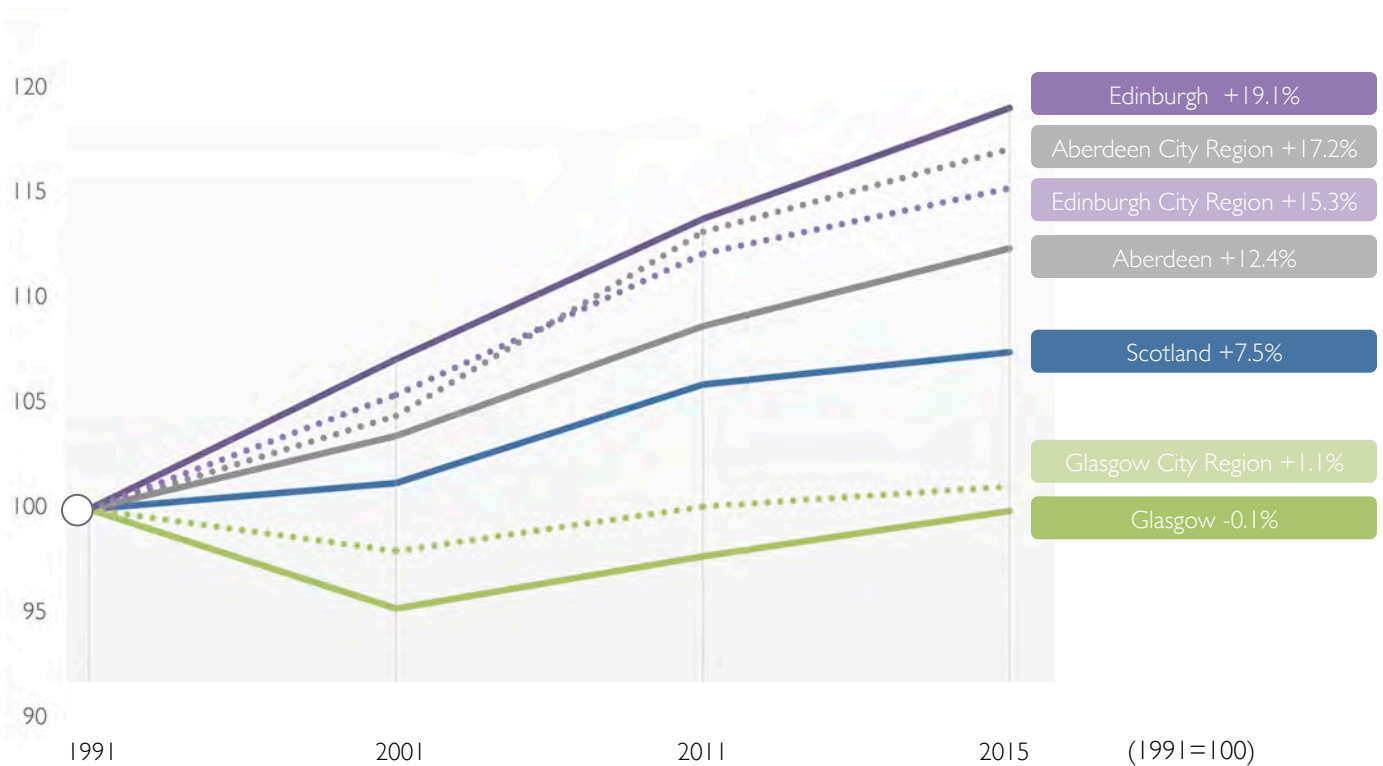
Living in the AGE cities – the housing system

Housing is the largest and most important urban land use, and responds to the population dynamics of cities and their regions. Adequate housing is a recognised human right. The UN charters promote sustainable housing as a key to quality of life – a view shared by the Scottish Government.¹²⁶ For AGE city residents as in Scotland and the UK generally, housing is both an economic good and a personal asset but, in some instances, it is a liability).

The Glasgow city-region has 864,900 dwellings, an increase of 4.8% since 2008. The Edinburgh city-region stock increased by 8.2% to 643,500, while Aberdeen city-region recorded the fastest rate of growth (9.1%) to 232,800. Figure 5-5 (City Regions: New House Building) compares building rates in the city-regions before and after the 2008 financial crash. Glasgow city region's annual completion rate has fallen by approximately 50% to 4,200, largely because the private sector is much less active. The completion rate in Edinburgh city-region is down by 32%, but with a year-on-year increase in private and social sectors since 2012 in the context of rising population and household numbers. Aberdeen city region's house building rate has been stable, as the private sector-dominated market has continued building in a legacy of strong local economic circumstances. Among the cities, the housing completion rate has been lowest in Glasgow, with a 3.6% increase in the housing stock since 2006. In the same period, Edinburgh's stock increased by 8.1%, while Aberdeen added 6.6% (with some volatility) Figure 5-6 (Cities: New House Building).

Although the population of Glasgow is larger than Edinburgh, the volume of residential sales since 2007-08 has been similar at just over 100,000. There were some 50,000 sales in Aberdeen in the

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	Population aged 60+ (a)	Non white UK/Irish ethnic origin (a)	Level 4 or higher quals (b)	Students (c)
Scotland	23.2	6.2	26.1	9.2
Aberdeen	20.0	16.2	33.2	15.0
Aberdeen city region	21.6	10.2	30.0	10.3
Glasgow	18.6	15.4	25.9	14.1
Glasgow city region	21.5	7.8	23.6	9.8
Edinburgh	19.6	16.2	41.4	15.8
Edinburgh city region	22.3	9.0	30.4	10.6
AGE cities	19.2	15.8	32.9	14.9
City regions (ex AGE)	23.3	4.5	23.4	7.4

- (a) Based on total population
- (b) Based on population aged 16+
- (c) Based on population aged 16-74

Figure 5-3: Shifting east: population change 1991-2015, Scotland, AGE cities and AGE city regions – ABOVE
 Figure 5-4: AGE cities and city regions 2011: key demographic indicators – BELOW

SCOTLAND'S URBAN AGE

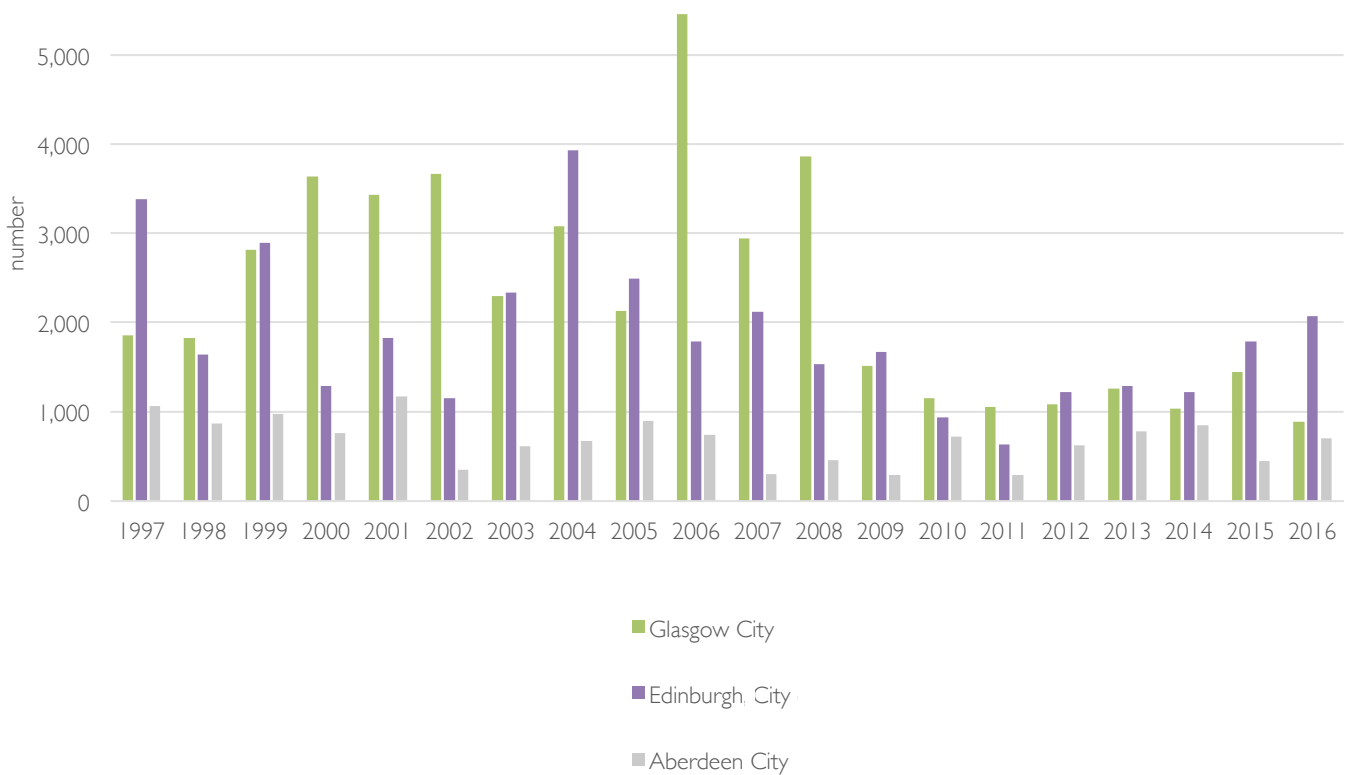


Figure 5-5: City Regions: New Build Housing – ABOVE

Figure 5-6: Cities : New Build Housing – BELOW

SCOTLAND'S URBAN AGE

City	City Regions		Cities		
	Housing stock (no. of units)	% Increase in Development	% Increase in Development	Flats : houses ratio	Sales (2)
Aberdeen	0.233 million	+9.1%	+6.6%	55% : 45%	4,600 pa.
Glasgow	0.865 million	+4.8%	+3.6%	73% : 27%	9,500 pa.
Edinburgh	0.643 million	+8.2%	+8.1%	68% : 32%	9,500 pa.

Column 3 & 4: Total addition to stock 2006-17
 Column 5: Rounded annual averages since 2007/08

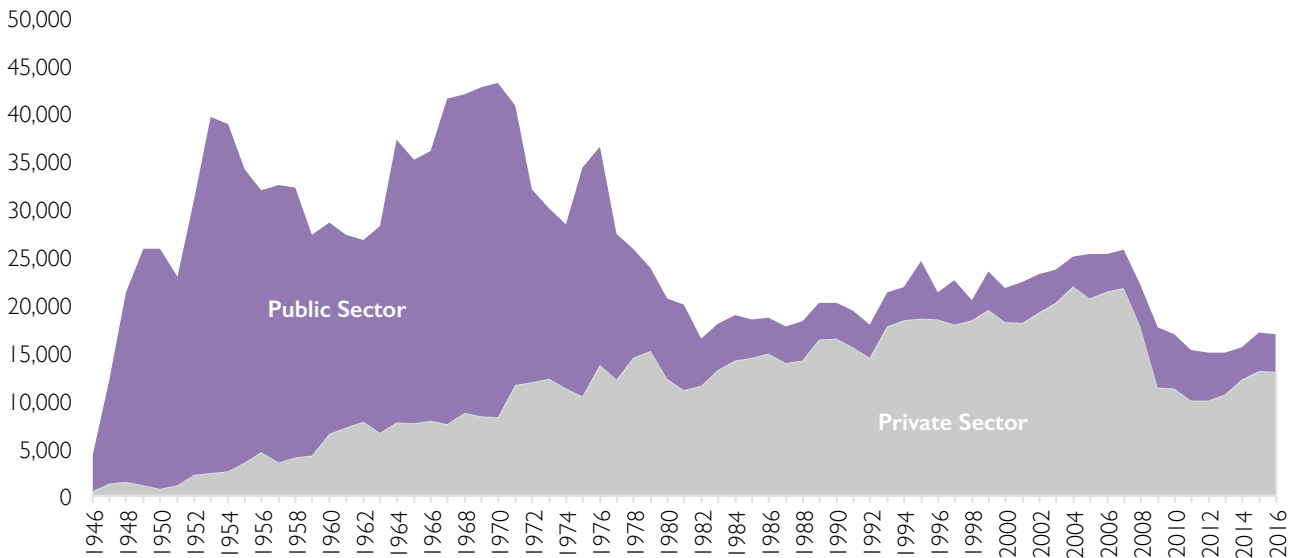


Figure 5-7: Volume of house sales AGE cities – TOP
 Figure 5-8: Scotland New Build Housing Starts – MIDDLE
 Figure 5-9: Housing Completions in Scotland by Sector – BOTTOM

same period (Figure 5-7: Volume of House Sales: AGE cities). Demand for housing in all three cities has had the effect of increasing prices (and rents) in existing stock rather than any significant acceleration of development. Estimates suggest that 92% of house sales in the AGE cities since 2007 were of existing stock with new home sales accounting for just 8%.¹²⁷ In the context of recent and forecast demographic trends, the current house building rate in Scotland and the AGE cities is suppressed and is clearly inadequate for the country's demographic needs (Figure 5-8: Scotland New Build Housing Starts). From 1950 to 1975, Scotland built 30,000 to 40,000 new homes annually, but the current completion rate is just 16,000. The growing population described above and falling household size through ageing and low fertility increase the overall need for housing, while stock demolitions continue to remove supply. Living in Scotland's cities is rightly seen as a critical national issue.

Over time, the public sector has moved from being the dominant provider of new homes to having a minority role in the housing system. The first dip in development of housing in Scotland was caused by the withdrawal of the public sector in the early 1980s in the wake of the UK Government's right-to-buy policy. The subsequent reliance on private developers, in parallel with the privatisation of housing in Scotland through right-to-buy has had a profound impact on the housing system. The proportion of Scotland's households living in social rented housing has fallen dramatically since 1981 from 51% to 23%. In parallel, private sector house building rose steadily from the early 1950s to 2007 (Figure 5-9: Housing completions in Scotland by sector). This trend in Scotland mirrored that across the UK and internationally and led to a bubble in housing markets that was a major contributing factor in the 2008 global financial crash. Although the trend in Scotland and its principal cities was less marked than elsewhere in the UK and internationally, it still led to rapid market adjustment and continued risk aversion has caused a second 'development dip'. The current suppressed level of building results in a very low replacement rate with the consequence that each new house must last for some 150 years – much longer than the design life of most new buildings.¹²⁸ The suppressed levels of new development (and tighter mortgage credit) directs market activity into the resale of existing stock that in turn drives house price inflation and sustains artificially high land values. Ultimately it is socially divisive. The private sector build-and-sell model – including provision of affordable homes where mandatory – is proven to work and is now dominant and delivering four-fifths of new homes in Scotland. Inevitably, however, the private sector model is selective and favours viable, growing markets.

At its peak in 2007, the development market delivered infrastructure and public goods in support of housing development. Since the crash however, delivery of these vital assets through the housing market has been patchy, and has become an unseen drag on development, particularly through the provision of high cost facilities such as schools. Nonetheless, new infrastructure and public goods are required to support new development and their delivery now places more strain on the planning system though a requirement to coordinate numerous organisations and agencies. This weak and time-consuming process might be alleviated by 'bundling' infrastructure into the partnership arrangements for City Deals. Certainly some creative thinking is necessary to improve a time-consuming and fragmented system reviled by public and private sectors alike.

The relationships between the owner-occupied, private rented and affordable housing sectors are complex and dynamic.¹²⁹ Owner-occupation in Scotland, which had increased from 40% in 1984 to 62% in 2008, has fallen back somewhat to 58%. Private renting now accounts for 15% and social rent 23%.¹³⁰ In the AGE cities, the rate of owner-occupation among 16-34 year-olds has fallen by nearly half since 2000 from 51% to 27% today.¹³¹ Scotland's housing policy and strategy clearly recognise and support a more diverse housing system, but the predominant and selective private sector delivery model tends to eschew affordable, rented and alternative housing with the consequence that social housing is priced out of the development land market. Since the crash, the number of 'alternative' developers has reduced with companies facing difficulties in effective financing in a hard economic climate. These issues are well-known and recognised by Government and by housing providers, and they reinforce the challenge in effecting systemic change in the private sector housing delivery model over a few decades.

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	Total Employment			
	2010	2015	% change 2010-15	% share of Scottish total 2015
Scotland	2347090	2455015	4.6	100.0
Aberdeen	173680	180395	3.9	7.3
Glasgow	397195	402325	1.3	16.4
Edinburgh	303285	324235	6.9	13.2
AGE cities	874160	906955	3.8	36.9
Aberdeen City Region	263935	285205	8.1	11.6
Glasgow City Region	810810	836135	3.1	34.1
Edinburgh City Region	597355	633620	6.1	25.8
AGE city regions	1672100	1754960	5.0	71.5

	Growth sectors			
	2010	2015	% change 2010-15	% share of Scottish total 2015
Scotland	591696	645938	9.2	100.0
Aberdeen	62784	64362	2.5	10.0
Glasgow	101468	113921	12.3	17.6
Edinburgh	104386	114870	10.0	17.8
AGE cities	268638	293153	9.1	45.4
Aberdeen City Region	91088	99225	8.9	15.4
Glasgow City Region	184775	203817	10.3	31.6
Edinburgh City Region	164068	176470	7.6	27.3
AGE city regions	439931	479512	9.0	74.2

	KIBS			
	2010	2015	% change 2010-15	% share of Scottish total 2015
Scotland	251685	263245	4.6	100.0
Aberdeen	27160	26185	-3.6	9.9
Glasgow	57310	58870	2.7	22.4
Edinburgh	67925	69245	1.9	26.3
AGE cities	152395	154300	1.3	58.6
Aberdeen City Region	36940	40810	10.5	15.5
Glasgow City Region	84460	88125	4.3	33.5
Edinburgh City Region	89090	91405	2.6	34.7
AGE city regions	210490	220340	4.7	83.7

Figure 5-10 Employment in the AGE cities and city regions 2010 – 2015 – TOP

Figure 5-11 Employment in the AGE cities and city regions 2010 – 2015 – growth sectors – MIDDLE

Figure 5-12 Employment in the AGE cities and city regions 2010 – 2015 – KIBS sector – BOTTOM

Where niche housing sectors such as student accommodation, retirement homes and build-to-rent are active in the AGE cities, this is because they are in viable, growth phases.¹³² This enables them competitive entry into the urban land markets – but only as long as market conditions remain favourable. A rented solution that is mid-market, affordable and professional is required, but the build-to-rent/private rented model is selective and in many instances only functions well in prime locations.

The AGE cities do have important and active developers and providers of affordable stock, some of whom are engaged in the regeneration of life-expired local authority housing estates. However the cities also have the most diverse, fastest-growing and mobile populations, constantly changing the nature of demands and needs.¹³³ The requirement to accelerate and diversify house building raises challenges in funding and capacity, and issues in civic and planning processes. Scotland is not building enough new homes, but planning applications for new residential developments can be contentious and resisted at the local level. There is a need to detoxify the debate around the subject by establishing an inclusive conversation in order to establish a better national case for housebuilding as part of a concerted programme of investment in civic assets, public spaces and sustainable communities. In this respect, housing needs to be repositioned as living to support better placemaking and a higher quality of life in the AGE cities and in Scotland nationally.

Economy of the Cities

The AGE cities play a dominant role in the Scottish economy. Together, the three cities (administrative boundaries only) accounted for 37% of employment in Scotland (2015); the three city regions accounted for 72%. Employment in the AGE cities grew slightly less in the AGE cities than in Scotland as a whole between 2010 and 2015, but there were significant differences between them, with Edinburgh recording growth of 6.9% compared with only 1.3% in Glasgow. The Aberdeen city region grew most rapidly (8.1%) in this period (Figure 5-10: Employment in the AGE cities and city regions 2010 – 2015).

Cities Outlook (from the Centre for Cities) monitors the performance of 63 UK cities annually, using 47 economic, labour market, quality of life and environmental measures.¹³⁴ This work characterises Aberdeen and Edinburgh as high-wage, low-welfare cities, whereas the performance of Glasgow is more mixed.¹³⁵

The Scottish Government gives priority to six growth sectors: creative and digital, energy, financial and business services, food and drink, life sciences and sustainable tourism. Although some of these play a key role in the rural economy, the AGE cities still account for a disproportionate share of growth sector employment (45.4%), thanks to the dominant role of Aberdeen in the energy sector, and Glasgow and Edinburgh in digital and financial/business services (Figure 5-11: Employment in the AGE cities and city regions 2010 – 2015 – growth sectors).

By most measures, Aberdeen performs best of the three AGE cities out-performing Edinburgh and Glasgow:

- Aberdeen's key strengths include a large business stock in relation to population; high productivity, expressed in GVA per worker; a high level of patent applications; high export earnings; a low level of dependency on manufacturing and public sector employment; and high workplace wages;
- Glasgow emerges as a post-industrial city transitioning to a knowledge city with a low level of manufacturing employment, a continuing post-industrial legacy challenges in the business stock and patent applications;
- Edinburgh has a similar profile to Aberdeen with key strengths that include a high level of private sector KIBS employment, low dependency on manufacturing jobs, and high average workplace earnings.

Figure 5-13: KIBS jobs by datazone Aberdeen City 2015.
KIBS jobs are concentrated to the north of the city centre around the medical complex and the University of Aberdeen and to the south-west along Anderson Drive.

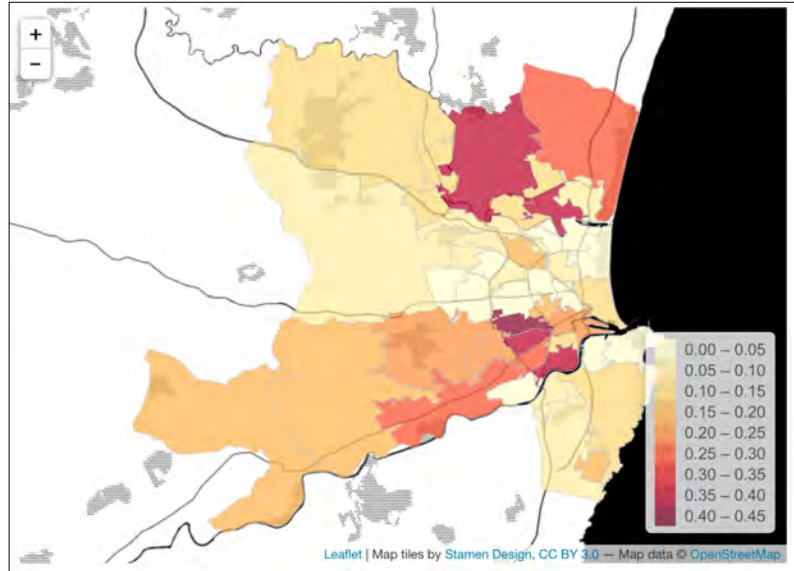


Figure 5-14: KIBS jobs by datazone Glasgow City 2015.
KIBS jobs are located around the universities and medical campuses with a particular concentration in the Blythswood new town.

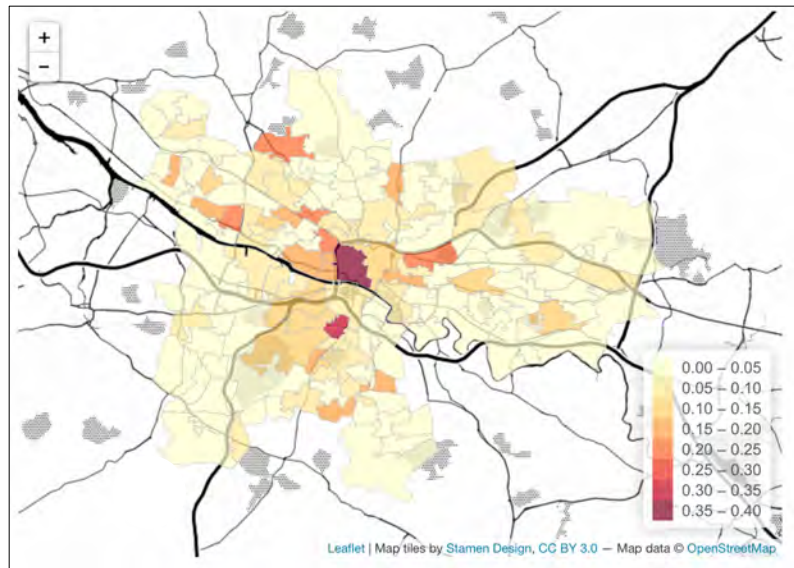
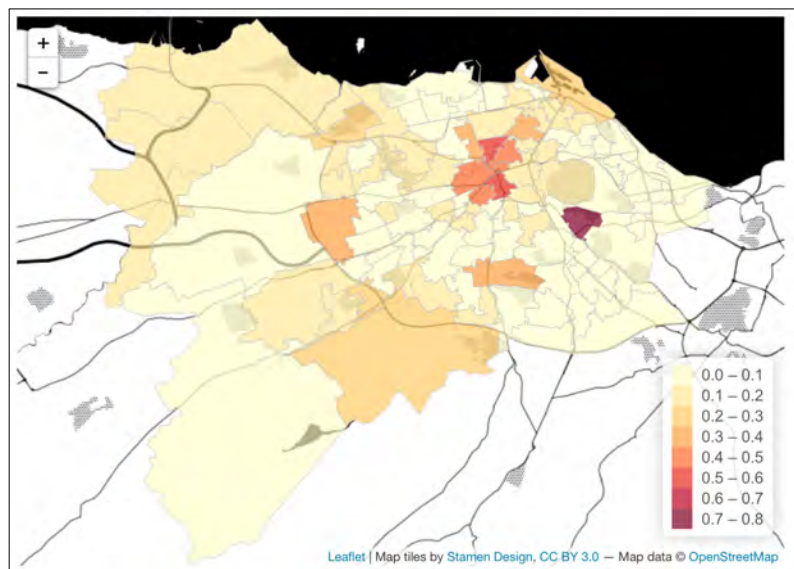


Figure 5-15: KIBS jobs by datazone Edinburgh City 2015.
KIBS jobs predominate in the west of the city centre with a notable concentration around the Royal Infirmary on the south-east.



The performance differences between the three AGE cities is reflected in Scottish Government data on business expenditure on R&D. Businesses in the three AGE cities were responsible for almost half (47.7%) of total R&D spend in 2015. Expenditure in Edinburgh amounted to £213 million (equivalent to £426 per head of population), in Aberdeen to £113 million (£492 per head) and in Glasgow £89 million (£146 per head).

There is also a concentration of high productivity jobs in knowledge-intensive business services (KIBS) in the AGE cities. They account for 18% of employment in the three AGE cities: nearly 60% of Scotland's KIBS jobs are in the AGE cities where business, financial and professional services play key and mutually supportive roles in the city's economy (Figure 5-12: Employment in the AGE cities and city regions 2010 – 2015 – KIBS sector).¹³⁶ Other significant figures include:

- Over 55% of energy sector jobs in the Aberdeen city-region (city 42%);
- Over 72% of financial and business service jobs in Glasgow and Edinburgh city-regions evenly divided 72.2% of (50% Glasgow and Edinburgh cities both evenly divided);
- Over 70% of employment in the creative and digital industries in Glasgow and Edinburgh city-regions (Glasgow city-region 40.0%, Glasgow City 27%; Edinburgh city-region has 30% and city 20%; and
- The Scottish Government has six growth sectors for Scotland: creative and digital, energy, financial and business services, food and drink, life sciences, sustainable tourism. 75% of jobs in the growth sector are in three city regions with 45% in the AGE cities.

There was a sharp decline in employment following the 2008 financial crash, and the recovery has been slow. KIBS employment came under severe pressure in the aftermath of the 2008-09 recession, and it has been slow to recover, but Figures 5-13 to 5-15 (KIBS jobs by datazone Aberdeen City 2015, Glasgow City 2015 and Edinburgh City 2015 respectively) show that these key, high-productivity sectors continue to cluster in city centres and some other favoured locations.¹³⁷ KIBS employment grew faster in the wider city regions than the AGE cities between 2010 and 2015, suggesting that there has been a modest level of suburbanisation of knowledge-intensive employment. Nevertheless, KIBS employment still tends to be highly concentrated in certain locations: in city centres, around universities, hospitals and research centres and in some prime business park locations.

Figure 5-16 (Employment change: Scotland, AGE cities and city regions 2010-2015 Key Sectors) summarises employment change in all categories (total, growth sectors, KIBS) between 2010 and 2015. The Scottish Government growth sectors (which account for about a quarter of all jobs in Scotland) have outpaced the rest of the economy in most locations. The AGE cities account for more than half of all business expenditure on R&D.¹³⁸ Edinburgh (27% of all Scottish expenditure) leads the way, followed by Aberdeen and Glasgow. R&D expenditure in Edinburgh is more than two and half times greater than in Glasgow.

Figure 5-17 (AGE cities and city regions 2015: % share of Scottish population and key sectors) summarises the contribution of the AGE cities to Scotland's prosperity. The AGE cities account for 24.9% of the population of Scotland, 36.9% of employment, 45.4% of growth sector employment, and 58.6% of KIBS jobs.

The Centre for Cities' annual Cities Outlook survey monitors the performance of 63 UK cities using a variety of economic, labour market, quality of life and environmental measures. The Centre for Cities uses primary urban areas (PUAs) as its unit of analysis. For these purposes the Aberdeen and Edinburgh PUAs are deemed to be coterminous with the cities' administrative boundaries, while the Glasgow PUA includes East Dunbartonshire, East Renfrewshire, Renfrewshire and West Dunbartonshire. Figure 5-18 (Cities Outlook rankings for selected measures 2018 AGE Cities [Primary Urban Areas]) shows how the AGE cities perform on a selection of measures. Aberdeen

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Total Employment, Growth Sectors & KIBS

	Population	Employment	Growth sector employment	KIBS employment
Aberdeen	4.3	7.3	10.0	9.9
Glasgow	11.3	16.4	17.6	22.4
Edinburgh	9.3	13.2	17.8	26.3
AGE cities	24.9	36.9	45.4	58.6
Aberdeen City Region	9.2	11.6	15.4	15.5
Glasgow City Region	33.6	34.1	31.6	33.5
Edinburgh City Region	25.1	25.8	27.3	34.7
AGE city regions	67.9	71.5	74.2	83.7

Outlook Ranking	Primary urban areas		
	Aberdeen	Glasgow	Edinburgh
Business stock per 10k population	398	282	364
Rank (of 63)	7	41	15
GVA per worker	£62,711	£47,890	£56,883
Rank (of 62)	6	36	12
Patent applications per 100k population	57	10	18
Rank (of 63)	6	50	23
Exports per job	£18,100	£12,170	£14,990
Rank (of 62)	14	32	22
Manufacturing share of employment	6.23%	5.23%	2.44%
Rank (of 62)	48	52	61
Private sector KIBS share of employment	13.91%	12.73%	21.04%
Rank (of 62)	19	24	3
Public sector share of employment	23.56%	31.42%	30.62%
Rank (of 62)	52	21	27
Average weekly earnings (workplace-based)	£593.40	£525.20	£578.20
Rank (of 63)	6	18	9

Figure 5-16: Employment change: Scotland, AGE cities and city regions 2010-2015 Key Sectors – TOP
 Figure 5-17: AGE cities and city regions 2015: % share of Scottish population and key sectors – MIDDLE
 Figure 5-18 Cities Outlook rankings for selected measures 2018: AGE cities (Primary Urban Areas) – BOTTOM

and Edinburgh outperform Glasgow in terms of business stock, output per worker and patent applications and exports. Wages are also higher in Aberdeen and Edinburgh, although earnings in Glasgow are still above the median level. Edinburgh has an exceptionally high level of KIBS employment and Aberdeen has a low level of public sector employment.

The Working Environment – office and industrial property

Scotland has over 9million sqm of office floorspace, in stock located in over 7,500 locations of mixed age, with significant proportions built before the 1960s and in recent years with a fallow period in the middle. (Figure 5-19: Scotland Office Stock by Ageband). This market concentration is illustrated in Figure 5-20 (Office Take-up September 2015 to September 2017) that compares recent office demand in each city and the wider city regions. The cities now account for 72% of activity in the city regions demonstrating a return to the cities.¹³⁹ The three city regions have 85% (7.7 million sqm) of Scotland's office space (Figure 5-21: AGE City Office Stock) and the AGE cities have 61% (5.6 million sqm). These figures are broadly in line with the respective shares of employment, and they reflect the concentration of KIBS jobs in the three principal city centres.

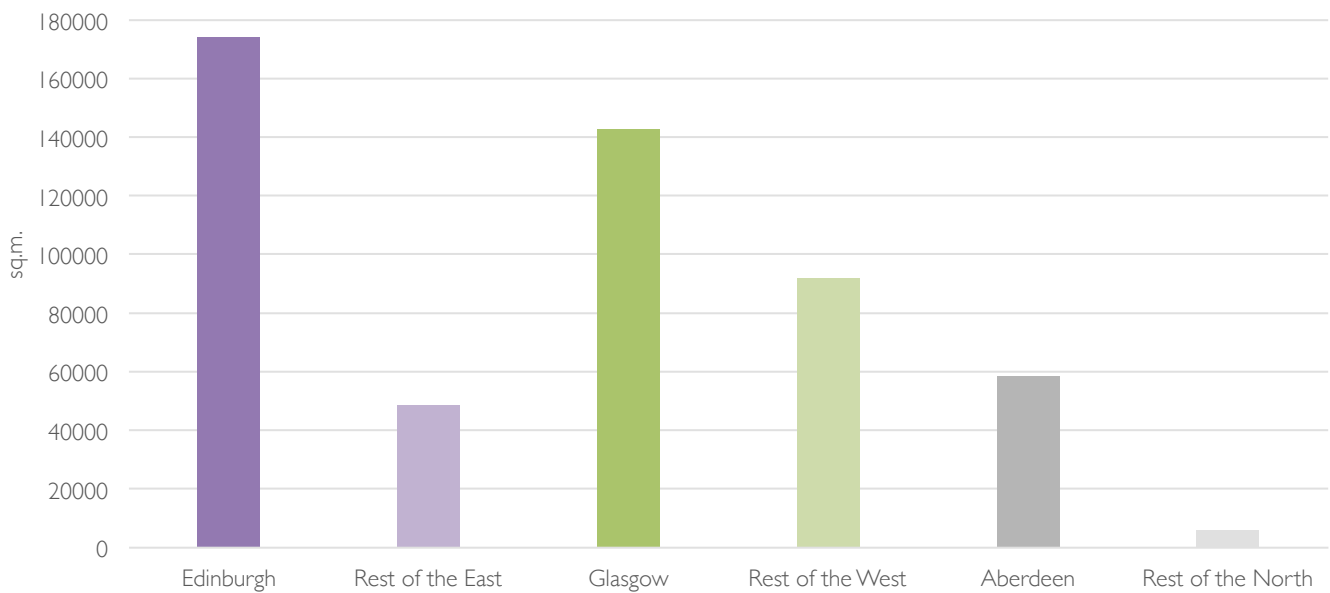
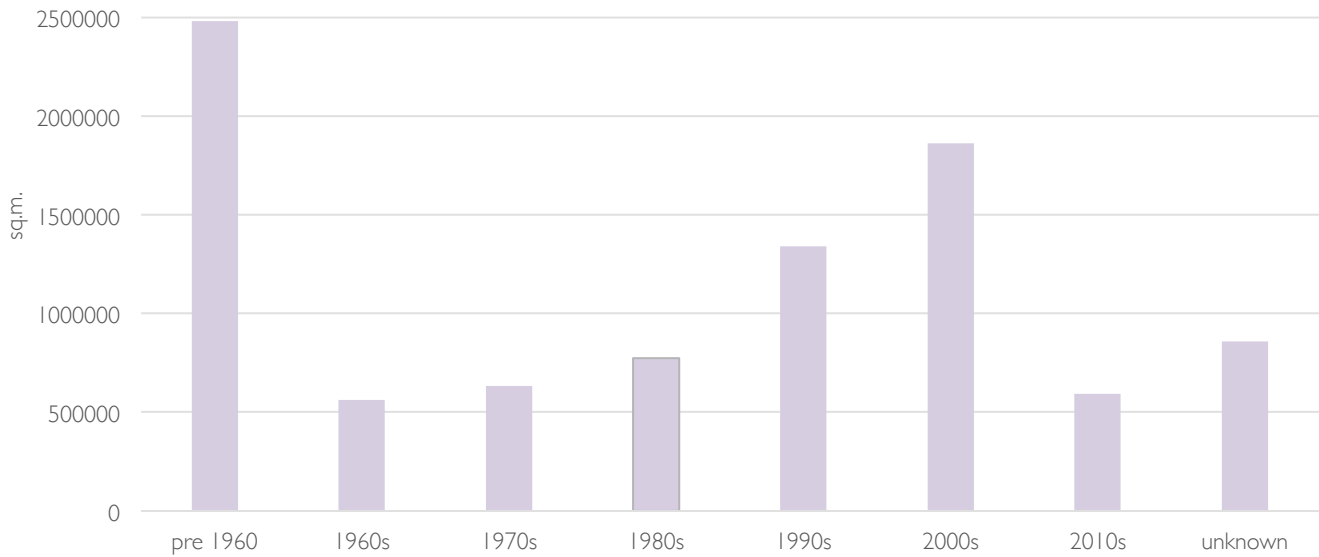
Current office development proposals would add only 7% to office stock in the AGE cities.¹⁴⁰ The current development pipeline of 0.58 million sqm, would add 6% to this stock. Since the financial crash, speculative development has been weak and most investment has been made into existing stock, avoiding development risk. It is clear, therefore, that the replacement rate for office stock is almost as much of an issue as it is with housing stock. A long run of growth in the service sector of the economy has fuelled demand in the office development market, although a parallel trend to more efficient and effective use of space mitigates demand to a degree.¹⁴¹ Continuing technological advance in the service industries is likely to entrench this trend. Agile working is also encouraging growth in wider range of business centres for a broader mix of sectors. The implication for the AGE cities is that smaller, better quality and more 'agile' office space is required and older, obsolescent stock provides an opportunity for re-purposing and changing the use of buildings.

Out-of-town business parks around the edge of cities were a preferred form of development from the late 1980 until the early 2000s (and beyond in Aberdeen where the oil boom drove demand). The current market trend however is to move back into city centres from satellite towns and out-of-town locations as office occupiers rediscover the experience economy offered in city centres in a clear demonstration of the trend towards urban concentration in the knowledge city discussed in Chapter 3.

In comparison with offices, industrial property is more dispersed across city regions. This is due in part to locational needs and demands, and in part to historic regional policy including the work of the New Town Development Corporations and the actions of the Scottish Development Agency. Over time, industry has declined and moved away from cities, to suburban and out-of-town locations, leaving core urban services and location-specific assets such as ports. There is some indication however that clean urban industries such as distilleries and ICT may move back into cities.

Scotland's industrial property stock extends to just over 20 million sqm in 10,400 units. Typically built by the public sector, it is now 35-40 years old, much of this stock was subsequently sold into private portfolios when the New Towns and Scottish Enterprise disposed of their estates in the 1990s and 2000s (Figure 5-22: Scotland Industrial Stock by Ageband). Since the public sector ceased activity, industrial development rates have been exceptionally low. The vacancy rate across this ageing stock is low at 6% and much of this is of poor quality in problematic buildings and locations. A current development pipeline of 0.22 million sqm would only add 1% to stock (assuming that existing buildings are retained and repaired rather than demolished). The age and looming obsolescence of Scotland's industrial stock combined with high occupancy rates has serious future implications for Scotland's economy, particularly in the city-regions with a majority share of the national economy. Arguably this ageing stock could represent misallocated land and capital and become a drag on productivity.

SCOTLAND'S URBAN AGE



City	Region office stock (sq.m.)	City office stock (sq.m.)	City vacancy rate
Aberdeen	1.21	1.03	14%
Glasgow	3.73 million	2.44	11%
Edinburgh	2.74	2.09	7%

Figure 5-19: Scotland Office Stock by Ageband – TOP

Figure 5-20: Office Take-up September 2015 to September 2017 – MIDDLE

Figure 5-21: AGE City Office Stock – BOTTOM

The age profiles of industrial property in the city regions are shown in Figure 5-23 (Age of Industrial Stock by City Region) with 44% of pre-1980 space in Glasgow city region, compared to 33% in Edinburgh and 26% in the Aberdeen (city regions). The Glasgow city region has 42% of Scotland's industrial property stock (reflecting a legacy of regional policy), Edinburgh city region has 21% and Aberdeen city region 10% (Figure 5-24: AGE City Industrial Property). Aberdeen and Glasgow have industrial space within their boundaries, but Edinburgh, with a different economic base, relies on its region for industrial space.¹⁴² A total of 0.20 million sqm of new industrial property is proposed across the three city regions representing only 1.4% additional space – a very low development rate. Although a number of industrial developments are under way, these are mostly bespoke buildings for specific occupiers or terraces of small units in top prime locations (such as Hillington or West Edinburgh). A private sector-led development-and-replacement cycle would be possible if Scotland wishes to compete for advancing manufacturing within the knowledge economy, but it would require high rents or public sector support and strong occupier demand in the face of a limited supply as demonstrated more recently in Aberdeen.

Recreation and Leisure

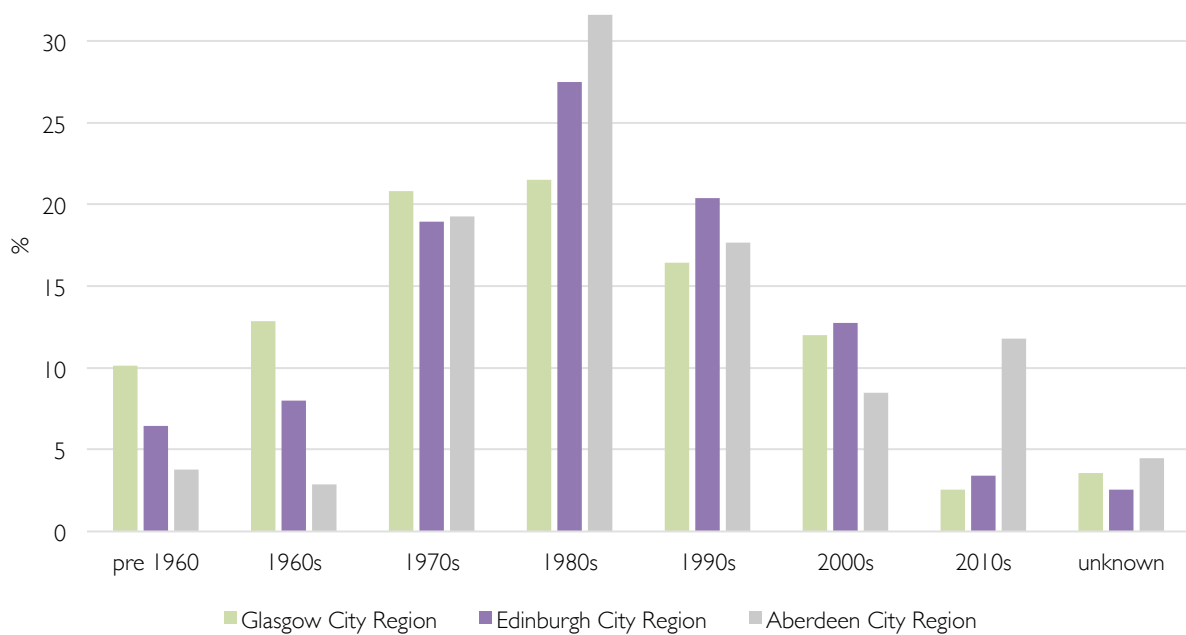
Commercial property (retail and leisure) is dependent on mobility and connectivity and is highly location-sensitive. With higher values and returns than residential or employment property it is becoming increasingly concentrated in prime locations where there is a higher concentration of capital. For decades, expenditure on consumer goods and leisure experiences has been increasing, but people are not necessarily making more shopping trips, while their basket of goods and services has grown ever more diverse.¹⁴³ These trends have favoured a small number of super-prime destinations that serve wide catchment areas and visitor markets.

The AGE city regions contain 71% of Scotland's retail floorspace (11.2 million sqm) while the cities have over half of this total (some 38% of overall Scottish floorspace). However, this underestimates the cities' importance in the retail hierarchy, as it does not differentiate between lower value local stock and more commercially valuable prime floorspace in city centres, where turnovers and rents can be many times higher.

Only a few major centres in Scotland can satisfy consumer aspirations for an extensive range of both retail brands and leisure opportunities such as bars, cafes, cinemas and restaurants. Around half of recent market demand for city centre commercial premises is for leisure uses rather than shops. These fortunate, super-prime locations benefit from a virtuous circle of rising shopper/visitor numbers and constant operator/developer interest as consumers increasingly prefer the wider, and constantly upgraded, retail and leisure choice on offer. In recent years around half of the market demand for AGE city centre commercial premises has come from leisure uses – bars, restaurants, cafes and sometimes hotels and cinemas – rather than shops. These locations – which include the AGE city centres and major malls on the outskirts of Glasgow and Edinburgh – are adept at accommodating this diversifying range of uses, and investing to extend their customers' dwell-time and spend. This is evidence in Scotland's principal cities of the emergence and dominance of the experience economy that is trending internationally as discussed above in Chapter 2.¹⁴⁴

On-line shopping is growing and now accounts for 16% of all retail spend.¹⁴⁵ For existing retailers this is increasingly leading to multi-channel, 'clicks-and-bricks' solutions, where online purchases are collected from or distributed by physical stores, and not all retailers have high-street stores: in floorspace terms Scotland's largest 'shop' is the Amazon fulfillment centre in East Dunfermline. The growing market concentration in super-prime centres is illustrated by Ryden's prime retail rent index for Scotland.¹⁴⁶ Figure 5-25 (Prime Retail Rents) separates the AGE cities from the remainder of the top 20 Scottish retail centres.¹⁴⁷ Figure 5-25 also shows that the 2008 financial crash was a watershed for the retail sector, which has stimulated the growth of super-prime centres and accelerated stagnation or decline elsewhere. The process is not yet complete and many household names have their shop portfolios under review, with the likelihood of further store losses outside of the super-prime centres.¹⁴⁸ These market trends have focused new commercial development into a few favoured locations concentrated in the AGE city centres and a severely limited development pipeline indicates market caution based on slow expenditure growth and an increasing

SCOTLAND'S URBAN AGE



City	Region industrial stock (sq.m.)	City industrial stock (sq.m.)	City vacancy rate
Aberdeen	2.06	1.44	5%
Glasgow	8.71	2.79	6%
Edinburgh	4.41	1.04	4%

Figure 5-22: Scotland Industrial Stock by Ageband – TOP

Figure 5-23: Age of Industrial Stock by City Region (by % of floorspace) – MIDDLE

Figure 5-24: AGE City Industrial Property – BOTTOM

displacement of expenditure online. The major developments currently underway are all within the AGE cities with the exception of with exception of East Kilbride and Cumbernauld in Glasgow city region. These new developments will further reinforce the market advantages of the three major cities.¹⁴⁹

This analysis of industrial and office space on the ground in the AGE cities represents further evidence of the paradigm shift from industrial to knowledge cities in Scotland, within the context of the international trends towards urban concentration described in Chapter 3.

Mobility and Connectivity

All competitive urban systems are dependent on excellent systems of mobility and communications. Scotland's Central Belt is the most highly inter-connected part of the country and transport infrastructure has been improved significantly in recent years and the City and City Region Deals will deliver further investment.

The completion of the M8 and the electrification of the Edinburgh-Glasgow rail link are welcome improvements as is the restoration of the rail link between Airdrie and Bathgate. The Waverley Line now connects Edinburgh to the Borders, and there are newer, faster trains between Glasgow and Ayrshire. A tram service now connects Edinburgh Airport to the city centre and a new railway station – Edinburgh Gateway – assists connections from the Airport north to Aberdeen and Dundee. A programme of improvement to major stations including Edinburgh's Waverley and Haymarket and Glasgow's Queen Street is underway. These strategic investments are complemented by local transport services of variable quality: Edinburgh has an excellent bus service but only a very limited suburban rail network; Glasgow has an extensive rail network and subway, but bus services are fragmented and often of poor quality.

Connections between Edinburgh or Glasgow and Aberdeen are slow and time-consuming, whether by road or rail, and the quality of rail services is generally poor. The rail journey from Aberdeen to Edinburgh or Glasgow is characterised by a series of suburban services joined end to end. Passengers travelling from city to city endure numerous stops and periods of overcrowding particularly during commuter times. Journey times of 2.5–3 hours mean that Aberdeen is relatively isolated from the Edinburgh-Glasgow nexus. Although completion of the Western Peripheral Route will reduce chronic congestion on the A90 and improve connections to and from the towns north of the city, this is no substitute for rapid inter-city transportation available throughout Europe.

Scotrail is committed to increasing the number of seats on the system by 23% in the period to 2019 and to the introduction of high speed trains to operate on inter-city routes serving the 7 cities in 2018.¹⁵⁰ This is a welcome step as Aberdeen in particular is poorly served by inter-city services. Whereas improvements to the franchised services are welcome, one of the principal issues affecting Scotland's railway network is the aged nature of the track system owned and operated by Network Rail. Even if services are improved and the travelling experience is enhanced, this benefit is limited if the track system means that routes are circuitous and speeds slow. Nonetheless, the introduction of some inter-city express services together with improved rolling stock and an enhanced on-train offer including high-speed wifi will be of some help in supporting business inter-connectivity between Aberdeen and the Central Belt.

Transport in the Glasgow and Edinburgh metropolitan region – an area comparable in size to the Ruhr-gebiet – has improved greatly in the past decade, especially in terms of strategic infrastructure, but there is still a long way to go to match the cohesive, integrated networks found in cities in France, Germany and the Netherlands. Aberdeen city and region is an area that has traditionally been car dependent and its suburban rail services are fragmentary and infrequent, and bus patronage is low.¹⁵¹

If connections within and between the city-regions are a continuing challenge, Scotland also needs fast and reliable surface connections to London, and other UK, European and international cities. Figure 5-26 (Direct flights from Scottish airports to international hubs) shows that Edinburgh,

SCOTLAND'S URBAN AGE



Principal Scottish Airports

EU hub destinations	Aberdeen	Glasgow	Edinburgh
Amsterdam	✓	✓	✓
Frankfurt	✓	✓	✓
Istanbul			✓
London Heathrow	✓	✓	✓
Paris CGD	✓	✓	✓

Principal Scottish Airports

Major UK cities	Aberdeen	Glasgow	Edinburgh
Belfast	✓	✓	✓
Birmingham	✓	✓	✓
Bristol	✓	✓	✓
Cardiff	✓	✓	✓
East Midlands	✓	✓	✓
Exeter		✓	✓
Leeds/Bradford	✓	✓	
London City	✓	✓	✓
London Gatwick	✓	✓	✓
London Luton	✓	✓	✓
London Southend		✓	
London Stansted	✓	✓	✓
Manchester	✓	✓	✓
Newcastle	✓		
Norwich	✓		✓
Southampton	✓	✓	✓

Figure 5-25: Prime Retail Rents – TOP

Figure 5-26: Direct flights from Scottish airports to international hubs – MIDDLE

Figure 5-27: Direct flights from Scottish airports to major UK cities – BOTTOM

Principal Scottish Airports

European capitals and major cities	Aberdeen	Glasgow	Edinburgh
Barcelona		✓	✓
Bergen		✓	
Berlin		✓	✓
Bilbao			✓
Bologna			✓
Bordeaux		✓	✓
Bratislava			✓
Bremen			✓
Brussels		✓	✓
Bucharest		✓	
Budapest		✓	✓
Copenhagen	✓		✓
Dublin		✓	✓
Dubrovnik		✓	✓
Dusseldorf		✓	✓
Eindhoven			✓
Gdansk	✓	✓	✓
Geneva	✓	✓	✓
Gothenburg			✓
Grenoble		✓	✓
Hamburg			✓
Helsinki			✓
Katowice		✓	✓
Krakov		✓	✓
Lisbon		✓	✓
Lyon			✓
Madrid		✓	✓
Marseille		✓	✓
Munich		✓	✓
Nantes			✓
Naples	✓	✓	✓
Nice			✓
Oslo	✓		✓
Porto			✓
Poznan			✓
Prague		✓	✓
Reykjavik	✓	✓	✓
Riga	✓	✓	
Rome		✓	✓
Sofia		✓	✓
Stavanger	✓		
Stockholm			✓
Stuttgart			✓
Szczecin			✓
Toulouse			✓
Turin		✓	✓
Vienna		✓	✓
Warsaw	✓	✓	✓
Zurich			✓

Figure 5-28: Direct flights from Scottish airports to European capitals and other major cities

Glasgow and Aberdeen have direct air services to London Heathrow and the major European hub airports including Amsterdam, Paris CDG and Frankfurt as well as scheduled air services to the great majority of major UK cities (Figure 5-27: Direct flights from Scottish airports to major UK cities).

An informal survey shows that there are direct services (not all of them daily) between the main Scottish airports and a total of 49 capital cities and large regional centres in Europe. Of these, the great majority (45) have services from Edinburgh, 28 from Glasgow and 9 from Aberdeen (Figure 5-28: Direct flights from Scottish airports to European capitals and other major cities). Journey times to British cities by other modes of transport are relatively slow, especially from Aberdeen. The A1, the main road linking Edinburgh and the east of Scotland to England is still a single carriageway for long stretches on both sides of the border with no immediate prospect of a motorway standard connection. Rail services between London and Edinburgh/Glasgow take 4.5–5 hours, and while new trains will improve journey times, a recent report by Transport Scotland reports that there is still “*no certainty*” that planned high-speed rail links will be extended in Scotland. This would be a big prize, but is at best a long term prospect.

Knowledge and Learning

Scotland has seven of the UK's 50 top-ranked universities and the top three universities are in the AGE cities: Edinburgh ranked 6th, Glasgow 10th and Aberdeen 28th. Research Fortnight magazine uses the Research Excellence Framework (REF) results to create an index of the ‘research power’ of universities with Edinburgh is ranked 4th, Glasgow 13th, Strathclyde 30th and Aberdeen 31st.¹⁵²

Whereas these figures provide useful indicators of the position of the leading HEIs located in the three cities, it is the overall knowledge capacity in these universities together with the KIBS jobs and other knowledge capacity in the cultural and creative industries that give the AGE cities their principal competitive advantage and the basis for future growth. For example, in the period from 2000 to 2010, the University of Edinburgh created 244 spinout and startup companies, the highest in the UK outside of London.¹⁵³

Institutional uses such as education (and healthcare) are critical services and part of the AGE cities' competitive advantage as centres of the knowledge economy through the provision of KIBS jobs in particular. These sectors appeared to be relatively insulated from automation and other threats, and therefore contribute to city resilience as well as acting as attractors and key services. A significant wave of modernisation of (often Victorian) facilities began in the 1990s through initiatives such as PFI and its variants and successors. Until the 2008 crash, this wave of investment was buoyed by a high point of public finance and private sector cross-funding. Although the funding situation is now more challenging, areas of continuing property investment have included the leading universities, colleges and schools programmes. The cities' larger and higher order institutional functions are comparatively successful at attracting new investment. It is the regional towns that suffer most from the combined forces of contracting public services and private sector dis-investment are most acutely felt, creating a continual regeneration challenge.

Poverty and Deprivation

Scotland's AGE cities are characterised by uneven development. The three major cities have experienced very different trajectories of change in the post-industrial era, and the same is true within city-regions as some locations have thrived while others have been left behind. Even in the most prosperous and successful places there are pockets of persistent poverty and deprivation. Uneven development is inevitable, but the challenge for city regions is to adapt quickly to prevent struggling areas from being locked into a cycle of decline, and to reconnect less favoured places to areas of opportunity.

Achieving this kind of resilience is a complex and multi-faceted task, but an accessible and well-connected urban system has an important role to play in facilitating an efficient labour market, promoting productivity and enriching the quality of life. European metropolitan areas such as the Ruhrgebiet combine efficient road connections with extensive and integrated public transport

Figure 5-29: Aberdeen –Scottish index of multiple deprivation.

The geography of deprivation in Aberdeen is concentrated in a northerly arc running east from Pittodrie through Kittybrewster, Mastrick and Sheddocksley to Hazlehead; and a southerly arc west from Garthdee, through Kincorth, Craiginch to Torry and East Kirkhill.

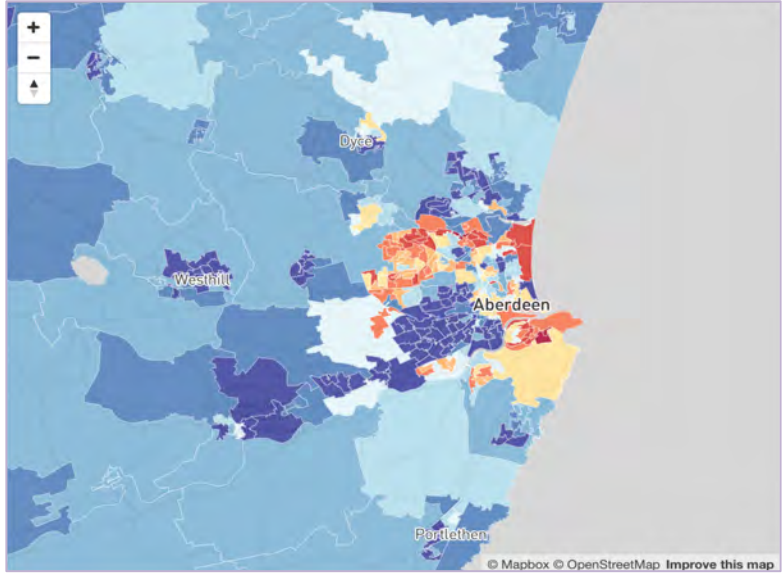


Figure 5-30: Glasgow–Scottish index of multiple deprivation.

Deprivation encircles Glasgow city centre with concentrations in: the north (from Clydebank east through Drumchapel to Springburn); the east (Bridgeton to Easterhouse; and the (Castlemilk, Pollok, Govan & Govanhill). The prosperous suburbs of the city lie outside its boundary in the north (Bearsden & Milngavie; Lenzie and Bishopbriggs) and in the south (Newton Mearns & Giffnock). It is impossible to understand Glasgow's economic geography within the existing city boundary.

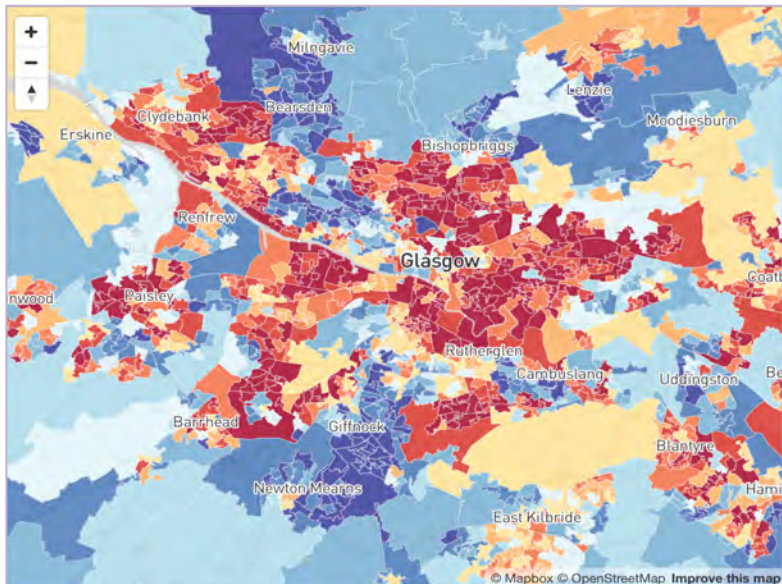
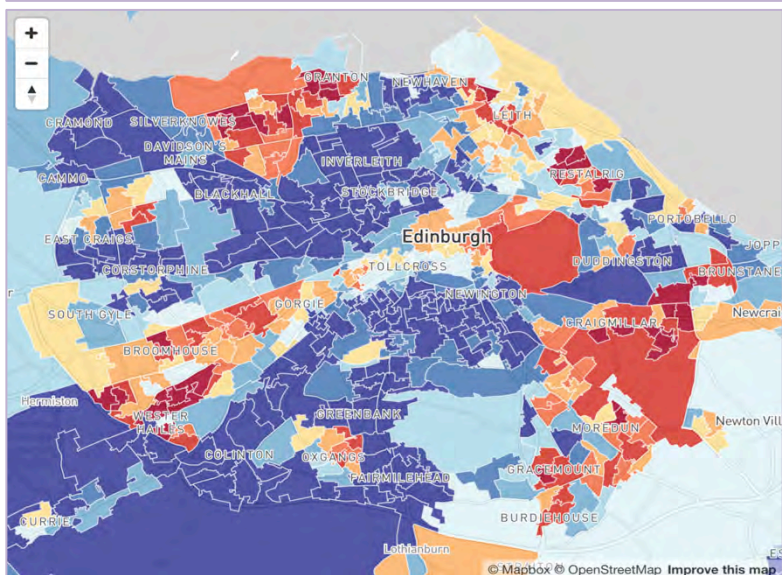


Figure 5-31: Edinburgh–Scottish index of multiple deprivation.

There are three wedges of deprivation in Edinburgh: north-west (Granton & Silverknowes); west (Wester Hailes & Geogrie) and south-east (Burdiehouse & Craigmillar).



services to facilitate movement throughout a complex polycentric urban system, enabling people to access work, education, leisure, culture and entertainment.

The Scottish Index of Multiple Deprivation (SIMD) maps the geography of poverty and deprivation at small area (datazone) level. The main index measures multiple deprivation, with more detailed analysis of seven 'domains': income, employment, health, education, geographical access, crime and housing. All large cities contain pockets of deprivation, often concentrated in particular localities. Figures 5-29 to 5-31 (Scottish Index of multiple deprivation Aberdeen, Glasgow and Edinburgh respectively) show the geography of poverty in the AGE cities. There are significant concentrations of multiple deprivation in Aberdeen and Edinburgh, although they are scattered across both cities. For reasons described earlier, Glasgow still contains areas of the city with high levels of poverty among the 10% most deprived places in Scotland. The way local authority boundaries are drawn has an effect on the geography of deprivation in the AGE cities with a substantial part of Glasgow's knowledge workforce domiciled within surrounding authorities to a much greater degree than Edinburgh or Aberdeen.

Culture

All three AGE cities are well endowed with civic and cultural facilities, the majority built during the Georgian and Victorian eras. All have excellent theatres and both Edinburgh and Glasgow have excellent contemporary theatre companies. There are national orchestra, opera and ballet companies headquartered in Glasgow that deliver a programme in all three cities and other locations in Scotland and Edinburgh benefits from most of Scotland's national institutions funded by the national exchequer, a further benefit of the 'capital city effect'

All three cities have refreshed and kept their cultural offer up to date with significant improvements to His Majesty's, Aberdeen; Citizens, Glasgow and the Festival theatre, Edinburgh. Edinburgh's International Festival is ranked as one of the world's leading festivals and Glasgow has developed an international reputation for the recovery of culture through its success with international events and home grown festivals including 'Celtic Connections' – one of the worlds premier winter festivals. These cultural programmes make a considerable contribution to the cities' economies:

- In 2010 the twelve Edinburgh Festivals between them generated additional output of £245m in Edinburgh and £261m in Scotland, and supported 5,242 new FTE jobs in Edinburgh and 4,917 in Scotland.¹⁵⁴
- During the 11 days of the Commonwealth Games in Glasgow 2014, there were over 500,000 visits to the Festival 2014 venue at Glasgow Green, and more than 3.4m travellers passed through Glasgow Central Station. Scottish companies won £290m of Tier 1 Games related contracts, and created 500 spaces for New Entrant Trainees. The Games helped to secure a further 37 high profile national events for Scotland with an estimated economic impact of £14m.¹⁵⁵

Place, Image and Identity

Whereas the analysis and the many figures presented here are necessary to understand the make-up and performance of the AGE cities, these do not by themselves convey a complete picture. A city is a much more complex phenomenon where the aesthetics and physical quality – the 'look' of the place and the culture and character of its people play a prominent role in its image and identity and have an intangible but nevertheless significant impact on the appearance and confidence exhibited by cities. Scotland's principal cities are fortunate to have an historic urban form and pattern. Remnants of medieval form are present in all three cities and prominent in the old town of Edinburgh. Georgian and Victorian townscapes provide an expressive fabric for all three cities. In spite of 20th century injustices narrowly missed or visited upon the fabric, the AGE cities recognise, value and enhance their built heritage. All three of Scotland's principal cities have been ardent adherents to cultural and physical development and regeneration that has paid dividends in terms of the image and reputation of the cities (Figure 5-32: Urban Regeneration in Aberdeen, Glasgow and Edinburgh).



Provost Skene's House, City Centre Masterplan, Aberdeen



Sauchiehall Street, Avenues Project, Glasgow



Carltongate Development, Edinburgh

Figure 5-32: Urban Regeneration in Aberdeen, Glasgow and Edinburgh

The EU prepares an annual survey of quality of life in the medium sized cities of Europe. A recent analysis by Glasgow School of Art compared Glasgow against five benchmark cities from the survey (Amsterdam, Barcelona, Berlin, Copenhagen and Manchester), Glasgow performed consistently second to Copenhagen against a wide range of criteria.¹⁵⁶

These qualities are hard won and require to be husbanded. Many of the signature developments in the AGE cities have received plaudits, but a not inconsiderable proportion of new development has attracted criticism:

*"The panorama of Scottish architecture in the 1990s, 2000s and 2010s is the same landscape of tacky, multi materials luxury flats, botched non-planning and iconic brand projects that you would find in the north of England at the same time. The largest scale development, such as Edinburgh 35 Harbour in Leith or the redevelopment of the Clyde with call centres and luxury flats, have been indistinguishable from contemporary practice in Bristol or Birmingham."*¹⁵⁷

As evidenced in Chapter 4, the importance of 'place' plays an increasingly important role in the attractiveness and competitiveness of a city in the knowledge age. These intangible characteristics are extremely important.

Conclusions

This chapter presents an account of the condition and prospects of the AGE cities, individually and collectively. The data reveals three inherently strong cities but with diverse and varying strengths, advantages and trends. Edinburgh is revealed as the strongest performer of the AGE cities in respect of economy and it faces fewer problems of disadvantage than Aberdeen or Glasgow. Whereas Aberdeen's economic performance has been strong over the past 20 years or so, this has stalled with its reliance on oil and the challenges facing this industry. By contrast, Glasgow has emerged more strongly at the start of the 21st century after a protracted period of consolidation and regeneration in the latter part of the 20th century and it remains hampered by the legacy of its industrial past. The concentration of population in the AGE cities and their immediate hinterlands reflects the international trend to urban concentration and the fact that capital cities tend to outperform the other cities in the country, demographically and economically.

In Scotland and its principal cities, the current house building rate is suppressed and clearly inadequate for the country's demographic needs. Although the pre-crash housing bubble was less extreme in Scottish cities than elsewhere, it has led to a considerable adjustment and a risk averse market leading to an extremely low replacement rate such that every new house needs to last for more than 150 years. In turn this has directed demand into the resale market that has led to house price inflation, high land values and a socially divisive system. The private sector build-and-sell model delivers four-fifths of new homes in Scotland which favours viable, growing markets.

Since the crash of 2008, the requirement to deliver infrastructure and public goods has become an unseen drag on development which in turn has put strain on the planning system with a requirement to coordinate numerous disparate organisations and agencies to achieve the delivery of public goods and infrastructure through a potentially weak and time-consuming process with uncertain outcomes that the new planning bill before the Scottish Parliament hopes to address. As an alternative, it may be that 'bundling' the delivery of infrastructure and public goods into City and City-region Deals could offer a more creative approach.

The relationship between owner-occupied, private rented and affordable housing sectors is complex and dynamic with owner-occupation falling from a peak in 2008. Scotland's housing policy and strategy clearly recognise and support the need for a more diverse housing system, but the predominant, selective private sector delivery model tends to eschew affordable, rented and alternative housing. To effect systemic change in the predominantly selective private sector delivery model for the housing market in a few decades is a very significant change and will take time to work out and work through. A rented housing market that is mid-market, affordable and professional is required, but the build-to-rent/private rented sector model is selective and favours

prime locations. The AGE cities have developers and providers of affordable stock, however the cities also have the most diverse, fastest-growing and mobile populations with changing needs and demands from an ageing population.

The requirement to accelerate and diversify house building raises funding and capacity challenges as well as civic and planning issues. Scotland is not building enough new homes and there is a need to detoxify the debate around the subject by establishing an inclusive conversation in order to establish a better national case for housebuilding as part of a concerted programme of investment in civic assets, public spaces and sustainable communities. In this respect, housing needs to be repositioned as living and an enabler of better placemaking in the AGE cities and in Scotland nationally.

A significant proportion of Scotland's employment is concentrated in the three principal AGE cities and their regions. This concentration greatly increases when considering the growth sectors identified by the Scottish Government, increases further when considering KIBS jobs and the degree of concentration and specialisation in creative and digital industries financial and business services in Glasgow and Edinburgh and energy in Aberdeen. This reflects the international trend across the UNECE countries with advanced economies towards both urban concentration and concentration of the knowledge economy in the principal competitive cities of most countries. By many indicators, Scotland is faring well and is well placed to compete in these industries but there is no cause for complacency. There was a sharp decline in employment following the 2008 financial crash, and recovery has been slow. Scotland is 'on-trend' with the best of the UNECE countries and holding its own with the OECD countries in terms of its the knowledge economy.

Central Scotland has very good inter-connectivity if not yet comparable with similar European inter-urban systems. Whereas improvements to the Scotrail service are to be welcomed, ownership of the track system by Network Rail means that any true high-speed services in Scotland are hampered by the numbers game on the UK rail system and the constant imperative to improve the system in London and the south-east. The AGE cities do however have reasonable air-connectivity within the UK and internationally.

Whereas the analysis and the many figures presented here are necessary to understand the make-up and performance of the AGE cities, a city is a much more complex phenomenon where the aesthetics and physical quality – the 'look' of the place and the culture and character of its people play a prominent role in its image and identity and have an intangible but nevertheless significant impact on the appearance and confidence exhibited by cities. In the knowledge age where the importance of place has been seen to play an increasing importance in the attractiveness and competitiveness of a city, these intangible characteristics are extremely important to the AGE cities in Scotland.

SCOTLAND'S
URBAN AGE

6

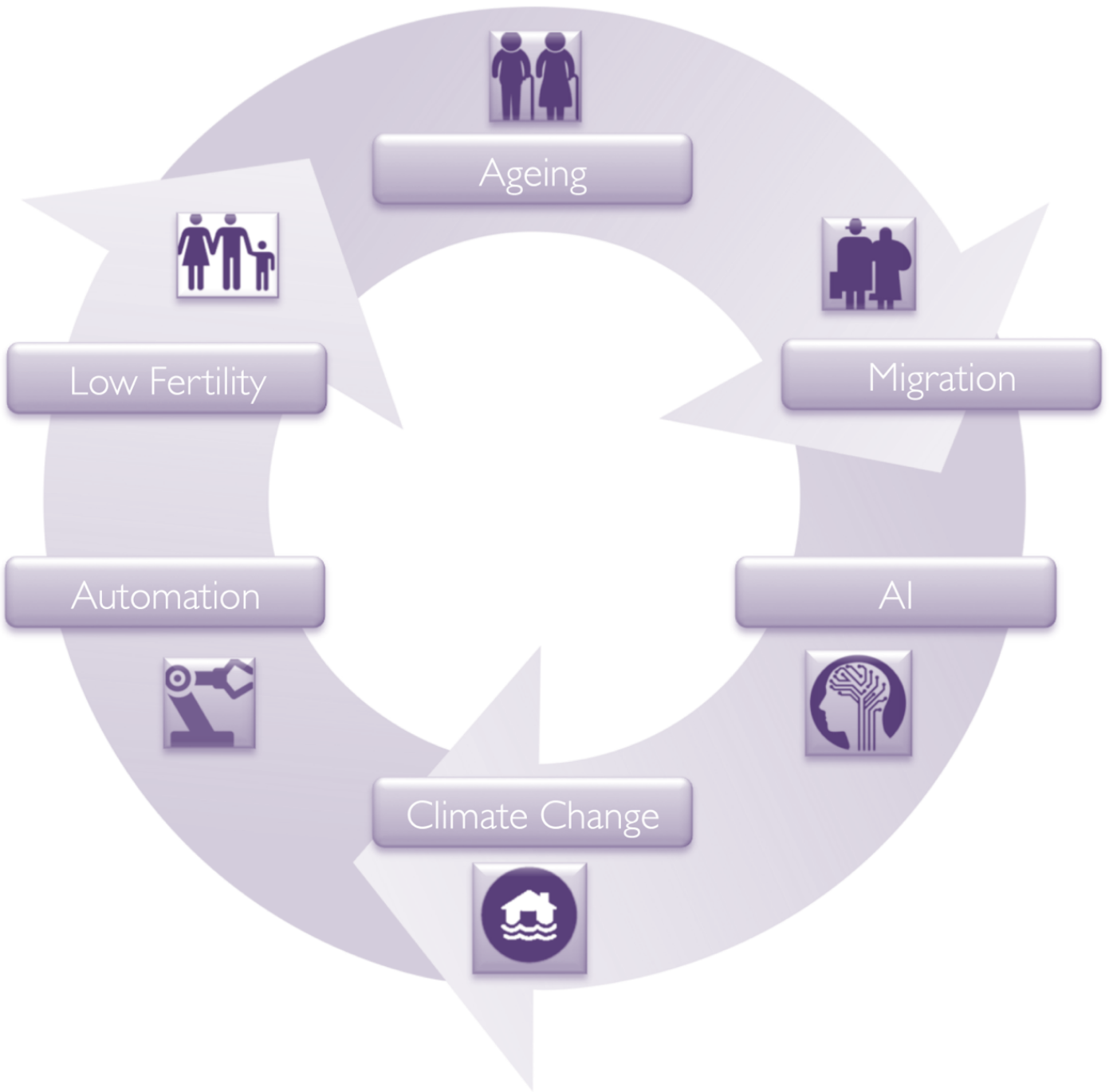
Towards

a

New Urban Agenda

for

Scotland



6: TOWARDS A NEW URBAN AGENDA FOR SCOTLAND

Scotland's major cities form a distinctive subset of the UK's urban hierarchy. Like the rest of the UK they operate in the shadow of London. The net effects are hard to gauge and contentious: are Scotland's cities – like those in the north of England – missing out on essential investment because of London's demands and opportunities, or do they all benefit from the wealth generated by a global city? Similar questions, of course, are asked wherever global cities are found.

Regardless of the London factor, Scotland's devolved status, its geography and its separate institutions and structures mean that it is legitimate to talk, albeit with some qualifications, in terms of a Scottish urban system. This document has described that system and the forces that impact on it in Chapters 4 and 5. Here, the threads of that discussion are pulled together to offer a view of the condition and prospects of the AGE cities and their regions.

Scotland does not have a single dominant city. It is better described as a duopoly of two major cities – bi-centric as opposed to polycentric. Edinburgh's recent growth to just in excess of 500,000 people means that it has become a medium sized city in international terms alongside Glasgow which with its own tightly bounded population of over 600,000 and a Primary Urban Area of 1.25 million is Scotland's only metropolitan city. Glasgow and Edinburgh whilst near neighbours, remain separate cities, fulfilling complementary roles and offering different urban experiences. Together with their own city regions, the Lothians, Fife, Ayrshire, Stirling and 'Greater' Falkirk the Central Belt remains Scotland's primarily metropolitan area and not insignificant compared to European examples comparable in scale if not in population or economy to Randstad in the Netherlands (see below). (Figure 6-1: Central Scotland and Randstad, Netherlands). Geographically and in other respects, Aberdeen is something of an outlier: a prosperous city, highly dependent on a single industry and, despite its modest scale, a global player. Inverness is a regional capital and Dundee and Perth are regional cities that complete an arc of settlement from Edinburgh north to Aberdeen. The closest European comparison, at least in terms of the size of its cities, is Sweden, with Stockholm (population 850,000), Gothenburg (510,000) and Malmö (293,000) the largest metropolitan areas (Figure 6-2: The Swedish Urban System shown in similar way to the Scottish Urban System). Sweden also has a group of small cities, some of them like Uppsala and Umeå very successful and the string of small cities north from Stockholm along the Baltic Coast is similar to the settlement pattern from Edinburgh north to Aberdeen along the North Sea Coast.

Scotland has seven cities and Dundee, in particular, is a dynamic and fast-changing place with an outstanding university, specialist research strengths, the new V&A Museum of Design and a growing technology sector. Available data and evidence confirm, however, that the AGE cities are the key drivers of the Scottish economy, and the focus of this research. This does not infer nor preclude a more significant role in the future for the small cities and towns of Scotland. Scotland has an urban system, the AGE cities sit at the head of the hierarchy but there is a systemic relationship and interdependence between the large and the small and the rural that make Scotland what it is today.

The trajectories of change in the AGE cities have been plotted over several decades and the results confirm that Scotland's urban system is dynamic and sometimes volatile. A key conclusion is that, over a 25-30 year period, Aberdeen and Edinburgh have performed well in the UK as well as Scottish contexts and Glasgow, burdened by a continuing industrial legacy, has nonetheless committed to a remarkable process of transformation, particularly in this century. The populations of Aberdeen and Edinburgh (and their respective city regions) have grown, especially since the start of the present century, and this has contributed to the west-to-east disparity discussed in Chapter 5. Over the same period, the population of Glasgow is almost unchanged and in the post-industrial communities to the west of the city it declined.

Glasgow: The city's narrative of adaptation and recovery after decades of decline can be understated by the headline statistics about the changing fortunes of the AGE cities. The renaissance of Glasgow since the late 1980s is one of the most remarkable regeneration success

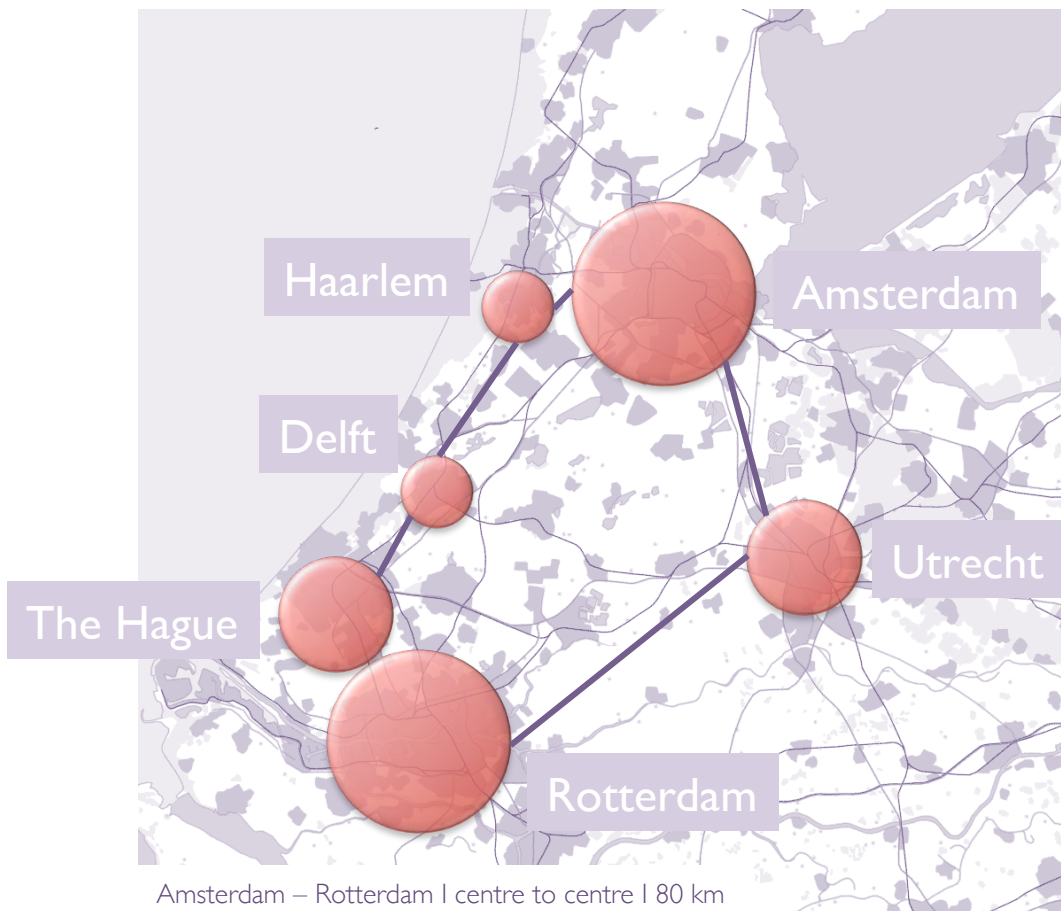
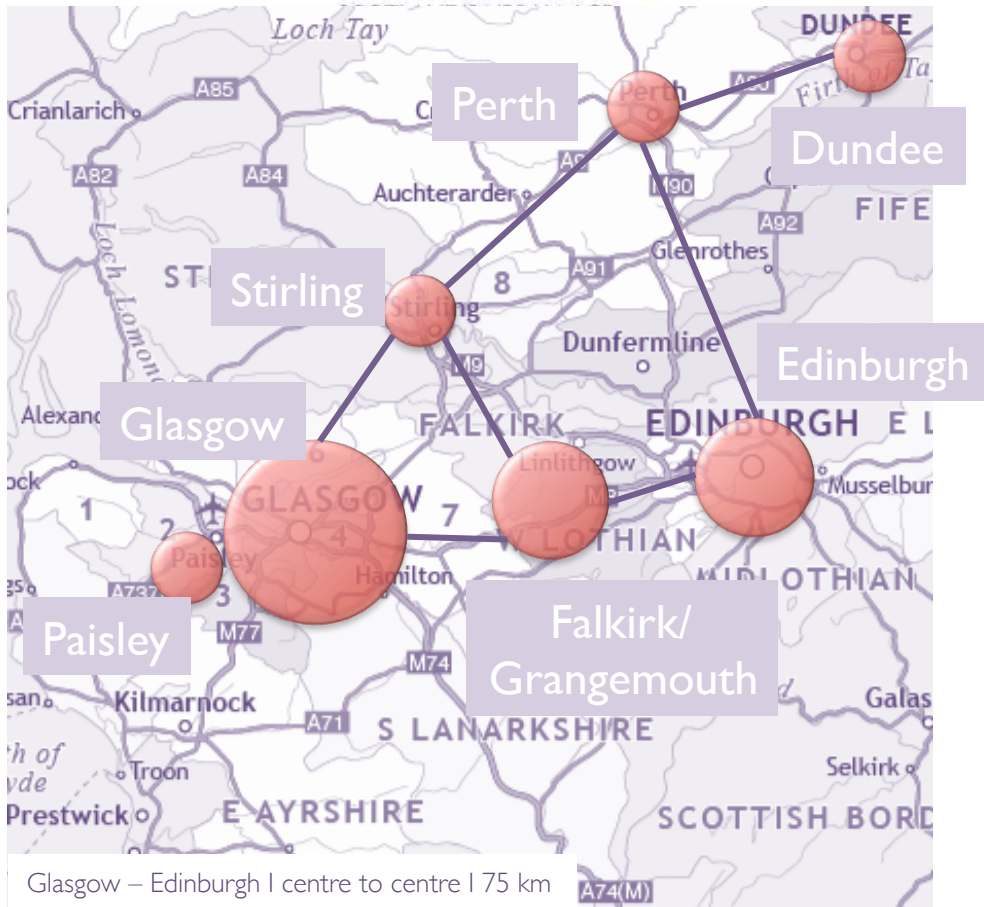


Figure 6-1: Central Scotland and Randstad, Netherlands

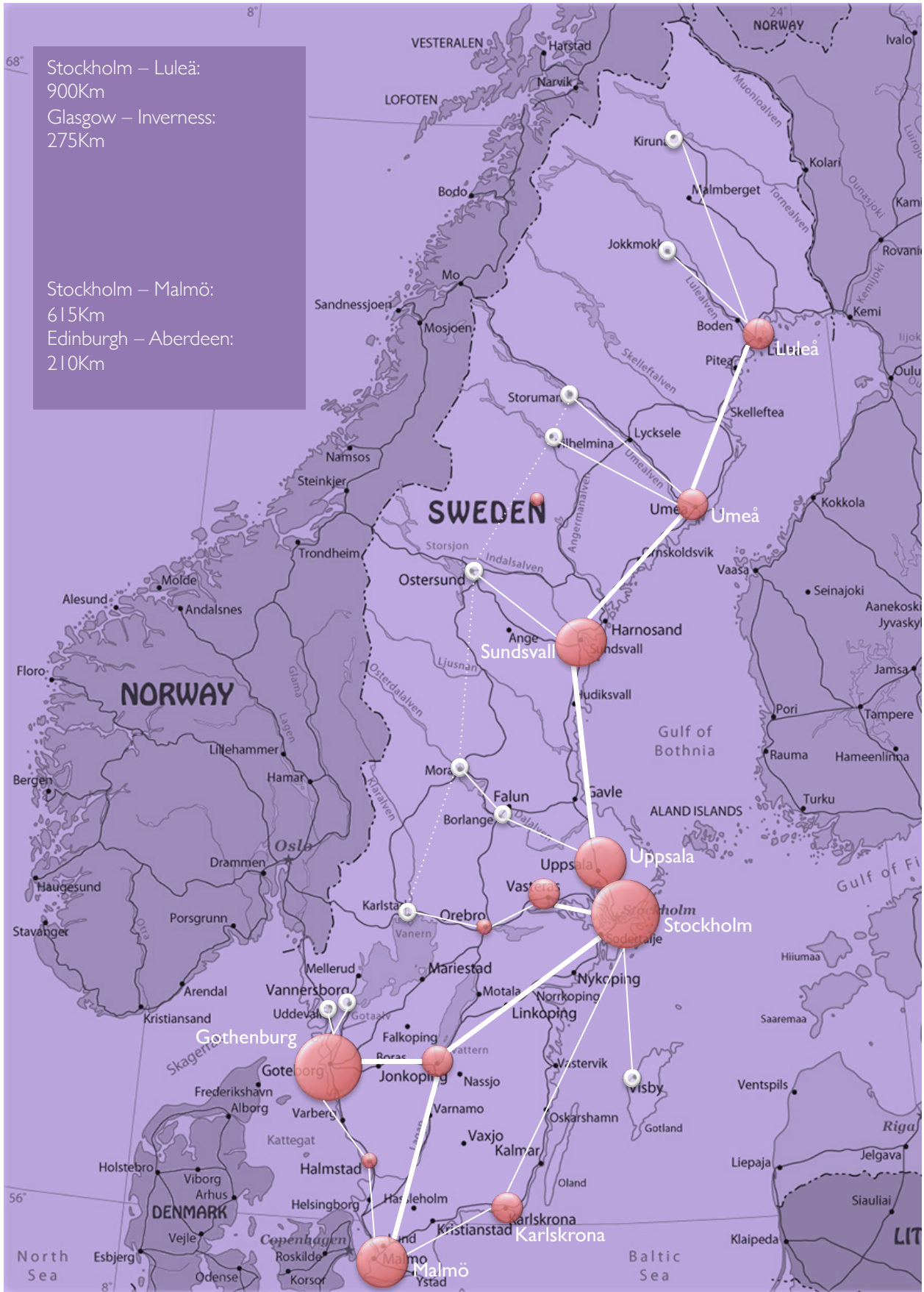


Figure 6-2: The Swedish Urban System shown in a similar way to the Scottish Urban System in Figure 4-6

stories of our time, and it is recognised as such internationally.¹⁵⁸ The city's progress has been marked by high-profile events (the Garden Festival, the European City of Culture, the Commonwealth Games) and campaigns such as 'Glasgow's Miles Better' and 'People Make Glasgow'. The city is renowned for culture, shopping and entertainment; new urban quarters such as the Merchant City and Finnieston have emerged and the public realm has been transformed. There is now a body of evidence to support Glasgow's reinvention as a diverse, outward-looking, post-industrial city through Glasgow's status as the UK's leading retail centre outside of London; visitor numbers and revenue; and population growth in the past decade. Earlier challenging times in the city have been reflected in parts of the city-region, which saw uneven development with population growth in the favoured suburbs and Lanarkshire balanced by decline in Inverclyde and West Dunbartonshire.

The experience of all major advanced economies shows that cities which, like Glasgow, were highly dependent on a few manufacturing industries were particularly vulnerable in the post-industrial era. The process of transition to knowledge cities is slow and painful and, very often, leaves a legacy of persistent poverty, deprivation and physical decay. Nonetheless evidence suggests that the legacy of skill and craft from highly successful industrial centres can, with considerable application be recovered and channelled into creative economies important in the knowledge age.¹⁵⁹ It is for these reasons and its evident tenacity in the face of challenge that Glasgow is keenly observed nationally and internationally.

Edinburgh, by contrast, has long been a diverse economy, a centre for government, business, finance and law as well as the nation's capital with all the inherent advantages this brings. Industry played its part in Edinburgh's past but on a relatively modest scale. Diversification, a skilled workforce, high quality public institutions, a rich architectural and cultural heritage have all contributed to the city's striking resilience, not immune to the effects of the market cycle, but better placed than most to absorb shocks and exploit new opportunities. A buoyant market has enabled the New Town, for example, to achieve a smooth transition from an economy built on business, financial and professional services to a high quality retail and leisure destination with a return to residential use.

The redevelopment of the St James Centre will reinvigorate the east end of the city centre. The troubled tram project and protracted programmes for major developments that have dented the city's reputation may yet recover when the extension to Leith is completed, closing the gap between the city and the waterfront. Edinburgh's livability as a compact city, with excellent quality of life and a diverse housing stock means that, whereas many other cities experience flight to the suburbs, its most prosperous residents often choose to live close to the centre. For this reason population growth in the city has more or less kept pace with its most popular commuter zones in the Lothians.

The relationship (functional and spatial) between Glasgow and Edinburgh is complex. Growth and sprawl have seen the two cities (or, more accurately, their city-regions) grow closer together as their satellite towns and commuter suburbs extend across the central belt with only a small tract of elevated countryside separating the two city-regions. This area marks the boundary between the two cities' spheres of influence, and the travel-to-work areas are still relatively self-contained. Half of Glasgow's workforce commutes from outwith the city, mostly from the surrounding city region that is the most populous of Scotland's city-regions; 35% of workers in Edinburgh are in-commuters, but three-quarters of them travel from the Lothians, Fife and the Borders and not much more than 10% from the Glasgow city region.

Mapping business-to-business and supply chain linkages across the Central Belt would be a worthwhile exercise however research carried out in the north of England suggests that it takes many decades to build integrated regional economies such as those evident in European examples or the critical mass that has been achieved in single world centres like London.¹⁶⁰ High-performance companies are likely to be export-orientated and possibly foreign-owned, and they are locked as

SCOTLAND'S URBAN AGE

Rank	City Name	Country
1	London	United Kingdom
2	Paris	France
3	Vienna	Austria
4	Amsterdam	Netherlands
5	Barcelona	Spain
6	Munich	Germany
7	Berlin	Germany
8	Madrid	Spain
9	Milan	Italy
10	Stockholm	Sweden
11	Copenhagen	Denmark
12	Tel Aviv	Israel
13	Stuttgart	Germany
14	Oslo	Norway
15	Hamburg	Germany
16	Frankfurt	Germany
17	Moscow	Russia
18	Lyon	France
19	Manchester	United Kingdom
20	Helsinki	Finland
21	Dublin	Ireland
22	Rome	Italy
23	Zürich	Switzerland
24	Prague	Czech Republic
25	Leipzig	Germany
26	Cologne	Germany
27	Düsseldorf	Germany
28	Brussels	Belgium
29	Budapest	Hungary
30	Lisbon	Portugal
31	Athens	Greece
32	St Petersburg	Russia
33	The Hague	Netherlands
34	Istanbul	Turkey
35	Edinburgh	United Kingdom
36	Warsaw	Poland
37	Glasgow	United Kingdom
38	Karlsruhe	Germany
39	Rotterdam	Netherlands
40	Bilbao	Spain
41	Geneva	Switzerland
42	Hannover	Germany
43	Mannheim-Heidelberg	Germany
44	Toulouse	France
45	Bristol	United Kingdom
46	Marseille	France
47	Dresden	Germany
48	Eindhoven	Netherlands
49	Nice	France
50	Essen	Germany

Figure 6-3: Innovative cities, the European top 50

much into global business and knowledge networks as local relationships, nonetheless economies of scale do play their part in what economists refer to as agglomeration economies.

Aberdeen illustrates this point well. Its highly specialised economy is dominated by the oil and gas sector, and the city is an international hub for global and locally owned businesses operating in the North Sea and exporting skills, expertise and technology worldwide. Concern about the city's dependency on a single industry has been a consistent narrative for many years, and the impact of the recent oil price crash has highlighted the vulnerability. Despite this, the city's global status, its skilled workforce, high quality universities, specialist research and professional services provide a degree of assurance in order to build for the future. ONE, the private sector economic development company, is leading the drive to diversify the regional economy with a focus on food and drink, life sciences, the digital economy and tourism and leisure. There are signs of confidence returning to the city, but the long-term outlook for both North Sea exploration and fossil fuels is challenging and Aberdeen has attempted to make the transition before. The skills base should help Aberdeen to adapt, people leaving the oil and gas sector are already making an important contribution to the business birth rate and the Granite City itself is one of Britain's finest, shaped in the early 19th century by Archibald Simpson.

Scotland is an urban society and two-thirds of the population lives in the AGE city-regions and, as this analysis has shown, they function as a loose confederation more than a tight-knit urban system. Edinburgh and Glasgow are only 45 miles apart, but they remain quite separate places, with self-contained labour markets and widely acknowledged (though informal) spheres of influence. Aberdeen is Britain's northernmost city of significant scale but every road and rail journey to the Central Belt carries a 2½-hour 'surcharge'. The local labour force still includes a substantial though much reduced number of offshore workers from across the UK and the landward travel-to-work area is almost entirely contained within the city-region. The facts of geography are plain. Nonetheless other countries, notably France, have done a great deal to shrink distance with time by investing in advanced infrastructures to speed communications and enhance mobility in their urban systems.

UK cities, with the exception of London and a cluster of medium-sized cities in the south east of England, lag behind their European counterparts on a range of economic indicators, especially in relation to skills, innovation and productivity. Many cities find themselves unable to compete with low-cost locations in Europe, but struggle to attract investment in high-skill knowledge-intensive services. Despite this, Britain has the most urbanised economy in Europe, with cities accounting for 60% of GVA (France 50%, Germany 35%).¹⁶¹ UK cities experience a persistent skills gap and investment deficit, two of the principal causes of low productivity. Nonetheless, the UK has one of the highest proportions among European nations of residents educated to degree level or above. Edinburgh, together with Cambridge and Oxford, is one of three UK cities in the European top ten for graduate residents. Glasgow and Aberdeen are not far behind.

In Germany, the Netherlands and Scandinavia, however, well trained, medium-skilled workers with vocational qualifications, complement the cohort of graduate employees to make a major contribution to high per capita GVA. In Scotland, as in the rest of the UK, a significant proportion of the workforce is low skilled. Aberdeen and Edinburgh have fewer low skilled than the UK average, Glasgow more, but all lag behind the best in Europe.

Business structure, skills, innovation, R&D expenditure and investment all contribute to per capita GVA. By this measure UK cities do not perform well. The Centre for Cities reports that the relative ranking for the AGE cities against the criterion of productivity is poor. Aberdeen, so often a special case, is one of only 6 UK cities where GVA per employee is above the European average, but the ranking for all the AGE cities is poor. The same study compared UK cities with 'twins' in Europe. Edinburgh was twinned with Geneva, where per capita GVA was 35% higher and Glasgow with Rotterdam (42% more productive) but Aberdeen outperformed its twin, Braunschweig, by 10% (a comparably sized city in Lower Saxony, Germany close to former west-west border).

There are many annual surveys of cities and each tends to adopt a slightly different perspective on key issues, usually as a result of combining quantitative and qualitative assessments in slightly different ways. Many exclude smaller cities such as Aberdeen. UK cities do consistently well in Savills Investment Management's annual survey of Europe's most 'dynamic cities'. Edinburgh makes the top 10, but Glasgow is outside the top 40.¹⁶² The well-established Innovation Cities Index from the '2thinknow' agency tends to favour capital cities and large second cities like Barcelona and Milan. Here, Edinburgh is ranked 35th in Europe and Glasgow 37th, both behind Amsterdam, Hamburg, Manchester, Zurich and Dublin but ahead of Rotterdam, Geneva, Bristol, Eindhoven and Bordeaux (Figure 6-3: Innovative cities, the European top 50).¹⁶³

NESTA produces an annual European Digital City Index, based on 10 key variables. Edinburgh ranks 19th in Europe and Glasgow is 36th. Edinburgh is ranked 2nd in Europe for lifestyle, and also scores well for its entrepreneurial culture. Both cities are highly ranked for access to markets, but they do less well on access to capital, knowledge 'spillovers' and infrastructure (digital and non-digital).¹⁶⁴ Glasgow performs well in the EU annual survey of Quality of Life in medium sized cities that does not include Edinburgh or Aberdeen.¹⁶⁵

The Arcadis Sustainable Cities Index focuses on three themes (people, plant, profit) and 18 key indicators to measure the social, environmental and economic sustainability of 100 global cities.¹⁶⁶ Edinburgh is ranked 13th overall, and top in the UK after London, with a particularly positive assessment of the 'profit' measures which include transport, economic development, the business environment, tourism, connectivity and employment. Glasgow is ranked 36th overall.

Comparing cities is an imprecise science. Many of the regular surveys draw on anecdotal and qualitative information as well as hard data, and the latter are always subject to methodological challenges. The results may sometimes appear paradoxical: the UK has high proportions of graduates and of unqualified people. Edinburgh and Glasgow appear in many global studies and most European surveys, but Aberdeen and the other Scottish cities are usually absent. The situation is further complicated because a number of the surveys use the 'Primary Urban Area' as the unit of measurement which in Glasgow's case puts the city's population at just over 1.25 million. This is a more reasonable definition of Glasgow's urban area as a 'medium-sized' city, worth bearing in mind when comparative statistics are used for the AGE cities and also partly explains why many international surveys have a settled view of Glasgow as Scotland's biggest city by far.¹⁶⁷ The UK's productivity problem is reflected in the comparative research, but it demands nuanced interpretation: even by the relatively narrow definition of Primary Urban Areas, the UK is Europe's most urbanised economy, responsible for 60% of total output. In our cities, high-productivity and low-productivity coexists.

With all these qualifications, a consistent picture emerges. Edinburgh is a consistently strong city performer, often ranked in Europe's top 10 once the global cities and national capitals are set aside (although slightly anomalous as Edinburgh benefits from the 'capital city effect' as discussed earlier). The broad range of measures used in the Arcadis survey suggests a healthy balance between economic vitality, quality of life and environmental sustainability, with a peer group of high-performing UK cities that includes Cambridge, Oxford and Bristol.

Glasgow has faced bigger challenges in the past 50 years but the surveys reviewed for this research suggest that it is managing the transition reasonably well and has every chance of continuing this trend given the opportunity to do so and the absence of externalities which could affect all Scotland's cities but hit Glasgow and now Aberdeen harder. In the UK, Manchester appears to set the benchmark for post-industrial renewal, and it is ahead of Glasgow in the Dynamic Cities and Innovation Cities rankings, but Glasgow's performance compares favourably with other former manufacturing centres such as Birmingham, Liverpool and Newcastle. With the exception of Aberdeen, however, there remains a productivity gap between Scotland's principal cities when compared with similar European cities such as Rotterdam, Antwerp and Dortmund or in Edinburgh's case Geneva.

Comparisons between the AGE cities and the Randstad in the Netherlands show that the latter is larger, more densely concentrated and better connected. Its fortunes are largely determined by the performance of Amsterdam and the three other large cities (The Hague, Rotterdam and Utrecht) but the Randstad is an efficient mechanism for sharing benefits such as access to jobs, education, leisure and cultural amenities across the region. The strategic links between the cities are augmented by a dense network of point-to-point connections. Although there are very few formal governance structures, the Randstad concept also promotes strategic planning and placemaking: the preservation of the 'Groen Hart' (green heart) contained within the urban ring ensures that everyone has access to a rural economy of farming and horticulture, space for recreation and nature reserves and a clear precedent together with the Emscher Park in the Ruhr-Gebeit for the landscape of Central Scotland now pursued through the Central Scotland Green Network initiative as a national development within the Scottish Government's National Planning Framework.

Lessons can be learned from the quality of residential development in parts of Scandinavia and northern and western Europe. Scotland (like the rest of the UK) has long struggled with the design of 'ordinary places'. Without effective guidance or strong direction, volume housebuilders have been given free rein in Scotland's city regions: the result has, for the most part, been undistinguished, anonymous suburban sprawl.

Scotland's cities face many challenges. Productivity needs to improve together with enterprise and innovation. Crucially, there is a need to tackle the persistent poverty and deprivation that blights too many lives, especially in parts of Glasgow and its city-region. That means turning the rhetoric of 'inclusive growth' into tangible action for social justice at every life stage.

This report has examined the condition and performance of Scotland's great cities, Aberdeen, Glasgow and Edinburgh. It has described their vital role as drivers of innovation, wealth-creation, learning and creativity, their rich history and heritage, and their profound cultural significance. Each has a prominent and role significant to Scotland's future.

The AGE cities and their regions will have a pivotal role to play in delivering the (Scottish Government) Programme for Government published annually. The Scottish Government was one of the first to sign up for the UN's 2030 Agenda and the Sustainable Development Goals (SDGs). Within the Agenda 2030 framework the New Urban Agenda sets "*a new global standard for sustainable urban development... a road map for building cities that can serve as engines of prosperity and centres of cultural and social well-being while protecting the environment*".¹⁶⁸

The AGE cities should be in the vanguard of the New Urban Agenda: Aberdeen is a dynamic global city with a high-productivity economy and an enviable standard of living; Glasgow's post-industrial renaissance has won international recognition, its creative life is burgeoning and its population is growing after decades of decline; and Edinburgh is a thriving capital city with an international reputation which sets the benchmark for city living in the modern era. In many ways the AGE cities represent the best of contemporary urban life: they are great places to live, work and visit and they have adapted successfully to new challenges. They are well set to embrace the paradigm shift to the 21st knowledge city.

But at best they are keeping pace with these changes, not falling behind certainly but not streaking ahead either. There remains much room for improvement and this is recognised by the cities themselves, by the Scottish Government and, to be fair, where reserved matters apply, by Westminster. Much of this concerns the dogged, committed work of those charged with leading, directing, governing and managing the cities week by week and year by year in the face of budgetary constraint, economic change, climate change and global externalities that can have serious implications for a city's trajectory and plans for change. This work is essential and absolutely necessary – it holds the position and moves it forward – but incrementally.

For Scotland's principal cities to perform to their full potential and thereby enhance the performance of Scotland itself, the cities need more than incremental change. Edinburgh needs to

strengthen its position at the apex of Britain's urban hierarchy; Glasgow needs to translate its urban regeneration into sustained and accelerating growth completing the transition from industrial to knowledge city and spreading the benefits regionally; and Aberdeen needs to safeguard its recent economic and productive performance by making an economic and cultural transition that, without leadership and early action, could be as painful as that of Glasgow. All three cities have the potential to move up the European league tables.

The AGE cities need to grow their knowledge economies, promote enterprise and innovation, close the productivity gap with their European counterparts and tackle the problems of low skills and low pay. They need to create the business ecosystems that will nurture and sustain high-performance economies, perhaps by creating innovation districts, places where "*ideas collide, emerge and recombine*".¹⁶⁹

Scotland also needs to practise better urbanism. The AGE cities have a great and diverse built heritage but, the quality of contemporary built development and placemaking is often disappointing. There are notable success stories such as the restoration of Marischal College in Aberdeen; Buchanan Street and Lauriston in Glasgow; and Bristo Square and Quartermile in Edinburgh – but these are the exceptions that prove the rule and the waterfront developments in all three cities are lamentable and in sharp contrast with Dundee. The real measure of a city's urbanity is the quality of ordinary places, not prestige schemes, and by that reckoning the AGE cities are not doing so well. Scotland is not building enough homes, of the right type and tenure across and those which are built often conform to a proxy model of what the consumer is thought to want that falls far short of the quality of volume house building in much of northern and western Europe or the best in the UK. This is a matter that the Scottish Government is acutely aware of and documented by the Commission on Housing and Wellbeing in 2015. This change takes time and the realignment of the housing market in Scotland is a work in progress.

The same is true for the remainder of the built stock, particularly our ageing office and industrial property, for mobility systems – the railways in particular – and for public services (schools, hospitals and other social and civic facilities) now that the peak of public and private investment in the early 2000s has passed. Scotland's transport infrastructure is improving but remains inadequate, while continuing addiction to low-density development creates tracts of low-density suburbs, embeds dependency on the private car and makes it difficult to provide viable, high quality public transport alternatives. A new vision is required for suburban Scotland that anticipates the changes to social awareness as people grasp the implications of climate change and automation. Interestingly, the suburban space is well placed to embrace the challenges of automation and increased localism if the twin challenges of cautious governance and civic culture can be addressed. It is not difficult, in spatial terms, to imagine suburban Scotland powered by autonomous electric vehicles, with autonomous delivery by drones and increased local food production. In terms of governance and culture the challenge is rather different.

Social justice is still elusive. All the AGE cities are polarised places, where wealth coexists with extreme and persistent poverty, reflected in huge variations in life expectancy within our cities. The challenge is greatest in Glasgow where the awareness and resolve to change is also greatest but it would be folly to imagine that there is no such challenge in Edinburgh and Aberdeen.

In recent decades, perhaps as a result of the imprinted memory of the 1960s and 70s, Scotland has come relatively late to urban policy. Publication of the Cities Agenda in 2011 was a significant step forward and since 2016, cities have formed part of various portfolios including the former Cabinet Secretary for Economy, Jobs and Fair Work. A refreshed version of the Cities Agenda was published in 2016, the Scottish Cities Alliance continues its work promoting collaboration for growth between Scotland's cities, and a series of City Region Deals have been brokered by the Scottish and UK Governments.

All this is welcome progress but the feeling persists that Scotland's urban policies – and the tools we need to implement them – are underpowered and inadequately resourced. The City Deals will

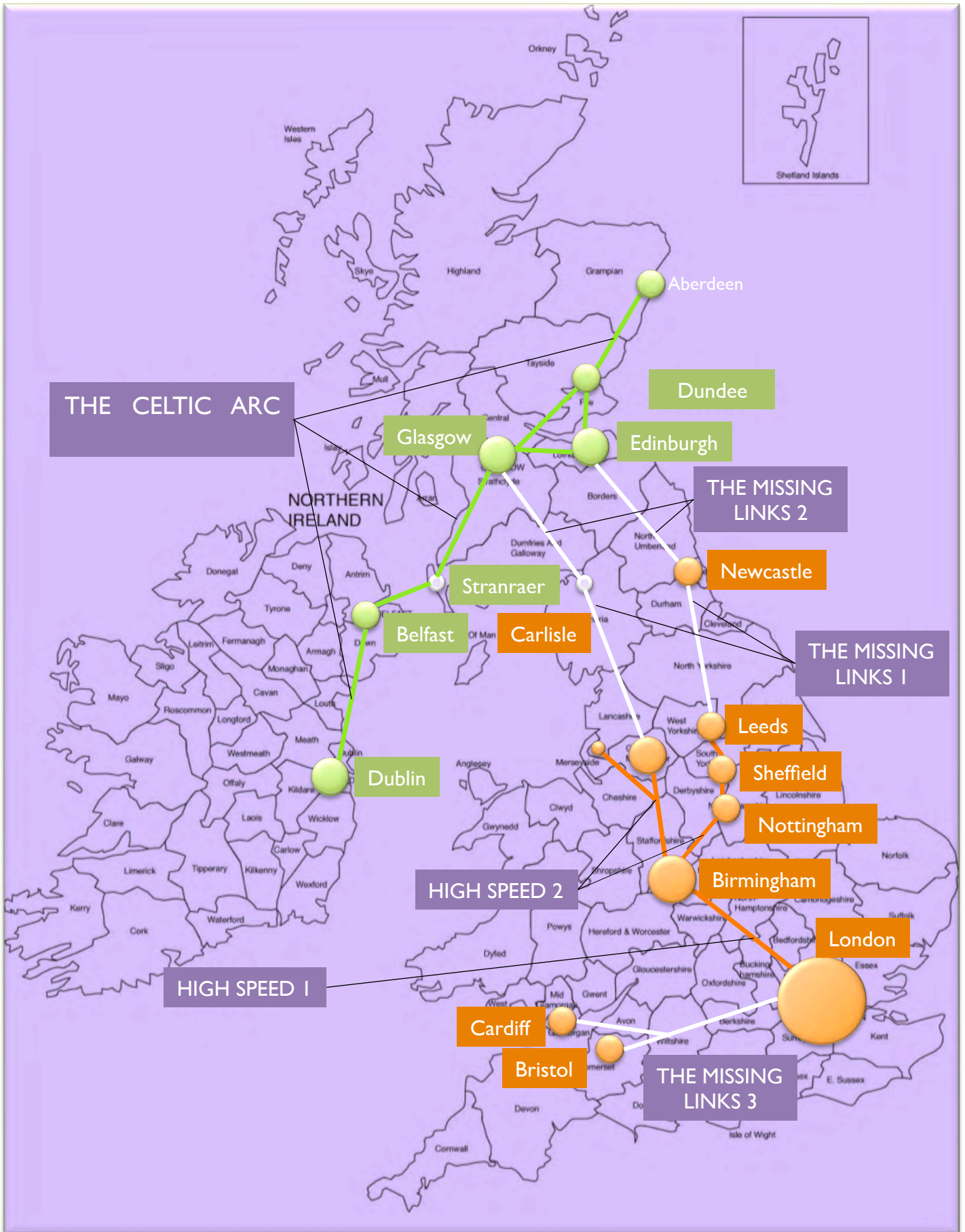


Figure 6-4: High-speed rail in the UK and Ireland

deliver much-needed infrastructure, but the scale of investment – a reported total of about £3bn in the AGE city regions, spread over 20 years - is relatively modest and cannot be expected to result in transformational change but continued incrementalism at best.¹⁷⁰ The Scottish City Deals are dwarfed by projects under way, planned and proposed in England:

- London's Crossrail project will cost £15 bn, and the budget for Crossrail2 is around £30 bn;
- the budget for HS2, which will link London, the West Midlands, Leeds and Manchester is an estimated £56 bn;
- Transport for the North has just published its draft Strategic Transport Plan for the whole of the north of England, which calls for investment totaling £60-70 bn over 30 years.

Against this backdrop it is important to remember that Scotland's GDP is equivalent to that of the leading economic regions of England such as Yorkshire and the Humber although for GVA per capita Scotland is second only to the South East of England outside of London.¹⁷¹ Spreading investment across the seven Scottish cities may be misguided: experience from Europe (especially the Randstad and the Ruhrgebiet) suggests Scotland needs to concentrate its major efforts on the three AGE cities and Dundee. The AGE cities will drive employment, innovation, enterprise and productivity growth, conferring benefits on their city-regions and the remainder of small town and rural Scotland. To realise full potential of the principal cities a genuinely ambitious Scotland needs to ramp up the rate of investment and development, champion placemaking and urban design throughout the city regions, and invest in a world-leading transport system to promote mobility and reduce car-dependency.

If urban Scotland is to meet the high aspirations of the annual Programme for Government there will need to be a step change in attitude, focus, culture and investment. Viewed in the round – as economies, societies, places and ecosystems – Aberdeen, Glasgow and Edinburgh have much to be proud of, but they still lag behind the best-in-class European cities in some important respects: they are smart, but only up to a point; they are relatively compact, but threatened by sprawl; they have growing knowledge economies but productivity remains stubbornly low; and social and economic polarisation means that they still not truly inclusive places.

Scotland needs an urban policy that recognises the special status and influence of Aberdeen, Glasgow and Edinburgh. As much as prioritising investment, Scotland needs to prioritise consistent focus and attention: a dedicated Minister for Cities would be a welcome step. But saying the major cities are important and tweaking resource allocation is not enough. Looking to the best-performing cities in Europe – Munich, Eindhoven, Rotterdam, Montpellier – it is clear that they are distinguished by:

- inspirational, visionary leadership, an open and transparent public dialogue together building a 20-year + perspective and prospects;
- effective strategic partnerships between business, academia and the civic sphere;
- a deep understanding of economic trends, environmental and societal challenges, cultural awareness and the potential of technology;
- a commitment to innovation and creativity;

These leading European cities think about – and take practical steps to address – the great global challenges identified in the UN report: immigration, automation, climate change, ageing and low fertility. In this context Scotland's city strategies seem earthbound and prosaic, and the scale of planned investment is inadequate.

Yet the AGE cities are extremely well placed to tackle this agenda. They have a rich vein of talent and skills, including world-class businesses and universities, and they are part of a web of global knowledge networks. The problem is not so much capability as capacity - how to mobilise and unleash the skills, enterprise, creativity and know-how of the AGE cities, to deliver a response of appropriate scale and ambition. That is far beyond the scope and capabilities of the Scottish Cities Alliance.

Increasing the three cities' capacity to adapt, innovate and deliver will inevitably raise questions about the powers and resources at their disposal. A city like Eindhoven – like others in the Netherlands – enjoys a far greater degree of autonomy than any in Scotland. It can establish its own, distinctive vision, develop an ambitious agenda for action and use tax raising and other fiscal powers to fund investment and deliver programmes. Perhaps the biggest challenge for politicians and policymakers is to trust Aberdeen, Glasgow and Edinburgh to take control of their own destiny.¹⁷²

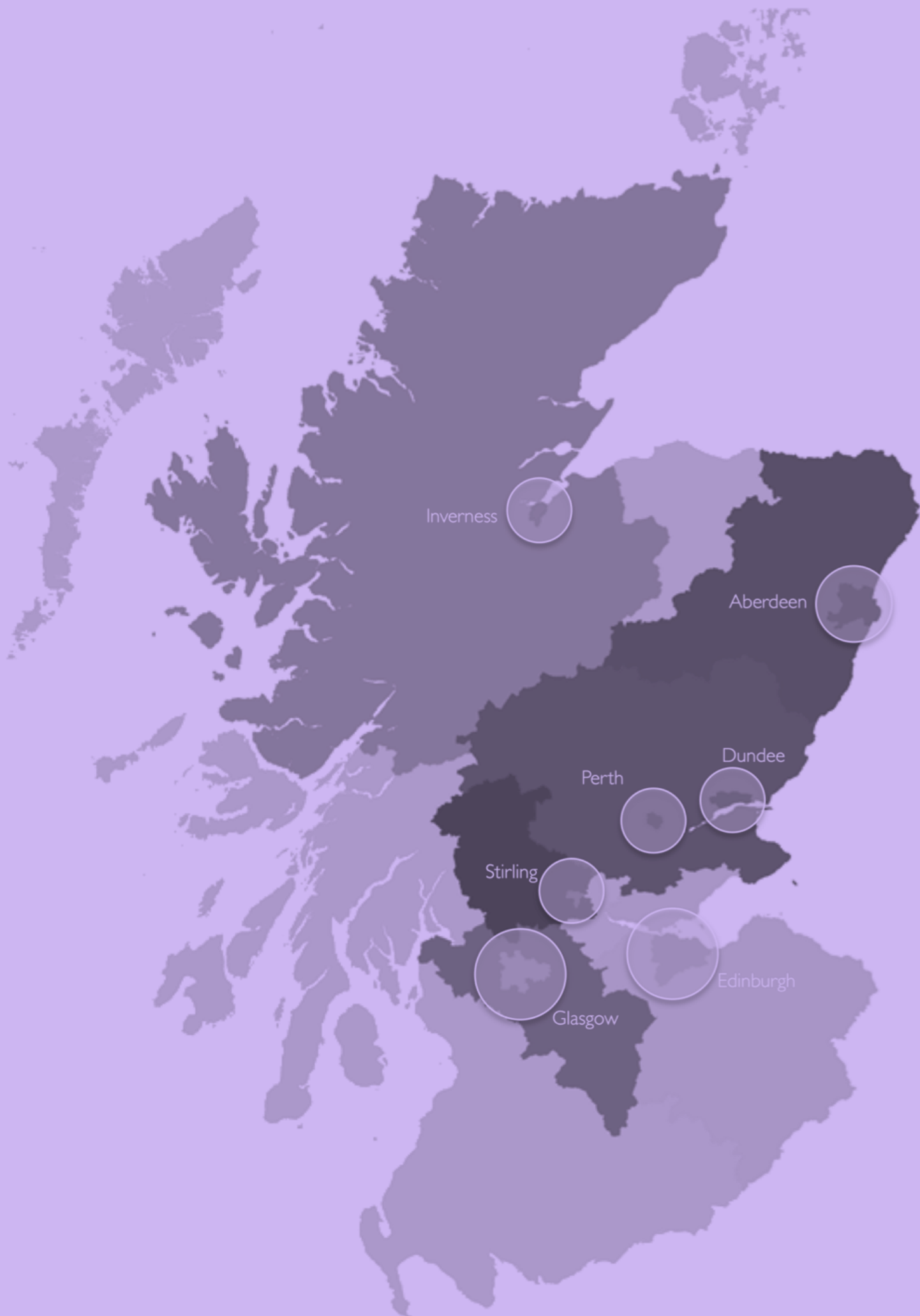
As the Scottish Parliament matures, it is clear that Scotland has governance institutions more tailored to the clear and present needs of the country and its people. And recent governments have shown that they are prepared to be ambitious in word and deed. Annual Government Programmes are ambitious and should be recognised for its commitment to the UN's Sustainable Development Goals (SDGs) and the 2030 Agenda – Transforming our World.¹⁷³ Equally, the challenge of replacing the Forth Road Bridge was both ambitious and successful in terms of delivery. A fast rail link from Edinburgh via Glasgow and Belfast to Dublin built in partnership with the Irish Government and Northern Irish Administration with a Celtic version of the Øresund Bridge in the North Channel (the Straits of Moyle) and with fast links to Aberdeen via Dundee and to Inverness – that would be ambitious, visionary and transformative (Figure 6-4: High speed rail in the UK and Ireland). In the past, this might have been a sure thing for EU involvement to galvanise action and resources around an idea. In the end Brexit will change everything and nothing. Ultimately, the action to drive forward the economy and society of Aberdeen, Glasgow and Edinburgh in the knowledge age, will need to be led in Scotland, by Scotland.

Aberdeen, Glasgow and Edinburgh – Scotland's AGE cities – are remarkable places. Each is distinctive with differing characteristics and culture but also with some common attributes: rich history and heritage, competitive global businesses, internationally renowned universities and research centres. They have distinctive urban personalities: **Aberdeen – the Granite City** with a northern facing outlook, **Glasgow – Dear Green Place**, creative, resilient and metropolitan and **Edinburgh – Athens of the North** – an elegant, competitive European capital. In spite of many attempts to come up with something new, these are the strap lines that stick. The AGE cities are “*places where talent wants to be*” precisely because they combine opportunities and challenges for the best with a quality of life which is envied around the world.¹⁷⁴ Cities are complex places, so it should come as no surprise that – in Scotland as elsewhere – these conditions coexist with poverty, labour market insecurity, preventable ill-health and unfit housing. Implementing the New Urban Agenda in Scotland means both unlocking the cities' entrepreneurial and creative potential, investing in and embedding competitive infrastructure and ensuring that these benefits are enjoyed by all.

SCOTLAND'S URBAN AGE

7

The Headlines



Inverness

Aberdeen

Dundee

Perth

Stirling

Edinburgh

Glasgow

Scotland's Urban Age: Aberdeen, Glasgow and Edinburgh in the Century of the City

documents research into the future of Scotland's principal cities in the context of international trends identified by the United Nations.

The first chapter – ***Scotland in the Urban Age*** – reviews research undertaken by the Glasgow Urban Laboratory for the United Nations and introduces the concepts of the *century of the city* and the *supercities* of the north. The second – ***The Urban Century and the New Urban Agenda*** – explores major trends in demography, migration and digital development and introduces the paradigm shift from the *industrial city* to the *knowledge city*.

Urban Systems – hierarchies and challenges (Chapter 3) examines the concentrating effect of ubiquitous air travel and the internet, reflects on urban systems in North America and Europe within a series of international trends and considers effects on city agglomeration and the emergence of the *supercity* with characteristics of *urban concentration*, *urban shrinking* and *urban sprawl* and responses that include *the compact city*, *the resilient city* and *the competitive city*. Chapter 4 – ***The Knowledge City, Pathways to Transition and Scotland's Urban System*** – describes the emergence of the knowledge city in the 21st century, considers trajectories of city change in the UK and the nature of Scotland's urban system.

Understanding the AGE Cities (Chapter 5) takes an in-depth look at Scotland's three principal cities (Aberdeen, Glasgow and Edinburgh, the capital), considers commonality and divergence between them and their ability to deal with global trends by looking at a wide range of issues including economy, living and place. Chapter 6 – ***Towards a New Urban Agenda for Scotland*** – introduces a number of thoughts about the future competitiveness of Scotland's cities.

These ***Headlines*** set out the key findings in summary form.

The **top-ten** findings at a glance:

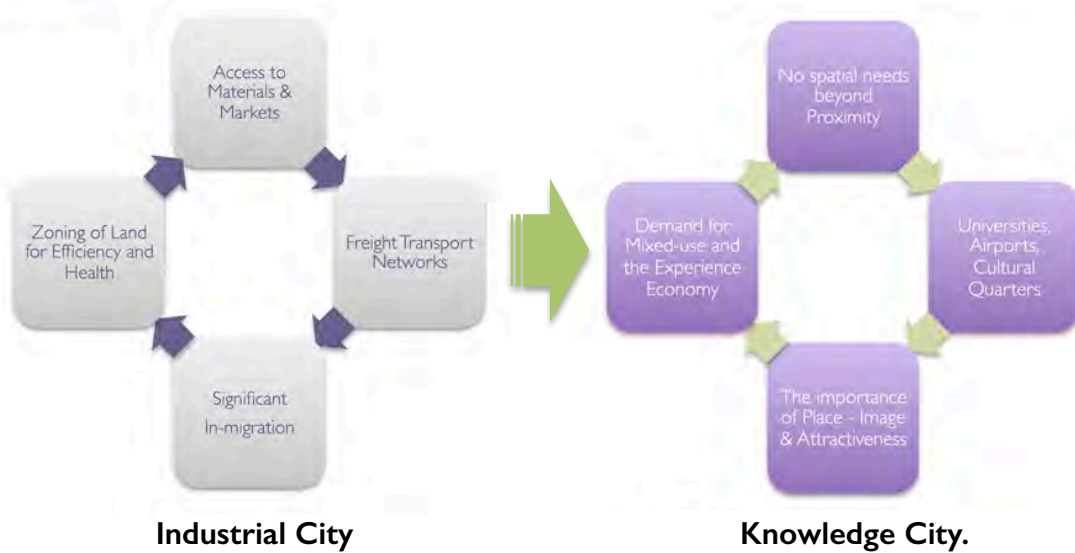
1. The 21st century is the **Century of the City** with a paradigm shift from the **industrial city** to the **knowledge city**.
2. A series of trends accompany this shift and influence all cities. They can combine to be benign or toxic – the outcome depends on vision, leadership and enlightened management.
3. The **jet-age** has combined with the **net-age** to reinforce **urban concentration** that can lead to sprawling and shrinking cities. The **global-local** paradox is real – the more similar and inter-connected we become, the more we value local distinctiveness.
4. The UN has identified **supercities** in the northern hemisphere that compete with the **megacities** of the east and south. The UK is a potential **supercity**.
5. Some cities seek to replicate success from earlier times, others seek to reinvent themselves to be better equipped for the knowledge era.
6. Scotland's principal cities are **proto-knowledge** cities and, together with their regions, power Scotland's economy.

7. **Scottish Cities reflect international trends** of concentration and sprawl.
8. **Scotland's principal cities have a familial likeness.** All 3 support excellent cultural facilities with significant economic impact but poverty and deprivation remain issues and inter-urban mobility falls far short of international comparators.
9. **The AGE Cities in a nutshell:** Over 25 years **Aberdeen & Edinburgh** performed well in the UK context. **Glasgow** although still burdened by a post-industrial legacy is delivering a remarkable transition to a proto-knowledge city. Growth in Aberdeen and Edinburgh has contributed to a west-east disparity.
10. **Urban Scotland in a Nutshell:** Scotland's principal cities are distributed across the country with no predominant international city. The AGE cities dominate the urban hierarchy and the Central Belt is a concentrated interconnected urban region. Dundee leads the second tier, shadowing Glasgow's proto-knowledge transition. The other cities and major towns should not be forgotten. The Scottish Cities Alliance is ill-configured and underpowered to deal with urban Scotland.

Towards a New Urban Agenda:

Aberdeen, Glasgow and Edinburgh are well-placed to lead and drive a transition to the *knowledge city* in Scotland. But they need to be empowered, trusted and resourced to bring this about. The Scottish Government should establish a *Minister for Cities* to coordinate investment and drive forward a knowledge-based urban renaissance in Scotland. A step-change in inter-urban connectivity and infrastructure is needed in parallel with the de-toxification of debate on change and the involvement of communities to bring place-making and sustainable economic growth into register.

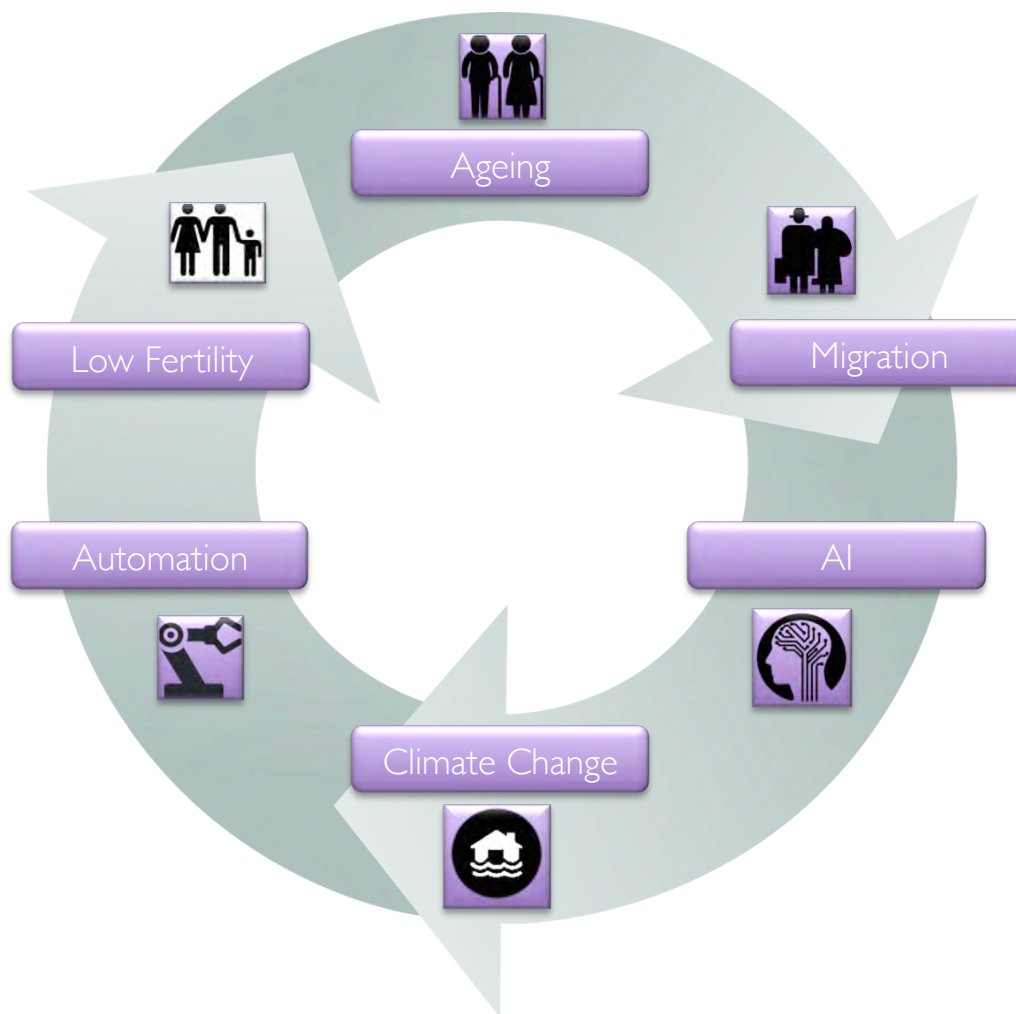
0 | ● The 21st century is the ● Century of the City



By 2050, 70% of the world's population will live in cities.

There is a a paradigm shift from
the **industrial city** to the **knowledge city**.

02: Six trends are driving the shift in cities



Ageing, low fertility, migration, climate change, automation and artificial intelligence are forces driving change in cities and the paradigm shift to a knowledge base. These forces can combine to be benign or toxic for communities.

Vision, leadership and pragmatic management are needed to respond to these global trends. This is the 21st century challenge for Government, Business and Education at National, Regional and City level.

03: There is a pronounced trend towards urban concentration

Fast air travel combines with fast digital access. The **jet-age** combines with the **net-age** to reinforce **urban concentration** that can lead to urban sprawl and urban shrinking in less successful cities.

The **death of distance** and the dispersed **city of bits** (where internet access rather than physical access predominates) have not come about. **Face to face** contact remains important in the experience or **flat-white** economy.

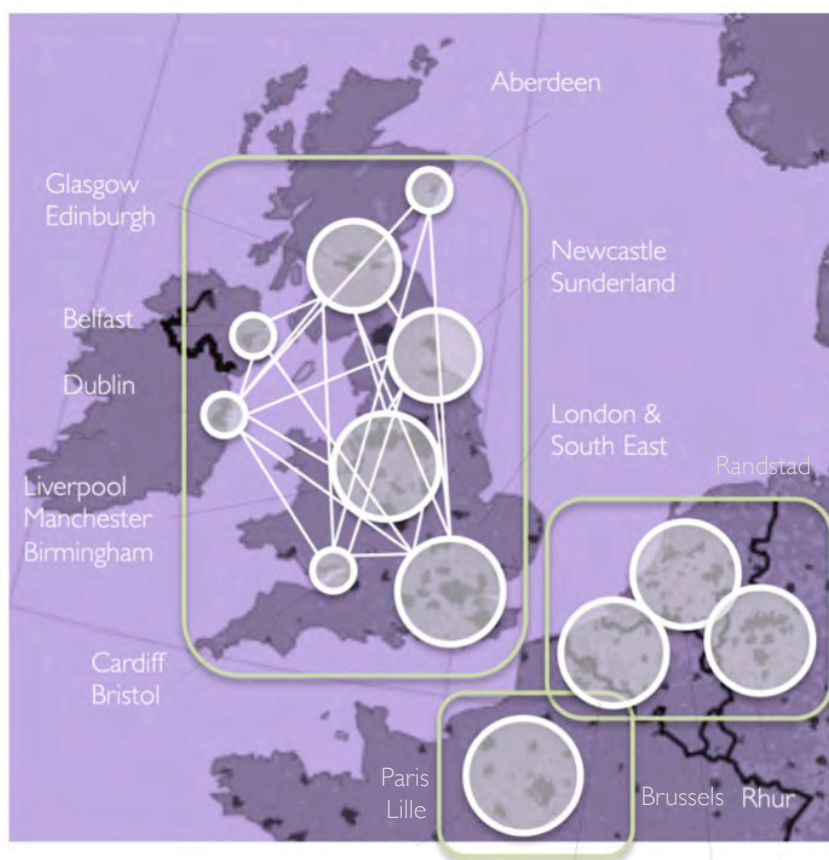
The **global-local** paradox is real. The more similar and inter-connected we become, the more we value local distinctiveness.



04: Supercities of the north compete with Megacities of the east & south

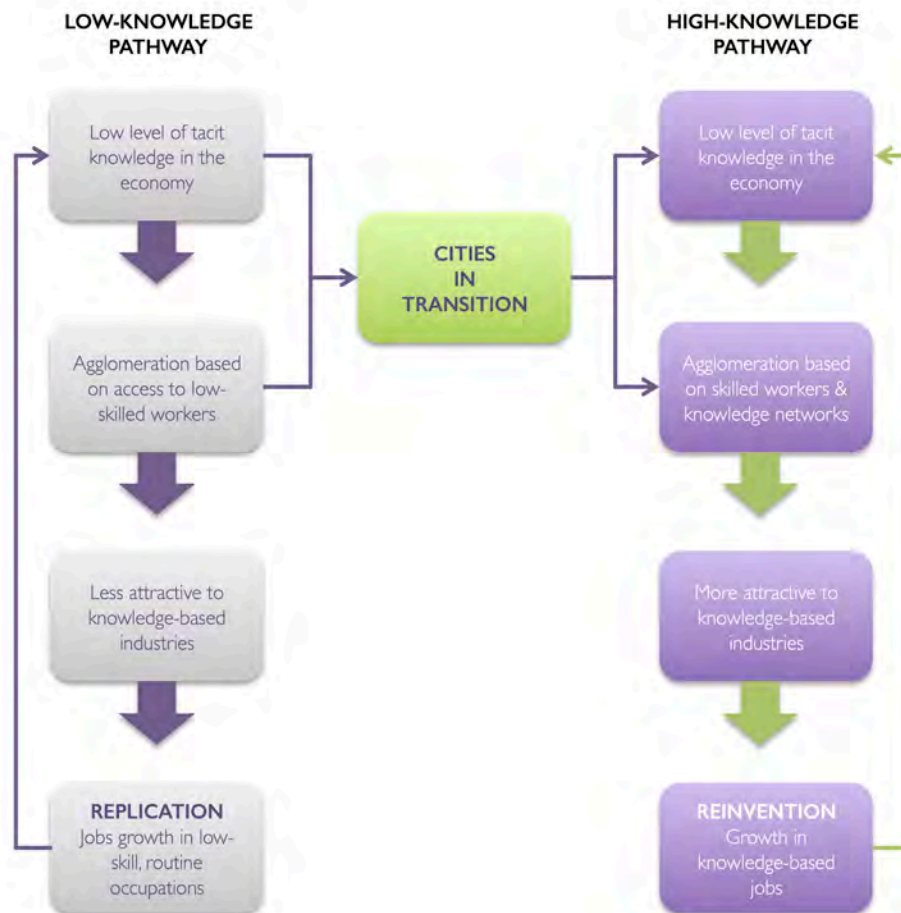
Supercity characteristics include:

- Concentrations of population and of economic, research, cultural and knowledge power.
- Clusters of discrete and distinctive cities in a mega-region.
- Cities inter-connected by high-speed air and rail and short travel time.
- Constituent cities 'borrow scale' from one another.
- A tendency towards coalescence and sprawl.
- The presence of a 'mother lode' world city – e.g. London.



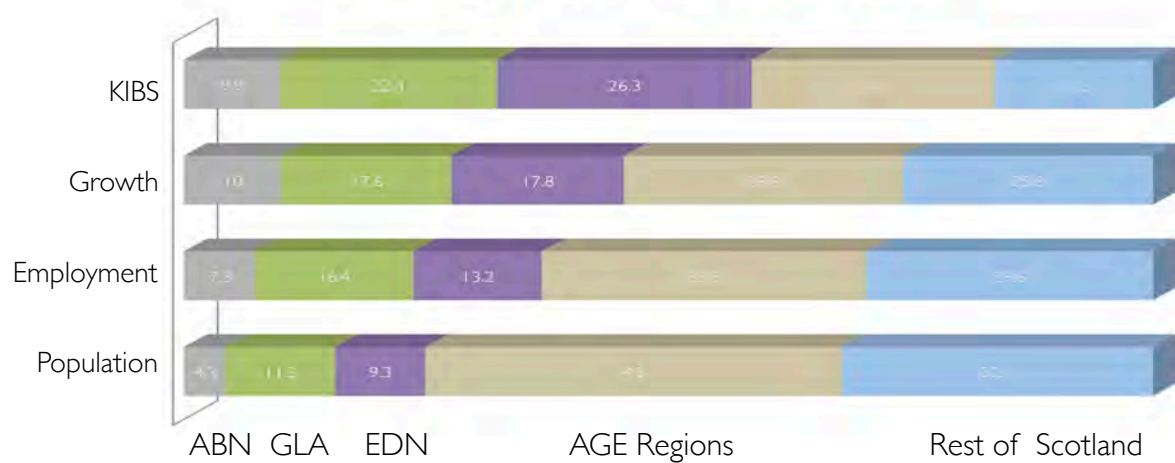
The principal cities of the UK and Ireland are a putative anglophone supercity. Scottish and Irish cities may look outwards to the world but are inextricably bound into this supercity system.

05: Some cities seek to replicate success, others reinvent.



- Reinventors can combine global trends to make them benign.
- Replicators run the risk of a toxic combination from trends.
- Reinventor cities experience cycles of growth.
- Replicator cities face cycles of decline.

06: Scotland's principal cities are Proto-knowledge Cities.



- 25% of population (rising to 70% with city regions).
- 60% of KIBS jobs (rising to 82.5% with city regions).
- 60% of GDP.
- 54% of employment and higher in ScotGov growth sectors.
- Younger populations.
- Leading universities and 65% of business R&D.

07: Scottish Cities reflect international trends of concentration and sprawl.

The AGE cities demonstrate the paradigm shift from industrial city to knowledge city. There is evidence of a burgeoning '**experience economy**' and a clear trend to urban concentration.

AGE Cities Overall:

- World-class universities, nascent KIBS market and experience economy.
- Quality of place, cultural institutions, quality of life are all generally high.

AGE Cities Performance:

- 25% of population, 60% of KIBS jobs and 45% of growth sector jobs.

AGE City Regions:

- 70% of population, 82.5% of KIBS jobs and 75% of growth sector jobs.
- Differential growth – west to east.

AGE City R&D:

- The AGE cities and city regions dominate Scotland's R&D and knowledge potential.

AGE cities are a distinctive subset of the UK city system.

- Operate in the shadow of London.
- No dominant city, but a duopoly – bi-centric, not polycentric.
- Glasgow is under-bounded and under-recognised as a metropolitan city.
- Glasgow & Edinburgh are near neighbours with separate & complementary roles and a history of mistrust. Aberdeen is an outlier.
- AGE cities head the Scottish Urban Hierarchy and are the key drivers of Scotland's economy and growth potential.

08: Scotland's principal cities have a familial likeness:

- Distinctive and fine aesthetic born out of the medieval Scots Burgh underlain by topography, materiality, climate and culture.
- Coherence of townscape and public realm.
- 21st century regeneration and renaissance built on inherited character.



Aberdeen



Provost Skene's House, City Centre Masterplan, Aberdeen



Glasgow



Sauchiehall Street, Avenues Project, Glasgow



Edinburgh



Cartongate Development, Edinburgh

09: The AGE Cities in a nutshell

Over 25 years Aberdeen & Edinburgh performed well in the UK context. Glasgow is still burdened by an industrial legacy but committed to remarkable transformation. Aberdeen and Edinburgh growth has contributed to a west-east disparity.

Aberdeen:

- High productivity (GVA/worker), high wage, high skill, global economy, high export earnings.
- Highly specialised economy dominated by oil & gas.
- International hub for global & local industries – export worldwide.
- Single industry – oil price drop – vulnerability.
- Global status with skilled workforce some reassurance.
- Clock running to diversify to knowledge economy.
- 2½ hour travel surcharge to central belt contributes to existential challenge.

Glasgow:

- Hugely improved post-industrial performance: economically & socially diverse, confident and forward looking with pronounced creative & media cluster.
- Current narrative of adaption, recovery and reinvention: renaissance since 1980s is one of UK's most remarkable regeneration success stories recognised internationally.
- Body of evidence for diverse, outward-looking proto-knowledge city.
- Legacy of persistent poverty, deprivation and dereliction but embedded skill & craft can be recovered and channeled into creative economy.

Edinburgh:

- Capital city benefits: Scotland's centre for government, national institutions, business, finance & law.
- Diverse economy with high % KIBS, low manufacturing, skilled workforce and high average earnings.
- Well placed to absorb economic shocks.

Edinburgh needs to top the UK urban hierarchy – Glasgow needs to translate urban regeneration into sustained and accelerating metropolitan growth and complete the transition to knowledge city – Aberdeen needs to safeguard economy and effect transition to knowledge city.

09: AGE City Summaries: Economy, Work & Knowledge

Economy of the AGE Cities:

- 50% R&D, 60% KIBS in cities 82.5% in regions.
- Scot Gov growth sectors (creative & digital, energy, fintech & business services, food & drink, life sciences, sustainable tourism).
- 45% in cities and 75% in city regions.

Working in the AGE Cities:

- Limited office development mitigated by more efficient, agile working.
- Demand for smaller, better offices releases obsolete for re-purposing.
- Movement back into city centres – rediscovery of the CBD.
- Industrial stock increasingly obsolete but still well-occupied – implications for economies of 3 primary city regions.
- Retail and leisure uses concentrating in city centres and major malls.

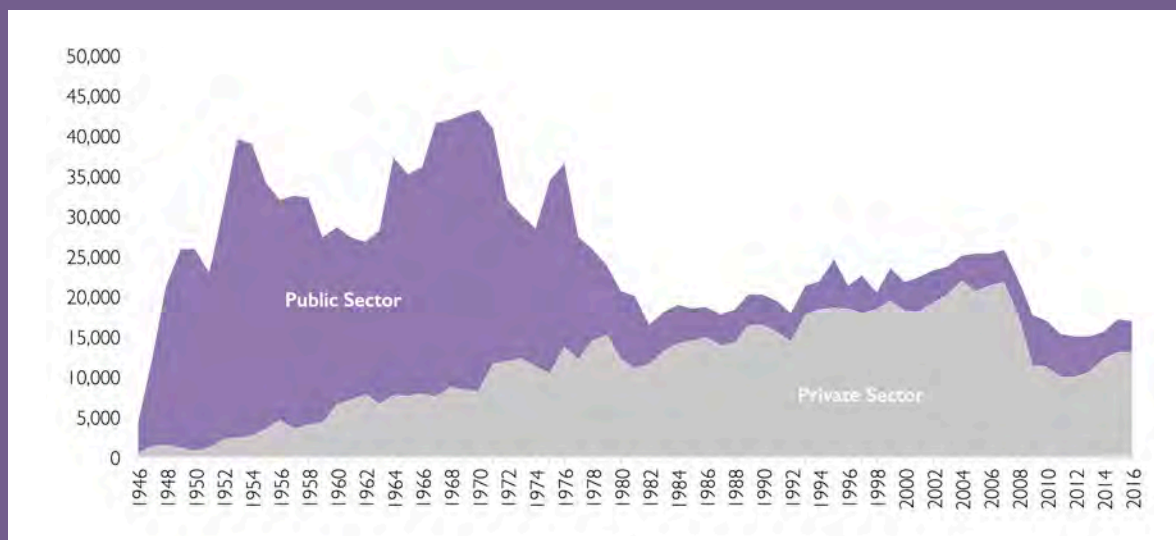
Knowledge & learning in AGE cities:

- Scotland has 8 of top 50 UK universities – 2 Edinburgh, 2 Glasgow, 2 in Dundee (St.And), 1 Aberdeen, 1 Stirling.
- Overall capacity of these institutions together with other HEIs and KIBS jobs give AGE cities their competitive advantage & potential for growth.

09: AGE City Summaries: Living & Housing

Living in the AGE Cities:

- Housing is not being replaced fast enough to meet need and demand.
- Strong demand benefits resale most.
- Social housing reduced and owner-occupation down: “**rise of the renters**”.
- Reliance on house builders favours proven market areas.
- Systemic changes takes decades and needs continuing innovation.
- Need to detoxify debate, open an inclusive conversation, invest in civic assets, public spaces, sustainable communities, living environments – **provide for place-making as part of profit-growing.**



Housing completions by sector:

09: AGE City Summaries: Culture, Poverty & Mobility

Culture in AGE cities:

- All 3 well-endowed with civic and cultural facilities (theatres & orchestras) – excellent performance venues.
- Strong festivals offer and significant economic impact.

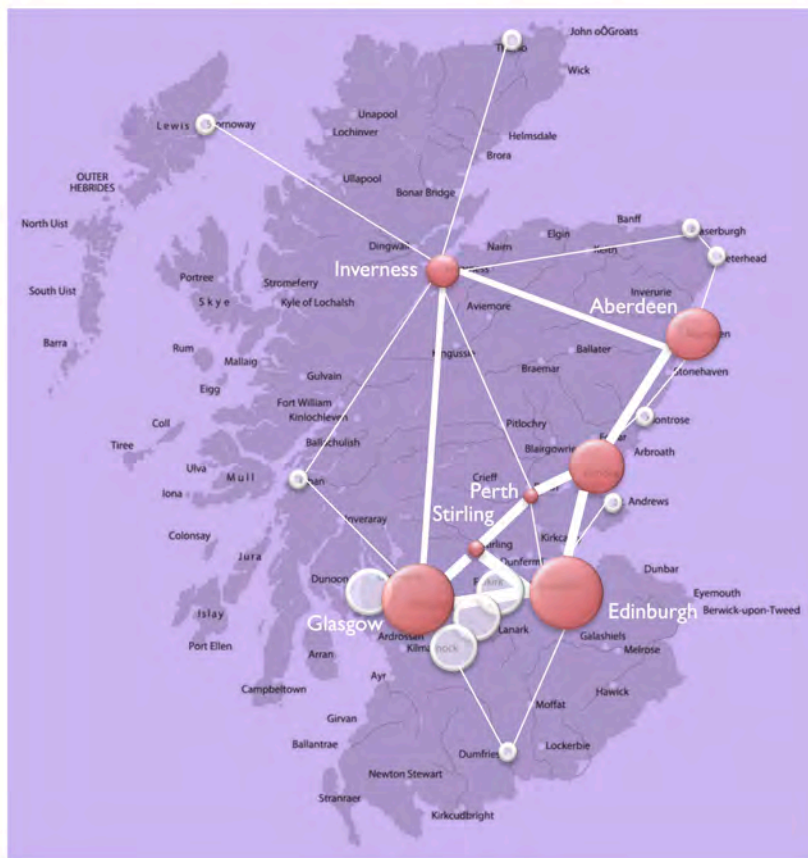
Poverty & deprivation in AGE cities:

- Different trajectories of change.
- Even most prosperous cities have pockets of persistent poverty & deprivation.
- Glasgow has legacy and boundary issues (significant part of knowledge workforce domiciled in 'Greater-Glasgow' over city boundary, but now only 10% of most deprived places in Scotland a significant improvement).
- Wave of moderisation of health and education facilities pre-2010 has slowed – AGE cities still successful but other small cities and towns acute.

Mobility & Connectivity in the AGE cities:

- Railways being improved – local transport of variable and frequently poor quality.
- Central belt is highly inter-connected, but connections to Aberdeen slow & time-consuming with a 2½ hour journey time surcharge.
- Need fast & reliable connections to north and south to London.
- 'Quite' well served by air.

10: Urban Scotland in a nutshell



- Scotland's Urban System is distributed across Scotland – with no predominant international city but the AGE cities dominate the urban hierarchy.
- The Central Belt is a concentrated interconnected urban region.
- Dundee heads second tier shadowing Glasgow's proto-knowledge transition and leading Inverness, Perth, Stirling, Paisley, Falkirk/Grangemouth and others should not be forgotten.
- SCA is ill configured and underpowered to lead urban transformation in Scotland.
- A 'New Deal' is needed to support of Glasgow as a managed-metropolis and Aberdeen as a specialised global technology hub.
- Practice better urbanism – great diverse heritage but quality of contemporary development and placemaking is often disappointing – the measure of urbanity lies in everyday not prestige projects.

10: Urban Scotland Summary: Challenges & Opportunities

- Urban Scotland is well-placed to embrace the 21st C paradigm shift to the knowledge city.
- Scotland has the opportunity to be in the vanguard of implementing the UN Strategic Development Goals and act as a pilot for the New Urban Agenda.
- The AGE cities must play a pivotal role in the delivery of the Government's Programme for Scotland.
- The AGE cities have an excellent offer of contemporary urban life and are great places in which to live, work and visit.

But

- The AGE cities are, at best, keeping pace with change – they do very well in the face of budgetary constraint, economic change, climate change and global externalities – they are holding position.
- Change is incremental, a step change required and productivity needs to improve.
- City region deals are welcome but fall far short of English or European counterparts.
- The three principal cities need to move up the European rankings – grow knowledge economies, promote innovation, enterprise and productivity – tackle low skills and low pay – business ecosystems and innovation districts.
- A new vision is needed for suburban Scotland.
- Two of the three AGE cities need special assistance.
- Transport is improving but remains inadequate & low-density embeds carbon & private car dependency
- Social justice is still elusive – all AGE cities are polarised to some degree – blight & poverty still affects too many.

Towards a New Urban Agenda:

If urban Scotland is to deliver for the country in the 21st century, a step change in attitude, focus, culture and investment will be necessary.

Aberdeen, Glasgow and Edinburgh lag behind the best in class in Europe – they are compact, but run the risk of sprawl – they have growing knowledge economies but productivity is low.

At the moment, depending on the issue, Cities are the responsibility of several Cabinet Secretaries and Ministers. Scotland needs a dedicated Minister for Cities to coordinate city and city region deals and prioritise Glasgow & Aberdeen in a new knowledge renaissance.

Aberdeen, Glasgow and Edinburgh – Scotland's Knowledge AGE cities – are well-placed to innovate, adapt & deliver. They can become recognised internationally for their commitment to the UN's Strategic Development Goals and be exemplars in the delivery of the New Urban Agenda. The Scottish Government needs to resource cities and trust them to do the job.

Ambition needs to be turned into vision and delivery.

SCOTLAND'S URBAN AGE

Appendices



ANNEX: A NOTE ON METHODOLOGY

The report draws on publicly available sources and data and on the experience of the authors working in city development in Scotland, the UK and internationally for over 25 years.

It is important to record that not all datasets and indices about cities – spatially as well as economically – use the same definitions and territories. Some of the differences are minor and make little or no difference to a strategic view – less than a decimal point in certain cases – but some are quite significantly different. With one in particular the differences are important to understanding urban Scotland and its cities. This concerns the size of our cities. The administrative boundaries of our cities have evolved over time and have developed as a result of historical, geographical and social reasons. This raises an issue when the widely accepted view of the built-up area of a city now spans more than one administrative boundary.

The Centre for Cities (C4C) is one of the UK's most highly respected and prolific think tanks seeking to understand and document cities in the UK and internationally. The Centre was set up by Lord Sainsbury in 2005 as an independent, non-partisan research organisation with the goal to understand how and why economic growth and change takes place in Britain's cities, and to produce research that helps cities improve their performance. With a focus on the drivers of urban success, the Centre for Cities publishes valuable insights into the economic performance of UK cities. (<http://www.centreforcities.org/about/>).

The principal measure used by C4C upon which data is aggregated is the 'Primary Urban Area' (PUA), i.e. a measure of the physical extent of the built up area of the city. Unless otherwise stated, the Centre for Cities uses data for Primary Urban Areas (PUA) in all its analysis. The PUA is a measure of the "built-up" area of a city, rather than the local authority boundary. The PUA is used to provide a consistent measure for comparing concentrations of economic activity in cities across the UK. The PUA is distinct from city regions or combined local authority geographies. (<http://www.centreforcities.org/wp-content/uploads/2016/01/2016-PUA-Table.pdf>).

There are three implications about this measure that have a bearing on this report. The first is that for some cities in the UK, it is generally accepted that the administrative boundary and the PUA are, in effect, the same. The second is that where these vary, the differences are significant. For example, the Primary Urban Area for Manchester includes eight other local authorities in addition to the City of Manchester (including Bolton, Oldham, Salford and Stockport). The PUA for Birmingham has five additional areas (including Solihull, Walsall and Wolverhampton) and London has nearly 50. Thirdly there is a formal definition of the Primary Urban Area in England but there is no such definition in Scotland.

PUA data only exists for English cities. C4C have considered this anomaly and have concluded that for Edinburgh and Aberdeen, the administrative boundary of the local authority area and the PUA are coterminous but for Glasgow, which they describe diplomatically as 'tightly-bounded', C4C uses an aggregate of five local authorities, including East Dunbartonshire, East Renfrewshire, Renfrewshire and West Dunbartonshire in addition to the City itself. South Lanarkshire, and to lesser extent North Lanarkshire, which take large bites out of Glasgow are excluded because of the extent of the landward areas. C4C has adopted a similar approach to Belfast which is defined as the aggregate of Belfast City, Carrickfergus, Castlereagh, Lisburn, Newtownabbey and North Down.

In using this definition of the PUA for Glasgow puts the City's population at closer to 1.25 million, nearly double the population of city itself. This can be significant for this is the only meaningful way to compare Glasgow with Manchester or Birmingham for example. It is therefore important to understand which measure is being used when Glasgow is being compared with other cities in Scotland, the UK and internationally.

This understanding also helps to explain why the United Nations and the EU consider that in Scotland, only Glasgow constitutes a medium-sized city i.e. is a city with over 500,000 of a population. Recent surveys have put Edinburgh's population at just over 500,000, but this has not yet reached international databases and in any case would make no difference to the comparisons used in this document, although with Glasgow, the differences can be marked.

Because the PUR does not formally exist as a measure in Scotland, Scottish Government data uses the local authority areas in comparative figures for Aberdeen, Glasgow and Edinburgh and the situation is further complicated because Scotland now has city-region deals and a further spatial definition of what is included in the regions for the cities of Aberdeen, Glasgow and Edinburgh city-regions.

This can mean that the Glasgow being compared internationally or within the UK, is not the same as the Glasgow being compared within Scotland and this can have consequences for the interpretation and perceived performance of Glasgow against certain indices. This document takes care, however, to distinguish the measures being used in the analysis and to comment where appropriate.

The complications do not end here as the area of the strategic development plans for Aberdeen, Glasgow and Edinburgh do not match up with their newer city-region definitions. These complications do mean that the reader of any report about Scotland's cities does need to be vigilant about the extent of the city that is being described.

This document is interested in the nature, character and performance of Aberdeen, Glasgow and Edinburgh individually and as a group of cities in Scotland, their fitness to participate within their immediate city systems (in Scotland, the UK and Europe) and the challenges and opportunities they face. Although some degree of comparison is inevitable, it is not the purpose of the work however which to discuss the strengths and weaknesses of the individual cities and the collective performance of urban Scotland in the knowledge age.

ACKNOWLEDGEMENTS

This research was commissioned to provide decision makers, stakeholders, businesses and practitioners with new insights into Scotland's principal cities and to encourage further discussion on their future roles and prospects.

Thanks are due to the leadership team at Burness Paull for their insight and support and for the help and encouragement of their clients who contributed to the debate and the content of the work. Similar thanks are due to the Directorate of the Glasgow School of Art, the Heads of Research & Enterprise and of the Mackintosh School of Architecture and to the Project Board for the Glasgow Urban Laboratory.

Many of the initial insights were gained through the opportunity afforded to the Glasgow Urban Laboratory in leading research into the UNECE region for UN-Habitat for Habitat III and to SCDI for the opportunity to carry out an initial review of UN trends in Scotland. Thanks are due to both for permission to reproduce graphics from these pieces of work. The authors have drawn on many sources notably the invaluable work of the Centre for Cities. Interpretation, conclusions and veracity is however the responsibility of the authors.

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Burness Paull is a law firm with a Scottish heart and a global mindset and, with over 500 employees, one of Scotland's largest independent commercial practices. With offices in Edinburgh, Glasgow and Aberdeen, the firm has strength in depth in all three of the country's major cities. The firm is well-resourced in every key sector of the Scottish economy and was voted "Scottish Firm of the Year 2017" at the Legal 500 UK Awards. In 2018 the firm has been confirmed as the top legal corporate dealmaker in Scotland for the third year running. Burness Paull is also the exclusive Scottish member of Lex Mundi – the world's leading network of independent law firms with in-depth experience in more than 100 countries worldwide.

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THE GLASGOW URBAN LABORATORY

The Glasgow Urban Laboratory (GUL) is a research group within the Mackintosh School of Architecture, The Glasgow School of Art focusing on the Contemporary and Future City. GUL has three strategic partnerships with the City of Glasgow, the Academy of Urbanism and the United Nations Economic Commission for Europe in Geneva that recently established a UN Charter Centre of excellence at the Urban Lab. GUL participates extensively in international research networks including the US-UK Fulbright Commission throughout the USA and the EU COST Programme throughout the EU and is working towards the establishment of a collaborative doctoral programme. In the last three years, GUL has carried out a number of strategic international commissions and published seven books including *Growing Awareness: How green consciousness can change perceptions and places* that won a prestigious research award from the UK Landscape Institute.

www.gsa.ac.uk/urbanlab

[@GSofAreserach](https://twitter.com/GSofAreserach)

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John Lord is the founding director of yellow book Ltd, an Edinburgh-based consultancy specialising in economic development and regeneration. He is an associate of the Glasgow Urban Lab, a Member of the Academy of Urbanism and a member of the Historic England Urban Panel. Before setting up his own practice, John was a director of Scottish Enterprise and a director of EDAAW. He works extensively for government departments, development agencies, local authorities, third sector organisations, universities, community groups and private sector developers.

Mark Robertson is a Partner in Ryden and a Fellow of the Royal Institution of Chartered Surveyors. He joined Ryden in 1993 after completing his PhD in Land Economics and provides internal market research to the firm and external market research to clients. Following a period as head of Ryden's Planning and Research Business Group, he has been for some years, the Managing Partner of the Edinburgh Office. Mark has led an extensive portfolio of research consultancy projects for clients and in 2017, won the RTPI UK award for research excellence for *Planning for Infrastructure* report for the Scottish Government.

FOOTNOTES

¹ The Urban Age Programme organised by LSE Cities with Deutsche Bank's Alfred Herrhausen Gesellschaft. It is an international investigation of the spatial and social dynamics of cities focussed on an annual conference, research initiative and publications.

² BRIC - Brazil Russia India China; MINT – Mexico, Indonesia, Nigeria, Turkey. Acronyms coined by Lord Jim O'Neill.

³ Habitat I Vancouver – 1976; Habitat II Istanbul – 1996; Habitat III Quito – 2016. The 'New Urban Agenda' is the international and inter-governmental accord issued following H III

⁴ The five regional commissions are: Africa (ECA); Latin American & the Caribbean (ECLAC); Asia and the Pacific (ESCAP); Western Asia (ESCWA); and Europe, North America and the Commonwealth of Independent States (UNECE).

⁵ Projected Share of the UK's GDP in 2022, *Office for National Statistics, TUC, Guardian Graphics*

⁶ UN-Habitat Regional Report on the UNECE, 'Towards a city-focused, people-centred and integrated approach to the New Urban Agenda, Evans. B.M. et al, UN, Geneva, 2016.

⁷ London, the core cities (Birmingham, Bristol, Cardiff, Glasgow, Leeds Liverpool, Manchester, Newcastle, Nottingham, Sheffield), Edinburgh, Aberdeen, Dublin and Belfast.

⁸ Scottish Government, Scotland's Agenda for Cities, March 2016 and Professor Greg Clark, "Cities, global cities and Glasgow – some reflections", University of Strathclyde International Public Policy Institute, Occasional Paper 2016

⁹ Based on OECD definitions, Scotland has one urban area of metropolitan scale (Glasgow) and two medium-sized urban areas (Edinburgh and Aberdeen).

¹⁰ Ibid

¹¹ In 2015, UN-Habitat commissioned five reports to review changes in urbanisation in different global regions over the period 1996-2016 and to explore scenarios towards 2036 and the next Habitat the global conference on sustainable development, the five regional reports. The report covering Scotland and the UK was Towards a city-focused, people-centred and integrated approach to the New Urban Agenda: UN-Habitat Regional Report on the UNECE, Evans, B.B. et al, UN-Habitat & UNECE 2016

¹² UNECE regional report - The report commissioned for the area of the UN Economic Commission for Europe (UNECE) identified a number of trends – ageing, low-fertility, automation and migration. This preparation of this regional report has had a number of consequences: firstly the ideas it contained made a significant contribution to Habitat III and to the emergence of the New Urban Agenda, the principal mechanism by which the 17 Strategic Development Goals of the UN from the Paris Accord on climate change will be delivered; and secondly, the research findings of the report were used as the platform upon which to build the Ministerial Declaration for the Committees of the UNECE in taking forward dialogue and action with their 56 member states, particularly in respect of SDG 11 – sustainable cities.

¹³ Described in various texts such as including: <https://www.rockefellerfoundation.org/report/century-of-the-city/>; <http://www.nature.com/news/2010/101020/pdf/467900a.pdf> The century of the city will change the way we do politics, <https://next.ft.com/content/ee818994-dcb5-11e2-b52b-00144feab7de>; A century of cities Urban economic change since 1911 Paul Swinney & Elli Thomas March 2015, <http://www.centreforcities.org/wp-content/uploads/2015/03/15-03-04-A-Century-of-Cities.pdf>

¹⁴ UN Department of Economics and Social Affairs, World Urbanization Prospects, 2014.

¹⁵ Ibid.

¹⁶ Evans et al 2016 Op. cit. and Evans, B.M. *Productive Places*, Scottish Council Development & Industry, 2017

¹⁷ Population Trends and Policies in the UNECE Region: Outcomes, Policies and Possibilities, Chapter 1: Population Dynamics: Past and Future Trends, p. 4.

¹⁸ OECD, 2015:49.

¹⁹ See for example <http://www.insidehousing.co.uk/older-people-chose-family-homes/6518478.article>

²⁰ OECD, 2015.

²¹ The best known example is Copenhagen which has systematically changed its emphasis from movement based on the car to movement based on walking cycling and public transport. See also publications by Jan Gehl (*Cities for People, New City Spaces, New City Life*) as well as 'The Walkable City', Jeff Speck, 2013.

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- ²² European Commission, 2015:14.
- ²³ Eurostat.
- ²⁴ Administration on Aging. 'Highlights'. http://www.aoa.acl.gov/Aging_Statistics/Profile/2013/2.aspx [Accessed 29 March 2015.]
- ²⁵ Administration on Aging. 'Future Growth'. http://www.aoa.acl.gov/Aging_Statistics/Profile/2013/4.aspx [Accessed 29 March 2015.]
- ²⁶ Such as the U.S. Department of Health and Human Services' Community Innovations for Aging in Place Initiative (CIAIP) from 2006 to assist community efforts to enable older adults to sustain their independence and age in place in their homes and communities. US Draft National Report, 2015.
- ²⁷ Evans et al UN-habitat 2016, Op. cit.
- ²⁸ Eurostat.
- ²⁹ Maytree Foundation, Toronto, Canada. 2012. Available at: www.maytree.com. See also: http://citiesofmigration.ca/wp-content/uploads/2012/03/Municipal_Report_Main_Report2.pdf
- ³⁰ Gebhardt, 2014.
- ³¹ The International Organisation for Migration (IOM) is the leading inter-governmental organization in the field of migration and works closely with governmental, intergovernmental and non-governmental partners. The World Migration Report 2015: Migrants and Cities, New Partnerships to Manage Mobility is the eighth report in IOM's World Migration Report (WMR) series. It is available at: <http://www.iom.int/world-migration-report-2015>
- ³² The issue is dealt with in several Scottish Government papers including, for example, *Scotland – the new case for optimism: A strategy for inter-generational economic renaissance*, the report of the Sustainable Growth Commission, 2018
- ³³ OECD Digital Economy Outlook 2015, executive summary.
- ³⁴ OECD, 2013a.
- ³⁵ Evans et al, Op cit
- ³⁶ OECD Op cit
- ³⁷ OECD Op cit
- ³⁸ The Habitat Agenda in the urban millennium, Special Session of the General Assembly for an Overall Review and Appraisal of the Implementation of the Habitat Agenda, New York, 6-8 June 2001.
- ³⁹ See for example *Delivering for Today, Investing for Tomorrow: The Government's Programme for Scotland 2018-19*, pp30-31
- ⁴⁰ Cities with more than 10 million people. UN Department of Economics and Social Affairs, Op. cit.
- ⁴¹ UNECE Housing and Land Management analysis based on the data at <http://data.worldbank.org/>
- ⁴² Refer to maps 1,2 and 3.
- ⁴³ 'Aerotropolis – The Way We'll Live Next'. J.D. Kasarda and G. Lindsay.
- ⁴⁴ 'The 'Marchetti Constant' holds that 'time is fixed but space is elastic'. After the Italian physicist Cesare Marchetti. The principle used in France and Japan to 'shrink' distance through the introduction of high-speed train networks, now widely replicated.
- ⁴⁵ World Bank, 2014.
- ⁴⁶ World Bank, 2014.
- ⁴⁷ In work to come, we will examine this index for other parts of the UNECE region and against the trend lines for 1976 and 1996. It is intended that we illustrate this graphically and comment on whether the literature supports a proposition that there is a maximum threshold for urban population expressed in percentage of the population.
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- ⁴⁹ US Draft National Report for Habitat III, April 2015.
- ⁵⁰ *Ibid*, p 2.
- ⁵¹ 'BosWash' was given its name in the 1960s by the futurist H. Kahn, <http://www.prb.org/Publications/Articles/2011/us-megalopolises-50-years.aspx>
- ⁵² M. Mather, co-author of PRB's Reports on America: First Results from the 2010 Census.
- ⁵³ Add in the map and table that accompanies the graphic of US super-cities.
- ⁵⁴ *Triumph of the City: How our Greatest Invention makes us Richer, Smarter, Greener, Healthier and Happier*. E. Glaeser, Macmillan, 2011. <http://www.economist.com/node/18111592#sQrAW9eY05O4RQ.99>
- ⁵⁵ US Draft National Report for Habitat III, April 2015, p 2.
- ⁵⁶ *Confronting Suburban Poverty in America*, E. Kneebone and A. Berube, Brookings, 2013.
- ⁵⁷ W.H. Frey. 'A Population Slowdown for Small Town America'. Brookings, 31 March 2014. <http://www.brookings.edu/research/opinions/2014/03/31-population-slowdown-small-town-america-frey> [Accessed 29 March 2015.]
- ⁵⁸ UN Population Division, 2015.
- ⁵⁹ Eurostat.
- ⁶⁰ Roger Brunet, 1973.
- ⁶¹ http://ec.europa.eu/regional_policy/sources/docoffic/official/reports/pdf/sum_en.pdf
- ⁶² <http://www.worldometers.info/world-population/uk-population/>, <http://worldpopulationreview.com/countries/united-kingdom-population/cities/>
- ⁶³ The UK Foresight programme brought together the voices of business, government, the science base and others to look at what might happen in the future and what could be done to secure long-term competitive advantage and quality of life.
- ⁶⁴ François Batisse, *Restructuring Railways (part 2) Restructuring of Railways in France: "Salvage Operation"*, *Japan Railway & Transport Review* No. 8 (pp.31–39)
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- ⁶⁶ Läßle, *Op. cit.*
- ⁶⁷ Richard Florida, "The Dozen Regional Powerhouses Driving the US Economy", www.citylab.com, March 2014
- ⁶⁸ Identified originally by RECLUS, a group of French geographers managed by Roger Brunet in 1989.
- ⁶⁹ Centre for Cities, 2016, *Building the Northern Powerhouse: lessons from the Rhine-Ruhr and Randstad*
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- ⁷¹ Schlappa et al., 2013.
- ⁷² UN-Habitat, 2013.
- ⁷³ UN Habitat, *Urban Expansion Programme*, 2016, New York University, UN-Habitat, New York University, and the Lincoln Institute of Land Policy
- ⁷⁴ OECD glossary, p. 15.
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- ⁹³ The UK Foresight programme *Op. cit.*
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- ⁹⁹ The Centre for Cities, A Century of Cities, 2015
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- ¹²⁵ There were significant variations in population figures at the sub-regional level where population growth was most rapid in the immediate commuter areas around each of the main cities: for Edinburgh, West Lothian (+24%) and East Lothian (+23%); for Aberdeen, Aberdeenshire (+22%); and, for Glasgow, East Renfrewshire (4.4%) and South Lanarkshire (0.9%). In Glasgow city-region, however, this growth was offset by population decline in Inverclyde (-12%) and West Dunbartonshire (-7%).
- ¹²⁶ UN Geneva Charter on Sustainable Housing, 2015
- ¹²⁷ Based upon rounded 258,000 sales since 2007 and 20,800 private sector completions (dates do not match exactly and not all private sector completions may be for sale, which could further reduce the new-build sales %)
- ¹²⁸ Scotland's housing stock is 2.584 million dwellings. 38% are flats and 61% houses.
- ¹²⁹ UNECE, 2015
- ¹³⁰ The final 4% is accounted for by vacant or second homes
- ¹³¹ Scottish Household Survey

¹³² Build-to-rent (or PRS, Private Rented Sector) is super-concentrated in larger cities. Scotland's total pipeline of 2765 units in 7 consented and unconsented schemes is only 2% of the UK total. London accounts for 56% of the UK total (analysed from British Property Federation monitoring data).

¹³³ Government Office for Science, Future of An Ageing Population

¹³⁴ Centre for Cities, Cities Outlook 2017. Cities Outlook monitors Primary Urban Areas (PUAs). Aberdeen and Edinburgh are defined by their city boundaries. The Glasgow PUA includes East Dunbartonshire, East Renfrewshire, Renfrewshire and West Dunbartonshire.

¹³⁵ Note: Aberdeen and Edinburgh are defined by their city boundaries whereas Glasgow includes East Dunbartonshire, East Renfrewshire, Renfrewshire and West Dunbartonshire, a more realistic measure of Glasgow's performance and a recurring theme throughout this work.

¹³⁶ Knowledge Intensive Business Services (commonly known as KIBS) are services and business operations heavily reliant on professional knowledge. They are concerned mainly with providing knowledge-intensive support for the business processes of other organisations.

¹³⁷ Total employment in Scotland in 2015 was 1.0% higher than in 2009, but KIBS employment was down 4.7%. Employment in Edinburgh rose by 4.0% over this period, with KIBS down 5.5%; Aberdeen grew by 1.2% (KIBS down 7.7%); and Glasgow decreased by -4.2% with KIBS down a significant 14.2%. The Aberdeen city-region was the standout performer over the period, with an overall 6.2% rise and an increase of 6.9% in KIBS employment.

KIBS employment came under severe pressure in the aftermath of the 2008-09 recession, and it has been slow to recover, but Figures 5-8 to 5-10 show that these key, high-productivity sectors continue to cluster in city centres and some other favoured locations. In Aberdeen (Figure 5-8) KIBS jobs are concentrated in the city centre and around the Energy and Innovation Parks; (There is an oddity here and above with Aberdeen's KIBS performance, which may be explicable by the major jobs growth in Westhill?); in Glasgow (Figure 5-9) they are clustered in the city centre and close to the universities and hospitals; and in Edinburgh (Figure 5-10) KIBS jobs are concentrated in the city centre, around the Bioquarter and at West Edinburgh, notably in Edinburgh Park.

¹³⁸ <https://www.insider.co.uk/news/business-research-development-spending>

¹³⁹ Aberdeen and Edinburgh cities are particularly dominant in their regions whereas Glasgow sits at the heart of a more extensive metropolitan region. Demand trends and market evidence (e.g. vacancy rates and rental levels) indicate that the concentration of offices in urban areas is continuing. Vacancy rates are reflecting the market demand cycles; Aberdeen's rate is 14%, with Glasgow at 11% and Edinburgh 7%. Supply side developments also influence these figures: Edinburgh has had most success in converting obsolete offices – upper floors, 1960s buildings and townhouses – to alternative uses such as residential, while Glasgow's progress is more gradual and Aberdeen's high vacancy rate is a new phenomenon reflecting the uncertainties of the oil price and a weaker offshore industry in the period 2014-17 (Figure 5-27).

¹⁴⁰ Current office development proposals in Aberdeen, Glasgow and Edinburgh total 0.43 million sqm, but there is an imbalance with only 15% of the pipeline in Edinburgh, as opposed to 50% in Glasgow and 34% in the over-supplied Aberdeen market. Reflecting the Scottish position, this development pipeline would add only 7% to office stock in the AGE cities although given the extent of market concentration and occupational density, the quality and location of offices (including refurbishments) matter as much as net new stock.

¹⁴¹ Facilities management and ICT have increased occupational density where the average space per worker has fallen from 16 sqm to 12 sqm, and new buildings are currently planned at 8-10 sqm per person, close to half the recent historic figure.

¹⁴² Aberdeen's oil boom delivered 12% of the region's industrial stock between 2010 and 2017, compared with only 4% in Glasgow and 3% in Edinburgh City Regions. At the city level, Glasgow has the largest industrial property stock followed by Edinburgh and Aberdeen, but Edinburgh in particular has a comparatively small industrial property stock. Demand is catered for in the wider city region. As shown in Figure 5-30, vacancy rates are low and similar across market areas, although the rate in Edinburgh is particularly low.

¹⁴³ This can also be explained using a reductive form of Maslow's hierarchy of needs from the social sciences, whereby basic needs for food are met first, then clothing, increasingly discretionary items and experiential leisure activities at the apex. An analysis of long run growth by expenditure type conforms to this pattern.

¹⁴⁴ For a brief period in the 2000s it appeared that superstores were also intending to diversify and join this market by offering ever-larger ranges of comparison goods. However that trend has peaked and the foodstore market remains largely local and is often driven by price competition as well as convenience and quality.

¹⁴⁵ Office for National Statistics, 14.6%, 2017

¹⁴⁶ This can be demonstrated using many indicators, eg. vacancy rates, number of national multiple retailers, retailer demand for centres, investment yields, new floorspace developed and proposed.

¹⁴⁷ Edinburgh, Glasgow and Aberdeen City Centres, Gyle (Edinburgh), Silverburn (Glasgow) and Braehead (now Renfrewshire though on the Glasgow boundary and formerly in both local authority areas)

¹⁴⁸ Since 2000, prime retail rents in the AGE cities have risen by 33%. Among the other cities and larger towns, rents have fallen by 8% since 2000, even although these are not necessarily secondary or struggling towns and are among some of Scotland's most notable urban centres in small cities and towns. Smaller local centres in the AGE City Regions sit even further down the commercial hierarchy of retail and leisure. They are increasingly dependent upon a highly localised mix of convenience shops and services, perhaps supplemented by visitor expenditure, or an attraction such as a shopping park. The gradual loss of more traditional services from these town centres such as travel, insurance and banks as they migrate on-line will further exacerbate their loss of branded multiple retailers.

¹⁴⁹ The major development currently underway is Edinburgh St James, a 79,000 sqm retail and leisure scheme due for completion in 2020. St Enoch Shopping Centre in Glasgow city centre is delivering a 8,360 sqm leisure development with significant developments in the Glasgow city-region including The Hub at East Kilbride (with a new 6,500 sq m leisure quarter) and 7,770 sq m extension to the Cumbernauld Retail Park, while the Bon Accord & St Nicholas centres in Aberdeen are adding restaurants, cinema, hotel and residential development.

¹⁵⁰ <https://www.transport.gov.scot/public-transport/rail/scotrail-franchise/#37380>

¹⁵¹ Aberdeen & Grampian Chamber of Commerce (2015), Reducing the barriers to bus use

¹⁵² Times Higher Education Supplement and also see <https://www.theguardian.com/news/datablog/ng-interactive/2014/dec/18/university-research-excellence-framework-2014-full-rankings>

¹⁵³ <https://www.ed.ac.uk/informatics/news-events/stories/2010-2014/spinoutsandstartups>

¹⁵⁴ Edinburgh Festivals Impact Study, BOP Consulting, 2011 <http://www.eventscotland.org/resources/downloads/get/82.pdf>

¹⁵⁵ <http://www.thecgf.com/games/2014/G2014-Official-Post-Games-Report.pdf>

¹⁵⁶ Quality of Life in European Cities 2015 (published January 2016), European Union, Directorate of Regional and Urban Policy. Glasgow is the only Scottish City included in the EU ranking of medium-sized cities. (http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/survey2015_en.pdf).

¹⁵⁷ Owen Hatherley writing in Dezeen in 2014. <https://www.dezeen.com/2014/09/11/owen-hatherley-opinion-scottish-independence-impact-on-architecture/>

¹⁵⁸ Myerscough, J., Glasgow Cultural Statistics Digest: A Digest of Cultural Statistics, Glasgow City Council, Creative Scotland, 2011

¹⁵⁹ OECD Territorial Reviews: Competitive Cities in the Global Economy, OECD, 2006

¹⁶⁰ Centre for Cities, 2016, Building the Northern Powerhouse: lessons from the Rhine-Ruhr and Randstad

¹⁶¹ Centre for Cities, Competing with the Continent: how UK cities compare with their European counterparts (September 2016). The analysis in this report is based on the UK's Primary Urban Areas (PUAs) and their nearest European equivalents.

¹⁶² <http://www.dynamiccities.savillsim.com/>

¹⁶³ <http://www.innovation-cities.com/>

¹⁶⁴ <https://digitalcityindex.eu/>

¹⁶⁵ EU Annual Quality of Life survey for medium sized cities in Europe.

¹⁶⁶ <https://www.arcadis.com/en/global/our-perspectives/sustainable-cities-index-2016/>

¹⁶⁷ The Centre for Cities uses data for Primary Urban Areas (PUA) in its analysis – a measure of the "built-up" area of a city, rather than individual local authority districts. PUA data only exists for English cities. For Welsh and Scottish cities, we use the corresponding local authority area, with the exception of tightly-bounded Glasgow, where CfC have defined the city as an aggregate of five local authorities, including East Dunbartonshire, East Renfrewshire, Renfrewshire, West Dunbartonshire in with Glasgow City. (See <http://www.centreforcities.org/wp-content/uploads/2014/07/12-03-19-Primary-Urban-Areas-definitions.pdf>).

¹⁶⁸ <http://www.un.org/sustainabledevelopment/blog/2016/10/newurbanagenda/>

¹⁶⁹ *Where Good Ideas Come From: The Natural History of Innovation* Steven Johnson, Allen Lane, 2010

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¹⁷¹ *Scotland – the new case for optimism: A strategy for inter-generational economic renaissance*, the report of the Sustainable Growth Commission, 2018

¹⁷² Greg Clark *Ibid.*

¹⁷³ The Government's Programme for Scotland, *Delivering for Today: Investing for Tomorrow 2018-19 & A Nation with Ambition, 2017-18*.

¹⁷⁴ In 2011, Sir Paul Callaghan (the MacDiarmid Institute's founding director) used this phrase with the younger generation as a challenge for New Zealand's transition to a world-class and globally competitive small country through science, technology and an evidence base for decision-making.

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