

The Evidence Base for London's Local Industrial Strategy – Final report

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Executive summary

Introduction

The Local Industrial Strategy (LIS) for London is an opportunity to shape a more inclusive and sustainable economy. One that improves living standards for all Londoners, creates opportunities across all parts of the city, supports the wider UK economy and is more environmentally sustainable.

It is widely understood that improvements in productivity underpin increases in living standards and therefore are a necessary (although not sufficient) condition for inclusive growth. It is being increasingly recognised though (by the OECD among others) that the relationship also runs in the other direction – inequality can act as a drag on productivity. Policies that aim to address both inclusion and productivity – maximising synergies while managing potential trade-offs – are therefore needed to make progress towards the ultimate objective of inclusive growth¹.

In order to inform LIS development and priorities, the LIS evidence base report seeks to:

- Reflect a wealth of evidence and analysis that the Greater London Authority (GLA) has developed over the years, including for example the Economic Evidence Base for London 2016, the draft London Plan 2017 and numerous technical publications by GLA Economics.
- Consider future opportunities and challenges alongside the current strengths and weaknesses of London's economy and recent history.
- Provide, where feasible, more granular geographical detail to convey the complex and diverse nature of London's economy.
- Go beyond descriptive analysis to provide clear and useful policy insights.

The rest of the Executive Summary introduces the overall theme for the London LIS; supporting productivity improvements to unlock more inclusive growth. It then provides an overview of the key findings on productivity in London and on the UK Industrial Strategy's five foundations of productivity: Business Environment, People, Infrastructure, Ideas and Places.

London's economic performance

London is a very successful economy; it has performed strongly over the past 20 years in terms of output and employment growth and it is pivotal to the UK economy.

- London's economic output (Gross Value Added - GVA) increased at an average rate of 3.1% per year between 1998 and 2017. In 2017 London's GVA totalled £426.2 billion; twice the size of the economies of Scotland and Wales put together and accounting for 23.8% of UK GVA².
- London's net contribution to the Exchequer in 2017/18 was around £34.3bn.
- London's level of productivity has historically been higher than in the rest of the country – between 19% and 31% higher than the UK average over the last 20 years³. Statistics based on different territorial definitions also point to London as being one of the most productive regions or metropolitan areas in Europe⁴.

¹ See for example the blog by Gabriella Ramos (OECD Chief of Staff) for the OECD Forum 2016: <http://www.oecd.org/social/productivity-equality-nexus.htm>.

² Based on the 2018 GVA release from the ONS - ONS (2018). 'Regional gross value added (balanced) local authorities by NUTS1 region'.

³ Based on output per hour relative to the UK average (1997-2017). Source: ONS (2019), 'Industry by region estimates of labour productivity: 2017'.

⁴ ONS (2018), 'Regional and subregional productivity comparisons, UK and selected EU countries: 2014', looking at regions, or OECD.Stat [accessed 19/06/2019], looking at metropolitan areas definitions.

- The recession of 2008-09 was a serious hit for London's economy given the contraction of key sectors in its economic base (especially the finance and insurance sector). On the other hand, London's economy has shown a remarkable resilience in the post-recession years which other parts of the UK and of Europe lacked, especially in terms of jobs growth⁵.
- Employment and unemployment rates are currently near historical highs/lows respectively (although unemployment rates in London have historically and consistently been above the UK average).
- Notwithstanding Brexit-related uncertainty, long-term projections still point to London as a growing economy which will continue to create new employment.

However, productivity growth in London has stalled since the financial crisis, as in the rest of the country. There are big differences in productivity performance between firms within sectors and between different parts of the city.

- Running at just 0.3% per year on average, real productivity growth in London between 2010 and 2017 was more or less in-line with stalling productivity in the UK as a whole.
- While most industry groups in London exhibit high levels of labour productivity compared to the rest of the UK, aggregate productivity benchmarks mask large variations in productivity performance between firms (and workers) within the same sectors.
- GVA per hour worked in the most productive part of the capital (Inner London West) is over 42% higher than in the least productive part of London (Outer London South). Since 2010 productivity in real terms has actually declined in some parts of the capital⁶.

The challenge of inclusive growth in London

London has a major inequality problem, whether we look at wealth or income. Housing costs are a significant factor in determining this outcome.

- New housing supply in London has failed to keep up with demand. Specifically, in the last two decades the number of jobs in London has grown by 45% and the number of people by 27%, but the number of homes by only 18%⁷. This in turn has led to a housing affordability crisis, whose impact on the economy, poverty, social and geographical mobility and well-being are of national significance.
- Household incomes in the bottom half of the distribution in London are lower than in the rest of the UK once housing costs are taken into account. Median household incomes in London are broadly in line with the UK average when measured on the same basis.
- London households in the bottom half of the wealth distribution own just 5% of total household wealth, while households in the richest 10% own more than 60% of total household wealth.
- Housing wealth is a key driver of wealth inequalities in London. Between 2013 and 2018 average housing wealth in London grew by £122,000 (34%), propelled by rapidly increasing house prices⁸. At the same time, levels of home ownership in London remain significantly below the national average at 48% in 2017 compared to 63% across England according to the English Housing Survey.

⁵ GLA Economics (2018), Current Issues Note 57: '[Regional, sub-regional and local gross value added estimates for London, 1997-2016](#)'.

⁶ Outer London South, Outer London East and North East and Inner London East. Source: ONS (2019), '[Regional and sub-regional productivity in the UK: February 2019](#)'.

⁷ Mayor of London (2019), '[Housing in London: The evidence base for the Mayor's Housing Strategy](#)' p39.

⁸ Breach, A. (2019), '[Capital cities- How the planning system creates housing shortages and drives wealth inequality](#)'.

When accounting for housing costs, London also has higher rates of relative poverty and of child poverty than any other part of the UK. A significant amount of poverty is concentrated within households where at least one person works.

- 28% of London's population lives in relative poverty once housing costs have been taken into account. This percentage rises to 33% in inner London⁹.
- When taking housing costs into account London also has a higher proportion of children living in poverty than any other part of the UK – 37% of all London's children live in poverty, rising to 44% of inner London children.
- Low incomes are not just associated with households of people who are unemployed, economically inactive or retired. Around half of low-income families in London have at least one member who is in some form of employment.
- The recent [Survey of Londoners](#) paints a picture of a widespread lack of food security¹⁰ with 1.5 million adults and 400,000 children in London having low or very low food security. Six out of ten adults suffering from food insecurity are in full-time or part-time work.

Key findings across the five foundations of productivity

- The figure below presents an overview of how the five foundations relate to London's economy, providing a very high-level summary of the report's key findings on London's strengths as well as current and future challenges, risks and opportunities. A slightly expanded summary of key findings is also provided.
- More detailed findings are set out in the next section.

⁹ Unless otherwise stated, this and other statistics in these bullets are taken from the GLA's Economic Fairness Indicators and are based on Based on DWP (2018), '[Household Below Average Income, 2014/15-2016/17](#)'.

¹⁰ Having food security means having access at all times to enough food for an active, healthy life. A full definition of food security was provided at the World Food Summit in 1996. See FAO (2006), '[Food Security: Policy Brief June 2016, Issue 2](#)'.

London and the five foundations of productivity

Foundation of Productivity	London's strengths	Key challenges, risks and opportunities
BUSINESS ENVIRONMENT – Being the best place to start and grow a business	<ul style="list-style-type: none"> • Unique dynamic business ecosystem and competitive strengths as a global city • Strong agglomeration economies • Specialisation in high-skilled activities • Diversity in business activities 	<ul style="list-style-type: none"> • Cost of doing business (including costs and availability of business space) affecting diversity and competitiveness • Global risks (e.g. Brexit, changes in trade) • Challenges (and opportunities) of clean growth and transition to a low carbon, circular economy
PEOPLE – Securing good jobs and greater earning power for all	<ul style="list-style-type: none"> • London's diverse and highly educated work force • London's strong labour market and job creation performance • Strong school performance and progression to tertiary education overall 	<ul style="list-style-type: none"> • Inequalities in skills and job market outcomes • Low pay/insecure employment/underemployment • High living costs (especially housing affordability) • Risks from post-Brexit migration frameworks • Automation risks and uneven access to adult training
INFRASTRUCTURE – Delivering modern and accessible infrastructure that underpins growth and prosperity	<ul style="list-style-type: none"> • London's mature transport network and high levels of radial connectivity • High level of infrastructure endowments (physical, green) 	<ul style="list-style-type: none"> • Pressure from growing population on infrastructure requirements (especially transport, housing) • Gaps in London's digital connectivity and delay with regard to next generation mobile and broadband • Infrastructure funding gap regarding expected requirements
IDEAS – Maintaining and enhancing the ability to innovate – to develop new ideas and deploy them	<ul style="list-style-type: none"> • London's innovative assets (Higher Education Institutions, global HQs) • Access to equity and loan finance (non SMEs) • London's lead R&D sectors, including tech & digital, advanced urban services, life sciences and creative industries 	<ul style="list-style-type: none"> • Average rates of reported business innovation compared to the rest of the UK • Scope for greater levels of innovation diffusion (including AI) among the business population • Maximising opportunities and managing disruption of transformative innovations
PLACE – Building prosperous communities across the UK	<ul style="list-style-type: none"> • Clusters and local employment hubs • Interconnectedness between London's economy and the Wider South East • Interconnectedness between London's economy and the broader UK economy 	<ul style="list-style-type: none"> • Difference in economic performance across London (different London areas, inner-outer) • Pockets of entrenched socio-economic disadvantage (compounding drivers) • Opportunities and constraints of regional infrastructure (radial and orbital links)

Note: The type of risks identified here are risks to inclusive economic growth. As with other global cities, London faces additional societal risks (e.g. terrorism or flu pandemics).
Source: GLA Economics.

Business environment

- **Strengths:** London's business environment is exceptionally dynamic and reflects London's place as a global business capital, which is very much open to international trade and a leading attractor of foreign direct investment. It is characterised by strong agglomeration economies and specialisation in high-skilled sectors and activities. At the same time, it is also diverse in terms of its sectoral and employment base.
- **Key challenges, risks and opportunities:** the high costs of doing business in London could adversely affect the diversity of its economic base (e.g. in terms of Small and Medium Enterprises (SMEs) growth) and - at least at the margin - its competitive position. As in the rest of the UK, SMEs tend to have lower rates of productivity than larger firms, with evidence pointing to management practices being a key driver of this gap. London's international openness also means that it is highly exposed to global risks. Potential disruption to international trade (especially as a result of Brexit) therefore poses particular risks for the capital. Finally, the global and UK transition to a net zero carbon and circular economy will present significant opportunities for London's economy, but also a major transitional challenge for its businesses.

People

- **Strengths:** London benefits from a diverse and highly-skilled workforce, with employment and unemployment rates at nearly historical highs/lows respectively and a very strong job creation performance in recent years (with more growth projected to 2041). Its schools are also good overall, with good levels of progression to tertiary education.
- **Key challenges, risks and opportunities:** London faces persistent inequalities in skills and labour market outcomes across different population groups (e.g. by gender, ethnicity, disability status) with a combination of education, skills, transport accessibility, health, social and childcare barriers affecting outcomes. The recent buoyancy of London's labour market has also been accompanied by an increase in low-pay and insecure employment. The impact of low pay on living standards is compounded by the high costs of housing in London, with relative poverty affecting a large number of households where someone is in work. Looking ahead, key risks to this foundation of productivity include the potential impacts of a post-Brexit migration framework on London's labour market. They also include the transition to an economy with much higher levels of automation and of uneven access to adult training.

Infrastructure

- **Strengths:** London has very extensive and mature transport networks, with very good radial connections which are key to maintaining its agglomeration economies. Beyond transport, it has got high levels of infrastructure endowments which help keep the city and its economy efficient and attractive, including physical infrastructure and green infrastructure (e.g. London's parks, open spaces and water networks).
- **Key challenges, risks and opportunities:** London faces significant infrastructure challenges resulting from the pressures of a growing city on transport, housing and infrastructure, both city-wide and in specific locations. There are significant gaps in the provision of digital connectivity in London, with significant delays compared to international competitors in terms of the rollout of next generation mobile and broadband connectivity. There is also a large gap between the city's infrastructure requirements and the levels of public and private investment that are likely to be available to address them.

Ideas

- **Strengths:** London has a number of strengths concerning ideas and innovation. These include the quality of its higher education institutions and the presence of many global/European headquarters of highly innovative businesses. Generally speaking, it offers good access to loan and equity finance for innovative firms. And critically, it has competitive strengths in several leading R&D sectors, including tech and digital, low-carbon and environmental goods and services, advanced urban services, life sciences and the creative industries.
- **Key challenges, risks and opportunities:** notwithstanding its great assets, reported levels of innovation among London businesses are only average in comparison with other parts of the UK, and there is also significant scope to raise business spending on R&D. As in the rest of the UK, there is capacity for the greater diffusion of innovation (including artificial intelligence) among London's business population. Longer term, there are significant opportunities to be gained (but also a need to manage the potential disruption) from transformative innovations.

Place

- **Strengths:** there are a high number of emerging clusters and employment hubs (e.g., strategic industrial areas, town centres, local business parks) dotted around Greater London, providing opportunities for employment in high-value activities outside of central London. London is also highly interconnected with the geography and the economy of the wider South East, creating synergies that benefit both. Also, London is highly integrated in the broader UK economy, with links regarding trade, finance, investment and skills that generate benefits in both directions.
- **Key challenges, risks and opportunities:** there remain large differences in economic performance (especially in productivity levels and trends) between different areas of London (e.g., inner and outer London). There are also widespread and entrenched pockets of socio-economic disadvantage across all London's boroughs¹¹, which are likely to be compounded by a number of social and economic factors. Finally, there are both constraints and opportunities from improving radial and orbital infrastructure connectivity, both within London and that of inter-regional connectivity with the wider South East.

¹¹ Where reference is made to London boroughs on the whole, this refers to the 32 boroughs and the City of London Corporation.

Expanded findings on the five foundations of productivity

Business Environment

London is a global business capital that has adapted and thrived in an era of structural change and the increase in international trade since the mid-1990s. It attracts investment, skills and visitors from all over the world.

- In 2017, nearly a fifth of all UK private sector businesses (19%) were located in London, up from 17% in 2013¹².
- Business start-ups have driven this growth¹³ and London is also the best place for businesses to grow, with the highest incidence of high-growth firms in England¹⁴.
- Between 2011 and 2018 London secured 3,910 FDI projects, the highest among global cities (Figure 3.3). London tops this global list even in more recent years, despite Brexit-related uncertainties.
- London has also the largest number of foreign-owned businesses (21,340) among UK regions, accounting for more than a fifth (21%) of all foreign-owned businesses in the country¹⁵.

Since the mid-1990s London has become increasingly specialised in high-skilled services, led by finance and professional services. More recently, it has experienced strong growth in the science and technology industry.

- Exports from the high-skilled services sectors are a key driver of London's trade surplus with the rest of the world¹⁶.
- Sectoral specialisation has been accompanied and reinforced by spatial concentration as these economic activities have tended to locate in London's Central Activities Zone (CAZ) and in the Northern Isle of Dogs (NIOD) to benefit from 'agglomeration effects', i.e. the productivity benefits of concentration of many businesses in geographical proximity to each other¹⁷.

London's business environment is also diverse. Other supporting activities remain crucial in providing employment opportunities, ensuring that the capital remains a well-functioning, liveable city.

- While many globally competitive businesses locate in central London, other sectors (particularly those serving local markets) are located closer to population centres, their growth driven by the capital's population growth as well as by demand from central London businesses.
- A wide range of 'foundational' sectors play a significant role in the London economy. The wholesale and retail trade, health, education and public administration sectors, for example, together account for over 1.9 million jobs in the capital, equal to a third of all jobs and around a fifth of economic output¹⁸.

¹² For background, see: ONS (2018), '[Business Demography, UK: 2017](#)'. Note: the term 'business' is used here to represent an enterprise rather than an individual local unit. An enterprise can be comprised of one or more legal units.

¹³ GLA Economics (Trends Business Research Ltd) (2016), Working Paper 73: '[The changing spatial nature of business and employment in London](#)'.

¹⁴ ERC (2019), UK Local growth dashboard: September 2019. Note: High-Growth is defined as annualised average growth in employment of 20% or more over a three-year period (2015-18) and restricted to a business having at least 10 employees in 2015.

¹⁵ ONS (2019), '[Foreign-owned businesses in the UK non-financial business economy \(Annual Business Survey\): 2017](#)'. Note: the ABS covers only the UK Non-Financial Business Economy which accounts for two-thirds of UK economy in terms of approximate gross value added (aGVA).

¹⁶ GLA Economics (2019), '[The London Input-Output Tables](#)'.

¹⁷ Agglomeration economies reflect a number of advantages (e.g. economies of scale, low-transaction costs, skills matching, knowledge spillovers) that arise as businesses concentrate in proximity to their suppliers, customers, labour markets and even competitors.

¹⁸ ONS (2019), 'Workforce jobs by region and industry'; ONS (2018), 'Nominal and real regional gross value added (balanced) by industry'.

- A number of Strategic Industrial Locations (SIL) identified in the draft London Plan accommodate strategically important activities such as logistics, waste management and transport functions that are crucial to running the capital.

The cost of doing business in London is however a challenge for competitiveness and a significant threat to sectoral and business diversity.

- Housing costs, business space costs and transport costs (including negative externalities) are factors that go towards offsetting (at least at the margin) the many positives associated to doing business in London.
- According to the Savills Live/Work 2017/18 Index, London is the most expensive place to accommodate a worker in Europe (see Figure 1.8)¹⁹. This can affect the decisions of both high-skilled individuals and businesses to locate in the capital.
- The mix and affordability of workspaces will be crucial to maintaining London's sectoral diversity and resilience and in allowing businesses to grow, particularly among the SME population²⁰.
- London will continue to specialise in high-skilled services. However, rising living costs combined with the potential loss of market access and recruitment issues post-Brexit risk making London a less attractive place to do business.

In line with the rest of the UK, the lack of good management practices is one of the main obstacles to improving the productivity of London's businesses, particularly SMEs.

- ONS productivity statistics show that except for micro plants (1 to 9 employment) average GVA per worker generally increases with the firm size, and this is true for all UK regions including London²¹.
- The ONS Management and Expectations Survey²² also highlights the positive relationship between management practices and labour productivity in UK firms. Among other ways in which they can affect productivity, better management practices could support the adoption and implementation of existing and new technologies.
- Smaller firms tend to have poorer management practices, which could be one of the reasons why (beyond micro plants) smaller firms in London are often less productive.

Leaving the EU (in terms of its potential impacts on trade, investment and the availability of labour and skills) remains one of the largest economic risks to London's business environment and broader economy.

- Research and analysis produced in January 2018 by Cambridge Econometrics (CE) for the GLA showed, in line with other analyses, that the more severe the type of Brexit, the greater the negative impact on London was expected to be²³.
- The results showed that Brexit will not only reduce the size of the economy (compared to what it might have been if Britain remained in the Single Market and customs union – Scenario 1), but also put it on a slower long-term growth trajectory.

¹⁹ Savills (2018), '[Savills 2017/18 Live/Work Index](#)'.

²⁰ CAG consultants (2017), 'London Industrial Land Demand', Final Report.

²¹ ONS (2019), '[Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)'.

²² ONS (2018), '[Management practices and productivity in British production and services industries – initial results from the Management and Expectations Survey: 2016](#)'.

²³ GLA (2018), 'Preparing for Brexit' 2018.

- The Government's own impact assessments, published in November 2018²⁴, also found that all forms of EU exit would reduce long-term GDP. Its estimates were higher than the CE work, and a no deal exit might reduce GDP by 7.7% in the long term.
- This work argued that London would not necessarily be more resilient than the rest of the economy. London would do comparatively less badly in scenarios which disproportionately affected goods exports and be relatively worse off where service exports bore more of the impact.

London's transition towards a zero carbon and circular economy by 2050 can ensure long-term growth and new opportunities, including for the fast-growing Low Carbon and Environmental Goods and Services (LCEGS) sector. However, this transition will not be without its challenges.

- In 2017, London's Greenhouse gas (GHG) emissions were estimated at around 29.7 MtCO₂e (million tonnes of carbon dioxide equivalent), around 8% of the UK's total emissions²⁵.
- London's GHG emissions are dominated by workplaces. In 2015 it is estimated that: 40% of emissions were generated from London's workplaces (three quarters came from private businesses with the remainder from public buildings); homes accounted for 36% of the emissions; and transport for 24%.
- Reducing emissions from workplaces will be crucial to support the transition to clean growth and provide growth opportunities, but this will require actions and investment across the economy.

People

The number of Londoners with higher level qualifications has increased considerably in recent decades. This is partly because the capital attracts highly-qualified people to live here, but also because more young people are progressing to higher education.

- In 2018, 58% of Londoners aged 25-64 held a 'high' level qualification (NVQ4 or above), compared to 41% in the rest of the UK. This is up from 36% of London adults in 2004. In fact, London is now more qualified than most places in Europe.
- Over half of young Londoners now enter higher education by age 19, the highest progression rate among UK regions²⁶.

Overall school performance in London is strong, with some challenges around teacher recruitment and retention. Transition to work and employee training have considerable scope for improvement.

- The overall performance of London's schools is strong²⁷; yet London has a higher rate of teachers leaving the profession than in other areas and recruiting and retaining enough teachers to serve growing numbers of pupils is a major issue for the education system.
- The transition from education to work can also be a challenge for school leavers. While the majority of London employers find school leavers reasonably well prepared for work, a significant minority do not. At the same time, participation in classroom-based further education in London has been falling, coinciding with reductions in adult skills funding.
- Despite increasing in recent years, the volume of apprenticeship starts remains lower in London than other parts of the country. Many London employers still lack good knowledge about what's involved in

²⁴ See '[Exiting the European Union: Publications](#)' – GOV.UK.

²⁵ BEIS (2019), '[UK local authority carbon dioxide emissions estimates 2017](#)'.

²⁶ GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²⁷ GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

an apprenticeship²⁸, while there is notable under-representation of certain population groups, especially when analysed by subject area.

- As in the rest of the UK, there are also signs that the level and quality of workplace training is not being maintained. Focusing on training quantity (one proxy for quality), training hours per person trained fell by more than half (-62%) between 1997 and 2017.
- Reversing the decline in adult education (excluding apprenticeships) and tackling entrenched inequalities in the context of accelerated structural change is likely to require significant additional resources for labour market training²⁹.

The overall supply of skills in London is high, but employer surveys still show unmet demand. At the same time London may have a problem with the under-use of skills.

- Although demand for labour is increasingly met successfully, around 13% of employers still reported either a skills gap or skills shortage vacancy in 2017 (compared to 17% nationally). In absolute terms, more employers in London reported skills deficiencies than in most regions in England and more than in any other local enterprise partnership area³⁰.
- There are, however, considerable variations between occupations. Employers are most likely to encounter skills deficiencies in skilled trades roles (e.g. chefs, electricians) and caring & leisure roles³¹.
- At the same time, 10% of people working in London were considered by their employers to be 'under-utilised' in 2017. The proportion of staff identified as under-utilised has increased since 2015 (when it was 8%) and tends to rise for smaller employers³². Measures to improve the supply of skills should be combined with measures to help managers and employees (including migrant workers, who are often overqualified for the tasks they perform³³) to improve the usage of skills in the workplace³⁴.

Unlike in the rest of the UK, total jobs growth accelerated in the capital over the last decade. However, there continue to be significant inequalities between different population groups and insecure and low-paid employment is also rising.

- Not all Londoners have the education or skills to access the opportunities that the capital has to offer. For example, despite improvements, employment rates remain relatively low for women, people from non-white ethnic groups and disabled Londoners.
- There are also signs of falling job quality. One in ten people working in London were employed in insecure work in 2017 (up from 8% in 2006), while a fifth of employee jobs in the capital now pay below the London Living Wage (compared with 12% in 2006).
- As with the rest of the UK, there is also an inequality dimension to training in London: more qualified individuals are disproportionately likely to benefit, while cost and lack of time are also barriers for individuals taking on learning opportunities³⁵.

²⁸ Only 28% of London employers said they were aware of and had good/very good knowledge of what's involved in an apprenticeship in 2016. Source: Department for Education (2017), '[Employer perspectives survey 2016: England data tables](#)'.

²⁹ See, for example: NIESR (2019), '[Education Policy Priorities and a Look in the Manifestos](#)'; Institute for Fiscal Studies (2019) 2019 annual report on education spending in England'.

³⁰ Source: Department for Education (2018), '[Employer skills survey 2017: England LEP summary data tables](#)'.

³¹ Department for Education (2018), '[Employer Skills Survey 2017: England data tables](#)'.

³² Under-utilised is defined as where an individual's skill is not fully deployed in the workplace. For more information see: GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

³³ IPPR (2019), '[Measuring the benefits of integration: The value of tackling skills underutilisation](#)'.

³⁴ Felstead et. al. (2018), '[Skills and Employment Survey 2017](#)'.

³⁵ See Social Mobility Commission (2019), '[The adult skills gap: is falling investment in UK adults stalling social mobility?](#)' and ONS (2019) '[Characteristics and benefits of training at work, UK: 2017](#)'.

- More broadly, a combination of education, skills, transport accessibility, health, social and childcare barriers is preventing many Londoners from fully realising their productive potential as individuals, which is likely to have repercussions on the capital's overall productivity.

Post-Brexit migration regimes and automation are some of the challenges facing London's labour market in the near and long-term future.

- Around 14% of jobs in London were held by workers born in the rest of the European Economic Area (EEA) in 2017. The comparable figure for the rest of the UK is 6%. This means that, post-Brexit, London is more exposed to the risk of an unnecessarily restrictive immigration regime.
- Longer term, automation will pose a significant challenge in terms of training and re-skilling, although the sectoral and occupational structure of London's economy means that job exposure to automation is likely to be lower than in the rest of the UK.

Infrastructure

Looking ahead, London faces significant challenges resulting from the pressures of a growing city on transport, housing and infrastructure, both city-wide and in specific geographical areas.

- London's population has grown steadily since the late 1980s, driven by natural change and international migration. It currently stands at around 8.9 million and the latest GLA projections have it reaching 10.72 million by 2042³⁶.
- More people and jobs in London mean that travel demand across all modes is expected to increase to around 32 million trips on an average day in 2041, five million more than today³⁷. Without adequate investments in transport infrastructure to boost capacity in London and in the Wider South East, congestion will increase.
- Many of the areas with the greatest capacity for development have poor transport connectivity, depressing values and hampering the market.

An integrated infrastructure response will be needed to address pressures that may limit London's economic dynamism, and to ensure that growth is inclusive and sustainable.

- Investment in public transport will be needed to unlock housing developments, to retain accessibility to the Central Activities Zone (CAZ) and the northern part of the Isle of Dogs (NiOD), and to ensure that parts of outer London can overcome poor transport connections that currently limit access to jobs, education and training³⁸.
- Relative to some other global cities, London is poorly served by next generation 'full fibre' broadband and mobile telecommunications. These are needed to support productivity growth, facilitate innovation in the workplace, and to sustain London's international competitiveness.
- London will need investment in its infrastructure networks to support the global and UK transition to a low/zero carbon economy and to improve the city's resilience to climate change. Achieving 'clean growth' should also create significant opportunities for London's businesses.
- Maintaining and improving environmental quality by tackling London's air quality crisis and preserving and enhancing London's green infrastructure, will also be important for competitiveness and the health and well-being of Londoners.

³⁶ GLA (2019), '2017-based Trend Projection Results'.

³⁷ TfL (2017), '[Mayor's Transport Strategy: Supporting Evidence Outcomes Summary Report](#)'.

³⁸ TfL (2017), '[Mayor's Transport Strategy: Supporting Evidence Challenges and Opportunities](#)'.

There is a large funding gap towards meeting London's needs in terms of privately and public-funded infrastructure. Alongside cost efficiencies, new funding sources need to be found to close the gap.

- Modelling for the GLA by consultants Arup puts the total capital and operating expenditure requirements for London's infrastructure in the region of £968bn (2018 prices) over the period 2019-2041³⁹. Approximately 80% of the estimated costs relate to transport and affordable housing investment requirements.
- Based on current levels of funding, the public sector funding gap is estimated to be £121bn (2018 prices) in the period 2019-2041.
- Closing the gap will require a range of measures including better use of existing assets, deriving greater commercial income from the infrastructure asset base, and cost savings in future projects. However, new funding mechanisms will also need to be considered.

Ideas

Ideas (or innovation) are a key foundation of productivity growth, while properly directed innovation policy can help to promote inclusive growth.

- There is now a substantial body of research linking innovation to productivity growth at the national level, but also highlighting the importance of innovation for regional and local economic performance.
- Tackling the gap between innovative and less innovative firms is important in ensuring that growth and productivity improvements can be achieved across the wider economy.
- As well as contributing to economic performance via productivity, innovation also has a direct effect on the places where it is located. Innovation clusters can support local job creation, though different studies reach different conclusions about the types of employment created and, therefore, on the impact of cluster policies on inclusive growth.

London is a highly innovative region compared with other European regions, and has become more innovative over time (although it has lost position in overall European rankings in the last few years).

- The 2019 Regional Innovation Scoreboard (RIS)⁴⁰ ranks London as an Innovation Leader, with performance more than 20% above the EU average⁴¹.
- Looking at successive iterations of the RIS, London's scores have increased over time. However, London's ranking among European regions slipped from 24 in 2017 to 36 in 2019.
- London, the South East and the East of England make up the three most innovative regions in the UK according to the RIS, and they may function together as an innovation system.

London has strong fundamentals for innovation.

- London has a very highly qualified workforce and strong, often world-leading, higher education institutions (HEIs). These contribute to human capital formation as well as undertaking innovation activities themselves.
- As one of the world's leading financial centres and start-up hubs, London is a great place for innovative businesses to access finance and business support.

³⁹ GLA (2019), 'The cost of London's infrastructure requirements to 2041 and the funding gap'.

⁴⁰ The RIS is a basket of 18 indicators of innovation activity, collated from a range of sources and including a combination of inputs to and outputs of the innovation process. See: European Commission (2017), '[RIS 2017 – Methodology report](#)'.

⁴¹ European Commission (2019), '[Regional Innovation Scoreboard 2019](#)'.

- Standing at £5,548m in 2017, London's R&D spending is lower than that of other highly innovative UK regions. However, it has been growing strongly in recent years, with an average annual growth rate of over 10%, more than twice the rate for the UK as a whole. This was driven by growth in business R&D spending, which in London tends to be dominated by the service sector.

Rates of reported business innovation in London are not high in comparison with many other parts of the UK.

- At just under 47% in 2017, the proportion of London businesses that are innovation active has increased over time, but it remains slightly below the UK average of 49%⁴².
- London businesses do not report particularly high rates of product and service or process innovation in comparison with other LEP areas. They perform relatively more strongly on sales of innovative products and services, which provides a measure of the near-term success of a firm's innovations⁴³.
- London's slightly lower rates of innovative activity are likely to be driven more by the sectoral composition of the London economy than by the innovativeness of its individual firms. Regardless, there is a need for further research to understand the patterns of business innovation in London.

Larger firms are more likely to be innovative in London, while innovation is most common among firms in London's knowledge-intensive industries.

- Micro firms are least likely to innovate in London, with 53% of firms surveyed in the London Business Survey reporting being innovation active. This compares with 75% of SMEs and 88% of large enterprises⁴⁴.
- Businesses established between 2009 and 2012 were more likely than both older and younger businesses to be innovating in 2014, with 66% innovation active.
- The industries in London with the highest percentage of innovative companies are health, social work, scientific R&D and veterinary services (75%), financial and insurance activities (67%), and digital technologies (67%).

London is also home to a thriving knowledge economy, with international strengths in life sciences, tech and digital, culture and creative industries, advanced urban services and low carbon and environmental goods and services.

- The city has established or is establishing competitive strengths in these emerging and/or crosscutting sectors (either across the piece or in specific industries or activities within them).
- These sectors are clearly future-focused, with rapidly growing and substantial potential demand for the goods and services they produce.
- They are sectors in which innovation has an important role to play in improving Londoners' well-being and in helping address the large-scale challenges facing London, the rest of the UK and states and citizens globally – climate change, ageing and low productivity among them.
- They often have a vital role to play in tackling the Government's four Grand Challenges (artificial intelligence and data, ageing society, clean growth and future of mobility), and the more specific 'missions' within them.

⁴² Department for Business, Energy and Industrial Strategy. 'UK Innovation Survey 2014-16: statistical annex'.

⁴³ Roper, S. and Bonner, K. (2019), 'Benchmarking local innovation - the innovation geography of England: 2019'.

⁴⁴ GLA Economics (2014), '[London Business Survey 2014: Main findings](#)'.

- There is potential for appropriate, targeted policy interventions by the Mayor of London to assist these sectors in overcoming the barriers they face, enabling them to fully realise their strengths and capitalise on emerging market opportunities.

Innovation is wider than inventing new ways of doing things; the spread of existing technology and ways of working can be a key driver of productivity growth. There is scope for innovation diffusion to be more effective in London.

- Analysis for the GLA by Belmana Consulting suggests that about 20% of London employees are in businesses where productivity is lower than the median business calculated sector-by-sector, suggesting potential opportunity gains through sharing of best practice^{45,46}.
- This research identified a range of factors that could be slowing the diffusion and uptake of existing technologies among London businesses. These include market failures (e.g. asymmetric information leading to skills gaps); broader system failures (e.g. disconnects between businesses and researchers); and so called 'emergence failure', where key ingredients in the innovation ecosystem (e.g. skills, business capacity, regulatory standards) are missing.
- There could be scope for GLA-led policy actions to help overcome these barriers and facilitate the spread of ideas, for example through targeting of adult skills and training provision, convening and supporting networks for the sharing of ideas and working more closely with London's universities to achieve diffusion objectives.

Going forward, London will need to take advantage of the opportunities offered by its leading R&D-intensive sectors, while also stepping up the pace of innovation and innovation diffusion across the broader economy.

- As in the rest of the UK, there is likely to be scope for London's businesses to adopt existing innovations, particularly digital technologies, closing gaps with European and international competitors⁴⁷.
- Like the UK and the global economy, London could be significantly impacted by penetration of new, transformational technologies such as AI. These offer the promise of considerable benefits beyond productivity⁴⁸.
- There is scope for public sector leadership (including at a regional level) to steer the impacts of innovation in a direction that benefits society, both by managing technological transitions and disruptions and by setting long-term goals for innovation.

⁴⁵ This work was produced using statistical data from ONS. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

⁴⁶ Belmana Consulting (2020). 'Innovation diffusion in London' (forthcoming).

⁴⁷ These have been highlighted among others by the Government's 2017 Digital Strategy: Department for Digital, Culture Media and Sport (2017), '[UK Digital Strategy: The wider economy – helping every British business become a digital business](#)'.

⁴⁸ McKinsey Global Institute (2019), '[Tech for Good - Smoothing disruption, improving well-being](#)'. May 2019.

Place

There are stark socio-economic inequalities between different parts of the city, with widespread pockets of disadvantage.

- There is huge variation in levels of unemployment and inactivity between different London boroughs (e.g. from 3.6% in Harrow to 6.3% in Lambeth). This reflects a mixture of historical legacy and more recent socio-economic change.
- At a local level, variation in socio-economic outcomes is even greater. For example, Kensington and Chelsea includes three of the five areas in London with the lowest employment deprivation⁴⁹ (0.5% or lower) and two of the five areas in London with the highest employment deprivation rates (27% or higher).
- After accounting for housing costs, incomes⁵⁰ in the richest areas of London – in parts of Wandsworth, Kensington & Chelsea and the City of London – are more than three times the averages of the lowest income areas – parts of Haringey, Enfield and Barnet.
- Small area differences can be even starker, even within the same borough. Low incomes, poor housing, ill health, a lack of work and low education attainment tend to compound socio-economic disadvantage in large pockets of inner and outer London.

London's economic influence extends well beyond the administrative boundaries of Greater London, with links to the wider South East (WSE) of England and to the rest of the UK.

- Around 800,000 commuters travel into London each day (more than half of the workforce in some of the local authorities bordering London), making an important contribution to both London's economy and commuters' own local economies when they return home.
- London is a key gateway to the rest of the UK for international investors and a great business accelerator. While London's business start-up rate is consistently above that of the UK, between 2012 and 2013 there was a net migration of firms moving out of London, with 1,600 more firms leaving London than moving in⁵¹. The main destination for these firms was the WSE.
- While trade is more important to London's economy than the UK's economy, this is not just or predominantly about international trade – London trades more with the rest of the UK than it does with the rest of the world⁵².
- The trade and supply chains linkages between London and the rest of the UK economy mean that for every pound of consumption or investment in London, 24p of production is generated elsewhere in the UK.
- Analysis of regional trade patterns undertaken by Arup in a forthcoming report for the GLA⁵³ and based on the EUREGIO database highlights the importance of trade links in intermediary goods and services between London and a number of UK regions with key city regions at the centre of their economy. These include Eastern Scotland, West Wales & The Valleys, the West Midlands, Greater Manchester and West Yorkshire.
- The Arup research also points to the role of London-headquartered enterprises as key employers in the regions and to linkages between economic activity in London and in city regions, including through functional specialisation.
- Given these interactions, there are opportunities to collaborate with neighbouring regions on shared challenges and to explore potential synergies with other cities and regions of the UK.

⁴⁹ Defined as the proportion of the working-age population in an area involuntarily excluded from the labour market.

⁵⁰ The precise income measure is 'equalised household incomes' accounting for housing costs. Equalised incomes are adjusted to account for housing size and composition.

⁵¹ GLA Economics (2016), 'Economic Evidence Base for London 2016'.

⁵² GLA Economics (2019), Working Paper 97 'The London input-output tables'.

⁵³ Arup (2020), 'London's Economic Relationship with the Rest of the UK' (forthcoming).

1 Overview

Michele Pittini, Senior Economist, GLA

1.1 Introduction

This report presents the evidence that has been informing and supporting the development of London's Local Industrial Strategy (LIS).

The Local Industrial Strategy for London is an opportunity to shape a more inclusive and sustainable economy. One that improves living standards for all Londoners, creates opportunities across all parts of the city, supports the wider UK economy and is more environmentally sustainable.

It is widely understood that improvements in productivity underpin increases in living standards and therefore are a necessary (although not sufficient) condition for inclusive growth. It is being increasingly recognised though (by the OECD among others) that the relationship also runs in the other direction – inequality can act as a drag on productivity. Policies that aim to address both inclusion and productivity – maximising synergies while managing potential trade-offs – are therefore needed to make progress towards the ultimate objective of inclusive growth⁵⁴.

In order to inform LIS development and priorities, the LIS evidence base report seeks to:

- Reflect a wealth of evidence and analysis that the Greater London Authority (GLA) has developed over the years, including for example the Economic Evidence Base for London 2016, the draft London Plan 2017 and numerous technical publications by GLA Economics.
- Consider future opportunities and challenges alongside the current strengths and weaknesses of London's economy and recent history.
- Provide, where feasible, more granular geographical detail to convey the complex and diverse nature of London's economy.
- Go beyond descriptive analysis to provide clear and useful policy insights.

In the rest of this section we introduce the overall theme for the London LIS; supporting productivity improvements to unlock more inclusive growth. We do this by looking in turn at London's economic performance (its many strengths and its issues with productivity growth in recent years) and at the challenge of achieving inclusive growth in London. We then introduce the structure for the rest of the report.

⁵⁴ See for example the blog by Gabriella Ramos (OECD Chief of Staff) for the OECD Forum 2016: <http://www.oecd.org/social/productivity-equality-nexus.htm>.

1.2 London's economic performance

London is a very successful economy which is pivotal to the UK's economy. It has performed strongly over the past 20 years in terms of GVA and employment growth.

- London's economic output (gross value added - GVA) increased at an average rate of 3.1% per year between 1998 and 2017 (Figure 1.1). In 2017 London's GVA totalled £426.2 billion; twice the size of the economies of Scotland and Wales put together and accounting for 23.8% of UK GVA.
- If London's economy is ranked against European countries (on a comparable basis) it is the eighth biggest economy. London's economy is larger than Belgium, Sweden, Austria or Norway for example.
- London's net fiscal contribution to the Exchequer in 2017/18 was around £34.3bn.
- London's level of productivity has historically been higher than in the rest of the country – between 19% and 31% higher than the UK average over the last 20 years⁵⁵.

London is a global city that has adapted and thrived in an era of structural change and the increase in international trade, foreign direct investment and global value chains since the mid-1990s. It attracts investment, skills and visitors from all over the world and has a number of highly innovative sectors.

- London's economy is specialised in a number of highly productive, export-oriented service sectors, such as finance and insurance and advanced professional services (see Chapter 3). Exports from these sectors are a key driver of London's trade surplus with the rest of the world⁵⁶.
- London tops (or is near the top) of a number of international rankings for competitiveness (Box 1.1).
- Between 2003 and 2015, London secured 39% of all foreign direct investment (FDI) projects in the UK and 26% of all FDI project-related jobs in the UK⁵⁷.
- Approximately 3.1 million people living in London were born abroad at the time of the 2011 Census. This was around 37% of the total London population, compared to around 9% in the rest of the UK. Looking at the labour market, 14% of jobs in London in 2017 were held by workers born in the European Economic Area (EEA) compared to 6% in the rest of the UK.
- London is home to a thriving knowledge economy, with international strengths in life sciences, tech and digital, culture and creative industries, advanced urban services and low carbon and environmental goods and services. These sectors are all research and innovation intensive and are vital to solving the challenges London and the wider UK faces.

⁵⁵ Based on output per hour chained volume measure on output per hour relative to the UK average (1997-2017). Source: ONS (2019), '[Industry by region estimates of labour productivity: 2017](#)'.

⁵⁶ GLA Economics (2019), 'The London Input-Output Tables', <https://www.london.gov.uk/sites/default/files/london-input-output-tables-working-paper-97.pdf>.

⁵⁷ London and Partners (2017), '[Understanding London+ FDI](#)'.

Box 1.1: London in international competitiveness rankings

Leading global city in PWC's Cities of Opportunity Ranking

2nd in the Global Financial Centres index

1st in Nesta's European Digital City index

1st in ARCADIS' 2018 Sustainable Cities Mobility Index

2nd most visited city in the world in 2017 according to the Mastercard Destination Cities index

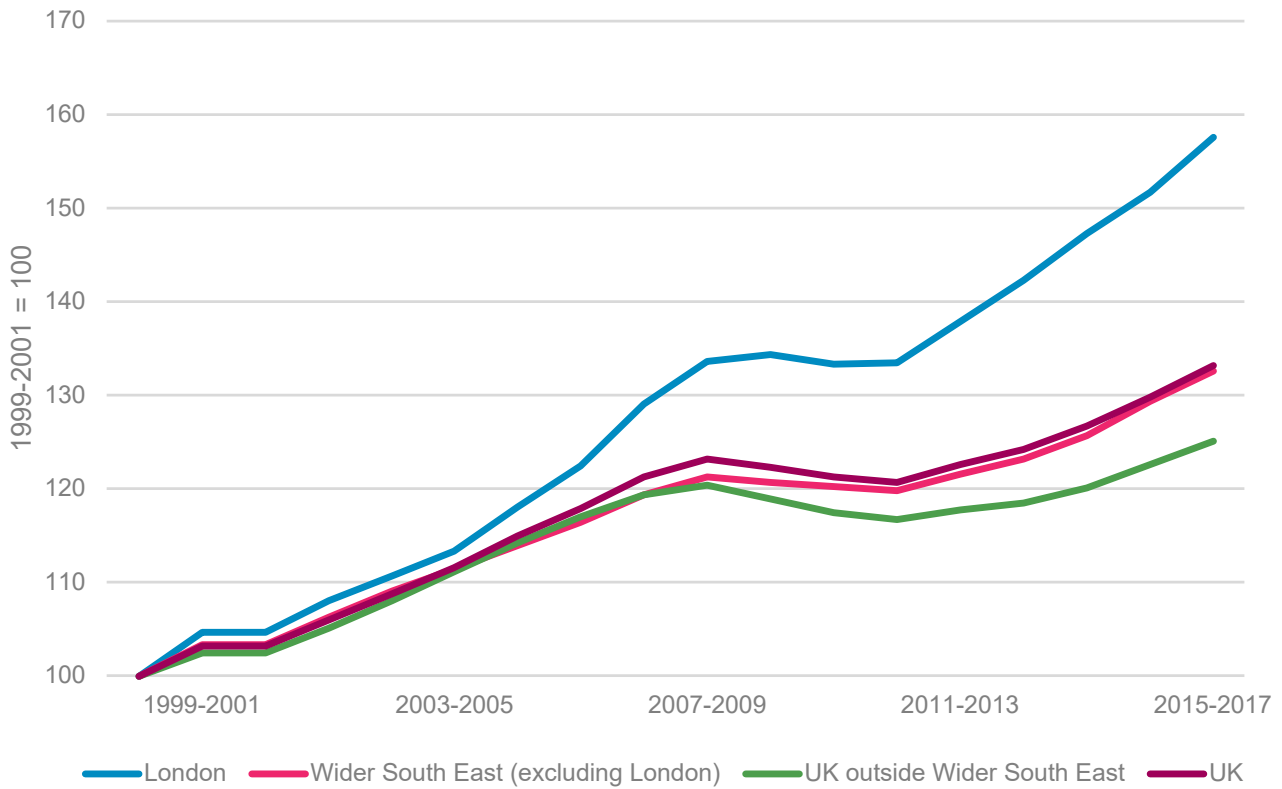
In terms of GVA and employment, the capital has shown a resilience post-financial crisis, which other parts of the UK and Europe lacked.

- The financial crisis of 2008-09 was a serious hit for London's economy as key sectors in its economic base contracted (especially finance and insurance), but overall the economy of the capital has been remarkably robust in the following years. In a recent study, Martin and Gardiner found that London performed relatively well among British cities in terms of GVA resistance to the shock of the economic crisis, as part of a general greater level of resilience (in terms of depth of the contraction and speed of recovery) of southern British cities compared to northern cities⁵⁸.
- Regarding employment, the recession caused only a relatively short dip on a trend of strong growth which has otherwise been observed consistently for the past 20 years⁵⁹. Since 2011 London has witnessed robust growth in employment, with workforce jobs now standing at around six million (Figure 1.2) and expected to continue to grow.
- Employment and unemployment rates are currently at historical highs/lows respectively (although unemployment rates in London have historically and consistently been above the UK average).
- Notwithstanding Brexit-related uncertainty (including uncertainties about post-Brexit migration regimes) long-term projections still point to London as a growing economy which will continue to see growth in employment.

⁵⁸ Martin, R., Gardiner, B., 'The resilience of cities to economic shocks: A tale of four recessions (and the challenge of Brexit)', *Papers in Regional Science*, Vol. 98(4).

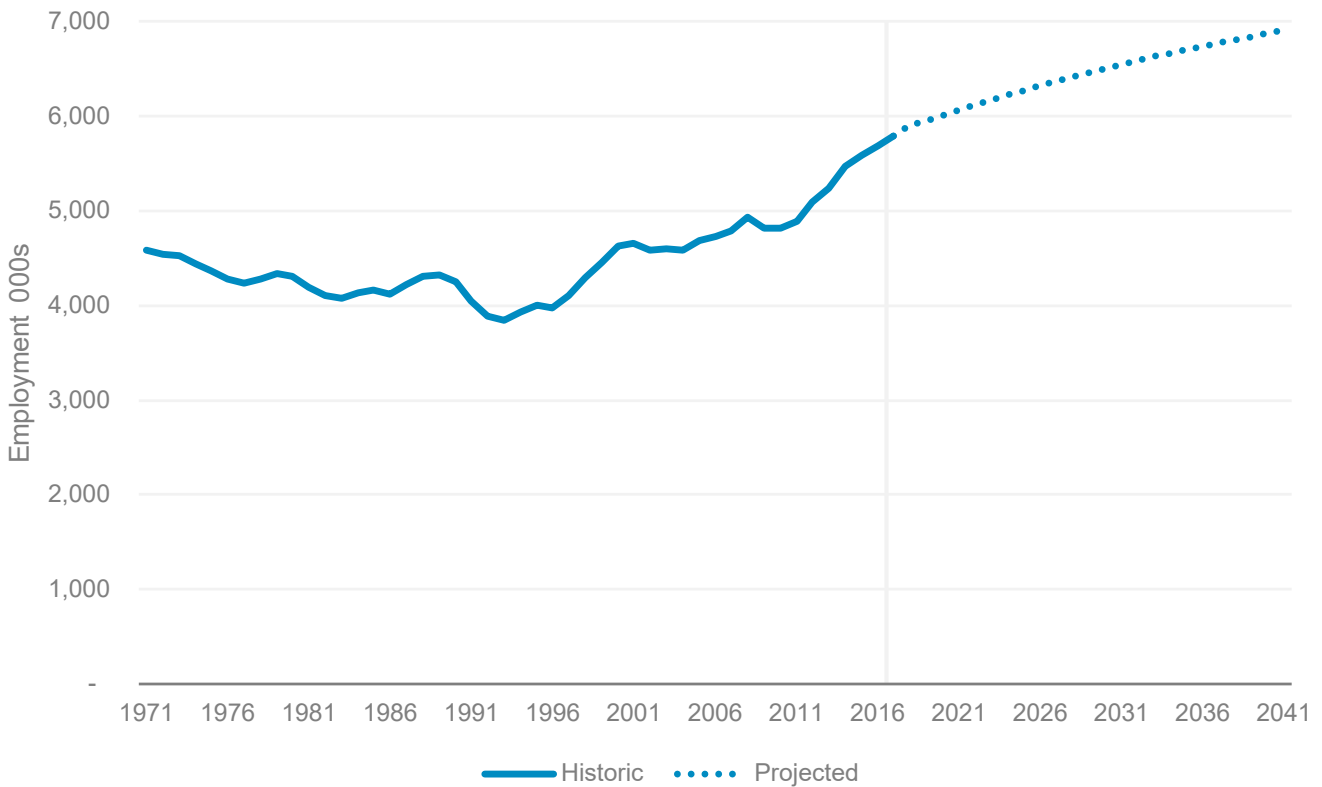
⁵⁹ GLA Economics (2018), Current Issues Note 57: '[Regional, sub-regional and local gross value added estimates for London, 1997-2016](#)'.

Figure 1.1: GVA Index – London, UK and Wider South East, 1999-2017



Sources: ONS Nominal and real regional gross value added (balanced) by industry & GLA Economics calculations.

Figure 1.2: London's historical and projected employment (000s)



Source: GLA Economics.

Productivity growth in London has significantly slowed down since the financial crisis, as in the rest of the country. There are big differences in productivity performance between firms within sectors and between different parts of the city.

- Running at just 0.3% per year on average, real productivity growth in London between 2010 and 2017 was more or less in line with (low) productivity growth in the UK.
- A recent analysis of regional economic performance and resilience since the financial crisis by Sensier and Devine⁶⁰ found that when productivity resilience is considered alongside GVA and employment as part of a resilience scorecard for UK regions and countries London appears mid-table.
- While most sectors in London tend to have higher productivity than the same sector in the rest of the UK, average productivity benchmarks mask large variation in GVA per worker within sectors (see Chapter 2).
- In 2017 productivity in the most productive part of London (Inner London West), measured as GVA per hour worked, was over 42% higher than in the least productive part of London (Outer London South).
- Between 2010 and 2017 productivity in real terms actually declined in Outer London South, Outer London East and North East and Inner London East⁶¹.
- In looking at sub-regional performance, Sensier and Devine also highlight that sub-regions with greater specialisation, and higher rates of investment and skills were more resilient to the impact of the financial crisis. In London, the scorecard shows a big gap in resilience ranking between the parts of London that perform relatively well (Inner-London West and Inner-London East) and the rest of the city.

⁶⁰ Sensier, M. and Devine, F., (2019), '[Understanding regional economic performance and resilience in the UK: trends since the Global Financial Crisis](#)'. University of Manchester Working Economics Discussion Paper 192.

⁶¹ ONS (2019), '[Regional and sub-regional productivity in the UK: February 2019](#)'.

1.3 The challenge of inclusive growth in London

London has a major inequality problem, whether we look at wealth or income.

- London households in the bottom half of the wealth distribution own just 5% of total household wealth, while households in the richest 10% own more than 60% of total household wealth (Figure 1.3).
- Housing wealth is a key driver of wealth inequalities in London. A recent report by the Centre for Cities⁶² found that between 2013 and 2018 average housing wealth in London grew by £122,000 (34%), propelled by rapidly increasing house prices. At the same time, levels of home ownership in London remain significantly below the national average (standing at 48% in 2017 compared to 63% across England according to the English Housing Survey). Analysis by Savills UK shows that while housing wealth in London is more evenly distributed across the different age groups of owner occupiers compared to the rest of the UK, it is still the case that the over 50s account for the large majority of the capital's housing wealth. Specifically, they account for 65% of housing wealth held by owner occupiers, while the under 35s own 11%⁶³.
- Household incomes in the bottom half of the distribution in London are lower than in the rest of the UK once housing costs are taken into account. Median household incomes in London are broadly in line with the UK average when measured on the same basis (Figure 1.4).

Figure 1.3: Wealth owned by households by decile 2014-2016

Percentage of total wealth owned by households in each decile



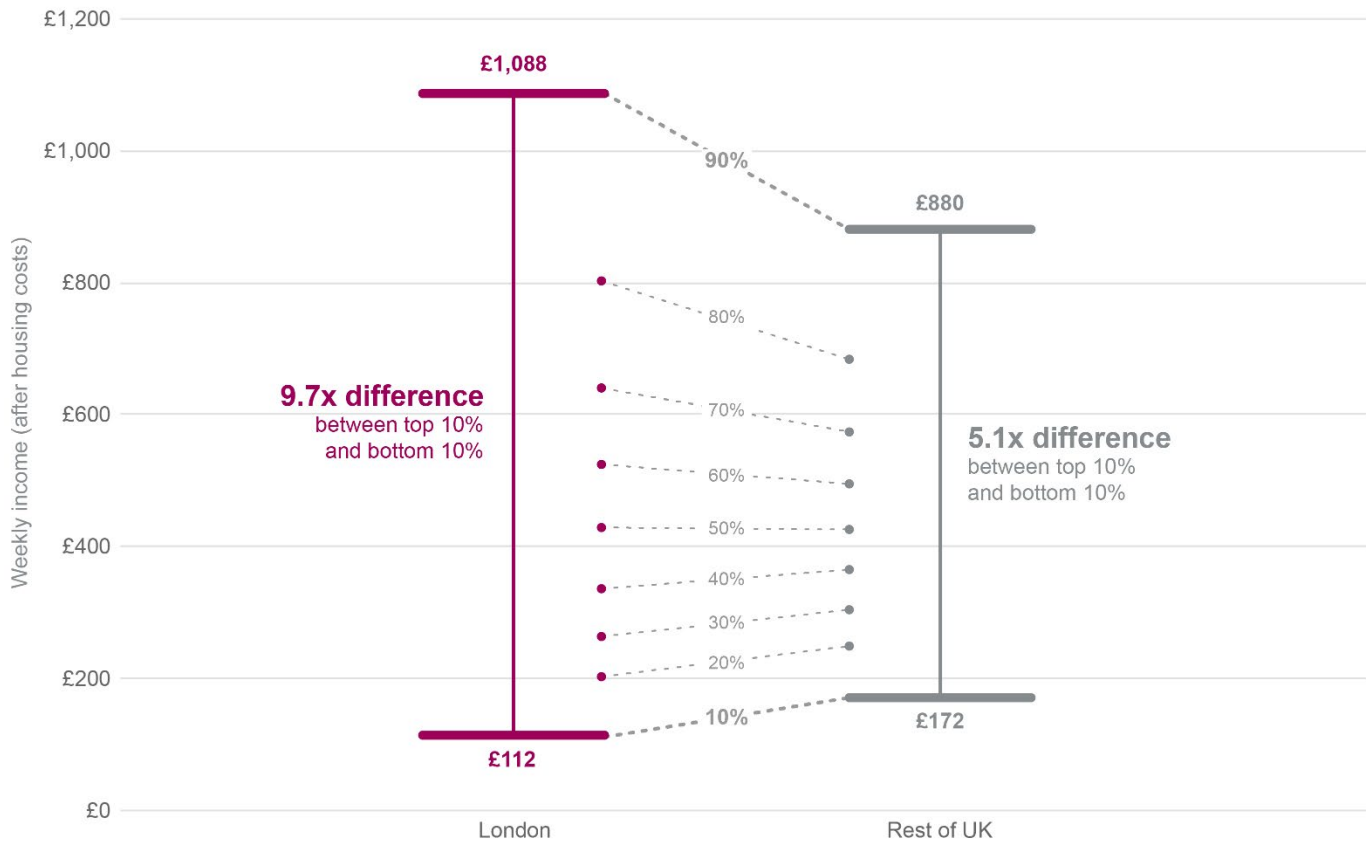
Source: Wealth and Assets Survey 2014-16, ONS.

⁶² Breach, A. (2019), 'Capital cities- How the planning system creates housing shortages and drives wealth inequality'.

⁶³ [https://www.savills.co.uk/insight-and-opinion/savills-news/239639-0/over-50s-hold-75--of-housing-wealth--a-total-of-%C2%A32.8-trillion-\(%C2%A32-800-000-000\)](https://www.savills.co.uk/insight-and-opinion/savills-news/239639-0/over-50s-hold-75--of-housing-wealth--a-total-of-%C2%A32.8-trillion-(%C2%A32-800-000-000)).

Figure 1.4: Income inequality 2015/16 – 2017/18

Difference in income (after housing costs) between top 10% and bottom 10%

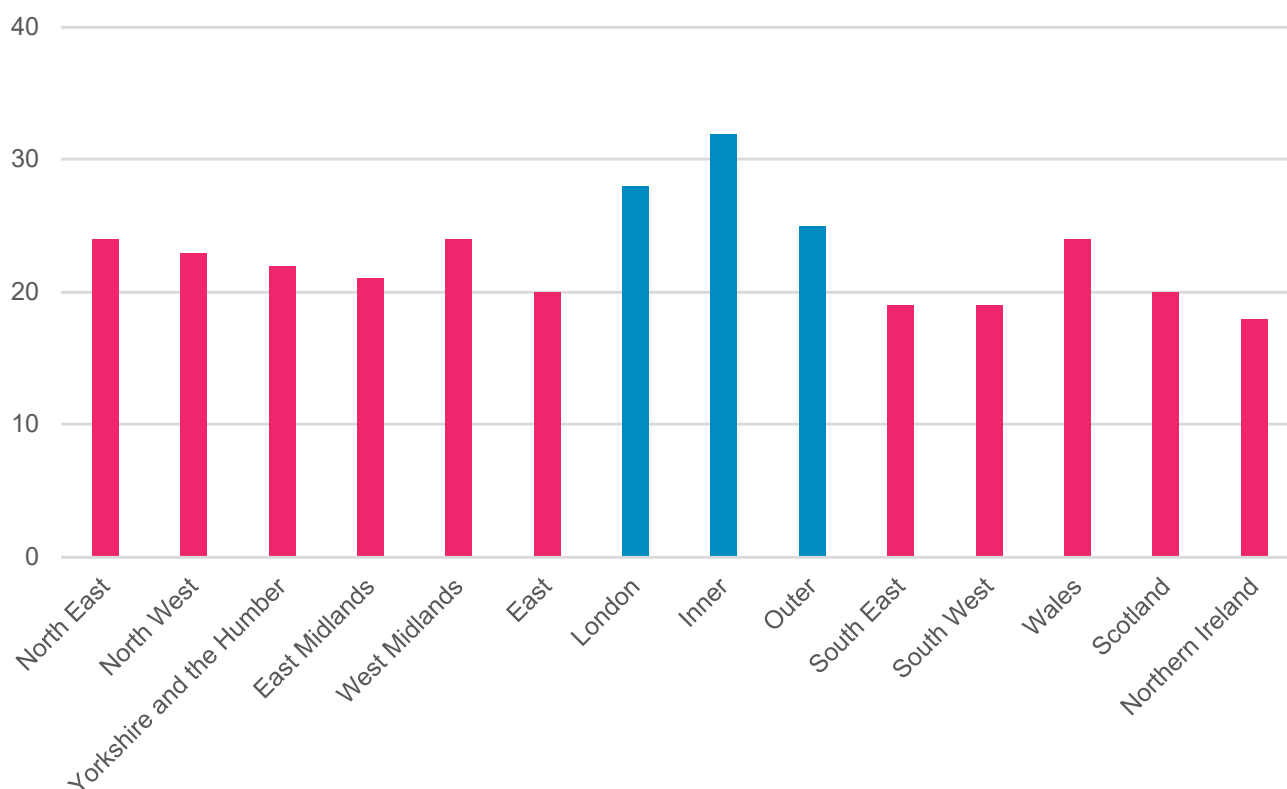


Source: Households Below Average Income 2015/16–2017/18, DWP.

When accounting for housing costs, London also has higher rates of relative poverty and of child poverty than any other part of the UK. A significant amount of poverty is concentrated with households where at least one person works.

- 28% of London's population lives in relative poverty once housing costs have been taken into account. This percentage rises to 33% in inner London (Figure 1.5)
- When taking housing costs into account London also has a higher proportion of children living in poverty than any other UK – 37% of all London's children live in poverty, rising to 44% of inner London children. Low incomes are not just associated with households of people who are unemployed, economically inactive or retired. Around half of low-income families in London have at least one member who is in some form of employment⁶⁴.
- The recent [Survey of Londoners](#) paints a picture of a widespread lack of food security with 1.5 million adults and 400,000 children in London having low or very low food security. Again, this is not a problem confined to the economically inactive or to the unemployed. Six out of ten adults suffering from food insecurity are in full-time or part-time work.

⁶⁴ Based on DWP (2018), 'Household Below Average Income, 2014/15–2016/17'.

Figure 1.5: Population in poverty after housing costs, 2015/16 to 2017/18

Source: DWP Households Below Average Income.

Many Londoners are still not able to benefit from the opportunities offered by London's labour market and dynamic business environment.

- While overall labour market outcomes have improved, headline measures conceal significant inequalities between different population groups. For example, Londoners with disabilities are much more likely to be unemployed than their counterparts without disabilities, while black and ethnic minority Londoners are more likely to be unemployed than white Londoners (Chapter 4).
- Insecure and low paid employment has also increased. Insecure employment stands at around 10% (compared to 8% in 2006), while 20% of employee jobs in the capital now pay below the London Living Wage (compared with 12% in 2006).
- A combination of education, skills, transport accessibility, health, social and childcare barriers is preventing many Londoners to fully realise their productive potential as individuals, which is likely to have repercussions on overall city productivity.
- Black, Asian and minority ethnic (BAME) business owners are more likely to operate in sectors where productivity and wages tend to be lower, such as retail and wholesale and hospitality (Chapter 3), while BAME groups are also underrepresented in highly innovative sectors in London's economy such as the creative industries (Chapter 6).

There are also stark socio-economic inequalities between different parts of the city, with widespread pockets of disadvantage. Overall, a significant minority of Londoners feel that their economic situation does not allow them to live the life they want.

- There are very large differences in levels of unemployment and inactivity between different London boroughs⁶⁵ (e.g. from 3.6% in Harrow to 6.3% in Lambeth). This reflects a mixture of historical legacy and more recent socio-economic change.
- At a local level, variation in socio-economic outcomes is even greater. For example, Westminster includes three of the five areas in London with the lowest employment deprivation – (below 1%) and two of the five areas in London with the highest employment deprivation rates (above 30%).
- After accounting for housing costs, incomes⁶⁶ in the richest areas of London – in parts of Wandsworth, Kensington & Chelsea and the City of London – are more than three times the averages of the lowest income areas – parts of Haringey, Enfield and Barnet (Chapter 7). Small area differences can be even starker, even within the same borough. Low incomes, poor housing, ill health, a lack of work and low education attainment tend to compound socio-economic disadvantage in large pockets of inner and outer London (Chapter 7). A recent GLA survey on Londoners' economic perceptions and confidence point to a dramatic reduction in confidence over the past couple of years and to a significant minority of respondents who feel that their economic situation does not allow them to live the life they want. Cost of living, low income and cost of housing are identified as the main barriers (Box 1.2).

Box 1.2: Representative polling on Londoners' economic perceptions and confidence

In 2019, polling with a representative sample of the London population was conducted to understand Londoners' perception of the city's economy⁶⁷. A number of questions replicated previous rounds of telephone and online polling, to provide some basic trending data over time.

Londoners are generally more pessimistic about both their personal financial situation and the economic future of London compared to previous years. Just 21% of Londoners are confident they could get a job similar to their current job if they lost theirs, compared to 36% who are not confident. Confidence has dropped dramatically since Nov 2017, from 35% to 21% now.

Forty-two per cent of Londoners think that the capital's economy will worsen while 29% think it will stay the same (29%) over the next year. Just 12% think it will improve. There are few demographic differences in opinion, but remain voters are much more pessimistic than leave voters; some 50% of remain voters think the economy will deteriorate compared to 30% of leave voters.

When asked the extent to which Londoners feel their economic situation allows them to live the life they want to, Londoners are fairly split; some 48% say they are able to lead the life they want to, compared to 44% who feel they are not able to. Male Londoners are more positive than female Londoners, older Londoners more positive than younger ones, and higher socio-economic grades are more positive than lower ones. White Londoners are most positive (52%), while black Londoners the least (31%).

The main barriers to Londoners living the life they want to are the cost of living (49%), low income (34%) and the cost of housing (29%). Low social grades are more than twice as likely to cite poor health as a barrier, as well as low income. Higher social grades are much more likely to cite a lack of free time, but also more likely to reference the cost of living generally.

⁶⁵ Where reference is made to London boroughs on the whole, this represents the 32 boroughs and the City of London Corporation.

⁶⁶ The precise income measure is 'equivalised household incomes' accounting for housing costs. Equivalised incomes are adjusted to account for housing size and composition.

⁶⁷ GLA/YouGov poll, 27-30 May 2019, representative sample of 1272 London adults.

1.4 Future challenges to London's growth

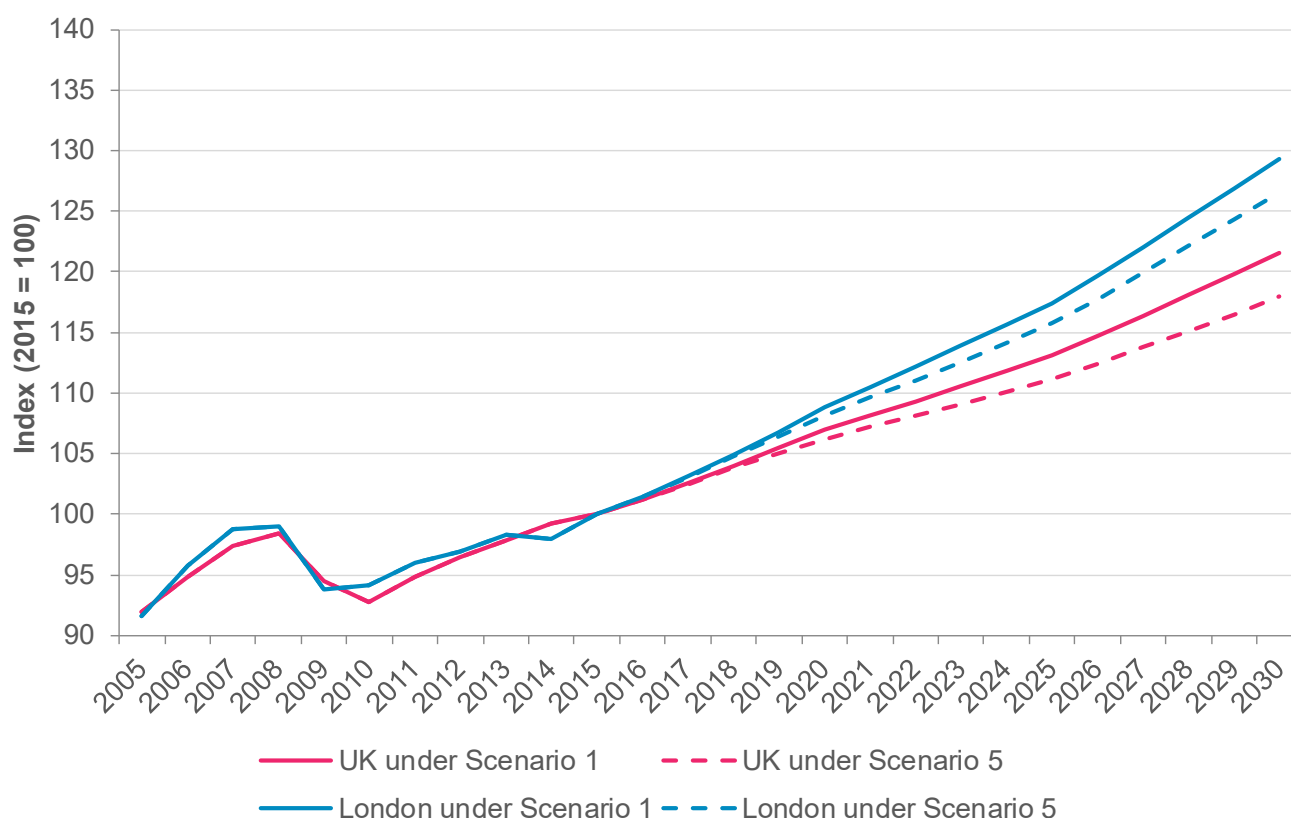
Leaving the EU (in terms of its potential impacts on trade, investment and availability of labour and skills) remains one of the largest economic risks to London's economy.

- In the longer term, leaving the EU will reduce the openness of the London and UK economies, as there will cease to be free movement of goods, people, services and capital across borders. The introduction of tariffs, non-tariff barriers (NTBs) and customs procedures will be a supply side shock that will raise costs for businesses and will most likely make some businesses uneconomic⁶⁸.
- The long-term losses to the UK of a no-deal Brexit have been estimated at between 3 and 10% of GDP. Research and analysis produced in January 2018 by Cambridge Econometrics (CE) for the Greater London Authority (GLA) showed, in line with other analyses, that the more severe the type of Brexit, the greater the negative impact on London was expected to be⁶⁹.
- The results showed that Brexit will not only reduce the size of the economy (compared to what it might have been if Britain remained in the Single Market and customs union – Scenario 1), but also put it on a slower long-term growth trajectory (Figure 1.6)
- The Government's own impact assessments, published in November 2018⁷⁰, also found that all forms of EU exit would reduce long-term GDP, and this would depend on the decisions taken. Its estimates were higher than the CE work, and a no deal exit might reduce GDP by 7.7% in the long term.
- This analysis showed London would do less badly compared to the rest of the UK in GVA growth in scenarios which disproportionately affected trade costs for goods. At the same time, it suggested that London could be relatively worse off where trade costs for services bore more of the impact. This would be a reversal of the recent historical experience of London's greater resilience compared to several parts of the UK.

⁶⁸ GLA Economics (2019), ['The economic impact of Brexit on London'](#).

⁶⁹ GLA (2018), 'Preparing for Brexit'.

⁷⁰ See [Exiting the European Union: Publications](#) – GOV.UK.

Figure 1.6: Potential impacts of alternative Brexit scenarios on London's economy

Notes: Scenario 1 is a Status Quo (EU membership) scenario. Scenario 5 is a worst-case scenario (with no transition, no membership of the Single Market or customs union, and no preferential trade agreements 5). CE found that the UK could experience a loss of 3.0% (£54.5bn) in GVA by 2030 in Scenario 5 compared to Scenario 1, while London could experience a loss of up to 2.1% (£10.8bn) in GVA.

Source: Cambridge Econometrics for the GLA.

Beyond Brexit, London will need to adapt to a rapidly changing world economy in order to preserve its economic dynamism and competitive edge as a global city.

- London will need to react to competition from existing and emerging global cities, taking advantage of changes in global value chains especially in relation to the growing role of services trade, as highlighted in a recent McKinsey report⁷¹, and of the rise of the knowledge economy and of its international connections.
- It will need to react to external events and trends beyond Brexit (such as automation and population ageing) that will affect its business environment and the supply and demand for labour and skills (see Chapters 3 and 4).
- It will need to take advantage of the opportunities offered by its leading R&D-intensive sectors, while also stepping up the pace of innovation and innovation diffusion across the broader economy to unlock productivity gains and enhance living standards (Chapter 6).
- Automation offers great opportunities but it will also pose a significant challenge for training and re-skilling. The sectoral and occupational structure of London's economy means that job exposure to automation is likely to be lower than in the rest of the UK, but there are likely to be challenges for certain groups of London workers (Chapter 4).

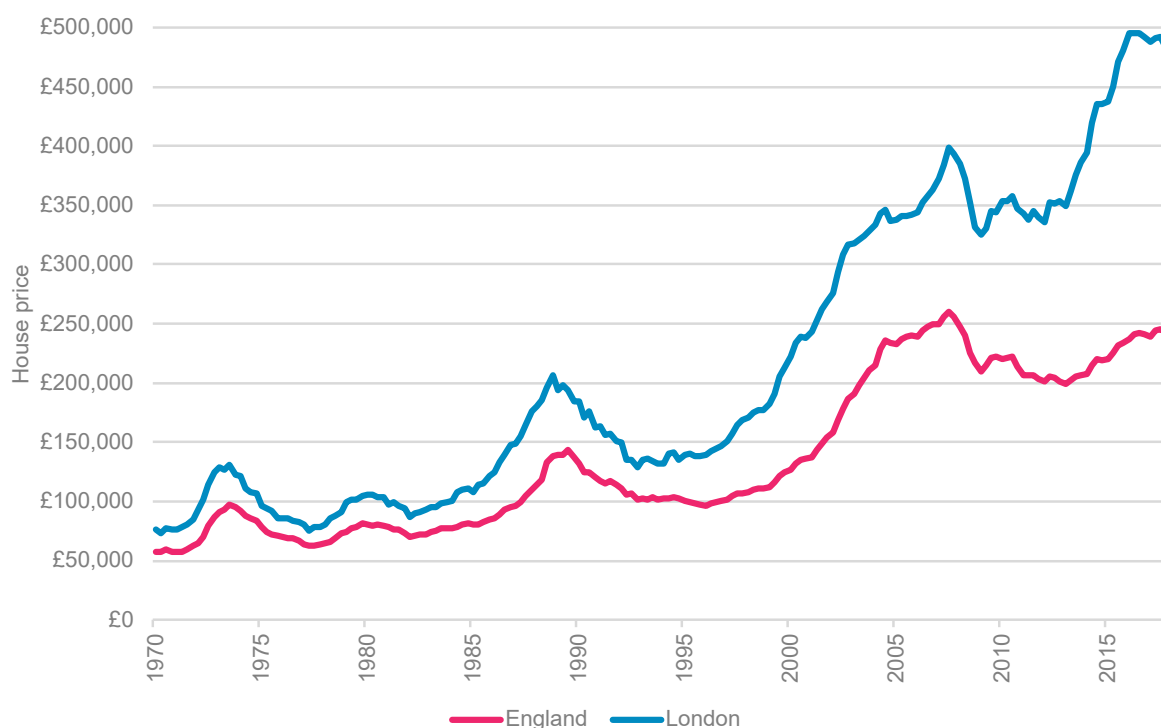
⁷¹ McKinsey Global Institute (2019), 'Globalization in transition: The future of trade and value chains'.

- Given the depth and breadth of London's economic links with the Wider South East, it will also need to collaborate with neighbouring regions on shared challenges and make the most of potential synergies (Chapter 8).

Looking ahead, London faces significant challenges resulting from the pressures of a growing city on transport, housing and infrastructure, both city-wide and in specific geographical areas.

- London population has been growing steadily since the late 1980s, driven by natural change and international migration. It currently stands at around 8.9 million and was predicted to reach 10.72 million by 2042 in the latest GLA projections⁷².
- More people and jobs in London mean that travel demand across all modes is expected to increase to around 32 million trips on an average day in 2041, five million more than today. Without adequate investments in transport infrastructure to boost capacity in London and in the Wider South East, congestion costs will increase (Chapter 5).
- New housing supply in London has failed to keep up with demand. Specifically, in the last two decades the number of jobs in London has grown by 45% and the number of people by 27%, but the number of homes by only 18%⁷³. This in turn has led to a housing affordability crisis (Figure 1.7), whose impact on the economy, poverty, social and geographical mobility and well-being are of national significance. With London's average prime office rents looking distinctively more expensive compared to most competitor cities and very high residential costs, London's business environment also risks becoming a victim of its own success, making it more difficult for businesses to grow and creating a barrier to sectoral diversity (Figure 1.8 and Chapter 3).

Figure 1.7: Average house prices in London and England after adjusting for inflation, 1970 to 2017

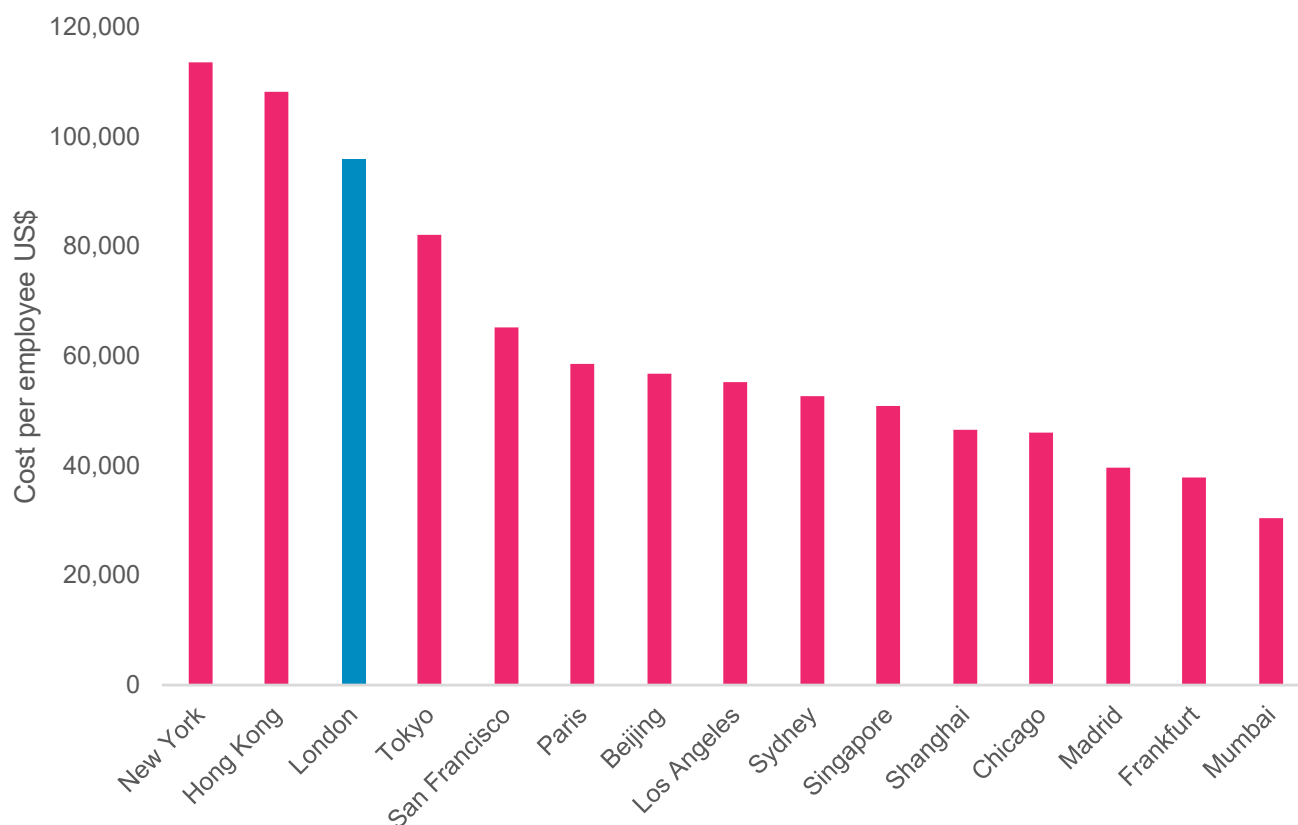


Source: GLA (2018), [Housing in London - The evidence base for the Mayor's Housing Strategy](#).

⁷² GLA (2019), '2017-based Trend Projection Results'.

⁷³ GLA (2019), [Housing in London - The evidence base for the Mayor's Housing Strategy](#).

Figure 1.8: Average cost of office space and residential accommodation in global cities (US\$ per worker, per year), 2017/18



Source: Savills 2017/18 Live/Work Index.

An integrated infrastructure response will be necessary to address pressures that may limit London's economic dynamism while ensuring that growth is inclusive and sustainable.

- Good public transport connections will be key to unlock housing developments, to retain accessibility to the Central Activity Zone (CAZ) and Northern Isle of Dogs and to ensure that parts of outer London can overcome poor transport connections that are currently limiting access to jobs, education and training (Chapters 5 and 7)⁷⁴.
- London will need investment in next generation broadband and mobile telecommunications to support productivity growth, facilitate innovations in the workplace and new ways of working and sustain international competitiveness (see Chapter 5).
- London will need investment to support the global and UK transition to a low/zero carbon economy, while also investing in climate resilience and maximising the opportunities of clean growth for London businesses (Chapters 5 and 6).
- Maintaining and improving environmental quality (including tackling London's air quality crisis and preserving and enhancing London's green infrastructure) will also be important for maintaining London's competitive edge and supporting health and productivity (as well as improving Londoners' well-being more generally).

⁷⁴ TFL (2017), '[Mayor's Transport Strategy: Supporting Evidence Challenges and Opportunities](#)'.

Overall, a combination of investments in infrastructure, skills and innovation can help ensure that London's economy can continue to thrive in the future while also ensuring that economic success can support the prosperity and well-being of all Londoners.

- Figure 1.9 presents an overview of how the five foundations relate to London's economy, providing a very high-level summary of the report's key findings on London's strengths as well as on current and future challenges, risks and opportunities.

Figure 1.9: London and the five foundations of productivity

Foundation of Productivity	London's strengths	Key challenges, risks and opportunities
BUSINESS ENVIRONMENT – Being the best place to start and grow a business	<ul style="list-style-type: none"> • Unique dynamic business ecosystem and competitive strengths as a global city • Strong agglomeration economies • Specialisation in high-skilled activities • Diversity in business activities 	<ul style="list-style-type: none"> • Cost of doing business (including costs and availability of business space) affecting diversity and competitiveness • Global risks (e.g. Brexit, changes in trade) • Challenges (and opportunities) of clean growth and transition to a low carbon, circular economy
PEOPLE – Securing good jobs and greater earning power for all	<ul style="list-style-type: none"> • London's diverse and highly educated work force • London's strong labour market and job creation performance • Strong school performance and progression to tertiary education overall 	<ul style="list-style-type: none"> • Inequalities in skills and job market outcomes • Low pay/insecure employment/underemployment • High living costs (especially housing affordability) • Risks from post-Brexit migration frameworks • Automation risks and uneven access to adult training
INFRASTRUCTURE – Delivering modern and accessible infrastructure that underpins growth and prosperity	<ul style="list-style-type: none"> • London's mature transport network and high levels of radial connectivity • High level of infrastructure endowments (physical, green) 	<ul style="list-style-type: none"> • Pressure from growing population on infrastructure requirements (especially transport, housing) • Gaps in London's digital connectivity and delay with regard to next generation mobile and broadband • Infrastructure funding gap regarding expected requirements
IDEAS – Maintaining and enhancing the ability to innovate – to develop new ideas and deploy them	<ul style="list-style-type: none"> • London's innovative assets (Higher Education Institutions, global HQs) • Access to equity and loan finance (non SMEs) • London's lead R&D sectors, including tech & digital, advanced urban services, life sciences and creative industries 	<ul style="list-style-type: none"> • Average rates of reported business innovation compared to the rest of the UK • Scope for greater levels of innovation diffusion (including AI) among the business population • Maximising opportunities and managing disruption of transformative innovations
PLACE – Building prosperous communities across the UK	<ul style="list-style-type: none"> • Clusters and local employment hubs • Interconnectedness between London's economy and the Wider South East • Interconnectedness between London's economy and the broader UK economy 	<ul style="list-style-type: none"> • Difference in economic performance across London (different London areas, inner-outer) • Pockets of entrenched socio-economic disadvantage (compounding drivers) • Opportunities and constraints of regional infrastructure (radial and orbital links)

Note: The type of risks identified here are risks to inclusive economic growth. As with other global cities, London faces additional societal risks (e.g. terrorism or flu pandemics).

Source: GLA Economics

1.5 Structure of the LIS evidence base report

The rest of the report is organised as follows:

- Chapter 2 takes a closer look at London's productivity as a key determinant of living standards and an enabler of inclusive growth.
- Chapter 3 looks at the business environment in London to identify ways in which the public sector can intervene to make the business environment more inclusive while maintaining its dynamism.
- Chapter 4 takes a closer look at the people living in London to understand the extent to which London residents have access to skills and good employment opportunities which allow them to contribute to and benefit from economic growth in the capital, now and in the future.
- Chapter 5 considers the key role of continuing infrastructure investments in supporting inclusive, resilient and sustainable growth in London (looking across transport, digital, clean growth, resilient growth and green infrastructure).
- Chapter 6 presents evidence on London's innovation performance across a range of indicators, looking at both inputs to and outputs from the innovation process, barriers to innovation and key innovative sector strengths. It also looks at the inclusiveness of innovation in London and at the extent to which all Londoners and London businesses can participate in innovation. Finally, it touches on how innovation is likely to impact on London's economy in the future.
- Chapter 7 considers inclusive growth in London and the five foundations of productivity from a geographical perspective. It therefore looks at the distribution of economic activity, jobs and living standards in London and at the evidence on policies that can help address local disadvantages.
- Chapter 8 completes the report by addressing the links between London, the Wider South East and the rest of the UK. London's economy does not stop at the administrative boundaries of the Greater London Authority, therefore it is necessary to expand our analytical outlook in order to fully understand London's strengths, weaknesses and opportunities.

2 Productivity in London

Christopher Rocks, Economist, GLA

2.1 Introduction

Increasing productivity is widely seen as a key enabler for improving living standards in the long term and as a necessary condition for sustainable economic growth. At the same time, productivity growth on its own is not sufficient for economic growth to be inclusive⁷⁵. Job quality and inequalities between firms and workers will, for example, shape how broadly the gains of growth are shared.

In this chapter we begin by looking at recent productivity trends in London's economy. We go on to identify aspects of productivity performance that the public sector could usefully target in sustaining economic growth and ensuring that growth is inclusive.

We first present evidence on the relationship between productivity and living standards, highlighting the importance of raising productivity for achieving inclusive growth. We then turn to key statistics on productivity trends, drawing attention to the sharp slowdown in productivity growth in the capital in recent years. We examine a number of comparisons of productivity by geography and sector. Finally, we summarise different perspectives on London's productivity performance, issues and solutions.

⁷⁵ See, for example: IPPR Scotland (2019), '[How productivity could deliver inclusive growth in Scotland](#)'.

2.2 The two-way relationship between a more inclusive economy and higher productivity

Obstacles standing in the way of broader productivity gains also contribute to wider inequality while high inequality levels can limit productivity growth. Identifying win-win policies is therefore key for inclusive growth.

- In the long run raising productivity is key to economic growth and increasing pay and living standards⁷⁶. The ONS, for example, estimates that market sector wages would now be £5,000 higher for the average worker if productivity had grown in-line with its long-term trend since 2008 (assuming wages as a share of income had remained constant)⁷⁷.
- There is little evidence of an overall employment-productivity growth trade-off over time⁷⁸. Nevertheless, traditional measures to boost productivity can have adverse impacts on inequalities. The link between productivity and wages is also more complex than often thought, with relative pay growth tending to lead productivity growth at the sector level⁷⁹.
- At the same time, there is increasing recognition that high levels of inequality can undermine the development of human capital and productivity growth – by, for example, limiting the ability of individuals and firms to access finance or invest in education and skills.
- On this basis the OECD has advocated a focus on 'win-win' policies that can both reduce inequalities and support productivity growth⁸⁰. The emphasis is on measures to widen access to economic opportunity such as improving education and adult skills, tackling labour market discrimination, and reducing the productivity dispersion between firms⁸¹. A recent IMF report also underlines the economic benefits of closing gender gaps⁸².

⁷⁶ This follows from the fact that economic output can only rise sustainably by increasing the volume of inputs used in production or by using inputs more efficiently.

⁷⁷ ONS (2019), ['Productivity economic commentary: January to March 2019'](#).

⁷⁸ Rather, in the long run, productivity and employment have tended to 'grow hand-in-hand at the aggregate level', but with local / sectoral variations. Source: McKinsey Global Institute (2019), ['Tech for Good: Smoothing disruption, improving well-being'](#).

⁷⁹ For example, see: Tuckett, A. (2017), ['Does productivity drive wages? Evidence from sectoral data'](#).

⁸⁰ OECD (2018), ['The productivity and equality nexus'](#).

⁸¹ OECD (2018), ['Opportunities for All: A Framework for Policy Action on Inclusive Growth'](#).

⁸² IMF (2019), 'Economic Gains from Gender Inclusion: New Mechanisms, New Evidence'.

2.3 Overall average labour productivity in London and trends over time

In economic terms London as a whole is by far the most productive place in the UK and one of the most productive in Europe. Although the UK displays large regional disparities in productivity, this is partly driven by structural changes (e.g. the rise of a 'knowledge-based' economy) common to many advanced economies.

- London has the highest level of labour productivity of any UK region: gross value-added (GVA) per hour worked was one third above the UK average in 2017, with a relatively large gap to the rest of the country. Excluding imputed rental incomes, such as rents capturing the wider value of housing services, only makes a small difference⁸³.
- The capital's strong relative performance holds for a range of different comparisons:
 - London also has the highest level of labour productivity among 38 local enterprise partnership (LEP) areas – 11% above the next productive LEP, Thames Valley Berkshire.
 - Looking more widely, London is one of the most productive places in Europe. Only Île-de-France (which includes the city of Paris) has a higher level of GDP per worker than London among 52 regions in Western Europe (see Figure 2.1)⁸⁴.
 - Comparing urban areas alone, London would be the fifth most productive metropolitan area in selected Western European countries according to OECD data⁸⁵. Note, however, this definition is based on economic functions rather than administrative boundaries.
- The UK is not unique in having a large gap between the performance of its first and second most productive regions. Spatial disparities in productivity are partly driven by structural changes common to many advanced economies, including the economic benefits accruing to large cities due to the rise of a knowledge-based economy⁸⁶.

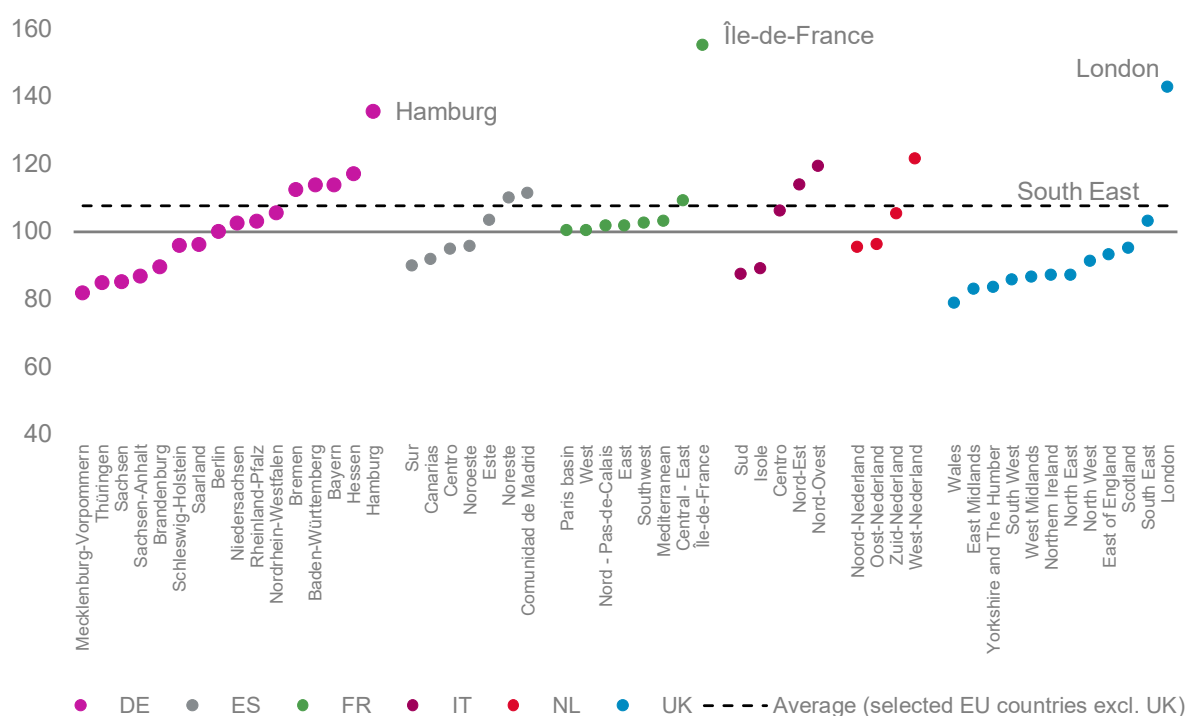
⁸³ ONS (2019), 'Regional and sub-regional productivity in the UK: February 2019'.

⁸⁴ This analysis compares UK regions with regional productivity levels in France, Germany, Italy, Netherlands and Spain. Source: ONS (2018), '[Regional and subregional productivity comparisons, UK and selected EU countries: 2014](#)'.

⁸⁵ OECD.Stat [accessed 19/06/2019]. 'Metropolitan areas' are urban agglomerations with more than half a million inhabitants. Consistent with previous ONS analysis this covers urban areas in Germany, Spain, France, Italy, the Netherlands and the UK.

⁸⁶ This profile of productivity performance between places looks even less unique when focusing on metropolitan areas alone. See: OECD (2018), '[Reducing regional disparities in productivity in the United Kingdom](#)'.

Figure 2.1: GDP per worker by region, UK and selected EU countries, 2017 (Index UK=100)



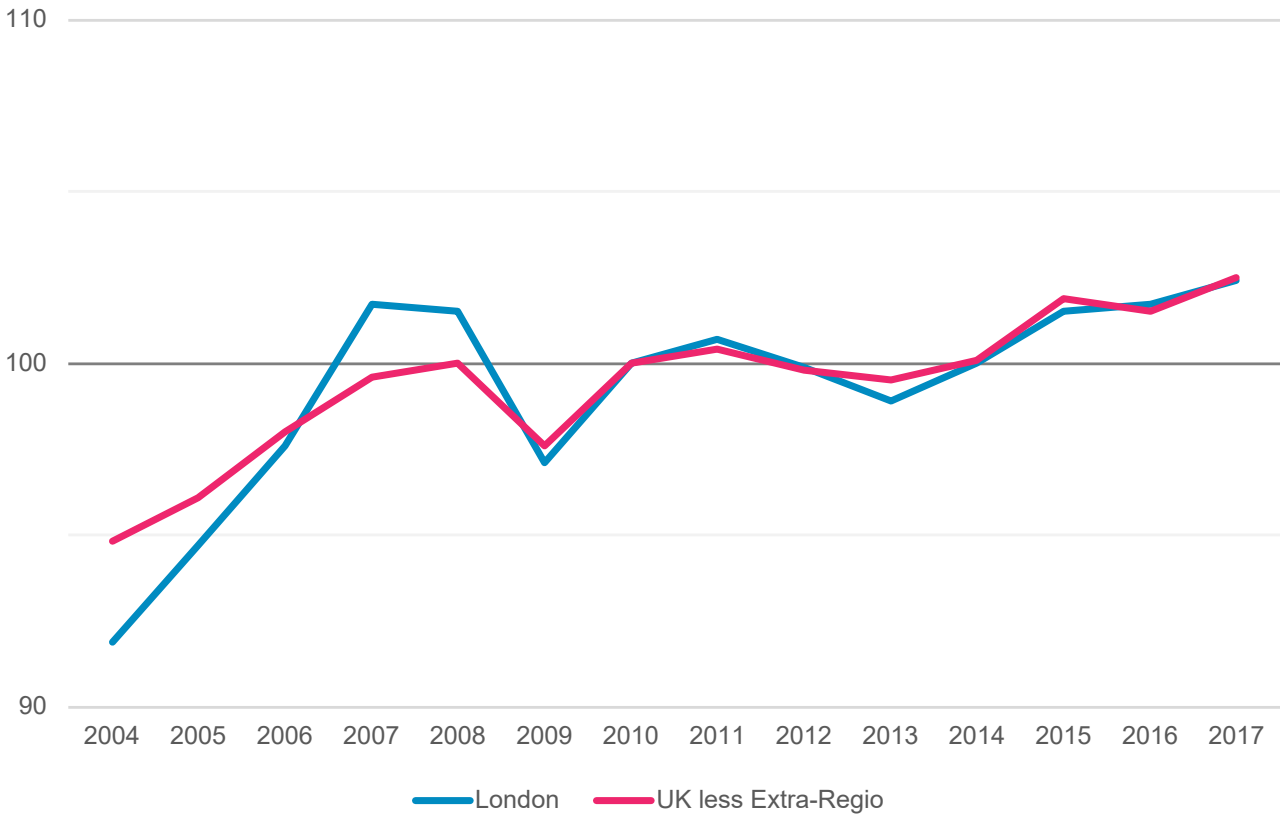
Source: GLA Economics analysis of Eurostat data. Note: indexed data where the level of GDP per worker in the UK equals 100. Following an approach previously adopted by the ONS⁸⁷, each marker represents one of 52 regions in Germany, Spain, France, Italy, the Netherlands and the UK.

As in the rest of the country, productivity growth in London has remained weak in the aftermath of the 2007/08 financial crisis, partly down to recent weakness in business investment.

- Running at just 0.3% per year on average, real productivity growth in London between 2010 and 2017 was in-line with (low) productivity growth in the UK overall (Figure 2.2). Over the same period real wage growth in London has also been significantly lower – averaging 1.0% per year from 2010-2017, down from 2.2% per year from 1998-2007⁸⁸.
- Overall, labour productivity in London is now about 24% below where it would have been had pre-crisis trends continued, compared to 17% below for the UK as whole. Although productivity growth has diverged from trend before, the recent deviation is more significant than in any period since 1971 (the earliest year where data is available)⁸⁹.
- As for most UK regions, growth in economic output has mirrored a similar growth in hours worked recently, resulting in only small changes in labour productivity. Although London is unusual insofar as growth in both GVA and hours have been higher than elsewhere in the UK – increasing by 27% (real GVA) and 24% (hours worked) between 2010 and 2017.
- At a national level business investment fell sharply during the financial crisis and has stalled again recently, largely attributed to Brexit-related uncertainties⁹⁰. Investment in ICT equipment and other machinery has been particularly weak, while trends in gross-fixed capital formation appear similar in London and other parts of the country⁹¹.

⁸⁷ ONS (2018), 'Regional and subregional productivity comparisons, UK and selected EU countries: 2014'.
⁸⁸ Median full-time weekly pay adjusted for CPI inflation. Source: ONS (2019), 'Annual Survey of Hours and Earnings'.
⁸⁹ GLA Economics (2017), 'London labour market projections 2017' – see Box 1 for long-term productivity trends.
⁹⁰ Bank of England (2019), 'Inflation Report: February 2019'.
⁹¹ ONS (2017), 'Regional Gross Fixed Capital Formation, NUTS1 and NUTS2, 2000 to 2016'. Note this is not official UK statistics and should only be regarded as estimates.

Figure 2.2: Real GVA per hour worked, London and UK, 2004 to 2017 (Index 2010=100)



Source: Office for National Statistics. Note: UK excludes the small amount of UK economic activity that cannot be attributed to a region (e.g. offshore oil and gas and activities of UK embassies): so-called extra-regio GVA.

2.4 Productivity across sectors and compared to sector-level productivity in the rest of the UK

London's relatively high level of productivity is not just about having more firms in certain industries. While the capital is more specialised in more productive service industries, a productivity premium is evident across *most* sectors of the economy.

- London's industry structure appears to play a relatively small role in productivity differences with other parts of the country⁹². Firms in London have higher median levels of productivity in most industries when compared to other regions (Figure 2.3). It is these 'within-sector' differences that are more important for explaining London's current high level of labour productivity, as well as its relatively strong long-term performance⁹³.
- Median GVA per worker in London's knowledge-intensive services sectors is 24% higher than the next most productive region in Great Britain; this compares to 10% higher than the next region in less knowledge-intensive services⁹⁴. Although average productivity in manufacturing and construction firms is not particularly high in London, these sectors account for a smaller share of economic activity in the capital, which is comparatively orientated towards knowledge-intensive activities (see Chapter 3 for more detail)⁹⁵.
- These differences are in-line with evidence linking firm-level productivity with economic mass and positive agglomeration effects. Knowledge-intensive sectors like 'Finance and insurance' and 'Professional services' are thought to benefit more from agglomeration economies and large local markets, highlighting the need for spatially-focused policies⁹⁶.

⁹² See, for example: ONS (2018), '[Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)'. It should be noted that this analysis uses a special version of the Annual Business Survey (ABS) that apportions firms' output to their various sites (also known as local units) across geographic locations where the economic activities take place. Where statistical techniques, such as apportionment, are used to help derive regional estimates there is an increased risk that the methods used will introduce sampling error or modelling imprecision to the data, with the possibility of producing misleading results. For more detail, see: ONS (2018), '[Analysis of the extent of modelling and estimation in regional GVA](#)'.

⁹³ Martin et al. (2018), '[The city dimension of the productivity growth puzzle: the relative role of structural change and within-sector slowdown](#)'.

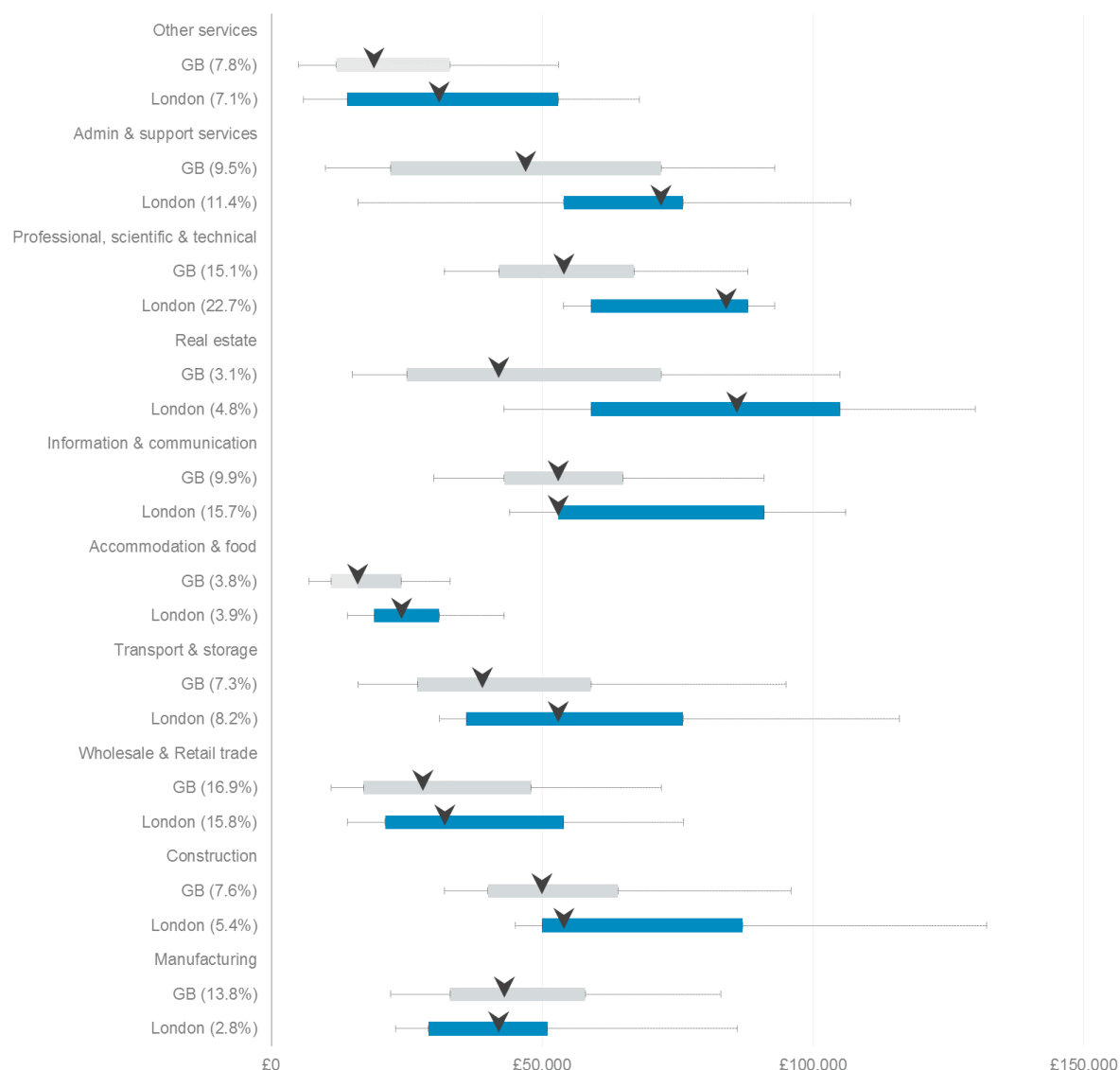
⁹⁴ Services are mainly aggregated into knowledge-intensive services (KIS) and less knowledge-intensive services (LKIS) based on their share of tertiary educated workers at detailed industrial level. KIS sectors include telecommunication or information service activities; market services such as architectural and engineering or legal and accounting activities; and other services such as veterinary activities. LKIS sectors include accommodation and food services or wholesale and retail trade. For further information, see: ONS (2018), 'Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018'.

⁹⁵ [Recent analysis](#) by the ONS using the Krugman Specialisation Index indicates London was the region that had the most dissimilar industrial structure to Great Britain as a whole. Also see: ONS (2018), '[Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)'.

⁹⁶ OECD (2018), '[Reducing regional disparities in productivity in the United Kingdom](#)'.

Figure 2.3: Median productivity levels within most industries are substantially higher for London firms compared to the Great Britain average, especially in services sectors

Distribution of local plant GVA per worker in selected industries, London and Great Britain, 2014. Key: arrow (▼) = median; bars (■) = interquartile range; lines (|—|) = 10th and 90th deciles.



Source: Annual Business Survey, Office for National Statistics. Note: each local plant is assigned to a single SIC 2007 group, corresponding to the plant's principal activity. 'Mining & utilities' is excluded for readability.

Nonetheless there is considerable variation in productivity performance between firms in the same industries in London.

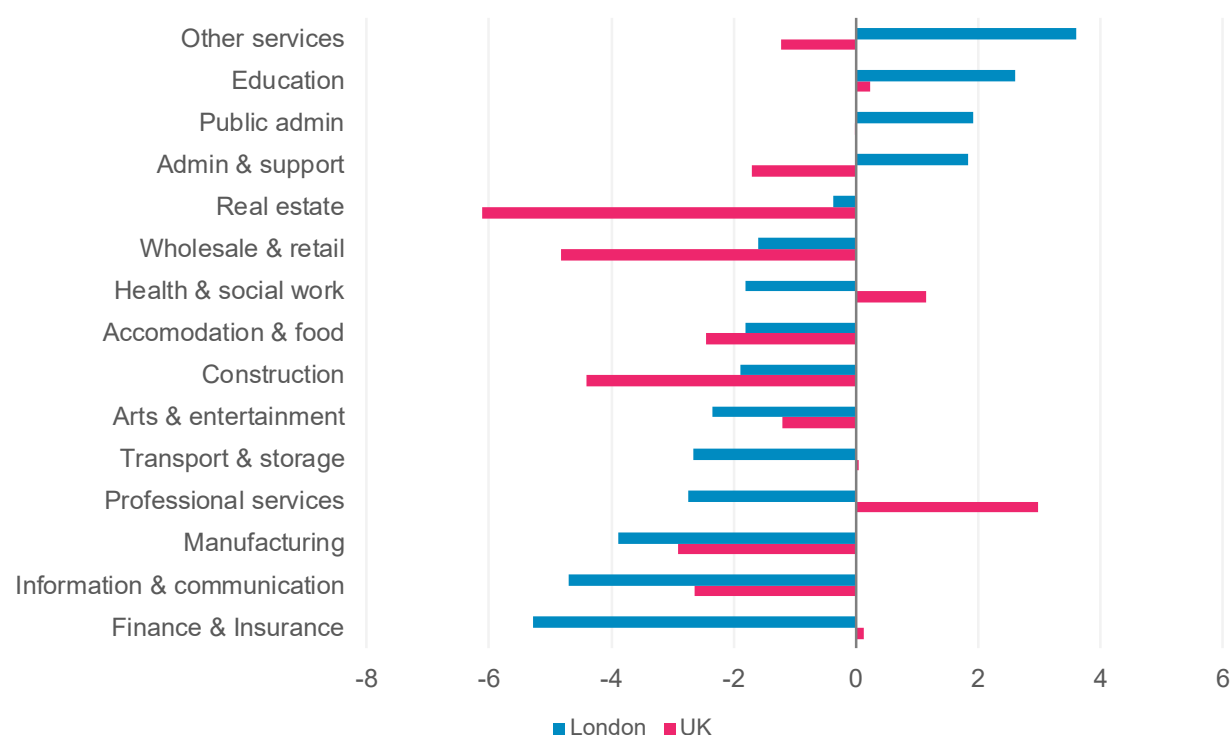
- Looking at the distribution of firm-level productivity (Figure 2.3) the top 10% of local plants in terms of GVA per worker in London are at least 2-3 times more productive than the bottom 10% in each industry group. In some cases, such as 'Administrative and support services' and 'Other services', the gap between the highest and lowest performing plants is even wider.
- Local plants in less knowledge-intensive services account for the vast majority (91%) of firms in the bottom fifth of London's productivity distribution (in the non-financial business economy); while the top end is dominated by local plants in knowledge-intensive sectors (73% of the top fifth)⁹⁷.

⁹⁷ ONS (2018), 'Regional firm-level productivity analysis for the non-financial business economy, Great Britain April 2018'.

Despite these disparities between sectors, GLA Economics research confirms that London's productivity slowdown has not been confined to specific sectors.

- London's post-financial crisis productivity slowdown does not seem to be caused by changes in the sectoral composition of employment:
 - Most industry groups in London have seen productivity growth fall in the period from 2010-2017 compared to the pre-crisis period of 1998-2007 (Figure 2.4).
 - The slowdown is especially pronounced in previously high-performing business services sectors – consistent with evidence that the post-crisis productivity puzzle (in aggregate productivity growth) is driven by *more* productive firms⁹⁸.
 - Holding the sectoral composition of hours worked constant between 2010 and 2017 would only make a small difference to London's productivity shortfall⁹⁹.
- The sharp slowdown in the 'Finance and insurance' sector is worth highlighting. The (direct) impact of the financial boom/bust cycle was more significant for London than other parts of the country. This has been attributed to deleveraging following unsustainable growth pre-crisis and this helps to explain the depth of London's productivity puzzle (see Section 2.7)¹⁰⁰.

Figure 2.4: Change in productivity growth by selected industry group, London and UK, 2010-2017 - 1998-2007 (percentage points)



Source: Office for National Statistics.

⁹⁸ Schneider, P. (2018), '[Decomposing differences in productivity distributions](#)'. Bank of England: Staff Working Paper No. 740. Note, however, 2004 to 2007 may have been a period of unusually strong growth at the top of the GB labour productivity distribution. See also: ONS (2019), '[Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)'.

⁹⁹ GLA Economics (2019), '[Productivity trends in London](#)'.

¹⁰⁰ Deleveraging includes repayment of bank debt and increased retention of earnings. It is likely to be linked to slower growth in loan volumes in recent years. See, for example: McKinsey Global Institute (2018), '[Solving the United Kingdom's productivity puzzle in the digital age](#)'. Mismeasurement of financial services output may also have contributed to the measured slowdown, by overemphasising the effects of higher leverage pre-crisis and the subsequent effects of deleveraging. Source: Bank of England (2019), '[Inflation Report: February 2019](#)'.

2.5 Productivity and firm characteristics

There are several firm-level characteristics associated with higher performing firms, including exposure to international trade and foreign-ownership.

- The success of the local export base is a key determinant of productivity performance. London as a whole accounts for a high share of international trade, including almost half (47%) of Great Britain's service exports¹⁰¹. Firms that export benefit from scale economies, competition and integration into global supply chains and typically show higher levels of productivity than domestically-oriented firms, on average by a third^{102,103}.
- But trading behaviour is also unequally distributed. Only a minority of firms trade internationally, and the largest traders are responsible for the bulk of trade¹⁰⁴.
 - In-line with these findings the value of service exports is highly concentrated in London's economy. Two NUTS3 areas – 'Camden and City of London' and 'Westminster' – contributed half of the capital's service exports in 2016¹⁰⁵.
 - There are signs that world trade has slowed in recent years, with further risks on the horizon (e.g. relating to Brexit and the broader geopolitical climate). Given the considerable productivity benefits linked to external openness it is important to encourage exports, particularly in light of Brexit¹⁰⁶.
 - It is, however, unlikely that any firm can simply become an exporter to increase its productivity. More likely is that the movement of already efficient, highly productive firms into the export market explains more of the productivity differences observed between exporting and non-exporting firms¹⁰⁷.
- Keeping other relevant factors constant, firms with inward foreign direct investment (FDI) are also 74% more productive than non-FDI firms¹⁰⁸. Among the benefits associated with receipt of FDI are access to cheaper inputs, more structured management practices and access to more advanced technologies. However, the productivity premia of FDI firms is not homogeneous across industries and is more pronounced in a few capital-intensive industries¹⁰⁹. For more on FDI see Chapter 3.
- Firm ownership is another factor linked to productivity performance, with foreign-owned firms found to have been 18% more productive (on average) than equivalent domestically-owned businesses from 2006 to 2017¹¹⁰. These firms may invest more in research and development or be more likely to promote the diffusion of ideas. At 2.6%, the proportion of foreign-owned firms in London is double the UK average¹¹¹.

¹⁰¹ ONS (2019), '[International exports of services from subnational areas of Great Britain: 2016](#)'.

¹⁰² Haldane, A. (2018), '[The UK's Productivity Problem: Hub No Spokes](#)'.

¹⁰³ Controlling for size, industry and ownership status, firms which report goods exports or imports are 21% and 20% more productive than non-traders; more productive firms also export more products and import from more destinations. Source: ONS (2018), '[UK trade in goods and productivity: new findings](#)'.

¹⁰⁴ ONS (2018), '[UK trade in goods and productivity: new findings](#)'.

¹⁰⁵ ONS (2019), '[International exports of services from subnational areas of Great Britain: 2016](#)'.

¹⁰⁶ OECD (2018), '[Reducing regional disparities in productivity in the United Kingdom](#)'.

¹⁰⁷ 'Meanwhile, less-productive firms are more likely to remain only operating in the domestic market'. Source: ONS (2019), '[Understanding spatial labour productivity in the UK](#)'.

¹⁰⁸ ONS (2017), '[Foreign direct investment and labour productivity, a micro-data perspective: 2012 to 2015](#)'.

¹⁰⁹ ONS (2019), '[Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)'.

¹¹⁰ ONS (2019), '[Firm-level labour productivity measures from the Annual Business Survey, Great Britain: 2017](#)'.

¹¹¹ ONS (2019), '[Analysis of enterprises in the UK by region and UK and foreign ownership](#)'.

Although there is some correlation between firm size and productivity, this is not a major factor behind regional differences in productivity

- Enterprises in London that are older and larger – in employment terms – have relatively high levels of average productivity compared to younger and smaller firms (see Chapter 3, Section 3.4). This is consistent with the expectation that such firms have more scope to benefit from specialisation of functions and economies of scope and scale¹¹².
- Yet according to ONS research the role of these factors in explaining the productivity of the firm is ‘at best partial’¹¹³. Neither firm age nor size appears to have large effects on spatial differences in aggregate average productivity between UK regions, with the distribution of local plants by these characteristics being similar between geographies.
- On the other hand, there is a significant relationship between management practices and labour productivity, with an increase in management score of 0.1 associated with a 9.6% increase in productivity¹¹⁴. Structured management practices are more prevalent among firms which are larger, foreign-owned and that employ better-educated workers than among firms that are domestically-owned, family-owned and employing less-educated workers.
- While these firms may be relatively well represented in London, the Business, Energy and Industrial Strategy Committee has also noted that: ‘poor management is a problem for far too many SMEs’, which often lack the resource or inclination to invest in training, while ‘others do not have the capacity to take advantage of new digital technologies’¹¹⁵.

¹¹² Albeit local plants belonging to the same enterprise can have very diverse characteristics and productivity levels. Source: ONS (2018), [‘Regional firm-level productivity analysis for the non-financial business economy: April 2018’](#).

¹¹³ ONS (2018), [‘Regional firm-level productivity analysis for the non-financial business economy: April 2018’](#).

¹¹⁴ ONS (2018), [‘Management practices and productivity in British production and services industries - initial results from the Management and Expectations Survey: 2016’](#).

¹¹⁵ Business, Energy and Industrial Strategy Committee (2018), [‘Small businesses and productivity’](#).

2.6 Labour productivity across London

Headline statistics mask significant disparities in performance across the capital. Labour productivity trends have been weak in most parts of London in the last five years, with outer London and inner east London witnessing a decline in productivity.

- 'Inner London-West' had the highest labour productivity in 2017 when the UK is broken down into 41 (NUTS2) subregions, at 50% above the UK average (Figure 2.5). Excluding imputed rental income only 2 out of the 21 NUTS3 areas in the London region displayed productivity levels below the UK average in 2017¹¹⁶.
- Nonetheless there is also large variation in productivity performance between places within the capital. Comparing the NUTS3 geographies with the highest and lowest levels of productivity within London shows that aggregate labour productivity in Tower Hamlets (which includes Canary Wharf) is around 1.9 times higher than in Croydon¹¹⁷.
 - These disparities are partly influenced by differences in industry mix. Inner London areas have long-standing relative specialisations in knowledge-intensive and high-tech services and have benefitted from the strong growth in these sectors. By comparison, outer London areas tend to be relatively specialised in real estate activities¹¹⁸.
 - Even then, variations in productivity at the sub-regional level continue to be led more by differences in firm productivity within sectors (as compared to industry mix).¹¹⁹ This firm-productivity advantage is more pronounced in inner than outer London and could reflect the relative impact of agglomerations or other location-related factors.
- That said (and as mentioned in Chapter 1), there are a number of London NUTS2 areas ('Outer London – South', 'Outer London – East and North East' and 'Inner London – East') that have seen a reduction in productivity levels between 2010 and 2017 (Figure 2.6).
 - In the case of 'Inner London – East' this is partly caused by a marked fall in output growth in financial services. This downturn has been attributed to a process of deleveraging following unsustainable growth in the years preceding 2007/08.
 - More broadly, Sensier & Devine find that sub-regions with greater specialisation in knowledge-intensive services, higher rates of investment and higher skill levels have tended to recover more quickly in the post-financial crisis period¹²⁰.

¹¹⁶ 'Croydon' and 'Merton; Kingston upon Thames; Sutton' had productivity levels around 5% below the average for the UK and 28% below the London average in 2017. Source: ONS (2019), '[Regional and sub-regional productivity in the UK: February 2019](#)'. As noted earlier: where statistical techniques, such as apportionment, are used to help derive regional estimates, there is an increased risk that the methods used will introduce sampling error or modelling imprecision to the data, with the possibility of producing misleading results.

¹¹⁷ Excluding imputed rental income. Source: ONS (2019), '[Regional and sub-regional productivity in the UK: February 2019](#)'.

¹¹⁸ ONS (2018), '[Examining regional gross value added growth in the UK: 1998 to 2016](#)'.

¹¹⁹ ONS (2018), '[Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)'.

¹²⁰ Sensier, M. and Devine, F. (2019), '[Understanding regional economic performance and resilience in the UK: trends since the Global Financial Crisis](#)'.

Figure 2.5: Gross value added per hour worked by NUTS2 sub-regions in London, current prices, 2017 (index UK =100)



Source: ONS (2017) Regional and sub-regional productivity in the UK: February 2019.

Figure 2.6: Scatter plot of total growth in real gross value added compared with total growth in hours worked for NUTS2 sub-regions of the UK, 2010 to 2017



Source: ONS (2017) Regional and sub-regional productivity in the UK: February 2019.

2.7 Perspectives on London's productivity performance, issues and solutions

A range of factors are likely to have influenced London's poor productivity performance in recent years. Exposure to slower global trade growth and weaker financial sector performance compared to pre-financial crisis years are among them.

- The openness of the London economy and the size of its financial sector mean that global developments, such as slower world trade growth and financial sector deleveraging, are likely to have been particularly important in driving the slowdown in productivity growth.
 - The McKinsey Global Institute previously found that a fifth of the UK's productivity growth slowdown could be attributed to the financial sector¹²¹. Analysis of ONS data suggests this is even higher in London – with around a quarter of the capital's productivity shortfall accounted for by Finance and insurance alone¹²².
 - Although the sector's performance should improve as deleveraging 'runs its course', productivity growth is unlikely to return to pre-crisis rates given that those were supported by excessive risk-taking¹²³. Other sectors would have to make-up for this shortfall to recover London's pre-crisis labour productivity growth rates¹²⁴.

At the same time, it is unlikely that the sectoral composition and trade specialisation of London's economy can fully explain its productivity puzzle. The combination of strong employment growth and weak investment growth in the recovery years have been another major factor.

- As shown in Section 2.4, productivity growth has slowed in most industries over recent years, suggesting that wider factors operating across sectors must be at play. Several relevant factors – such as business formation (Chapter 3), skills attainment and job quality (Chapter 4), diseconomies of scale (Chapter 5) and innovation adoption (Chapter 6) – are discussed in more detail later in this report.
- What is generally noteworthy is that since 2010 London firms have hired labour nearly as fast as economic output has increased.¹²⁵ This is despite output growing at a faster rate in London than in other parts of the country (see Table 2.1 and Appendix to Chapter 2 (Table A.1) for comparisons).
 - Rapid labour expansion has been partly attributed to the UK's flexible labour market facilitating a fall in real wages, alongside a ready supply of potential workers – including from the rest of the European Economic Area (see Chapter 4)¹²⁶.
 - It has also been linked to the high degree of economic uncertainty in the UK post-crisis – related to austerity, the Eurozone crisis and especially Brexit – which may have led firms to opt for labour recruitment over investments in new plant and machinery (since, with the UK's flexible labour market, hiring is usually more reversible than investment¹²⁷).

¹²¹ McKinsey Global Institute (2018), '[Solving the United Kingdom's productivity puzzle in the digital age](#)'.

¹²² GLA Economics (2019), '[Productivity trends in London](#)'.

¹²³ Tenyero, S. (2018), '[The fall in productivity growth: causes and implications](#)'.

¹²⁴ McKinsey Global Institute (2018), '[Solving the United Kingdom's productivity puzzle in the digital age](#)'.

¹²⁵ In most broad industry groups in London the annual average growth rate in hours worked in the period 2010-2017 was higher than in period 1998-2007. Source: GLA Economics (2019), '[Productivity trends in London](#)'.

¹²⁶ See, for example: Pessoa, J. P. and Van Reenen, J. (2014), '[The UK Productivity and Jobs Puzzle: Does the Answer Lie in Wage Flexibility?](#)'

¹²⁷ Saunders, M. (2019), '[Shifting balance of risks](#)'. Speech given at Barnsley & Rotherham Chamber of Commerce & Institute of Chartered Accountants.

Table 2.1: Growth in real gross value added, productivity hours and labour productivity by NUTS1 region, 2010 to 2017

Region	Real GVA	Productivity Hours	Labour Productivity
UK (less extra regio)	15%	12%	2%
North East	7%	2%	4%
North West	11%	9%	2%
Yorkshire and The Humber	9%	8%	1%
East Midlands	13%	11%	2%
West Midlands	18%	13%	5%
East of England	16%	16%	0%
London	27%	24%	2%
South East	13%	13%	0%
South West	10%	9%	1%
Wales	13%	8%	5%
Scotland	12%	8%	3%
Northern Ireland	13%	7%	5%

Source: Office for National Statistics¹²⁸. Note: UK excludes the small amount of UK economic activity that cannot be attributed to a region (e.g. offshore oil and gas and activities of UK embassies): so-called extra-regio GVA.

In other words, as firms have expanded through increased hiring, investment has become increasingly subdued due to a combination of lower aggregate demand and persistent uncertainty. This has created an unusually job-rich, investment-poor recovery (Figure 2.7).

- According to Bloom et al. the Brexit process has reduced UK investment levels by around 11% over the three years since the referendum¹²⁹. Internationally orientated firms (which are prominent in London) are especially exposed to Brexit-related uncertainties¹³⁰.
- The resulting weakness in the growth of capital used per hour worked ('capital deepening') has been widespread across sectors¹³¹ and, according to one estimate, can account for over half of the overall productivity slowdown at the UK-level¹³².
- The types of investment also matter for productivity. OECD analysis suggests that raising the level of capital intensity in knowledge-intensive services sectors such as Information and communication would deliver the largest productivity boost in the capital¹³³.

¹²⁸ ONS (2019), 'Regional and sub-regional productivity in the UK: February 2019'.

¹²⁹ Bloom, N., et al. (2019), '[The impact of Brexit on UK firms](#)'. Bank of England Staff Working Paper No. 818.

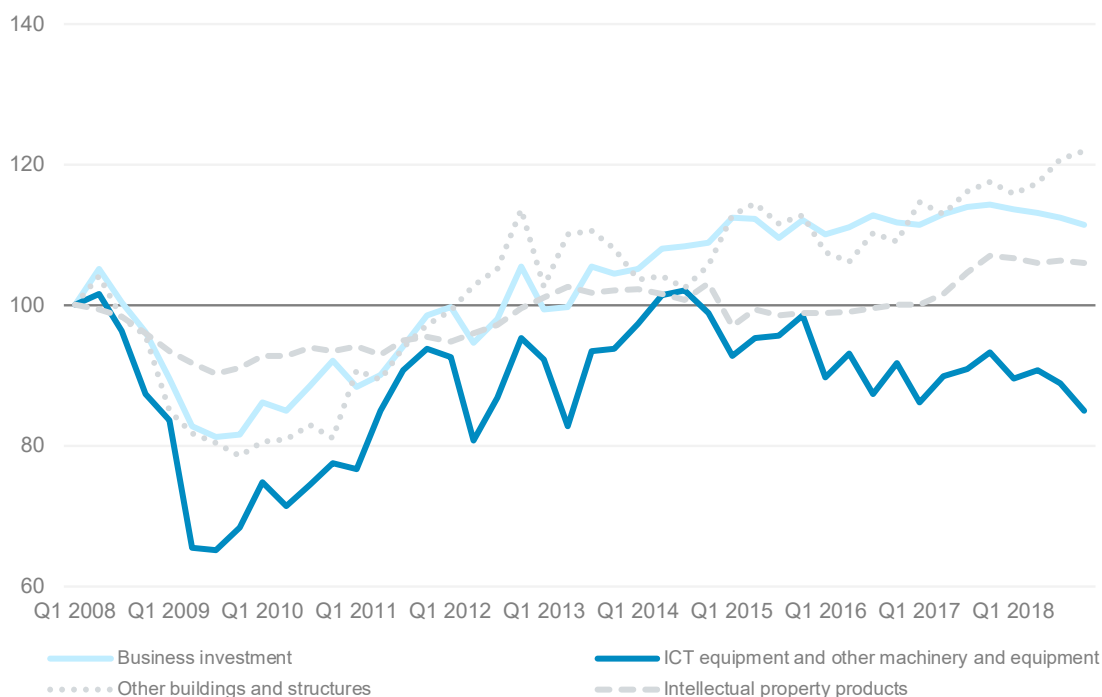
¹³⁰ Going forward, the London economy could follow very different paths depending on Brexit developments. There is considerable potential for Brexit-related uncertainties to remain elevated in the nearterm, with implications for business investment and productivity. See, for example: Saunders, M. (2019), '[Shifting balance of risks](#)'.

¹³¹ Ramsden (2018), '[The UK's productivity growth challenge](#)'.

¹³² Tenreyro, S. (2018), '[The fall in productivity growth: causes and implications](#)'.

¹³³ Kierzenkowski, R., P. Gal & G. Fulop (2017), '[Where to get the best bang for the buck in the United Kingdom? Industrial strategy, investment and lagging regions](#)'. OECD Economics Department Working Papers, No. 1426.

Figure 2.7: Total business investment levels and selected components, chained volume measure, seasonally adjusted, UK, Q1 2008 =100



Source: Office for National Statistics¹³⁴.

Although the post-crisis productivity slowdown has been most pronounced at the top tail of the distribution – among the highest-productivity ‘frontier’ businesses – there are also long-term concerns about slow productivity growth in other firms.

- Even though London has a larger share of firms with higher levels of productivity than other UK regions, there is still a substantial proportion of firms where productivity is clustered at lower (or negative) levels. Section 2.4 of this Chapter highlighted the wide disparities in firm-level productivity performance observed even within sectors in London.
- While it is unlikely that the post-financial crisis productivity puzzle can be attributed to this gap between high and low productivity firms, there are concerns about the lower rate of productivity growth for firms outside of the leading few: on average over the ten years to 2014, the top 1% of firms in London experienced annual productivity growth of 8% per year, while the other 99% saw productivity grow by only 2% per annum on average¹³⁵.
- One possibility is that technology diffusion has slowed, with the UK now ranking 38th on one global measure of knowledge diffusion, down from 18th in 2013¹³⁶. OECD research has also cited the ‘uneven’ uptake of digital technologies as a key measure to improving productivity performance, recommending a range of measures to stimulate efficient digital adoption and diffusion¹³⁷. Chapter 6 takes a closer look at innovation in London.

In the next chapters of this report we examine in turn each of the five foundations of productivity highlighted in the Industrial Strategy White Paper (business environment, people, infrastructure, ideas and places), looking at London's current performance and future outlook through the lens of inclusive growth.

¹³⁴ ONS (2019), ‘[Business investment in the UK: analysis by asset](#)’.

¹³⁵ Haldane, A. (2018), ‘[The UK's Productivity Problem: Hub No Spokes](#)’.

¹³⁶ Cornell University, INSEAD and WIPO (2017), ‘[The Global Innovation Index 2017](#)’.

¹³⁷ For example, see: Sorbe, S., et al. (2019), ‘[Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies](#)’. OECD.

3 Business Environment

Gabriele Piazza, Economist, GLA

3.1 Introduction

Productive, well-managed businesses and an open and dynamic business environment have a key role to play in providing good employment opportunities for all Londoners, contributing to skills development and supporting technology diffusion.

This section examines the business population in London. It aims to identify ways in which the public sector can intervene to make the local businesses environment more inclusive while maintaining its dynamism.

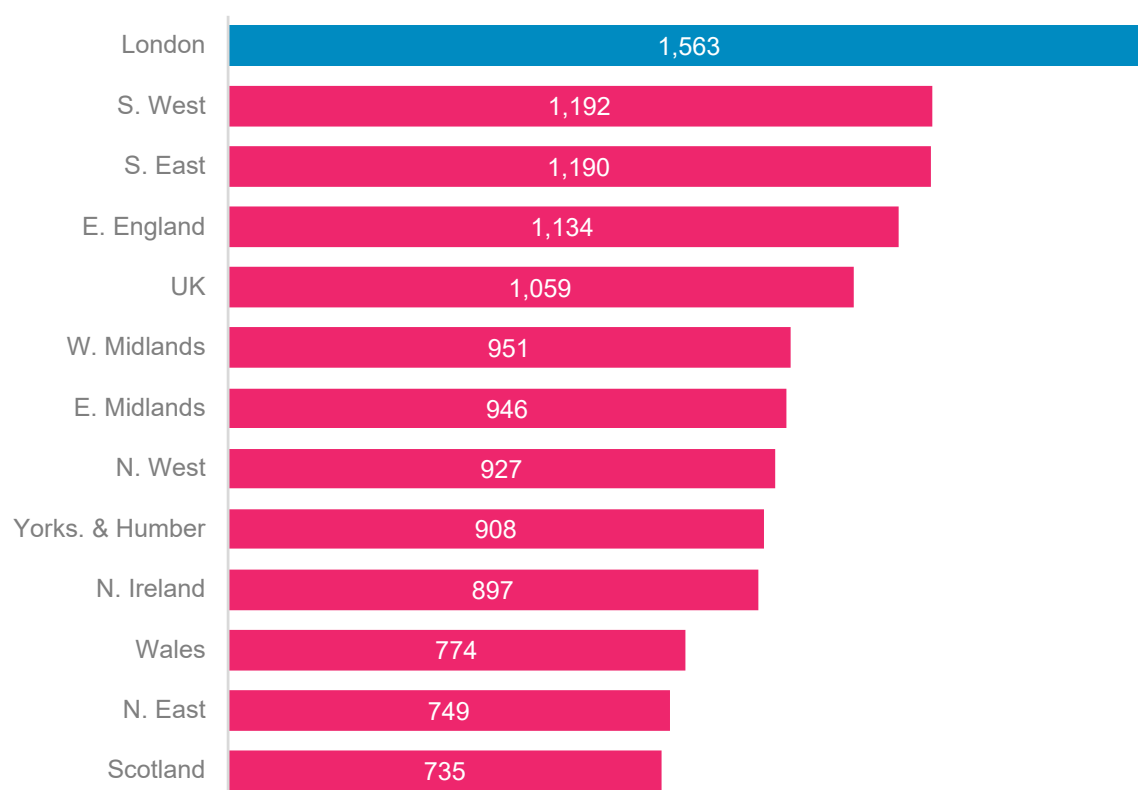
First, we present key statistics highlighting the dynamism of London's business environment and international attractiveness as a place to do business. Second, we look at how London's specialisation in high-skilled, high value-added activities has increased over the last few decades, while sitting alongside a diverse fabric of sectoral/spatial economic activities that help sustain London's competitiveness and liveability. We then look at the issues and challenges that businesses face both in terms of productivity and inclusiveness to identify market failures and potential areas of focus for industrial policy. Finally, we look at future trends and challenges.

3.2 London's business environment – key features

Overall London is a powerhouse for UK's business activity, with growth in its business stock being primarily driven by start-ups.

- In 2017, nearly a fifth of all UK private sector businesses (19%) were located in London. This has gone up from 17% in 2013, suggesting that business activity is becoming more concentrated in the capital¹³⁸.
- This is not only a result of its size: London has the highest number of businesses per 10,000 resident adults (1,563) of any UK region or country and this is higher than it was in 2013 (Figure 3.1).
- Business start-ups have driven this growth: research by TBR for the London Economic Evidence Base 2016 showed that between 2004 and 2013 only 0.2-1.2% of London's firm population came from business in-migration from elsewhere in the UK, compared to 10-12% from business start-ups¹³⁹.
- London is also the best place for businesses to grow; with 7.9%, it has the highest incidence of high-growth firms in England over the three-year period 2015-18¹⁴⁰.

Figure 3.1: Businesses per 10,000 adults, 2017



Source: BEIS Business Populations Estimates.

¹³⁸ For background, see: ONS (2018), '[Business Demography, UK: 2017](#)'. Note: the term 'business' is used here to represent an enterprise rather than an individual local unit. An enterprise can be comprised of one or more legal units.

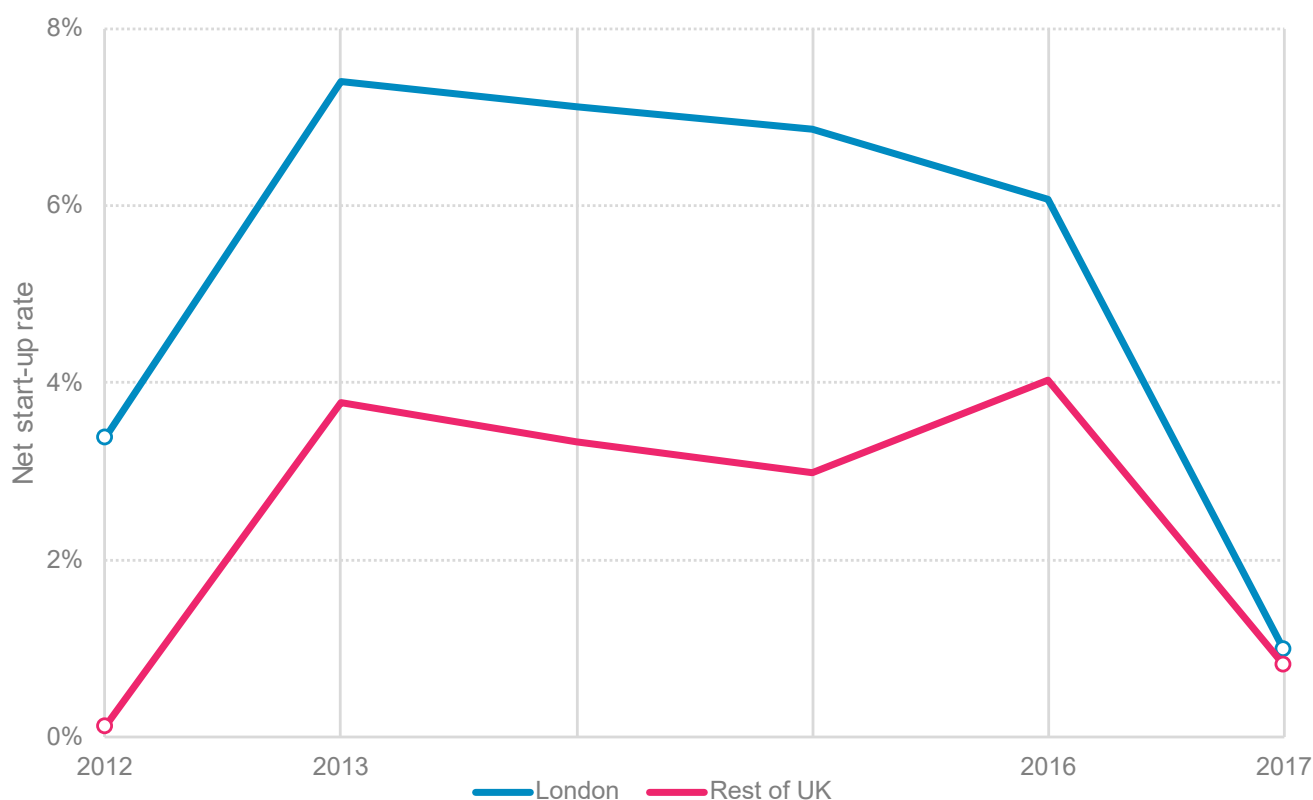
¹³⁹ GLA Economics (Trends Business Research Ltd) (2016), Working Paper 73: '[The changing spatial nature of business and employment in London](#)'.

¹⁴⁰ ERC (2019), UK Local growth dashboard: September 2019. Note: High-growth is defined as annualised average growth in employment of 20% or more over a three-year period (2015-18) and restricted to a business having at least 10 employees in 2015.

London's business environment is dynamic and competitive, with a high number of business births and closures – but its dynamism makes it more vulnerable to external factors.

- Urban regions (capital regions in particular) tend to be at the forefront when it comes to indexes of business creation and destruction¹⁴¹. London is no exception.
- London has a competitive business environment: it is the region with the second highest rate of business births (15.2%), after the North-West¹⁴². It also has the highest business closure rate (14.2%) in the country.
- The competitive nature of the business environment also means that business survival rates in London are relatively low. Data shows that for businesses set up in 2012, the one, three and five-year business survival rates are lower in the capital than in the UK as a whole, with 39.3% of London businesses born in 2012 still in operation five years later compared to 43.2% of UK businesses born in the same year¹⁴³.
- There has been a pronounced fall in the net start-up rate in London since 2013 (see Figure 3.2). This is the result of a continued increase in business closures and a fall in business births in 2017 and has been particularly marked in the capital. Uncertainty related to the UK's future relationship with the EU, subdued economic growth and sterling depreciation have been cited as explanatory factors¹⁴⁴.

Figure 3.2: Annual business net-start up rate, London and the UK, 2012-2017



Source: GLA Economic Calculations drawn from ONS Business Demography.

¹⁴¹ OECD (2017), 'The Geography of Firm Dynamics: measuring business demography for Regional Development'. Paris: OECD.

¹⁴² New business registrations are referred to as business births and the birth rate is calculated using the number of births as a proportion of the active businesses in that year.

¹⁴³ The statistics for business survival, business births and closure in this section are drawn from the 'ONS Business Demography 2017' dataset.

¹⁴⁴ ONS (2018), 'Business demography, UK: 2017'.

The dynamism of the capital's business environment makes a positive contribution to its overall productivity but also brings benefits to the rest of the UK.

- TBR research shows that London is a net contributor of firms and employment to the rest of the UK economy through outward migration. Between 2008 and 2013 (TBR's study period), London has seen 1% of its business stock relocating elsewhere in the UK each year¹⁴⁵.
- Research by Centre for Cities shows that London-headquartered businesses in finance and professional services accounted for almost 220,000 jobs in other British cities in 2017¹⁴⁶.

London continues to be a major attractor of international businesses looking to expand their operations overseas, especially those high value-added activities.

- In today's global economy multinational businesses tend to locate their higher value-added activities in cities. This is because cities reduce the costs of distance by agglomerating advanced service providers and facilitating knowledge flows¹⁴⁷.
- Research also shows that investment location decisions by multinational businesses are driven by the number of pre-existing investments in the same sector or in the same business function¹⁴⁸.
- Given these general trends, there are many reasons why multinational businesses may specifically decide to locate in London. It offers a range of factors that are not found in combination in other places.
 - Some factors that are also found in other UK regions include the UK's well-established legal, political and regulatory frameworks; the use of the English language as a means of international communication; international transport links; and, a low rate of corporation tax (currently 19% compared to an OECD average of 23.5%¹⁴⁹).
 - Other important factors however are specific to London. The capital offers a uniquely large pool of high-skilled workers to recruit from (see Chapter 4) and the productivity benefits associated with economic mass (the so-called 'agglomeration economies' – see Section 3.3).

The attractiveness of London as a place to do business is reflected in its overall performance in attracting Foreign Direct Investment (FDI) and in the number of foreign-owned businesses

- Between 2011 and 2018 London secured 3,910 FDI projects, the highest among global cities (Figure 3.3)¹⁵⁰. London tops this global list even in more recent years showing that, despite Brexit-related uncertainties, London has so far remained an attractive destination for foreign investors.
- Between 2011 and 2018, 'Software & IT services' (35%) accounted for the largest share of FDI projects followed by 'Business services' (15%) and 'Financial services'(11%).
- Looking at the type of business functions (arguably a more insightful lens to understand what may attract multinational business to London) shows that the largest share of FDI projects were in 'Sales,

¹⁴⁵ GLA Economics (Trend Business Research Ltd) (2016), '[Working Paper 73: The changing spatial nature of business and employment in London](#)'.

¹⁴⁶ Breach, A. & Piazza, G. (2018), [London Links](#). London: Centre for Cities. Note: Centre for Cities uses the primary urban area definition (PUA) for London and other UK cities. See <https://www.centreforcities.org/city-by-city/puas/> for more details.

¹⁴⁷ Goerzem, A. et al. (2013), '[Global cities and multinational enterprise location strategy](#)'. *Journal of International business studies*, 44 (5), 427-450.

¹⁴⁸ Crescenzi, R. et al (2014), '[Innovation drivers, value chains and the geography of multinational corporations in Europe](#)'. *Journal of Economic Geography*, 14, 1053-1086.

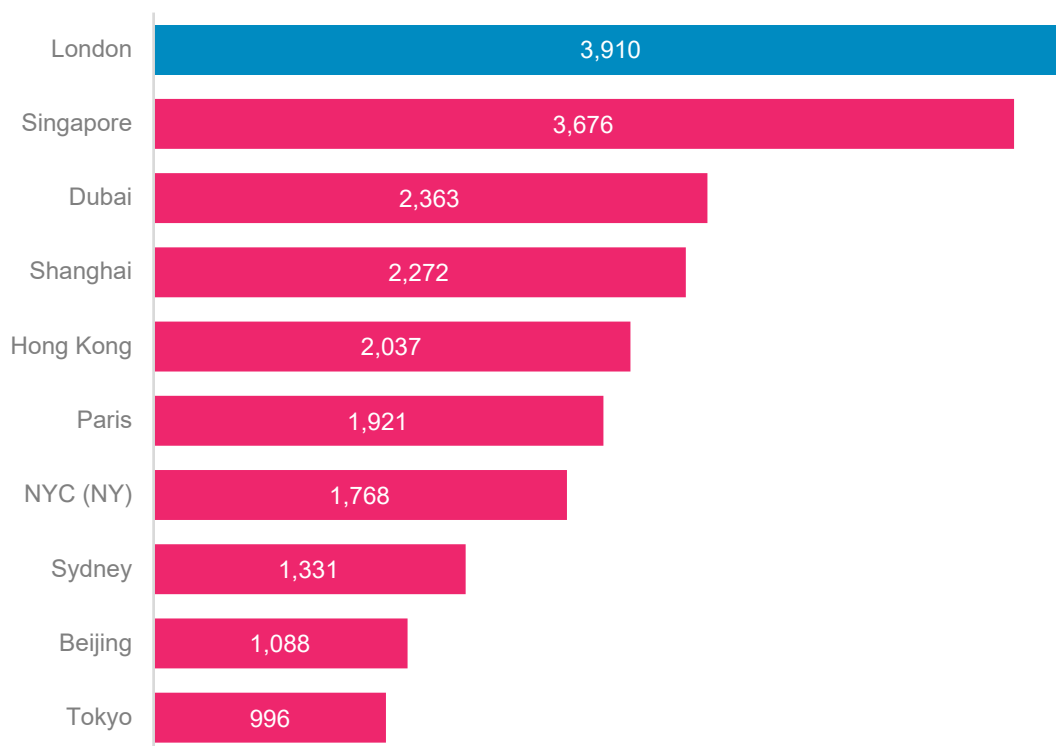
¹⁴⁹ See: OECD Corporate Statistics: <https://stats.oecd.org/Index.aspx?QueryId=78166#>. Figures include national and subnational rates. Different exemptions and deductions may apply in different countries.

¹⁵⁰ FDI statistics for this section are drawn from [FDI Markets](#).

Marketing and Support' (38%) followed by 'Business services' (28%). This is also what we see in other European global cities, where services account for the vast majority of investments¹⁵¹.

- The largest proportion (44%) of investments into London are from North America. The Western Europe and Asia-Pacific regions account for 32% and 15% respectively. While London is less reliant than the UK as a whole on investments from Western Europe (40% of the total), this still accounts for almost a third of all FDI projects in London.
- London has also the largest number of foreign-owned businesses (21,340) among UK regions, accounting for more than a fifth (21%) of all foreign-owned businesses in the country¹⁵².

Figure 3.3: Number of inbound FDI projects by global city, 2011 – 2018 (top 10)



Source: GLA Economics calculations drawn from FDI Markets.

London is also a city of headquarters, representing an attractive business base for European and global operations for a large number of multinational businesses

- Analysis by Deloitte found that London was the global or regional headquarters for 40% of Fortune 250 companies, far ahead of any other European city¹⁵³.
- Between 2011 and 2018, 10% of the FDI projects into the capital were to establish either global or regional headquarters. However, research indicates that multinational corporations' decisions about where to locate their headquarters depend more on national context and pre-existing investments, and less on regional features¹⁵⁴.

¹⁵¹ Shapiro, D. et al. (2018), 'Cities, Multinationals and Trade'. Global investment and local development, [21 November 2018].

¹⁵² ONS (2019), 'Foreign-owned businesses in the UK non-financial business economy (Annual Business Survey): 2017'. Note: the ABS covers only the UK Non-Financial Business Economy which accounts for two-thirds of UK economy in terms of approximate gross value added (aGVA).

¹⁵³ Deloitte (2014), 'London Futures: London crowned business capital of Europe'.

¹⁵⁴ Crescenzi, R. et al (2014), 'Innovation drivers, value chains and the geography of multinational corporations in Europe'. *Journal of Economic Geography*, 14, 1053-1086.

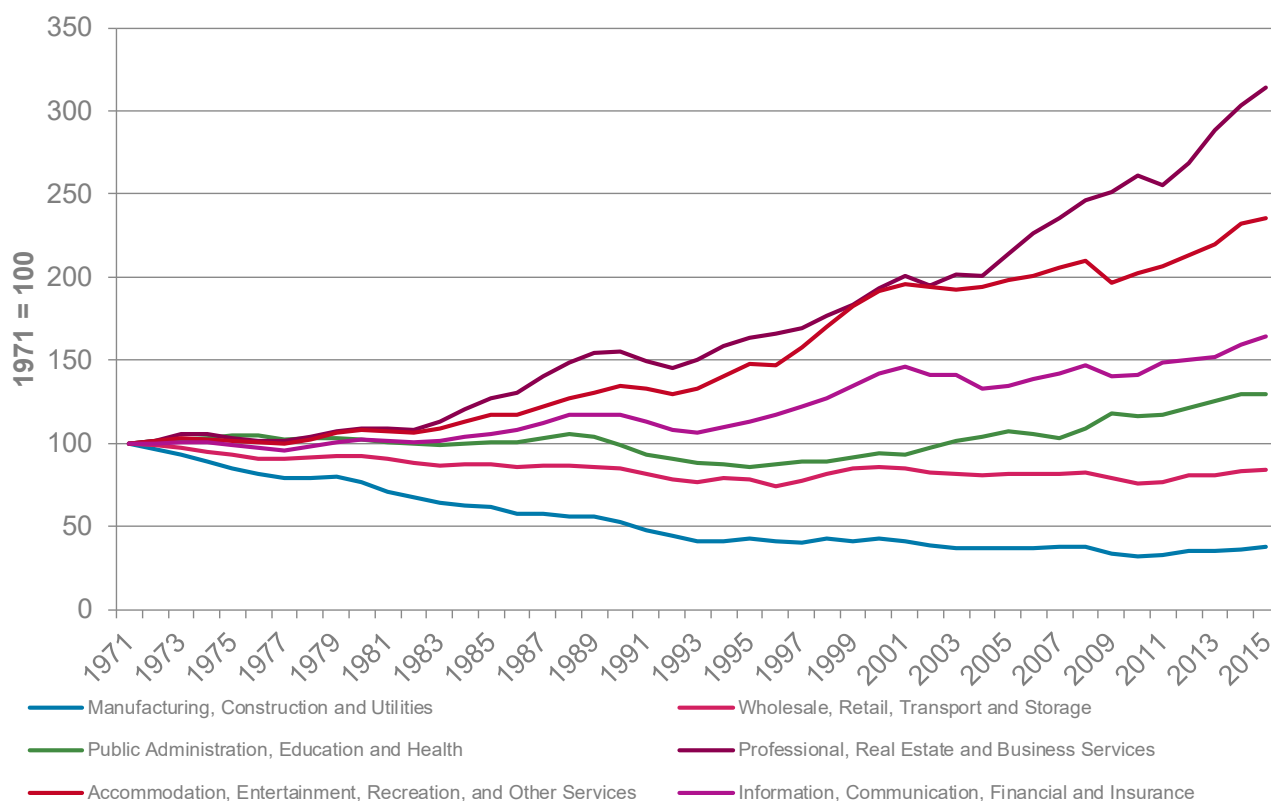
- Yet, when it comes to employment, headquarters may play less of a role than is officially reported. Research by the OECD finds that the measurement of employment growth in multi-plant firms can be susceptible to 'headquarter bias', leading to more employment being attributed to capital-city regions (where headquarters are often based) than is actually located there¹⁵⁵.

3.3 Change, specialisation and diversity in London's business environment

The composition of London's economy has seen a significant shift in employment towards services since 1971. Relative concentration of economic output in manufacturing activities, transport and logistics and the public sector also fell over this period.

- Looking at jobs by sector between 1971 and 2015 shows the rise of high-value added service activities and the decline of 'Manufacturing' in London (Figure 3.4).
- There has been a significant rise in the number of jobs in 'Professional, Real Estate, Scientific and technical activities' (which more than trebled over the past 40 years) and more generally a rise in service sector activity. In contrast, there has been a fall in employment in primary sectors, with 'Manufacturing' falling by 85% over the period.
- Looking at economic output by broad sector and at relative specialisation of London's economy (measured by location coefficients) compared to the rest of the UK also highlights the further decline of manufacturing (from relatively low concentrations, transport and logistics and the public sector)¹⁵⁶.

Figure 3.4: Jobs by sector in London, 1971-2015



Source: Workforce Jobs, Office for National Statistics; GLA Economics calculations.

¹⁵⁵ OECD (2017), 'The Geography of firm Dynamics: measuring business demography for regional development'. Paris: OECD.

¹⁵⁶ Tyler, P., Evenhuis, E., Martin, R., Sunley, P. and Gardiner, B. (2017), 'Growing apart? Structural transformation and the uneven development of the British cities', Cambridge Journal of Regions, Economy and Society, 10, 425-454.

Specifically, since the mid-1990s London has become increasingly specialised in high-skilled services, led by Finance and Professional services.

- 'Professional, Scientific and technical activities' accounted for 9.4% of London gross value added (GVA) in 1997, rising to 12.1% in 2016¹⁵⁷. The corresponding figures for 'Manufacturing' are 7.0% and 1.9% (whereas 'Manufacturing' accounts for 10.0% of UK GVA)¹⁵⁸.
- The 2016 index of specialisation indicator shows that sectors such as 'Finance' and 'Professional services' have become particularly concentrated in London compared to the rest of Great Britain (Figure 3.5)¹⁵⁹. Specifically:
 - 'Finance' shows a number of areas of specialisation, including 'Fund management activities' and 'Security and commodity contracts brokerage'.
 - 'Professional services' show specialisations in 'Advertising and market research', 'Legal and Accounting activities' and 'Management Consultancy Activities'¹⁶⁰.
 - The 'Information and Communication' sector shows a number of specialisations in London. These include 'Publishing', 'Motion Picture Video, TV programming and sound production', 'Programming and broadcasting'.
 - Other areas of specialisation include 'Air transport', 'Creative, Arts and Entertainment activities'.
- In their comparative analysis of structural change in British cities, Tyler et al. highlight that since the mid-1990s local competitiveness effects in London appear to have boosted economic growth. Specifically, these effects (e.g. human capital, agglomeration effects, entrepreneurship, innovation and local policies) turned from being a drag on London's growth into a big positive, compounding the beneficial effects of London having a large share of nationally fast-growing sectors¹⁶¹.

¹⁵⁷ This category is not the same used for the workforce jobs statistics above. In addition, it was not possible to look at GVA data by industry before 1997.

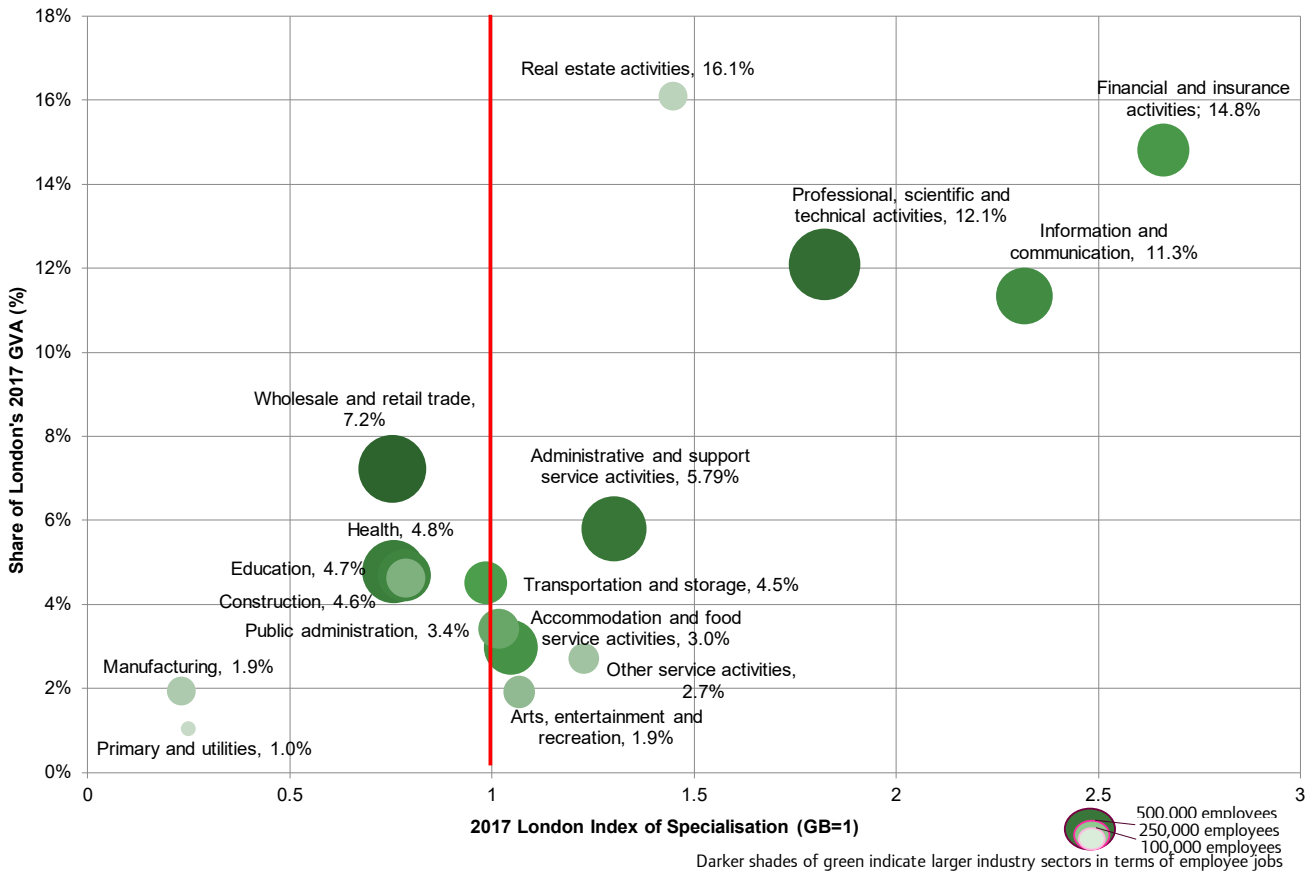
¹⁵⁸ ONS (2018), [Nominal and real regional gross value added \(balanced\) by industry](#).

¹⁵⁹ Index of specialisation is calculated as follows: (sector employee jobs in London / all employee jobs in London) / (sector employee jobs in Rest of GB / all employee jobs in Rest of GB). Both GVA and employee jobs numbers refer to 2016.

¹⁶⁰ GLA Economics (2016), [Economic Evidence Base for London](#).

¹⁶¹ Tyler, P., Evenhuis, E., martin, R., Sunley, P. and Gardiner, B. (2017), 'Growing apart? Structural transformation and the uneven development of the British cities', *Cambridge Journal of Regions, Economy and Society*, 10, 425-454.

Figure 3.5: Indices of Specialisation compared to output share, London, 2017



Source: GLA Economics calculations; drawn from Business Register and Employment Survey, and Regional Accounts, both ONS.

Box 3.1: London's key sectors

The Mayor has identified seven key sectors that are key to achieving a fairer and sustainable economy¹⁶². These are: 'Advanced Urban Services', 'Cultural and Creative Industries', 'Financial and Business Services', 'Life Sciences', 'Low Carbon and Environmental Goods and Services', 'Tech and Digital' and 'Tourism'. This box gives a snapshot of these sectors. The Appendix to Chapter 6 provides more details and spells out the rationale for public sector intervention and future opportunities for these sectors.

Advanced Urban Services (AUS)

While there is no agreed definition for this sector, according to the Royal Institution of Chartered Surveyors, this comprises firms that operate across traditional sectors including finance, planning, engineering and consultancy, design, delivery and operation of urban services, infrastructure, service design, construction, software, data management and modelling. Looking at some of these subsectors reveals the importance of the AUS sector for London's economy:

In 2016, there were 26,200 jobs in the architecture sector and it produced £1.9 billion in GVA and equivalent to 0.5% of London's economy. Between 2009 and 2016, this sector has grown 7.7% per annum on average and this was faster than the London economy¹⁶³.

¹⁶² GLA (2018), 'The Mayor's Economic Development Strategy for London'.

¹⁶³ GLA Economics (2018), 'London's Architecture Sector – Update 2018'.

In 2017, London accounted for 16% of the construction firms in Great Britain and 14% of construction-specific employment¹⁶⁴.

Cultural and Creative Industries

The DCMS definition of creative industries includes: advertising and marketing; architecture; crafts; design and designer fashion; film, TV, video, radio and photography; IT, software and computer services; publishing; museums, galleries and libraries; and music, performing and visual arts.

In 2017, the cultural and creative industries accounted for 12% of the total GVA in the capital. In the same year, more than half of the UK's creative industries GVA was produced in London¹⁶⁵.

Between 2010 and 2017, the output in this sector in London grew by 73.3% and this was the fastest among UK regions.

GVA per workforce job in London's creative industries in 2015 was £71,400. This was 22.2% higher than the rest of the London economy and 35.5% higher than for the UK creative industries.

Businesses across the UK are also further benefitting from the capital's creative industries, with case studies of eight London-based organisations showing that 40% of their suppliers are located in other parts of the country¹⁶⁶.

Financial and Business Services

The financial services sector includes banking, insurance, securities dealing, derivatives and fund management. Related professional services include legal services, accounting and management consulting. The biggest financial and related professional services cluster in the UK is centred in and around Canary Wharf, the City of London and the City fringe.

In 2015, around a third of those employed in this sector in the UK work in London and with 751,000 jobs it accounted for 15% of the employment in the capital. In the same year, the sector contributed £81bn to the London economy, over a fifth of overall London GVA¹⁶⁷.

Life Sciences

The Life Sciences Industrial Strategy describes 'Health Life Sciences' as referring to "the application of biology and technology to health improvement, including biopharmaceuticals, medical technology, genomics, diagnostics and digital health¹⁶⁸".

There are different ways of defining and measuring the sector statistically (see the Appendix to Chapter 6 for a brief discussion) but according to all definitions life sciences is a significant a growing component of the London economy, with MedCity reporting 1,105 life sciences companies based in London as of October 2019¹⁶⁹.

¹⁶⁴ Office for National Statistics (2018), '[Construction statistics: Number 19 – 2018 edition](#)'.

¹⁶⁵ This and other statistics on the cultural and creative industries presented here are from the Department for Digital, Culture, Media and Sport (2019), '[DCMS Sectors Economic Estimates 2017 \(provisional\): Regional Gross Value Added \(GVA\)](#)'.

¹⁶⁶ Greater London Authority (2019), '[Creative Supply Chains Study](#)'.

¹⁶⁷ TheCityUK (2017), '[UK-based financial and related professional Services: enabling growth across the UK](#)'.

¹⁶⁸ Bell, J. 'Life Sciences Industrial Strategy – a report to the Government from the life sciences sector'.

¹⁶⁹ MedCity. 'MedCity Map'.

The London life sciences sector constitutes a significant proportion of the sector in the UK and is also a key part of the 'Golden Triangle' of London, Oxford and Cambridge – the strongest biosciences cluster in Europe.

Low Carbon and Environmental Goods and Services (LCEGS)

This sector comprises 24 sub-sectors that are grouped into three broad categories: environmental, renewable energy and low carbon.

- In 2017/18 there were 13,906 LCEGS businesses in the capital employing over 246,000 workers¹⁷⁰. This accounted for 19.2% of all the LCEGS businesses in the UK (72,478), and 19.6% of employees (1,257,182).
- Over the last decade this sector experienced strong growth: in terms of sales LCEGS grew by 90% in the capital, higher than the growth for the UK as a whole – 80%.
- Looking at the three broad categories, the low carbon category exhibited the strongest growth over this period, growing by 108%, compared to growth of 88% in the UK.

Tech and Digital

This sector includes the 'digital technologies' sub-categories of the 'Science and technology' category as defined by the ONS.

London accounts for half of the total annual turnover of the UK sector and 30% of all businesses in London¹⁷¹. In the decade to 2013, there was a 14.6% rise in the number of employee jobs in this sector, playing an important role in the rise of the 'Professional, scientific and technical activities sector' in the capital.

The fastest growth over this period was in the 'Digital technology' sub-category – 29%.

Tourism

Tourism plays a vital role in London's economy. The sector employs 700,000 people – one in seven of the capital's jobs – and accounts for 11.6% of London's GDP¹⁷².

Between 2011 and 2016, the number of overnight domestic and overseas trips to London increased by 18%.

£14.9 billion was generated from overnight visits in 2016, an increase of 27% since 2011.

London's specialisation is not confined to finance and related industries. In the last decade, London has experienced strong growth in the creative industries and it is well-equipped to develop specialisations in other sectors.

- In 2018, the creative industries accounted for 13% of the total employment in the capital and this is more than double the share of people employed in the creative industries in the UK as a whole (6.2%)¹⁷³.

¹⁷⁰ The statistics on the sector presented here are taken from Greater London Authority (2019), '[London Low Carbon Market Snapshot \(2019\)](#)'.

¹⁷¹ Analysis of regional data from Tech Nation (2019), '[UK Tech on the Global Stage](#)'. Note: TechNation uses a different definition of the tech sector to the ONS defined 'digital technologies' category. 473Tech Nation. 'London'.

¹⁷² All the tourism sector statistics presented here are based on London & Partners (2017), '[A tourism Vision for London](#)'.

¹⁷³ Tether, B. (2019), '[Mind the gap: Regional inequalities in the UK's creative industries](#)'. Creative Industries Policy & Evidence Centre.

- Between 2011 and 2018, employment in the creative industries grew by almost 40% in London, second only to the North East¹⁷⁴. The fastest growth (91%) over the same period was in the 'IT and Software' sub-category - London has the highest number of software companies of any city in Europe¹⁷⁵. There was also strong growth in the 'Design' and 'Advertising & Marketing' sub-categories – 51% and 42% respectively¹⁷⁶.
- Research by the University of Cambridge shows that three boroughs in London (Camden, City of London and Islington) top the Economic Complexity Index ranking in the UK¹⁷⁷. According to this index, the more complex a place's economy, the stronger its productive capacity and the more adaptable it is to market changes.
- There is an agreement in the literature that industry specialisation does not fully capture the differences in type of activity within the same industry¹⁷⁸. As a result of changes in global value chains, many industries now include firms that vary in the type of occupations and functions they perform.

The sectors in which London specialises are also the capital's key exporting sectors.

- Three of the sectors in which London specialises account for 42% of the city's exports, rising to nearer 50% for exports outside the UK¹⁷⁹. Data from London input-output analysis (Table 3.1) shows that in 2013:
 - 'Financial and Insurance activities' accounted for £51bn of exports;
 - 'Information, Communications, Arts, Entertainment and Recreation' accounted for £35bn;
 - 'High-value business support' accounted for £20bn.
- Other sectors associated with the movement of people and goods accounted for another third of the capital's exports. Specifically:
 - 'Wholesale' accounted for £30bn of exports;
 - 'Accommodation, Food, Travel and Tourism' for £28bn;
 - 'Transport and Storage' for £22bn.

¹⁷⁴ Tether, B. (2019), '[Mind the gap: Regional inequalities in the UK's creative industries](#)'. Creative Industries Policy & Evidence Centre.

¹⁷⁵ GLA Economics (2012), '[London's digital Economy](#)'.

¹⁷⁶ Tether, B. (2019), '[Mind the gap: Regional inequalities in the UK's creative industries](#)'. Creative Industries Policy & Evidence Centre.

¹⁷⁷ Mealy, P. & Coyle, D. (2019), '[Greater Manchester Independent Prosperity Review: Economic Complexity Analysis](#)'.

¹⁷⁸ Martin, R. et al. (2018), '[The city dimension of the productivity growth puzzle: the relative role of structural change and within-sector slowdown](#)'. *Journal of Economic Geography*, 18 (2018) pp. 539–570.

¹⁷⁹ GLA Economics (2019), '[The London Input-Output Tables](#)'.

Table 3.1: London exports by sectors (excluding imports), by destination, 2013

Product classification					
SIC Code	Description	Total	EU	Rest of the world	Rest of the UK
A, B, D & E	Primary & Utilities	£2bn	£0bn	£1bn	£1bn
C	Manufacturing	£33bn	£7bn	£7bn	£20bn
F	Construction	£8bn	£0bn	£0bn	£7bn
45+46	Wholesale (inc. motor trades)	£30bn	£7bn	£6bn	£17bn
47	Retail (exc. motor trades)	£1bn	£0bn	£0bn	£0bn
H	Transport and storage	£22bn	£5bn	£4bn	£14bn
I + 79	Accommodation, food, travel and tourism	£28bn	£7bn	£6bn	£15bn
J+R	Information, communications, arts, entertainment and recreation	£35bn	£8bn	£10bn	£17bn
K	Financial and insurance activities	£51bn	£16bn	£13bn	£22bn
L+71+81	Real estate, architecture, engineering and building services	£8bn	£2bn	£1bn	£5bn
M-71-72-75	High-value business support	£20bn	£5bn	£4bn	£11bn
N+S-79-81	Administrative and support services	£6bn	£2bn	£2bn	£2bn
Q+72+75	Health, social work, scientific R&D and veterinary services	£9bn	£0bn	£1bn	£7bn
O+P	Public administration & education	£1bn	£0bn	£0bn	£1bn
T	Households as employers	£0bn	£0bn	£0bn	£0bn
	Total	£253bn	£60bn	£53bn	£139bn

Source: GLA Economics, London Input-Output Tables.

Sectoral specialisation has been accompanied and reinforced by spatial concentration as these economic activities have tended to locate in London's Central Activity Zone (CAZ) and in the Northern Isle of Dogs (NIOD) to benefit from 'agglomeration effects'.

- As a result of the pull factors discussed in Section 3.2, Central London has a very high concentration of jobs and businesses.
 - Most of London's CAZ, NIOD and the 1km fringe around them had employment densities of between 25,000 and 165,000 employees per square km in 2014¹⁸⁰.
 - In 2018, three boroughs, Westminster (10.0%), Camden (6.1%), the City of London (4.8%), accounted for a fifth of all business local units¹⁸¹.
- London's CAZ and NIOD has a particular attraction for many firms in the most productive sectors. For example, looking at employment by sector, the CAZ and NIOD accounts for around 83% of all 'Financial and Insurance' employment in London and 61% of all jobs in the 'Professional, scientific and technical' sector¹⁸².
- Research indicates that these are the sectors that benefit most from 'agglomeration economies' – the productivity benefits that occur when a high number of businesses co-locate at a particular location and gain a number of advantages (e.g. economies of scale, low-transaction costs, skills matching, knowledge spillovers) from proximity to their suppliers, customers, labour markets and even competitors¹⁸³.

¹⁸⁰ GLA Economics (2016), '[Economic Evidence base for London](#)'.

¹⁸¹ CEBR (Forthcoming), London Business Base.

¹⁸² GLA Economics (2015), Working Paper 68: '[Work and life in the Central Activities Zone, northern part of the Isle of Dogs and their fringes](#)'.

¹⁸³ Graham, D. (2007), '[Agglomeration, productivity and transport investment](#)'. *Journal of Transport Economics and Policy*, 41(3).

- This suggests that the concentration of these types of businesses is not only the result of the large number of highly skilled workers living in London ('sorting') but also a reflection of tougher business competition making it viable only for the most productive firms to operate in the capital's market environment ('selection')¹⁸⁴.
- The value of being located in central London should be reflected in the cost of office space. Indeed, office rental values are far higher in central London than in other parts of the UK; in the capital's most popular locations (the West End, for example) they are among the highest in the world¹⁸⁵. However, despite high costs, office vacancy rates in London are generally lower than in other global cities¹⁸⁶, some 3% below in some core office areas¹⁸⁷.

Notwithstanding clear patterns of specialisation, London's business environment is also diverse. Other supporting activities remain crucial in providing employment opportunities, maintaining London's competitiveness, and ensuring that the capital remains a well-functioning, liveable city.

- While many globally competitive businesses locate in central London, other sectors (particularly those serving local markets) are located closer to population centres.
 - Employment in sectors such as 'Wholesale and retail trade', 'Health and social work', 'Education' and 'Public administration' tends to be distributed more evenly across the capital.
 - In Outer London the type of business tends to be less niche and more evenly distributed across different industries. Research by CEBR shows that Brent, Enfield, Haringey and Waltham Forest score high on business diversity with share of firms from different industries evenly spread within these boroughs¹⁸⁸.
 - Hubs of employment are found across London; for example, the lower super output area with the most jobs per square km is next to Heathrow airport (Figure 3.6).
- A wide range of 'foundational' sectors play a significant role in the London economy. The four industry groups mentioned above, for example, together account for over 1.9 million jobs in the capital, equal to a third of all jobs and around a fifth of economic output¹⁸⁹. In employment terms, 'Wholesale and Retail' is the second largest industry group; 'Health and Social work' is fourth largest. Clearly, London is a diverse economy¹⁹⁰.
- Much of the demand for local services is driven by the capital's population growth as well as by business activity in central London through the multiplier effect. According to research by the 'What Works Centre for Local Economic Growth' each additional high-skilled job creates on average 2.5 jobs in non-tradeable sectors, i.e. in local shops and restaurants¹⁹¹.
- The size of the local economy also plays an important role in attracting FDI. 'Retail' accounted for 16% of all FDI projects in London from 2011 to 2018, the third largest business function share after 'Sales, Marketing and Support' and 'Business services'.
- Several Strategic Industrial Locations (SIL) identified in the draft London Plan accommodate strategically important activities such as logistics, waste management and transport functions that are also crucial for running the capital. These areas include Park Royal, the Thames Gateway SILs in Newham (Royals), Charlton, and Barking and Dagenham (River Road)¹⁹².

¹⁸⁴ For a discussion on agglomeration, sorting and selection in cities see here: Behrens, K. et al. (2014), '[Productive Cities: Sorting, Selection, and Agglomeration](#)'. *Journal of Political Economy*, Vol. 122, No. 3, pp. 507-553.

¹⁸⁵ The West End, for example, was recently cited as the second most expensive office location in the world for 'cost per workstation' (\$22,665 per year). Source: Cusham & Wakefield (2017), '[Office space across the world 2017](#)'.

¹⁸⁶ GLA Economics (2016), '[Economic Evidence Base for London](#)'.

¹⁸⁷ Ramidus Consulting Limited (2017), '[London Office Policy Review 2017](#)'.

¹⁸⁸ CEBR (Forthcoming), London Business Base.

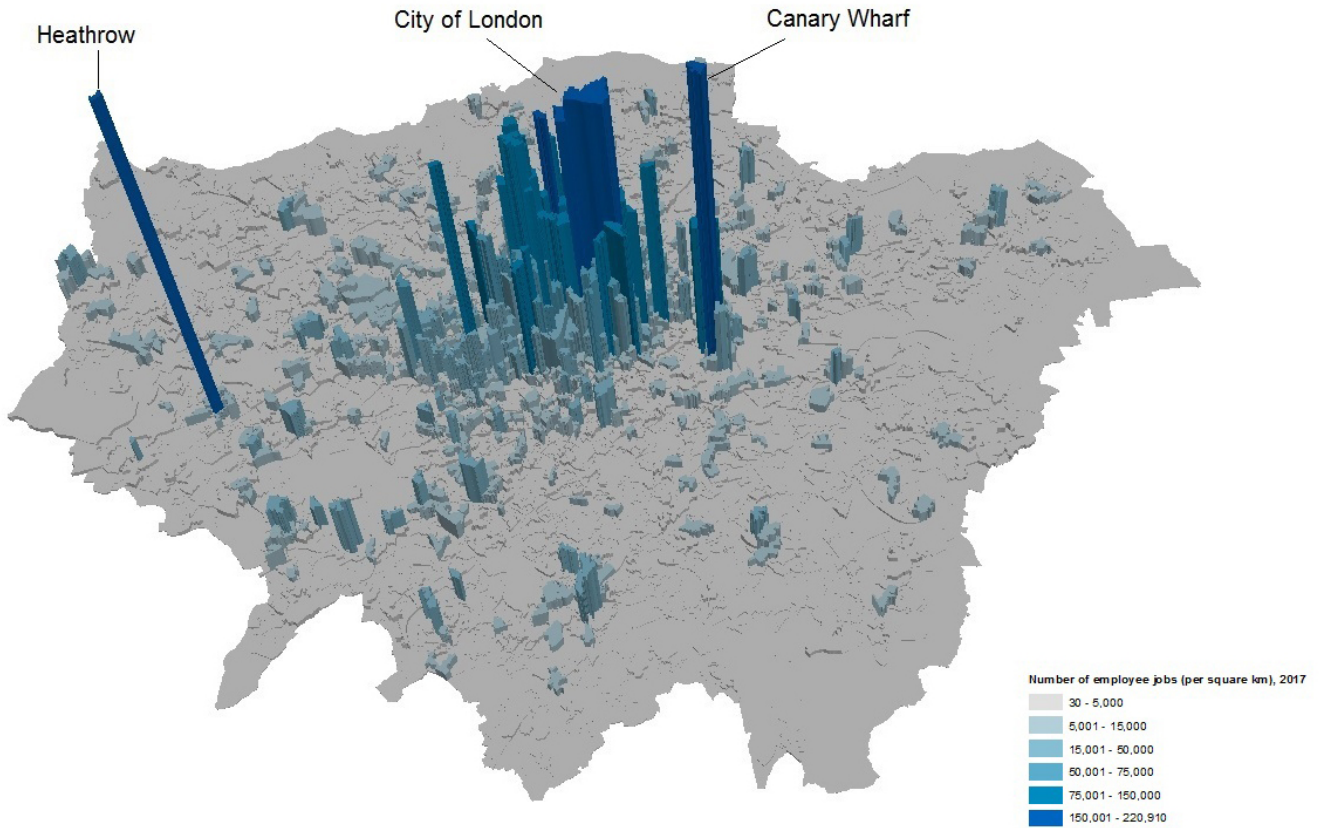
¹⁸⁹ ONS (2019), '[Workforce jobs by region and industry](#)'; ONS (2018), '[Nominal and real regional gross value added \(balanced\) by industry](#)'.

¹⁹⁰ GLA Economics (2016), '[Economic Evidence Base for London](#)'.

¹⁹¹ What Works Centre for Local Economic Growth (2019), '[Toolkit: Multiplier Effects](#)'.

¹⁹² GLA (2016), '[The London Plan](#)'.

Figure 3.6: Number of employee jobs per square kilometre in 2017 in London, by Lower Super Output Area (LSOA)



Note: Heathrow airport is located in Hillingdon but many jobs which support the airport are in Hounslow. See GLA Economics (2017), [Labour Market Projections 2017](#), Appendix F, for more details.

Source: GLA Economics calculations; drawn from ONS BRES.

3.4 Challenges for London's business environment

While city scale and agglomeration bring benefits, they can also lead to challenges by increasing the costs (financial or external) of operating in London.

- Housing costs, business space costs and transport costs (including negative externalities such as congestion/increased journey times) are factors that go towards offsetting (at least at the margin) the many positives associated to doing business in London (see Section 1.2).
- Population growth places additional demands on local services and transport infrastructure which may increase the costs and/or affect the quality of service provision (see Chapters 5 and 7).
- According to the Savills Live/Work 2017/18 Index, London is the most expensive place to accommodate a worker in Europe (see Figure 1.8)¹⁹³. This can affect the decisions of both high-skilled individuals and businesses to locate in the capital.
- In the London Business Survey 2014, 36% of London businesses rated London as poor or very poor for availability of suitable and affordable workspace. The corresponding percentage ratings of poor and very poor for availability/cost of housing and other living costs were 63% and 57% respectively¹⁹⁴.

The high costs of doing business in London represent a challenge for business and sectoral diversity and for SMEs aiming to grow and prosper.

- As already mentioned in the section above, office occupancy costs in central London are higher than many other global cities. This could be a barrier for the growth of SMEs and start-ups and make the capital less attractive.
- The cost of living could be a reason for the high number of vacancies in some of London's lower paid sectors such as 'Transport and Storage' (14% of the total) and 'Wholesale and Retail' (10%)¹⁹⁵.
- The mix and affordability of workspaces will be crucial for maintaining London's business diversity and resilience, particularly among the SME population¹⁹⁶. Yet differentials in land values can create pressures to convert land away from industrial and related uses, with more than 1,300 hectares of industrial land released to other uses in 2001–2015, well in excess of previous benchmarks¹⁹⁷.
 - The draft London Plan addresses the need to retain sufficient industrial, logistics and related capacity by seeking, as a general principle, no overall net loss of industrial floorspace capacity in designated industrial locations¹⁹⁸.
 - The draft London Plan also highlights the need for provision of affordable workspace (in defined circumstances) and the need for workspace to be designed to meet the needs of micro, small and medium-sized businesses¹⁹⁹.

¹⁹³ Savills (2018), '[Savills 2017/18 Live/Work Index](#)'.

¹⁹⁴ GLA Economics (2014), '[London Business Survey: Main Findings](#)'.

¹⁹⁵ GLA Economics (2016), Working Paper 75: '[Trends in the demand for labour and skills across London as a whole](#)'.

¹⁹⁶ CAG consultants (2017), 'London Industrial Land Demand', Final Report.

¹⁹⁷ Mayor of London (2019), '[Draft London Plan](#)'.

¹⁹⁸ The draft London Plan addresses the need to retain sufficient industrial, logistics and related capacity by seeking, as a general principle, no overall net loss of industrial floorspace capacity in designated industrial areas. See: [Policy E4 Land for industry, logistics and services to support London's economic function](#).

¹⁹⁹ See: [Policy E2 Low-cost business space and Policy E3 Affordable workspace](#).

Government decisions about business taxation also affect the costs of doing business in the capital. The recent revaluation of business rates (the tax on property used for business purposes) has added further pressure on small businesses in London.

- The most recent revaluation of the rating of commercial premises in England and Wales came into effect on 1 April 2017²⁰⁰. This involves all properties being given a rateable value (RV) based largely on the rental values prevailing at April 2015, with business rates (rates) calculated by applying the Uniform Business Rate (UBR) multiplier.
- The latest revaluation led to increases in rates of over 20% across London sectors²⁰¹. This compared with an average increase in England of less than 10%.
- In the long-term higher business rates are likely to be at least partially offset by lower rents²⁰², but there are a number of frictions in the rental markets (e.g. long-term rental agreements) that prevent adjustment in the short to medium-term.
- Higher business rates might affect the decisions of smaller enterprises in lower margin activities. Specifically:
 - A survey conducted by the Federation of Small Businesses (FSB) shows that three quarters (73.9%) of respondents cited the rating revaluation as the most important concern to their business.
 - When asked what their likely responses would be, only 15.7% said there would be no impact; 32.8% stated that they would cut back on capital expenditure; 20.1% said they would reduce headcount; 23.1% they would look at shutting their business; 18.7% saying they would seek to move further from the centre of London.

In line with the rest of the UK, lack of good management practices is likely to be one of the main obstacles to improving the productivity of London's businesses, particularly SMEs.

- Except for micro-plants (1 to 9 employment) average GVA per worker generally increases with the firm size, and this is true for all UK regions (Figure 3.7)²⁰³.
- The ONS Management and Expectations Survey highlights the positive relationship between management practices and labour productivity in UK firms²⁰⁴. In-line with the idea that 'managerial capital' is complementary to technological adoption, better management practices could support the adoption and implementation of existing and new technologies²⁰⁵. For example, the adoption of new technologies (such as ICT) often requires organisational restructuring, which in turn benefits from managerial capacity.
- Another important finding from empirical studies is that smaller firms tend to have poorer management practices, which could be one of the reasons why (beyond micro plants) smaller firms in London are often less productive.

²⁰⁰ The revaluation involved non-domestic properties liable to taxation being given a new rateable value based largely on the rental values prevailing at April 2015, with business rates then calculated by applying a uniform multiplier.

²⁰¹ All the evidence on the impact of business rates on London SMEs is taken from Ramidus (2017), '[The Business Rates Revaluation in London](#)'.

²⁰² See for example Bond S., Denny K., Hall J. and McKluskey W. (1996), 'Who Pays Business Rates?', *Fiscal Studies*, Vol 17(1): 19-35.

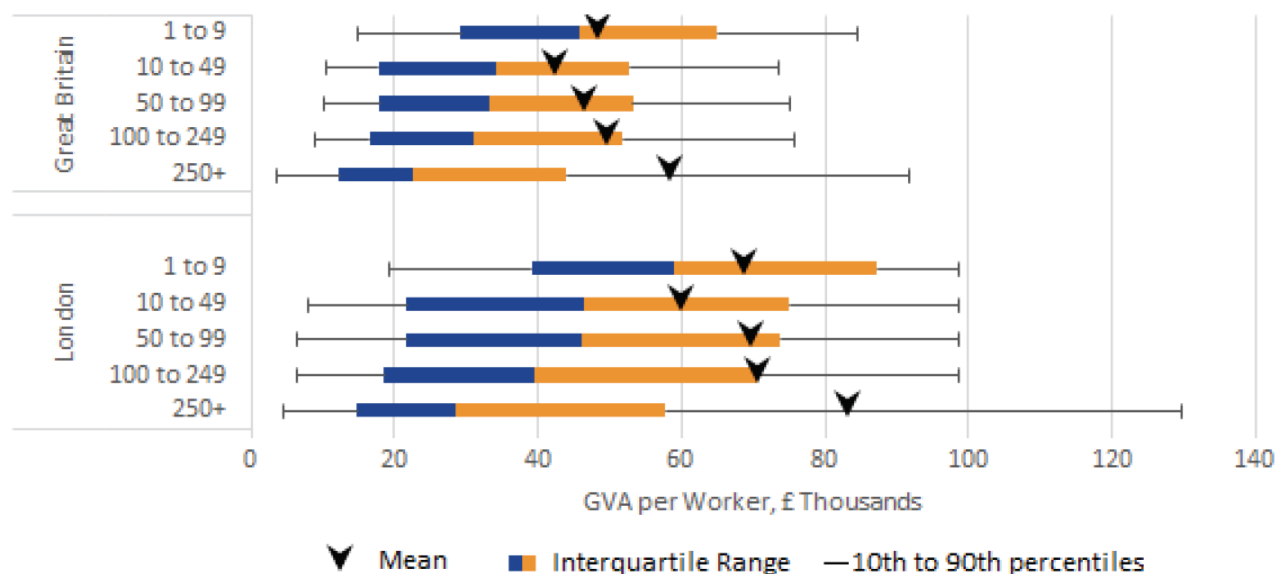
²⁰³ ONS (2019), '[Regional firm-level productivity analysis for the non-financial business economy, Great Britain: April 2018](#)'.

²⁰⁴ ONS (2018), '[Management practices and productivity in British production and services industries - initial results from the Management and Expectations Survey: 2016](#)'.

²⁰⁵ Bloom, N., R. Sadun and J. Van Reenen (2012), '[Americans Do IT Better: US Multinationals and the Productivity Miracle](#)'. *American Economic Review*, 102(1): 167-201.

- Bloom et al. find that the greatest constraint for improving management practices in the UK is an inadequate supply of managerial human capital^{206,207}.
- Beaver and Prince also find that management in small businesses is too often driven by short-term operational needs, pointing to a lack of managerial skills²⁰⁸. The evidence in Chapter 4 shows that only 9% of organisations in London are regarded as high-performance employers, and this is likely to be even lower among smaller businesses, leaving scope to encourage take-up of better management practices²⁰⁹.

Figure 3.7: GVA per worker, by firm size, 2015



Source: Annual Business Survey (ABS), ONS and Inter-Departmental Business Register (IDBR). ONS Calculations.

Maintaining and improving access to finance will also be key to supporting entrepreneurship, innovation and productivity growth among London businesses.

- LSE Research shows that, on average, issues with access to finance depressed labour productivity growth by 0.3 percentage points (pp) per year over the period 2004-2012. Smaller firms were more affected, with credit market frictions depressing productivity growth by 0.35pp (0.11pp for large firms)²¹⁰. This could also stop firms from growing.
- The London Business Survey found that 35% of SME business units attempted to access external finance in the 12 months to mid-2014. Of these: 48% obtained all of the money they needed, 30% obtained partial financing and the remaining fifth (22%) of SMEs seeking finance were unsuccessful or their cases were unresolved²¹¹.

²⁰⁶ Bloom, N., R. Lemos, M. Qi, R. Sadun and J. Van Reenen (2011), ‘Constraints on developing UK management practices’. BIS Research Paper No. 58, Department for Business Innovation and Skills.

²⁰⁷ Simpson and Docherty also argue that one of the main reasons behind informal and obsolete management practices in small enterprises is a lack of knowledge. Source: Simpson, M. & Docherty, A. (2004), ‘E-commerce adoption support and advice for UK SMEs’. *Journal of Small Business and Enterprise Development*; 11, 315-328

²⁰⁸ Beaver, G. & C. Prince (2004), ‘Management, strategy and policy in the UK small business sector: a critical review’. *Journal of Small Business and Enterprise Development*, 11, 34-49.

²⁰⁹ For example, see: Department for Education (2018), ‘Employer skill survey 2017’.

²¹⁰ Roland, I. (2018), ‘Unlocking SME productivity’. London: LSE Centre for Economic Performance.

²¹¹ GLA Economics (2014), ‘London Business Survey’.

- Research by the British Business Bank on the regional distribution of bank lending to SMEs shows that London receives a lower share of this type of lending to SMEs than its share of SME population²¹². However, this does not necessarily mean that businesses in London are struggling to access finance.
 - Firstly, SMEs in London may have greater knowledge of, and access to, other types of finance such as venture capital that is more favourable for some highly innovative businesses in London compared to elsewhere in the UK²¹³. For example, London is second only to New York in attracting venture capital (see Chapter 6). This suggests that businesses in the capital are less reliant on bank lending.
 - Secondly, there could be a headquarter effect: the number of SMEs reported as being in London overstates how many are carrying out day-to-day operations there²¹⁴.

And not all groups of Londoners are able to access and contribute to the capital's dynamic business environment.

- With almost a million self-employed individuals, London accounts for 20% of all self-employed people in the UK²¹⁵. And compared to the rest of the country, self-employed people in the capital are more likely to be in high-skilled occupations.
- But self-employment is less diverse than other forms of employment: women are still under-represented in this part of the labour market. In 2019, women accounted for 45% of the employment in the capital but filled only 34% of self-employment jobs^{216,217}. However, in 2011, across industries this share ranges from 3.3% in construction to 76.6% in health/social work²¹⁸.
- Looking at self-employment by ethnicity shows that in 2018 white Londoners accounted for 74% of self-employment jobs but 65% of the capital's total employment^{219,220}.

²¹² British Business Bank (2019), '[Small Business Finance Markets 2018/19](#)'.

²¹³ Roland, I. (2018), '[Unlocking SME productivity](#)'. London: LSE Centre for Economic Performance.

²¹⁴ British Business Bank (2019), '[Small Business Finance Markets 2018/19](#)'.

²¹⁵ Evidence on the number of self-employed peoples comes from Centre for Cities (2019), '[The gig smoke? How London has become the capital of self-employment](#)'. Note: Centre for Cities uses the primary urban area definition (PUA) for London and other UK cities. See <https://www.centreforcities.org/city-by-city/puas/> for more details.

²¹⁶ ONS (2019), '[H100 Regional labour market: Headline Labour Force Survey indicators for all regions](#)', GLAE Calculations.

²¹⁷ ONS (2019), '[Self Employed in London and rest of the UK, 2010 to 2018, by age, ethnicity and sex](#)', GLAE Calculations. Note: This includes self-employed jobs with employees and no employees.

²¹⁸ GLA Economics (2013), Working Paper 56: '[Self-employment in London](#)'. Note: self-employment is more common in the Construction industry than in other sectors. For further details, see: <https://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN00196#fullreport>

²¹⁹ ONS (2019), '[Annual Population Survey – regional – ethnicity by industry](#)'.

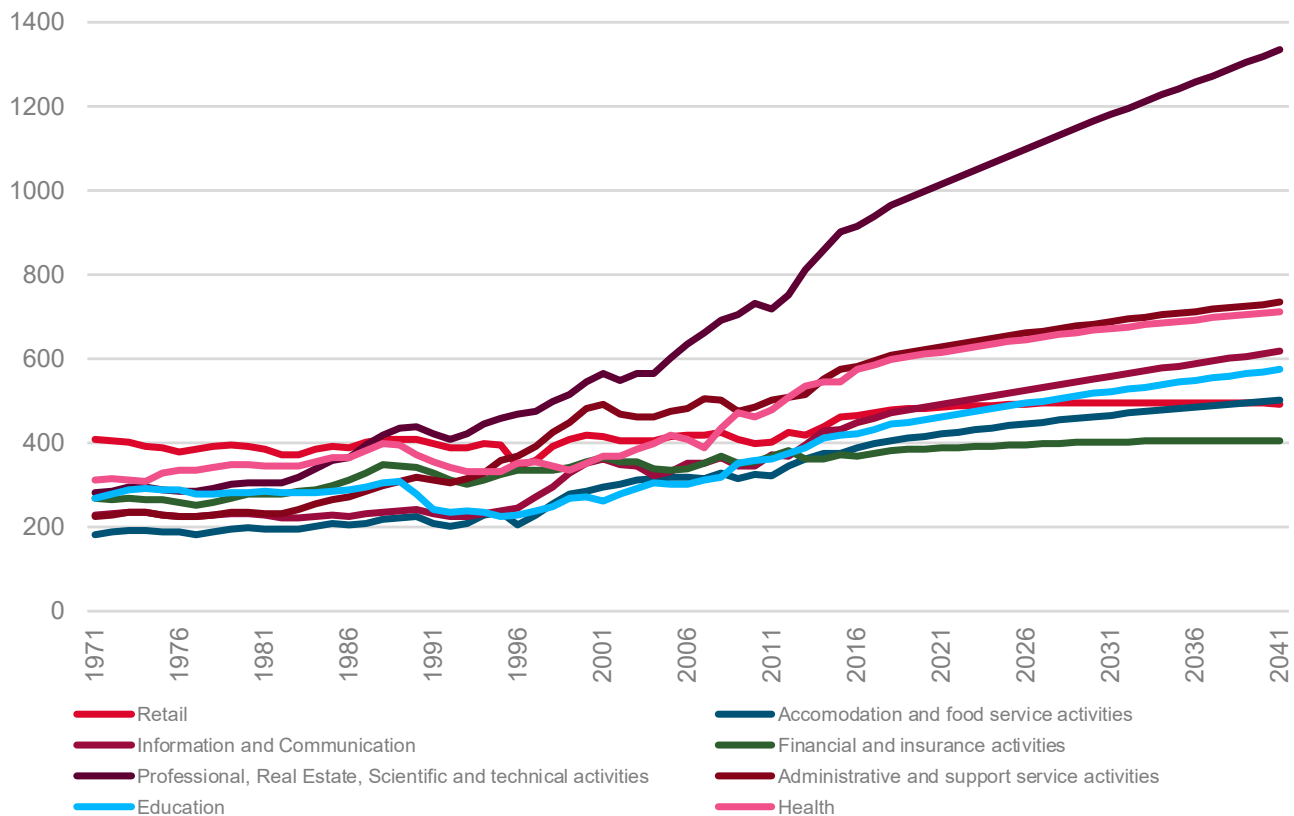
²²⁰ ONS (2019), '[Self Employed in London and rest of the UK, 2010 to 2018, by age, ethnicity and sex](#)', GLAE Calculations. Note: This includes self-employed jobs with employees and no employees.

3.5 The future of London’s business environment

Looking ahead, there may be opportunities for London-based firms to capitalise on existing strengths in high-skilled services, which are seeing an increase in global trade.

- GLA Economics’ projections suggest that London will continue to specialise in services. Just over a third of projected employment growth is expected to come from the ‘Professional, real estate, scientific and technical activities’ sector. ‘Information and communication’, ‘Administrative and support services’, and ‘Accommodation and food service activities’ are also expected to see large increases in employment (Figure 3.8).
- International trade in industries such as ‘IT services’, ‘Business services’, ‘Health’, and ‘Education’ is expected to continue to grow²²¹. This in itself would create opportunities for London businesses.
- There is also scope for more London businesses to engage in international trade, which can benefit growth and productivity. While export activity is likely to involve self-selection, the literature suggests that exporting activities can be increased through Export Promotion focussing on addressing asymmetric information issues and through Export Credit Agencies (a particular form of support)²²².

Figure 3.8: Employment projections by sector in London (‘000s)



Source: GLA Economics, London labour market projections 2017.

²²¹ McKinsey Global Institute (2019), ‘Globalization in transition: The future of trade and value chains’.

²²² GLA Economics (2019), ‘Productivity Levers in London’.

At the same time, as one of the most globally integrated parts of the UK economy, London is particularly exposed to changes in the global economy. Loss of market access and recruitment issues post-Brexit risk making London a less attractive place to do business.

- Falling trade costs have made an important contribution to increased intra-EU trade flows in recent decades; a reversal could reduce the trade intensity of the UK economy²²³.
- Brexit also remains one of the key future risks for London's international trade, especially for trade in the advanced business and financial services in which London specialises.
 - According to Dhingra et al. an increase in Brexit-related trade barriers could have a particular impact on areas specialised in business activities and financial intermediation²²⁴.
 - Losing access to the Single Market could make the capital less attractive to investors. One of the largest threats is the loss of passporting rights for firms based in the UK that provide financial services to the rest of the EU²²⁵.
- While different analyses point to different conclusions on London's relative resilience compared to the rest of the UK (see Chapter 1), the impact of proposed changes in the migration system may be stronger in London. This is because of the far larger contribution of EEA workers in the capital. The possible impact of the proposed new migration system is discussed in greater detail in Chapter 4.

London's transition towards a zero carbon and circular economy by 2050 can ensure long-term growth and new opportunities, including for the fast-growing Low Carbon and Environmental Goods and Services Sector (LCEGS). However, this transition will not be without its challenges.

- In 2017, London's Greenhouse gas (GHG) emissions were estimated at around 29.7 MtCO₂e (million tonnes of carbon dioxide equivalent), around 8% of the UK's total emissions²²⁶.
- London's GHG emissions are dominated by workplaces²²⁷. In 2015 it is estimated that: 40% of emissions were generated from London's workplaces (three quarters came from private businesses with the remainder from public buildings); homes accounted for 36% of the total emissions; and transport for 24%.
- Reducing emissions from workplaces will be crucial to support the transition to clean growth and provide growth opportunities (see Appendix to Chapter 6) but this will require actions and investment across the economy.
 - In 2014, 37% of non-residential buildings given an Energy Performance Certificate since 2009 have energy ratings of E, F or G. This means they are wasting energy and money.
 - Barriers to reducing emissions in workplaces have limited the roll-out of energy efficiency measures. These include: complex relationships between freeholders, leaseholders and tenants; a lack of low-cost financing for energy efficiency measures (particularly for SMEs) and a lack of financial incentive or imperative to retrofit energy efficiency measures.

²²³ Office for Budget Responsibility (2018), '[Discussion paper No.3: Brexit and the OBR's forecasts](#)'.

²²⁴ See, for example: Dhingra, S., Machin, S., & Overman, H. (2017), '[Local economic effects of Brexit](#)'. National Institute Economic Review. Note that recent OECD research also points to a negative economic impact of regulatory restrictions on services trade, especially for smaller firms. Source: Rouzet, D, Benz, S. & Spinelli, R. (2017) [Trading firms and trading costs in services: Firm-level analysis](#). OECD Trade Policy Papers.

²²⁵ The source for these bullets on Brexit impacts is Greater London Authority (2018), '[Preparing for Brexit](#)'. January 2018.

²²⁶ BEIS (2019), '[UK local authority carbon dioxide emissions estimates 2017](#)'.

²²⁷ The source for the bullet points in this section is Greater London Authority (2018), '[London Environment Strategy](#)'.

4 People

Christopher Rocks, Economist, GLA

4.1 Introduction

It has long been recognised that education and skills are important drivers of economic growth and productivity²²⁸. However, skills attainment also matters for achieving an inclusive economy given the positive links between qualifications and labour market outcomes. This chapter therefore looks closer at the people living in London. It aims to understand to what extent our residents have access to the skills and employment opportunities that allow them to contribute to and benefit from economic growth in the capital, both now and in the future.

The chapter continues as follows. We first outline the headline statistics on qualifications and skills among London's resident population, highlighting significant improvements in higher level attainment in recent years, but also stark inequalities in access to skills and training. We then present evidence on employment in the capital, looking at both the quantity and quality of work, and what this means for inclusive growth. Specifically, we examine differential labour market outcomes for diverse groups of Londoners and barriers to participation. Finally, we review some of the trends which are most likely to impact on the future of London's labour market, including the post-Brexit immigration system, ageing of the workforce and automation.

²²⁸ NIESR (2015), '[UK skills and productivity in an international context](#)'. BIS research paper number 202.

4.2 Londoners' qualifications and skills

4.2.1 Qualification levels

Skills are key to achieving an inclusive economy given the positive link between qualifications, labour market outcomes and productivity (at both an individual and 'macro' level).

- Rising skills attainment has been a key driver of productivity growth. According to Holland et al. at least a third of the increase in UK labour productivity from 1994 to 2005 can be attributed to the accumulation of graduate skills in the labour force²²⁹. Another recent study pointed towards higher skill levels among London's workforce as explaining a large part of the productivity gap between the capital and the rest of the country²³⁰.
- The link between an individual's skills and labour market outcomes is also well established: people with higher qualifications are more likely to be in employment, and once in work are more likely to be in skilled roles, earn higher wages, and enjoy greater job security²³¹.
- At a London-level, the employment rate for residents aged 16-64 with degree level qualifications (NVQ 4+) is twice that for people without formal qualifications (85% vs 42%).
 - Although socio-economic background also influences labour market outcomes, two recent studies controlling for other factors found positive returns from both degree and vocational qualifications (albeit earnings returns vary by subject area and institution)²³².
 - There is also evidence that, while earnings growth has stalled for both high and low skilled workers recently, this has not been evenly distributed: there continues to be a significant education premium for high skilled over low skilled workers in the UK²³³.

Recent decades have seen rising demand for higher level skills; during this time, the number of Londoners with higher level qualifications has also increased considerably.

- In 2018, 58% of Londoners aged 25-64 held a 'high' level qualification (NVQ4 or above), compared to 41% in the rest of the UK and up from 36% of London adults in 2004²³⁴. Thus:
 - London has more adult residents with NVQ4+ qualifications than other LEP areas – both in absolute and relative terms (see Appendix to Chapter 4 (Table A.2)). Oxfordshire (56%) and Thames Valley Berkshire (54%) have the next highest shares with NVQ4+ qualifications.
 - The capital is now more qualified than most places in Europe. In 2017 London's NUTS2 areas ranked first, second, fifth, eighth and twenty-seventh out of all regions in Europe for the share of adults aged 25-64 with tertiary level education (Figure 4.1)²³⁵.

²²⁹ Holland, D., Liadze, I., Rienzo, C. & Wilkinson, D. (2013), '[The Relationship Between Graduates and Economic Growth Across Countries](#)'. London, UK: Department for Business, Energy and Industrial Strategy.

²³⁰ Overman, H. (2015), '[The Economic Performance of UK Cities: Can urban and regional policy make a difference to the North-South divide?](#)'

²³¹ Cedefop (2017), '[Investing in skills pays off: The economic and social cost of low-skilled adults in the EU](#)'.

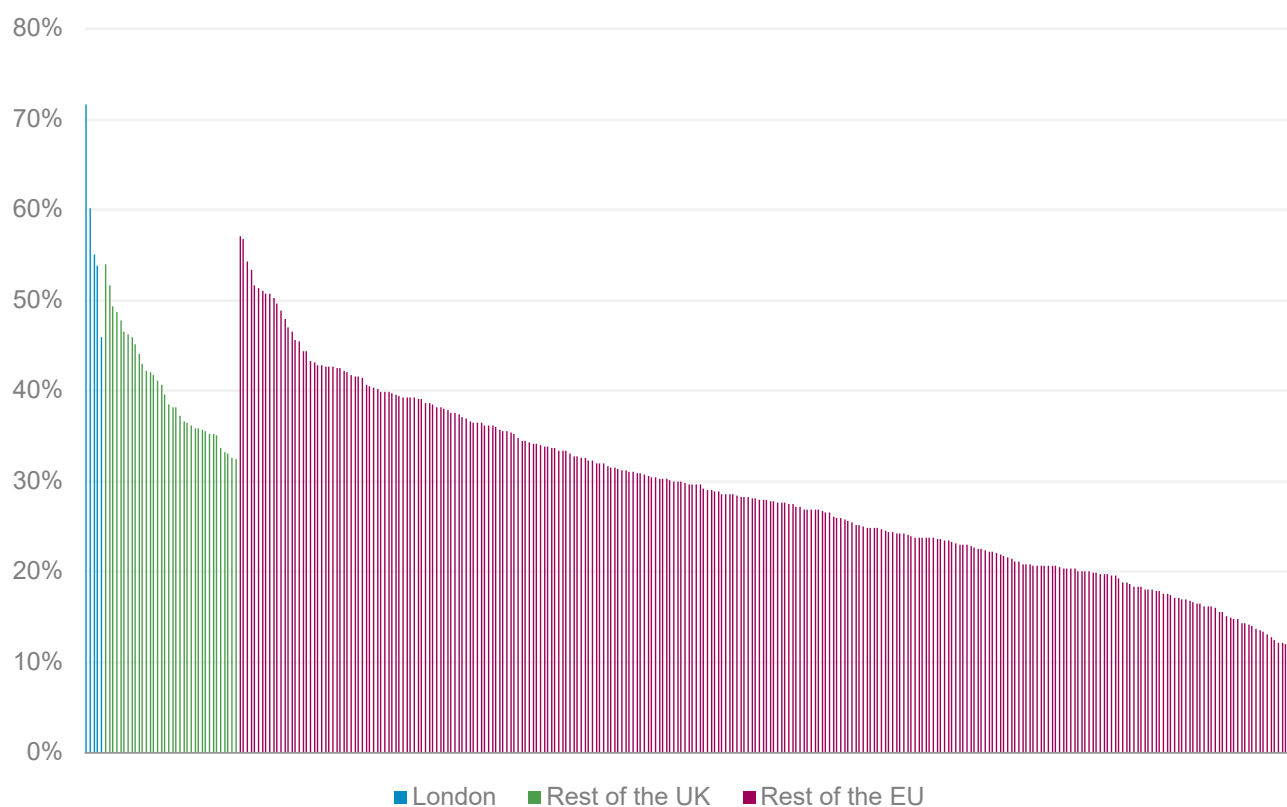
²³² BIS (2011), '[The returns to higher education qualifications](#)' and BIS (2011), '[Returns to intermediate and low level vocational qualifications](#)'.

These studies estimated that degrees increase earnings by a quarter (compared to A-levels) and vocational qualifications at NVQ Level 3 increase earnings by between 10-20% (compared to NVQ2 qualifications).

²³³ The education premium has remained 'roughly stable' in the last 15 years, apart from a 'spike' around the financial crisis. See: Postel-Vinay, F. & Sepahsalari, A. (2019), '[Labour Mobility and Earnings in the UK, 1992-2016](#)'; also: Blundell, R. et al (2017), '[The UK Wage Premium Puzzle: How did a Large Increase in University Graduates Leave the Education Premium Unchanged?](#)'; Overman, H, G. (2019), '[People, Places and Politics: Policy Challenges of the UK's Uneven Economic Geography](#)'.

²³⁴ GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²³⁵ There are 281 NUTS 2 regions in total. The figures for London's five NUTS 2 regions were: 'Inner London – West', 72%; 'Inner London East', 60%; 'Outer London – West and North West', 55%, 'Outer London – South', 54%; and 'Outer London – East and North East', 46%. These compare to the overall rate for the 28 EU countries of 32%, and the overall UK rate of 43%. Source: Eurostat (2019), '[Population aged 25-64 by educational attainment level and NUTS 2 regions](#)' [accessed 18/04/19].

Figure 4.1: Population aged 25-64 with tertiary qualification, NUTS 2 regions (%)

Source: Eurostat.

This is partly because the capital attracts highly-qualified people to live here, but also because more young people are progressing to higher education (HE).

- While London has traditionally attracted large numbers of graduates from other parts of the UK and beyond, there are signs that *internal* net graduate migration may have become more subdued recently: between 2013 and 2016 only 4,000 more graduates moved into London than left according to Resolution Foundation analysis²³⁶.
- This reflects the fact that, while many early-career graduates move to or remain in London for work (influenced by the availability of high-skilled jobs²³⁷), there are also large numbers of graduates who leave the capital to live in other regions. This includes moves to other parts of the wider south-east region.
- At the same time, over half (53%) of young Londoners now enter HE by age 19 – up from 37% in 2005/06²³⁸. This has coincided with a narrowing of the gap in progression rates between Free School Meal and non-Free School Meal pupils (down from 15 to 11 percentage points between 2005/06 and 2016/17)²³⁹.

²³⁶ Resolution Foundation (2017), '[Get A Move On? The decline in regional job-to-job moves and its impact on productivity and pay](#)'.

²³⁷ According to HESA data for 2015/16, 21% of all working graduates were employed in London six months after graduation. This figure was broadly in-line with London's share of UK jobs in 'higher level' occupations in 2016 (defined as the following major SOC groups: Managers, directors and senior officials, Professional occupations and Associate professional and technical occupations). For a discussion see: Centre for Cities (2016), '[The Great British Brain Drain Where graduates move and why](#)'.

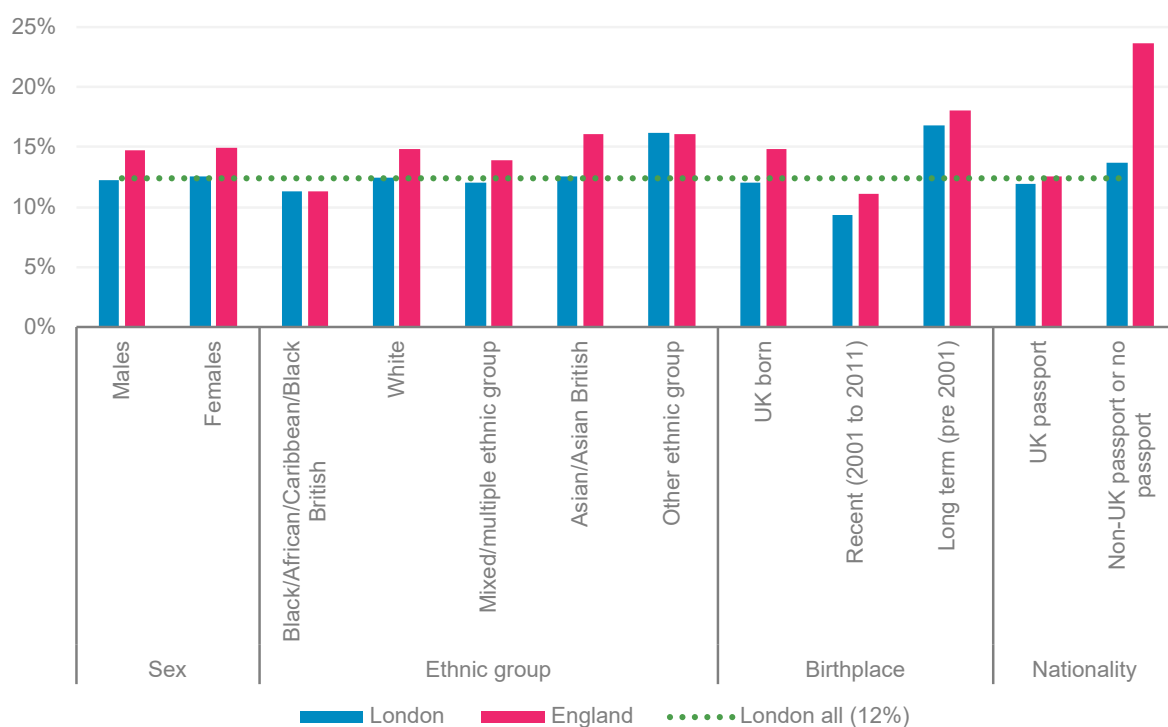
²³⁸ Department for Education (2018), '[Widening participation in higher education: 2018](#)'.

²³⁹ FSM Status relates to whether pupils were receiving Free School Meals at age 15 or not. The gap is the difference in HE progression by age 19 between FSM and all other pupils expressed in percentage points.

Despite strengths in higher level qualifications, there are still large parts of the capital's population with lower skills levels, with particular challenges in basic literacy and numeracy.

- Around one in eight (13%) London residents aged 25-64 had low or no qualifications in 2018²⁴⁰. Although this rate is some way below the UK average, it still amounts to 669,800 adults living in the capital – a higher *number* of 25-64 year olds with low or no qualifications than in any other local enterprise partnership area (see Appendix to Chapter 4 (Table A.2).
- There is also a relatively high proportion of adult Londoners with lower proficiency in 'basic skills' compared to adults in England as whole.
 - Basic skills proficiency makes a strong contribution to variation in earnings and other aspects of well-being²⁴¹.
 - Of nine English regions, London ranks only fifth for literacy and seventh for numeracy²⁴². This is only partly explained by the fact that London is home to many people who do not have English as a first language.
- As a result, large skills inequalities persist in the capital based on people's background. This is evident in the disparities in qualification attainment between different population groups (as well as labour market outcomes, see Section 4.2). For example, based on 2011 census data, the groups showing higher rates with no qualification include the 'other' ethnic group, longer-term migrants, and those without a UK passport (Figure 4.2)

Figure 4.2: Percentage of 16-64 year-olds with no qualifications in London (2011)



Source: ONS Census 2011. Note: disability is self-defined, and here means that day-to-day activities are limited. For disabled and non-disabled groups, the age range is 16+, unlike 16-64 for all other groups. For birthplace the 'recent' and 'long term' categories refer to the time period of arrival for individuals born outside of the UK.

²⁴⁰ No qualifications or NVQ1 only. Source: ONS Annual Population Survey.

²⁴¹ OECD (2016), 'Skills Matter: Further Results from the Survey of Adult Skills'. Note: according to OECD analysis the contribution of literacy and numeracy skills, relative to other components of human capital, is relatively high in England (United Kingdom).

²⁴² Department for Business Innovation and Skills (2013), 'Adult skills international survey 2012'. See also: Department for Business Innovation and Skills (2012), '2011 Skills for Life Survey'.

There is also considerable geographic variation in skills attainment within the capital, with stark inequalities appearing between different London Boroughs.

- Within London the share of adults with low qualifications varies widely: from very low (6% of 25-64-year olds in Richmond upon Thames) to very high (21% in Barking and Dagenham and 25% in Havering). In several boroughs in the east and north-east of London the share of the adult population with low formal qualifications is above the UK average of 18%²⁴³.
- Both unemployment levels and income follow similar spatial patterns, with areas of relative disadvantage found in boroughs such as Tower Hamlets, Newham, and Barking and Dagenham (and elsewhere). Other pockets of disadvantage sit alongside areas of relative advantage and are less visible at a borough level. Section 7 of this report takes a closer look at socio-economic differences within different parts of London.

4.2.2 Skills shortages

The overall supply of skills in London is high, but employer surveys still show unmet demand for skills, either in 'skills shortage vacancies' or 'skills gaps'.

- While demand for labour is increasingly met successfully, around 13% of employers still reported either a skills gap or skills shortage vacancy in 2017 (17% nationally). This means that, in absolute terms, more employers in London reported skills deficiencies than in most regions and more than in any other local enterprise partnership area²⁴⁴.
- This often reflects a lack of 'workplace skills' rather than mismatches in qualification levels²⁴⁵.
 - There are considerable variations between occupations, with London employers most likely to encounter skills shortage vacancies in 'Skilled trades' (e.g. chefs, electricians) and 'Caring & leisure' roles (Figure 4.3).
 - The most prevalent skills shortage reported by London employers is a lack of specialist skills or knowledge needed to perform the role (the cause of 69% of skill-shortage vacancies)²⁴⁶. There are also concerns about a lack of management and leadership skills²⁴⁷.
- Recruitment of EU nationals is a common way of trying to fill hard-to-fill vacancies among employers in London (with 50% of employers facing hard-to-fill vacancies relying on this recruitment route), suggesting that skills deficiencies in the capital would be compounded were Brexit to result in a reduction in labour supply (see Section 4.4 of this chapter).

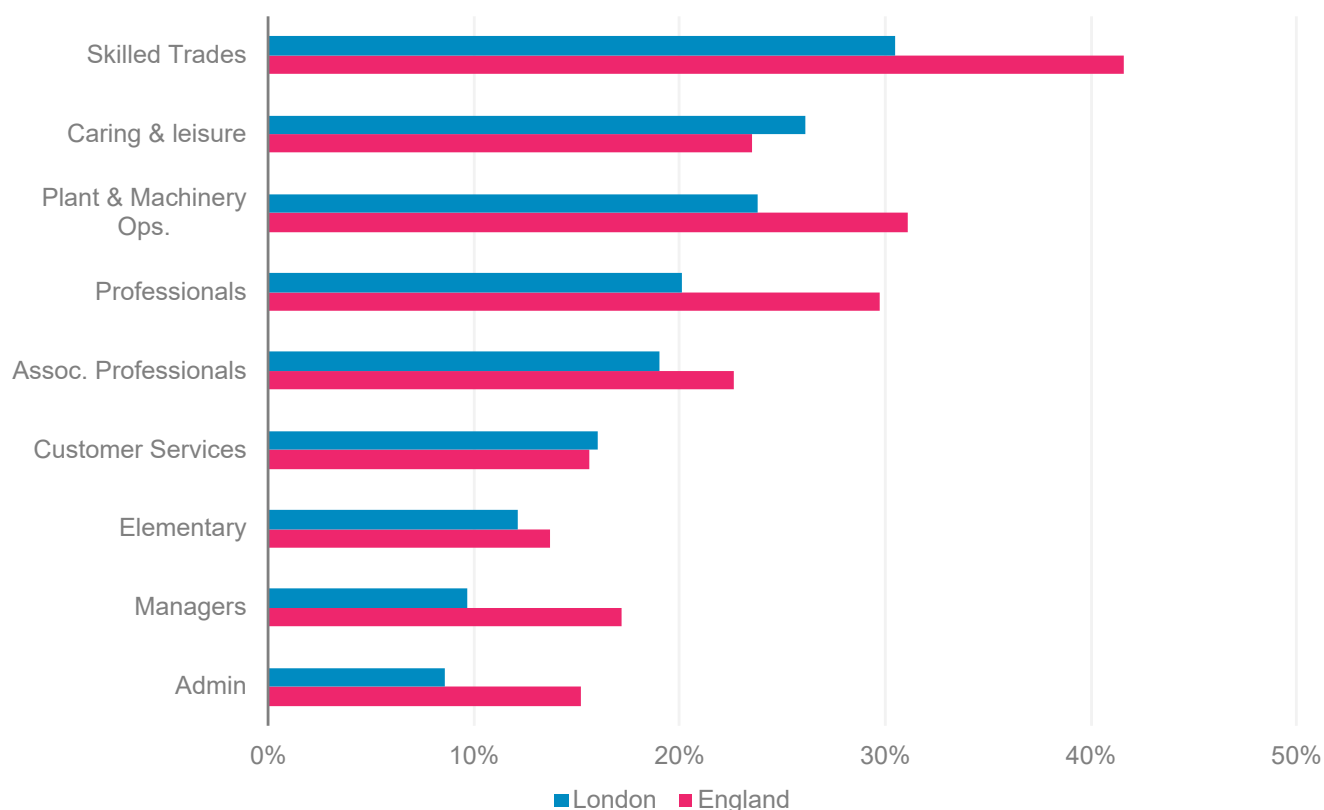
²⁴³ [Note: the interaction between person-level and geographic inequalities is not clear. Person-level inequalities are likely to manifest spatially as people 'sort' into different areas. See: GLA Economics \(2018\), 'Skills strategy for Londoners: Evidence base'.](#)

²⁴⁴ While London has previously been described as being in a 'high skills equilibrium' there are still 150,100 people working in London who are considered by their employers to be under-skilled for their job (3% of employment) and 29,200 vacancies proving hard to fill because of a lack of skills among applicants (16% of vacancies). Source: Department for Education (2018), '[Employer skills survey 2017: England LEP summary data tables](#)'.

²⁴⁵ [Industrial Strategy Council \(2019\) UK Skills Mismatch in 2030.](#)

²⁴⁶ Department for Education (2018), '[Employer Skills Survey 2017: England data tables](#)'.

²⁴⁷ Learning and Work Institute (2019), 'An overview of local labour market challenges'.

Figure 4.3: Density of Skills Shortage Vacancies by occupation, 2017

Source: Employer Skills Survey (ESS). Note: density refers here to skill-shortage vacancies as a proportion of all vacancies by occupation.

And while employers competing for workers can be a sign of a healthy economy, the evidence indicates that greater labour shortages are likely to have a negative impact on London's economic performance, including on employers' capacity to innovate.

- According to the 2017 Employer Skills Survey, 44% of London employers struggling to fill vacancies due to skills shortages reported a loss of business or orders to competitors²⁴⁸. More medium term impacts include delays to the development of new products or services (40%).
- The latest UK Innovation Survey found that 10% of enterprises engaged in innovation said that lack of qualified personnel was the most important barrier to innovation²⁴⁹.
 - Access to ICT-related skills has been highlighted as a key factor to enable the diffusion of digital technologies and maximise their productivity impact²⁵⁰.
 - As noted in Chapter 2, there is also a strong link between management practice scores and labour productivity.
- London's innovation performance is discussed further in Chapter 6.

²⁴⁸ Department for Education (2018), '[Employer Skills Survey 2017: England data tables](#)'.

²⁴⁹ Department for Business, Energy & Industrial Strategy (2018), '[UK innovation survey 2017: headline findings](#)'.

²⁵⁰ Sorbe, S., et al. (2019), '[Digital Dividend: Policies to Harness the Productivity Potential of Digital Technologies](#)'. OECD.

The performance of London's schools is strong²⁵¹; but London has a higher rate of teachers leaving the profession than in other areas and recruiting and retaining enough teachers to serve growing numbers of pupils is a major issue for the education system.

- Research by the National Audit Office shows that the proportion of both primary and secondary schools with at least one vacancy increased in London between 2010 and 2015 – outer London now faces the highest rates in the country on both measures²⁵².
- Skills shortages are likely to be a factor. Based on the Employer Skills Survey almost one in three hard-to-fill vacancies in the capital's education sector in 2017 was due to difficulties in finding applicants with appropriate skills, qualifications or experience²⁵³.
- A report by the National Foundation for Educational Research resolved that: 'London's teacher labour market faces a particularly acute challenge over the coming decade'²⁵⁴. Housing and childcare costs are among the main barriers to teacher retention, with 60% of young teachers expecting to leave London within five years due to high living costs²⁵⁵.

School leavers' transition from education into work is also a challenge. Though most London employers find school leavers to be reasonably well prepared for work, a significant minority do not.

- In 2016, 46% of London employers deemed their 16 year-old school leavers poorly prepared for work and 35% for 17-18 year olds – far higher proportions than for university or higher education leavers²⁵⁶. These findings are in-line with employers in other parts of the UK.
- There is also evidence that young people are not well informed when it comes to decisions about careers and future study²⁵⁷, which could affect people from disadvantaged backgrounds in particular²⁵⁸. Yet, even though the proportion of employers in London offering work placements is above average, the majority of employers (54%) do not.

Participation in classroom-based FE is falling, coinciding with reductions in adult skills funding, while the volume of apprenticeship starts is still lower than in other parts of the country.

- The amount of public funding allocated to adult further education and skills in England fell by 14% in real terms between 2010/11 and 2015/16. These reductions coincided with a 24% fall in participation in further education (FE) in London, with a particularly sharp decline in the number of 'adult' learners (age 19 and above) in classroom-based FE²⁵⁹. Beyond funding issues, there are also long-standing concerns about the quality of information available to potential FE learners²⁶⁰.
- Although apprenticeship numbers have increased since 2010/11, demand in London remains lower than in the rest of the country. For example:

²⁵¹ GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²⁵² National Audit Office (2017), '[Retaining and developing the teaching workforce](#)'.

²⁵³ Department for Education (2018), '[Employer Skills Survey 2017: England LEP summary data tables](#)'.

²⁵⁴ National Foundation for Educational Research (2018), '[Teacher Supply, Retention and Mobility in London](#)'.

²⁵⁵ National Union of Teachers (2016), '[London Young Teachers' Housing Survey 2016](#)'.

²⁵⁶ This was most commonly due to school leavers having a 'poor attitude' or a perceived lack of relevant experience. Source: Department for Education (2017), '[Employer perspectives survey 2016: England data tables](#)'.

²⁵⁷ A 2016 inquiry by a parliamentary subcommittee concluded that 'too many young people are leaving education without the tools to help them consider their future options or how their skills and experiences fit with opportunities in the job market... having a negative impact on the country's productivity'. Source: Sub-committee on Education, Skills and the Economy (2016), '[Careers advice, information and guidance inquiry](#)'.

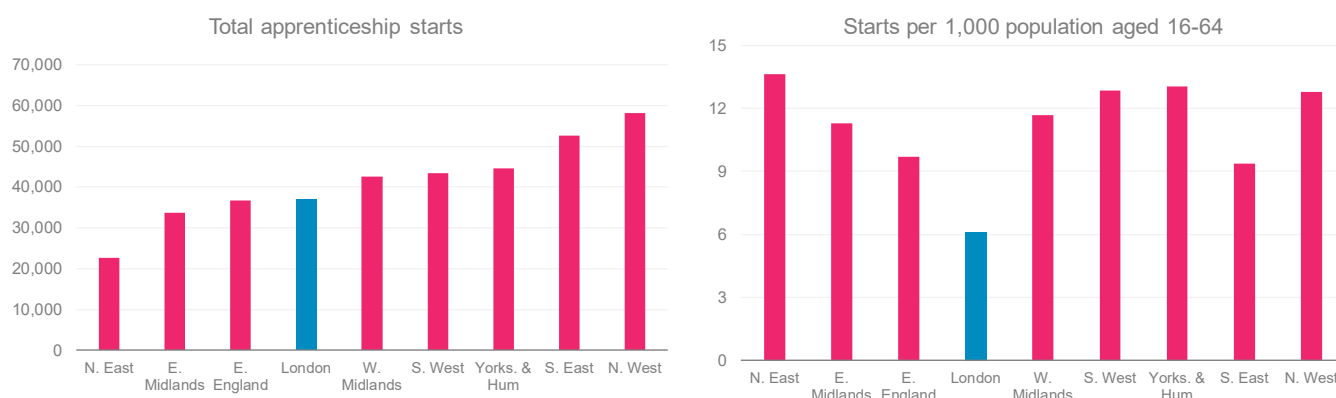
²⁵⁸ For more information, see: GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²⁵⁹ GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²⁶⁰ Department for Business, Innovation and Skills (2016), '[Understanding the further education market](#)'.

- The 37,000 starts in the capital in 2017/18 was below most English regions, particularly when normalised by population size (Figure 4.4).
- At the time of the 2016 Employer Perspectives Survey 86% of London employers did not offer apprenticeships, compared to 81% across England²⁶¹.
- This is partly explained by higher progression rates to HE, and partly because jobs in London are generally weighted towards 'low-apprenticeship employing' sectors.
- However, many employers also lack awareness and/or good knowledge about what's involved in an apprenticeship²⁶² and there is notable under-representation of certain population groups, especially when analysed by subject area. For example, among women in IT apprenticeships and among ethnic minorities in engineering²⁶³.

Figure 4.4: Apprenticeship starts by English Region, 2017/18



Source: Department for Education / ONS mid-year population estimates.

In addition to skills shortages, the proportion of staff identified as under-utilised by their employers is also relatively high in London. Policies are needed to support managers and employees (including migrant workers) to improve the usage of skills in the workplace²⁶⁴.

- Employers making better use of skills are likely to be more productive²⁶⁵. Yet 10% of people working in London were considered by their employers to be 'under-utilised' in 2017 – around three times the share with skills gaps. The proportion of staff identified as under-utilised has increased since 2015 (8%) and tends to rise for smaller employers²⁶⁶.
- While the adoption of 'High Performance Working' practices can help firms make better use of workforce skills, only 9% of organisations in London are currently regarded as high-performance employers, leaving scope to promote the take-up of these practices²⁶⁷. Chapter 3 also noted the link between management practices and productivity performance.

²⁶¹ Department for Education (2017), '[Employer perspectives survey 2016: England data tables](#)'.

²⁶² Only 28% of London employers said they were aware of and had good/very good knowledge of what's involved in an apprenticeship in 2016. Source: Department for Education (2017), '[Employer perspectives survey 2016: England data tables](#)'.

²⁶³ GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²⁶⁴ Felstead, A. et. al. (2018), '[Skills and Employment Survey 2017](#)'.

²⁶⁵ OECD (2017), '[Better Use of Skills in the Workplace: Why It Matters for Productivity and Local Jobs](#)'.

²⁶⁶ Under-utilised is defined as where an individual's skill is not fully deployed in the workplace. For more information see: GLA Economics (2018), '[Skills strategy for Londoners: Evidence base](#)'.

²⁶⁷ Defined as adopting at least 14 of the 21 High Performance Working practices covered in Employers Skills Survey. Source: Department for Education (2018), '[Employer Skills Survey 2017](#)'.

- Depending on how it is measured, London also features a higher proportion of ‘overeducated’ workers than in the rest of the UK²⁶⁸, and this generally carries a wage penalty. According to the OECD overqualified workers in England earn 15% less than workers with the same skills proficiency in a well-matched job²⁶⁹. This finding is supported by recent ONS analysis on the pay penalty faced by overeducated workers²⁷⁰.
- The higher rate of overqualification in London is largely down to the composition of the labour force – specifically the high proportion of migrant workers. Widening access to English language training and improved recognition of international qualifications could have particular economic benefits in the capital through better use of migrant skills²⁷¹.

4.2.3 Receipt of training at work

Training for staff is one means through which employers can help tackle skills shortages as well as to develop workforce skills and productivity²⁷².

- Addressing forthcoming skills challenges cannot be left to the education system alone. Analysis of GLA population projections shows that over two-thirds (71%) of London's working age population in 2030 will have left compulsory education by the year 2019²⁷³.
- Thus workforce training has an important role to play in improving productivity. According to Dearden et al. raising the share of workers in an industry who receive training by one percentage point increases value added per worker by 0.6% and average wages by 0.3%²⁷⁴. On-the-job training is also linked to better innovation performance²⁷⁵.
- In-line with the UK average, around two-thirds of employers in London (65%) provided some kind of training for their staff over the past 12 months in 2017, with either off the-job training or on-the-job training provided by around half of all employers in each case²⁷⁶.

However, there are signs that the level and quality of workplace training is not being maintained in London and the UK.

- UK employer investment in skills is low by international standards, and volumes appear to be declining compared to training levels in past years²⁷⁷. For example:
 - Fewer than 18% of working age Londoners were in receipt of job-related training in the last 13 weeks in 2018, down from 20% of Londoners in 2004²⁷⁸.
 - Focusing on training quantity (one proxy for quality), training hours per person trained fell by more than half (-62%) between 1997 and 2017 (Figure 4.5).

²⁶⁸ In London, 25% of those in employment aged 16-64 had more education than required for their job in 2017, compared to 16% in the UK as a whole. See: ONS (2019), '[Overeducation and hourly wages in the UK labour market; 2006 to 2017](#)'. That said, adopting another measure, the share of graduates working in non-graduate roles is below the UK average in the capital.

²⁶⁹ OECD (2016), '[Skills Matter: Further Results from the Survey of Adult Skills](#)'. Note: according to OECD analysis mismatch by field of study does not have such a strong impact on wages, the impact is more down to mismatch by qualification levels.

²⁷⁰ ONS (2019), '[Overeducation and hourly wages in the UK labour market; 2006 to 2017](#)'.

²⁷¹ IPPR (2019) [Measuring the benefits of integration: The value of tackling skills underutilisation](#).

²⁷² Department for Education (2018), 'Employer Skills Survey 2017'.

²⁷³ GLA (2017), [Central Trend population, 2017-based. Note: 'working age' is defined here as aged from 16-64](#).

²⁷⁴ Dearden, L., Reed, H., & Van Reenen, J. (2006), [The Impact of Training on Productivity and Wages: Evidence from British Panel Data](#).

²⁷⁵ Dostie, B. (2014), '[Innovation, Productivity, and Training](#)'. Note: UK employers also report of improvements in employee performance following (publicly funded) basic skills training. Source: BIS (2016), '[Impact of Poor Basic Literacy and Numeracy on Employers](#)'. BIS Research Paper No. 266.

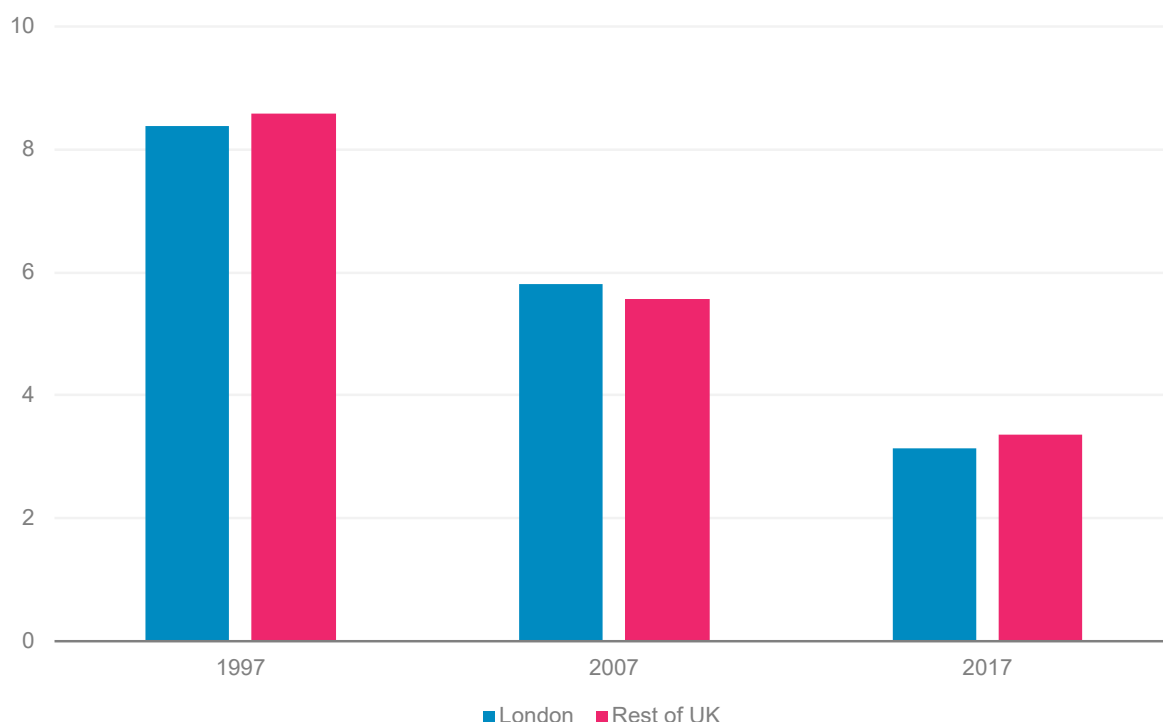
²⁷⁶ Department for Education (2018), 'Employer Skills Survey 2017'.

²⁷⁷ GLA Economics (2018), '[Skills Evidence Base](#)'.

²⁷⁸ ONS Annual Population Survey.

- Although headline trends track the UK average, the share of staff trained to nationally recognised qualifications is relatively low in the capital. Only 24% of employers offered training leading to recognised qualifications in 2017 – the lowest for any UK region²⁷⁹.
- Increasing skills demand has an important role in boosting investment in training, with many employers reporting that training is not needed or preferring to recruit to overcome skills challenges²⁸⁰. At the same time, almost half (44%) of London employers would like to deliver more training; lack of funds and staff time are among the main barriers reported.

Figure 4.5: Training hours per week per person trained, London and rest of UK, 1997 to 2017



Source: ONS Labour Force Survey.

As with the rest of the UK, there is also an inequality dimension to training in London: more qualified individuals are disproportionately likely to benefit, while cost and lack of time are also barriers for individuals taking on learning opportunities.

- Almost three in ten working age Londoners qualified at NVQ 4+ received training in the past 13 weeks in 2018, compared to less than a fifth of those qualified at NVQ3 or below (Figure 4.6). This inequality contributes to a widening existing skills gap²⁸¹, despite the evidence that those in mid-skilled roles receive a higher wage boost from training²⁸².
- A recent survey of Londoners found that cost (49% report this as one of their two top barriers) and lack of time (40%) are also the main barriers for individuals taking on learning opportunities²⁸³. Younger people, ethnic minorities and women are most likely to report a lack of resources to invest in their own human capital.

²⁷⁹ For example, only 21% of training establishments in London provided training to Level 3 or 4 in 2017 compared to 26% in England as a whole. Source: Department for Education (2018), '[Employer Skills Survey 2017](#)'.

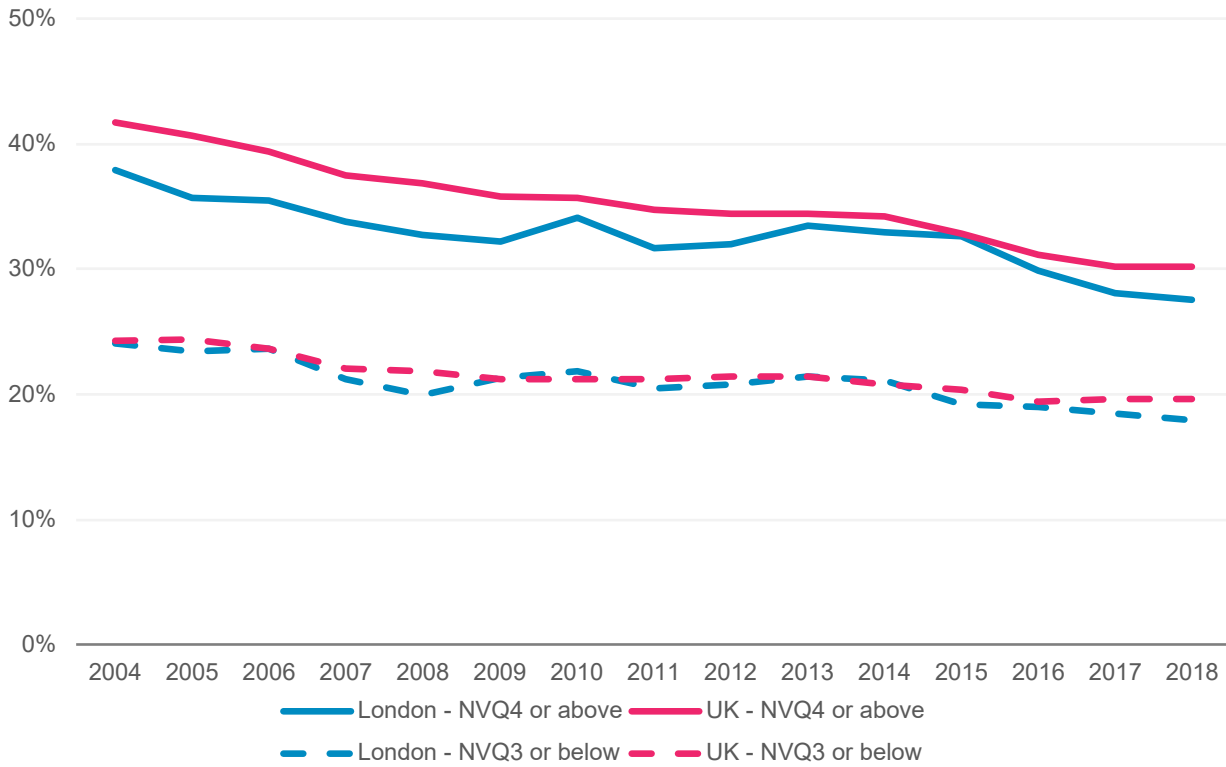
²⁸⁰ For a discussion at the London level, see: GLA Economics (2018), '[Skills Evidence Base](#)'; also see: Department for Education (2017) [Continuing vocational training survey: CVTS 5](#).

²⁸¹ Social Mobility Commission (2019), '[The adult skills gap: is falling investment in UK adults stalling social mobility?](#)'

²⁸² ONS (2019), '[Characteristics and benefits of training at work, UK: 2017](#)'.

²⁸³ GLA/You Gov poll, 18-21 Dec 2017, representative sample of 1,088 London adults, conducted as part of the Skills Strategy consultation.

Figure 4.6: Percentage of 16-64 year olds who received job-related training in the past 13 weeks by level of qualification attainment, London and UK, 2004-2018



Source: ONS Annual Population Survey.

4.3 Quantity and quality of work

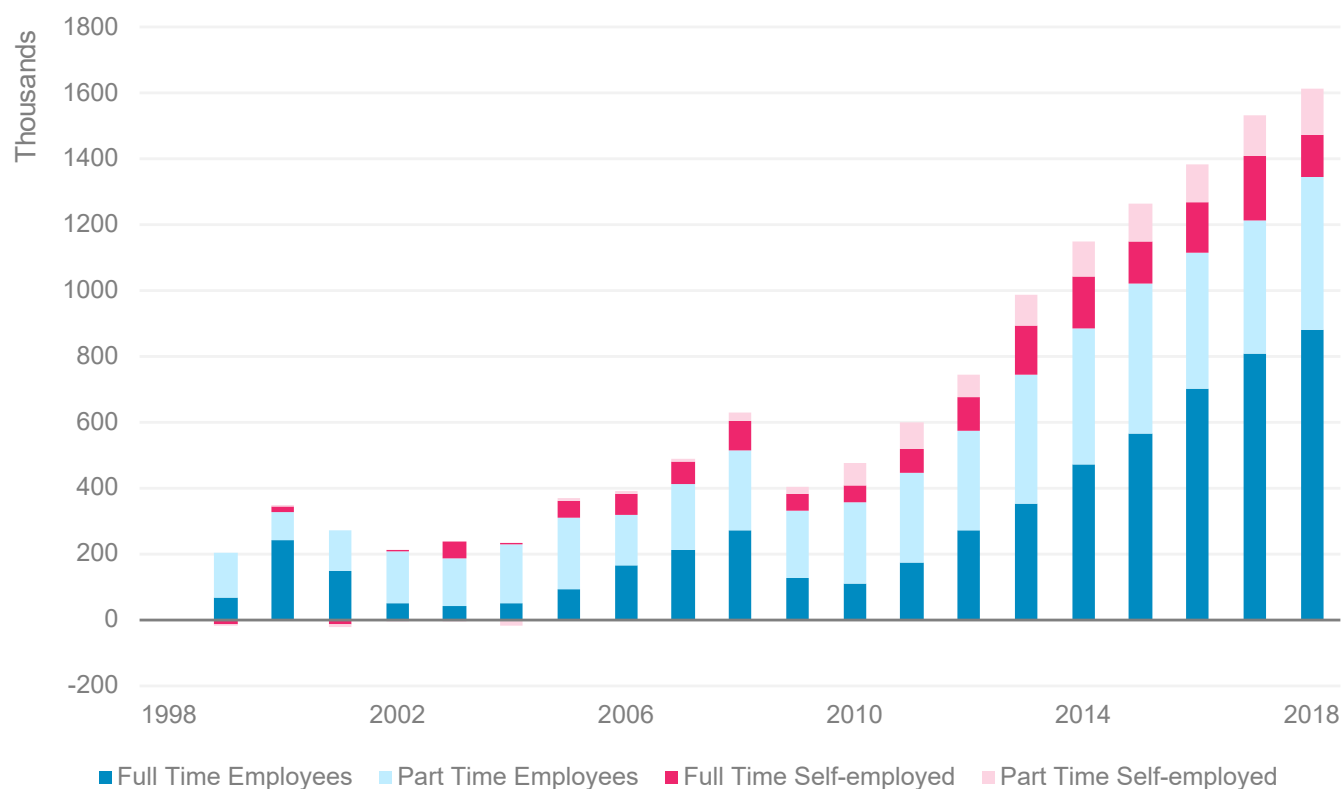
London has a dynamic economy and generally favourable business environment (Chapter 3). Unlike in the rest of the UK, total jobs growth accelerated in the capital over the last decade, with strong growth in self-employment and part-time work.

- As noted in Chapter 2, London has seen strong employment growth in the last decade. There were over 5.9 million workforce jobs in London in 2018 – 970,000 more than in 2008, compared to jobs growth of around 650,000 in the preceding decade (1998–2008). Since 2008 over a third of UK (net) jobs growth has been in the capital, while the rate of employee jobs growth from 2015 to 2018 was the eighth highest among 38 LEP areas (see Appendix to Chapter 4 (Table A.3))²⁸⁴.
- Most of the growth in jobs since the financial crisis has come from permanent employee jobs, especially in more recent years (Figure 4.7). At the same time, self-employment has contributed a disproportionate share of the net change in jobs since 2008 – accounting for 16% of the increase, despite making-up just 12% of jobs overall²⁸⁵. As in the rest of the UK, self-employed Londoners typically have lower earnings than employees²⁸⁶.
- Part-time work has also increased considerably, accounting for half of the net change in self-employed jobs and almost a third of employee jobs growth since 2008. Altogether 28% of jobs in London are now part-time compared to 32% for the UK as a whole.

²⁸⁴ According to the ONS Business Register and Employment Survey the number of employee jobs in the capital increased by 239,000 or 4.9% between 2015 and 2018. This is the highest absolute growth in employee jobs of any LEP area during this time – although, in relative terms, Greater Manchester (9%) and Hertfordshire (11%) recorded a faster rate of growth.

²⁸⁵ Some rising self-employment could be linked to an increase in skilled freelancers and is often associated with higher levels of job satisfaction. See, for example: IPSE (2018), '[Exploring the rise of self-employment in the modern economy](#)'; CIPD (2018), '[More Selfies? A picture of self-employment in the UK?](#)'

²⁸⁶ That said, self-employed earnings are higher in London than in other UK regions and have increased over time. Source: ONS (2018), '[Trends in self-employment in the UK](#)'.

Figure 4.7: Cumulative jobs growth in London since 1998 by employment status (000s)

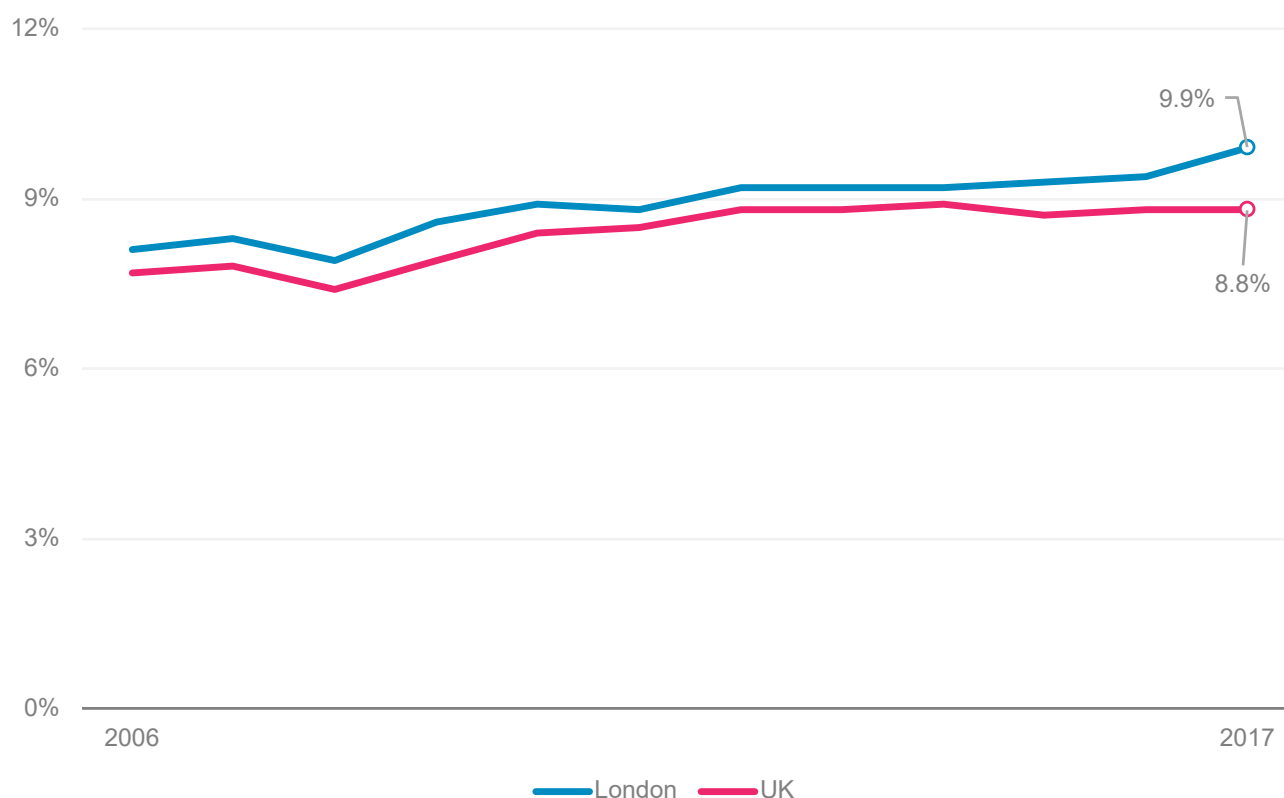
Source: ONS Annual Population Survey.

Alongside significant growth in permanent employment, there are signs of increasing insecurity in the capital's jobs market.

- A growing share of employment in the capital can be characterised as insecure:
 - As Figure 4.8 shows, around 10% of people working in London were employed in a job with a temporary contract, working through an employment agency or self-employed in 'insecure' occupations in 2017, up from 8% in 2006²⁸⁷.
 - In addition, there are signs of an increase in employees on 'zerohours' contracts (2.6% of employment); while as noted above the number of part-time jobs also rose faster than full-time jobs in the last decade (28% vs.18%).
 - Recent research for the Department for Business, Energy and Industrial Strategy found that a quarter of adults involved in the 'gig economy' lived in the capital in 2017²⁸⁸.

²⁸⁷ Such as caring, leisure or other service occupations, process plant and machine operatives or in elementary occupations.

²⁸⁸ Department for Business, Energy & Industrial Strategy (2018), ['The Characteristics of those in the Gig Economy'](#).

Figure 4.8: Percentage of workers in insecure employment, London and UK

Source: ONS Annual Population Survey.

To some extent these trends could reflect a welcome move to more flexible working. However, a significant minority of London's part-time and temporary workers would rather have full-time or permanent employment if given a choice.

- In theory part-time and temporary work can increase firms' productivity by allowing employers to adapt to variations in demand; it can also provide a means to enter or re-enter the labour market for workers who might otherwise drop-out of the labour force²⁸⁹.
- Yet a significant minority of London's part-time (15%) and temporary (26%) workers are simply unable to find full-time or permanent employment respectively²⁹⁰. There also are concerns about the impacts of insecure work on well-being and productivity:
 - In the UK research indicates that poor quality work can be just as detrimental to an individual's health and well-being as not being in work at all²⁹¹.
 - The presence of temporary agency workers has also been linked to lower job satisfaction and higher job anxiety among employees; it could limit the build-up of firm-specific skills, which in turn can reduce worker productivity²⁹².
 - At a sector level, there is some evidence of a negative relationship between productivity growth and changes in the incidence of insecure employment, albeit the causal link remains undetermined²⁹³.

²⁸⁹ Garnero, A. (2016), '[Are part-time workers less productive and underpaid?](#)'

²⁹⁰ ONS Annual Population Survey 2018.

²⁹¹ Chandola, T. and Zhang, N. (2017), '[Re-employment, job quality, health and allostatic load biomarkers: prospective evidence from the UK Household Longitudinal Study](#)'; see also Green, F. (2015), '[Health effects of job insecurity](#)'.

²⁹² Bryson, A. (2013), '[Do temporary agency workers affect workplace performance?](#)' Journal of Productivity Analysis.

²⁹³ Learning and Work Institute (2017), '[What is driving insecure work? A sector perspective](#)'.

Moreover, the flipside of rapid employment growth in the capital is a particularly acute post-crisis pay squeeze, even more pronounced than at the national level.

- In real-terms full-time gross weekly earnings for employees in London were still 4.5% below 2008 levels in 2019, compared to 2.9% below for the UK as a whole (Figure 4.9). This pay squeeze has been especially marked for those entering work for the first time²⁹⁴.
- Over a longer time, the proportion of Londoners in working households living in relative poverty increased from 12% to 15% between 1994 and 2017 (after housing costs). Although in-work poverty rose in every region in this period, the largest increase was in London, with rising housing costs for lower income households playing a leading role²⁹⁵.
- Beyond housing costs, a range of other factors play an important role in shaping experiences of in-work poverty. Employers' decisions have an important impact on financial well-being among their employees; paying wages above living wage rates and providing security in working hours are among the most important contributions they can make²⁹⁶.
- While median wage levels in the capital tend to be higher than in the rest of the UK across occupations, wages for lower earners (employee jobs in the bottom decile of earnings) are similar once regional price differentials are taken into account²⁹⁷. Low income is the main barrier that prevents Londoners in lower social grades 'living the life they want to'²⁹⁸.
- Reflecting the recent slowdown in earnings growth, one in five employee jobs in the capital now pays below the London Living Wage, up from 12% in 2006 (Figure 4.10)²⁹⁹. Some groups are at greater risk of low pay than others. The incidence of low pay is particularly high for employees working in hospitality (63%) and retail (51%) – sectors where the workforce is comparatively young, female and non-UK born.

²⁹⁴ According to Resolution Foundation analysis London's pay squeeze has been especially pronounced for those entering employment for the first time, i.e. from unemployment or after leaving education. This has reduced average pay levels in the capital, although the typical pay rise earned by those staying in work remains relatively high. This is partly due to compositional changes in the workforce. Source: Resolution Foundation (2018), '[London Stalling: Half a century of living standards in London](#)'.

²⁹⁵ Institute for Fiscal Studies (2019), '[Why has in-work poverty risen in Britain?](#)'

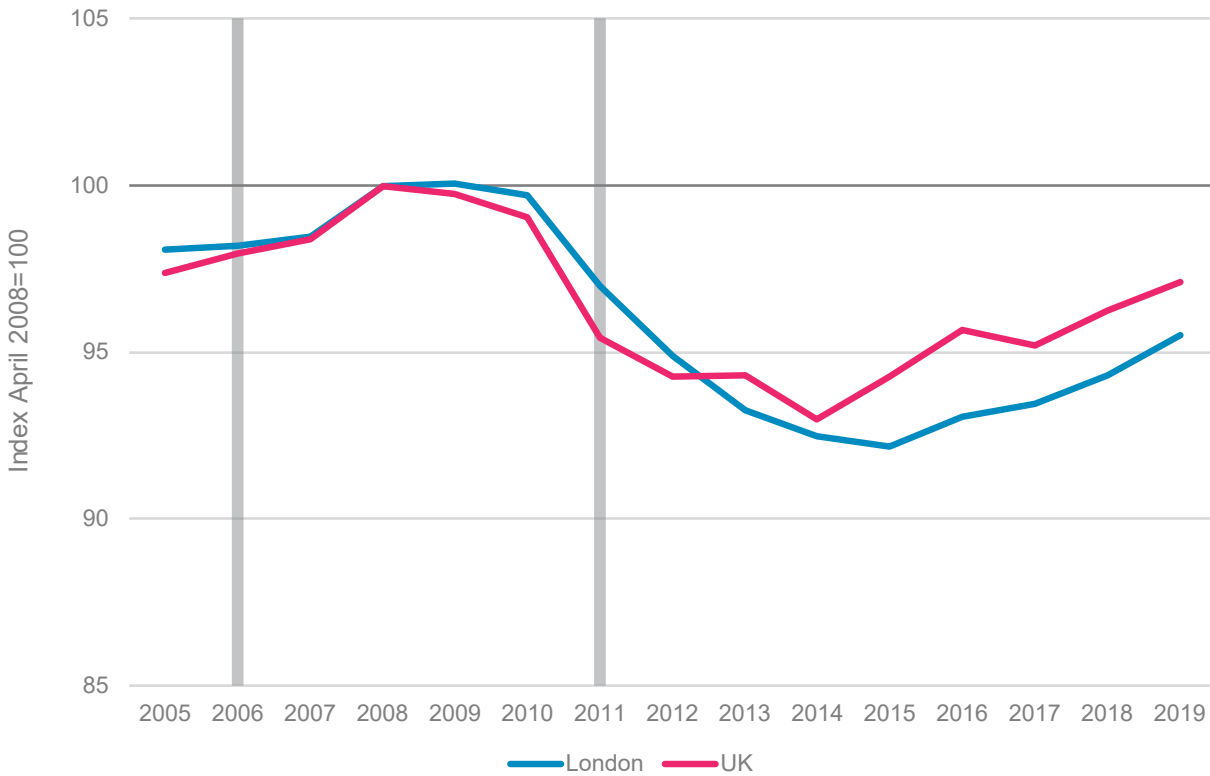
²⁹⁶ Findlay, P. et al. (2019), '[Influencing employers so more people break free from poverty through work](#)'. Joseph Rowntree Foundation.

²⁹⁷ Annual Survey of Hours and Earnings (2018 provisional, gross hourly pay); Relative regional consumer price levels of goods and services, UK: 2016, ONS.

²⁹⁸ Based on a representative survey of 1,272 adult Londoners carried out by YouGov in May 2019. 'Lower social grades' refers here to the C2DE group. Detailed results can be found here: <https://data.london.gov.uk/gla-poll-results/2019-2/>.

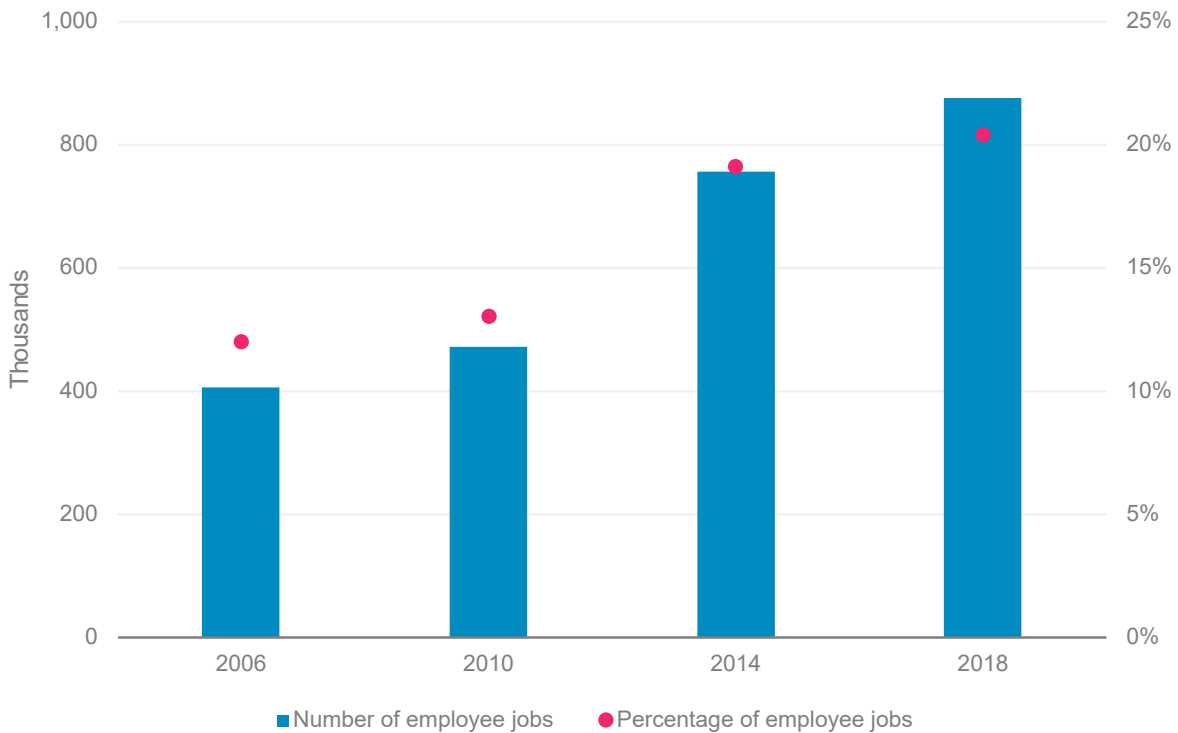
²⁹⁹ The London Living Wage is calculated independently and also accounts for changes in living costs.

Figure 4.9: Index of real (CPIH-adjusted) median full-time gross weekly earnings, London and UK, April 2005 to 2019 (April 2008 = 100)



Source: ONS Annual Survey of Hours and Earnings. Note: caution should be taken when comparing across time series as there are discontinuities in the 2006 and 2011 ASHE estimates.

Figure 4.10: Employee jobs in London paid less than the London Living Wage, 2006–2018 (aged 18+)



Source: ONS Annual Survey of Hours and Earnings.

Firms' demand for labour combined with slow wage growth and changes to welfare policy have been pull and push factors for attracting workers from disadvantaged groups into the London labour market.

- There is some evidence that people are working more to compensate for a loss of earning power (Figure 4.9) and a fall in other sources of income³⁰⁰. It is notable that the (anticipated) loss of income for working age Londoners due to cuts to welfare spending since 2010 is above the national average, especially in poorer London boroughs³⁰¹.
- According to the Resolution Foundation employment rates for many 'low activity-groups' – including single parents, ethnic minorities, and people with disabilities – increased relatively quickly in London between 2011 and 2017³⁰². However, this research also found a disproportionate rise in 'involuntary' part-time and temporary work in the capital, calling for more attention to be given to the security and standard of work³⁰³.

Yet headline labour outcomes for Londoners still trail the UK average and conceal significant inequalities, including by parental status.

- Headline labour market outcomes for Londoners still trail the UK average³⁰⁴. This is partly down to the large gap in participation rates for those with and without dependent children. Londoners with no children have employment rates above the UK average, while employment rates among parents remain far below the average (Figure 4.11).
 - Accessibility and affordability of childcare, as well as the availability of local employment opportunities, are potential barriers to (re)entering employment and progressing in-work for those with caring responsibilities (often mothers)³⁰⁵.
 - However, their labour market participation is also shaped by the ability to find work that fits around childcare or school. Policies are therefore needed to encourage employers to offer employment with 'family-friendly' hours³⁰⁶.
 - Flexible working is one way to help achieve this (and to raise productivity)³⁰⁷. But just one in six workers in London reports some form of flexible working arrangement – slightly below the UK rate and with little change over recent years³⁰⁸.

³⁰⁰ Resolution Foundation (2019), '[Setting the record straight: How record employment has changed the UK](#)'.

³⁰¹ Although the overall (net) impact of welfare reform on employment is likely to be mixed with offsetting consequences. Source: Beatty, C. and Fothergill, S. (2016), '[The uneven impact of welfare reform: the financial losses to places and people](#)'.

³⁰² Resolution Foundation (2018), '[London Stalling: Half a century of living standards in London](#)'.

³⁰³ Resolution Foundation (2018), '[London Stalling: Half a century of living standards in London](#)'.

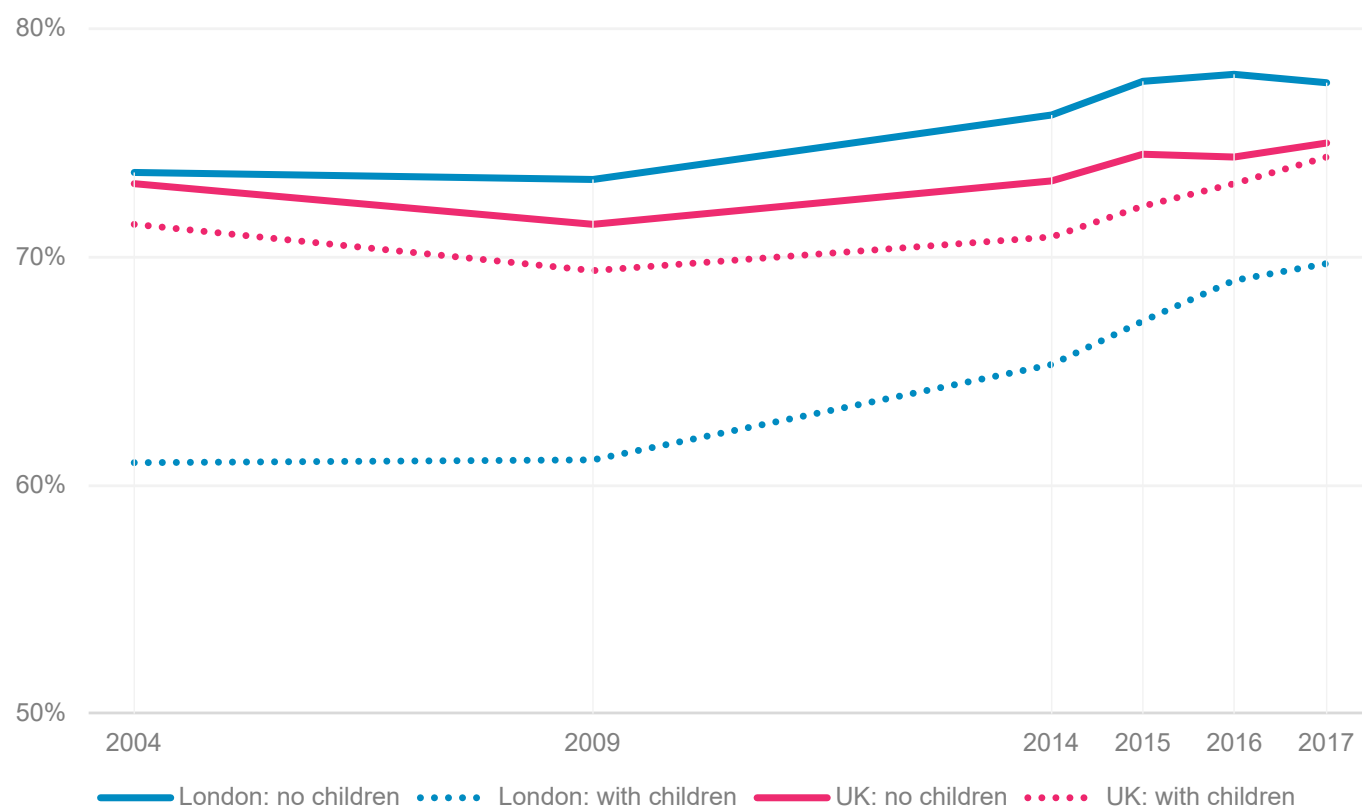
³⁰⁴ In terms of employment (1.2 percentage points below the UK average), unemployment (0.5 pps above the UK average) and economic activity (1.0 pps above the UK average). See: GLA Economics (2019), '[Labour market update for London – June 2019](#)'.

³⁰⁵ Note: there is insufficient childcare across a range of parental requirements of types of childcare, both in London and nationally. Source: GLA Economics (2018), '[Demand for childcare in London – drivers and projections](#)'.

³⁰⁶ Department for Work and Pensions (2011), '[Families and work: Revisiting barriers to employment](#)'.

³⁰⁷ There is evidence that flexible working can improve employee well-being, as well as personal and team productivity. While reduced hours flexible work arrangements have also been linked to reduced levels of chronic stress among women who combine work and family roles. See, for example: OECD (2016), '[Be Flexible! Background brief on how workplace flexibility can help European employees to balance work and family](#)'; Chandola, T. et al (2019), '[Are Flexible Work Arrangements Associated with Lower Levels of Chronic Stress-Related Biomarkers? A Study of 6025 Employees in the UK Household Longitudinal Study](#)'.

³⁰⁸ GLA Intelligence (2018), '[Economic Fairness Indicators](#)'. See, also: Timewise (2018), '[Flexible Jobs Index 2018](#)'.

Figure 4.11: Employment rates by parental status, London and the UK, 2004-2017

Source: Office for National Statistics.

More broadly, significant inequalities in labour market participation persist across a range of other characteristics.

- Compared to the London average, employment rates are relatively low among women (68%) and people with lower qualifications, particularly for those without formal qualifications (46%). People from 'black', 'other', 'mixed' and 'Pakistani / Bangladeshi' ethnic groups also have below average employment rates, as do disabled Londoners (52%) (Figure 4.12).
- Moreover, while the rate of long-term unemployment in London has fallen considerably in recent years, it remains higher than in the rest of the country. There is evidence that long-term unemployment increases the risk of poor health, contributing to wider inequalities³⁰⁹.
 - 147,000 or 2.4% of working age residents had been unemployed for one year or more in 2018, compared to 2.1% of 16-64 year olds nationally³¹⁰. London accounts for almost one fifth (18%) of long-term unemployed people in Great Britain on this measure.
 - There is also considerable variation in the proportion of long-term Jobseekers Allowance claimants at a sub-regional level – from 0.9% of working-age residents in Hackney, to 0.1% in Sutton and Hounslow³¹¹. See Chapter 7 for more on sub-regional disparities.

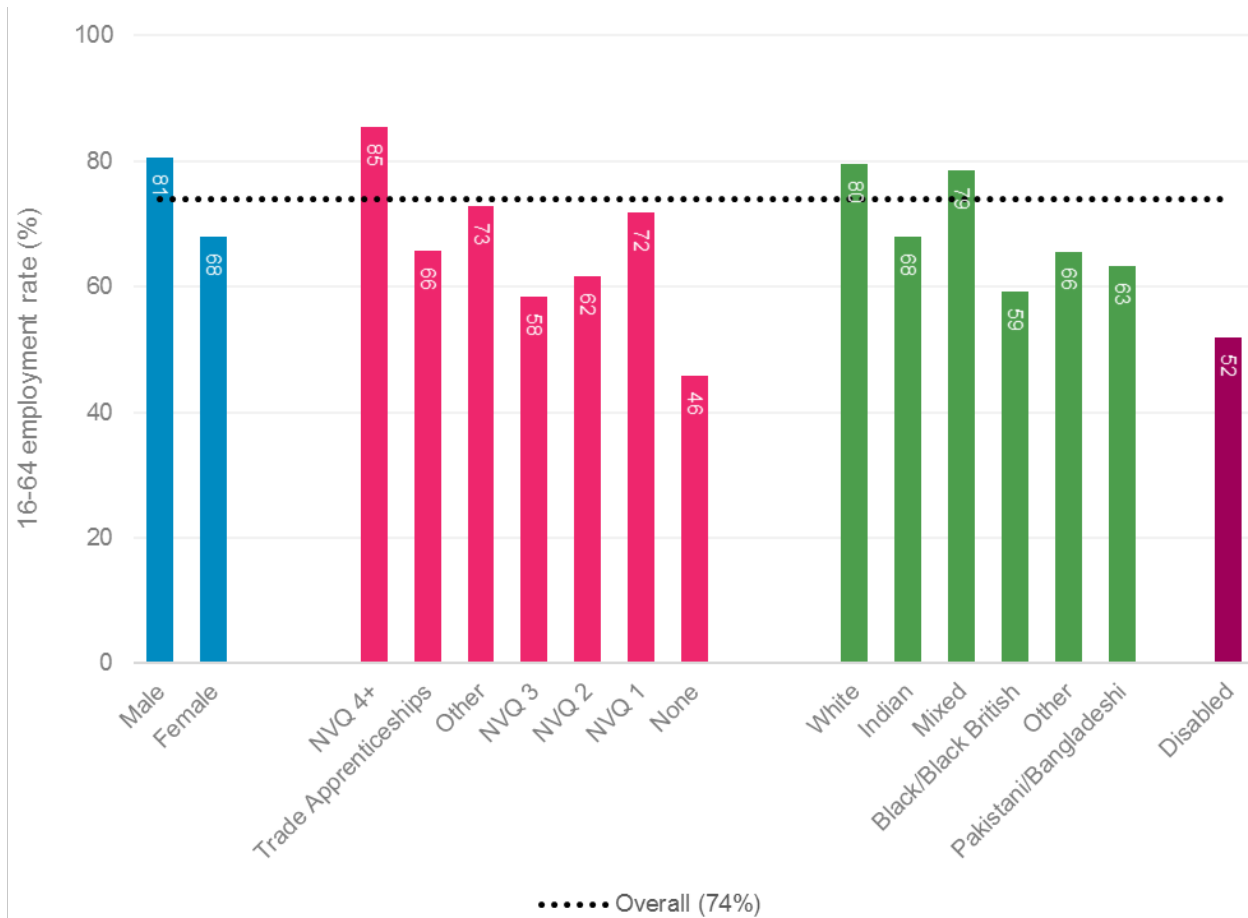
³⁰⁹ Public Health England (2014), 'Local action on health inequalities: Increasing employment opportunities and improving workplace health'.

³¹⁰ ONS Annual Population Survey, January to December 2018. Data available at: <https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/adhocs/10820numberofresidentsaged16to64yearsingreatbritainregionsbyunemploymentandreasonofinactivityandbyduration2018>.

³¹¹ ONS Nomis (2019), Jobseeker's Allowance by age and duration [accessed 25/06/2019]. Note: the replacement of income-based JSA with Universal Credit can affect local areas differently, so comparisons should be treated with caution.

- Excluding students, there are another 779,000 working-age Londoners who have been economically inactive for one year or more in 2018 (Figure 4.13) – 13.0% of 16-64 year olds in the capital, in-line with the national average (13.5%).
 - The main reasons for being long-term economically inactive are looking after family (345,000) or being sick, injured or disabled (243,000)³¹².
 - At the same time, more than a fifth of all economically inactive residents aged 16-64 say they would like a job but have been unable to participate in the labour market³¹³.
 - Among men, those from black ethnic groups are more likely to be economically inactive, while more than half of Pakistani or Bangladeshi women are economically inactive.

Figure 4.12: 16-64 employment rate (%) for select groups in London, 2018

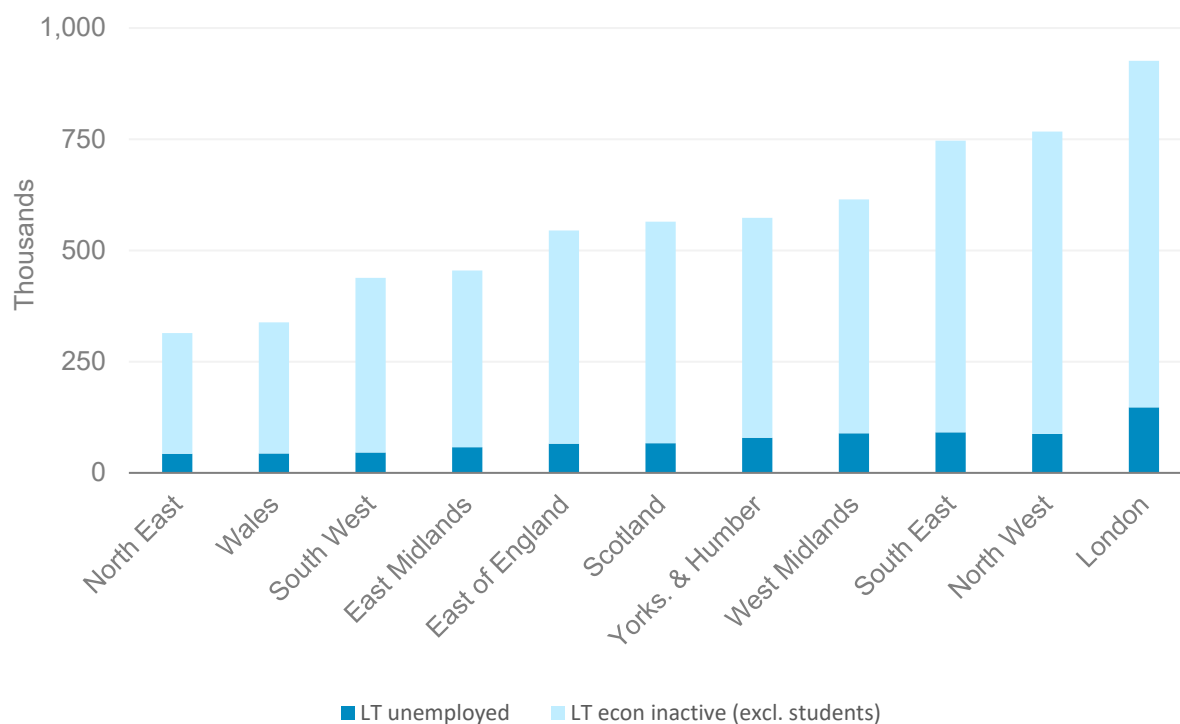


Source: ONS Annual Population Survey.

³¹² ONS Annual Population Survey, January to December 2018. Note: Excludes students and those waiting for results of job application; includes either temporarily or long-term sick, injured or disabled.

³¹³ 20.7% of all economically inactive residents (for any length of time) aged 16-64 in London in the 12 months to June 2019, in-line with the UK average. Source: ONS (2019), 'Annual Population Survey'.

Figure 4.13: 16-64 unemployed and economically inactive (excl. students) for one year or more, by region/country, 2018



Source: ONS Annual Population Survey. Note: Excludes students and those waiting for results of job application.

Despite some progress there are also considerable disparities in terms of pay and progression in the London labour market.

- The incidence of low pay in London is more prevalent among women than men, among employees from an ethnic minority than from a white background (especially from Bangladeshi or Pakistani origin), and among disabled over non-disabled employees³¹⁴.
- As a result, pay gaps continue to exist between residents from different backgrounds in the capital. For example, the gap in average pay between black and white groups is particularly pronounced and on average female employees are paid less than men (there is an 18% difference in median hourly pay, rising to 22% for mean pay)³¹⁵. According to the ONS London's gender pay gap is, moreover, narrowing far more slowly than in other regions³¹⁶.
- Analysis of longitudinal data suggests that almost one in three low-paid employees working in London in 2012 were still in low pay four years later³¹⁷. While this is a lower share than for other areas, recent Social Mobility Commission research found that the proportion of people in London moving out of low pay and earning higher wages for a *sustained* period is below the British average³¹⁸. Whereas London's share of 'cyclers' – those moving out of low pay, but not consistently escaping – was nearly 8 percentage points above the average.

³¹⁴ The low pay rate for Bangladeshi and Pakistani employees is more than double the rate for white British employees. Source: London's Poverty Profile (2017), '[London's Poverty Profile 2017](#)'.

³¹⁵ GLA Intelligence (2019), '[Economic Fairness Indicators](#)'. Note: to some extent headline differences in pay can be explained by factors such as the proportion of these groups working part-time or in different occupations. For example, a higher proportion of women work in occupations such as caring roles, which tend to offer lower salaries.

³¹⁶ ONS (2018), '[Gender pay gap in the UK: 2018](#)'.

³¹⁷ Resolution Foundation (2019), '[Low pay in Greater Manchester](#)'.

³¹⁸ Social Mobility Commission (2017), '[The Great Escape? Low pay and progression in the UK's labour market](#)'.

- Some groups are also more likely to progress out of low-pay than others. Looking at UK data for the period between the years ending 2012 and 2016, regression analysis carried out by the ONS shows that, holding other factors constant:
 - an increase in age decreases the likelihood of escaping relative low pay;
 - women were less likely to escape relative low pay compared to men;
 - increased household earnings are linked to better odds of pay progression; and,
 - those of white ethnicity were more likely to move out of low pay than people of mixed, Asian or other ethnicities – although those of black ethnicity showed the highest odds of moving consistently out of low pay for the period analysed³¹⁹.

In addition to the skills and insecurity issues discussed above, many Londoners face multiple barriers to securing good employment outcomes, particularly among those in the lowest income groups.

- Difficulties with access to appropriate transport (including the time required to travel), employment flexibility and scheduling of work (particularly where there are health or caring issues), and lack of job security can all form barriers. As the OECD notes these kinds of inequalities can lock individuals (and firms) in low-productivity traps³²⁰.
- London is also an expensive city, with high land values driving up the costs of housing and a range of other essential services. Related financial issues and problems with debt can make obtaining or keeping employment a greater challenge³²¹. For example:
 - formal childcare is typically around 30% more costly than for Great Britain as a whole;
 - one in ten households in London are estimated to be in fuel poverty³²²; and
 - one in 14 family units is in arrears on at least one of their household bills³²³.
- In addition, low-pay combined with the high cost of living is also making it difficult for a large number of Londoners to maintain acceptable living standards. The recent Survey of Londoners paints a picture of widespread low food security, with 1.5 million adults and 400,000 children in London having low or very low food security³²⁴. Notably, 6 out of 10 adults suffering from food insecurity are in full-time or part-time work³²⁵.

³¹⁹ ONS (2018), [‘Young people’s earnings progression and geographic mobility, England and Wales: tax year ending 2012 to tax year ending 2016’](#). Note: relative ‘low annual pay’ is here defined as those with annual earnings of less than two-thirds of the aged 16 to 64 years employed populations’ median earnings for each tax year.

³²⁰ OECD (2016), [The productivity and equality nexus](#).

³²¹ National Audit Office (2018), [‘Tackling problem debt’](#); Learning and Work Institute (2019) [‘Working Capital: Third Evaluation Report’](#)

³²² The government’s Low Income High Costs measure defines a household as living in fuel poverty if they have required fuel costs above the national average and would be below the official poverty line if they were to spend that amount.

³²³ GLA Intelligence (2018), [‘Economic Fairness Indicators’](#).

³²⁴ Having food security means having access at all times to enough food for an active, healthy life. Being ‘food insecure’ means that at times a person’s food intake is reduced and their eating patterns are disrupted because of a lack of money and other resources for obtaining food. For more detail, see: GLA (2019), [‘Survey of Londoners Headline findings’](#).

³²⁵ GLA (2019), [‘Survey of Londoners Headline findings’](#).

Poor health is also a major barrier to entering work and sustaining labour market participation.

- Despite improvements, there are almost 290,000 Employment and Support Allowance claimants in the capital – the second highest among regions in Great Britain, and equal to 4.8% of the capital's working age population³²⁶.
- Of this group, more than half (51%) have a mental health issue as their primary condition³²⁷. A range of health conditions and other issues can also interact to form complex barriers to employment³²⁸.
- Schemes such as the devolved Work and Health Programme aim to provide personalised support to help people with disabilities and/or health conditions return to work. Emphasis should also be given to support for existing employees who develop a health condition or disability to stay in work³²⁹.

³²⁶ As noted earlier, there are 243,000 working age Londoners who have been economically inactive for one year or longer due to being (temporary or long-term) sick, injured or disabled – a higher number than in any other Great Britain region.

³²⁷ ONS Nomis [accessed 27/06/2019]

³²⁸ See, for example: [Learning and Work Institute \(2019\) Working Capital: Third Evaluation Report](#).

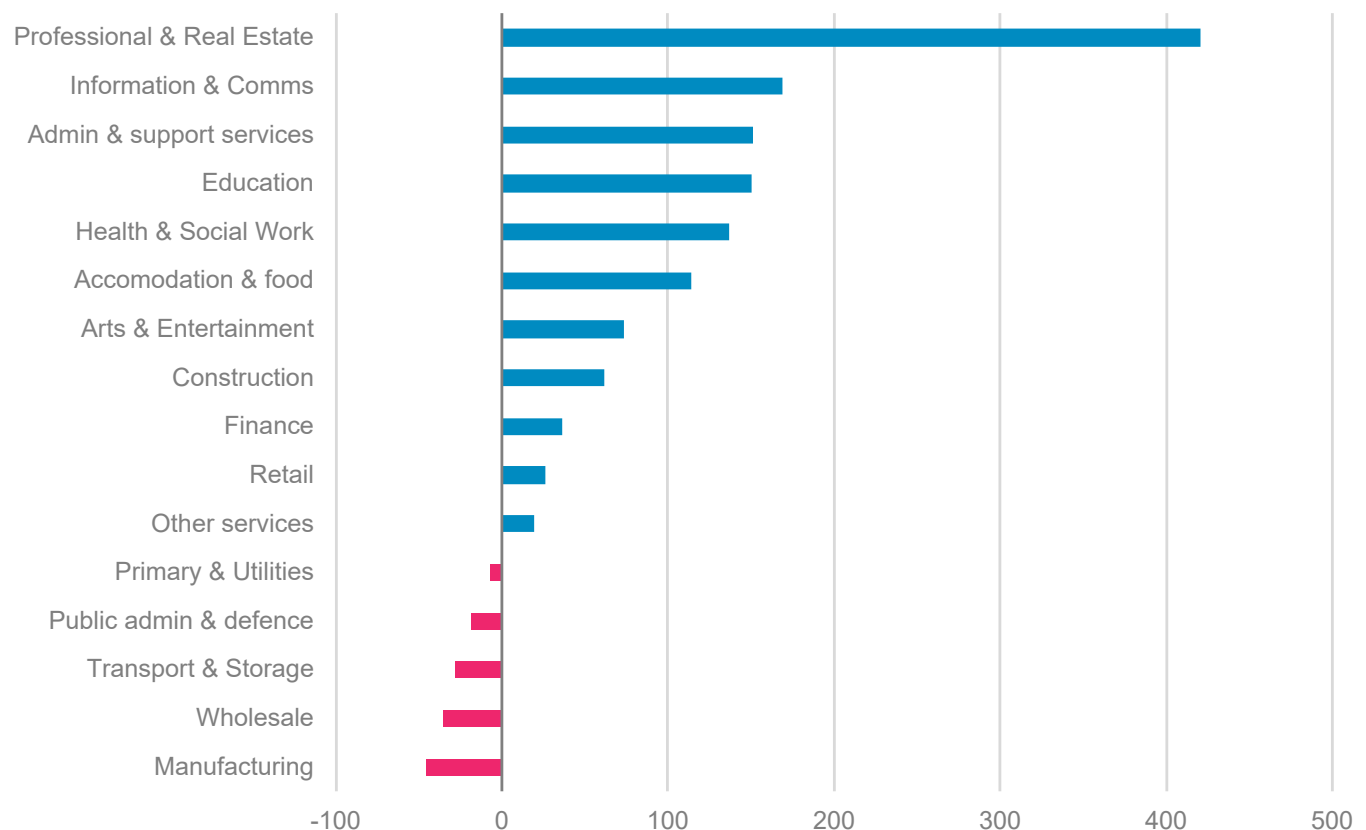
³²⁹ Resolution Foundation (2016), '[Retention deficit: A new approach to boosting employment for people with health problems and disabilities](#)'.

4.4 The future of London's labour market

Employment growth is expected to remain robust in the coming decades, with continued growth in demand for degree level qualifications.

- According to GLA Economics' trends-based projections, employment in London will reach 6.9 million by 2041, equal to an additional 49,000 jobs per year³³⁰. Much of this growth is set to come from sectors where London is relatively specialised, with the largest increases expected in the Professional & Real Estate and Information & Communication sectors (Figure 4.14).
- In-line with these headline trends, future jobs growth is also expected to be more prominent at the top of the occupational distribution, in addition to limited jobs growth at the lower end and some job losses in the middle³³¹. There is a concern that this could mean fewer opportunities for labour market progression, although the relative growth of jobs requiring higher skills would not be a new occurrence (see Section 4.2).
- As a result of these shifts, demand for workers with degree level qualifications will continue to increase in London over the coming decades, whereas demand for people with below-degree level qualifications will increase only slightly³³². Over half (54%) of jobs in London will require either an ordinary or higher degree by 2041, with only 3% of jobs likely to require no formal qualifications whatsoever.

Figure 4.14: Projected jobs growth in London by industry group, 2016-2041 (000s)



Source: GLA Economics (2017).

³³⁰ GLA Economics (2017) '[Long Term Labour Market Projections 2017](#)'.

³³¹ GLA Economics (2016) '[Long Term Labour Market Projections 2016](#)'.

³³² GLA Economics (2016) '[Long Term Labour Market Projections 2016](#)'.

But we are in a period of heightened economic uncertainty. The UK's departure from the European Union, in particular, is likely to impact on the supply of skills in London.

- Access to a diverse and skilled labour force is a notable feature of the capital's labour market. With 14% of jobs filled by workers born in the rest of the EEA in 2017, the economic contribution of EEA workers born is far greater than in the rest of the UK³³³.
- EEA workers play a particularly prominent role in certain industries. They account for a third of jobs in London's construction sector (34%) and over a quarter of jobs in the accommodation and food sector (28%) (Figure 4.15), as well as making a significant contribution to the capital's adult care workforce³³⁴. At the same time, EEA workers also hold a high number of jobs (in absolute terms) in high value-added sectors such as Professional services, Finance and insurance and Information and communication³³⁵.
- According to Campo et al. immigration has a positive and significant impact on productivity, as measured at a geographical level³³⁶. While higher-skilled workers drive this finding, most EEA job holders in London hold qualifications at NVQ level 4 or above.

The increase in EEA workers in London appears to have slowed since the UK voted to leave the EU in June 2016³³⁷. There is a risk that replacing Freedom of Movement with a more restrictive system could damage the capital's supply of skills and potentially its productivity performance.

- Most employers do not recruit EEA workers in explicit preference to British workers³³⁸. The significant role played by migrants in the London economy is more likely to reflect persistent labour shortages as well as long-standing challenges in attracting UK-born candidates to fill certain jobs (e.g. due to their precarious nature or lower rates of pay)³³⁹.
- In this context, there is uncertainty about how employers would respond to a sharp reduction in the supply of EEA workers. Employers have voiced concerns about the future immigration system: which skills will be included and what salary thresholds will be set³⁴⁰.
 - In volume terms London is the region 'most affected' by the skilled worker policy proposals that were outlined in the government's Immigration White Paper, accounting for a third of the projected reduction in long-term EEA worker inflows³⁴¹.
 - An RQF3+ minimum skills threshold and £30,000 minimum salary threshold would have a significant impact in the capital, especially given the high share of employee jobs which pay below this level in sectors such as 'Construction' and 'Accommodation and food' (Figure 4.15)³⁴². Overall, GLA Economics analysis indicates that 6 in 10 jobs currently held by EEA workers in London would not meet these criteria³⁴³.
 - Employers recruiting for some roles will be more able to respond than others, including through automation³⁴⁴. Further GLA Economics research suggests that roles such as 'Construction & Building

³³³ This follows rapid growth in recent years: less than 8% of London's jobs were held by EEA workers in 2004. A third of UK jobs held by EEA workers was based in London in 2017. See: GLA Economics (2018), '[EEA workers in the London labour market](#)'.

³³⁴ Rolfe, H. (2018), '[It's all about the Flex](#)'.

³³⁵ For example, see: GLA Economics (2018), '[EEA workers in the London labour market](#)'.

³³⁶ Campo, F., Forte, G., & Portes, J. (2018), '[The Impact of Migration on Productivity and Native-born Workers' Training](#)'.

³³⁷ The latest long-term international migration statistics indicate a decline in net migration to the UK from the EU and the growth in London jobs held by EEA workers is likely to have stalled in recent quarters (based on ONS Labour Force Survey).

³³⁸ Migration Advisory Committee (2018), '[EEA migration in the UK: Final report](#)'.

³³⁹ For example: Rolfe, H (2018), '[It's all about the Flex](#)'; Green, A. (2019), '[Low-Skilled Employment in a New Immigration Regime](#)'.

³⁴⁰ See, for example: Migration Advisory Committee (2019), '[Full review of the Shortage Occupation List](#)'.

³⁴¹ HM Government (2018), '[The UK's future skills-based immigration system](#)'.

³⁴² 46% of employee jobs in London were paid below £30,000 in 2017. Source: ONS Annual Survey of Hours and Earnings 2017. Note RQF is the Regulated Qualification Framework in England and Northern Ireland.

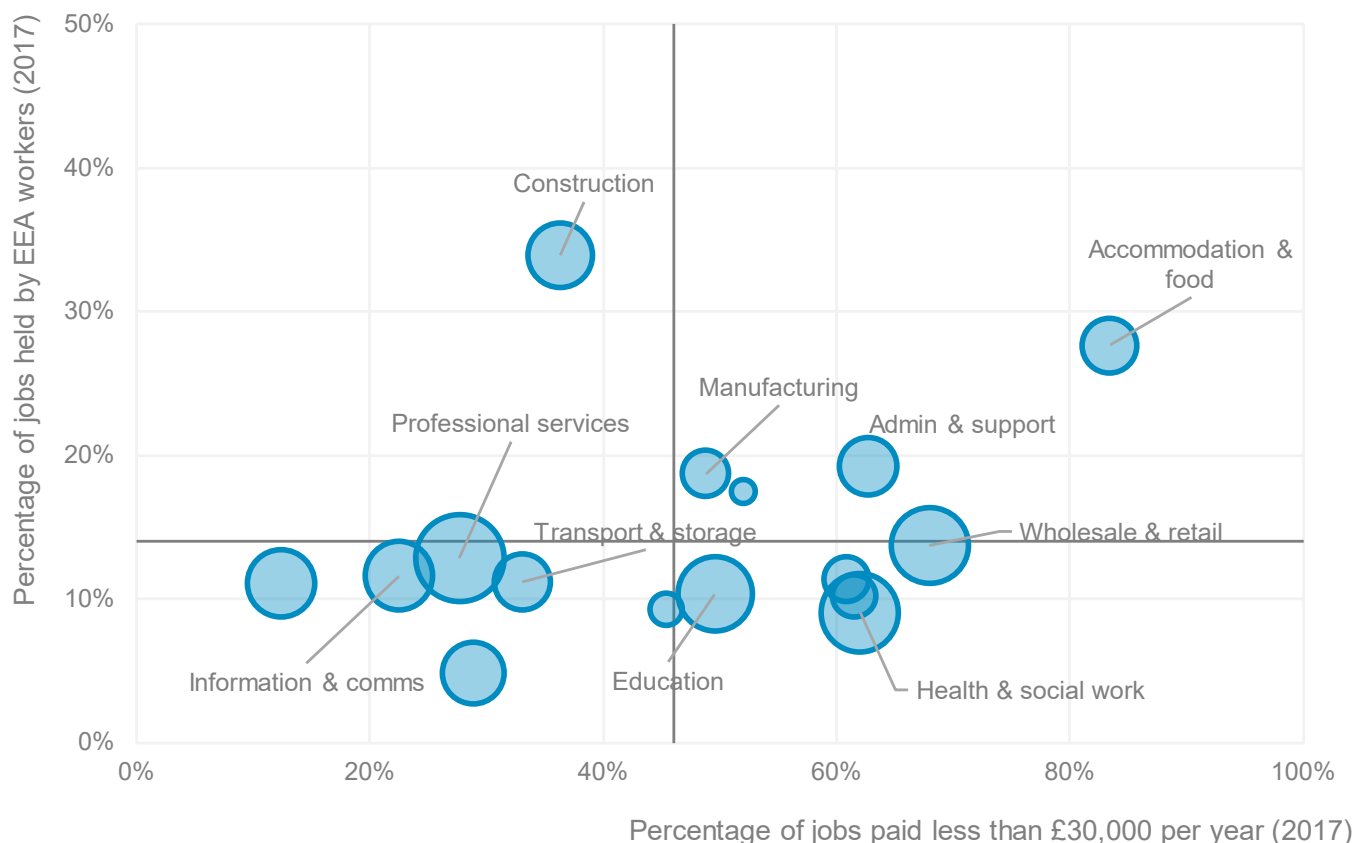
³⁴³ GLA Economics (2019), '[Potential impacts of skills-based immigration policies in London](#)'.

³⁴⁴ Home Office (2019), '[The UK's future skills-based immigration system](#)'.

Trades', 'Food Preparation & Hospitality Trades' and 'Childcare Services' are especially exposed to changes to UK immigration policy³⁴⁵.

- There are likely to be challenges to training Londoners to fill roles with a heavy reliance on EEA workers, at least in the short to medium run. Despite concerns, Campo et al. find no evidence that immigration has reduced training for UK-born workers³⁴⁶. There is a further risk that attempts to control lower-skilled migration could, by increasing the bureaucratic burden, discourage the skilled migration required by London's employers³⁴⁷.

Figure 4.15: Total jobs held by workers born in the European Economic Area vs. employee jobs paid below £30,000 per year, London, 2017



Source: Office for National Statistics³⁴⁸. Note: circle size relates to total employment by sector. The vertical and horizontal lines represent the 2017 average proportions of jobs held by EEA workers in London (14%) and paid below £30,000 (46%).

Older people account for an increasing proportion of the London workforce, offering one potential source of additional labour. This is driven in part by demographics, but also by increasing rates of labour market participation among older individuals.

- London is a relatively young place compared to the rest of the country. But the capital is still home to around 2.5 million residents aged 50 and over, with the number of people in this age group set to

³⁴⁵ GLA Economics (2019), 'Potential impacts of skills-based immigration policies in London'.

³⁴⁶ Higher-skilled migrants may even be associated with an increase in native workers' training. Source: Campo, F., Forte, G., & Portes, J. (2018), 'The Impact of Migration on Productivity and Native-born Workers' Training'.

³⁴⁷ Migration Advisory Committee (2018), 'EEA migration in the UK: Final report'.

³⁴⁸ GLA Economics (2018), 'Jobs held by EEA-born workers earning less than £30,000 per year'.

increase by 24% to reach 3 million in 2030 (14% rise across the UK)³⁴⁹. These trends will have significant labour market implications.

- Controlling for other factors, workplaces in London generally have a smaller proportion of older workers than other UK regions – reflecting the age composition of the local population³⁵⁰.
- However, even if employment rates were to remain constant, GLA Economics estimate that the number of Londoners aged 50+ in employment is likely to rise from 1.15 million in 2018 to approximately 1.4 million in 2030.
- Looking further ahead to 2041, this figure is expected to grow even further to approximately 1.6 million, with the number of people working beyond state retirement age also set to increase.
- Enabling more people to continue in work for longer can offer a wide range of benefits to individuals (in terms of living standards and well-being), the economy (in terms of skills and workforce³⁵¹) and the state (increased tax revenues and other fiscal benefits)³⁵². The Department for Work and Pensions, for example, currently spends around £7 billion per year on the main out-of-work benefits for people aged 50 to state pension age³⁵³.

Despite improvements, older workers often face a wide range of barriers to employment and in-work progression.

- Older Londoners face several challenges to participating in the labour market, particularly in terms of the quality of work on offer. For example:
 - ONS analysis shows that older workers are generally at greater risk of redundancy, long-term unemployment, and becoming stuck in low pay^{354,355}.
 - Controlling for a range of relevant factors, employees aged 50 and over are also less likely to receive training in work than employees of other ages³⁵⁶.
 - In London the 50 to 64 age group has the highest share of workers who would like to work shorter hours than at present in their current job³⁵⁷.
- Age discrimination could be a factor³⁵⁸. Although there are signs that UK employers are keen to retain their existing older workers, they are typically less likely to recruit them. This is especially true among the smaller and younger workplaces that account for a relatively high proportion of the capital's business base (also see Chapter 3)³⁵⁹.
- Inequalities in terms of people's choice over when they retire are also noteworthy, with lower earners generally more likely to work longer from financial necessity³⁶⁰. Yet many older people also need to balance work with family and other caring commitments. For example, an estimated 16% of older

³⁴⁹ GLA (2017), '[Central Trend population, 2017-based](#)'.

³⁵⁰ Department for Work and Pensions (2017), '[Older workers and the workplace](#)'.

³⁵¹ Note: despite often cited concerns that older workers staying in work could block opportunities for younger workers, analysis by the Institute for Fiscal Studies (2008), '[Releasing Jobs for the Young? Early Retirement and Youth Unemployment](#)'.

³⁵² Centre for Ageing Better (2018), '[A silver lining for the UK economy?](#)'

³⁵³ DWP (2017), '[Fuller Working Lives: evidence base 2017](#)'.

³⁵⁴ ONS (2017), '[Redundancies by industry, age, sex and re-employment rates](#)'.

³⁵⁵ Yet, while older workers tend to earn less than employees in middle age groups, there is variation. In London median pay for part-time workers aged 50-64 is higher than for employees in other age groups. Source: ONS (2019) '[Median and average hourly pay for employee jobs, broken down by age and working pattern \(full-time or part-time\), in London and rest of the UK](#)'.

³⁵⁶ Department for Work and Pensions (2017), '[Older workers and the workplace](#)'.

³⁵⁷ ONS (2019), '[Number of persons wanting to work longer or shorter hours at current basic rate of pay](#)'.

³⁵⁸ Centre for Ageing Better (2018), '[A silver lining for the UK economy?](#)'

³⁵⁹ Department for Work and Pensions (2017), '[Older workers and the workplace](#)'.

³⁶⁰ As the Centre for Ageing Better has noted: '[a]most half of the highest fifth of earners retire before state pension age, while less than a third of low and middle income earners do so'. Source: Centre for Ageing Better (2018), '[A silver lining for the UK economy? The intergenerational case for supporting longer working lives](#)'.

Londoners provide care to other adults in a non-professional capacity, with the average carer providing 1,700 hours of care per year³⁶¹.

- This chapter has highlighted a range of challenges related to pay, progression and job security in London – the policy solutions that aim to tackle these issues should respond to barriers faced by workers of all ages, as well as highlighting age-specific factors³⁶².

Falling costs of computing power and the development of AI and other technologies are increasing the range of tasks that technology can perform. But the evidence about the extent to which jobs will be replaced by automation remains controversial.

- Because of its occupational structure, the exposure of jobs in London to automation is generally lower than elsewhere. While a range of studies have estimated that between 5% and 33% of the capital's jobs could be at 'high risk' in the coming decades:
 - These results are sensitive to methodological assumptions and various economic, legal and other factors will affect the pace of technology adoption³⁶³.
 - The overall impact of automation on employment also depends on the balance of job displacement and creation.
- In the past automation has helped to create more jobs than it has displaced and there is little evidence this will not continue in years ahead. PwC, for example, estimates that London will see a net increase of 138,000 jobs due to automation from 2017 to 2037³⁶⁴. Still, tasks in almost every job will be changed as interaction with technology increases³⁶⁵.

With certain tasks more likely to be automated, some groups will be more exposed than others. While automation offers a route to overcoming labour shortages and boosting productivity growth (see Chapter 6), there is a need to ensure that both current and future London residents do not lose out.

- Tasks are generally less susceptible to automation if they involve higher-level cognitive skills. In this way the risk of automation remains – unsurprisingly – closely linked to education levels (Figure 4.16). Based on ONS analysis, activities in the lower skilled or routine 'Retail' and 'Accommodation and food sectors' are among the most automatable³⁶⁶.
- The likelihood of working in 'at risk' occupations is, moreover, not evenly distributed across the population: women, younger and older workers, and those who work part-time – groups that already face disadvantage in the labour market – are more likely to find themselves either displaced by new technologies or less equipped to fill emerging roles³⁶⁷.
- The adoption of innovative technologies will also change the skills that employers require.
 - The demand for social, creative, and logical reasoning abilities is expected to rise, especially at more advanced levels³⁶⁸. This is in-line with evidence of increasing utilisation and returns to analytical and interpersonal skills in the UK in recent years³⁶⁹.

³⁶¹ Previous GLA Economics analysis estimated the 'economic' value of care provided by Older Londoners at £4.7bn per year or roughly £14,600 per older care giver in London. Source: GLA Economics (2013), ['The Economic Contribution of Older Londoners'](#).

³⁶² Centre for Ageing Better (2018), ['A silver lining for the UK economy? The intergenerational case for supporting longer working lives'](#).

³⁶³ OECD (2018), ['Job Creation and Local Economic Development'](#).

³⁶⁴ PwC (2018), ['July 2018 Economic Outlook'](#).

³⁶⁵ McKinsey Global Institute (2017), ['Jobs lost, jobs gained: Workforce transitions in a time of automation'](#).

³⁶⁶ ONS (2019), ['The probability of automation in England: 2011 and 2017'](#).

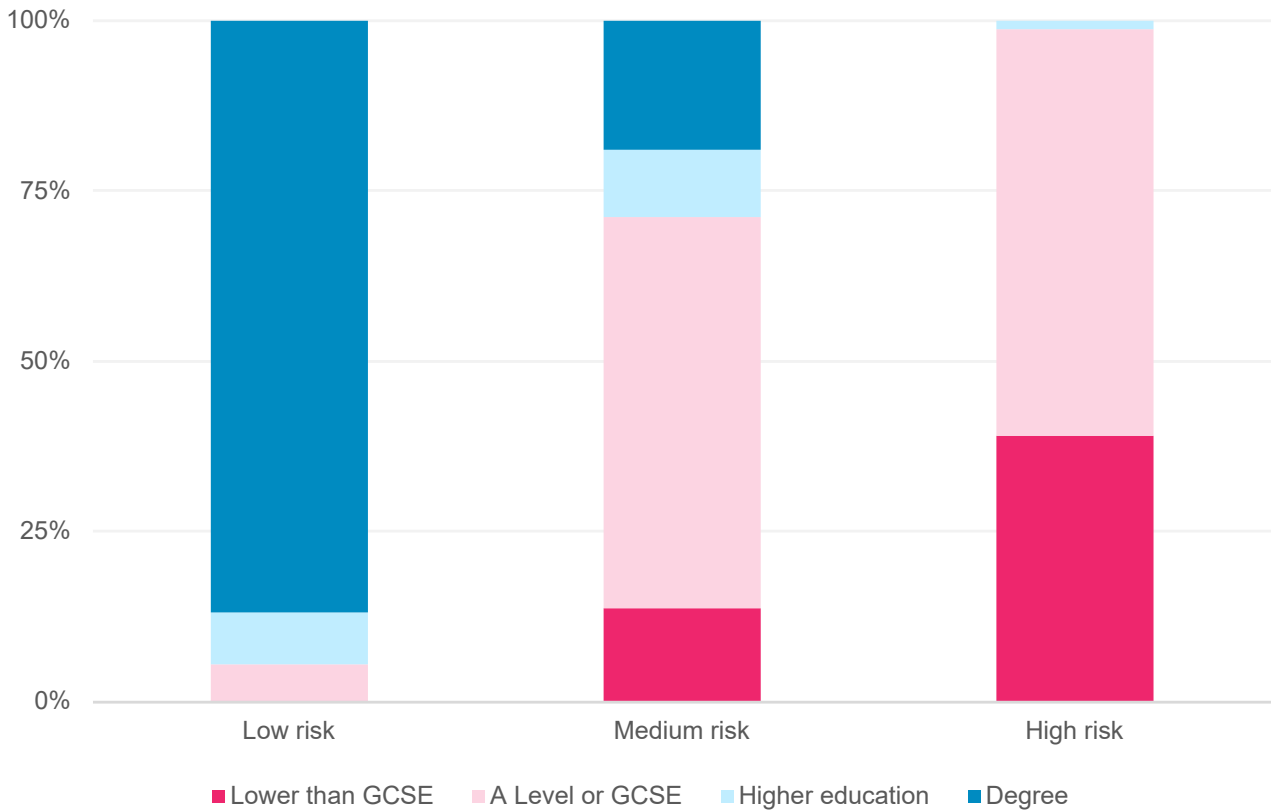
³⁶⁷ ONS (2019), ['Which occupations are at highest risk of being automated?'](#)

³⁶⁸ Deloitte (2014), ['Agiletown: The Relentless march of Technology and London's Response'](#). Also see: Industrial Strategy Council (2019) [UK Skills Mismatch in 2030](#).

³⁶⁹ Dickinson, A. and Morris, D. (2019), ['The Changing Demand for Skills in the UK'](#). Centre for Vocational Education Research.

- According to UK level analysis carried out for the Industrial Strategy Council, the most widespread area of under-skilling is likely to be in basic digital skills, which are likely to become more advanced in comparison to what is currently required³⁷⁰.
- To prepare for the complex work transitions anticipated in the coming decades, there is a need to promote and widen access to education and workforce development. As OECD research concludes: ‘the likely challenge for the future lies in coping with rising inequality and ensuring sufficient (re)training especially for low qualified workers’³⁷¹.

Figure 4.16: Main jobs at risk of automation by education level, England, 2017



Source: Office for National Statistics³⁷².

³⁷⁰ Industrial Strategy Council (2019) UK Skills Mismatch in 2030.

³⁷¹ Arntz, M., Gregory, T. & Zierahn, U. (2016), *The Risk of Automation for Jobs in OECD Countries: A Comparative Analysis*.

³⁷² ONS (2019), *The probability of automation in England: 2011 and 2017*.

5 Infrastructure

Matthew Daley, Economist, GLA and **Chloe Cook**, Economist, GLA

5.1 Introduction

Transport, water, energy, waste and digital infrastructure are all essential to our daily lives but often taken for granted. Without services like potable water, electricity, or regular waste collections, the economy would simply grind to a halt. Improvements to infrastructure such as public transport or digital connectivity can also boost productivity by reducing transaction costs, improving access to markets and supporting agglomeration³⁷³.

Infrastructure is important for economic inclusion. The availability and cost of transport and digital services affect peoples' ability to access the labour market and vital public services like healthcare and education. Meanwhile, water, energy and waste policy and investment decisions all impact on household bills and the cost of living.

There is also growing recognition of the importance of natural capital (green spaces, parks, trees and rivers) for their environmental and health benefits. Together with a greener built environment (e.g. buildings with green roofs and walls, and drainage systems that allow rainwater to flow back to rivers and streams more naturally) these assets can be thought of and managed as 'green infrastructure'. Protecting and enhancing them can help to make London a city which is more 'liveable' for residents and workers.

This chapter considers the state of London's infrastructure today and future challenges facing the capital³⁷⁴. It first takes a brief look at the role that infrastructure played in shaping the evolution of London. It then looks at the key role of investments in transport and digital infrastructure in ensuring that London can continue to grow and prosper, as well as the importance of different kinds of infrastructure needed to ensure that London's growth is clean, resilient and beneficial to Londoners' well-being.

³⁷³ See the What Works Centre for Local Economic Growth for a review of the evidence on the economic benefits of [transport](#) and [digital](#) infrastructure. See also GLA Economics (2019), '[Productivity levers in London: A literature review to inform the LIS evidence base](#)'.

³⁷⁴ The definition of infrastructure in this chapter includes transport, digital, energy, water, waste, green and social infrastructure. This is a slightly broader definition than that in the National Infrastructure Commission's remit, which excludes green and social infrastructure.

5.2 The role of infrastructure in shaping the evolution of London

Infrastructure has both shaped and underpinned London's emergence as a global city, but population growth and climate change mean the city's infrastructure networks are facing growing pressure.

The Port of London, the Bazalgette sewerage system, the London Underground, the suburban railways and the Thames Barrier, are just some examples of infrastructure which underpinned London's rise as the great Victorian Metropolis³⁷⁵ and later its emergence as a global city and financial centre.

Over the years London has benefited from regional and local institutional arrangements that have enabled significant investment in infrastructure. There is evidence that such arrangements may help to improve the economic returns from infrastructure investment by shaping the choice of projects and allowing individuals and firms connected physically by the transport network to interact productively³⁷⁶.

However, as London's population and its economy continue to grow so its infrastructure networks (some of which still date back to the Victorian era) are coming under increasing pressure. More people and jobs in London mean that travel demand across all modes is expected to increase to around 32 million trips on an average day in 2041, five million more than today³⁷⁷. Coping with this rising demand together with the need to ensure growth is equitable, clean and environmentally sustainable will require major investment in new forms of infrastructure and the maintenance and renewal of existing networks, as well as policies to manage demand.

Without careful planning and investment, London's infrastructure may begin to fail or underperform, impinging on economic growth through declining levels of service or unacceptable price rises.

³⁷⁵ Hebllich, S., Redding, S.J., and Sturm, D.M. (2018) '[The Making of the Modern Metropolis: Evidence from London](#)'. Their research shows that steam railways dramatically reduced travel times and permitted the first large-scale separation of workplace and residence in the London area.

³⁷⁶ Crescenzi R., Di Cataldo M, Rodríguez-Pose A. (2016), '[Government quality and the economic returns of transport infrastructure investment in European regions](#)'. *Journal of Regional Science*, 56(4), 555-582.

³⁷⁷ TfL (2017), '[Mayor's Transport Strategy: Supporting Evidence Outcomes Summary Report](#)'.

5.3 Transport infrastructure to keep London moving and unlock new homes

Major investment is needed in London's public transport to maintain the network and provide additional capacity.

- There is a well-established economic theory which links connectivity to agglomeration effects and improvements in local productivity (as discussed in Chapter 1). In a study for the Department for Transport, Venables, Laird & Overman concluded that the intense economic interactions fostered by transport links can increase productivity, both within a narrowly defined area and by linking different areas³⁷⁸.
- London's public transport network, particularly its rail network, helps to support agglomeration, connecting businesses and people within London and to the Wider South East and beyond. Rail-based modes of travel make up 80% of the 1.3 million trips to central London in an average weekday morning peak period³⁷⁹. But if the comfort, safety, accessibility and affordability of London's transport network were compromised, it could impinge on labour supply and investment.
- London's railway stations are some of the busiest in the country, with almost two thirds of all national rail journeys in Britain either starting or ending in London³⁸⁰. Nearly 600,000 railway passengers arrive into London in the morning peak, more than two and half times the number of morning peak arrivals into all other cities in England and Wales combined³⁸¹.
- There is significant crowding on London's tube network and mainline trains at peak times within Zone 1³⁸². Even with new investments like the Elizabeth line (Crossrail) opening, demand is expected to increase faster than supply. By 2041, TfL expects one million additional daytime journeys to/from central London by rail, leading to a 50% increase in severe crowding on the Underground and a 90% increase on the National Rail network (Figure 5.1).
- Crowding in stations and on trains causes delays and frustration, affecting the well-being of commuters³⁸³. It also increases journey times as customers wait for less crowded trains, leading to lost economic output.
- As set out in the Mayor's Transport Strategy, the London Underground needs significant investment to modernise the network and increase capacity, including new track, trains, signalling and other improvements. Major new public transport schemes and line extensions are also needed to increase capacity and extend the network, most notably Crossrail 2. As noted by the National Infrastructure Commission, future growth will not be possible in London without substantial increases to the capacity of the transport network³⁸⁴.

³⁷⁸ Venables, A.J., Laird, J. & Overman, H. (2014), '[Transport investment and economic performance: Implications for project appraisal](#)' for the Department for Transport.

³⁷⁹ TfL (2018), '[Mayor's Transport Strategy](#)' p.164.

³⁸⁰ Department for Transport (2018), '[Rail Factsheet 2018](#)'.

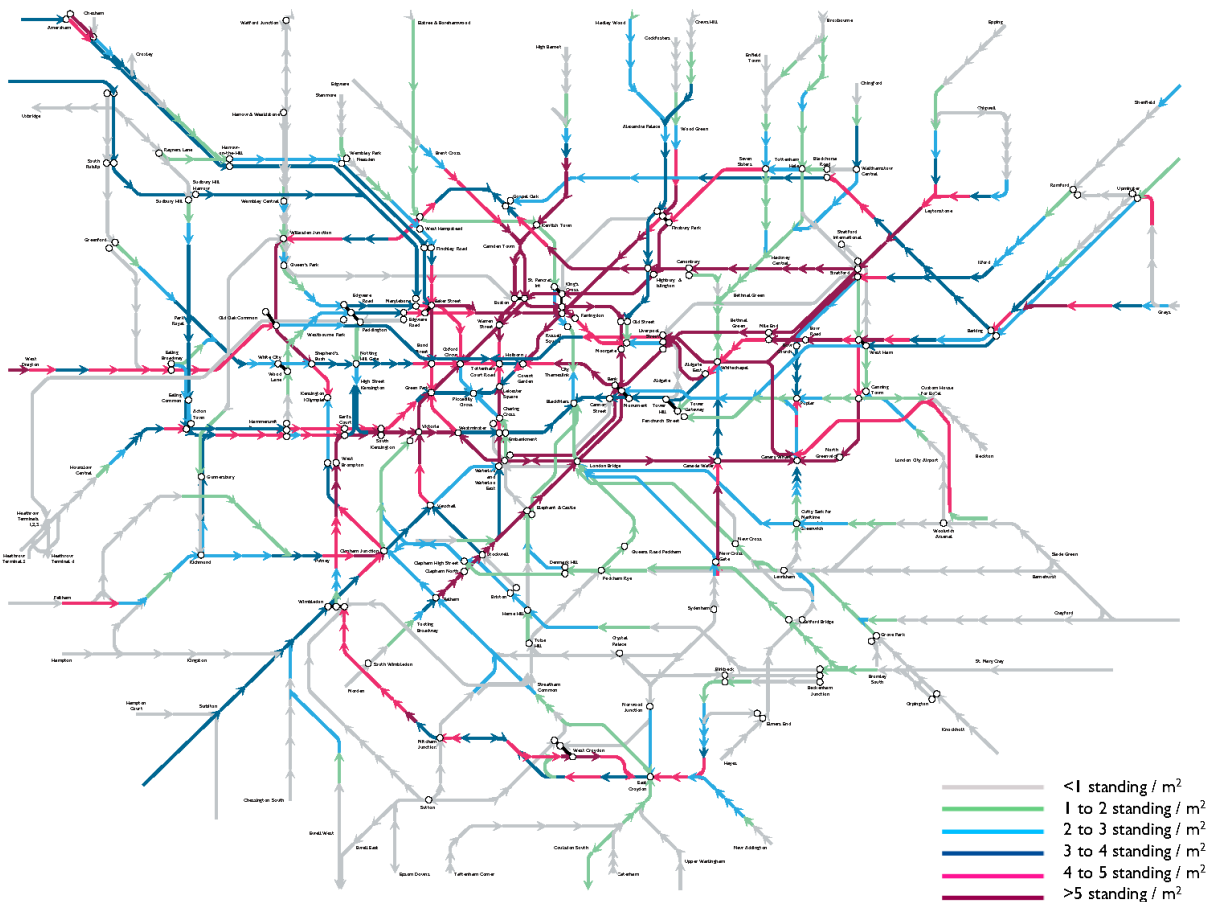
³⁸¹ Department for Transport (2019), '[Rail passenger numbers and crowding on weekdays in major cities in England and Wales: 2018](#)'.

³⁸² Defined by TfL as more than four people standing per square metre.

³⁸³ ONS (2014), '[Commuting and Personal Well-being, 2014](#)'.

³⁸⁴ National Infrastructure Commission (2018), '[National Infrastructure Assessment](#)' p.80.

Figure 5.1: Crowding on London's Rail Network in 2041 with funded schemes only



Source: TfL³⁸⁵.

An inclusive, accessible, affordable transport network benefits all Londoners and visitors, and is vital for accessing employment opportunities.

- The cost of travel is an important factor in peoples' ability to access employment. Between 2008 and 2015, single Tube and bus fares increased by around 60% (nominal terms). While this supported investment in the transport network, those on the minimum wage saw their pay rise just 17% (nominal terms), making travel costs a larger proportion of their spending³⁸⁶.
- Despite significant improvements, only 41% of the public transport network meets TfL's definition of being fully accessible³⁸⁷, limiting employment and other opportunities for those with mobility impairments.
- London's bus services provide the most extensive public transport network in the capital, offering low cost, accessible travel across London's residential outer areas as well as a dense network of services in central London. Buses are a space-efficient and affordable mode of transport, but congestion on the roads and falling speeds affect the experience of users.
- While bus travel grew by 71% between 2000 and 2015, passenger volumes fell in recent years, largely as a result of slowing speeds and changing travel patterns. Investment in the bus network is needed to support sustainable travel, particularly in outer London where buses can also help to support local economies.

³⁸⁵ TfL (2017), 'Mayor's Transport Strategy: Supporting Evidence Challenges & Opportunities'.

³⁸⁶ TfL (2017), 'Mayor's Transport Strategy: Supporting Evidence'.

³⁸⁷ Ibid.

London's roads are some of the most congested in Europe contributing to road safety concerns, poor air quality, carbon emissions and physical inactivity.

- According to Inrix, London is the 6th most congested city globally, with road users losing an average of 227 hours per year idling in traffic³⁸⁸.
- The extent of congestion (Figure 5.2) on the roads highlights the need to manage road space more efficiently so that people can travel on more sustainable modes of transport such as the bus. Currently 75% of congestion is caused simply by there being too great a demand for limited street space³⁸⁹.
- Adding to congestion in London is the increase in freight activity. Between 1994 and 2015 van traffic accounted for at least 10% of the increase in traffic in 25 London Boroughs. The volume of goods vehicles on the road is expected to continue growing due to trends in ecommerce, just-in-time deliveries, and lengthening supply chains. In 2015, LGV vehicle kilometres were 20% higher and HGV vehicle kilometres 4% higher than the average between 1994 and 1999³⁹⁰.
- Congested roads also pose a threat to the safety of Londoners. 2,501 people were killed or seriously injured on London's streets in 2016/17. 80% of these incidents were people walking, cycling or on motorbikes.
- Sales of electric vehicles (EVs) are expected to increase significantly over the next decade, offering a cleaner form of road transport. To support the uptake of EVs, London needs a comprehensive network of rapid charging points across the city, as set out in the London EV Infrastructure Delivery Plan³⁹¹. While EVs will help to reduce harmful emissions, they will not solve the problem of congested streets in London.
- In the longer term, connected and autonomous vehicles will bring many benefits, improving safety, accessibility, freeing up driver time and boosting productivity. However, some studies suggest the number of vehicles on the road could in fact increase, placing more pressure on road space and potentially deterring people from active, efficient and sustainable transport modes³⁹². There is a fundamental role for public authorities to help shape these new transport services to meet the city's needs.

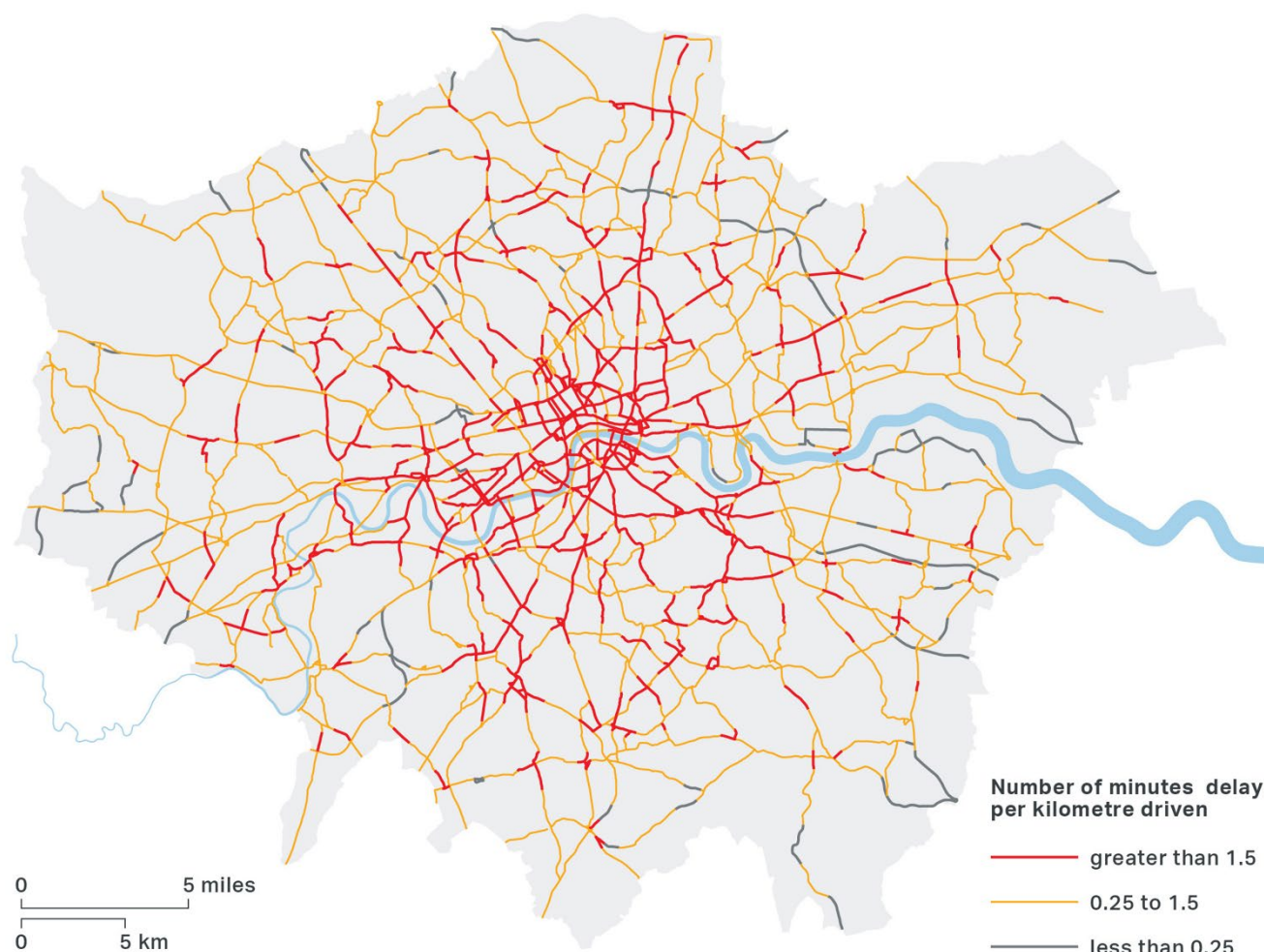
³⁸⁸ Inrix (2019), [Inrix 2018 Global Traffic Scorecard](#).

³⁸⁹ TfL (2018), ['Mayor's Transport Strategy'](#) p.74.

³⁹⁰ TfL Surface Transport in Mayor of London/TfL (2017), ['Mayor's Transport Strategy: Supporting Evidence'](#).

³⁹¹ Mayor of London (2019), ['London electric vehicle infrastructure delivery plan'](#).

³⁹² National Infrastructure Commission (2018), ['National Infrastructure Assessment'](#) p.12.

Figure 5.2: Car journey delays across London (2017)

Source: TfL.

Encouraging more people to adopt active forms of travel (like walking or cycling) is needed to tackle over-crowding on public transport, congestion on the roads and environmental and health concerns.

- Adults need at least 150 minutes and children 420 minutes of physical activity a week to stay healthy and reduce their risk of common preventable diseases. Currently a third of Londoners achieve the recommended daily amount of physical activity from active travel³⁹³. More people need to be encouraged and supported to change their daily routine. TfL estimates that there are 2.4 million trips in London that could be walked all the way but aren't at present.
- The Mayor's Transport Strategy (Box 5.1) sets a target for 80% of all trips in London to be made on foot, by bike or using public transport by 2041, from a baseline of 63% in 2015.
- In order to achieve this, streets need to be re-designed around the needs of people rather than motor vehicles. Yet London's streets do not currently meet people's expectations. Figure 5.3 shows that against all the criteria which define 'Healthy Streets', Londoners' experiences fall below their expectations³⁹⁴.

³⁹³ TfL (2017), '[Mayor's Transport Strategy: Supporting Evidence Challenges & Opportunities](#)' p.15. The recommended daily amount of active travel is two sessions of walking or cycling for at least 10 minutes.

³⁹⁴ For more on the Healthy Streets Approach, see: TfL (2018), '[Healthy Streets for London](#)'.

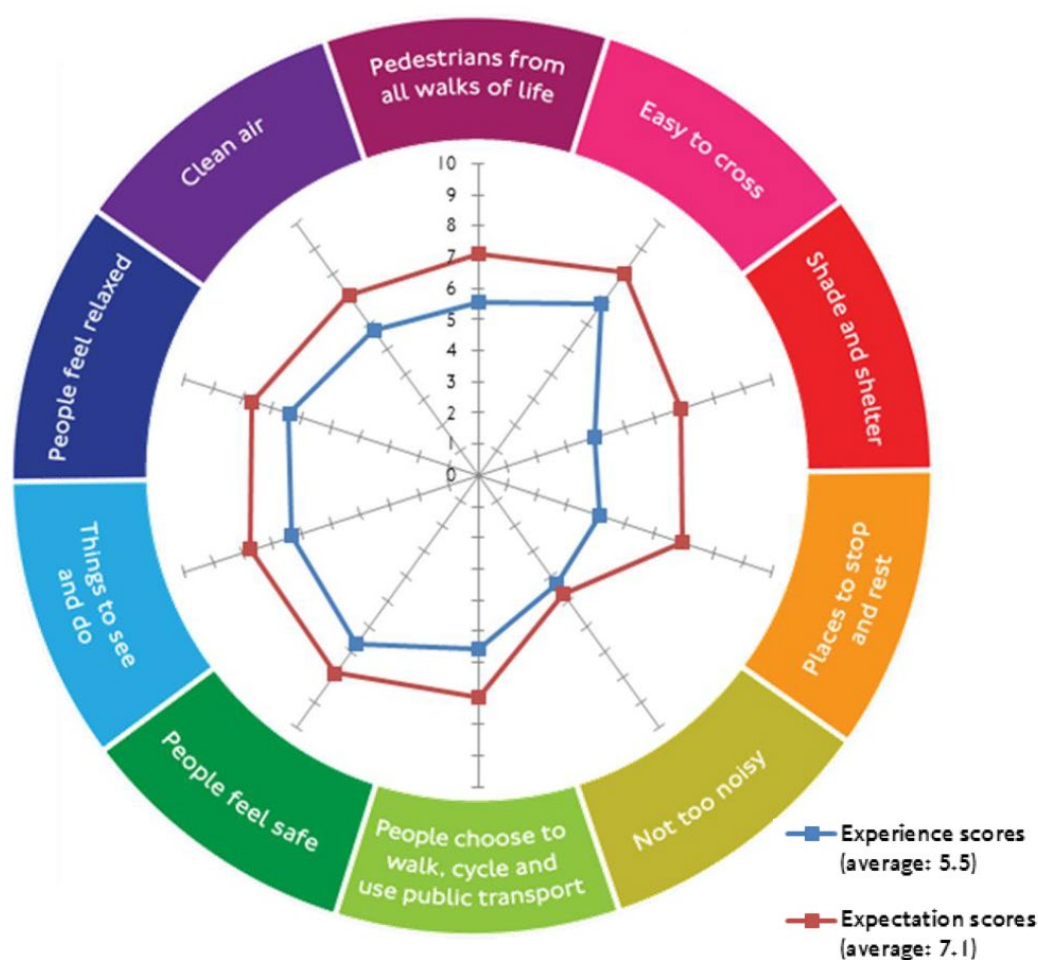
Box 5.1: The Mayor's Transport Strategy

The Mayor is required to prepare and publish a transport strategy (the Mayor's Transport Strategy or 'MTS') which contains:

- policies for the promotion and encouragement of safe, integrated, efficient and economic transport facilities and services to, from and within Greater London;
- proposals for discharging the Mayor's duty of exercising his powers under Part IV of the Greater London Authority Act 1999 ('the GLA Act') for the purpose of securing the provision of those transport facilities and services; and
- proposals for providing accessible transport.

The current MTS was published in March 2018 following public consultation and sets out plans to transform London's streets, improve public transport and create opportunities for new homes and jobs.

Figure 5.3: Comparison of experience and expectation scores for Healthy Streets indicators



Source: TfL³⁹⁵.

London needs significantly more housing to support population and economic growth.

- As discussed in Chapters 1 and 3, housing costs in London have a significant, detrimental impact on living standards. They are also a threat to London's international competitiveness because the costs of

³⁹⁵ TfL (2017), 'Mayor's Transport Strategy: Supporting Evidence Challenges & Opportunities'.

accommodating workers in the capital are among the highest of all global cities. In a recent survey of Londoners, 64% of respondents said 'making housing in London more affordable to buy or rent' was the most important issue to improve London's economy³⁹⁶.

- In the last two decades, the number of jobs in London has grown by 45% and the number of people by 27%, but the number of homes by only 18%³⁹⁷. Evidence for the draft London Plan found that London needs 66,000 new homes a year for 20 years to support population growth³⁹⁸ (see Chapter 7 for further information on the London Plan).
- According to the latest Annual Monitoring Report, a net total of 32,083 dwellings were completed in 2017/18³⁹⁹, which is significantly below the level of estimated need.
- Supporting inclusive growth will also mean providing more affordable housing. Evidence for the draft London Plan found that 43,000 (65%) of the 66,000 new homes a year should be genuinely affordable if the needs of Londoners are to be met⁴⁰⁰.
- A net total of 4,703 affordable units were completed in London in 2017/18, representing only 15% of total completions⁴⁰¹. The total stock of affordable homes in London in 2018 (excluding shared ownership) was 803,200, a total which has changed little over recent years, as new additions have been balanced by demolitions and sales out of the sector⁴⁰².
- The draft London Plan and the Mayor's Housing Strategy set out proposals to boost housing supply in London, including proactive intervention in land markets; targeted investment to de-risk development; diversification of the housebuilding industry; and tackling the construction skills gap⁴⁰³. To address the latter, the Mayor's Construction Academy has been established to improve the quality of construction skills training and the supply of construction workers to the industry⁴⁰⁴.

Investing in new transport infrastructure in London will help unlock new homes and jobs.

- Transport can unlock housing and commercial development sites by providing connectivity. It can also enhance delivery rates and increase densities, which improve the viability of developments. The potential for transport to unlock development Opportunity Areas is outlined in Chapter 7.
- High density living close to public transport nodes can also help people to make more sustainable travel choices. Evidence shows that car use in London rises as public transport accessibility falls. Housing growth and public transport investment therefore need to go hand-in-hand, both to unlock growth and to ensure it is sustainable⁴⁰⁵.
- Major schemes that could enable significant housing development, but which require funding, include:
 - **Crossrail 2:** a proposed rail route from Surrey to Hertfordshire, providing a new north-south rail link across London (200,000 homes)
 - **Bakerloo Line Extension:** an extension of the Bakerloo line to Lewisham via the Old Kent Road and New Cross Gate, with the potential to extend to Hayes (50,000 homes)
 - **Metroisation:** the integration of stopping services in south and south east London to create a suburban metro network (housing impact being assessed)

³⁹⁶ Non-representative self-selecting sample of 1,737 Talk London Economic Development Strategy consultation responses, 13 Dec 2017-13 Mar.

³⁹⁷ Mayor of London (2019), '[Housing in London: The evidence base for the Mayor's Housing Strategy](#)' p.39.

³⁹⁸ Mayor of London (2017), '[The 2017 London Strategic Housing Market Assessment](#)'. Part of the London Plan evidence base. This includes both conventional completions of self-contained houses and flats, and non-conventional student bedrooms, care homes, and non-self-contained accommodation in hostels and houses in multiple occupation.

³⁹⁹ GLA (2019), '[London Plan Annual Monitoring Report 15 2017/18](#)' p.82.

⁴⁰⁰ Mayor of London (2017), '[The London Plan: The Spatial Development Strategy for Greater London](#)' Draft for public consultation. p.18.

⁴⁰¹ GLA (2019), '[London Plan Annual Monitoring Report 15 2017/18](#)' p.21.

⁴⁰² Mayor of London (2019), '[Housing in London: The evidence base for the Mayor's Housing Strategy](#)' p.40.

⁴⁰³ Mayor of London (2017), '[The London Plan: The Spatial Development Strategy for Greater London](#)' Draft for public consultation. p.18.

⁴⁰⁴ See the [Mayor's Construction Academy](#) webpages on the GLA website for more information.

⁴⁰⁵ TfL (2017), '[Mayor's Transport Strategy: Supporting Evidence Challenges & Opportunities](#)'. p45.

- **Extension of the DLR to Thamesmead:** with the potential to extend into Bexley (15,000 homes)
- **West London Orbital:** a proposed orbital rail route across West London, between Hounslow and Cricklewood via the major growth areas at Old Oak and Brent Cross (10,000 homes)
- **Sutton link:** an extension of the tram network on a north-south corridor from South Wimbledon or Colliers Wood to Sutton town centre via Morden (9,000 homes)
- **Elizabeth Line Extension:** an extension of the Elizabeth line eastwards from Abbey Wood to Ebbsfleet (55,000 homes)
- Further information about these schemes can be found in the box below and in the Mayor's Transport Strategy.

Box 5.2: Housing enabled by major transport schemes

Crossrail 2

Crossrail 2 is a major strategic rail project which connects national rail lines in Surrey and Hertfordshire with two new 37km tunnels from Wimbledon to Tottenham Hale and New Southgate. This main section will carry up to 30 trains an hour in each direction, increasing London's rail capacity by 10% and improving connectivity across London and the Wider South East. A model to estimate the project's impacts on over 4,000 potential development sites has been developed and tested with local authorities along the route corridor, as well as an independent Crossrail 2 Growth Commission.

The analysis shows that under a scenario consistent with the Mayor's draft London Plan, Crossrail 2 could unlock more than 100,000 new homes in the corridor. However, with some policy changes – commensurate with the scale of transport accessibility improvement – it could unlock around 200,000 new homes. The increased capacity provided could also support tens of thousands of new homes across the wider region.

Bakerloo Line Extension

The Bakerloo line extension is a proposed southern extension of the London Underground Bakerloo line in south London, from its current terminus at Elephant & Castle. The proposal includes an extension to Lewisham via two new stations along the Old Kent Road, as well as an upgrade to the existing line, with options for a further extension from Lewisham to Hayes. The extension would significantly increase public transport connectivity and capacity in a part of south east London where there is significant potential for new housing.

It is estimated that the full scheme to Hayes could support up to 50,000 new homes. This is based on a comprehensive assessment of all potential development sites along the route corridor, as well as from sites served by the additional trains that can be operated from across south east London by removing services from the Hayes branch. Further work will be undertaken to refine this estimate over the next 18 months.

Metroisation

Metroisation encompasses a change in approach for rail service provision and network design in south London, through the integration of stopping services into a single network delivering seamless transfers, increased passenger capacity and improved customer outcomes. Over the past 20 years, levels of housing delivery in south London have been lower than in other parts of the city, partly due to the poorer levels of relative public transport connectivity. The scheme will increase service frequency and capacity and make south London a more attractive place to live and work, which will increase developer interest and support higher rates of housing delivery. Work is currently underway to identify the scale of the housing that will be unlocked by the scheme.

Extension of the DLR to Thamesmead

A Docklands Light Railway (DLR) extension under the River Thames from Gallions Reach in Newham to Thamesmead in Greenwich could support the development of thousands of new homes on both sides of the

river. It also has the potential to be extended into Bexley. Thamesmead is one of the most poorly connected areas of London and land values are amongst the lowest in the city. TfL and the GLA have been working with the landowners and boroughs on both sides of the river to identify the scale of development that can come forward without a DLR extension, and how much is dependent on the scheme. Over 10,000 units are directly dependent on the extension in Greenwich, with up to 5,000 units dependent in Newham.

West London Orbital

The West London Orbital is a rail scheme which will enhance public transport connectivity (in particular orbital connectivity) in west and north west London. The scheme provides a direct link between Hounslow to Cricklewood via the major growth areas at Old Oak and Brent Cross. Initial work undertaken in partnership with the boroughs has identified that the scheme could unlock around 10,000 new housing units. Further work to refine this estimate is currently underway.

Sutton Link

The Sutton Link is a potential 8km on-street tram route from South Wimbledon or Colliers Wood to Sutton town centre via Morden. Bus Rapid Transit (BRT) options are also being considered. A detailed assessment of potential development sites has identified that the tram scheme could support up to 9,000 new housing units.

Elizabeth Line Extension

The Elizabeth line extension could link to High Speed 1 at Ebbsfleet, boosting rail connectivity throughout the Wider South East and providing vital support for growth in Kent. The Government's Thames Estuary Growth Commission identified that the scheme could help to unlock up to 55,000 new homes. This figure is currently being refined as part of more detailed work being undertaken by the Crossrail to Ebbsfleet Partnership.

Projections of future passenger and freight demand indicate that the south east of England needs additional aviation capacity. However, whether airport expansions are compatible with inclusive and sustainable growth crucially depends on whether the environmental and health impacts can be fully addressed, including through adequate investment in new infrastructure.

- London's major airports support vital trade, inward investment and tourism, and provide a significant number of jobs. They are crucial to London's continuing international competitiveness and world-city status. The Airport Commission forecast the need for additional runway capacity in the south east to meet demand (in line with Airports Commission forecasts)⁴⁰⁶.
- At the same time, the challenges associated with air travel must be addressed including carbon emissions, air and noise pollution – as well as securing sustainable surface access without placing undue pressure on existing transport networks.
- Specifically, TfL has estimated that an expanded Heathrow Airport would mean an additional 135,000 trips by passengers and staff each day and that for this to happen without extra road trips to and from the airport the percentage of people using public transport to get there would need to increase from 39% to 66%⁴⁰⁷.
- For significant airport expansion to be accommodated sustainably and not lead to additional road traffic movements, it will require major investment in new infrastructure by airport authorities and central Government, particularly rail, in order to deliver the necessary additional capacity and connectivity.
- The draft London Plan sets out the Mayor's policy on aviation⁴⁰⁸.

⁴⁰⁶ Airports Commission (2015), '[Airports Commission: Final Report](#)'.

⁴⁰⁷ TfL (2018), '[Heathrow third runway: Surface access analysis](#)'.

⁴⁰⁸ Mayor of London (2018), '[Draft London Plan](#)' Policy T8 Aviation.

5.4 Social infrastructure for inclusive growth

Social infrastructure, such as schools and hospitals, is needed for a growing population especially in areas of major housing development.

- Social infrastructure covers a range of services and facilities that are important for inclusive growth and quality of life. It includes health services, education, community, play, youth, recreation, sports, faith, and emergency facilities. Green infrastructure in all its forms is also a key component of social infrastructure and is discussed later in this chapter.
- The draft London Plan sets out some of the social infrastructure challenges in London and planning policies to ensure there is enough provision. Population growth means there is expected to be a significant requirement for new social infrastructure. For example, there is an estimated need for 71,000 additional childcare places between 2016 and 2041⁴⁰⁹. There is also projected demand for an additional 60,000–67,000 primary school places and 105,000–122,000 secondary school places in state-maintained schools up to 2025⁴¹⁰.

⁴⁰⁹ GLA (2017), [‘Childcare Demand Projections 2017’](#).

⁴¹⁰ GLA (2015), [‘Projected Demand for School Places’](#).

5.5 Digital infrastructure to support productivity and growth

Fast and reliable digital connectivity is essential for most businesses and households.

- Benefits from fast and reliable digital connectivity include those to consumers of being able to access new services, benefits to businesses from being able to access new markets, cost savings in the delivery of public services, as well as wider indirect impacts such as enhanced labour force participation, potential for innovation, and external impacts such as improvements in health, well-being, and inclusion⁴¹¹.
- It is widely recognised by Government and industry that full-fibre connections are needed to serve the future needs of businesses, households and city infrastructure as more devices become connected to the internet. The Government's Future Telecoms Infrastructure Review sets a goal for universal Fibre to the Premises (FTTP) coverage by 2033.
- Full-fibre connections can deliver speeds greater than 1 gigabit per second (1,000mb/s) compared to standard superfast broadband (part-fibre, part-copper based technology) which offers speeds of up to 30mb/s⁴¹². An evaluation of the Superfast Broadband Programme commissioned by the Department for Digital, Culture, Media and Sport (DCMS) found that firms located in areas where broadband speeds rose by 200mb/s or more experienced an increase in turnover per worker of 3.8%⁴¹³. Full fibre connections are also five times more reliable than copper connections⁴¹⁴ making them cheaper to maintain and operate.
- Research commissioned by the National Infrastructure Commission⁴¹⁵ (NIC) estimated net benefits to the UK from investment in FTTP with 100% coverage of up to £28 billion (in present value terms) by 2050⁴¹⁶.

The capacity and speed of London's fixed and mobile broadband networks need to keep pace with the demands of the modern economy to allow London to remain internationally competitive.

- According to Ofcom, average monthly data use per residential fixed broadband line, and average monthly data use per mobile data connection, increased by 26% to 240GB and 25% to 2.9GB respectively in 2018⁴¹⁷.
- London's superfast broadband coverage (speeds up to 30mb/s) has improved and according to Ofcom data is available to over 96% of all premises in London⁴¹⁸. However, actual speeds achieved by consumers may fall well below this due to local circumstances.
- Deployment of FTTP in the UK lags behind other countries. 4% of premises in the UK have access to FTTP compared with current world leaders like South Korea (c.99%) and Japan (c.97%)⁴¹⁹. According to Ofcom data from September 2018, 11.5% of properties in London have access to FTTP (Figure 5.4).

⁴¹¹ Frontier Economics (2018), '[Future Benefits of Broadband Networks](#)' for the National Infrastructure Commission.

⁴¹² Superfast broadband does not have a single definition. The UK Government defines it as speeds greater than 24Mbps, whereas Ofcom and the European Commission define it as speeds greater than 30Mbps.

⁴¹³ Ipsos MORI (2018), '[Superfast Broadband Programme Evaluation Annex B: Economic Impacts](#)' for the Department for Digital, Culture, Media and Sport.

⁴¹⁴ National Infrastructure Commission (2018), '[National Infrastructure Assessment](#)' p.18.

⁴¹⁵ Frontier Economics (2018), '[Future Benefits of Broadband Networks](#)' for the National Infrastructure Commission.

⁴¹⁶ The estimated benefits include only the benefits to consumers from being able to access new innovative services and cost savings in the delivery of public services. There is no allowance for wider economic benefits associated with productivity improvements, greater scope for innovation, enhanced labour force participation, or 'externality' impacts related to improved health, well-being, inclusion or environmental benefits.

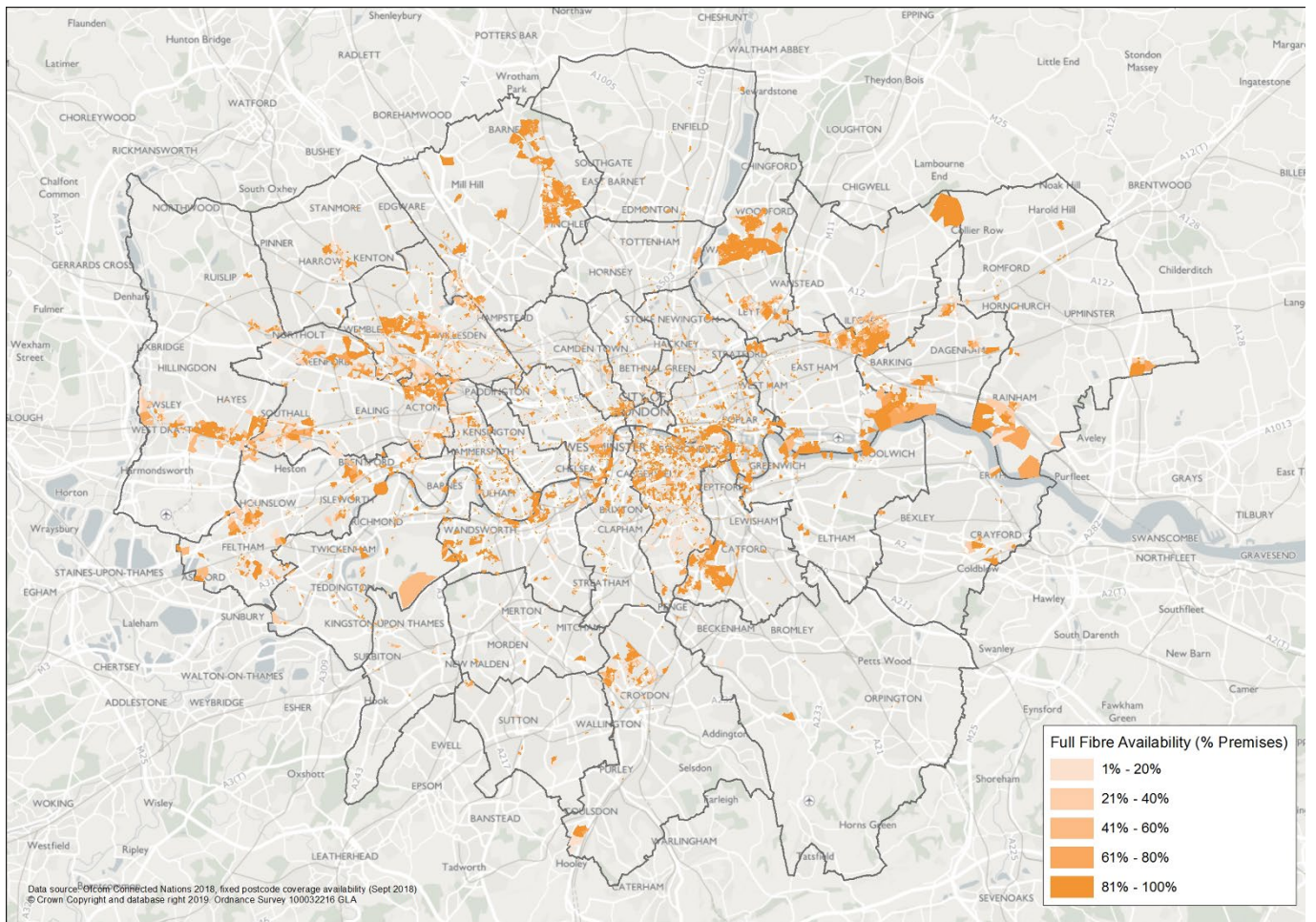
⁴¹⁷ Ofcom (2019), '[Communications Market Report 2019](#)'.

⁴¹⁸ House of Commons Library (2018), '[Superfast broadband in the UK](#)'. Briefing paper CBP06643, 13 November 2018.

⁴¹⁹ DCMS (2018), '[Future Telecoms Infrastructure Review](#)'.

- While there is strong private sector interest and investment in FTTP in London, there are barriers that could slow down deployment and increase costs, necessitating government intervention. Issues identified by stakeholders in London include access to properties (wayleave agreements) and the ‘hold-up’ problem, whereby monopoly incumbent copper providers have little incentive to invest in full fibre⁴²⁰.

Figure 5.4: Availability of Fibre to The Premises in London



Source: GLA analysis of Ofcom data, 2019.

⁴²⁰ The ‘hold-up’ problem occurs in areas where the existing copper provider has little incentive to invest in FTTP unless it faces losing customers to a rival FTTP network. However, a rival network contemplating investment in these areas will anticipate that if it invests the incumbent will follow, with a head start on existing infrastructure and customers. The incumbent, in turn, will be aware that this risk will be sufficient to deter new providers from entering the area. As a result, there is no investment. See DCMS (2018) [‘Future Telecoms Infrastructure Review’](#) for further information.

The rollout of 5G Mobile will support mobile working and a smarter London

- More and more of London's infrastructure and transport services (including driverless cars) will need fast and reliable mobile internet connections in the future.
- 5G is expected to deliver faster and better mobile broadband services to consumers and businesses, enabling innovative new services across many sectors of the economy.
- In some parts of London where mobile 4G services are theoretically available, for example around London's mainline stations, networks can struggle to cope with demand at peak times. 5G should help to increase the capacity and improve the resilience of mobile networks.
- While London represents an attractive market for Mobile Network Operators to invest, stakeholders have identified some barriers to 5G deployment. These include access to sites and planning regulations which need to facilitate the deployment of communications infrastructure like masts, and in future, small cells⁴²¹.
- The London Underground has historically been difficult to serve with mobile and internet coverage but TfL plans to offer mobile connectivity from all operators, and to deploy fibre through its network of tunnels creating a fibre spine across the city to which broadband providers can connect.

⁴²¹ For a discussion of the barriers to 5G deployment, see Ofcom (2018), ['Enabling 5G in the UK'](#).

5.6 Infrastructure to meet the clean growth imperative

Long-term economic growth will need to be clean, otherwise it could be constrained by higher pricing of externalities, legal requirements, or changing business and consumer attitudes.

Air quality in many parts of London regularly exceeds the legal limits, posing a risk to health and productivity. Investing in cleaner transport infrastructure and services will be necessary to address the issue.

- London is the UK's main air pollution hotspot. Nitrogen dioxide (NO₂) concentrations are particularly bad in central London, across much of inner London and along major roads, although there are locations in every borough that exceed legal limits (Figure 5.5).
- Particulate emissions pose a significant threat to cardiovascular and lung health, having been linked to several conditions such as asthma and cancer. The UK has a legal duty to protect the quality of air citizens breathe and faces the risk of EU fines for breaching limit values for air pollutants concentrations under the Ambient Air Quality Directives.
- But the health problems resulting from exposure to air pollution also have a high cost to society, contributing to chronic health problems and in the worst cases premature deaths. Economic costs include those to the health service through hospital admissions and productivity as poor health affects peoples' ability to work.
- There are well-documented inequalities in the distribution of pollutants in London, with people living in the most deprived areas being more likely to be exposed to poor air quality than those in less deprived areas⁴²².
- The Royal College of Physicians and Royal College of Paediatrics and Child Health concluded that overall exposure to air pollution is linked to around 40,000 early deaths in the UK each year, with an associated annual social cost of £22.6 billion⁴²³.
- 24% of all schools in London are exposed to an annual average NO₂ concentration above the legal limit (Figure 5.5)⁴²⁴. Moreover, primary school children travelling to school in London are five times more exposed to air pollution than at any other time of the day⁴²⁵.
- Looking at the sources of air pollution in London, road transport contributes to around half of nitrogen oxide emissions (NO_x) and over a quarter of particulate emissions (PM₁₀ and PM_{2.5})⁴²⁶. Diesel vehicles are the worst contributors, accounting for 23% of NO_x and 12% of the particulate emissions from road transport. Investing in cleaner transport infrastructure and services (e.g. charging points for electric vehicles and zero emissions buses) is a key part of the Mayor's Transport Strategy with the aspiration to achieve zero emission transport in London by 2050.
- Gas combustion for heat and power generation is also a large contributor to poor air quality. 10% of total NO_x emissions originate from gas combustion for commercial use and 6% from gas combustion for residential use⁴²⁷.

⁴²² King, K. and Healy, S. (2013), '[Analysing Air Pollution Exposure in London](#)'. 51% of Lower Layer Super Output Areas (LSOAs) within the most deprived 10% of London have concentrations above the NO₂ EU limit value. This contrasts with 1% above the NO₂ EU limit value in the 10% least deprived areas.

⁴²³ Royal College of Physicians and Royal College of Paediatrics and Child Health (2016), '[Every breath we take: The lifelong impact of pollution](#)'. This methodology uses the standard impact pathway approach, beginning with the source of pollution (e.g. road transport) to dispersion and atmospheric conversion (e.g. from primary NO_x to secondary pollutants such as ozone, O₃) and the subsequent health impact (e.g. number of hospital admissions, premature deaths) and monetisation by valuing the 'life years lost' due to air pollution.

⁴²⁴ GLA and TfL Air Quality (2016), '[London Atmospheric Emissions Inventory](#)'.

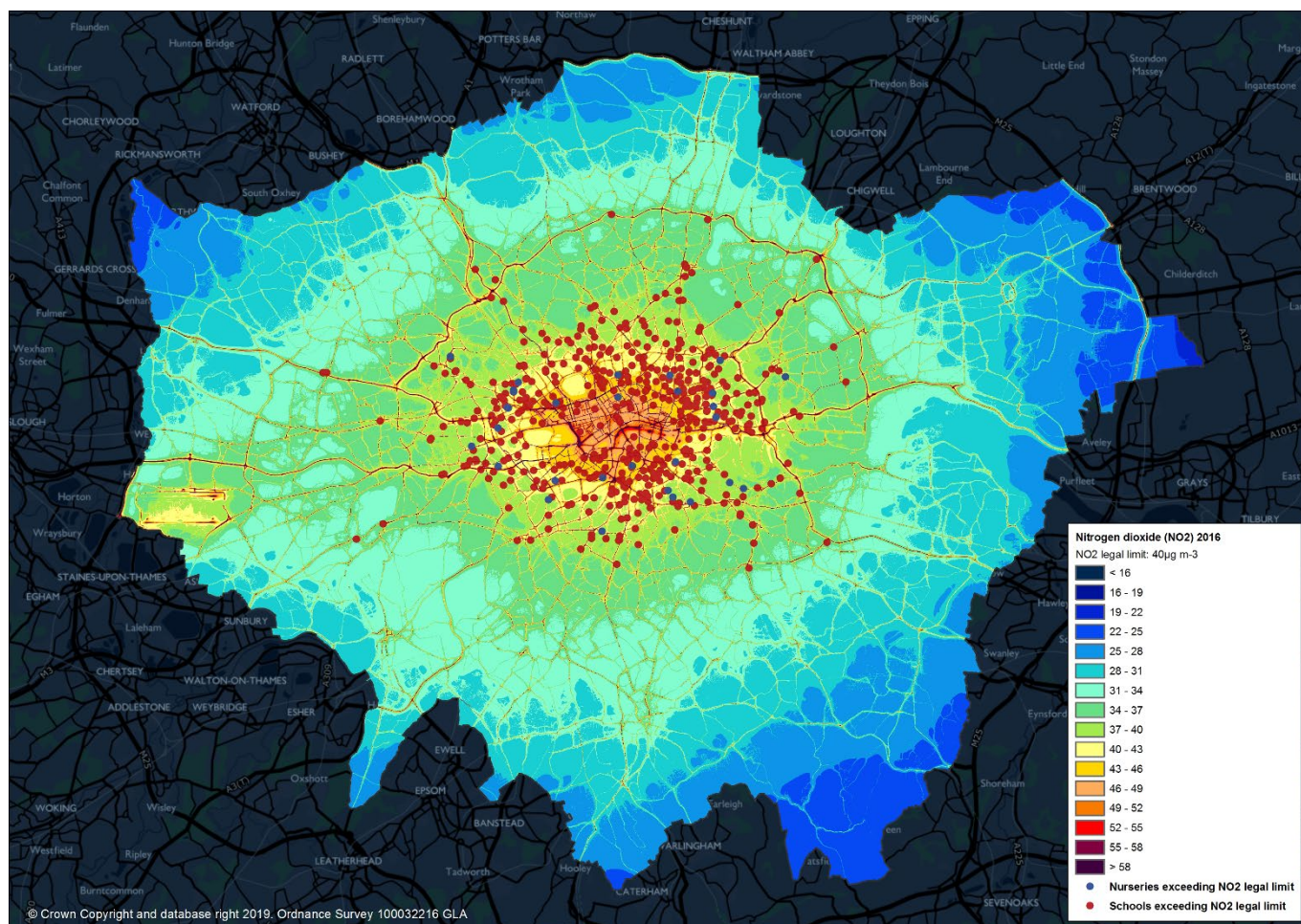
⁴²⁵ King's College London (2019), '[The Breathe London Wearables Study: Engaging primary school children to monitor air pollution in London](#)'.

⁴²⁶ GLA and TfL Air Quality (2016), '[London Atmospheric Emissions Inventory](#)'.

⁴²⁷ Ibid.

- Nearly half of PM₁₀ and PM_{2.5} emissions in London originate from industrial and commercial use, mostly from the emissions associated with construction (e.g. dust and exhaust fumes from non-road mobile machinery)⁴²⁸.

Figure 5.5: Annual average concentrations of nitrogen dioxide (NO₂) across London, 2016



Source: GLA and TfL Air Quality [London Atmospheric Emissions Inventory \(2016\)](#).

Note: the legal limit is 40 µg m⁻³. All areas in yellow, orange and red exceed this limit.

The transition to net zero carbon will require London to make significant investments in low-carbon energy infrastructure.

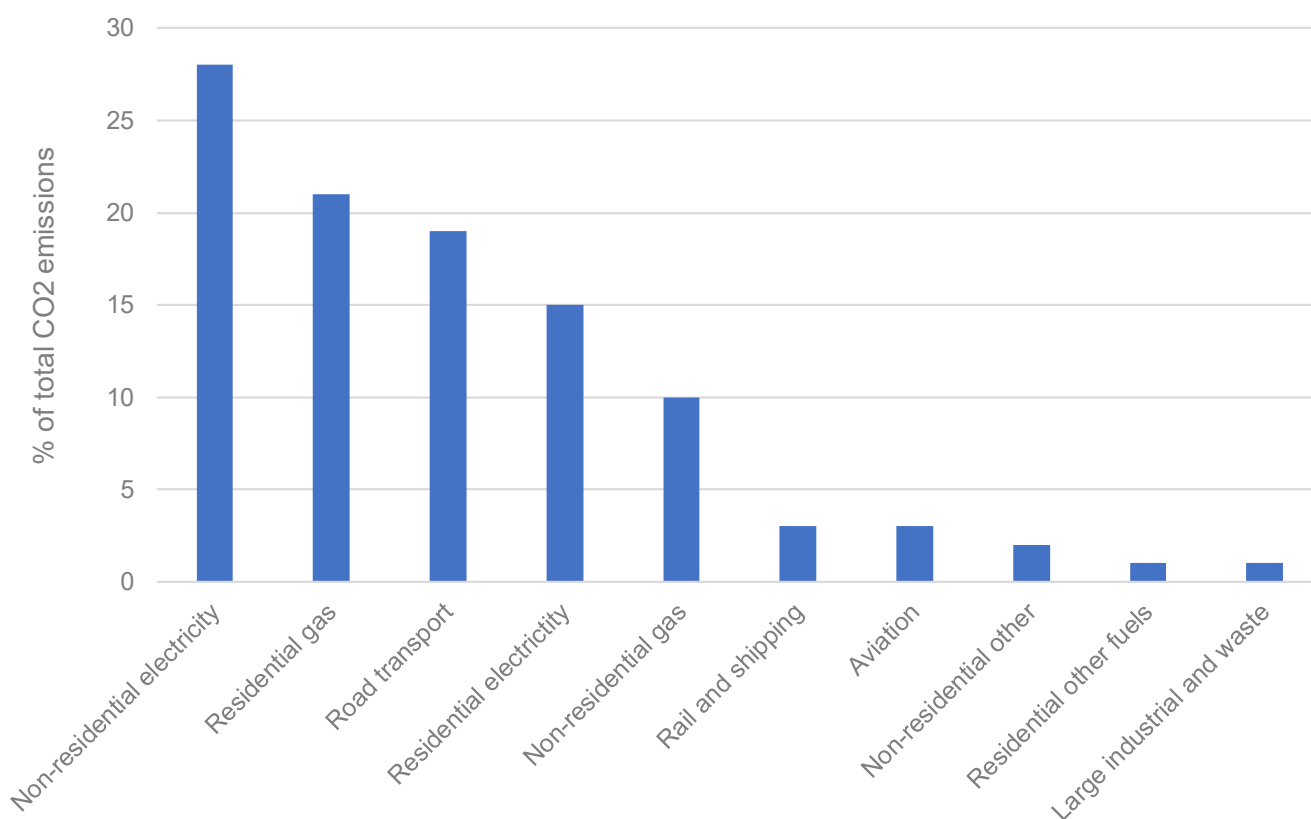
- Energy is a key input to the production process for businesses and access to power and heat is a basic requirement for all residents and workers in London. However, the full social cost of the consumption of fossil fuels, which generate carbon emissions and contribute to climate change, is not taken into account in the decision-making of most businesses and consumers, hence the need for government intervention to secure a more efficient market for energy.
- In 2016, London's greenhouse gas emissions were estimated at around 31 MtCO₂e (million tonnes of carbon dioxide equivalent)⁴²⁹. This represents a 32% reduction on 1990 levels.

⁴²⁸ Ibid.

⁴²⁹ London Energy and Greenhouse Gas Emissions Inventory ([LEGGI](#)).

- Approximately 36% of London's CO₂ emissions come from residential gas and electricity⁴³⁰. 40% comes from heating and powering workplaces and 24% from transport (Figure 5.6).

Figure 5.6: CO₂ emissions by source in London, 2015



Source: Mayor of London (2018), *London Environment Strategy*.

- Scenarios developed for the London Environment Strategy show the possible pathways towards London becoming a net zero carbon city by 2050 (Box 5.3). Achieving this objective will require a mix of national and local policy interventions and investment to support a move away from power, heat and transport networks that rely on fossil fuels.
- All the scenarios rely on a significant increase in energy efficiency building retrofits by 2030. Only 35% of homes currently achieve adequate energy efficiency performance (EPC C or above) and at least 70% need to achieve EPC C by 2030⁴³¹. Less than 1% of new build dwellings in London achieve the highest energy efficiency rating (EPC A)⁴³².
- Retrofitting homes and delivering new energy efficient homes will be costly and require innovation in housing design and construction methods to make it possible.

⁴³⁰ Mayor of London (2018), [‘London Environment Strategy’](#).

⁴³¹ Element Energy in Mayor of London (2018), [‘Zero Carbon London: A 1.5°C compatible plan’](#).

⁴³² Mayor of London (2019), [‘Housing in London: The evidence base for the Mayor’s Housing Strategy’](#) p.115.

Box 5.3: Pathways to net zero carbon by 2050

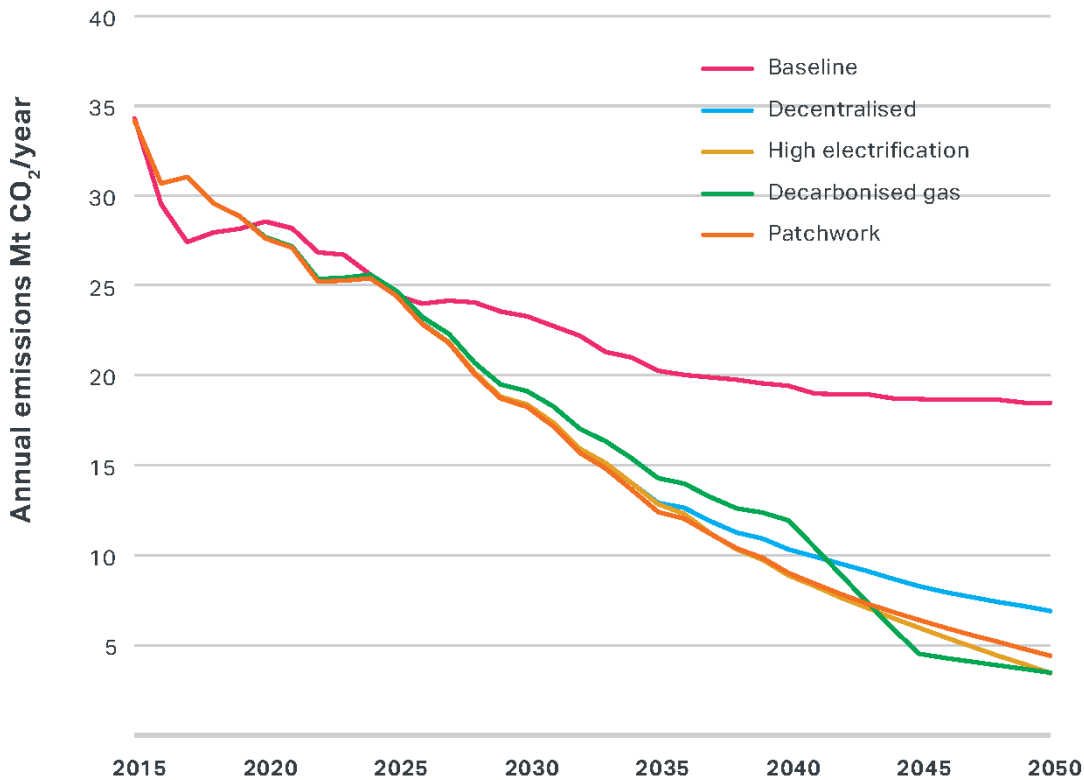
In 2015 the UK signed up to the Paris Agreement along with 178 other countries to try to limit the global average temperature rise to 1.5°C above pre-industrial levels. Cities like London need to achieve a steady decline in greenhouse gas emissions and the Mayor's Environment Strategy is designed to be compatible with the highest ambition of the Paris Agreement, committing London to becoming a net zero carbon city by 2050.

In order to meet the Mayor's net zero carbon target, the GLA has modelled a number of different scenarios for London's future energy systems. The four scenarios are:

- Decentralised energy – focused on heat networks.
- High electrification – heat pumps powered by a renewable electricity grid.
- Decarbonised gas – hydrogen replaces gas in the grid. Carbon capture and storage enabling hydrogen to be made from natural gas.
- Patchwork – a combination of heat pumps, heat networks and a partial hydrogen network.

Figure 5.7 shows the projected level of carbon emissions in the four scenarios. All would achieve deep decarbonisation, but some have higher cumulative emissions.

Figure 5.7: London's projected emissions in different scenarios (MtCO₂e) 2015-2050



Source: Element Energy⁴³³.

⁴³³ Element Energy in Mayor of London (2018), '[Zero Carbon London: A 1.5°C compatible plan](#)'.

At the same time, a fuel poverty programme targeting support for those less able to meet the costs of energy consumption could help to address social inclusion.

- In 2016, there were an estimated 341,000 London households living in fuel poverty⁴³⁴, 10% of all households in the capital. This was slightly below the national average of 11% of English households living in fuel poverty⁴³⁵.
- In 2016, the fuel poverty gap - the amount needed to avoid falling into fuel poverty – in London was estimated to be £298 compared to £326 nationally⁴³⁶.
- There is evidence that living in a cold home is associated with poor health, including an increased risk of disease and death for all age groups. Health impacts include mental health issues, as well as respiratory and circulatory problems⁴³⁷. These in turn impact on productivity through increased rates of morbidity and mortality in the workforce.
- For more detailed analysis on fuel poverty in London see The London Fuel Poverty Action Plan and supporting evidence⁴³⁸.

⁴³⁴ Fuel poverty in England is measured using the Low Income High Costs (LIHC) indicator. Under the LIHC indicator, a household is considered to be fuel poor if: 1) they have required fuel costs that are above average (the national median level); and 2) were they to spend that amount, they would be left with a residual income below the official poverty line.

⁴³⁵ BEIS (2018), [Fuel Poverty Statistics Detailed Tables 2016](#) Table 6.

⁴³⁶ Mayor of London (2018), '[London Fuel Poverty Action Plan](#)'.

⁴³⁷ Ibid.

⁴³⁸ Ibid.

5.7 Infrastructure for resilient growth

To continue to grow, London will also need to meet the resource needs of a growing population efficiently whilst also adapting to a changing climate.

- Climate change is expected to mean hotter, drier summers and extreme weather events. The Thames Water area of London and the Wider South East are already classed by the Environment Agency as 'seriously water stressed'⁴³⁹. Thames Water predicts that without action, the combination of climate change and population growth in London will lead to a shortfall between the amount of water available and the amount needed of 864 million litres per day by 2100⁴⁴⁰.
- Climate change is also expected to increase the frequency of intense precipitation events that lead to flash, surface and fluvial flooding. The combination of freshwater flow and rising tidal waters expected to affect the Thames means that much of London is at risk from flooding⁴⁴¹. Currently 6% of London is at high risk (1 in 30-year event) of tidal, river or surface water flooding and 11% at medium risk (1 in 100-year event) (Figure 5.8)⁴⁴².
- Planning for resilience to these events could save costs. For example, the National Infrastructure Commission⁴⁴³ estimate that relying on emergency measures in the case of extreme drought would cost the UK an estimated £40bn over the next 30 years, while introducing more resilient systems and processes would cost £21bn.

⁴³⁹ The water stress method takes a long-term view of the balance between water availability and the demand for public water supply.

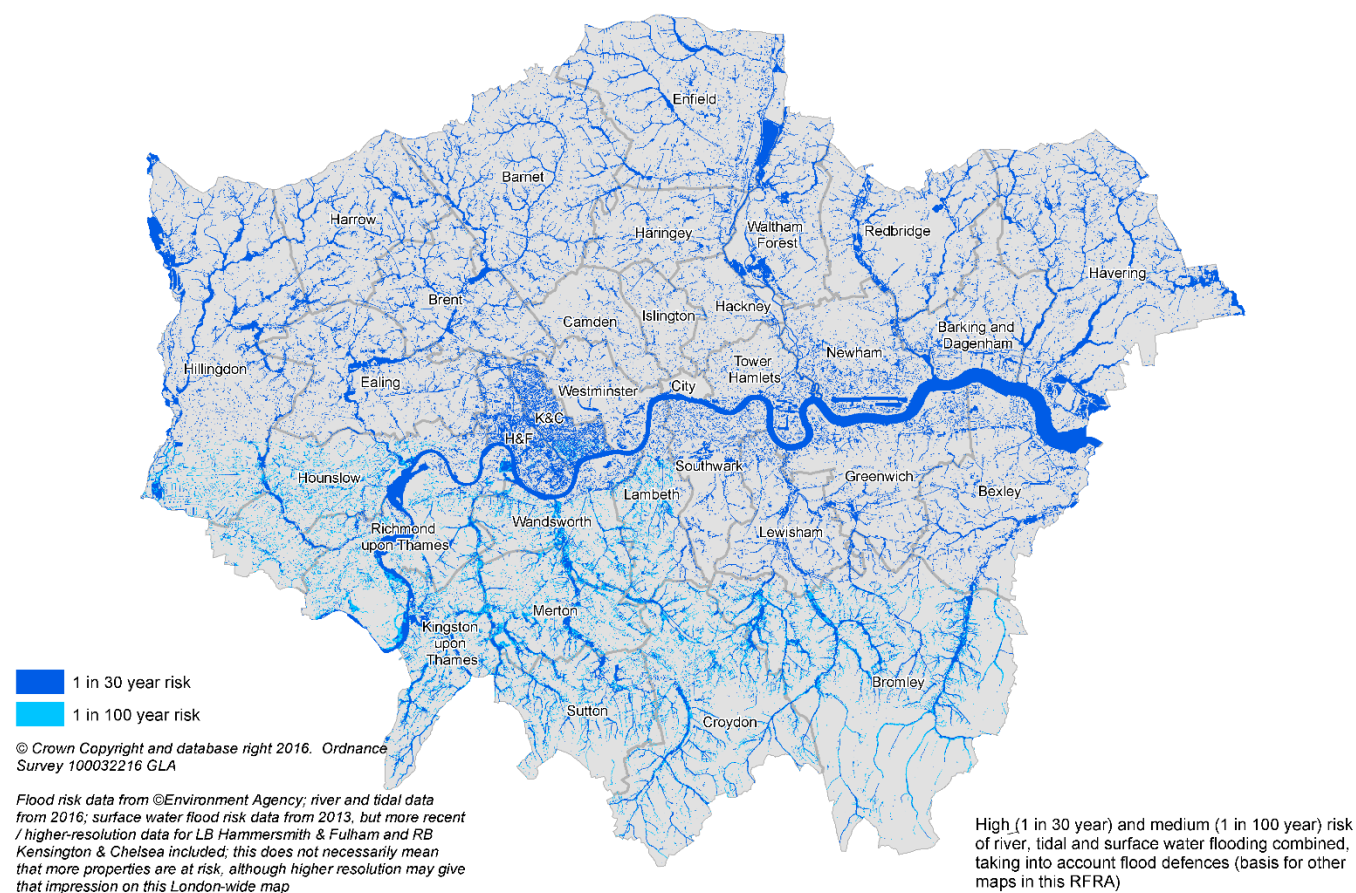
⁴⁴⁰ Thames Water (2018), ['Draft Water Resource Management Plan'](#).

⁴⁴¹ UKCP09 Projections in Mott MacDonald (2018) ['Technical Assistance to Deliver London's Climate Action Plan'](#). Climate Action Planning Technical Assistance Programme Work Package 4: Impacts Assessment.

⁴⁴² GLA (2018), ['Regional Flood Risk Appraisal'](#). This is based on Environment Agency mapping that combines tidal, fluvial and surface water flood risk.

⁴⁴³ National Infrastructure Commission (2018), ['National Infrastructure Assessment'](#) p.85.

Figure 5.8: Risk of flooding from multiple sources in Greater London, 2017



Source: Environment Agency data in GLA (2018) Regional Flood Risk Appraisal.

- A growing population in London also means more waste. The management and disposal of this waste generates negative external environmental impacts such as greenhouse gas emissions, water pollution and contamination of land. The full social cost of these impacts is not fully taken into account in the consumption and production decisions of consumers and businesses⁴⁴⁴. There is growing recognition of these external environmental costs such as the damage caused by plastics entering the ecosystem.
- Around seven million tonnes of waste are produced from London's homes, public buildings and businesses each year. Local authorities deal with about half of this waste and the rest is dealt with by the private sector. Around two-thirds of Local Authority Collected Waste (LACW) is either incinerated or sent to landfill. Both are undesirable, costly and an inefficient use of resources.
- Relative to other regions, London has the lowest rate of household recycling at 27% of LACW compared an average of 41% for the rest of England (Figure 5.9).
- London manages around half the waste it produces. The rest is exported to other parts of the UK (mainly the Wider South East) or abroad. The capacity of landfills accepting London's waste is expected to run out by 2026 and no new capacity is currently planned⁴⁴⁵.

⁴⁴⁴ For a longer discussion of the market failures in the waste market see Defra (2011), [‘The Economics of Waste and Waste Policy’](#).

⁴⁴⁵ GLA (2018), [‘London Environment Strategy: Evidence Base’](#).

Figure 5.9: Regional Local Authority Collected Waste recycling rates⁴⁴⁶

Source: Defra, LACW statistics 2017-18.

Infrastructure investments will need to play a role alongside creative approaches to demand management in meeting these scarcity and resilience challenges.

- Thames Water's draft Water Resource Management Plan has examined new water supply options including new reservoir storage, water transfer, groundwater abstraction, river abstraction, water reuse, desalination, aquifer recharge/storage and recovery⁴⁴⁷. A major new water resource (likely to be a reservoir) is needed by 2037 to meet demand.
- Action is also needed to maintain and improve the resilience of the existing water supply network. Around 25% of the water put into Thames Water's supply is lost through leaks from supply pipes and customers' pipes. Reducing leakage will require a major programme to replace and repair water pipes.
- Londoners also need to use less water. On average, households that have a smart meter reduce their water use by between 15-20%⁴⁴⁸. Rolling out smart meters to a large proportion of London's population will therefore be important to help them manage their consumption better, improving water conservation across the city.
- Whilst well protected against tidal flooding now by the Thames Barrier, climate change will make existing defences vulnerable. The costs of a major flood to London's economy would be severe in terms of damage and disruption. Much of the current flood management infrastructure, constructed 30 years ago and in some cases more, is gradually deteriorating and will come to the end of its useful life during the period 2030 to 2060⁴⁴⁹. The Thames Estuary 2100 Plan sets out future requirements for London's tidal flood defences.

⁴⁴⁶ Defra, LACW statistics 2016/17

⁴⁴⁷ Thames Water (2018), '[Draft Water Resources Management Plan 2019](#)'.

⁴⁴⁸ Ibid.

⁴⁴⁹ Environment Agency (2012), '[Thames Estuary 2100 Plan](#)'.

- Alongside this, more of London's surface water needs to drain to Sustainable Urban Drainage Systems (SUDS) to prevent it entering the combined sewerage network.
- London's waste infrastructure requirements in different scenarios are set out in the London Environment Strategy and the supporting Evidence Base. These will depend on the amount of waste produced per person, the amount of waste recycled, and how food waste is handled. London needs both to reduce the amount of waste produced, and ensure it has access to sufficient capacity to recover value from more of its waste and remove the reliance on landfill.
- Waste is also an input to economic activity from the recovery of material or energy from waste. The way waste is managed, and materials reused, could support new forms of economic activity in the 'low carbon circular economy', one that seeks to keep products, components and materials at their highest use and value at all times. Analysis by Amec Foster and Wheeler found that it could contribute an additional £7bn per annum to the London economy based on the net financial benefits in five areas, namely: the built environment, food, textiles, electricals and plastics⁴⁵⁰.

Resilient and well-planned infrastructure also requires coordination between organisations and greater acknowledgement of the interdependencies between infrastructure systems.

- The infrastructure market in London can suffer from coordination and information failures between infrastructure providers, leading to maintenance and reinforcement happening in silos⁴⁵¹. When streets are unnecessarily dug up more than once it leads to social costs such as travel delays, carbon emissions and pollution. Moreover, coordinating the necessary investment in infrastructure in parallel (or ahead of) major development in London can be challenging, leading to delays or suboptimal development. The Mayor is seeking to address these challenges through the creation of a new Infrastructure and Development Coordination Team.
- Infrastructure systems are increasingly interdependent; a catastrophic failure of one system (e.g. digital) can have major knock-on impacts to another (e.g. transport). But these interdependencies can also bring benefits, for example using the batteries in electric vehicles to store electricity from renewable energy supplies and better match electricity demand with supply. Research by the Infrastructure Transitions Research Consortium (ITRC) highlights the need for Infrastructure to be understood, and planned for, as an integrated system of systems for it to be more resilient and contribute to sustainable development⁴⁵².

⁴⁵⁰ See London Waste & Recycling Board, '[Towards a circular economy – context and opportunities](#)'.

⁴⁵¹ Mayor of London (2018), '[Infrastructure and Development Coordination Business Case](#)'.

⁴⁵² UNOPS (2018), '[Infrastructure: Underpinning Sustainable Development](#)'.

5.8 Green infrastructure for well-being and productivity

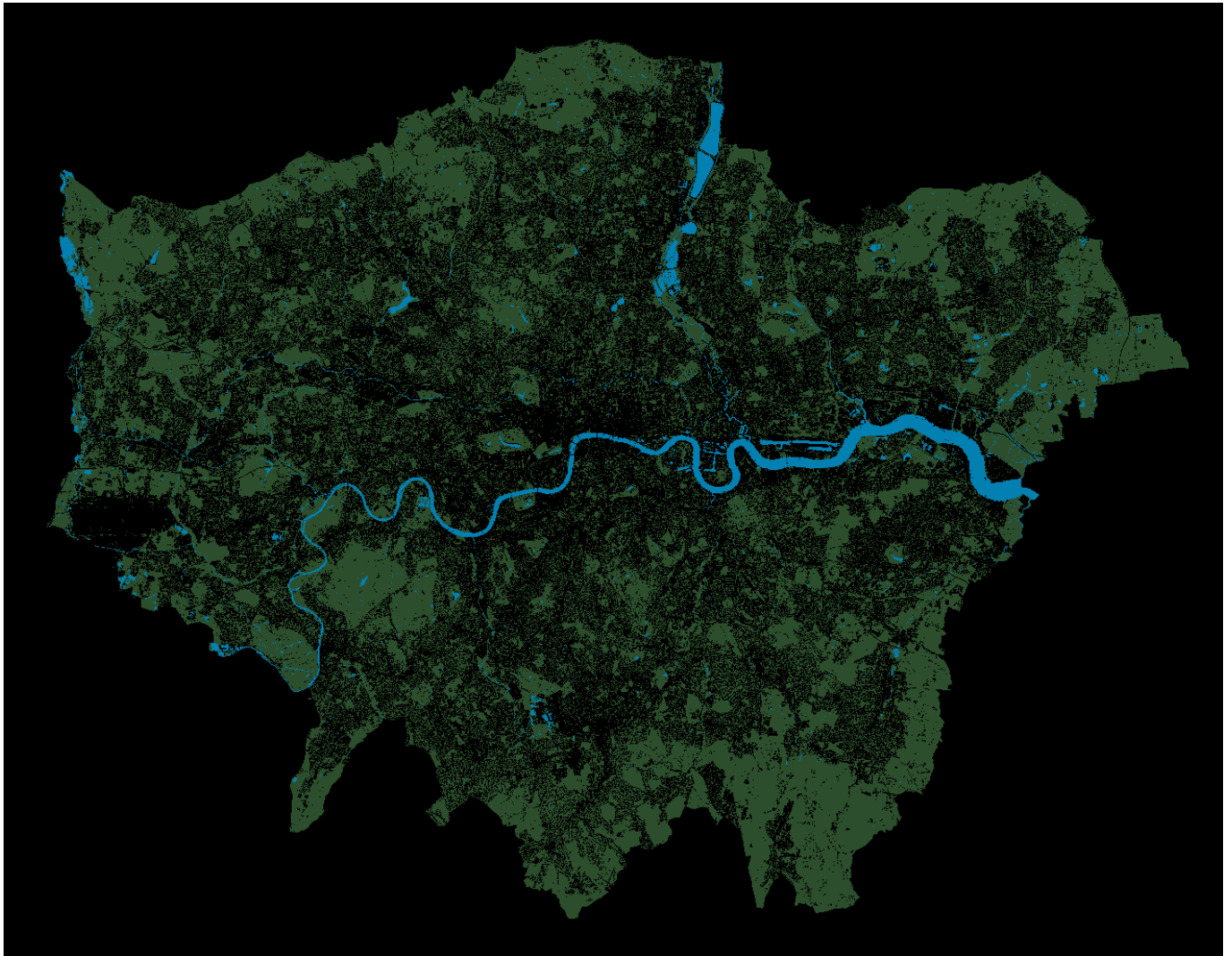
Continuing to invest in green infrastructure should support Londoners' health, well-being and productivity, as well as helping to mitigate the impacts of climate change.

- Green infrastructure can promote healthier living, enhance mental well-being, increase property values and reduce the burden on other infrastructure such as the drainage and sewerage system. These benefits are economically valuable but are not widely understood.
- Methodologies such as Natural Capital accounting have sought to address this by presenting the benefits in a similar way to other capital assets. In London, a Natural Capital account for London's Parks and Green Spaces⁴⁵³ and an economic evaluation of London's trees and woodlands showed that:
 - Public parks and green spaces provide services, such as the improvement of public health, that are valued at £5bn per year, with each £1 spent on public green space providing at least £27 of economic value.
 - London's approximately eight million trees provide at least £133m of economic benefits a year by removing pollution, storing carbon and reducing surface water flooding.
- The impacts of population growth and climate change in London will require the provision of more green infrastructure to:
 - Provide Londoners with sufficient open space (for their health, well-being and recreation needs).
 - Increase London's resilience to climate change.
 - Ensure the conservation and enhancement of the natural environment.
- A surprisingly large amount of London's land area is already 'green' - estimated to be between 48%-51% (Figure 5.10). However, there is an average net loss of between 10 and 15 hectares of green space each year to new development⁴⁵⁴. While these losses can be relatively small at the margin, over time they erode and further fragment the green infrastructure network and are not easily replaced.
- The efficiencies that can be achieved through 'clean growth', and the political imperative of tackling climate change, mean there are significant opportunities for growth in the environmental goods and services sector. London's strengths in these areas are set out in Chapter 6.

⁴⁵³ Vivid Economics (2017), '[Natural capital accounts for public green space in London](#)'. Report for the Greater London Authority, National Trust and Heritage Lottery Fund.

⁴⁵⁴ GLA (2017), [London Development Database](#).

Figure 5.10: Green cover in London



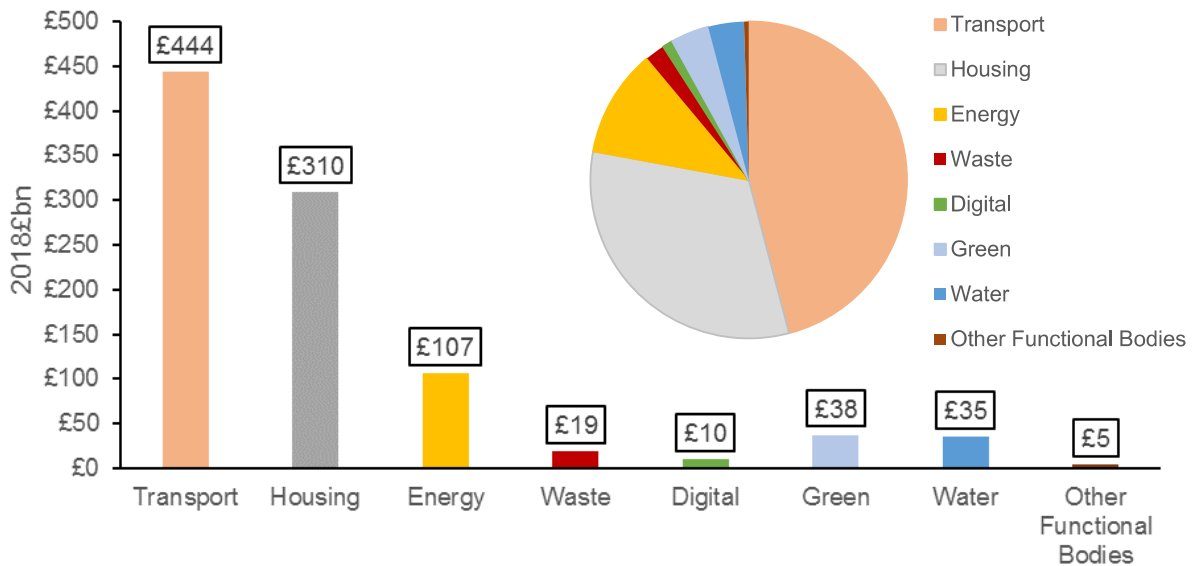
Source: Mayor of London, [Green Infrastructure Maps and Tools](#).

5.9 Funding London’s infrastructure requirements

A major programme of public and private sector investment is needed to deliver the infrastructure London needs but there is a large funding gap. Alongside cost efficiencies, new funding sources need to be found to close the gap.

- Modelling for the GLA by consultants Arup puts the total capital and operating expenditure requirements for London’s infrastructure in the region of £968bn (2018 prices) over the period from 2019 to 2041⁴⁵⁵. This includes all the private and public sector expenditure needed to meet the Mayor’s policy objectives across transport, affordable housing, energy, water, waste, green, and digital infrastructure. Approximately 80% of the estimated costs relate to transport and affordable housing investment requirements (Figure 5.11).
- Based on current levels of funding, the public sector funding gap is estimated to be £121bn (2018 prices) in the period from 2019 to 2041. Closing the gap will require a range of measures including better use of existing assets, deriving greater commercial income from the infrastructure asset base, and cost savings in future projects.
- However, even with these efficiency measures, new funding mechanisms will need to be considered. One is the tax uplift anticipated from some of the major housing and transport investments in the Mayor’s strategies. In addition, there may be a need to introduce additional marginal local taxation or new fees and charges to fund the infrastructure London needs to grow sustainably. To address the infrastructure funding challenge, the Mayor has argued for more funding and powers to be devolved to London government, as set out in the report of the London Finance Commission⁴⁵⁶.

Figure 5.11: Infrastructure expenditure requirements by type 2019-2041



Source: Arup.

Note: ‘Other Functional Bodies’ refers to the estimated capital requirements for fire and police services and the Mayor’s development corporations (and excludes operating expenditure requirements).

⁴⁵⁵ GLA (2019), ‘[The cost of London’s infrastructure requirements to 2041 and the funding gap](#)’.

⁴⁵⁶ London Finance Commission (2017), ‘[Devolution: a capital idea](#)’.

6 Ideas

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6.1 Introduction

Innovation is a critical driver of productivity growth, at the national and local level. The economic literature points to the key role of technological change (brought about by innovation) in supporting long-term growth, allowing output to be increased without requiring more inputs⁴⁵⁷.

Innovation is important too from the perspective of inclusion, both in terms of the process – the extent to which all individuals, social groups, firms, sectors and places can participate in innovation – and in terms of whether and how innovation contributes to inclusive growth outcomes. Local innovation, especially in partnership with other community stakeholders, can also help to generate solutions to local challenges, for example around sustainability or the delivery of public services.

This chapter presents evidence on London's innovation performance across a range of indicators. It examines both inputs to and outputs from the innovation process, barriers to innovation and industry research strengths. It also presents data on the inclusiveness of innovation in London – the extent to which all of London's businesses and all Londoners can participate in innovative activities. Finally, it touches on how innovation is likely to impact on the London economy in the future.

The evidence presented in this chapter is indicative of London's innovation performance rather than a conclusive assessment. Data on innovation performance at the local level is not extensive and there are important limitations associated with many of the main indicators. The Greater London Authority will look to carry out more analysis of the city's innovation performance in the future to further develop this picture.

⁴⁵⁷ See Huggins, R. (2018), '[Innovation and Productivity: Towards a Research and Policy Agenda](#)' and Department for Business, Innovation and Skills (2011), '[Innovation and Research Strategy for Growth](#)' for an overview of the theory.

Box 6.1: Defining R&D, innovation and inclusive innovation

Research and development (R&D) is defined by the OECD as comprising “creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.” It covers three types of activity: research, applied research and experimental development⁴⁵⁸.

Innovation is typically thought of as a broader concept than simply R&D. The OECD for example defines innovation as four activities⁴⁵⁹:

- 1. Product innovation:** A good or service that is new or significantly improved.
- 2. Process innovation:** A new or significantly improved production or delivery method.
- 3. Marketing innovation:** A new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.
- 4. Organisational innovation:** A new organisational method in business practices, workplace organisation or external relations.

Similar definitions are employed by the European Commission and in the UK^{460,461}.

The criticism of this definition that it focuses heavily on degree of novelty as the mark of innovation, and has nothing to say about the extent to which new innovations diffuse and are adopted. This is where the potentially transformational impact of innovation lies⁴⁶². We need to take account of both new-to-market and new-to-firm innovations.

The OECD defines *inclusive innovation policies* as those that: “aim to remove barriers to the participation of individuals, social groups, firms, sectors and regions that are underrepresented in innovation activities. Their objective is to offer all segments of society equal opportunities to successfully participate in and benefit from innovation⁴⁶³.”

⁴⁵⁸ OECD (2015), '[Frascati Manual 2015: Guidelines for Collecting and Reporting data on Research and Experimental Development](#)' (pp. 44-45).

⁴⁵⁹ OECD, '[Defining Innovation](#)'.

⁴⁶⁰ Eurostat, '[Glossary: Innovation activity](#)'.

⁴⁶¹ Department for Business, Energy and Industrial Strategy, '[The UK Innovation Survey: Headline Findings 2014 to 2016](#)'.

⁴⁶² Greater Manchester Independent Prosperity Review (2019), '[Understanding Innovation and Innovation Ecosystems](#)'.

⁴⁶³ Planes-Satorra, S. and Paunov, C. (2017), '[Inclusive innovation policies: Lessons from international case studies](#)' (p. 6).

6.2 The importance of innovation for local inclusive growth

There is now a substantial body of research linking innovation to productivity growth at the national level, but also highlighting the importance of innovation for regional and local economic performance.

- Hall concludes from her review of 25 studies that there is a positive relationship between innovation and firm-level productivity, acknowledging the significant difficulties associated with measuring innovation⁴⁶⁴.
- Looking at the UK specifically, the Department for Business, Innovation and Skills (BIS) found a strong correlation between product innovation (developing new products) and labour productivity, with a 1% increase in firms' innovation sales per employee associated with a 0.55% increase in productivity⁴⁶⁵.
- BIS also found in a separate study that 'regions' prosperity significantly depends upon their institutions' capacity to support innovative firms, institutions and people⁴⁶⁶.
- In line with this assessment, econometric analysis for the Greater Manchester Independent Prosperity Review found that the proportion of science and technology jobs in a local economy – a proxy for innovation – is highly correlated with productivity in the UK city-regions studied⁴⁶⁷.

Innovation is also relevant from the perspective of inclusive growth. Tackling the gap between innovative and less innovative firms is important in ensuring that growth and productivity improvements can be achieved across the economy.

- Unequal participation in innovation is starting to be identified as a potential contributor to the widening gap between 'frontier' firms and those that lag behind⁴⁶⁸.
- According to the OECD, while frontier firms invest, innovate and grow their productivity, the bulk of firms that are less productive are unable to keep pace and increasingly unable to benefit from the innovations created at the frontier⁴⁶⁹.
- This growing gap in innovativeness and productivity between firms is linked to inequality between workers, with employees in innovative, knowledge economy firms seeing their wages and opportunities rise, while those in less productive firms see their wages and opportunities stagnate or decline.
- There is plenty of empirical evidence that more innovative or R&D intensive firms pay higher wages on average. This appears to benefit both low and high-skilled workers within the firm, and perhaps particularly the lower skilled. Aghion et al. find that the wage premium to working in a more R&D intensive firm is higher for low-skilled workers than for high-skilled workers. They suggest that this is because of the lower-skilled worker's highly firm-specific skills, which strongly complement the other production factors within the firm⁴⁷⁰.

⁴⁶⁴ Hall, B. (2011), ['Innovation and Productivity'](#).

⁴⁶⁵ Department for Business, Innovation and Skills (BIS) (2011), ['Innovation and Research Strategy for Growth'](#).

⁴⁶⁶ Department for Business, Innovation and Skills (BIS) (2015), ['Mapping Local Comparative Advantages in Innovation'](#) pp. 6.

⁴⁶⁷ Greater Manchester Independent Prosperity Review (2019), ['Audit of Productivity'](#).

⁴⁶⁸ See for example Nesta (2019), ['Imagination Unleashed: Democratising the Knowledge Economy'](#).

⁴⁶⁹ OECD (2017), ['Making Innovation Benefit All: Policies for Inclusive Growth'](#).

⁴⁷⁰ Aghion, D. et al. (2017), ['The Innovation Premium to Low Skill Jobs'](#).

As well as contributing to economic performance via productivity, innovation also has a direct effect on the places where it is located. Innovation clusters can support local job creation, though different studies reach different conclusions about the types of employment created.

- Innovation is a place-based process given the clustering of innovation assets. There is an incentive for universities, research institutes, innovative firms and other innovators to locate next to one another to benefit from economies of agglomeration, including knowledge transfer and the sharing of ideas⁴⁷¹.
- These innovation clusters can have effects on the local labour market in terms of employment, the composition of employment and wages. Employment effects can be direct (in institutions that are part of the cluster), indirect (in businesses servicing the cluster) or induced (arising from the increased demand for goods and services in the local economy generated by employees of the cluster)⁴⁷².
- The academic literature on the effects of innovation clusters on local labour markets does not point to conclusive findings on either the direction of the overall effect on employment or differential impacts on different types of employment (Box 6.2). As a result, it is difficult to draw general conclusions on the inclusive growth impacts of policies aimed at promoting innovation clusters.

⁴⁷¹ See Carlino, G. and Kerr, W. (2014), '[Agglomeration and Innovation](#)'.

⁴⁷² Tyler, P. et al. (2015), '[The Cambridge Bioscience Impact Assessment Study](#)'.

Box 6.2: Studies of the impact of innovation clusters on local employment

There are a number of recent academic studies that have considered the impacts of innovation clusters on local employment. The question of whether jobs in high-tech/innovative clusters impact favourably (through multiplier effects), neutrally or negatively on other forms of local employment is clearly important for an inclusive innovation and from a place perspective.

A review of the literature by Ciarli et al. concludes that, in general, innovation activity leads to increased employment (though not all studies find a positive relationship)⁴⁷³. Different studies however reach different conclusions about the types of employment created.

Looking at the UK specifically, Lee and Clarke find that high-tech jobs have a positive employment multiplier, with most of the jobs they create located in low-paying services and going to low-skilled residents⁴⁷⁴.

Tyler et al.'s assessment of the local economic impact of the Cambridge biosciences cluster, however, found that most of the employment generated by the cluster across the local economy was in high-skilled, R&D roles⁴⁷⁵.

Ciarli et al. find that the employment effects depend on the prior characteristics of the area. In areas with a high share of employment in routinised jobs, increased R&D by local firms increases employment overall, but employment in manufacturing falls while jobs are created in services (mainly non-tradable and personal services). Meanwhile, in areas with a low proportion of routinised jobs, increased R&D has no overall impact on employment, but creates high-skill jobs in manufacturing at the expense of low-skill⁴⁷⁶. Given London is an area with a relatively low proportion of routinised jobs, this would imply that innovation by firms will tend to shift the composition of employment towards high-skilled jobs.

The impacts of innovation clusters on local poverty and inequality are hard to pin down conclusively. A review of the evidence for the Greater Manchester Independent Prosperity Review summarised that while attracting high-tech, innovative industries can have a positive impact on employment and wages locally, it is not a sufficient measure to address local poverty and income inequality⁴⁷⁷.

Making innovation more inclusive could also contribute to improved innovation performance, innovation that better meets citizens' needs and stronger economic performance.

- Recent studies have suggested that higher levels of inequality and lower participation in the innovation process can be detrimental to the quality of innovation outputs^{478,479}. Ensuring innovators are more representative of the population can help to better ensure that innovations meet the needs of citizens.
- The OECD also argues that more inclusive innovation can support growth and job creation, with unequal opportunities for participation representing a misallocation of resources⁴⁸⁰.

⁴⁷³ Ciarli, T. et al. (2018), [‘The Impact of R&D on Employment and Self-Employment Composition in Local Labour Markets’](#).

⁴⁷⁴ Lee, N. and Clarke, S. (2017), [‘Who gains from high-tech growth? High-technology multipliers, employment and wages in Britain’](#).

⁴⁷⁵ Tyler, P. et al. (2015), [The Cambridge Bioscience Impact Assessment Study](#)

⁴⁷⁶ Ciarli, T. et al. (2018), [‘The Impact of R&D on Employment and Self-Employment Composition in Local Labour Markets’](#).

⁴⁷⁷ Greater Manchester Independent Prosperity Review (2019), [‘Understanding Innovation and Innovation Ecosystems’](#).

⁴⁷⁸ Greater Manchester Independent Prosperity Review (2019), [‘Understanding Innovation and Innovation Ecosystems’](#).

⁴⁷⁹ Nesta (2019), [‘Imagination Unleashed: Democratising the Knowledge Economy’](#).

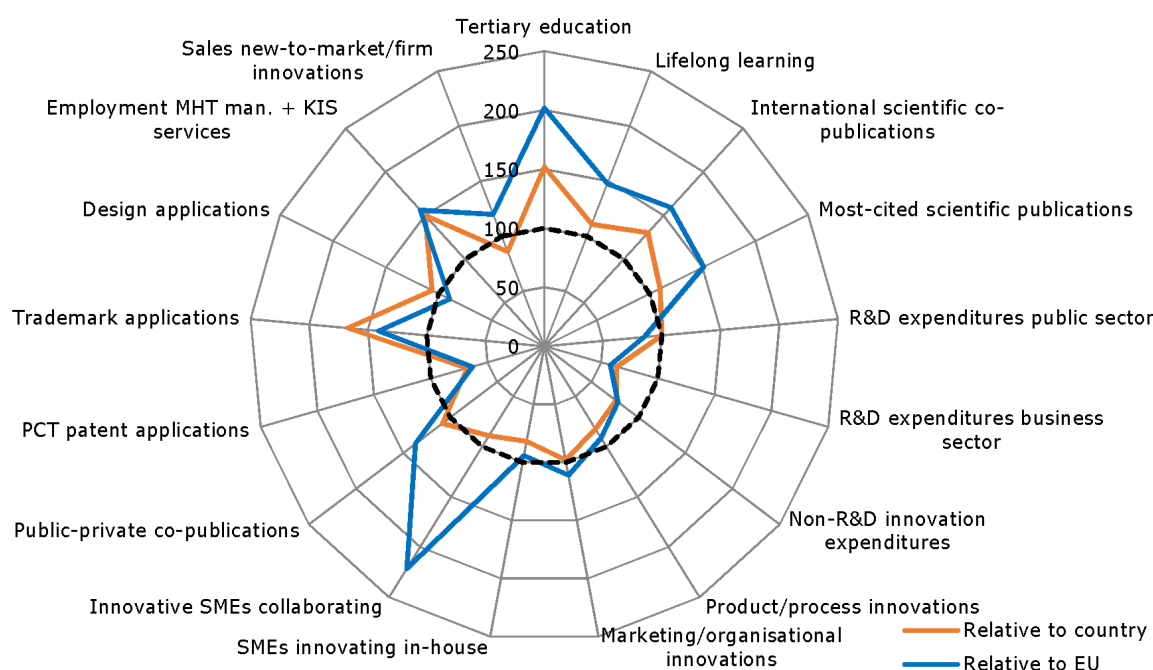
⁴⁸⁰ OECD (2017), [Making Innovation Benefit All: Policies for Inclusive Growth](#).

6.3 London's overall innovation performance

London is a highly innovative region in pan-European comparison and has become more innovative over time.

- The 2019 Regional Innovation Scoreboard (RIS)⁴⁸¹ ranks London as an 'Innovation Leader', with performance more than 20% above the EU average⁴⁸².
- London performs particularly strongly on tertiary education and collaboration by innovative SMEs, but has a relative weakness in R&D spending by the business sector (Figure 6.1)⁴⁸³.
- Looking at successive iterations of the RIS, London's scores have increased over time – by 10.6% since the 2011 iteration of the RIS^{484,485}. However, London's rank among European regions slipped from 24 in 2017 to 36 in 2019⁴⁸⁶.
- It is also important to emphasise the innovation strengths of the Wider South East region. London, the South East and the East of England make up the three most innovative regions in the UK according to the RIS, and the South East ranks among the top 25 Regional Innovation Leaders in Europe⁴⁸⁷. There is substantial collaboration on innovative activity among institutions across these regions, and they may function together as an innovation system to some extent.

Figure 6.1: London's innovation performance across key indicators, relative to the UK and to the EU in 2019



Source: European Commission Regional Profiles: United Kingdom.

⁴⁸¹ The RIS is a basket of 18 indicators of innovation activity, collated from a range of sources and including a combination of inputs to and outputs of the innovation process. See: European Commission (2017), '[RIS 2017 – Methodology report](#)'.

⁴⁸² European Commission (2019), '[Regional Innovation Scoreboard 2019](#)'.

⁴⁸³ European Commission (2019), '[Regional Profiles: United Kingdom](#)'.

⁴⁸⁴ Change over time is calculated as the difference between the performance in 2019 relative to that of the EU in 2011 and performance in 2011 relative to that of the EU in 2011.

⁴⁸⁵ European Commission (2019), '[Regional Innovation Scoreboard 2019](#)'.

⁴⁸⁶ European Commission (2019), '[Regional Innovation Scoreboard 2019](#)'.

⁴⁸⁷ European Commission (2019), '[Regional Innovation Scoreboard 2019](#)'.

The following sections will assess this performance in more detail, addressing innovation inputs, outputs, collaboration and barriers to innovation.

6.4 Inputs to innovation in London

London has strong fundamentals for innovation, with a very highly qualified workforce and strong, often world-leading, higher education institutions (HEIs). These contribute to human capital formation as well as being innovation actors.

- In 2018, 58% of Londoners aged 25-64 held a 'high' level qualification (NVQ4 or above), compared to 41% in the rest of the UK. This is up from only 36% of London adults in 2004⁴⁸⁸.
- This is important for innovation. The UK Innovation Survey observes that innovative firms employ more highly qualified staff than businesses that don't innovate⁴⁸⁹.
- According to London Higher, 40 of the UK's 172 higher education providers are located in London, and 16% of UK students studied at a London institution in 2017/18 – nearly 382,000 students^{490,491}.
- This includes five of the 'Russell Group' of research-intensive universities; Imperial College London, University College London, the London School of Economics and Political Science, King's College London and Queen Mary University of London⁴⁹².
- London universities secured 30% of all research grant funding (totalling £538 million) provided by Research England to higher education providers in England in 2018-19⁴⁹³.

As one of the world's leading financial centres and start-up hubs, London is a great place for innovative businesses to access finance and business support.

- According to data from PitchBook, London-based firms received almost £21.7bn in venture capital (VC) investment between 2008 and 2018, 58% of the total invested in the UK as a whole in that period (£37.2bn)⁴⁹⁴.
- Looking at other international cities, London is second only to New York in terms of its ability to attract venture capital (Figure 6.2).
- The vast majority of VC investment in London is in early stage and later stage VC (looking at total VC investment in London over the period 2008 to 2018, 34.8% was classed as early stage VC, and 42.6% as later stage). 5.2% was angel investment, and 5.8% was seed investment.
- The IT sector is the single most important destination for VC investment in London. Between 2008 and 2018, 43.8% of VC investment in London went into information technology. The next largest recipient was the business to consumer (B2C) sector, at 18.0% (Figure 6.3).
- London is home to a high concentration of accelerators and incubators, which can help to nurture innovative start-ups (Table 6.1)⁴⁹⁵.

⁴⁸⁸ GLA Economics (2018), ['Skills strategy for Londoners: Evidence base'](#).

⁴⁸⁹ Department for Business, Energy and Industrial Strategy. ['The UK Innovation Survey: Headline Findings 2014 to 2016'](#).

⁴⁹⁰ London Higher (2019), ['Students in Higher Education 2017/18'](#).

⁴⁹¹ 40 London HEIs includes Royal Holloway, the University of London and University College of Osteopathy, but excludes the Open University.

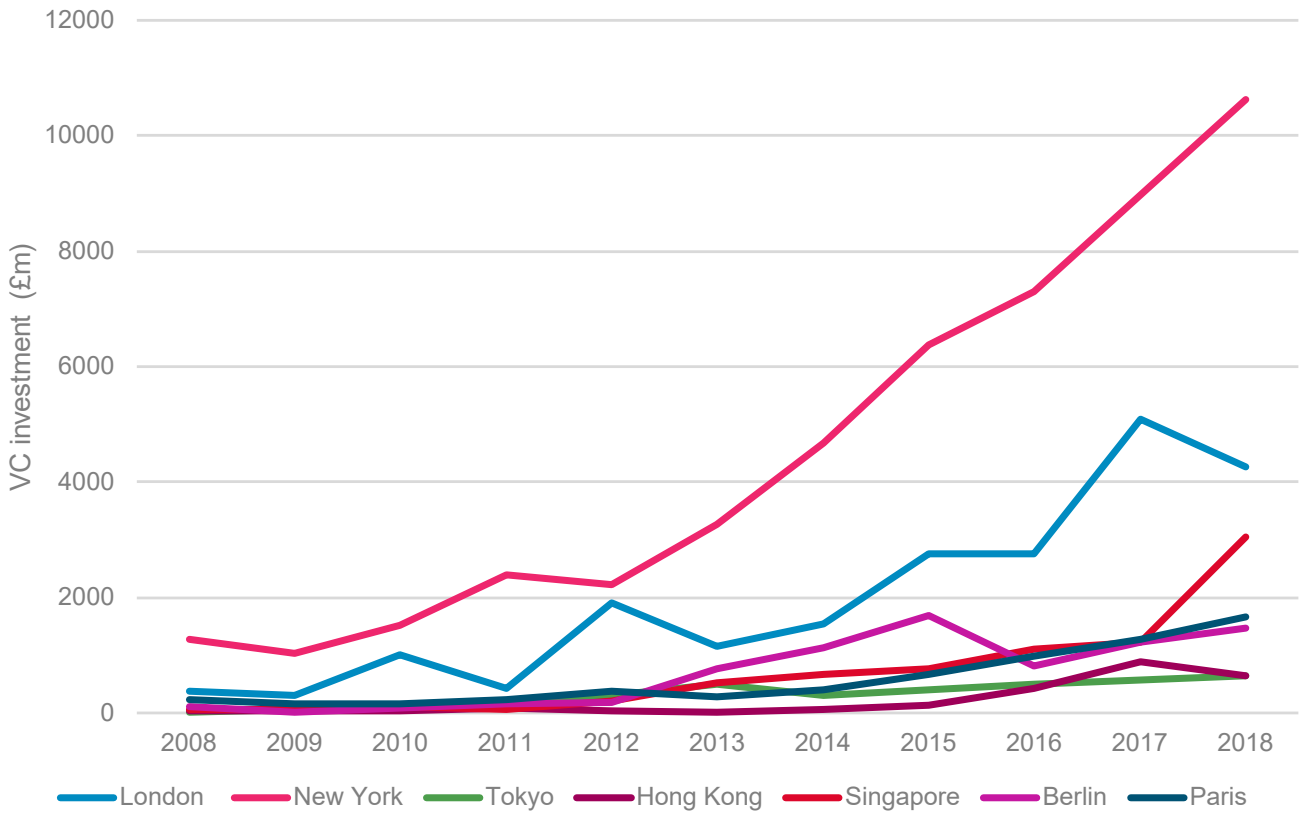
⁴⁹² Russell Group, ['Our universities'](#).

⁴⁹³ London Higher (2019), ['Teaching and Research Recurrent Grants for 2018-19'](#).

⁴⁹⁴ GLA Economics calculations using data from PitchBook.

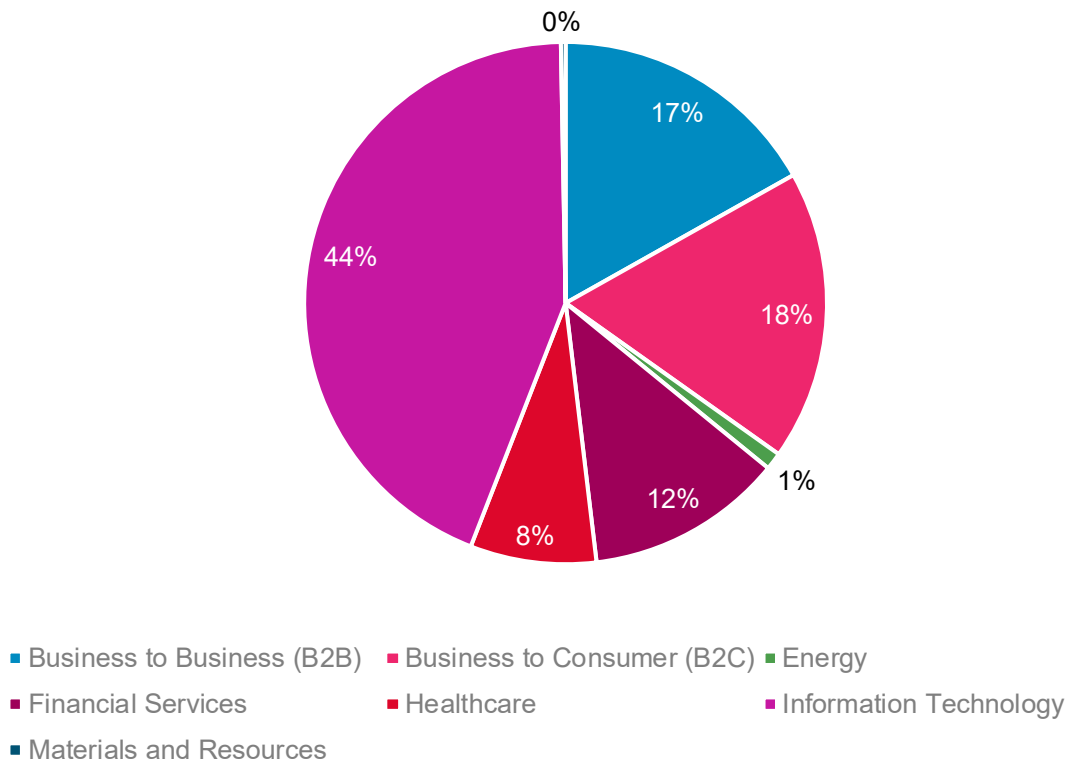
⁴⁹⁵ Department for Business, Energy and Industrial Strategy (2017), ['Business incubators and accelerators: UK directory'](#).

Figure 6.2: Total venture capital investment in selected international cities, 2008-2018



Source: GLA Economics calculations using data from PitchBook.

Figure 6.3: Venture capital investment into London by primary industry sector, 2008-2018



Source: GLA Economics calculations using data from PitchBook.

Table 6.1: Number of business incubators and accelerators (June 2017)

	London	Rest of the UK
Accelerators	80	92
Pre-accelerators	7	5
Incubators	33	183
Co-working spaces	17	34

Source: Nesta and Department for Business, Energy and Industrial Strategy Business Incubators and Accelerators: UK Directory.

London's R&D spending is lower than that of other highly innovative UK regions, but it has been growing strongly in recent years.

- R&D spending is viewed by the OECD as a key indicator of a place's innovative efforts⁴⁹⁶. The UK Government has also highlighted the importance of spending on R&D to drive innovation, committing in its Industrial Strategy to raising total spending on R&D to 2.4% of GDP by 2027, and 3.0% over the longer term.
- In 2017, R&D spending in London totalled £5,548m, almost 16% of total UK R&D spending. This is slightly less than the South East and the East of England⁴⁹⁷.
- However, R&D spending has grown fastest in London of any region over the last three years, with an average annual growth rate of over 10%. This is more than double the annual growth rate in R&D spend for the UK as a whole (Table 6.2).

Table 6.2: UK R&D expenditure 2015-17, regional breakdown

£ million	Total	Total	Total	
Current prices	2015	2016	2017	CAGR
United Kingdom	31,626	33,130	34,808	4.9%
London	4,539	4,899	5,548	10.6%
England	28,152	29,436	30,840	4.7%
North East	633	629	707	5.7%
North West	2,903	3,165	3,040	2.3%
Yorkshire and the Humber	1,439	1,401	1,641	6.8%
East Midlands	1,932	2,074	1,938	0.2%
West Midlands	2,648	2,782	2,965	5.8%
East Midlands and West Midlands	4,580	4,856	-	
East of England	5,430	5,662	5,938	4.6%
South East	6,527	6,665	6,730	1.5%
South West	2,101	2,159	2,334	5.4%
Wales	663	716	744	5.9%
Scotland	2,150	2,331	2,529	8.5%
Northern Ireland	660	647	695	2.6%

Source: Office for National Statistics.

Notes: CAGR is compound annual growth rate.

⁴⁹⁶ OECD (2013), 'Science and Technology: Research and Development'.

⁴⁹⁷ Office for National Statistics (2019), 'Gross domestic expenditure on research and development, by region, UK'.

R&D spending by higher education is more important in London than for other regions, and business spending less so, but business spending has been the driver of growth in recent years.

- In London, as in the UK, R&D expenditure by the business sector is the single largest contributor to total R&D spend. However, it is relatively less important in London than in the UK as a whole. Looking at the average for the period 2015-17, business expenditure accounted for 46.7% of total R&D spending in London, compared to almost 67.1% in the UK (Table 6.3)⁴⁹⁸.
- The flip side of this is the much greater significance of R&D spending by the higher education sector in London.
- However, since 2015, growth in R&D expenditure in London has been driven by the growth in business spending, with an average annual rate of growth of over 20%. Spending by the private non-profit sector has also grown significantly, but from a low base, while spending by the higher education sector has declined.
- Similar patterns are observed in the UK as a whole (with the exception of the growth in spending by the higher education sector at the UK-wide level). However, the growth in R&D spending by the business sector in London has been much faster.
- R&D spending as a proportion of GDP rose in London between 2015 and 2017, from 1.24% to 1.29%⁴⁹⁹. As described above, this was driven by an increase in business spending.
- The continued funding of R&D in London and in the rest of the UK is critical if the UK is to maintain its international R&D strengths and meet its targets for increases in total R&D spending. This is also important in the context of the UK's departure from the EU, as EU funding streams such as Horizon 2020 and European Structural and Investment Funds both contribute directly to the UK R&D target and leverage other investment⁵⁰⁰.

Table 6.3: R&D expenditure by sector of performance, 2015-17

£ million	UK			London		
	Average 2015-17	% of total	CAGR (%) 2015-17	Average 2015-17	% of total	CAGR (%) 2015-17
Government	2,158	6.5	2.3	442	8.8	2.1
Higher education	8,072	24.3	1.0	1,978	39.6	-0.6
Private non-profit	696	2.1	9.1	241	4.8	30.4
Business	22,265	67.1	6.5	2,335	46.7	20.9
Total	33,191	100	4.9	4,996	100	10.6

Source: Office for National Statistics.

Note: CAGR is compound annual growth rate.

R&D spending by London businesses is disproportionately carried out by the services sector. This is in contrast with the UK as a whole, where manufacturing dominates.

- Looking at broad sectors across the UK, R&D spending by manufacturing industries is relatively more important than spending by services industries. This pattern is reversed in London, reflecting the capital's greater orientation towards services (Table 6.4).
- While growth in R&D spend by manufacturing sectors in London between 2015 and 2017 has been comparable to growth in the UK as a whole, growth in spending by the services sector has been significantly higher (almost 24% per annum in London compared to 13% per annum in the UK). This

⁴⁹⁸ Office for National Statistics (2019), '[Gross domestic expenditure on research and development, by region, UK](#)'.

⁴⁹⁹ Calculated using data from Office for National Statistics (2019), '[Gross domestic expenditure on research and development, by region, UK](#)' and Office for National Statistics (2018), '[Regional economic activity by gross value-added \(balanced\) , UK: 1998-2017](#)'.

⁵⁰⁰ The Royal Society (2019), '[Investing in UK R&D](#)'.

might imply that services in London are relatively more research intensive and innovative than in the wider UK.

- While data at the London level is not available, it is interesting to note that for the UK as a whole a majority of business R&D spending is now undertaken by foreign-owned businesses (52.2% in 2017). This is up from just 27% in 1993, with 2011 the year in which R&D spending by foreign-owned firms first overtook that of UK-owned firms⁵⁰¹.

Table 6.4: R&D expenditure by broad product groups, 2015-17

£ million	UK		London	
	Average	CAGR	Average	CAGR
TOTAL	22,265	6.49%	2,335	20.9%
Manufacturing: Total	15,202	3.7%	427	4.7%
Chemicals	5,117	2.0%	262	-3.1%
Mechanical engineering	1,142	3.5%	8	48.3%
Electrical machinery	1,695	-1.9%	80	12.5%
Transport	3,640	14.4%	11	44.4%
Aerospace	1,709	-5.4%	15	30.8%
Other manufacturing	1,899	2.8%	55	14.9%
Services	6,342	13.1%	1,837	23.7%
Other: Total	721	9.1%	70	68.6%
Agriculture, hunting & forestry; Fishing	138	1.8%		
Extractive industries	185	-11.3%		
Electricity, gas & water supply; Waste management	173	-1.4%	21	-9.1%
Construction	225	47.8%	44	118.6%

Source: Office for National Statistics.

Notes: CAGR is compound annual growth rate.

Despite growing R&D spending by the business sector in London, a smaller proportion of London firms report undertaking R&D than in many other local economic areas in England.

- The Enterprise Research Centre (ERC) has analysed the 2017 UK Innovation Survey (covering data for the period 2014-16) according to the geography of Local Enterprise Partnerships (LEPs)⁵⁰². They find that 19.8% of firms in London undertook R&D in that period, with London ranking 25th out of 39 LEP areas⁵⁰³. In Oxfordshire, the best-performing region, 40.2% of firms undertook R&D.
- London's performance in 2017 was little changed from the 2015 iteration of the UK Innovation Survey, when 19.0% of London firms surveyed reported undertaking R&D⁵⁰⁴.
- There is more work to be done to understand the drivers of R&D investment in London, particularly by the private sector.

⁵⁰¹ Office for National Statistics (2019), '[Business enterprise research and development, UK: 2017](#)'.

⁵⁰² Roper, S. and Bonner, K. (2019), '[Benchmarking local innovation - the innovation geography of England: 2019](#)'.

⁵⁰³ There are now 38 LEPs, but the ERC use the old geography of 39 LEP areas so that their findings are directly comparable to their previous reports.

⁵⁰⁴ Roper, S., Bonner, K. and Vanino, E. (2017), '[Benchmarking local innovation - the innovation geography of England: 2017](#)'.

There is evidence that fiscal incentives can be effective at increasing R&D spending, but the effect on innovation is uncertain.

- A review of high-quality evidence by the What Works Centre for Local Economic Growth found that both R&D grants, loans and subsidies and R&D tax credits can increase firms' R&D expenditure⁵⁰⁵.
- R&D grants, loans and subsidies were found to sometimes raise innovative activity in recipients, but the effects are not always positive and the effect is stronger for self-reported measures of innovation. 'Sector neutral' approaches were found to be more successful at raising R&D spending and innovation than those targeting specific sectors.
- R&D tax credits too were found to sometimes increase R&D spending. The review found a lack of evidence on the impact of tax credits on innovative activity.

Increasingly, innovation research indicates that it is not only the quality of the inputs to the innovation process that matters, but the effectiveness of the system in which they are brought together.

- Cities tend to have stronger innovation systems compared with smaller places, though innovative performance also varies substantively across cities⁵⁰⁶.
- There is a lack of research focusing specifically on the strengths and weaknesses of the London innovation ecosystem, though Athey et al. point to the innovative strengths of the London fashion cluster, fuelled by high and diverse market demand, cultural dynamism and extensive informal networks among those working in the sector⁵⁰⁷.

⁵⁰⁵ What Works Centre for Local Economic Growth (2015), '[Evidence Review 9: Innovation](#)'.

⁵⁰⁶ Athey, G. et al. (2009), '[Innovation and the city](#)'.

⁵⁰⁷ Athey, G. et al. (2009), '[Innovation and the city](#)'.

6.5 Innovation activities and outputs in London

Innovation activity can result in a range of outputs, including new products and processes, the introduction of new approaches to marketing, or organizational and operational improvements. London firms carry out many types of innovation, at similar rates to firms across the UK.

- The UK Innovation Survey (UKIS) is the main source of data on the innovative activities of UK businesses.
- Looking at data from the UKIS 2017, the percentage of enterprises engaging in different types of innovation activity is similar in London to the UK as a whole (Table 6.5)⁵⁰⁸.
- Most common are wider innovation activities, involving improving forms of business organisation and marketing strategies; and investments to support innovation (for example in R&D, training or machinery and equipment). Product innovation (including the introduction of both new or significantly improved goods *and* services) is more common than process innovation.
- Overall, the proportion of London businesses that are innovation active has increased over time, but it remains slightly lower than the UK average. Between the 2013 and 2017 iterations of the UKIS, the proportions of UK businesses that were innovation active increased from 44.4% to 49.0%. Among London businesses over the same period, the proportion identified as innovation active increased from 42.2% to 46.9%.^{509, 510, 511, 512}

Table 6.5: Enterprises engaging in innovation activity by type of activity, 2014-16, London and UK

Type of activity per cent	UK	London
Broader innovator	50.3	48.5
Innovation active	49.0	46.9
Product innovator	23.7	21.5
Process innovator	15.8	14.4
Wider innovator	36.0	36.8
Ongoing innovation projects	16.8	15.7
Scaled back innovation projects	4.7	4.6
Abandoned innovation projects	3.8	3.3
Investment activities linked to innovation	44.2	41.2

Source: UKIS 2017.

Notes: The UKIS defines innovation as four activities⁵¹³.

- I. The introduction of a new or significantly improved product (good or service) or process;
- II. Engagement in innovation projects not yet complete, scaled back, or abandoned;
- III. New and significantly improved forms of organisation, business structures or practices, and marketing concepts or strategies;
- IV. Investment activities in areas such as internal research and development, training, acquisition of external knowledge or machinery and equipment linked to innovation activities.

A business that engages in I-III is considered 'innovation active', a business conducting any of the activities under III is described as a 'wider innovator', while a business that conducts any of I-IV is a 'broader innovator'.

⁵⁰⁸ Department for Business, Energy and Industrial Strategy, '[UK Innovation Survey 2014-16: statistical annex](#)'.

⁵⁰⁹ See following page for a definition of the term 'innovation active'.

⁵¹⁰ Department for Business, Energy and Industrial Strategy, '[UK Innovation Survey 2014-16: statistical annex](#)'.

⁵¹¹ Department for Business, Energy and Industrial Strategy (2016), '[UK Innovation Survey 2015: interactive report and statistical annex](#)'.

⁵¹² Department for Business, Innovation and Skills (2014), '[UK Innovation Survey 2013: statistical annex](#)'.

⁵¹³ Department for Business, Energy and Industrial Strategy, '[The UK Innovation Survey: Headline Findings 2014 to 2016](#)'.

Looking at the outcomes of innovation processes, London's performance is mixed in comparison with other LEP areas.

- The ERC's analysis of the 2017 UKIS looked at four measures of the success of innovation⁵¹⁴. The first of these is the proportion of firms producing a new or significantly improved product or service between 2014 and 2016. The second is the percentage of firms introducing a new to the market innovation in the period, (a more radical but also potentially more risky way to innovate). The third is the average proportion of sales by innovating firms between 2014 and 2016 that were derived from new or improved products or services (introduced in the same period), which captures the near-term success of the firm's innovations. The final measure is the percentage of firms introducing new or significantly improved processes between 2014 and 2016⁵¹⁵.
- London performs relatively more strongly in comparison with other LEPs on new to the market innovation and particularly on sales of innovative products and services⁵¹⁶. It is weaker on the prevalence on product and service and process innovation (see Table 6.6). This may imply that though London firms innovate slightly less than firms in many other regions, it is more commercially successful when they do.

Table 6.6: Innovation outcomes and sales in London as compared to other LEP areas, 2014-16

Measure	London score (%)	London rank (from 39)	Highest scoring LEP area (%)	Lowest scoring LEP area (%) ⁵¹⁷
Product or service innovation (% firms)	22.7	32	Buckinghamshire – 38.1	Tees Valley – 20.8
New to market product or service innovation (% firms)	9.2	16	Oxfordshire – 20.3	York, North Yorkshire and East Riding – 6.3
Sales of innovative products and services (% sales of innovating firms)	41.8	8	Oxfordshire – 49.9	Cumbria – 18.3
Process innovation (% firms)	15.2	31	Northamptonshire – 28.8	Tees Valley 12.5

Source: Roper and Bonner 2019.

Patent data provides an alternative indicator of the strength of London's innovation outputs, and the extent to which ideas produced in London are taken up elsewhere.

- Analysis by Belmana Consulting for the GLA looked at data on patents registered in London⁵¹⁸.
- Patents registered per capita in London are slightly lower than in the UK as a whole. For every Londoner there were 0.003 patents registered between 2000 and 2014, whereas in the rest of the UK this number was 0.006⁵¹⁹.
- Patent citations allow the diffusion of ideas originating in London to be tracked and – combined with estimates of the market value of patents – enable the value of the take-up of these ideas to be estimated. The average value of spillovers from London patents is high, at more than \$3m. This is comparable to the average for the US, which tops this indicator, and higher than the rest of the UK, which comes in at just under \$2.5m⁵²⁰.
- The total value of spillovers from London patents amounted to \$47bn between 2000 and 2014, about 0.5% of the US total for that period and about 10% of the rest of the UK. Biotech and pharma are particularly important contributors to this total.

⁵¹⁴ Roper, S. and Bonner, K. (2019), '[Benchmarking local innovation - the innovation geography of England: 2019](#)'.

⁵¹⁵ Roper, S. and Bonner, K. (2019), '[Benchmarking local innovation - the innovation geography of England: 2019](#)'.

⁵¹⁶ Roper, S. and Bonner, K. (2019), '[Benchmarking local innovation - the innovation geography of England: 2019](#)'.

⁵¹⁷ For confidentiality reasons data is not presented for all LEP areas for all metrics.

⁵¹⁸ Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

⁵¹⁹ The residential population of London will differ considerably from employment in the city due to commuting, however.

⁵²⁰ Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

- Innovations produced in different fields spill over to businesses at different geographies – in London, the rest of the UK and internationally. In life sciences, instruments and fundamental research on macromolecular chemistry, the spillovers are significantly to other London businesses. London telecom patents meanwhile have high spillovers which accrue outside of London, as many businesses in this sector are located outside the M25. Artificial intelligence and computer technology are sectors where spillovers accrue in both London and the rest of the UK, but they are relatively higher outside London.

Larger firms are more likely to be innovative in London, although there is no clear relationship between firm age and innovation activity. What is clear is that innovation is most common among firms in London's knowledge-intensive industries.

- Micro firms are least likely to innovate in London, with 53% of firms surveyed in the 2014 London Business Survey reporting being innovation active. This compares with 75% of SMEs and 88% of large enterprises⁵²¹.
- Businesses established between 2009 and 2011 were more likely than both older and younger businesses to be innovating in 2014, with 66% innovation active.
- The industries in London with the highest percentage of innovative companies are health, social work, scientific R&D and veterinary services (75%), financial and insurance activities (67%), and digital technologies (67%).

There is a lack of understanding of the drivers of innovation performance in London and elsewhere.

- The ERC study points out that differences in the prevalence of innovation between local areas can be driven both by the behaviours of firms and by the local industrial structure, with a need for more detailed analysis of why spatial patterns of innovation activity arise⁵²².
- The slightly lower rate of reported innovative activity among London businesses than businesses across the UK is likely to be driven more by the sectoral composition of the London economy than by the innovativeness of its individual firms. Manufacturing firms tend to be slightly more innovative than services firms, and the London economy is dominated by services⁵²³.
- Additionally, innovation can be more difficult to measure in some service industries, particularly where the service is highly individualised such as consultancy and ICT, both of which are important industries in London^{524,525}.
- Regardless, there is a need for further research to understand what is behind the patterns of innovation observed in London. This includes exploring whether and how London forms part of an innovation ecosystem with the Wider South East.

More work is also needed to establish effective policy levers for increasing innovation activity.

- A review for the Productivity Insights Network points to evidence on the role of entrepreneurship in innovation, with entrepreneurs acting as 'knowledge filters' that turn the knowledge generated by researchers into commercial opportunities⁵²⁶. This might imply that policies to support entrepreneurship could also positively impact on innovation.

⁵²¹ GLA Economics (2014), '[London Business Survey 2014 - Innovation](#)'.

⁵²² Roper, S. and Bonner, K. (2019), '[Benchmarking local innovation - the innovation geography of England: 2019](#)'.

⁵²³ Comments from Professor Stephen Roper, Enterprise Research Centre.

⁵²⁴ Comments from Professor Stephen Roper, Enterprise Research Centre.

⁵²⁵ Greater Manchester Independent Prosperity Review (2019), '[Understanding Innovation and Innovation Ecosystems](#)'.

⁵²⁶ Huggins, R. (2018), '[Innovation and Productivity: Towards a Research and Policy Agenda](#)'.

- This review also finds that evidence on the effectiveness of regional innovation policy is mixed. There is limited evidence, for example, to show that the channelling of public funding to weaker regions is successful in raising innovation and productivity.
- Local institutions may be important in determining the innovativeness of a region. Studies have found that there is a strong relationship between regional government quality and patent activity across the EU⁵²⁷, and that investments in innovative functions by multinational corporations are strongly influenced by a region's economic, social, political and institutional characteristics⁵²⁸.
- A 'smart specialisation' approach to regional innovation has been advocated by the EU and others in recent years^{529,530}. This involves prioritising innovation that builds from a region's existing assets and competitive strengths⁵³¹. The approach has been criticised for lacking a robust evidence base, however, and the evaluation of precursor programmes has found limited evidence of improvements in firm performance^{532,533}.
- Others have suggested that innovation policy has tended to be developed implicitly with manufacturing in mind, and that a different approach may be merited to promote innovation in services and the creative economy. Such approaches might include using public procurement to drive innovation in services, supporting skills development, promoting the mobility of skilled labour between companies and encouraging the use of Knowledge Exchange Partnerships between businesses and universities⁵³⁴.
- The need for more experimentation in innovation policy has also been highlighted⁵³⁵. Such an approach could support the development of more effective policies to both increase innovation activity and promote its successful diffusion across the economy.

⁵²⁷ Rodriguez-Pose, A. and Di Cataldo, M. (2014), '[Quality of government and innovative performance in the regions of Europe](#)'.

⁵²⁸ Crescenzi, R., Pietrobelli, C. and Rabelotti, R. (2014), '[Innovation drivers, value chains and the geography of MNCs in Europe](#)'.

⁵²⁹ Greater Manchester Independent Prosperity Review (2019), '[Understanding Innovation and Innovation Ecosystems](#)'.

⁵³⁰ Crescenzi, R., de Blasio, G. and Giua, M. (2018), '[What works \(and what doesn't\) for smart specialisation strategies in Italy's Mezzogiorno?](#)'.

⁵³¹ European Commission. '[What is Smart Specialisation?](#)'

⁵³² Crescenzi, R., de Blasio, G. and Giua, M. (2018), '[Cohesion Policy incentives for collaborative industrial research: evaluation of a Smart Specialisation forerunner programme](#)'.

⁵³³ Crescenzi, R., de Blasio, G. and Giua, M. (2018), '[What works \(and what doesn't\) for smart specialisation strategies in Italy's Mezzogiorno?](#)'.

⁵³⁴ Greater Manchester Independent Prosperity Review (2019), '[Understanding Innovation and Innovation Ecosystems](#)'.

⁵³⁵ See for example Bravo-Biosca, A. (2019), '[Experimental Innovation Policy](#)'.

6.6 Collaboration on innovation

Innovation today is not an isolated process conducted in laboratories, but involves collaboration with different actors to draw in external ideas⁵³⁶. London appears to be relatively strong at facilitating collaborative innovation.

- The UK Innovation Survey includes a question on whether the business cooperated on innovation activities with other actors, including other businesses, higher education institutions, the public sector or consultants.
- According to UKIS 2017, 58% of innovation-active businesses in the UK reported having cooperation agreements, up from 40% in the 2015 survey⁵³⁷.
- Cooperation with almost all types of partners is more common among London innovators than in the UK as a whole (Table 6.7).
- Both UK-wide and in London specifically, cooperation with all types of partners increased between the 2015 and 2017 surveys.
- The Higher Education Statistics Agency also collects data on the cooperation of universities with businesses via its Business-Community Interaction Survey⁵³⁸.
- According to this survey, London higher education providers have increased their income from collaborative research involving public funding with non-academic organisations over the last few years, from almost £250m in 2015-16 to £322m in 2017-18 (Figure 6.4).
- London institutions' share of all income earned from collaborative research by UK higher education providers has also increased over time, from 19.4% in 2015-16 to 23.5% in 2017-18.
- As of 2017-18, London HEIs had 242 active spin-off companies⁵³⁹, with 1512 in the UK as a whole⁵⁴⁰.
- However, there is some evidence that businesses in London face barriers to collaboration with HEIs. These barriers include identifying and accessing opportunities to collaborate and navigating universities' administrative processes⁵⁴¹. These barriers may particularly affect smaller businesses, which are less likely to collaborate with a university than larger businesses in London.

Table 6.7: Cooperation frequency (broader innovators, collaborative firms only) by type of partner, percentages, 2012-2014 and 2014-16

	London 2012-2014	UK 2012-2014	London 2014-2016	UK 2014-2016
Other businesses within enterprise group	56.6	43.7	74.0	66.5
Suppliers of equipment, materials, services or software	69.5	67.4	83.0	81.4
Clients or customers from the private sector	59.8	58.2	78.1	73.2
Clients or customers from the public sector	27.6	30.7	56.3	54.3
Competitors or other businesses in your industry	35.2	31.4	54.0	54.8
Consultants, commercial labs or private R&D institutes	31.9	24.7	54.4	49.3
Universities or other HEIs	22.8	21.0	41.9	39.5
Government or public research institutes	16.9	14.2	37.9	35.3

Sources: UKIS 2015 and UKIS 2017.

⁵³⁶ Huggins, R. (2018), '[Innovation and Productivity: Towards a Research and Policy Agenda](#)'.

⁵³⁷ Department for Business, Energy and Industrial Strategy (2018), '[The UK Innovation Survey - Headline Findings 2014-16](#)'.

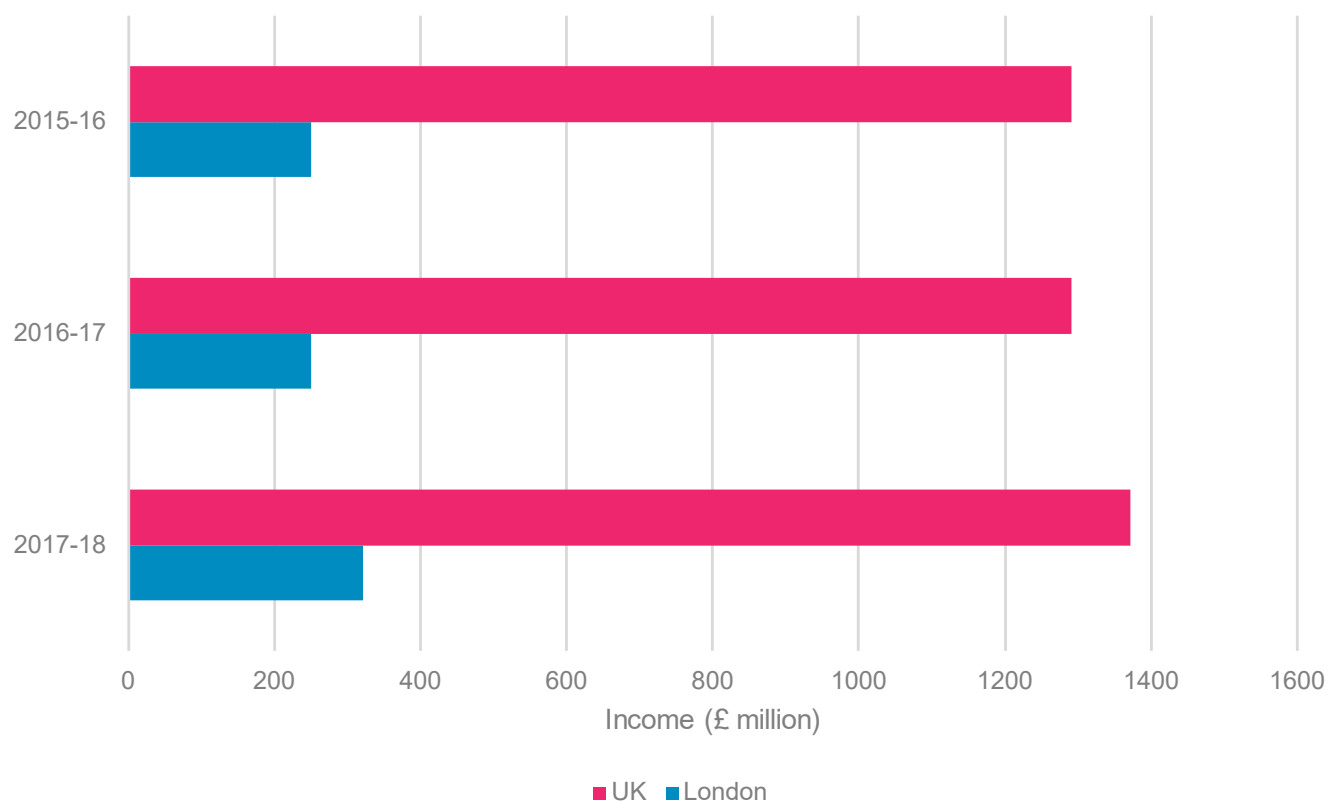
⁵³⁸ Higher Education Statistics Agency. '[Business and community services](#)'.

⁵³⁹ Including both spin-offs with some higher education provider ownership and those without.

⁵⁴⁰ Higher Education Statistics Agency. '[Intellectual property, start-ups and spin-offs](#)'.

⁵⁴¹ CBI (2019), '[London Business Survey 2019](#)'.

Figure 6.4: Income from collaborative research involving public funding, London and UK higher education providers, 2015-16, 2016-17, 2017-18



Source: HESA Business and Community Interaction Survey.

Data from Innovate UK shows that London performs well on collaborative R&D, but there may be scope to increase Knowledge Transfer Partnerships.

- According to data on Innovate UK-funded projects, there were more than 1,500 collaborative R&D projects funded in London in the five-year period 2014/15 to 2018/19, with a value of close to £331m^{542,543}. There were also 83 Knowledge Transfer Partnerships (KTPs), receiving over £7.5m in grant funding.
- In comparison with other highly innovative regions in the UK, London performs well on the prevalence of collaborative R&D. There were 1,248 projects funded in the South East and 817 in the East of England in the same period, with the value of these projects similar to the London figure in the South East (around £332m), and considerably less in the East of England (around £197m)⁵⁴⁴.
- There were fewer KTPs in London than in the East and in the South East of England, however. 137 KTPs were funded in the South East in the period, with a value of almost £13.3m, and 103 in the East of England, totalling around £10.7m.

⁵⁴² GLA Economics analysis of '[Innovate UK funded projects since 2004](#)'.

⁵⁴³ Note that value of grant is not provided for all projects in the Innovate UK dataset.

⁵⁴⁴ GLA Economics analysis of '[Innovate UK funded projects since 2004](#)'.

In terms of promoting collaboration and knowledge exchange, clustering alone may not be enough – firms' internal capabilities and the innovators' personal networks may matter more.

- There has been a considerable policy focus on enabling the clustering of firms to promote knowledge spillovers. However, there is also more recent evidence suggesting geographical proximity to other innovators may not be enough. Crescenzi and Gagliardi find that firms' internal capabilities exert a strong influence on whether they become more innovative from the presence of knowledgeable individuals around them⁵⁴⁵.
- Harris and Yan find that London firms exhibit greater 'absorptive capacity' than other regional centres, meaning they are more able to utilise knowledge from the external environment. Other firm characteristics related to absorptive capacity include firm size, involvement in R&D or innovation and exporting⁵⁴⁶.
- Crescenzi, Nathan and Rodriguez-Pose meanwhile find that organisational proximity (being part of the same organisation) and external networks founded on social connections are far more important determinants of innovative collaborations than simply being close to other innovators⁵⁴⁷.

⁵⁴⁵ Crescenzi, R. and Gagliardi, L. (2018), '[The innovative performance of firms in heterogenous environments: The interplay between external knowledge and internal absorptive capacities](#)'.

⁵⁴⁶ Harris, R. & Yan, J. (2017), '[Absorptive Capacity and Productivity](#)'.

⁵⁴⁷ Crescenzi, R. Nathan, M. and Rodriguez-Pose, A. (2015), '[Do inventors talk to strangers? On proximity and collaborative knowledge creation](#)'.

6.7 The barriers to innovation activity for firms in London

London businesses are likely to face a range of barriers to innovation, but there is a lack of evidence from which to reach firm conclusions about the nature and extent of these barriers.

- According to findings from the UKIS 2017, the percentage of companies in London reporting potential barriers to innovation is low, and in most cases slightly lower than UK average.
- The most commonly reported barriers for both UK and London-based companies relate to the financing of innovation. The direct cost of innovation was cited by 13.6% of UK companies and 11.9% of London companies as a barrier, 13.5% and 12.8% respectively cited the cost of finance, while 13.3% and 14.8% were concerned about the availability of finance. The outcome of the EU referendum was more commonly identified as a barrier to innovation by London-based firms compared with firms across the whole of the UK (12.1% vs 9.2%)⁵⁴⁸.
- Research by the National Institute for Economic and Social Research argues that the UK needs to do more to develop the skills needed for innovation. These include technical and science, technology, engineering and maths (STEM) skills, at both higher and intermediate level, as well as management and leadership skills⁵⁴⁹. It is likely that London is not exempt from this problem, which may be holding back innovation.
- Looking specifically at management skills, there is a strong body of literature linking better management to higher productivity in firms⁵⁵⁰. Evidence collated by the Department for Business, Innovation and Skills shows that the UK lags behind many key international competitors in terms of the quality of its management practices⁵⁵¹.
- It has been suggested by Andy Haldane of the Bank of England, among others, that better management can also facilitate the adoption of new technologies, products and processes⁵⁵². Innovation diffusion in London is the focus of the next section.

⁵⁴⁸ Department for Business, Energy and Industrial Strategy. [‘UK Innovation Survey 2014-16: statistical annex’](#).

⁵⁴⁹ National Institute for Economic and Social Research (2014), [‘Skills and training for a more innovation-intensive economy’](#).

⁵⁵⁰ Bloom et al. (2014), [‘The new empirical economics of management’](#).

⁵⁵¹ Department for Business, Innovation and Skills (2012), [‘Leadership and Management in the UK – The Key to Sustainable Growth’](#).

⁵⁵² Haldane, A. (2018), [‘The UK’s Productivity Problem: Hub no Spokes’](#).

6.8 Innovation diffusion in London

Innovation is wider than inventing new ways of doing things; the spread of existing technologies and ways of working across the economy and their adoption by other firms is an important form of innovation and a driver of productivity growth.

- Kitson emphasises the economic importance of innovation diffusion and adoption alongside R&D and invention, given that ‘innovation-using’ sectors are much bigger in terms of output and employment than ‘innovation-generating’ ones⁵⁵³.
- While London has many businesses at or near the productivity frontier, there is also a tail of lower productivity businesses. Analysis by Belmana Consulting for the GLA suggests that about 20% of employees are in businesses where productivity is lower than the median business calculated sector-by-sector^{554,555}. This highlights the potential in London for productivity improvements through sharing best practice.

The UK is lagging according to some measures of technology adoption, implying there is scope to strengthen innovation diffusion at the national and local levels.

- While very limited information is available on technology adoption in London specifically, there is information on the performance of the UK. The Government's 2017 Digital Strategy found that while UK businesses were comparable with their European peers on access to the internet and having a web presence, they are less likely to have digitised their back-office functions, such as managing customer relations and supply chains (Figure 6.5)⁵⁵⁶.
- Similarly, analysis by McKinsey found that UK businesses are lagging in investment in more advanced technologies such as Internet of Things and AI⁵⁵⁷.
- Looking at cloud computing services specifically, data from Eurostat for 2018 finds that almost 42% of enterprises in the UK use them. While significantly above the average for the EU28 of 26.2%, adoption in the UK is lower than in Ireland, the Netherlands, Denmark, Sweden and Finland (which leads with adoption over 65%)⁵⁵⁸.

⁵⁵³ Kitson, M. (2019), [‘Innovation policy and place: a critical assessment’](#).

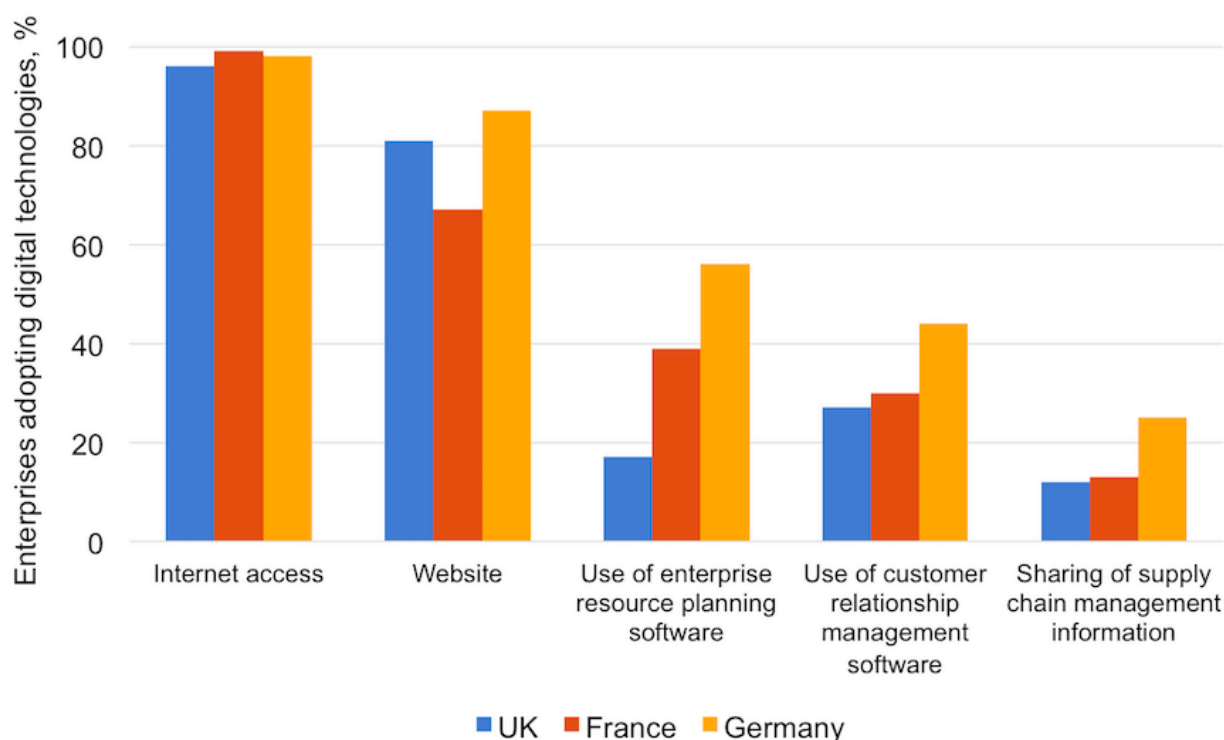
⁵⁵⁴ This work was produced using statistical data from ONS. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

⁵⁵⁵ Belmana Consulting (2020) for the GLA. ‘Innovation diffusion in London’ (forthcoming).

⁵⁵⁶ Department for Digital, Culture Media and Sport (2017), [‘UK Digital Strategy: The wider economy – helping every British business become a digital business’](#).

⁵⁵⁷ McKinsey Global Institute (2018), [‘Solving the United Kingdom’s Productivity Puzzle in a Digital Age’](#).

⁵⁵⁸ Eurostat. [‘Cloud computing – statistics on the use by enterprises’](#).

Figure 6.5: UK adoption of digital technologies in comparative perspective

Source: Government Digital Strategy 2017.

New research for the GLA has identified several potential reasons why innovations do not diffuse more effectively.

- A review of existing evidence and interviews with stakeholders by Belmana Consulting highlighted a number of potential barriers to effective innovation diffusion in London⁵⁵⁹.
- The literature points to a range of barriers to innovation diffusion centring around market failures (such as asymmetric information and credit market imperfections), as well as so-called system failure and emergence failure. System failures slow knowledge transfer, perhaps due to disconnects between businesses and researchers. Emergence failure is where key ingredients in the innovation ecosystem (from skills to standards) are missing.
- Interviews conducted with London stakeholders highlighted that businesses' capacity to absorb new ideas has an important bearing on innovation diffusion. This capacity is affected by skills gaps or competitive pressures preventing investment in change. A lack of demand for or understanding of innovation also acts as a barrier in some instances.
- Sector-specific barriers to diffusion were also highlighted, for example regulatory processes slowing innovation adoption in areas such as life sciences.

Emerging findings from this research point to policy actions that the GLA could consider to help overcome these barriers to diffusion and facilitate the spread of ideas.

- There is potential to speed the diffusion of ideas from research, especially using city-level testbeds. There are sectors in which the GLA leads public service delivery – such as waste and re-use – where a greater emphasis on diffusion could be valuable given that rapid innovation is occurring. There may be

⁵⁵⁹ Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

some benefit from the GLA identifying and addressing gaps in how technologies and associated skills might be spread in London⁵⁶⁰.

- Lessons can be learned from recent diffusion focused, place-based interventions. As the GLA is the spatial planning lead for London, it is involved in the promotion and delivery of area-based interventions. These could incorporate lessons from what has worked in London's recent Knowledge Quarter investments to promote diffusion.
- Diffusion may be encouraged by utilising adult skills and training provision in London. Given the importance of skills deficiencies to innovation adoption, improved skills provision is a central response. This could target specific sectors (low-pay, low productivity sectors) or the specific skills needed to support innovation adoption, such as digital skills or management skills in SMEs.
- Convening or supporting the development of networks across different sectors, across supply chains or between researchers and industry may also be helpful to enable wider innovation diffusion.
- Innovation vouchers have been found to be relatively successful where they introduce businesses to creative services supporting product and process design. However, the evaluation of previous innovation voucher schemes such as the Growth Vouchers Programme and Creative Credits scheme points to some lessons around their successful implementation.

It also highlights the role of London's universities in promoting knowledge exchange and diffusion, and the potential for policymakers to work more closely with them to achieve diffusion objectives.

- London universities have a strong record of income from consultancy. Intellectual property (IP) revenues are also strong, suggesting the city's universities can successfully commercialise the intellectual property outputs of their R&D⁵⁶¹.
- Spin-offs (with university involvement) exhibit a positive correlation with research quality and London's best performers are Imperial and UCL.
- London's best performers for student start-ups – the Royal College of Art and Kingston University – are amongst the universities that have programmes to support their students towards setting up a business. On staff start-ups, London's best performers are Queen Mary and UCL.
- The GLA can use its convening power to promote information sharing between London universities and London industry, highlighting examples of successful collaboration and opportunities from both sides – perhaps via an online platform⁵⁶².

⁵⁶⁰ Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

⁵⁶¹ Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

⁵⁶² Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

6.9 London's sectoral innovation strengths

We have identified five sectors as key London innovation sectors: advanced urban services, life sciences, tech and digital, cultural and creative industries and low carbon and environmental goods and services. There are economic, social and policy reasons behind this list.

- These sectors (some of which are emerging and/or crosscutting with respect to typical ONS definitions) are sectors in which the city has established or is establishing competitive strengths (either across the piece or in specific industries or activities within them).
- They are also clearly future-focused, with rapidly growing and substantial potential demand for the goods and services they produce.
- They are sectors in which innovation has an important role to play in improving Londoners' well-being and in helping address the large-scale challenges facing London, the rest of the UK and states and citizens globally – climate change, ageing and low productivity among them.
- They often have a vital role to play in tackling the Government's four Grand Challenges (artificial intelligence and data, ageing society, clean growth and future of mobility), and the more specific 'missions' within them.
- There is potential for appropriate, targeted policy interventions by the Mayor of London to assist these sectors in overcoming the barriers they face, enabling them to fully realise their strengths and capitalise on emerging market opportunities.
- The five sectors identified here are all among the seven priority sectors identified in the Mayor's Economic Development Strategy (EDS), signalling the Mayor's ongoing commitment to them⁵⁶³. Key areas of disruptive and productive innovation related to a sixth priority sector – financial and business services – are reflected in the appropriate sectors among our five. For example, fintech and carbon finance are reflected in the tech and digital and low carbon and environmental goods and services sectors respectively⁵⁶⁴.

The analysis of patent data provides an insight into the fields where London is most successful at generating new ideas, with areas of technology and life sciences performing particularly strongly.

- Research for the GLA by Belmana Consulting found that, compared to the OECD average, London has a comparative advantage in many technologies, with the greatest being in 3D printing, pharmaceuticals and IT methods for management. Comparative advantage is in London's favour where London patent share exceeds the wider average for a particular technology⁵⁶⁵.
- London produces the most patents in the categories of computer technology, telecommunications and AI⁵⁶⁶.
- The category 'IT methods for management' is fifth in London in terms of the number of patents, much higher than in the UK as a whole (where it is 26th).

⁵⁶³ Greater London Authority (2018), ['The Mayor's Economic Development Strategy for London'](#).

⁵⁶⁴ The seventh priority sector in the EDS, tourism, is economically important in London and a significant employer but it is not at the cutting edge of transformational innovation in the same way as sectors highlighted here. While there is a good case for policy intervention to help address challenges the sector faces, for example around skills and low pay, there is much less scope for intervention to support radical new innovations or the emergence of industries of the future.

⁵⁶⁵ Belmana Consulting (2020) for the GLA. 'Innovation diffusion in London' (forthcoming).

⁵⁶⁶ Impact is the total value of spillovers from the patents in a technology group, because of both the spillovers per patent and the number of patents. It is a present value, derived from changes in the market value of listed companies after a patent is announced.

Project funding by Innovate UK also generally reflects London's sectoral innovation strengths, most notably its expertise in AI and data.

- Innovate UK provides funding to businesses and research organisations to support the testing of ideas and the development of innovative products and services.
- Analysis of data on Innovate UK-funded projects in the five-year period 2014/15 to 2018/19 finds that, of the 19,188 projects funded in the UK in the period, 18.9% were located in London. Looking at projects by value rather than by number (captured by value of grant offered)⁵⁶⁷, 21.8% of the total grant funding allocated by Innovate UK over the period was to London-based businesses and research organisations⁵⁶⁸.
- London's research strengths in the sectors 'ageing society, health and nutrition' and 'AI and data', are clearly reflected in the Innovate UK funding data (Figure 6.6). London-based 'ageing society, health and nutrition' projects received close to a third (30.4%) of all the grant funding allocated to that sector in the time period, while for the 'AI and data economy' sector, London received 44.1% of allocated funding⁵⁶⁹.
- Looking at the nature of the enterprises in London engaged in Innovate UK projects in the period 2014/15 to 2018/19, 80.8% were private sector enterprises. 12.8% were academic institutions, while the remainder included catapult centres, charities, public sector organisations and research and technology organisations⁵⁷⁰.
- Looking at Innovate UK's project portfolio for the UK as a whole for comparison, academic institutions account for a higher proportion of projects (at 22.2%) and the private sector for a smaller proportion (at 72.4%) than in London⁵⁷¹. This is perhaps a surprising result given the strength of London's higher education sector, but may indicate that London businesses are more innovative than suggested by other indicators.

⁵⁶⁷ Note that value of grant is not provided for all projects in the Innovate UK dataset.

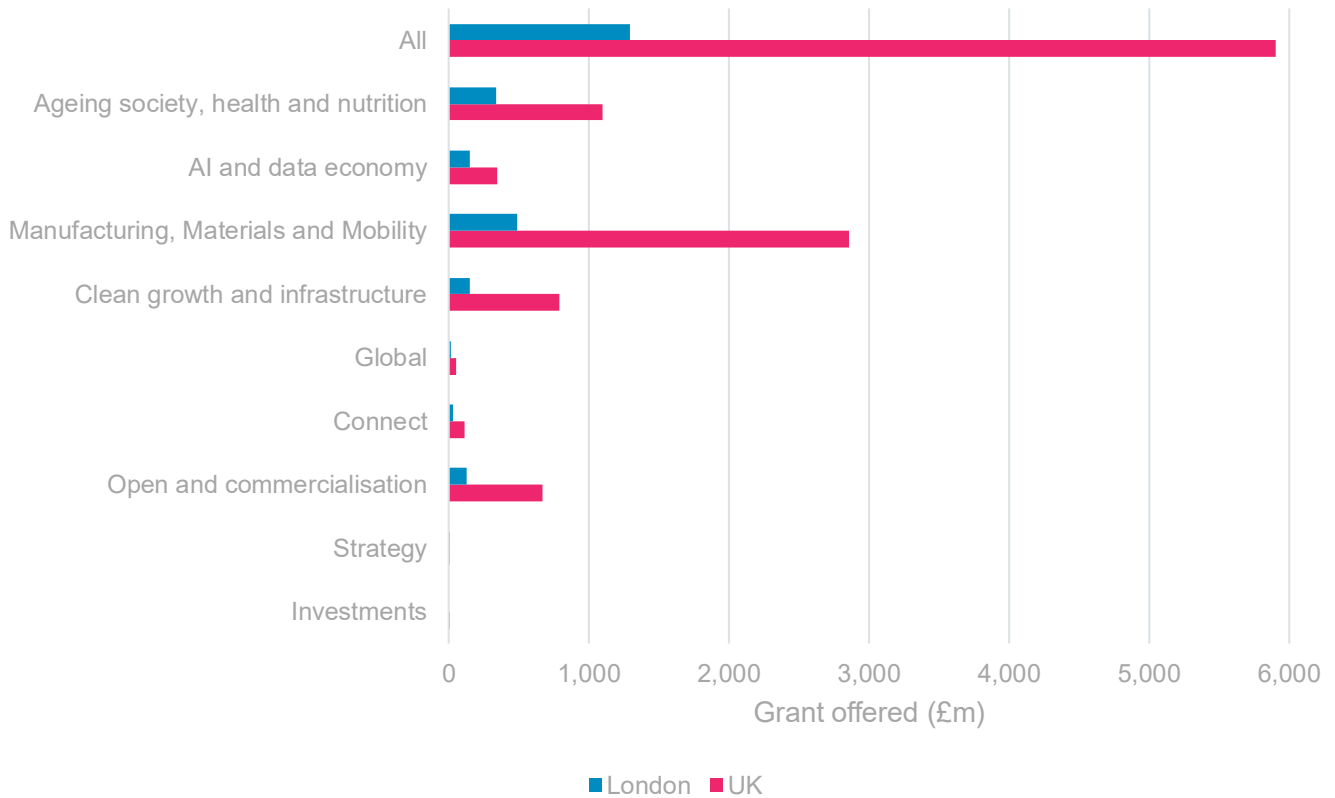
⁵⁶⁸ GLA Economics analysis of ['Innovate UK funded projects since 2004'](#).

⁵⁶⁹ GLA Economics analysis of ['Innovate UK funded projects since 2004'](#).

⁵⁷⁰ GLA Economics analysis of ['Innovate UK funded projects since 2004'](#).

⁵⁷¹ GLA Economics analysis of ['Innovate UK funded projects since 2004'](#).

Figure 6.6: Innovate UK project grant funding by sector 2014/15 – 2018/19, UK total and London total



Source: GLA Economics analysis of Innovate UK data.

The Appendix to this chapter provides more details on the definition of London's key R&D sectors and about each sector's strengths, opportunities and rationale for intervention.

6.10 Participation in innovation in London

There is evidence of a lack of diversity in the innovation process in the UK, which is likely to represent a drag on innovation rates and on the ability of innovation to meet citizens' needs.

- Research indicates that diversity can help to drive innovation and problem-solving^{572,573}. Ensuring innovators are more representative of the population can help to better ensure that innovations meet people's needs.
- According to data from the Intellectual Property Office, just 7.4% of patents filed in Great Britain between 2000 and 2015 were filed by women⁵⁷⁴.
- London performs better than the rest of UK in terms of female inventors; seven of the top ten postcode areas in Britain by the proportion of patent applications filed by women were in London. Ilford was the highest-scoring London location, with 15.1% of patents filed by women between 2000 and 2015.
- Of all the Nobel prize winners born and educated in the UK, almost two thirds (63%) attended private schools, and a further 28% attended grammar schools⁵⁷⁵.
- Research conducted in the US context by Bell et al. also points to the underrepresentation of women, ethnic minorities and people from low-income backgrounds in innovation, and identifies exposure to inventors (defined as someone who holds a patent) in childhood as an important determinant⁵⁷⁶. They find that proximity to inventors, both in the child's family and in the neighbourhood in which they live, exerts a causal effect on the likelihood of becoming an inventor, and the type of invention pursued⁵⁷⁷. For female children, it is their exposure to *female* inventors that matters, rather than inventors in general. The authors suggest that their findings point to the importance of networks and role modelling in determining participation in innovation⁵⁷⁸.

BAME groups are underrepresented in some highly innovative sectors of the London economy.

- Across the London economy in 2018, 31.4% of jobs were held by people of a non-white ethnic background⁵⁷⁹.
- Compared to the London economy as a whole, people of Black, Asian and Minority Ethnic (BAME) backgrounds are underrepresented in some key innovative sectors.
- Looking at the creative industries, for example, just 22.4% of jobs were held by BAME workers in 2016, up slightly from 20.8% in 2012⁵⁸⁰.
- BAME workers are also underrepresented in the London science and tech economy⁵⁸¹. 28.0% of all science and tech jobs in London were held by workers of BAME backgrounds in 2018, below the whole London economy rate of 31.4%^{582,583,584}. Looking at the UK as a whole, 13.3% of jobs in the science and

⁵⁷² Forbes Insights, '[Fostering Innovation Through a Diverse Workforce](#)'.

⁵⁷³ McKinsey (2015), '[Diversity Matters](#)'.

⁵⁷⁴ Intellectual Property Office (2016), '[Gender Profiles in UK Patenting](#)'.

⁵⁷⁵ The Sutton Trust (2016): '[Leading People 2016: The educational backgrounds of the UK professional elite](#)'.

⁵⁷⁶ Bell, A et al. (2018), '[Who becomes an inventor in America? The importance of exposure to innovation](#)'.

⁵⁷⁷ Bell, A et al. (2018), '[Who becomes an inventor in America? The importance of exposure to innovation](#)'.

⁵⁷⁸ Bell, A et al. (2018), '[Who becomes an inventor in America? The importance of exposure to innovation](#)'.

⁵⁷⁹ Office for National Statistics (2019), '[Number of jobs in London and the UK by ethnicity of worker, 2010 to 2018](#)'.

⁵⁸⁰ GLA Economics (2017). '[London's creative industries – 2017 update](#)'.

⁵⁸¹ The 'science and technology' ONS category includes digital technologies, healthcare and life sciences, publishing and broadcasting, other scientific/technological manufacture and other scientific/technological services.

⁵⁸² Office for National Statistics (2019), '[Number of jobs in London and the UK by Science and Technology category, 2010 to 2018, by ethnicity and sex of worker](#)'.

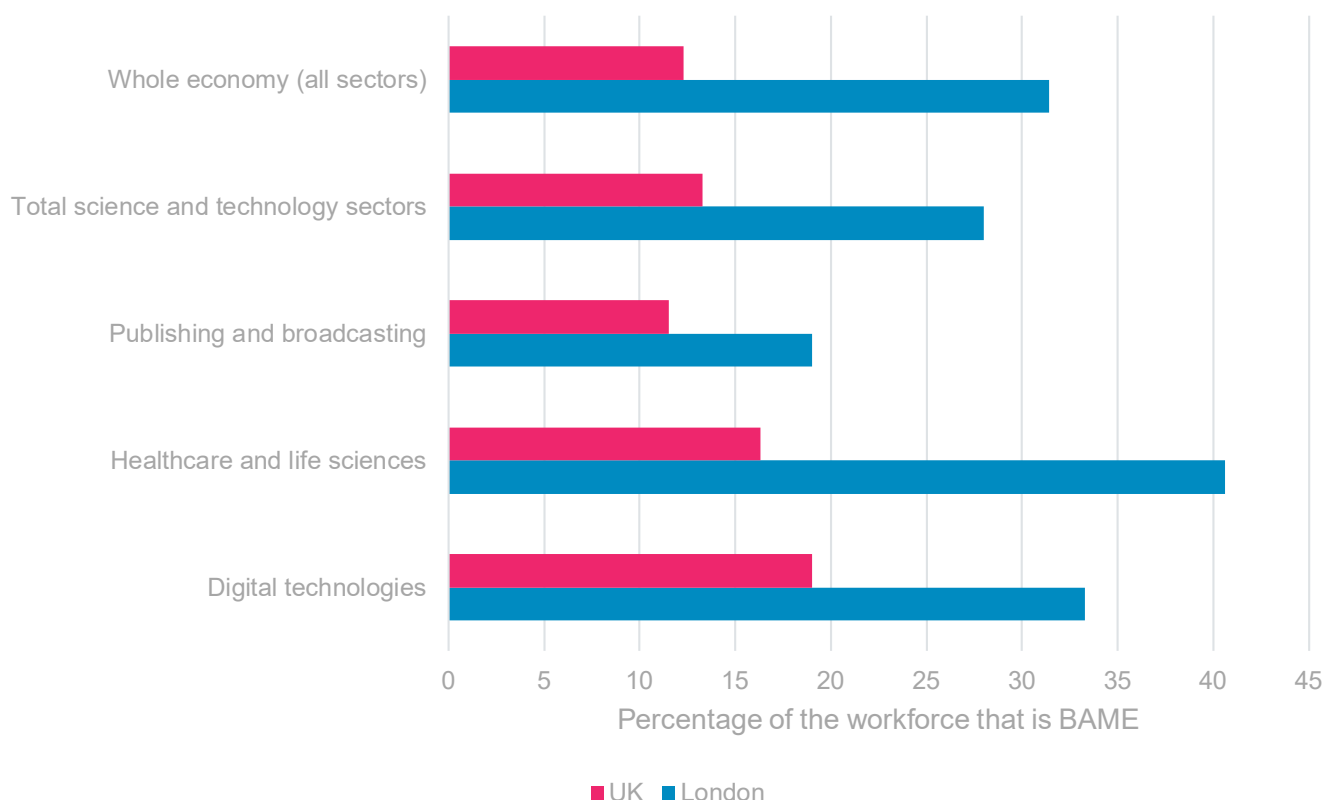
⁵⁸³ The total for BAME employment was derived by summing employment for the 'Asian', 'Black/African/Caribbean/Black British' and 'Any other ethnic group' categories from ONS data.

⁵⁸⁴ Office for National Statistics (2019), '[Number of jobs in London and the UK by ethnicity of worker, 2010 to 2018](#)'.

tech economy in 2018 were held by BAME workers, compared to 12.3% of jobs across all sectors of the UK economy.

- There are substantial differences between industries in the science and tech sector, however. Under 20% of London-based jobs in publishing and broadcasting were held by people of a BAME background in 2018, for example, compared to more than 40% in healthcare and life sciences (Figure 6.7).
- It is also important to note that this data looks at sectors rather than occupations, so may not accurately capture the representation of people of minority ethnic backgrounds in innovative roles within sectors. There is more work to be done to understand the diversity and inclusiveness of innovative activities in London.

Figure 6.7: BAME representation in science and technology industries in London and in the UK as proportion of workforce in 2018



Source: Office for National Statistics.

Women are also underrepresented in some innovative sectors, and hold less senior roles.

- Across the London economy in 2017, 44.1% of jobs were held by women⁵⁸⁵.
- Again, there is evidence of the underrepresentation of women in innovative sectors. To take the creative industries, 36.9% of roles were held by women in 2016⁵⁸⁶.
- While women's representation in the science and tech economy is broadly in line with their representation in the economy as a whole (holding 45.4% of jobs in 2018), this obscures substantial

⁵⁸⁵ Office for National Statistics (2018), '[London jobs broken down by various characteristics, 2017](#)'.

⁵⁸⁶ GLA Economics (2017), '[London's creative industries – 2017 update](#)'.

differences across industries. While women hold 69.5% of jobs in healthcare and life sciences, the equivalent figure for digital technologies is just 22.2%⁵⁸⁷.

- There are also indications that, within innovative sectors, women hold less senior positions. To take the creative economy, women's underrepresentation is greater in higher-paid occupations. 70.1% of roles as managers, directors and senior officials were held by men in 2016, and 69.9% of professional occupations⁵⁸⁸. While not London-specific, PwC has reported that just 5% of leadership positions in the technology industry are held by women⁵⁸⁹.

In terms of increasing diversity in the innovation process, there are some insights from other countries as to what works.

- A review for Innovate UK looked at policy responses in eight countries in Europe and North America, including the UK, to promote diversity and inclusion in innovation. It identified several examples of best practice for the design and implementation of policies, include supporting role models and champions, training those running programmes in unconscious bias and providing coaching and mentoring. Ensuring programmes are targeted at the specific challenges or barriers facing target groups was also found to be important⁵⁹⁰.

⁵⁸⁷ Office for National Statistics (2019), ['Number of jobs in London and the UK by Science and Technology category, 2010 to 2018, by ethnicity and sex of worker'](#).

⁵⁸⁸ GLA Economics (2017), ['London's creative industries – 2017 update'](#).

⁵⁸⁹ PwC. ['Women in tech: time to close the gender gap'](#).

⁵⁹⁰ Klingler-Vidra, R. (2018), ['Global review of diversity and inclusion in business innovation'](#).

6.11 The impact of innovation on London's economy and society in the future

Like the UK and the global economy, London could be significantly impacted by the take up of new, transformational technologies. These offer the promise of higher productivity and wider benefits.

- New data-driven technologies such as artificial intelligence (AI), augmented reality, cyber security and the internet-of-things are thought to have the potential to deliver significant productivity increases.
- According to an independent report for the Government⁵⁹¹, productivity gains from AI could be as high as 30% in the medium term in some sectors, while McKinsey sees AI and automation as having the potential to reverse the post-recession decline in productivity over the next decade⁵⁹².
- In a recent forward-looking analysis, McKinsey argue that the development and adoption of smart automation and AI has the potential to improve well-being in several ways (e.g. by increasing health, longevity and leisure time)⁵⁹³.

There is scope for public sector leadership (including at a regional level) to steer innovation in a direction that benefits society, both by managing technological transitions and disruptions and by setting long-term goals.

- McKinsey point to the importance of appropriate policy frameworks in maximising the benefits of new technologies while managing disruption during technological transitions, including job displacement. Specific sectors and locations can experience negative effects even if the overall impacts are significant and positive.
- As discussed in Chapter 4, estimates from the OECD and the ONS point to a lower percentage of jobs at high risk of automation in London compared to in the rest of the UK, but impacts are unlikely to be uniform across London or across different groups of Londoners. This suggests a need for targeted but potentially large-scale interventions (depending on the level of realised job displacement) to support London workers, including through training and re-skilling.
- Mazzucato has argued that innovation has a direction as well as a rate, where direction is the extent to which, as well as fuelling growth, innovation contributes to social, environmental and wider goals. This direction is something that policymakers can shape. The setting of 'missions' is one way to achieve this; clear, measurable objectives that activate innovation across sectors and disciplines to tackle a social, environmental or wider challenge⁵⁹⁴.
- The Industrial Strategy White Paper picks up this theme through its 'Grand Challenges', which the key London R&D sectors are well-placed to contribute to (see Appendix to Chapter 6).

⁵⁹¹ Hall, W. and Pesenti, J. (2018), '[Growing the Artificial Intelligence Industry in the UK](#)'.

⁵⁹² McKinsey Global Institute (2018), '[AI, automation, and the future of work: Ten things to solve for](#)'.

⁵⁹³ McKinsey Global Institute (2019), '[Tech for Good - Smoothing disruption, improving well-being](#)'.

⁵⁹⁴ Mazzucato, M. (2018), '[Mission-Oriented Research and Innovation in the European Union](#)'.

6.12 Further research to inform London's thinking on innovation

Research is ongoing looking at enabling technologies and London's economy.

- This project will improve the GLA's understanding of the technologies that will underpin future productivity growth, and their current stage of development in London. It will look at the barriers to the commercialisation and deployment of these technologies across the London economy, and what the Mayor can do to help surmount these barriers.

7 Places in London

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7.1 Introduction

This is a cross-cutting chapter, presenting evidence on inclusive growth in London and at the five foundations of productivity from a geographical perspective. As noted in the Industrial Strategy White Paper, “economic growth does not exist in the abstract. It happens in particular places”. At a national scale, this means that growth happens in particular cities, towns or rural areas. At a London scale, this means that growth dynamics play out at different special levels, e.g. Inner and Outer London, London's 33 local authorities and the many local communities and local economies within them.

The geographical perspective is important to understand London's productivity. Local labour market conditions, transport connections, levels of consumer spending and levels of agglomeration economies all affect economic performance of the city and of its constituent parts⁵⁹⁵. Furthermore, the geographical perspective is key to understand the degree to which London's economic growth is translating into prosperity and well-being across its places and communities.

The 33 local authorities vary considerably in geographical, population and employment size⁵⁹⁶, but even at this level, borough-wide figures often mask huge underlying differences in socio-economic outcomes. Evidence within this chapter is therefore presented at different levels of spatial analysis, according to availability and robustness of information, but may not show the full range of variation that exists.

The chapter provides a geographic breakdown of evidence on the economic activity within the capital and how various areas of the capital link together. It further examines the economic and social challenges and inequalities of London and how they are spread across the city. Specifically:

- Section 7.2 looks at the distribution of economic activity and jobs in London. It looks at how economic activity and jobs are distributed geographically across London and how this has changed over time as well as patterns of business clustering and of commuting.
- Section 7.3 looks at living standards in London. Specifically, it examines the combination of low incomes, poor housing, ill health, a lack of work and low education attainment in large pockets of inner and outer London.
- Finally, Section 7.4 looks at the policies that the GLA, London Boroughs and sub-regional partnerships have put in place to deliver inclusive growth across London.

London, however, does not stand isolated from the rest of the UK as shown quite easily by its large commuter flows both to and from the capital. Chapter 8 thus builds on this chapter by looking at London's place in the context of the Wider South East and the UK as a whole.

Several sections of this chapter refer to the evidence and policies in the draft London Plan (Box 7.1).

⁵⁹⁵ GLA Economics (2019), “[Productivity trends in London: An evidence review to inform the Local Industrial Strategy evidence base](#)”.

⁵⁹⁶ A wide variety of borough level data is available on the [London Datastore](#) at: <https://data.london.gov.uk/dataset?tag=borough-economic> in addition to the data examined in this chapter.

Box 7.1: The draft London Plan and Good Growth policies.

Under the legislation establishing the Greater London Authority (GLA), the Mayor is required to publish a Spatial Development Strategy (SDS) and keep it under review. The SDS is known as the London Plan. As the overall strategic plan for London, it sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years.

The draft London Plan⁵⁹⁷ was published in December 2017 and has recently been subject to Examination in Public.

The Plan sets out Good Growth Policies, which are intended to promote the strength and potential of the wider city region by ensuring diversification of London's economy, spreading growth more equitably across London and providing the social and physical infrastructure – including housing- required to achieve these objectives. London's spatial features are key to Good Growth objectives and evaluating progress towards achieving them.

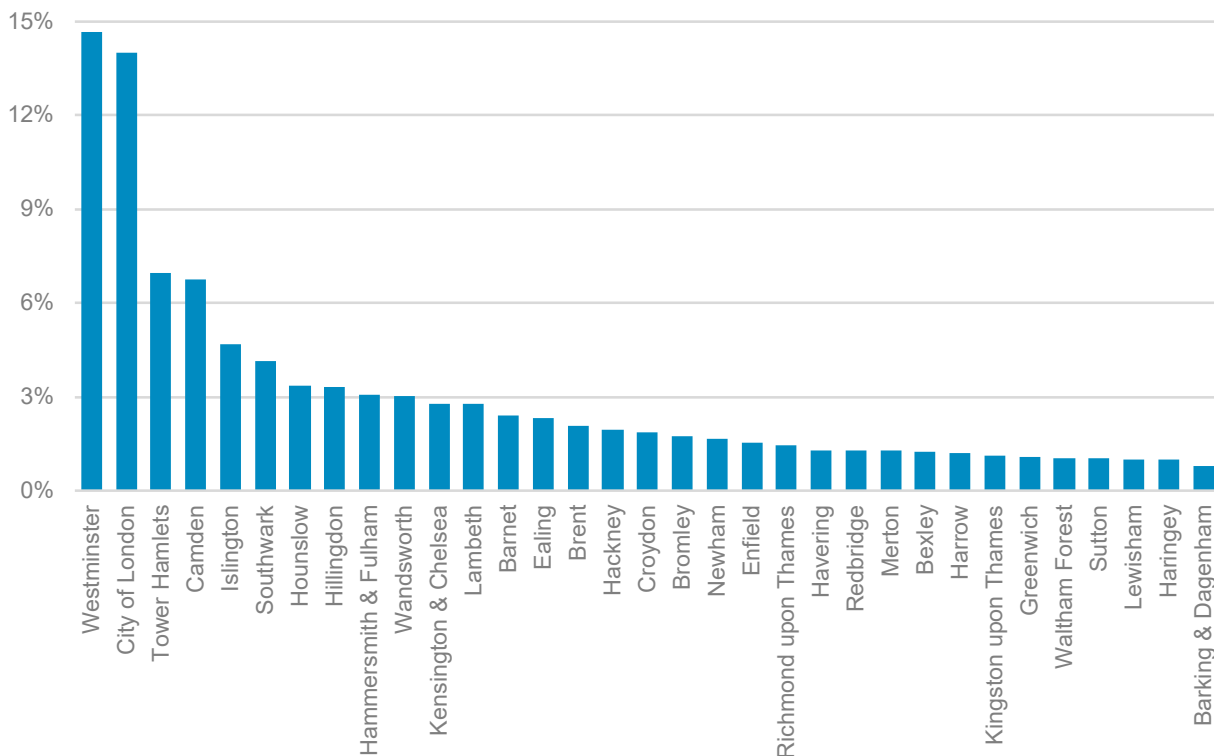
⁵⁹⁷ <https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/download-draft-london-plan-0>

7.2 Economic activity and jobs across London

The presence of unique agglomeration economies has led to a large concentration of economic activity in London, particularly in the Central Activities Zone and the Northern Isle of Dogs.

- The output of the Central Activities Zone (CAZ), Northern Isle of Dogs (NIoD) and a 1km fringe around them stood at just under £228bn in 2017, accounting for nearly 53% of London’s output and just under 13% of UK output from an area of land covering just 0.03% of the UK⁵⁹⁸.
- Westminster and the City of London were the local authorities (LAs) with the highest output in London in 2017 (£62.5 and £59.6 billion, respectively). These two boroughs plus the central boroughs of Tower Hamlets, Camden, Islington, and Southwark accounted for 51.2% of London’s total output in that year while the other 27 boroughs in London made up the remaining 48.8% of the total output (Figure 7.1).
- With just under 2 million employee jobs in 2016, projected to grow to around 2.5 million by 2041, the CAZ and NIoD⁵⁹⁹ together are and will likely remain the most significant employment centre in the Greater South East region, with exceptionally high employment density figures (see Chapter 3, Figure 3.6).
- Another area of significant agglomeration which overlaps but extends beyond the CAZ is Tech City. In 2017 the output of this area plus a 1km fringe around it stood at just under £146 billion and accounted for over 0.8 million employee jobs.

Figure 7.1: Contribution of London’s boroughs to total output in London in 2017



Source: [ONS \(2018\). ‘Regional gross value added \(balanced\) local authorities by NUTS1 region’⁶⁰⁰](#) & GLA Economics calculations.

⁵⁹⁸ Source: GLA Economics calculations based on the 2018 GVA release from the ONS - [ONS \(2018\). ‘Regional gross value added \(balanced\) local authorities by NUTS1 region’](#) and Business Register and Employment Survey data for 2017. For further details on the calculation methodology see: GLA Economics (2015), Working Paper 68: [‘Work and life in the Central Activities Zone, northern part of the Isle of Dogs and their fringes’](#).

⁵⁹⁹ These areas are defined here without the 1km fringe around them.

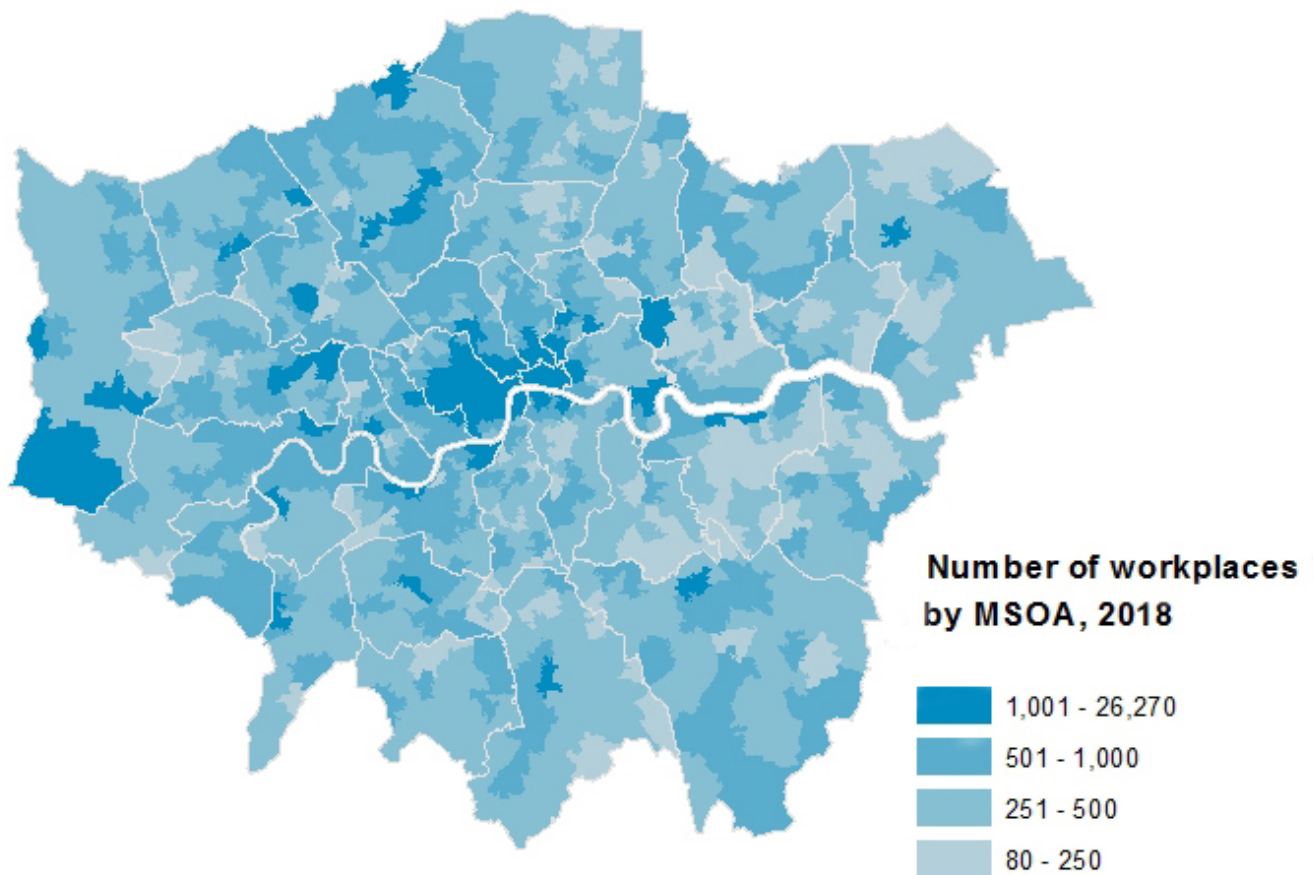
⁶⁰⁰ The local authority GVA(B) data used to calculate these percentages can be found at:

<https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedbalancedlocalauthoritiesbynuts1region>

However, other areas of London have significant concentrations of workplaces. This includes the west of London as well as various town centres and high streets across the whole of London, and several urban business parks, Strategic Industrial Locations (SIL) and Locally Significant Industrial Sites (LSIS).

- Significant centres of employment are found across the whole city (Figure 7.2)⁶⁰¹. The West End and Knightsbridge have around 70,000 people working in town centres, while around 25,000 work in town centres across London.
- 47% of businesses outside Central London are on a high street and 1.45 million employees work on or within 200 metres of a high street⁶⁰².
- There are also significant clusters of industrial activity in outer London. The largest property market areas are Park Royal and Thames Gateway, making up 50% of industrial land take-up between them. Between 2009-2015 these areas saw jobs grow by around 15,000 and 7,000 respectively⁶⁰³.

Figure 7.2: Workplaces in London in 2018 by MSOA



Source: ONS Inter-Departmental-Business Register.

⁶⁰¹ For more on the distribution of employment in London, see figure 3.6.

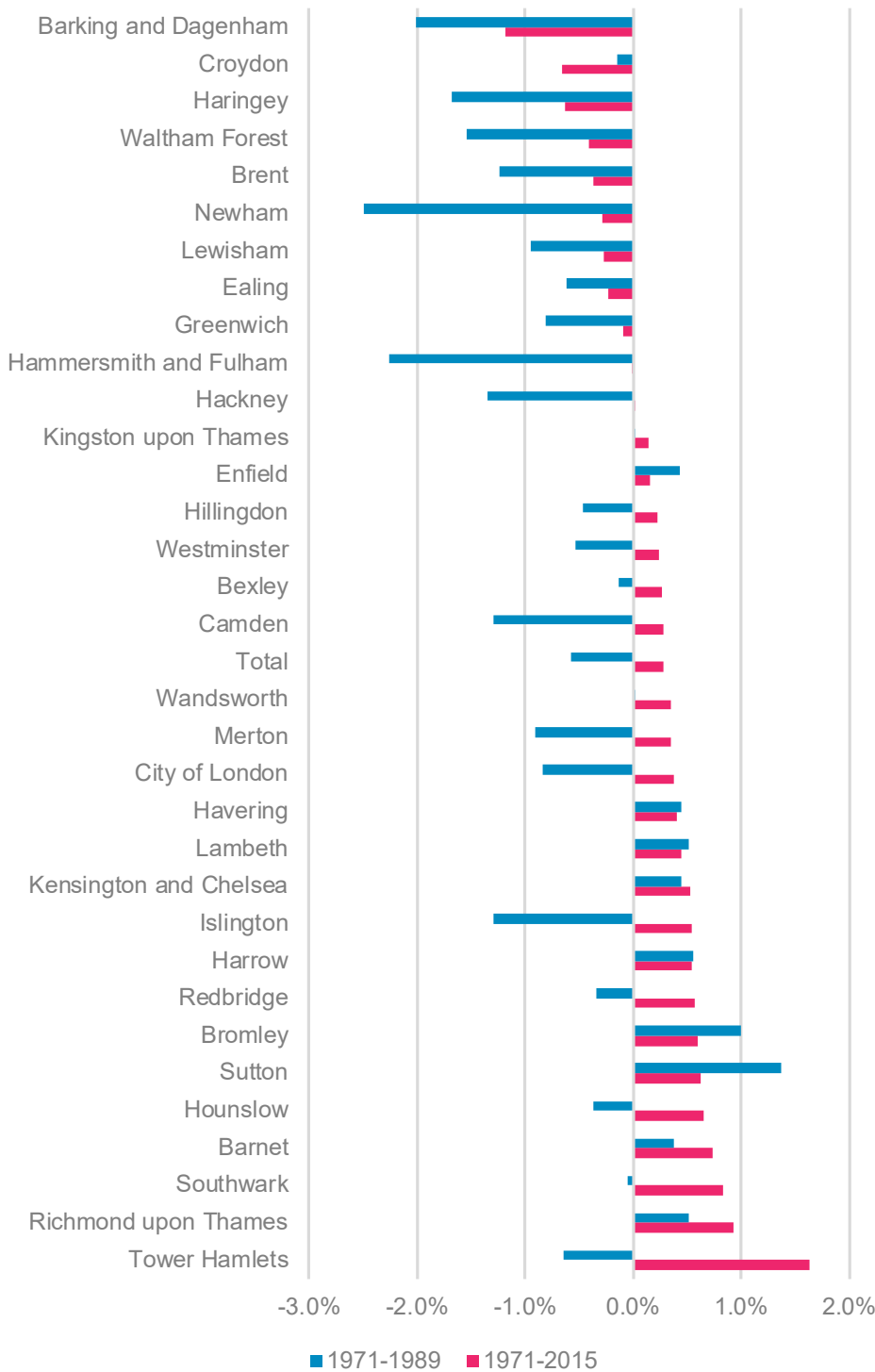
⁶⁰² GLA (2017), '[High streets for all](#)'.

⁶⁰³ GLA (2017), '[London Industrial Land Demand](#)'.

A number of boroughs that used to have a strong manufacturing presence have fewer jobs now than they had in the early 1970s. What has distinguished the more successful areas is their ability to attract jobs in business services.

- Underneath a general long-term trend of growth in jobs across the city, there are ten boroughs which by 2015 had not recovered the level of employee jobs seen in 1971, namely: Barking and Dagenham; Brent; Croydon; Ealing; Greenwich; Hammersmith and Fulham; Haringey; Lewisham; Newham; and, Waltham Forest. With the exception of Croydon, each of these boroughs has seen some jobs growth in recent years (Figure 7.3).
- Despite mixed fortunes over the period of 1971–2015, boroughs with a part in the CAZ have grown strongly in the period 2008–2015. These boroughs are: Camden; Hackney; Islington; Kensington and Chelsea; Lambeth; Southwark; Tower Hamlets; Wandsworth; and, Westminster.
- Manufacturing jobs have declined in every London borough since 1971, with an average rate of decline of 83.4%. However, between 2010 and 2015, 13 boroughs – primarily in outer London – saw modest increases in manufacturing jobs.
- Jobs in business services have grown by at least 1,000 jobs in each borough since 1971. In each of the 10 boroughs that form the CAZ, jobs in business services have grown by an average 8,500 per annum, compared to an average of 144 per annum for those boroughs outside the CAZ.
- Westminster, the City of London, Camden, Southwark and Islington have seen the greatest increase in business service jobs. With the exception of Camden, these are also the boroughs that have seen the highest overall growth.

Figure 7.3: Borough change in London employee jobs, 1971-1989⁶⁰⁴ and 1971-2015, compound annual growth rate



Source: GLA Economics calculations⁶⁰⁵.

⁶⁰⁴ 1989 was the cyclical peak in employment before the early 1990s recession.

⁶⁰⁵ GLA Economics (2017), Working Paper 92: [‘London’s boroughs: borough by sector jobs, data and methodology’](#).

As discussed in Chapters 1 and 2, headline productivity for London statistics mask significant disparities in performance across the capital. Between 2010 and 2017, most London sub-regions experienced a decrease in productivity.

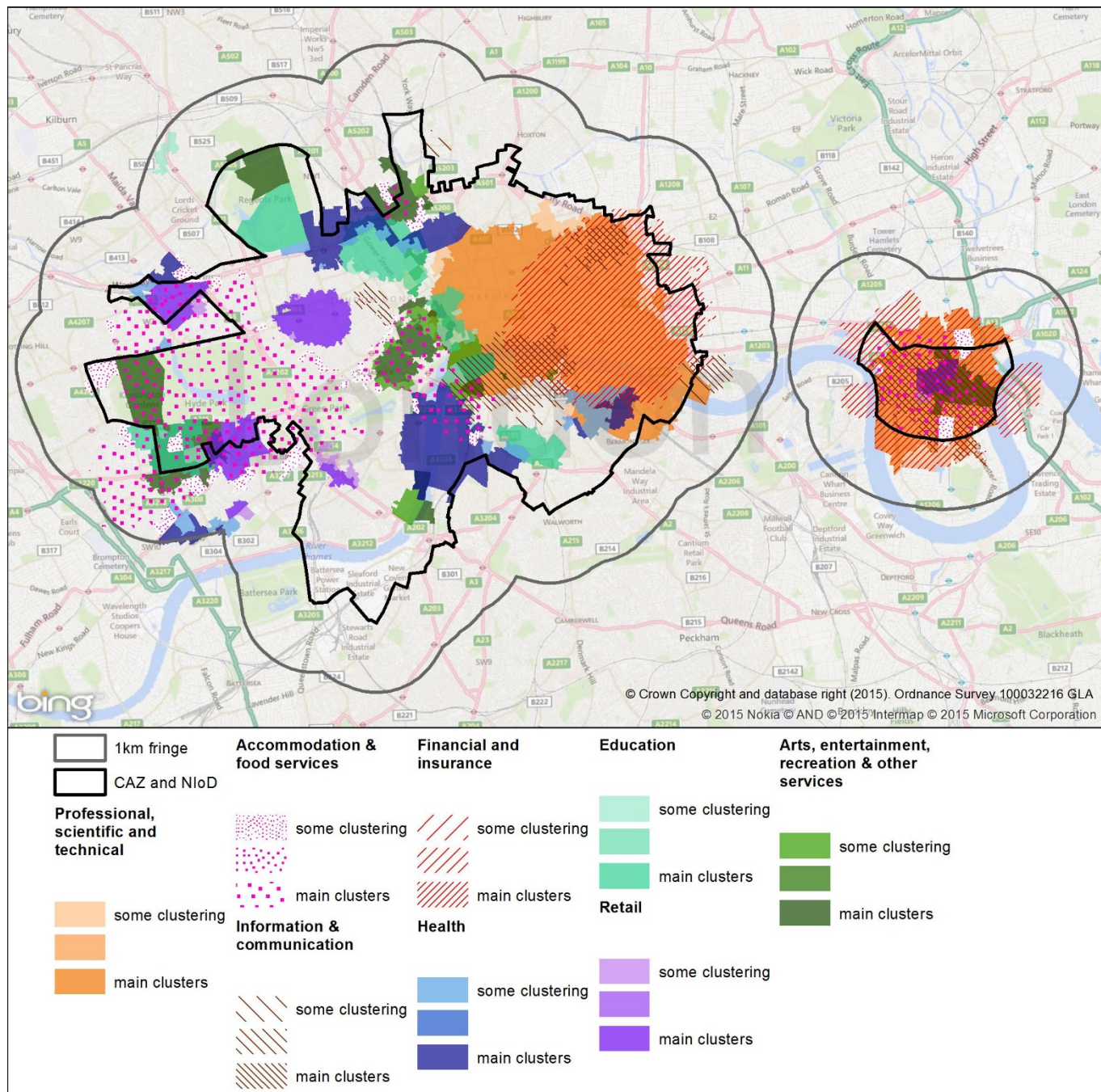
- ONS productivity estimates excluding rental incomes show Tower Hamlets, which includes Canary Wharf, as having the highest productivity level in 2017.
- The lowest levels of labour productivity in London were in Lewisham and Southwark, with labour productivity at 2% above UK average.
- As discussed in Chapter 2, there are a number of London regions (Outer London South, Outer London East and North East and Inner London East) that have seen a reduction in productivity between 2010 and 2017 (Chapter 2, Figure 2.6).

Businesses and employment show a clustered pattern in London, with particular types of industries tending to group together spatially. Areas of similar characteristics are, however, more dispersed than this might suggest.

- Maps of London clusters by industry and employment type in the CAZ, NLoD and 1 km fringe around them based on Census 2011 data tend to confirm a picture of sectoral clustering that one may expect in London, e.g. a strong agglomeration of Financial and Insurance in the City and in Canary Wharf, a main education hub around Bloomsbury/University of London/Holborn, a main retail cluster in the West End, etc. (Figure 7.4).
- More recent clustering analysis for the draft London Plan has identified further specialist clusters of activity within the CAZ, which contribute towards the capital's international and national roles. These clusters include significant concentrations of activity in arts and culture, state, health, law and education (Figure 7.5). For example, this analysis highlights a creative industries cluster in Soho and South Kensington's museum hub, which are not picked up in Figure 7.4.
- Analysis conducted on behalf of the GLA has expanded on previous work by looking at the dominant employment sectors in Greater London's workplace zones. By examining data on industry and employee characteristics it highlights the importance of certain types of clusters (e.g. Transportation and communication sector) in outer London, as well as the importance of local clusters of Public administration, Education and Human health activities (Figure 7.6). It shows some clusters of employee characteristics, revealing clusters of high-status jobs/sectors throughout London⁶⁰⁶.

⁶⁰⁶ Singleton et al (2017), '[London Workplace Zones Classification, Technical Report](#)'.

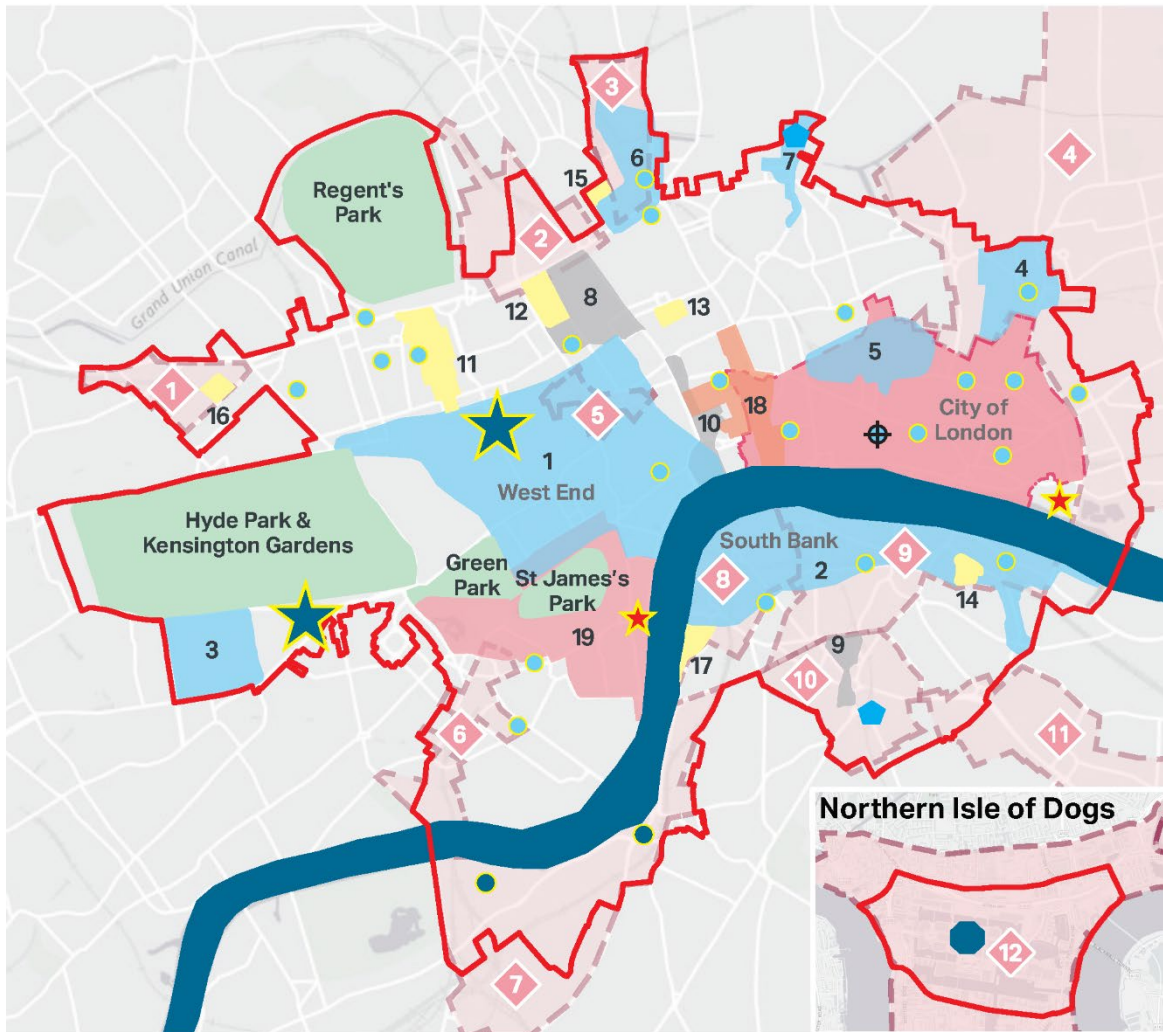
Figure 7.4: Clustering by industry employment type in the CAZ, NIOD and an approximately 1km fringe around them in 2011⁶⁰⁷



Source: GLA Economics (2015) *'Work and life in the CAZ, north part of the Isle of Dogs & fringes'*.

⁶⁰⁷ Note that the definition of the NIOD used in this figure is different to geography currently used, which covers a smaller area. The clusters in this figure were calculated using GIS Hot Spot Analysis. Given a set of weighted features, it identifies statistically significant hot spots and cold spots using the Getis-Ord G_i^* statistic. For more detail, see *'Work and life in the CAZ, north part of the Isle of Dogs & fringes'*.

Figure 7.5: Specialist clusters in the CAZ



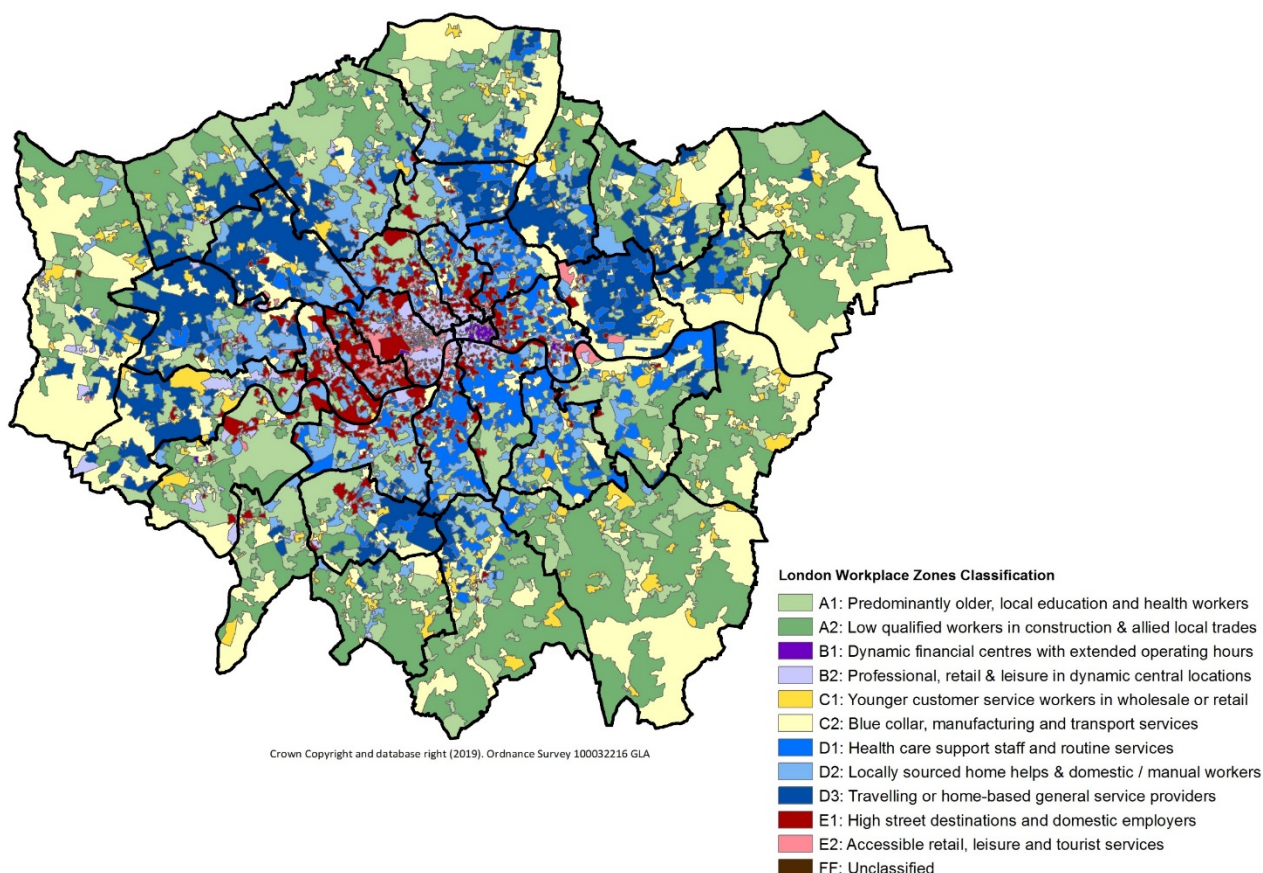
The Central Activities Zone and the Northern Isle of Dogs

- | | |
|---------------------|---------------------------------|
| CAZ and NIOD | Specialist Clusters |
| St Paul's Cathedral | Academic |
| World Heritage Site | Arts, culture and entertainment |
| Royal Parks | Health |
| City of London | Legal |
| River Thames | State |
| Opportunity Area | |

Source: GLA Planning

Contains OS data © Crown copyright and database right (2017)

Source: [Draft London Plan 2017](#).

Figure 7.6: London Workplace Zone Classification Group distribution

Source: [GLA Workplace Zone Classification](#)⁶⁰⁸.

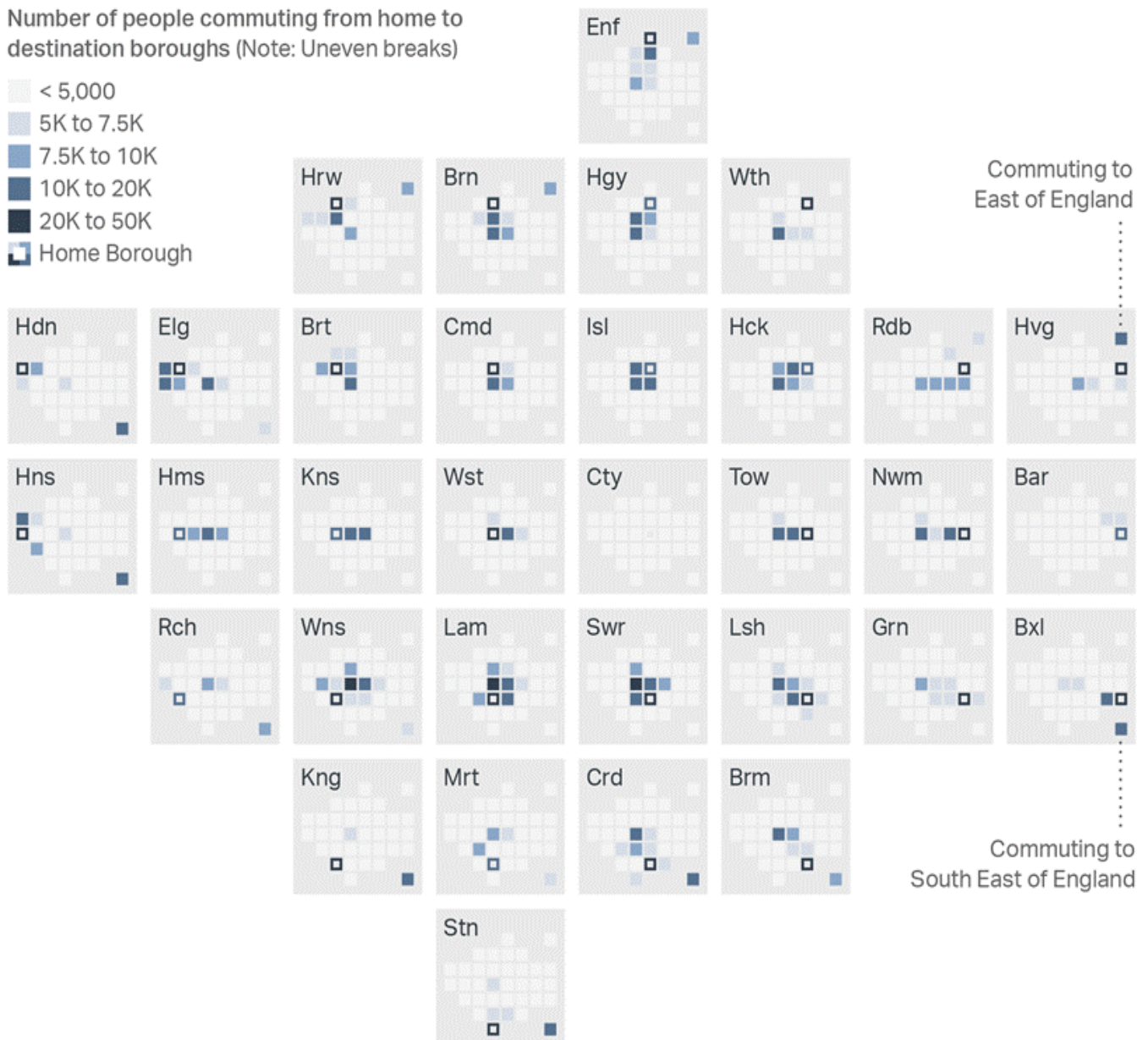
Commuting patterns are complex within London and to and from areas outside. People working in London travel on average nearly ten miles to reach their workplace.

- Around 650,000 Londoners work at or from home, 4.5 million travel to work elsewhere within London and 800,000 people commute in from outside London, while 300,000 travel to work outside London⁶⁰⁹.
- The central area of London (the boroughs forming the CAZ plus Tower Hamlets - which contains the NIoD) is a clear 'attractor' for workers from other boroughs and from neighbouring regions. More than half of the 800,000 residents from outside London that work in Greater London work in these boroughs, with Westminster and the City of London attracting a particularly high number of commuters.
- On a smaller scale, the Heathrow area has a similar attraction function with over 80,000 commuters from outside London into Hillingdon and Hounslow.
- In most boroughs, between around 25% and 40% of residents work in the same borough, rising up to over 40% in Hillingdon and over 50% in the Westminster/City area. However, residents make up a small proportion of those employed in Westminster and in the City.
- Other than commuting to the central area, Census 2011 data show that the largest flows are generally to/from neighbouring boroughs, including to/from areas outside London (Figure 7.7).

⁶⁰⁸ The data used to generate this map can be found at: <https://data.london.gov.uk/census/lwzc/>

⁶⁰⁹ ONS (2014), 'Place of Residence by Place of Work, Local Authority'.

Figure 7.7: Commuting flows map for London residents, borough level, 2011



Note that figures exclude people working at home or with no fixed workplace. Only flows over 5,000 people are illustrated. An interactive version allowing exploration of the full data can be found at <https://maps.london.gov.uk/commuter-flows/>.

Source: 2011 Census Workplace Statistics.

London Squared by After The Flood, based on previous work by @robradburn.

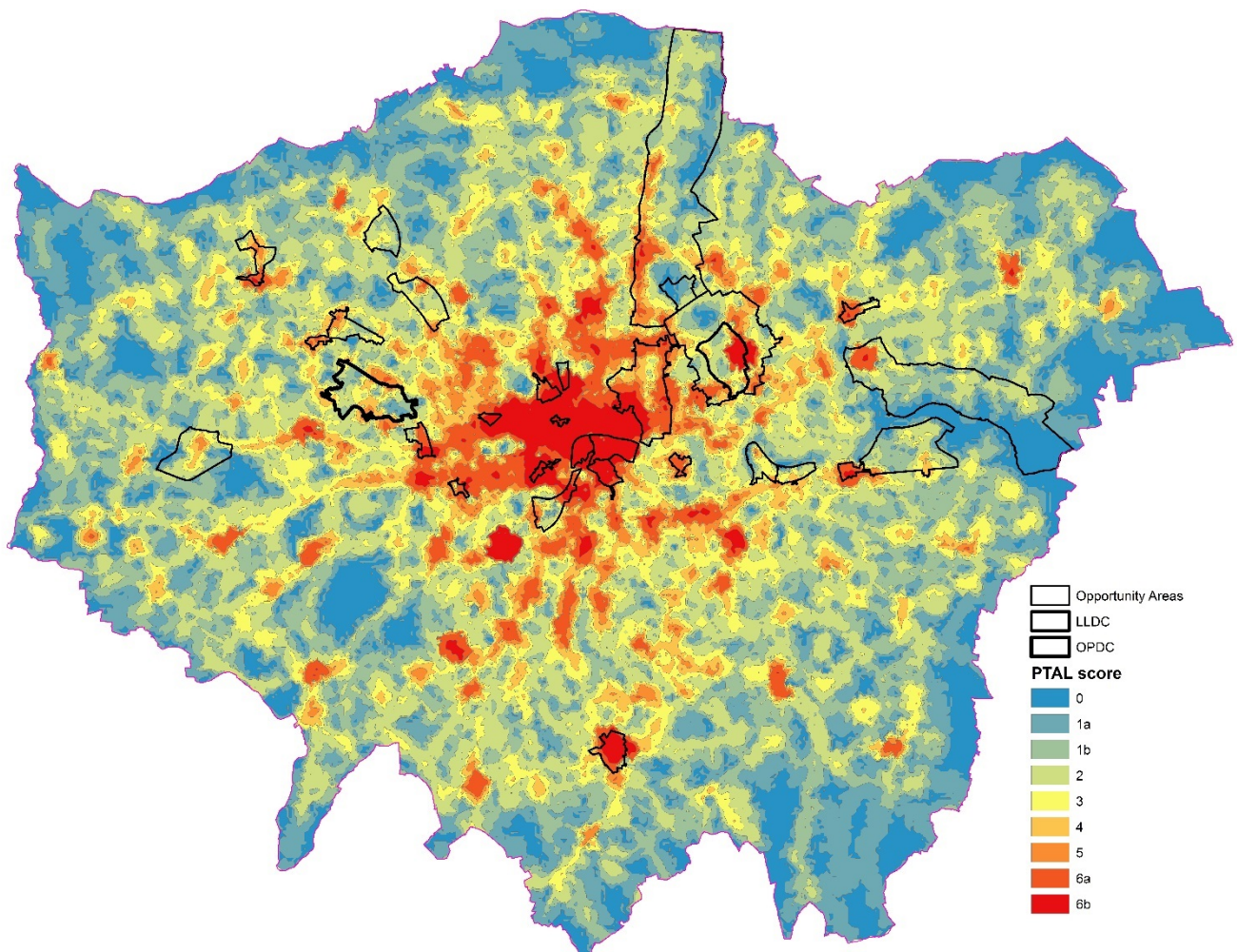
Within the capital, a dense public transport network significantly aids these commuting patterns. But targeting remaining gaps in public transport provision could help unlock commercial and housing development in outer London.

- London's extensive transport network allows people to reach the centre. Each small geographic area can be given a Public Transport Accessibility Level (PTAL), which is a way to measure the density of

the public transport network at any location within Greater London⁶¹⁰. This can be compared with undeveloped areas which might be used for commerce or housing.

- Opportunity Areas, the London Legacy Development Corporation (LLDC) (around the Olympic Park), and the Old Oak and Park Royal Development Corporation (OPDC)⁶¹¹ are London's major source of brownfield land with significant capacity for development. Transport infrastructure is typically key to unlock their potential⁶¹².
- In broad terms PTALs decline with distance from the centre of London, and development areas are more widely distributed across the city, (Figure 7.8). That is, the provision of additional transport infrastructure to these areas might unlock both housing and jobs.

Figure 7.8: Boundaries of Opportunity Areas, LLDC and OPDC, and 2015 PTALs, London



Source: GLA City Intelligence Unit modelling, incorporating TfL data.

Note: These are adopted Opportunity Areas at July 2019⁶¹³.

⁶¹⁰ For more information see [Public Transport Accessibility Levels - London Datastore](#).

⁶¹¹ The Development Corporations have responsibility to plan, develop, and regenerate the areas for which they are responsible.

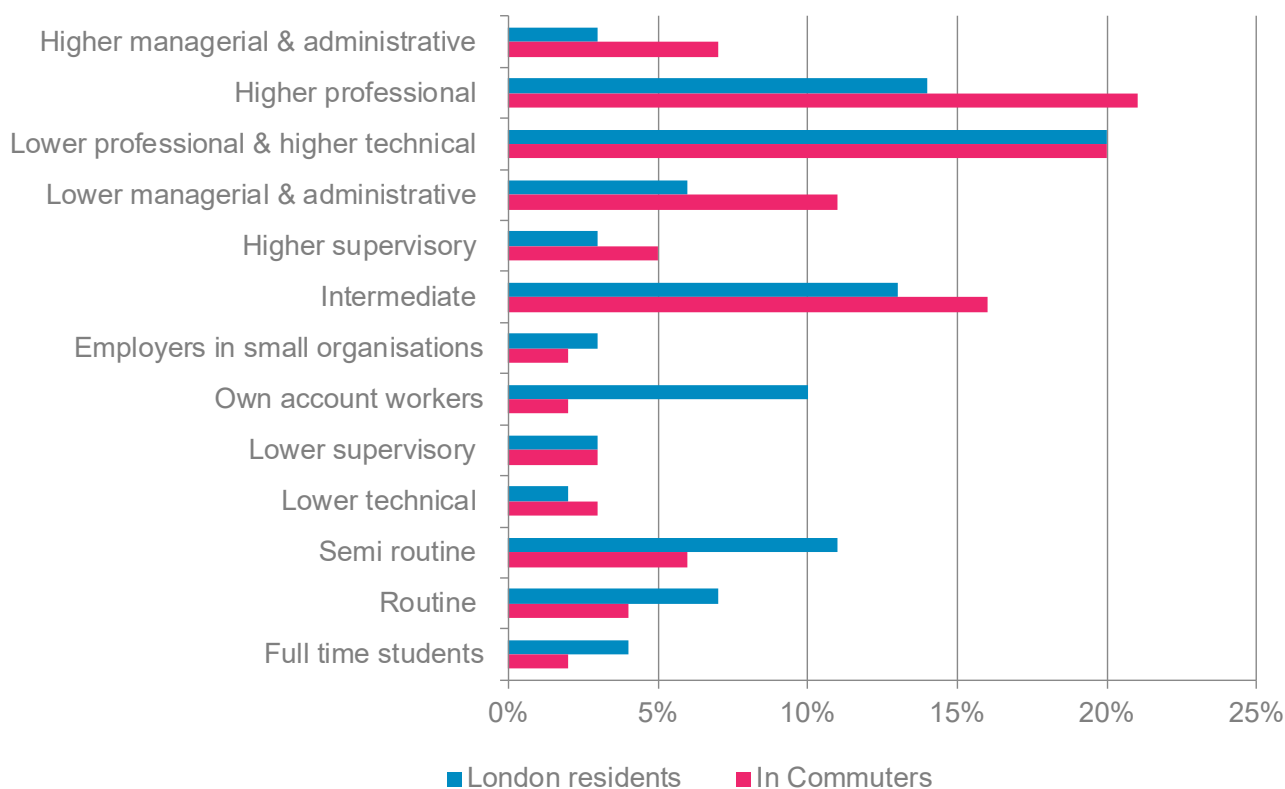
⁶¹² See [What are Opportunity Areas? | London City Hall](#).

⁶¹³ These are Canada Water; Charlton Riverside; City Fringe/Tech City; Colindale/Burnt Oak; Cricklewood/Brent Cross; Croydon; Deptford Creek/Greenwich Riverside; Earls Court & West Kensington; Elephant & Castle; Euston; Greenwich Peninsula; Harrow & Wealdstone; Ilford; Isle

There are clear differences in professional and pay profiles when looking at different types of London workers by place of residence. People from disadvantaged and lower occupational groups tend to commute much shorter distances.

- Commuting from outside London tends to be associated with higher professional status while people from disadvantaged groups and on lower income tend to commute much shorter distances, being limited in their ability to take full advantage of the opportunities of London's labour market.
- Census 2011 data analysed by GLA Intelligence⁶¹⁴ showed that workers in the higher occupational groups (managerial/professional and associate professional occupations) were more likely to commute in from outside London than to live in London (Figure 7.9). In-commuters are more likely to be older workers and to be male than their London-resident counterparts.
- The reverse is true for the lower occupational groups (e.g. in caring, personal services and sales), where workers are more likely to be London residents or from disadvantaged groups than commuters.
- The average distance travelled to work in London is 9.1 miles. Managers directors and senior officials travelled 12.1 miles on average. Professionals and Associate Professionals also had commutes above the London average, although workers in health and education travelled shorter distances in general than workers in other associate/professional occupations. Workers in medium and lower-skilled occupations generally have commuting distances below the London average (Figure 7.10).

Figure 7.9: London workers by NS SEC and place of residence



Source: 2011 Census Workplace Statistics.

of Dogs; King's Cross-St Pancras; London Bridge, Borough & Bankside; London Riverside; Lower Lea Valley (including Stratford); Paddington; Park Royal; Old Oak Common; Southall; Thamesmead and Abbey Road; Tottenham Court Road; Upper Lea Valley; Vauxhall, Nine Elms, Battersea; Victoria; Waterloo; Wembley; White City; Woolwich. Other proposed OAs are: Bexley Riverside; Bromley; Heathrow; Kensal Canalside; Kingston Direction of Travel; Lewisham, Catford and New Cross; Old Kent Road; Royal Docks & Beckton Riverside.

⁶¹⁴ GLA Intelligence (2015), '[Characteristics of Commuters – Census Information Scheme](#)'.

Figure 7.10: Average commuting distance by occupation group (miles)



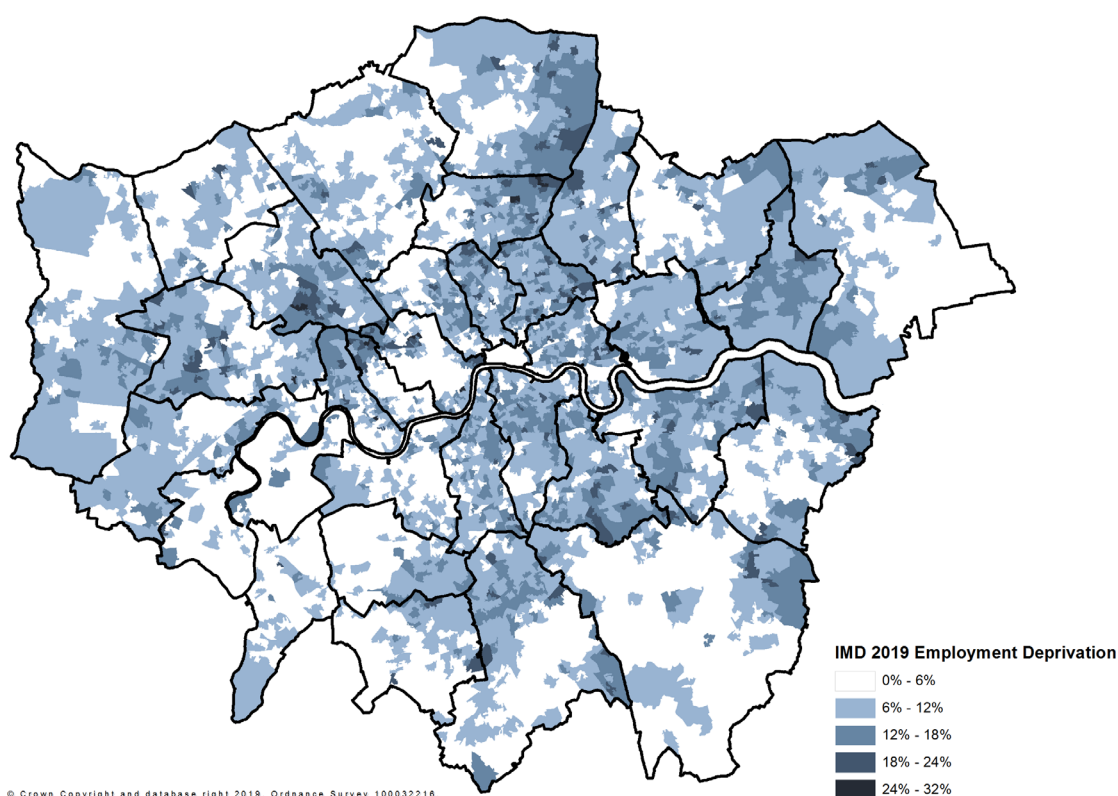
Source: 2011 Census Workplace Statistics.

7.3 Living standards across London

There is a very large variation in levels of unemployment and inactivity in different areas of London. This reflects a mixture of historical legacy and more recent socio-economic change.

- Unemployment is estimated to range between around 3.6% of the economically active population in Harrow to 6.3% in Lambeth. This compares to a national variation between 1.8% and 9.0% at local authority level⁶¹⁵.
- For smaller geographical areas, variation is even greater (Figure 7.11). The employment deprivation domain of the Indices of Deprivation captures the numbers of people involuntarily out of work, including because of illness or disability or caring responsibilities. This shows high levels of variation even within boroughs.
- Both Westminster and neighbouring Kensington & Chelsea each include some of the areas in London with the lowest employment deprivation rates – all below 1% and each includes eight of the least employment deprived 50 neighbourhoods in England. However, each of these boroughs also includes two of the five areas in London with the highest employment deprivation rates – 27% or higher and in the most deprived 3% of neighbourhoods in England⁶¹⁶.

Figure 7.11: Employment deprivation levels in London



Source: Index of Multiple Deprivation 2019, MHCLG.

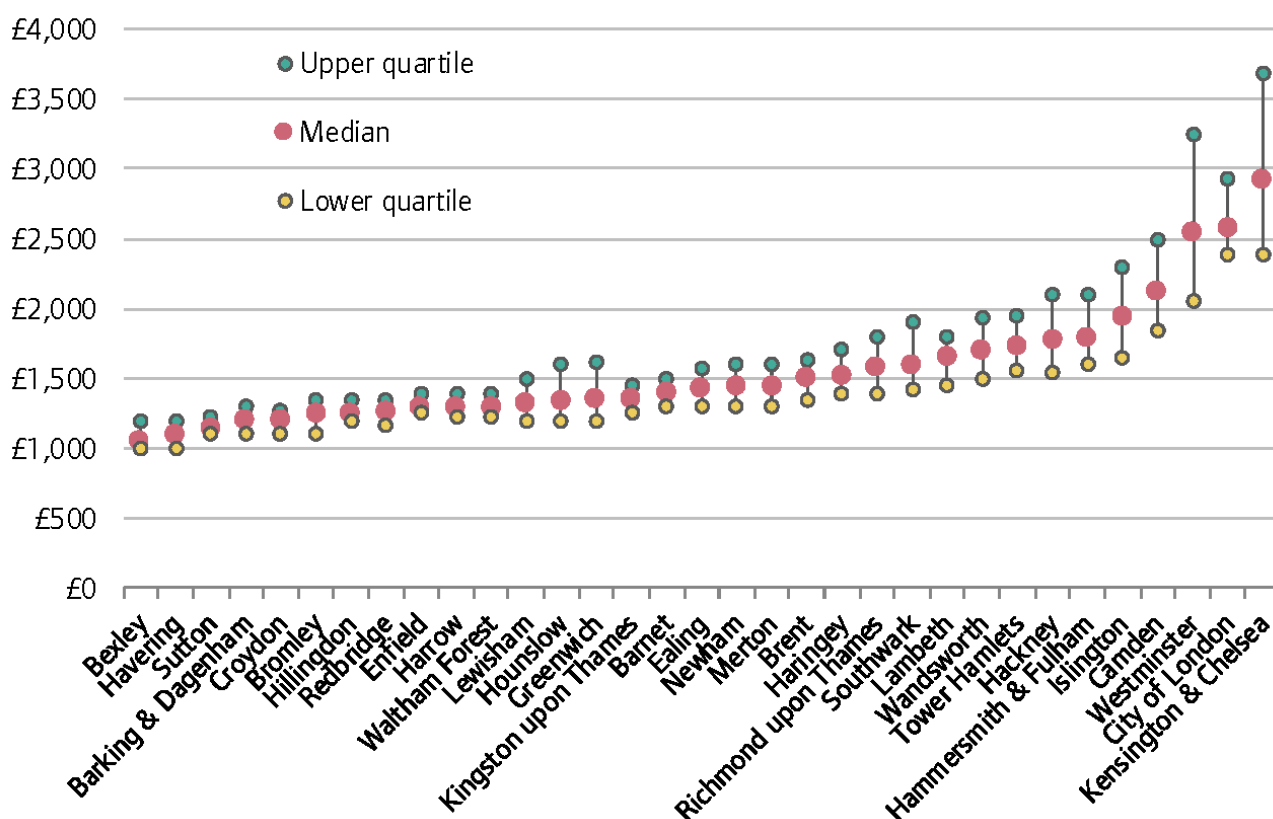
⁶¹⁵ Source: ONS modelled unemployment estimates Jan-Dec 2018.

⁶¹⁶ DCLG, Indices of Deprivation 2019.

As mentioned in previous chapters, housing affordability is a key challenge for London and this is true across the capital. At the same time, there is huge variation in rents within London and between the top and bottom of the market in the most expensive boroughs.

- The median rent for a privately rented home in London is £1,495 per calendar month, more than twice as high as the median in England as a whole (£695). London's rents are so much higher than those of other regions that the median monthly rent for a one-bedroom home in the capital (£1,279) is almost as high as the national median monthly rent for a home with four bedrooms or more (£1,320).
- Looking at boroughs, the lowest median monthly rent for a two-bedroom home is £1,050 in Bexley, while the median rent in Kensington and Chelsea is around three times higher at £2,925 (Figure 7.12).
- Richmond-upon-Thames was the outer London borough with the highest median private rent for a two-bedroom home (£1,575). Lewisham was the inner London borough with the lowest median private rent for a two-bedroom home (£1,325).
- 24 boroughs had median monthly rents within £600 of each other (from £1,050 in Bexley up to £1,650 in Lambeth). Divergence is much greater at the top of the market, with £1,200 separating the median rent in Wandsworth and Kensington and Chelsea.

Figure 7.12: Lower quartile, median and upper quartile monthly market rents for a two-bedroom home by London borough, 2019

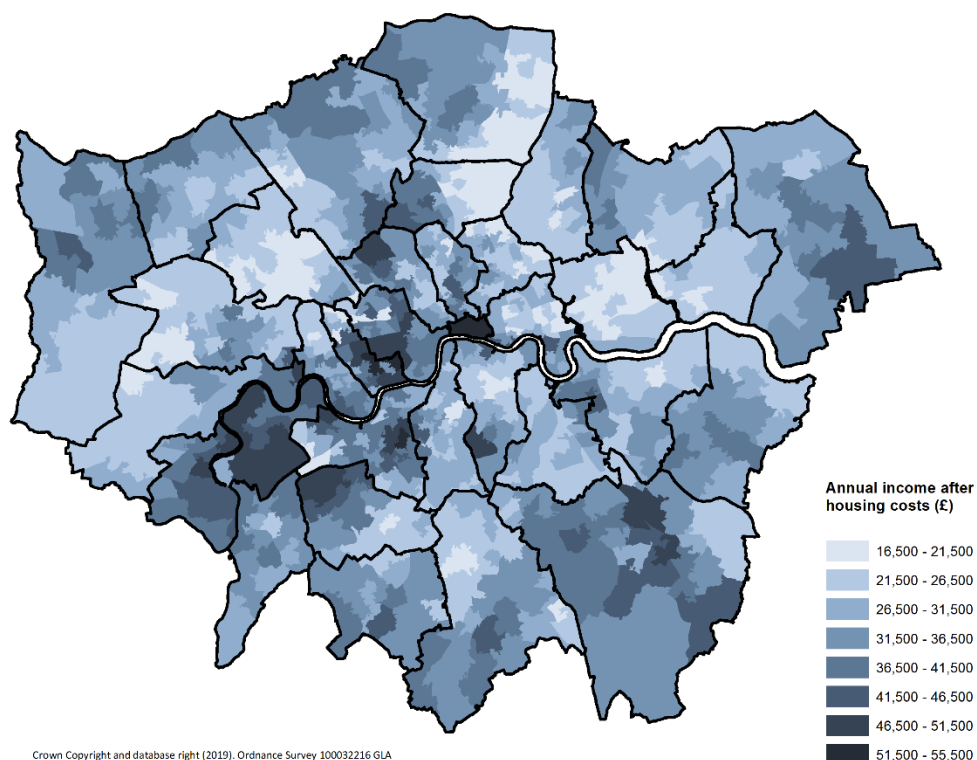


Source: GLA, *Housing in London 2019*.

Income, wealth and health levels show huge variation across London.

- It is well known that incomes vary widely across London. Taking averages, even across small areas of London hides a lot of the variation between households, but even so, there is considerable variation in the income available to households in different parts of the capital (Figure 7.13).
- Average equivalised⁶¹⁷ incomes after housing costs in the richest areas of London – in parts of Wandsworth, Kensington & Chelsea and the City of London – are more than three times the averages of the lowest income areas, in parts of Haringey, Enfield and Barnet.
- The distribution of housing wealth across the city is also subject to large geographical variation. At £1.35 million, the median price of a house in the most expensive borough (Kensington and Chelsea) in 2017 was nearly four and a half times more expensive than the median price of a house in the least expensive borough (Barking and Dagenham)⁶¹⁸.
- Health Inequalities are also apparent in many different ways across London and different issues are more prevalent in different areas. Child obesity rates are correlated with deprivation levels (Figure 7.14), healthy life expectancy follows income levels (Figure 7.15), while mental health issues are more widespread (Figure 7.16).

Figure 7.13: Average (mean) equivalised annual income in London 2015/16



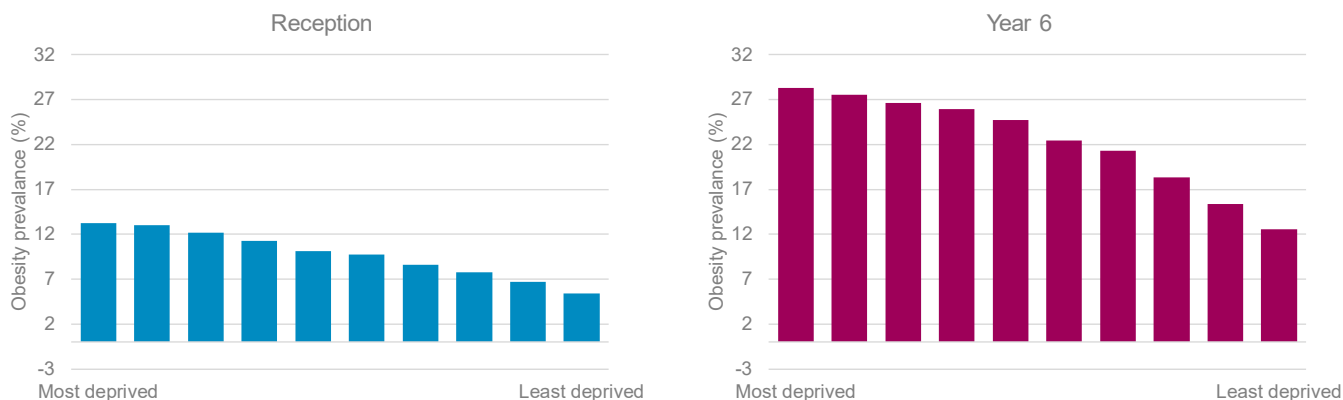
Source: Model-based income estimates (MSOA), year ending 2016, ONS⁶¹⁹.

⁶¹⁷ Equivalisation is a process that adjusts incomes to take account of household size and composition to allow comparison of living standards for different types of households.

⁶¹⁸ London Datastore: <https://data.london.gov.uk/average-house-prices/>

⁶¹⁹ Calculated using data from the DWP Family Resources Survey. See the [London Datastore](#) for more details.

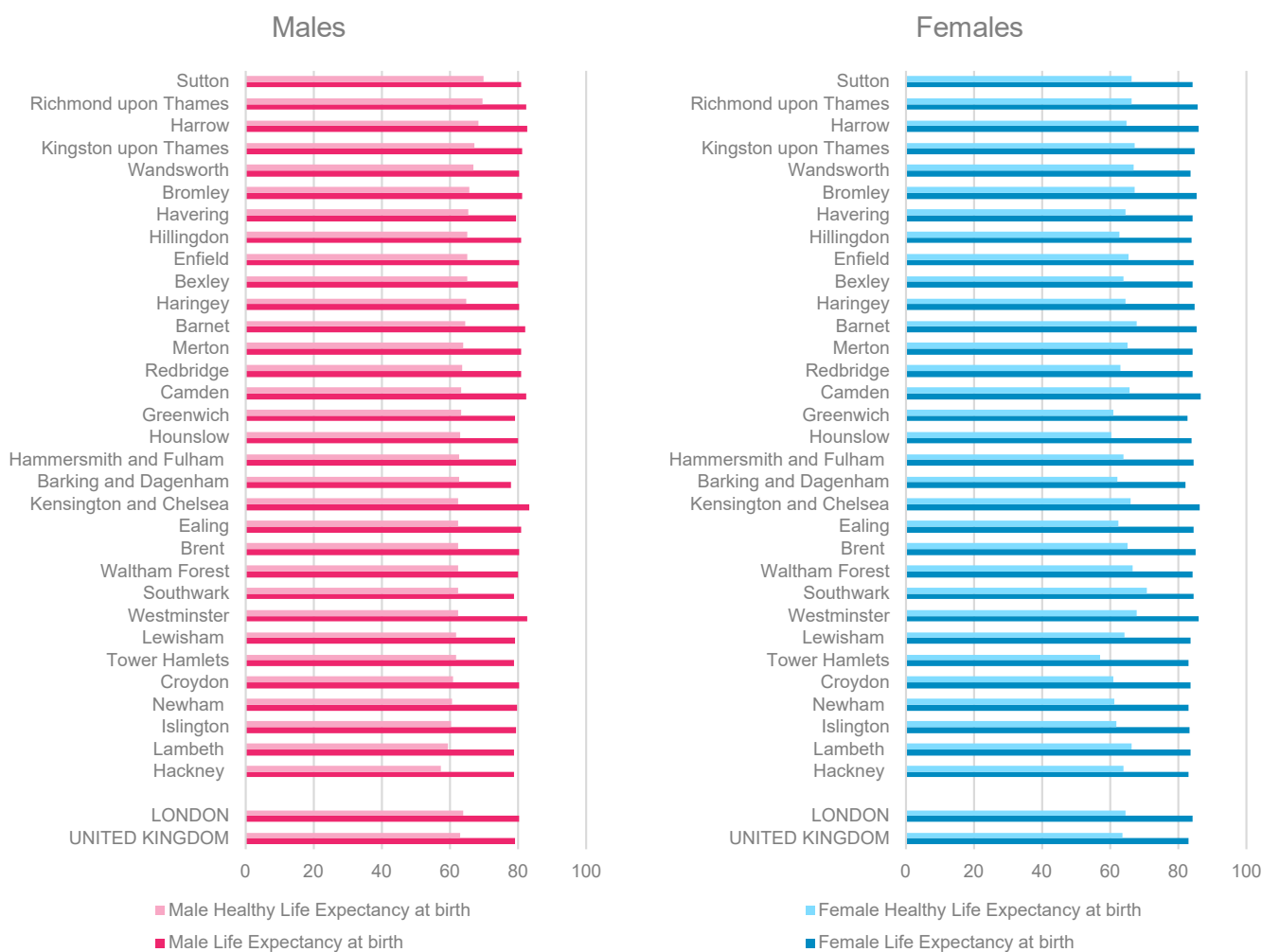
Figure 7.14: Child Obesity prevalence in London by deprivation decile at Reception and Year 6



Notes: Child obesity: BMI greater than or equal to the 95 percentile of the UK90 growth reference. 95% confidence intervals are displayed on the chart. Data are grouped over 3 years. Region-specific deprivation deciles are also displayed.

Source: National Child Measurement Programme 2015/16–2017/18, analysed by Public Health England, Population Health Analysis.

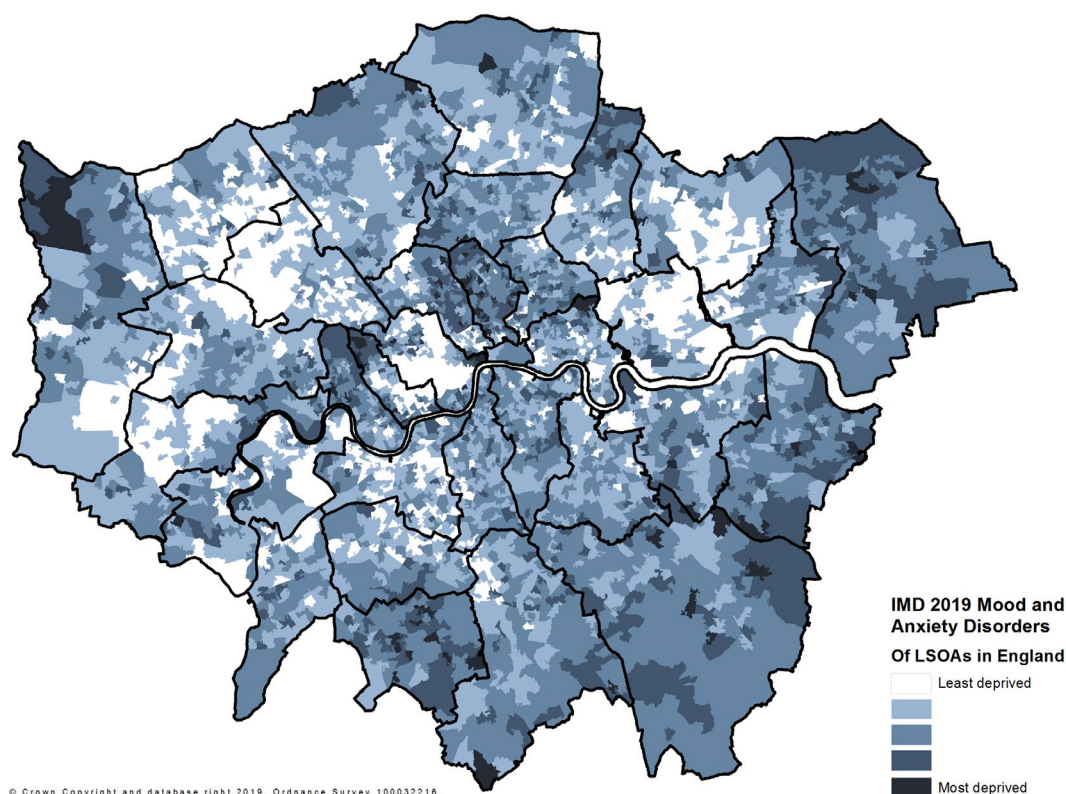
Figure 7.15: Whole life and healthy life expectancy by borough



Source: Health State Life Expectancies at Birth 2015-17, ONS

<https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/datasets/healthstatelifeexpectancyatbirthandage65bylocalareasuk>

Note that life expectancies are subject to variability and changes in denominators.

Figure 7.16: Mood and anxiety disorders indicator

Note:
Composite measure based on the rate of adults suffering from mood and anxiety disorders, hospital episodes data, suicide mortality data and health benefits data. Source: Index of Multiple Deprivation 2019, MHCLG.

Combinations of low incomes, poor housing, ill health, a lack of work and low education attainment in large pockets of inner and outer London tend to compound each other and may limit the ability of part of the population to fulfil their productive potential and improve their quality of life.

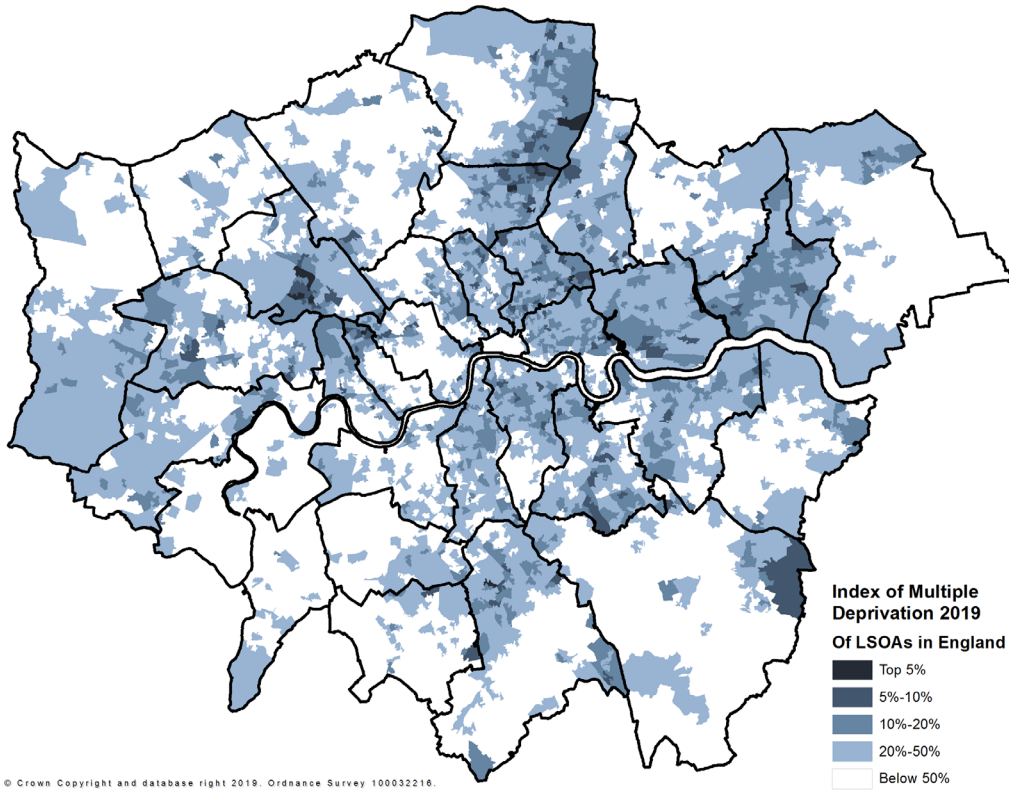
- While there is much variation in levels of poverty, low levels of education, health and housing quality across London, there is a degree of overlap in the areas where a number of these disadvantages are more prevalent. The Index of Multiple Deprivation (IMD) shows this by combining a range of indicators. This reveals a 'crescent of disadvantage' going from North to North East London, as well as concentrations of relatively deprived areas in large parts of South East and North West London (Figure 7.17).
- Healthy life expectancy in London varies across boroughs, as illustrated above, but also varies within boroughs. ONS research has shown that healthy life expectancy can vary by more than 20 years, even within a borough⁶²⁰.
- Certain areas such as north-east and inner south London show high levels of deprivation across domains of the IMD. More granular analysis shows that London does perform better on some domains of the IMD than others. For example, many Lower Layer Super Output Areas (LSOAs)⁶²¹ rank as less deprived on indicators of educational outcomes than on employment deprivation⁶²².

⁶²⁰ ONS (2015), 'How long will you live in good health?'

⁶²¹ Lower Layer Super Output Areas are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales.

⁶²² Further details on the IMD can be found at: <https://data.london.gov.uk/dataset/indices-of-deprivation>

Figure 7.17: Index of multiple deprivation



Source: Index of Multiple Deprivation 2019, MHCLG.

7.4 Policy interventions across London

The GLA, the London Boroughs and London's sub-regional partnerships have implemented a number of place-based interventions to support a more spatially balanced and inclusive growth across the capital and to maximise the opportunities of local areas.

- LEAP – the Local Enterprise Partnership for London – runs the Good Growth fund, a £67m regeneration programme. With three funding rounds between April 2017 – March 2022, the programme provides funding, expert regeneration advice, design support and knowledge sharing opportunities to a broad range of place-based, community, cultural and green infrastructure projects across the public, private and third-sector.
- The LEAP also has a strategic oversight role for the Royal Docks Enterprise Zone, attracting businesses to the area through Business Rates relief, enhanced capital allowances, simplified planning and improved broadband connectivity. The LEAP is due to retain business rates growth generated within the Royal Docks for at least 25 years for reinvestment in local economic growth.
- The Croydon Growth Zone is a partnership between Central Government, Croydon Council, the GLA and TfL. It will allow Croydon to retain business rates growth generated within a designated area, which in turn will enable borrowing to deliver infrastructure to support 23,500 new jobs, at least 10,000 new homes of different tenures and the wholesale renewal of the retail core.
- And several boroughs have funded local initiatives to promote inclusive growth. For example, Merton council has launched a business support programme, which supports start-ups and existing small business with business planning support, including financial and recruitment advice. The programme has supported 171 businesses, creating around 454 jobs.

Looking at London's planning horizon to 2041, housing development will be key to accommodate London's population growth and to tackle London's accommodation crisis.

- London is estimated to need around 66,000 new homes a year to meet the needs of a growing population and to address existing shortages⁶²³.
- Sites in designated Opportunity Areas (OA) account for 68% of London's estimated overall capacity on large sites between 2017 and 2041, potentially providing for around 460,000 new homes.
- Thames Gateway, the Lee Valley, Old Oak and the Isle of Dogs are some of the largest development opportunities over the next 25 years, bringing new homes, population and employment growth to these areas.
- The London Riverside OA (which forms the largest part of the Thames Gateway development) is expected to provide 44,000 new homes between 2019 and 2041. The Isle of Dogs, Old Oak and Lee Valley OAs are expected to provide 29,000, 25,000 and 21,000 new homes respectively.
- London Riverside is expected to support 29,000 jobs, with Isle of Dogs, Old Oak and Lee Valley supporting 110,000, 65,000 and 13,000 jobs respectively.
- All boroughs in West London include designated OAs alongside other identified regeneration priorities. The 11 West London opportunity areas identified in the draft London Plan are expected to deliver over 100,000 homes and workspace for over 140,000 jobs.
- Finally, it should be noted that although policies that help realise the economic potential of people and places across London are key to addressing deep-seated deprivation problems, they will need to work together with other policies, such as those set out in various GLA policy documents⁶²⁴ that cover such areas as increasing Londoners' access to good work and fair pay, addressing key barriers to employment access and progression, and improving the health of Londoners.

⁶²³ GLA (2017), 'Draft London Plan'.

⁶²⁴ GLA policy documents on a diverse range of matters can be found at: <https://www.london.gov.uk/>

8 London's place in the UK

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8.1 Introduction

This cross-cutting chapter expands on the evidence presented in the rest of the LIS evidence base report, with a particular focus on complementing the spatial evidence provided in Chapter 7. Specifically, it looks at how the economy of the capital described in detail in the other chapters in terms of businesses, jobs, infrastructure, innovation etc. fits into the broad context of the wider South East and of the UK as a whole.

As the economy of a global city and the UK's capital city, London's economy does not stop at the administrative boundaries of the Greater London Authority. In order to understand its strengths, weaknesses and opportunities it is therefore necessary to expand the outlook and consider the links between London, the wider South East and the rest of the UK. This can also help identify ways in which inclusive growth in London and in the rest of the country can be mutually supportive.

The rest of this Chapter is organised as follows:

- Section 8.2 highlights that London has wide and deep economic linkages beyond its administrative boundaries. In particular, it examines the economic linkages between Greater London's economy and the economy of the wider South East of England and the opportunities for cross-regional collaboration to promote inclusive growth.
- Section 8.3 builds on this and looks at the linkages between London's economy and the broader UK economy in terms of trade, investment and people.
- Section 8.4 briefly sets out an external research project that has been commissioned to further our understanding of these links, with a view to inform the LIS and LIS evidence base.

As in the previous chapter several sections of this chapter refer to the evidence and policies in the draft London Plan.

8.2 London's economy and the economy of the wider South East

London's economic influence extends well beyond the administrative boundaries of Greater London, with links to the wider South East (WSE) of England from which the whole region benefits. Commuting is a primary example.

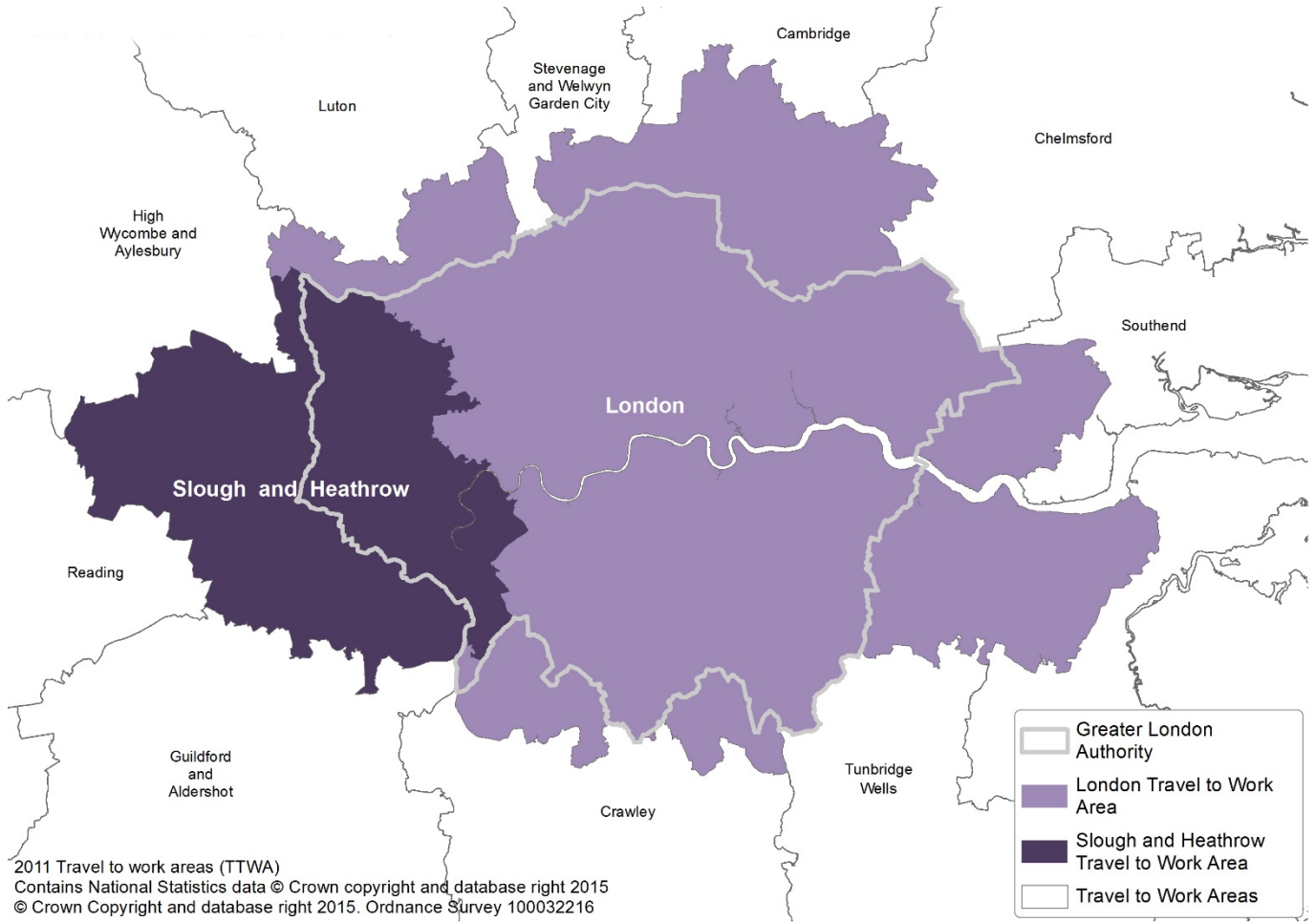
- Based on standard ONS definitions, London's Travel to Work Area (TTWA) includes parts of Berkshire, Essex, Hertfordshire, Kent and Surrey. It extends eastward and northwards beyond the capital's administrative boundaries and the M25. There is a separate Slough and Heathrow TTWA, half of which includes the most western parts of London (Figure 8.1).
- In recent research the ONS has highlighted that in the case of workers that commute by train the TTWA "covers close to the entire East and South East of England"⁶²⁵.
- Around 800,000 commuters travel into London each day (more than half of the workforce in some of the local authorities bordering London) and make an important contribution to its economy as well as to the commuters' own local economies when they return home.
- London's Functional Urban Area (a definition that allows international comparisons by cities and covers the wider area over which London's economic impact is thought to extend) stretches beyond the GLA administrative boundary into the WSE (Figure 8.2)⁶²⁶.
- In 2016, commuters from outside London held 16% of London's jobs, and earned £70bn worth of wages⁶²⁷. Figure 8.3 shows the reach of London's labour market into the WSE.

⁶²⁵<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/traveltoworkareaanalysingreatbritain/2016>

⁶²⁶ ONS (2016) Major Towns and Cities Boundaries

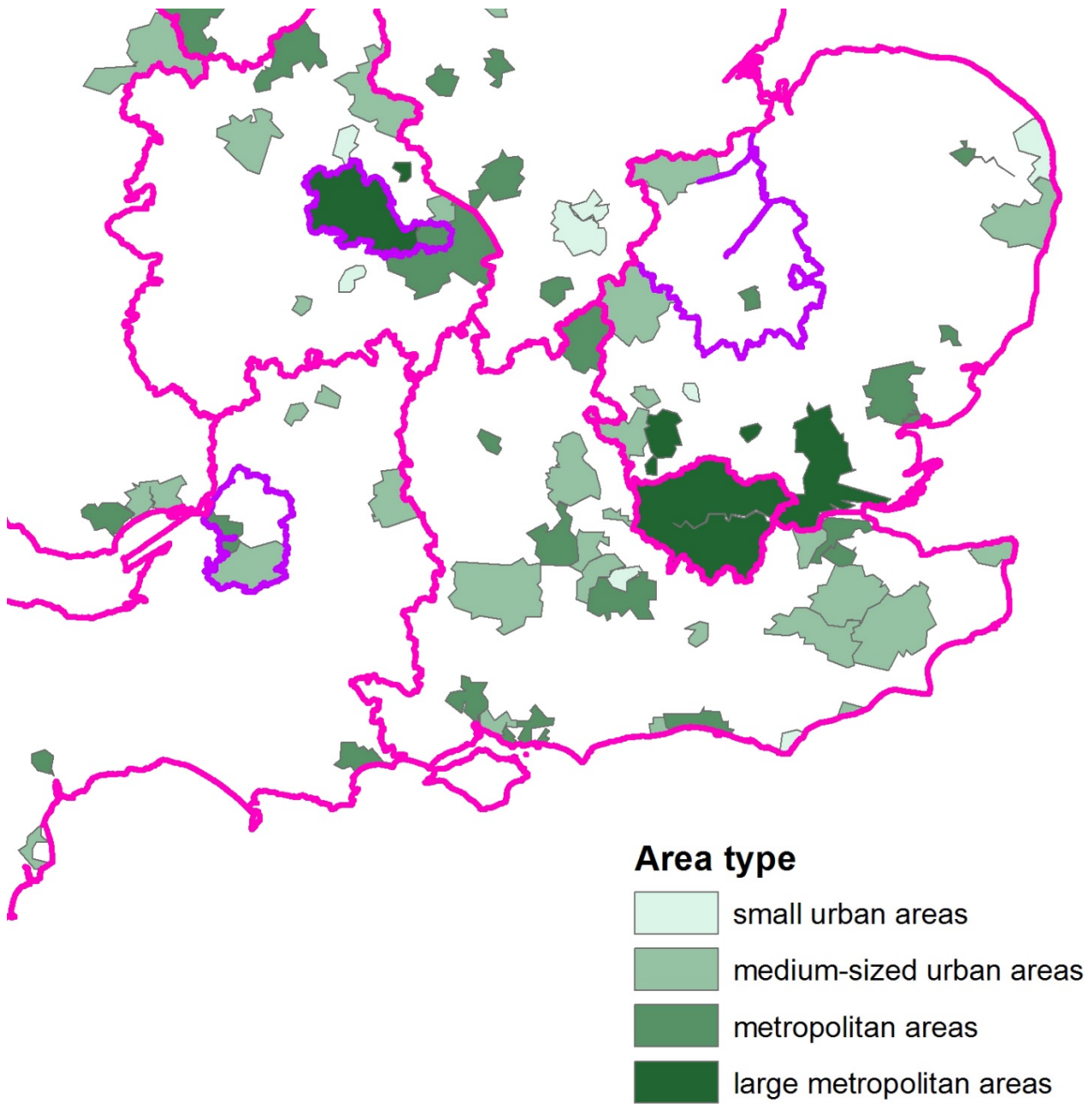
⁶²⁷ https://www.centreforlondon.org/wp-content/uploads/2018/01/Centre-for-London_Next-doors-Neighbours-Report_Compessed.pdf

Figure 8.1: London's and Slough and Heathrow's 2011 Travel to Work Areas



Source: ONS & GLA City Intelligence Unit.

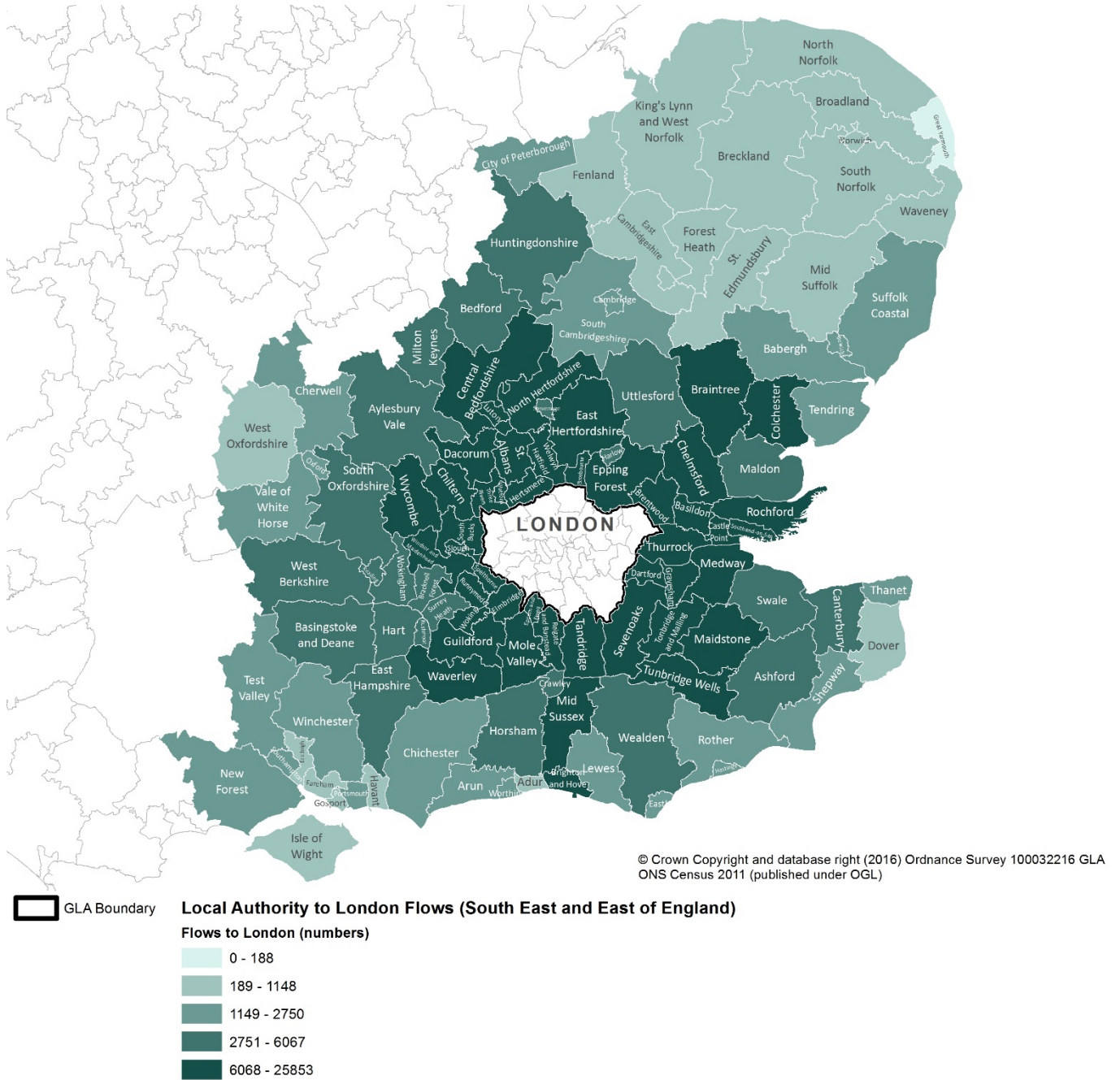
Figure 8.2: Map of Greater London's Functional Urban Area and administrative boundaries⁶²⁸



Source: GLA calculations of OECD data.

⁶²⁸ The definition has three steps. First, an urban core of 1km², and at least 1,500 inhabitants per km². Second, two urban cores are considered integrated if more than 15% of the residence population of any of the cores commutes to work in the other core. The third step is to identify the worker catchment area, which is all municipalities with at least 15% of their employed residents working in a certain urban core. See, [OECD Definition of Functional Urban Areas](#).

Figure 8.3: Workers in London based workplaces by residence origin in the Wider South East (excluding London), 2011, absolute numbers



Source: Census and GLA City Intelligence Unit analysis.

Box 8.1: The Wider South East – a large and dynamic economy.

There are 130 authorities in the WSE outside London. Although London is significantly larger than other centres in the WSE, it is part of an extensive and complex network of centres of different sizes and functions. Some are of considerable strategic importance in their own right and the focus of their own sub-regional networks of centres.

The network as a whole and the orbital and radial linkages which hold it together, comprise the most productive region in the UK accounting for nearly half its output and making by far the biggest net contribution to the national exchequer.

The WSE is home to 24.2 million people (8.9 million in London), 10 million households (3.6 million in London) and 13.7 million jobs (5.7 million in London)⁶²⁹. It is projected to grow more rapidly by 2041 than other parts of the UK – in population terms by 21% in London and 17% in the WSE outside London. Household numbers are expected to increase by 32% in London and 23% elsewhere in the WSE.

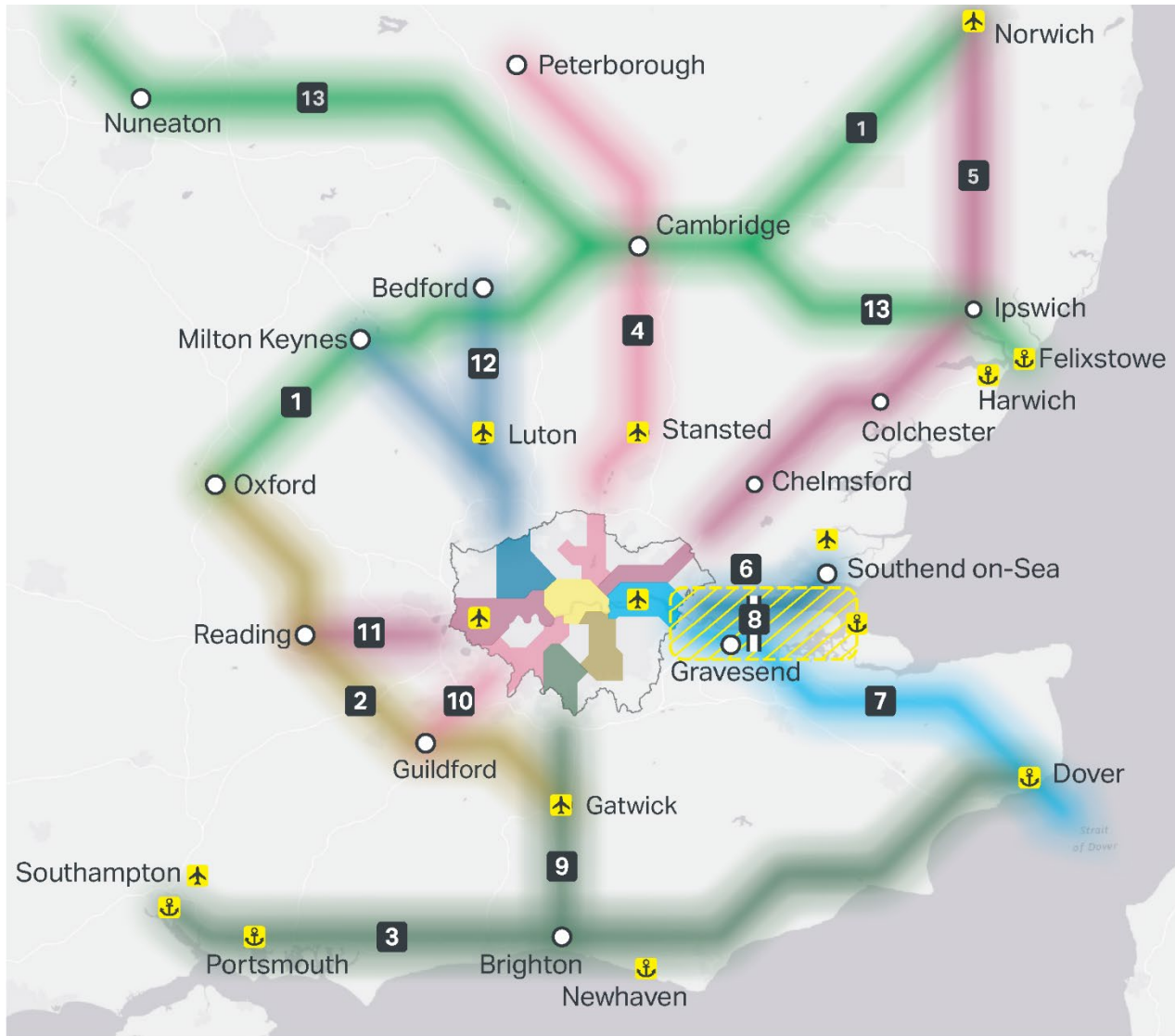
Source: [Draft London Plan, 2018](#)

Continuing to invest in efficient and reliable regional and national transport infrastructure will be key to ensuring prosperity across the WSE.

- The draft London Plan emphasises the importance of ensuring that growth in the WSE contributes to local vibrancy and economic activity at all times of the day and week, and that the scale of planned growth is proportional to public transport capacity in the area.
- 13 WSE Strategic Infrastructure Priorities have been endorsed by the WSE partners for initial delivery (Figure 8.4). Eight of these are radial priorities that connect directly to Growth Corridors within London. The remaining five are orbital priorities that can help reduce transit through London and stimulate the WSE economy beyond the capital.

⁶²⁹ Data refers to the period 2016/17.

Figure 8.4: Strategic infrastructure priorities in the Wider South East



Strategic Infrastructure Priorities

-  Airport
-  Port
-  Thames Estuary Ports
-  London Growth Areas

Source: Wider South East Partnership

Contains OS data © Crown copyright and database right (2017)

Source: [Draft London Plan](#).

Strategic infrastructure priorities

- 1.** East West Rail and new Expressway road link (Oxford - Cambridge), **2.** North Down Rail Link (Gatwick - Reading) including extension to Oxford, **3.** A27 / M27 / A259 and rail corridor (Dover - Southampton), **4.** West Anglia Mainline, Crossrail 2 North (London - Stansted - Cambridge - Peterborough) and M11, **5.** Great Eastern Mainline (London - Ipswich - Norwich) and A12, **6.** Essex Thameside, A217 and A13 corridor, **7.** Thames Gateway Kent: Elizabeth Line Extension and HS1 (London - North Kent - Channel Tunnel), **8.** Lower Thames Crossing, **9.** Brighton Mainline (London - Gatwick - Brighton), **10.** South West Mainline, Crossrail 2 South West (London - Surrey / Southern Rail Access to Heathrow) and A3, **11.** Great Western Mainline (London - Reading / Western Rail Access to Heathrow), **12.** Midlands and West Coast Mainline (London - Luton - Bedford / Milton Keynes), **13.** Felixstowe - Nuneaton / Midlands and A14

But the links between London and its hinterland are not just about commuting. Business links are also very important.

- While London's business start-up rate is consistently above that of the UK, between 2012 and 2013 there was a net migration of firms moving out of London, with 1,600 more firms migrating out of London than migrating in⁶³⁰. The main destination for these firms was the WSE.
- Analysis of industrial land use has found that companies moving out of Strategic Industrial Locations (SILs) typically move to elsewhere in London or move out to the WSE. When business owners were asked about the factors affecting their choice of site, cost was a prominent reason. Respondents in warehousing and manufacturing were especially likely to cite cost as an important factor⁶³¹.
- The amount of land used for industrial purposes has fallen in London over the last decade, while staying largely unchanged in the WSE. This reflects some businesses preferring to service the London market from locations in the WSE and beyond⁶³².
- Jobs in the South East are projected to grow by approximately 54,000 (0.98%) per year, while jobs in the East of England are projected to grow by around 32,000 (0.92%) per year. In percentage terms this is faster than London's projected growth of 49,000 (0.78%) per annum, possibly reflecting trends in business migration⁶³³.

Given these interactions, there are opportunities to collaborate with neighbouring regions on shared challenges and make the most of potential synergies.

- There are mutual benefits for authorities across the WSE in working together to tackle regionally important matters, including factors that influence economic prosperity. Historically, a formal regional structure was in place to coordinate approaches to these matters.
- As set out in the draft London Plan, a non-statutory strategic structure is now in place to address the need for pan-regional coordination. This is facilitated by South East England Councils, the East of England Local Government Association, London Councils and the Mayor⁶³⁴.
- The Mayor will also work with willing partners to explore strategic collaboration opportunities. The promotion of good links to/from potential employment locations outside London by the Mayor to help realise corresponding employment opportunities within and outside London is an example of how mutual benefits can be achieved. Exploring the scope for the substitution of business and industrial capacity is another example.

⁶³⁰ GLA Economics (2016), '[Economic Evidence Base for London 2016](#)'.

⁶³¹ Peter Brett Associates (2017), '[Industrial Land and Transport Study](#)'.

⁶³² CAG consultants (2017), '[London Industrial Land Demand](#)', AECOM (2015) '[London Industrial Land Supply and Economy Study](#)'.

⁶³³ GLA Economics (2018), '[Wider South East labour market projections 2017](#)'.

⁶³⁴ <https://www.london.gov.uk/about-us/organisations-we-work/policy-and-infrastructure-collaboration-across-wider-south-east>.

8.3 London's economy and the broader UK economy

As noted in Chapter 1, London represents just under a quarter of the UK's GVA. Over the past 20 years, when London has grown the rest of the UK has also grown. Small and medium sized cities with good connections with London have tended to do particularly well.

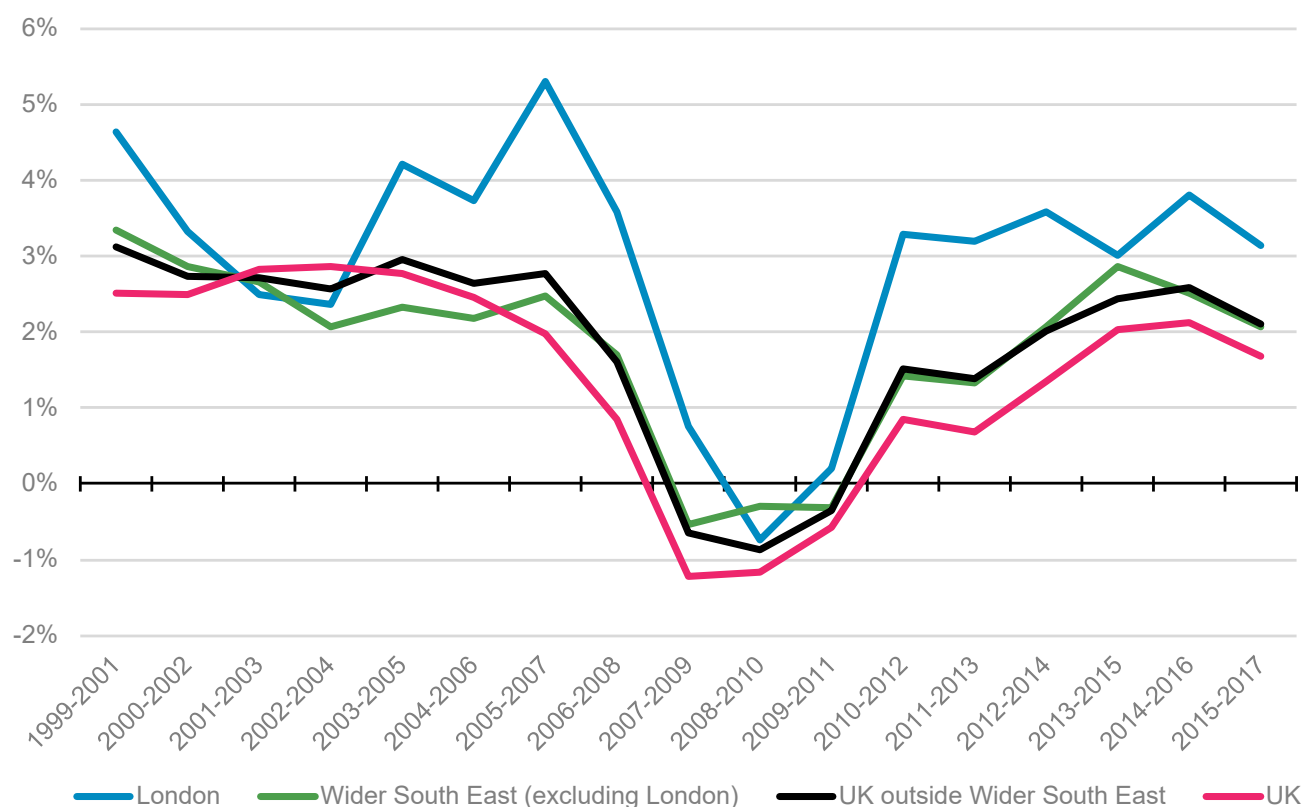
- In 1998 London accounted for around 19.2% of UK real GVA (B), while by 2017 this had increased to 23.8%⁶³⁵.
- Over the past 20 years there has been a general correlation in GVA trends between London and the rest of the UK (Figure 8.5).
- In a 2018 report, the Centre for Cities found that “the more productive a city, the better the employment outcomes of the towns around them. This is most clearly seen for cities in the Greater South East”⁶³⁶.
- Recent ESRC-funded⁶³⁷ research on past economic performance of British cities found that employment growth between 1981 and 2015 has been faster in both high and low skill occupations in cities closer to London. They also found some evidence that distance from London may influence speed of recovery after a recession, with cities that are closer to the capital recovering more quickly.
- Research by Martin and Gardiner into the resilience of cities to economic shocks found “clear evidence that the closer, geographically, is a city to London, the greater its recoverability from a recessionary shock tends to be. This was notably the case with the recovery from the last deep recession. It would appear that the dynamism of the London economy extends out in a sort of “sphere of influence” that tends to benefit those cities nearest to it”⁶³⁸.

⁶³⁵ GLA Economics calculations based on: ONS (2018), '[Nominal and real regional gross value added \(balanced\) by industry](#)'.

⁶³⁶ Source: Swinney, P. et al. (2018), '[Talk of the Town: The economic links between cities and towns](#)'. Centre for Cities.

⁶³⁷ Martin R. et al. (2019), '[The Economic Performance of Britain's Cities: Patterns, Processes and Policy Implications](#)', Summary report from the ESRC-Funded Research Project Structural Transformation, Adaptability and City Economic Evolutions, February 2019.

⁶³⁸ Martin, R., & Gardiner, B. (2019), 'The resilience of cities to economic shocks: A tale of four recessions (and the challenge of Brexit)'. Papers in Regional Science, Volume 98, Issue 4: 1801-1832. <https://doi.org/10.1111/pirs.12430>.

Figure 8.5: Annual real GVA growth for London and the rest of the UK, 1999 to 2017, three-year rolling averages

Sources: ONS real regional gross value added (balanced) & GLA Economics calculations.

Trade is more important to London's economy than to the UK's economy. But this is not just or predominantly about international trade – London trades more with the rest of the UK than it does with the rest of the World⁶³⁹.

- London trades more with the rest of the UK than it does with the rest of the world. Input output tables for London show that in 2013 exports to the rest of the UK were £158bn, compared to £126bn to the rest of the world (Table 8.1), of which £67bn was with the EU.
- London's trade was slightly in deficit with the rest of the UK by £2bn, but in surplus with the rest of the world to the value of £60bn, of which there was a surplus with the EU of £35bn.
- The rest of the UK had a surplus with London of £2bn and a trade deficit with the rest of the world of £99bn, of which £89bn was with the EU.
- The UK as a whole had a trade deficit of £39bn.
- Of the £226bn of imports to London, half (£113bn) formed part of exports. A fifth (£23bn) of the imports that formed part of exports were exported directly as part of final demand, while the remaining four fifths (£90bn) were an input to the production of goods and services for export. Overall, 56% (£64bn) of exports of imported goods or services were to the rest of the UK (Table 8.2).
- Despite these findings it should however be noted that currently, there is no national data source on regional trade flows, and so it was not possible in this work to fully understand the links between London and the rest of the UK. London and Scotland are the only administrations that publish sub-UK Input-Output Tables.

⁶³⁹ GLA Economics (2019), Working Paper 97: ['The London input-output tables'](#).

Table 8.1: Trade flows for London, the rest of the UK, and the UK, £bn, 2013

		London	Rest of the UK	UK
Rest of the UK	Exports	£158bn	£160bn	
	Imports	£160bn	£158bn	
	Net exports	-£2bn	£2bn	
Rest of the world	Exports	£126bn	£392bn	£518bn
	Imports	£66bn	£491bn	£557bn
	Net exports	£60bn	-£99bn	-£39bn
Total	Exports	£284bn	£552bn	
	Imports	£226bn	£649bn	
	Net exports	£58bn	-£97bn	

Source: GLA Economics calculations.

Table 8.2: Use of imports to London, £bn, 2013

use of imports	intermediate demand	final demand	all demand
household and government consumption	£65bn	£20bn	£85bn
investment	£18bn	£10bn	£28bn
exports to the rest of the UK	£50bn	£14bn	£64bn
exports to the EU	£21bn	£5bn	£27bn
exports to the rest of the world	£18bn	£4bn	£22bn
<i>total</i>	£173bn	£53bn	£226bn
<i>o/w exports</i>	£90bn	£23bn	£113bn

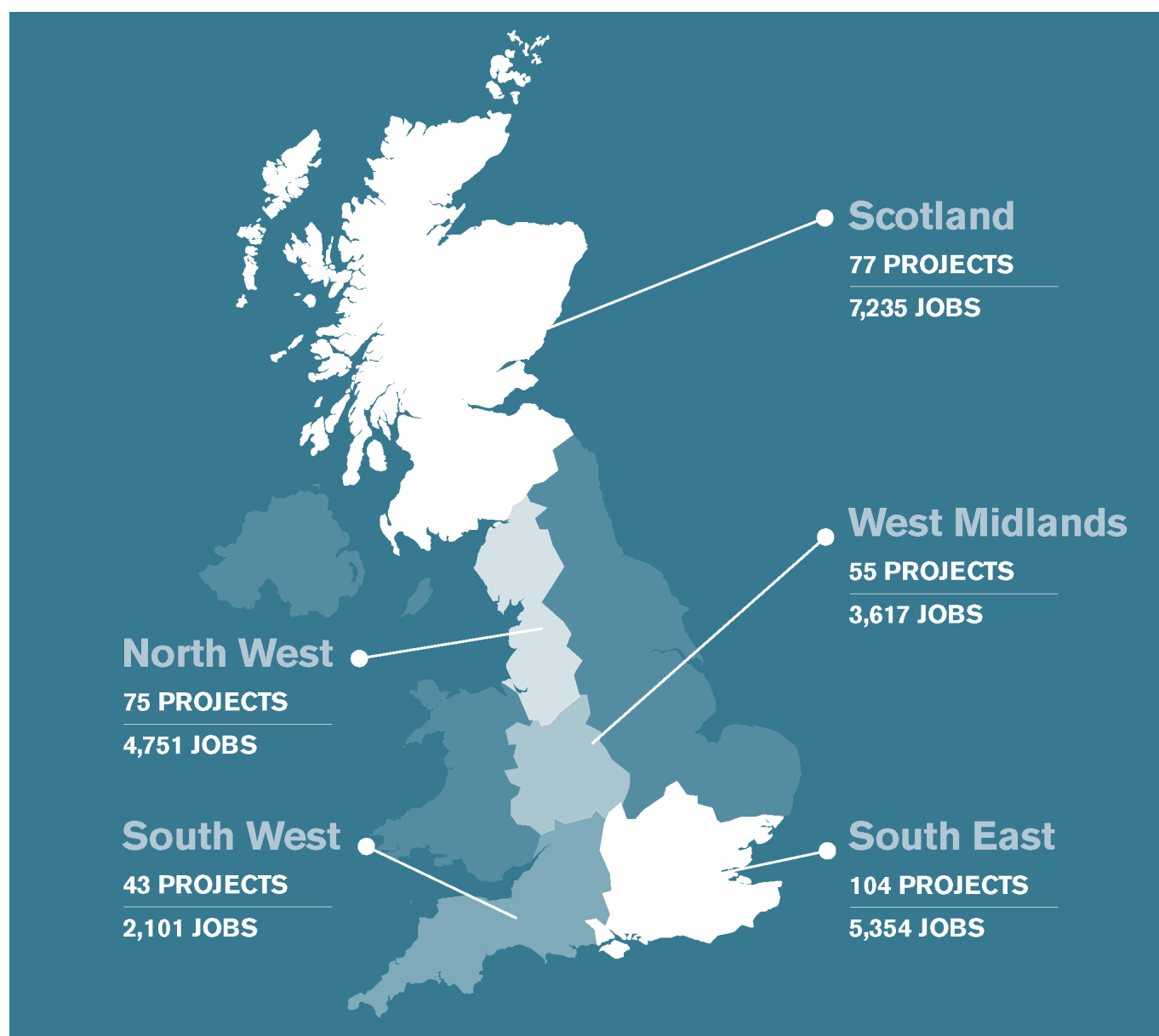
Source: GLA Economics calculations⁶⁴⁰.

London is a key gateway to the UK for international investors and a great business accelerator

- Analysis by London & Partners reveals that between 2003–15 over 12% of FDI projects in the rest of UK stemmed from an investment in London, creating over 38,000 jobs⁶⁴¹ and £7.6 billion in GVA (Figure 8.6).
- Only 0.2–1.2% of London's firm population came from in-migration from elsewhere in the UK, compared to 10–12% from business start-ups.
- One in every 13 overseas companies who first invested in London went on to invest somewhere else in the UK, generating £7.6 billion gross value. The top sectors for this investment were Hotels and tourism, Textiles, Financial services, and Software and IT services.

⁶⁴⁰ Calculations based on: GLA Economics (2019), Working Paper 97: '[The London input-output tables](#)'.

⁶⁴¹ London & Partners (2017), '[Foreign Direct Investment report, 2006-2016](#)'.

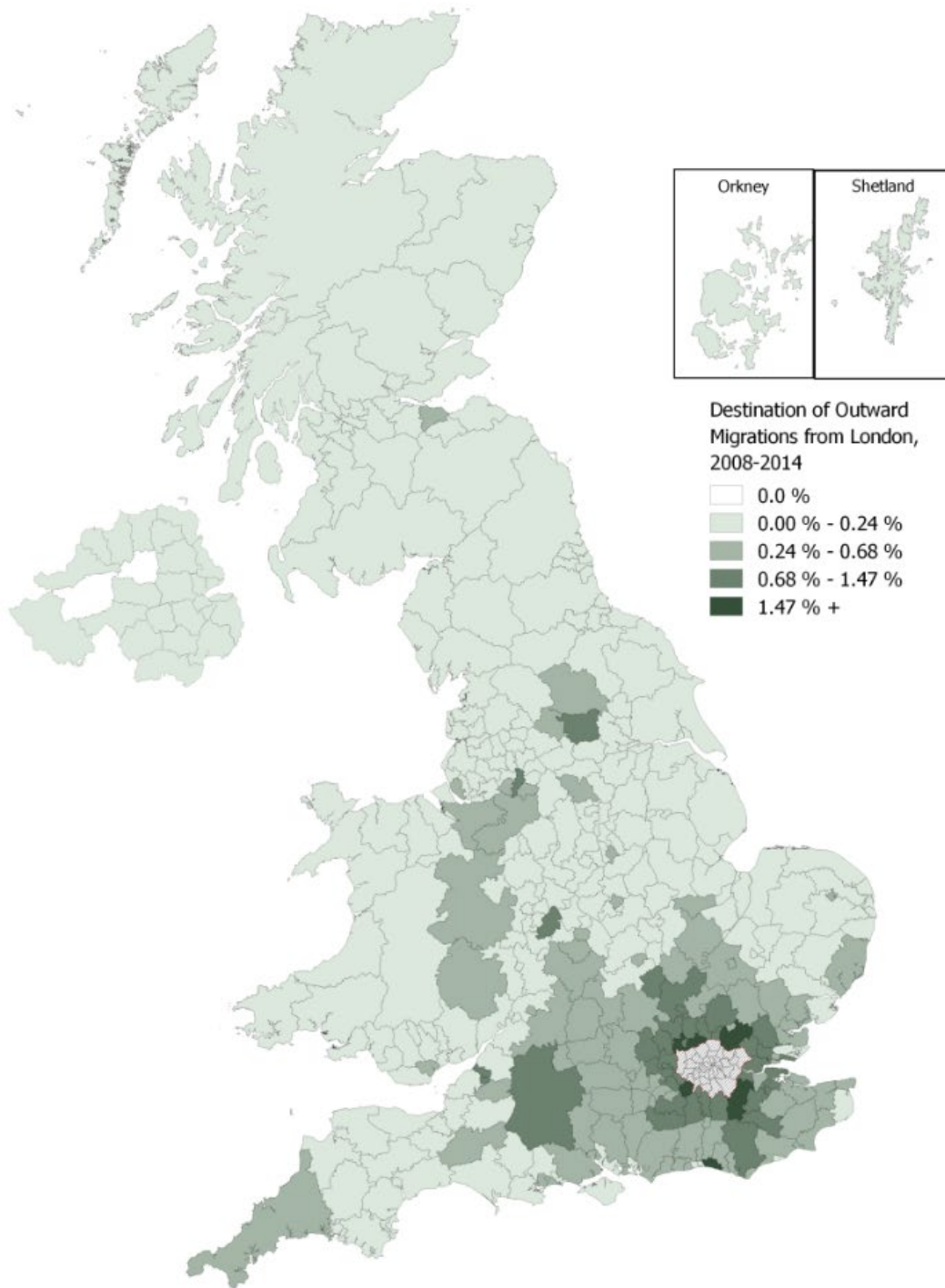
Figure 8.6: Top 5 destinations of FDI stemming from London

Source: London & Partners (2017) '[Understanding London + FDI](#)'.

More businesses migrate out of London than into London, taking jobs with them and spreading prosperity.

- Analysis by TBR for GLA Economics points to a net loss of firms from London to the rest of the UK in 2012/13, with a net loss of 10,470 jobs.
- While net firm migration is volatile, London has had a net loss of firms and employment to the rest of the UK since 2007 (Figure 8.7).
- Between 2008 and 2014, Primary & Utilities was the industry that drew in the most migration as a share of existing stock. This was followed by Information & Communication, Manufacturing, Administrative services and Construction. These sectors also saw high rates of outward migration, suggesting a high churn of firms.
- In 2012-2013, 65.8% of firms migrating out of London moved to the Wider South East (WSE). In contrast, 48.9% of outwardly migrating employment moved to the WSE, suggesting that larger firms were more likely to move to the rest of the UK than the WSE.

Figure 8.7: Destination of outward migrating firms from London, 2008-2014, by local authority (percentage of all outward migration)

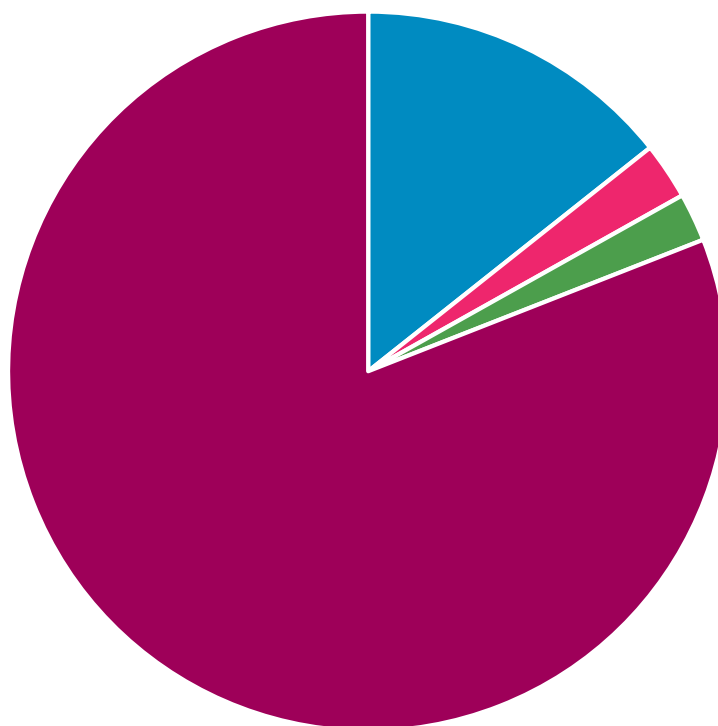


Source: TBR Observatory 2015. QGIS Development Team, 2015. QGIS Geographic Information System. Contains National Statistics data and Ordnance Survey data © Crown copyright and database right 2015. (TBR ref: W11/M1).

Domestic migration flows point to a dynamic equilibrium with net flows of people changing from positive to negative for different age-groups. London has tended to be particularly attractive to new graduates.

- ONS data reveal that only 5% of young people (18-29) actually moved to a city region like London over the period 2011 to 2015 (Figure 8.8)⁶⁴².
- Centre for Cities research highlighted that six months after graduation, London employed 22% of those graduates who moved city and were now in work, and 38% of those new graduates who have a first or upper second class degree from a Russell Group university⁶⁴³.
- As noted in Chapter 4, while London has traditionally attracted large numbers of graduates from other parts of the UK, there are signs that (internal) net graduate migration may have become more subdued recently.
- The overall net inflow to London of 19-29 year olds is relatively small, particularly compared to the net outflow of 30+ year olds (Figure 8.9).

Figure 8.8: Movement of people who were aged 18-29 in 2011, between the tax year ending 2012 to 2016



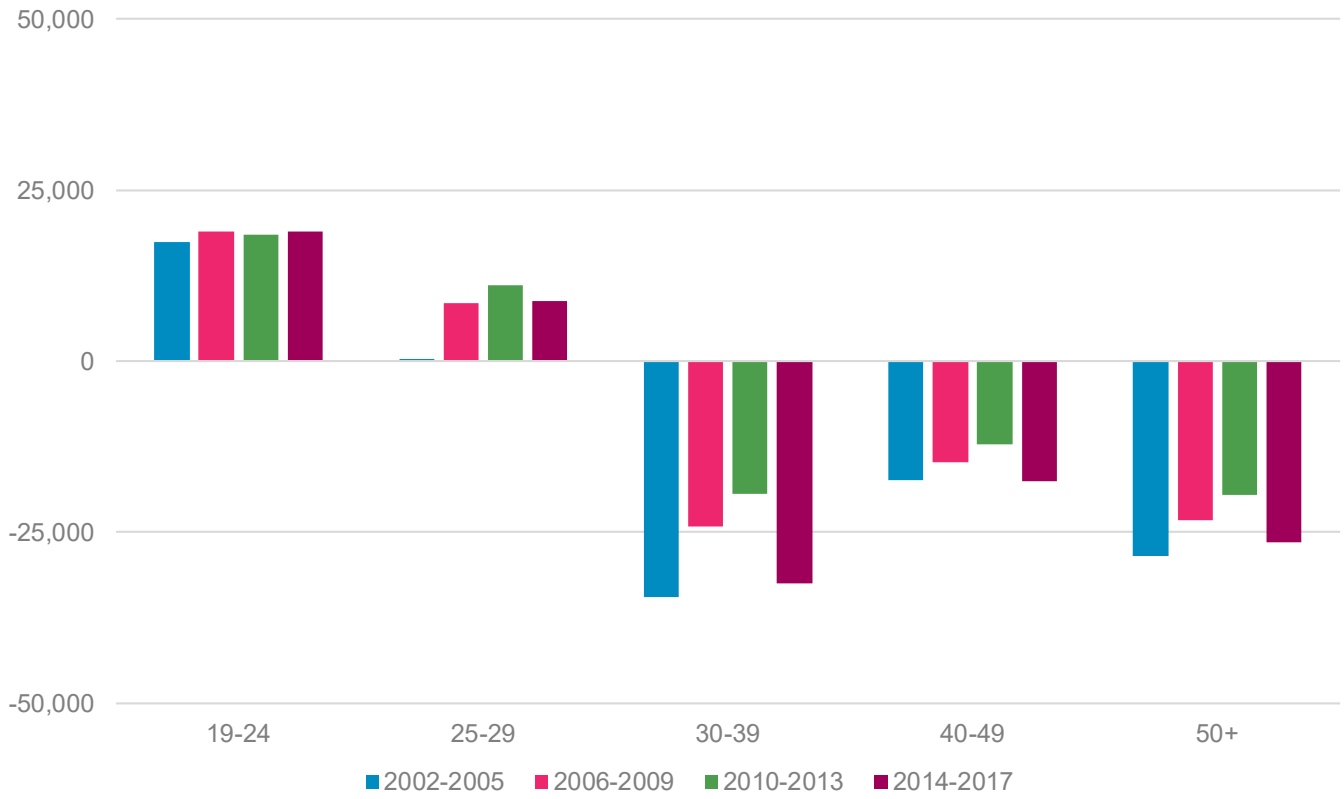
■ Move to a Non-city region ■ Move to Greater London ■ Move to Other city region ■ Non-mover

Source: ONS (2018) [Young people's earnings progression and geographic mobility, England and Wales: tax year ending 2012 to tax year ending 2016](#)

⁶⁴² Source: ONS (2019), 'Young people's earnings progression and geographic mobility, England and Wales: tax year ending 2012 to tax year ending 2016'.

⁶⁴³ <https://www.centreforcities.org/publication/great-british-brain-drain-where-graduates-move-and-why/>

Figure 8.9: Net inflows into London from the Rest of the UK, 3-year averages, adult population



Source: Net domestic migration flows, 3 year average, ONS mid-year population estimates; [Young people's earnings progression and geographic mobility, England and Wales: tax year ending 2012 to tax year ending 2016](#)

8.4 Further research on the economic relationship between London and the rest of the UK

In conjunction with the development of the evidence base for the LIS an external research project led by Arup⁶⁴⁴ was commissioned to deepen our understanding of the relationship between the economies of London and the rest of the UK. The research explored the nature of the economic interactions between London's key sectors and clusters in other city-regions, both in terms of cross-sectoral synergies (specifically in terms of trade in intermediate outputs) and in terms of functional specialisation.

Analysis of regional trade patterns based on the EUREGIO database⁶⁴⁵ highlights the importance of trade links in intermediary goods and services between London and a number of UK city regions.

- London is consistently one of the largest consumers of intermediary goods produced in the different UK regions. On average, the capital consumes 3% or more of all intermediate outputs produced in each region of the UK, rising to 7-9% in sectors such as construction and equipment.
- The data suggest that these goods and services may go through a 'value adding' mechanism in the capital as they are then exported as higher value goods and services to other UK regions.
- The Arup research found that the regions that are London's intermediary output largest recipients include Eastern Scotland, West Wales & The Valleys, the West Midlands, Greater Manchester and West Yorkshire.
- These regions host some of the UK's largest cities (in terms of population and GVA) and are, in turn, the main centres of economic activity in their respective regions.

Intra-firm linkages play an important role in driving economic activity in the UK and indicate that a substantial number of UK firms extend further than their headquarter location.

- The Arup analysis also looked at relationships between headquarters and local business units using the ONS Business Structural Database.
- Across all sectors and all enterprises in the UK over the 2007-2018 period, the share of enterprises with subsidiaries has increased by 10%.
- Over the same period, this share has increased by 124% in the Finance sector, while decreasing slightly by 20% and 15% in the Real estate and Hotel sectors (from 29% to 23% and 24% to 21% respectively).
- Enterprises have therefore become more spread out, geographically speaking – hiring more employees in other cities of the UK and setting up more subsidiaries across the country.

Consistent with economic theory, headquarters from different sectors tend to cluster in few large cities to enjoy the larger benefits of agglomeration for Business services. This especially applies to London.

- 42% of all UK enterprise turnover in 2018 was generated by enterprises with a London headquarter. This increased by 14% since 2007, demonstrating the concentration of value creation in London in comparison to other cities in the UK.
- 20% of all UK employees worked for enterprises headquartered in London. This increased by 3 percentage points since 2007.

⁶⁴⁴ Arup (2020), 'London's Economic Relationship with the Rest of the UK' (forthcoming).

⁶⁴⁵ The EUREGIO database is the first time-series Input-Output tables for the European Union at a regional level. The dataset was produced in 2018 by researchers led by the Netherlands Environmental Assessment Agency. The dataset's format thus permits the study of the flow of intermediate (non-finished) goods and services between different sectors and NUTS2 regions in the UK.

- 9% of jobs in regional subsidiaries depends on London headquartered enterprises with this rising to 21% in the Finance sector.
- London is home to the largest number of headquartered enterprises, (estimated at more than half a million in 2018) in the UK and 4% of local units in regional subsidiaries depends on London headquartered enterprises. This rises to 8% in the Finance sector.

The data point to the role of London-headquartered enterprises as key employers in the regions and to linkages between economic activity in London and in city regions, including through functional specialisation.

- When comparing across city regions with strong trade links with London, subsidiaries headquartered in London employ, on average, two to three times more employees than subsidiaries headquartered somewhere else and situated in the same city.
- When focusing on functions more specifically, Arup found evidence supporting the outsourcing of some activities from London to other cities in their sample. A few examples include the outsourcing of research activities to Edinburgh, data processing activities to Edinburgh, Leeds and Manchester, and finance and insurance activities to all cities in their sample.

Appendix to Chapter 2

Table A.1: Growth in real gross value added, productivity hours and labour productivity by local enterprise partnership area, 2010 to 2017

LEP area	Real GVA	Productivity hours	Labour productivity
Black Country	9.2%	3.4%	5.6%
Buckinghamshire Thames Valley	15.0%	24.7%	-7.8%
Cheshire & Warrington	17.7%	15.3%	2.1%
Coast to Capital	8.4%	7.9%	0.5%
Cornwall & Isles of Scilly	11.2%	12.2%	-0.9%
Coventry & Warwickshire	28.3%	16.2%	10.4%
Cumbria	4.6%	-3.1%	8.0%
Derby, Derbyshire, Nottingham & Nottinghamshire	12.1%	12.0%	0.1%
Enterprise M3	14.9%	8.5%	5.9%
Gloucestershire	8.9%	6.4%	2.3%
Greater Birmingham & Solihull	19.9%	17.5%	2.0%
Greater Cambridge & Greater Peterborough	17.0%	13.6%	3.0%
Greater Lincolnshire	10.5%	6.3%	3.9%
Greater Manchester	10.9%	12.7%	-1.7%
Heart of the South West	8.2%	7.3%	0.8%
Hertfordshire	18.0%	26.3%	-6.6%
Humber	-2.5%	5.4%	-7.5%
Lancashire	13.3%	1.5%	11.7%
Leeds City Region	10.6%	8.2%	2.2%
Leicester & Leicestershire	14.3%	11.9%	2.1%
Liverpool City Region	3.0%	10.6%	-6.9%
London	25.6%	23.7%	1.6%
New Anglia	10.9%	8.6%	2.2%
North East	7.9%	3.4%	4.4%
Oxfordshire	18.2%	21.8%	-3.0%
Sheffield City Region	12.8%	9.7%	2.8%
Solent	5.4%	7.5%	-2.0%
South East	11.9%	12.8%	-0.8%
South East Midlands	23.9%	17.7%	5.3%
Stoke-on-Trent & Staffordshire	9.3%	13.3%	-3.5%
Swindon & Wiltshire	9.1%	9.1%	0.0%
Tees Valley	1.9%	-0.5%	2.4%
Thames Valley Berkshire	11.5%	15.6%	-3.5%
The Marches	11.5%	10.4%	0.9%
West of England	10.7%	12.0%	-1.1%
Worcestershire	17.5%	14.7%	2.4%
York, North Yorkshire & East Riding	6.3%	4.5%	1.7%

Source: Office for National Statistics. Note: table excludes Dorset due to a statistical discrepancy in the underlying data in the mining sector that is affecting this LEP.

Appendix to Chapter 4

Table A.2: Headline skills attainment of residents aged 25-64 by local enterprise partnership area, 2018

LEP area	NVQ4+		Low or no quals	
	Number	Percentage	Number	Percentage
Black Country	161,100	27%	173,200	29%
Buckinghamshire Thames Valley	143,400	54%	36,300	14%
Cheshire & Warrington	217,800	46%	70,500	15%
Coast to Capital	529,100	50%	139,100	13%
Cornwall & Isles of Scilly	106,900	40%	50,000	19%
Coventry & Warwickshire	203,700	42%	85,100	18%
Cumbria	85,700	35%	45,800	19%
Derby, Derbyshire, Nottingham & Nottinghamshire	406,300	36%	224,500	20%
Dorset	147,400	39%	60,600	16%
Enterprise M3	388,000	50%	93,400	12%
Gloucestershire	138,000	43%	54,600	17%
Greater Birmingham & Solihull	376,300	38%	204,400	21%
Greater Cambridge & Greater Peterborough	344,800	41%	157,300	19%
Greater Lincolnshire	166,700	31%	118,700	22%
Greater Manchester	577,700	40%	305,100	21%
Heart of the South West	339,400	41%	131,400	16%
Hertfordshire	291,500	46%	103,700	16%
Humber	141,400	30%	105,100	22%
Lancashire	285,300	39%	150,800	20%
Leeds City Region	595,000	38%	327,300	21%
Leicester & Leicestershire	207,500	39%	114,300	22%
Liverpool City Region	291,500	37%	168,200	21%
London	2,930,900	58%	669,800	13%
New Anglia	278,100	34%	179,700	22%
North East	345,200	34%	209,100	21%
Oxfordshire	200,400	56%	42,000	12%
Sheffield City Region	350,600	37%	184,600	20%
Solent	251,000	40%	116,600	19%
South East	776,400	36%	460,800	22%
South East Midlands	430,200	41%	194,600	19%
Stoke-on-Trent & Staffordshire	209,100	37%	105,000	18%
Swindon & Wiltshire	151,600	41%	65,500	18%
Tees Valley	114,100	34%	79,400	23%
Thames Valley Berkshire	262,600	54%	62,200	13%
The Marches	134,300	39%	59,600	17%
West of England	310,200	52%	72,000	12%
Worcestershire	117,700	40%	48,900	17%
York, North Yorkshire & East Riding	255,000	45%	87,700	15%

Source: ONS Annual Population Survey. Note: 'Low or no quals' refers to those with no qualifications or NVQ level 1 only.

Table A.3: Change in number and percentage of employee jobs by local enterprise partnership area, 2015-2018

LEP area	2015	2018	Change	
			Number	Percentage
Black Country	449,000	450,000	1,000	0.2%
Buckinghamshire Thames Valley	228,500	234,500	6,000	2.6%
Cheshire & Warrington	478,000	493,000	15,000	3.1%
Coast to Capital	829,500	856,000	26,500	3.2%
Cornwall & Isles of Scilly	207,000	214,000	7,000	3.4%
Coventry & Warwickshire	436,500	461,000	24,500	5.6%
Cumbria	232,000	234,500	2,500	1.1%
Derby, Derbyshire, Nottingham & Nottinghamshire	923,500	929,500	6,000	0.6%
Dorset	320,000	335,000	15,000	4.7%
Enterprise M3	733,000	736,000	3,000	0.4%
Gloucestershire	285,000	289,000	4,000	1.4%
Greater Birmingham & Solihull	891,500	935,000	43,500	4.9%
Greater Cambridge & Greater Peterborough	758,500	801,000	42,500	5.6%
Greater Lincolnshire	421,000	433,500	12,500	3.0%
Greater Manchester	1,224,000	1,331,000	107,000	8.7%
Heart of the South West	696,500	715,500	19,000	2.7%
Hertfordshire	587,500	649,500	62,000	10.6%
Humber	379,000	392,000	13,000	3.4%
Lancashire	623,500	638,500	15,000	2.4%
Leeds City Region	1,353,000	1,399,500	46,500	3.4%
Leicester & Leicestershire	462,000	474,500	12,500	2.7%
Liverpool City Region	604,500	631,500	27,000	4.5%
London	4,923,500	5,162,500	239,000	4.9%
New Anglia	672,000	692,000	20,000	3.0%
North East	796,500	797,000	500	0.1%
Oxfordshire	358,000	365,500	7,500	2.1%
Sheffield City Region	739,500	754,500	15,000	2.0%
Solent	520,500	528,000	7,500	1.4%
South East	1,579,500	1,606,500	27,000	1.7%
South East Midlands	900,000	969,000	69,000	7.7%
Stoke-on-Trent & Staffordshire	459,000	470,500	11,500	2.5%
Swindon & Wiltshire	311,500	321,000	9,500	3.0%
Tees Valley	267,000	257,500	-9,500	-3.6%
Thames Valley Berkshire	494,500	518,500	24,000	4.9%
The Marches	280,000	289,500	9,500	3.4%
West of England	567,000	594,500	27,500	4.9%
Worcestershire	235,000	255,000	20,000	8.5%
York, North Yorkshire & East Riding	496,500	501,500	5,000	1.0%

Source: ONS Business Register and Employment Survey.

Appendix to Chapter 6: London's innovative sectors - strengths, opportunities and rationale for intervention

We have identified five sectors as key London innovation sectors: tech and digital; advanced urban services; life sciences; cultural and creative industries and low carbon and environmental goods and services.

There are economic, social and policy reasons behind this list which are set out below.

1 Tech and digital

1.1 Sector definition

The ONS has produced a classification of 'science and technology' businesses for the GLA comprising sections, divisions, groups, classes and sub-classes of the Standard Industrial Classification (SIC) that are judged to have a high science and technology content⁶⁴⁶. One sub-category of this classification is 'digital technologies'. This includes businesses involved in the manufacture and repair of computers and electronic components, and computer services including software development, internet services and computer consultancy, design and publishing of computer games and other software⁶⁴⁷.

However, the use of SIC codes to track the development of fast-growing industries such as technology have been criticised as the codes are updated only infrequently⁶⁴⁸.

1.2 Key strengths of the London tech sector

- **The London tech sector is nationally significant.** According to data from TechNation, London accounts for close to half of the total annual turnover of the UK tech sector, and almost 30% of UK tech businesses are based in London^{649,650}.
- **The productivity of digital tech in London is high.** The value of output per worker in the London tech sector is £201,000 per worker per year⁶⁵¹.
- **The sector is growing fast.** Jobs in the ONS 'digital technologies' category in London grew by 29% between 2003 and 2013, the fastest growth in any area of science and technology⁶⁵².
- **London is the top city in the world for foreign direct investment from overseas tech companies.** It attracted 91 tech investment projects in 2018, compared to 79 in Singapore, 46 in Paris and 32 in New York⁶⁵³. Over the last 10 years London has secured 916 tech FDI projects, more than any other city globally, and worth £9.5bn in total⁶⁵⁴.
- **London is the best place in Europe for tech companies to raise venture capital.** According to London & Partners and PitchBook, London's tech companies received £1.8 billion in venture capital funding in 2018, almost double the amount raised in Berlin, the next best city in Europe for venture capital for tech⁶⁵⁵.

⁶⁴⁶ GLA Economics (2015), [Working Paper 64: The science and technology category in London](#).

⁶⁴⁷ GLA Economics (2015), [Working Paper 64: The science and technology category in London](#).

⁶⁴⁸ GLA Economics (2015), [Working Paper 64: The science and technology category in London](#).

⁶⁴⁹ Analysis of regional data from Tech Nation (2019). [UK Tech on the Global Stage](#).

⁶⁵⁰ It is important to note that TechNation uses a different definition of the tech sector to the ONS defined 'digital technologies' category.

⁶⁵¹ Tech Nation. [London](#).

⁶⁵² GLA Economics (2015), [Working Paper 64: The science and technology category in London](#).

⁶⁵³ London and Partners (2019), [Global tech investors look to London for international growth](#).

⁶⁵⁴ London and Partners (2019), [Global tech investors look to London for international growth](#).

⁶⁵⁵ London and Partners (2019), [London and UK top European tech investment tables](#).

- **London is home to 45 of the UK's 70 tech unicorns** (start-ups valued at \$1bn or more) and produces 1 in 5 of all Europe's tech unicorns⁶⁵⁶.
- **There is a supportive start-up environment.** Tech.London identifies 89 incubators and accelerators in London supporting businesses operating across the tech sector⁶⁵⁷.
- **London has expertise in commercialising tech R&D**, including via the Digital Catapult.
- **There are significant and emerging clusters of tech activity across London, and tech has been identified as an important driver of borough-level economic growth.** For example, research by Regeneris for South London Partnership (SLP) identifies four established tech centres and five areas with substantial potential for tech growth across SLP's five boroughs. It also finds that the South London tech sector is growing rapidly, with the number of digital technology businesses increasing by almost 50% over the past five years⁶⁵⁸.
- **London has clear strengths in fintech, cyber security and artificial intelligence**, and is a leader in most other tech verticals and horizontals.
 - **Fintech:** London's status as a global centre for financial services makes it a natural home for innovation in the fintech sector. London is home to 7 of the world's 29 fintech unicorns, second only to San Francisco (which claims 9)⁶⁵⁹. In 2018, London-based fintech firms raised over £1.08bn from venture capital investors, over 90% of the total raised by UK fintech firms⁶⁶⁰.
 - **Cyber security:** London has significant assets for cyber security innovation, including GCHQ's National Cyber Security Centre, the Plexal Cyber Security Innovation Centre in East London and four Academic Centres of Excellence in Cyber Security Research (Imperial, UCL, King's and Royal Holloway)⁶⁶¹. Proximity to London's financial services sector is also important, as this sector is a major source of demand for cyber security products worldwide⁶⁶².
 - **Artificial Intelligence (AI):** According to research produced for the Mayor of London by CognitionX, there were 758 AI companies in London in 2018, with a rate of new supplier formation of 42% per annum⁶⁶³. This research identified the demand for AI products from London's leading industries as a key strength of the London market. Many leading companies working on AI are located in London, and London's HE research base is also strong; Imperial, UCL and King's all have significant AI and machine learning groups⁶⁶⁴. The Knowledge Quarter Science and Innovation Audit identified AI and machine learning as a key strength of the cluster, by virtue of its pre-eminent university strengths (with UCL, City, University of London and Birkbeck all possessing strong data science capabilities), wider research base and commercial assets. The Audit also identified strong links between the research community and data science businesses within the area⁶⁶⁵. London is also a leader in research into the ethics of AI, with the Centre for Data Ethics and Innovation, the Alan Turing Institute, the Ada Lovelace Institute and industry initiatives all located in the city.

1.3 Future opportunities for the sector to seize

- **Global tech giants are choosing London as a place to invest in innovation**⁶⁶⁶.
 - **Apple** is set to open a new London campus in 2021 at Battersea Power Station for 1,400 staff.

⁶⁵⁶ City AM (2019), ['London leads Europe's tech unicorn herd'](#).

⁶⁵⁷ Tech.London, ['Incubators and Accelerators'](#)

⁶⁵⁸ Regeneris (2017), ['The South London Tech Sector: A Framework for Growth'](#).

⁶⁵⁹ City AM (2019), ['London startups to take fintech unicorn crown from San Francisco'](#).

⁶⁶⁰ London and Partners (2019), ['London and UK top European tech investment tables'](#).

⁶⁶¹ National Cyber Security Centre. ['Academic Centres of Excellence in Cyber Security Research'](#).

⁶⁶² Department for International Trade. ['Cyber Security Export Strategy'](#).

⁶⁶³ CognitionX (2018), ['London: The AI Growth Capital of Europe'](#).

⁶⁶⁴ Hall, W. and Pesenti, J. ['Growing the Artificial Intelligence Industry in the UK'](#).

⁶⁶⁵ Knowledge Quarter (2018), ['Knowledge Quarter Science and Innovation Audit'](#).

⁶⁶⁶ London and Partners (2019), ['Global tech investors look to London for International Growth'](#).

- **Google** will open a new HQ in Kings Cross to house up to 4,500 staff.
- **Facebook** announced in 2018 that it will be leasing three new offices in King's Cross to double its London headcount. The company also announced it has chosen London as its base to develop Whatsapp payments.
- **LinkedIn** moved into its new UK HQ in Farringdon in January 2019.
- In April 2019, **Spotify** announced a new research and innovation hub in London, creating 300 new jobs.
- In 2018, **Microsoft** announced a \$20m investment to open its 'Reactor' accelerator space in Shoreditch for global start-ups.
- **Government is committed to ensuring the UK is a world leader in AI and data** through the AI sector deal and AI and Data Grand Challenge, the creation of national-level bodies within government aimed at overseeing the deployment of AI in society and government, and the medium-term funding provided to date.

1.4 Rationale for public sector support for the tech and digital sector in London

- The positive spillovers innovation in the tech sector has the potential to generate in terms of raising productivity across the economy.
- The potential to involve more of the economy in the innovation process and encourage the adoption of technologies across the economy.
- Tech's potential contribution to addressing all four of the UK Grand Challenges, along with other social, economic and environmental challenges affecting London and other places.
- The existence of market failures in the provision of risk capital to facilitate the long-term growth of tech firms, and the exploration of potential new technology areas.
- The need for coordination and the establishment of data standards to ensure that public services can utilise big data and digital technologies for the benefit of Londoners.
- The need from a social inclusion perspective to manage the potential adverse social impacts of disruptive technologies.

2 Advanced urban services (AUS)

2.1 Sector definition

There is not yet a formal definition for the sector.

The Royal Institution of Chartered Surveyors (RICS) submitted a response to the UK Government's Industrial Strategy Green Paper on behalf of the AUS sector. RICS stated that the sector comprises firms across traditional sectors including finance, planning, engineering and consultancy, design, delivery and operation of urban services, infrastructure, service design, construction, software, data management and modelling⁶⁶⁷.

The Connected Places Catapult sees the advanced urban services sector as 'improv[ing] life in cities by redesigning public services, creating new products and services, and overhauling existing governance structures', responding to rapid urbanization and technological change⁶⁶⁸.

⁶⁶⁷ Royal Institution of Chartered Surveyors (2017), 'The Advanced Urban Services Sector: A Sector Response to the UK Government's Green Paper 'Building Our Industrial Strategy'' [Unpublished].

⁶⁶⁸ Future Cities Catapult. '[Advanced Urban Services](#)'.

2.2 Key strengths of the London AUS sector

- **London's strengths in tech are critical to the current performance and future development of the AUS sector.** Along with the strengths outlined above, London also has important clusters of activity in tech 'verticals' related to the management of cities and the built environment, including future mobility, digital health, cleantech, govtech and proptech.
- **London has clear and growing strengths in architecture and urban design.** The London architecture sector grew on average 7.7% per annum in real terms between 2009 and 2016 – significantly faster than the London economy as a whole⁶⁶⁹. Overall, more than two-fifths of the GVA of the British architecture sector in 2016 was generated in London. By the value of services, London and Greater South East urban design firms accounted for three of the largest 15 firms worldwide in 2017⁶⁷⁰.
- **London has a large construction and project management industry** (including civil engineering), with 14% of the UK construction workforce employed in London, and a further 15% in the South East according to ONS data. London and the South East also made the largest contributions to UK construction employment growth in 2017⁶⁷¹.
- **London's universities have teaching and research strengths in key areas relevant to the AUS sector.** 16.5% of undergraduates and 34.7% of postgraduates studying architecture, building and planning in the UK did so in London during the 2015–16 academic year⁶⁷². UCL is first in the world in architecture and the built environment and Imperial College sixth in civil and structural engineering according to the QS World University Rankings^{673,674}.
- **Specialist research centres, incubators and accelerators have been set up in London to support AUS innovation.** For example, the Bosch Connectory and the London RoadLab are incubators for approaches to addressing London's urban mobility and logistics challenges. The Ordnance Survey and Land Registry have set up the Geovation Accelerator for start-ups using locational or property data, and Siemens' 'Crystal' Urban Sustainability Centre is home to the world's largest exhibition on the future of cities⁶⁷⁵.
- **London is the top European city for digital social innovation.** Nesta found that London was far ahead of other cities in using technology to tackle social challenges⁶⁷⁶.
- **London, through TfL, is a leader in transport data and innovation.** The release of open data by TfL is generating annual economic benefits and savings of up to £130m for travellers, London and TfL itself, and has led to the development of more than 600 apps⁶⁷⁷. TfL is also preparing to trial on-demand bus services in Sutton⁶⁷⁸.
- **London is taking steps to make more data available for innovation in AUS.** The Smarter London Together Roadmap commits London to further increase data sharing and collaboration for the benefit of Londoners⁶⁷⁹.
- **Major global corporates working in the built environment sector are based in London.**

⁶⁶⁹ GLA Economics (2018), ['London's Architecture Sector – Update 2018'](#).

⁶⁷⁰ Engineering News Record (2017), ['ENR 2017 Top 225 Design Firms 1-100'](#).

⁶⁷¹ Office for National Statistics (2018), ['Construction statistics: Number 19 – 2018 edition'](#).

⁶⁷² GLA Economics (2018), ['London's Architecture Sector – Update 2018'](#).

⁶⁷³ Top Universities, ['Engineering – Civil and Structural'](#).

⁶⁷⁴ Top Universities, ['Architecture/Built Environment'](#).

⁶⁷⁵ Siemens, ['The Crystal'](#).

⁶⁷⁶ Nesta (2019), ['Launching the European Digital Social Innovation Index'](#).

⁶⁷⁷ Deloitte (2017), ['Assessing the value of TfL's open data and digital partnerships'](#).

⁶⁷⁸ Transport for London (2019), ['On-demand bus services set to be trialled in Sutton'](#).

⁶⁷⁹ Greater London Authority (2018), ['Smarter London Together'](#).

- **The London smart city market is growing.** A 2016 study by Arup for the GLA estimated that the London market for smart goods and services could reach \$13.4bn by 2020, with almost half of this attributable to smart energy, water and waste management, transport and health and assisted living⁶⁸⁰.

2.3 Future opportunities for the sector to seize

- **Urbanisation is a global trend.** The UN estimates that, by 2050, 68% of the world's population will be living in cities or urban areas, up from around 55% today⁶⁸¹.
- **London's population is also projected to grow,** from around 8.9m residents today to 10.72m by 2042 according to the latest GLA projections⁶⁸².
- **Population growth and climate change present huge challenges to cities.** These challenges include air quality, congestion, meeting the water and energy needs of residents and dealing with waste, all of which the AUS sector can help to solve. Both London and the UK are also committed to being zero-carbon by 2050, and the built environment has a major role to play in achieving this. The global market for urban infrastructure is huge⁶⁸³.
- **Even the most advanced cities in the world have only partially adopted existing smart technologies,** according to research from McKinsey⁶⁸⁴. There is therefore clear potential for market growth. MarketsandMarkets estimated the size of the global smart cities market to be \$308.0bn in 2018, and forecast that it will rise to \$717.2bn by 2023⁶⁸⁵.
- **Government is committed to ensuring the UK is a world leader in mobility innovation via the Future of Mobility Grand Challenge.** Automated driving technology is advancing rapidly, and the UK market for connected and autonomous vehicles is forecast to be worth up to £52bn by 2035, out of a global market of £907bn⁶⁸⁶.

2.4 Rationale for public sector support for the AUS sector in London

- The scope for positive externalities from making London operate more efficiently and sustainably, including economy-wide productivity benefits and the improved health of Londoners.
- The need to both enable the availability of relevant data in a standardised format for use by innovators, and ensure this data is handled responsibly and securely to protect the privacy of Londoners.
- The existence of coordination failures and asymmetric information between public and private sectors, which prevents the more effective use of digital technologies by the public sector in London.
- The cross-cutting nature of the sector and the variety of potential applications means it is relevant to all the Grand Challenges.
- The unclear pathways to market for many smart technologies that can improve the way cities operate, and difficulties attracting the investment needed to scale them⁶⁸⁷.
- The value of developing common standards in smart infrastructure procurement and delivery to minimise duplication or waste.

⁶⁸⁰ Arup (2016), [‘Smart city opportunities for London’](#).

⁶⁸¹ UN (2018), [‘68% of the world population projected to live in urban areas by 2050’](#).

⁶⁸² GLA (2019), [‘2017-based Trend Projection Results’](#).

⁶⁸³ PitchBook (2018), [‘Smarter cities: How private markets are reshaping the urban landscape’](#).

⁶⁸⁴ McKinsey Global Institute (2018). [‘Smart cities: digital solutions for a more liveable future’](#).

⁶⁸⁵ MarketsandMarkets. [‘Smart cities market worth \\$717.2 billion by 2023’](#).

⁶⁸⁶ Transport Systems Catapult (2017), [‘Market forecast for connected and autonomous vehicles’](#).

⁶⁸⁷ Arup (2016), [‘Smart city opportunities for London’](#).

3 Life sciences

3.1 Definition

The Life Sciences Industrial Strategy describes 'health life sciences' as referring to "the application of biology and technology to health improvement, including biopharmaceuticals, medical technology, genomics, diagnostics and digital health⁶⁸⁸."

The life sciences sector in London can be defined and measured in different ways.

One approach is to define the sector according to SIC codes. The ONS undertook this exercise for GLA Economics, setting out a classification of 'science and technology' businesses including the sub-category of 'life sciences and healthcare'⁶⁸⁹. Setting healthcare aside, this category includes pharmaceutical manufacture, medical (excluding pharmaceutical), optical & precision equipment manufacture, and biotechnology research.

However, definitions based solely on SIC codes are unlikely to identify the full breadth of London's life sciences sector, with the exclusion of workers in life sciences occupations in non-life sciences industries a key limitation. The Office for Life Sciences (OLS) and MedCity therefore utilise different approaches to estimating the size of the sector. These involve drawing on a range of sources (including databases and stakeholder intelligence) to identify companies involved in life sciences activities. Only a fraction of the companies they identify would have been identified via the main life sciences SIC codes alone⁶⁹⁰.

3.2 The key strengths of the London life sciences sector

- **The life sciences sector has a significant footprint in London.**
 - Using the GLA Economics/ONS SIC code approach to measurement, the life sciences sector in London comprised 660 local units and 5,655 employees in 2018⁶⁹¹.
 - Using a broader approach to measurement, the OLS finds there to be approximately 832 life sciences sites and 23,410 employees in London in 2018⁶⁹², while MedCity reports 1,105 life sciences companies based in the capital as of October 2019⁶⁹³.
- **The London life sciences sector constitutes a significant proportion of the sector in the UK.** According to OLS data London is home to 9.4% of UK life sciences employees and 12.3% of sites⁶⁹⁴. Looking over the period from 2009 to 2018, London has seen the largest net increase in life sciences employment of any UK region or country (up by around 4,696 or 25.1%).
- **London is a part of the 'Golden Triangle' of London, Oxford and Cambridge** – the strongest biosciences cluster in Europe.
- **Strong and emerging life sciences clusters are present across London.** These include the Knowledge Quarter around Euston and King's Cross, Imperial College London's new campus at White City, the Whitechapel Life Sciences Centre and the London Cancer Hub at Sutton.

⁶⁸⁸ Bell, J. 'Life Sciences Industrial Strategy – a report to the Government from the life sciences sector'.

⁶⁸⁹ Harris, P. (2015), 'Identifying Science and Technology Businesses in Official Statistics'.

⁶⁹⁰ Office for Life Sciences (2019), 'Bioscience and Health Technology Sector Statistics 2018'.

⁶⁹¹ ONS Business Counts and Business Register and Employee Survey [accessed via Nomis]. Note: local units are individual sites that belong to a business.

⁶⁹² Office for Life Sciences (2019), 'Bioscience and Health Technology Sector Statistics 2018'.

⁶⁹³ MedCity. 'MedCity Map'.

⁶⁹⁴ Calculated from OLS data for London and the UK.

- **Three of the UK's six Academic Health Science Centres (AHSCs) are based in London**, with a remit to draw on their world-class research to improve patient care (King's Health Partners, Imperial College AHSC and UCLPartners)⁶⁹⁵.
- **Major research centres and funders are based in London**, including the Institute for Cancer Research, the Francis Crick Institute, the Translation and Innovation Hub at Imperial White City and the Wellcome Trust. London also has a key asset in MedCity, an organisation part-funded by the Mayor of London to promote and grow the life sciences sector in London and the Greater South East⁶⁹⁶.
- **London has clear strengths in genomics, advanced therapies, digital health, AI in healthcare and neuroscience.**
 - **Genomics:** A Deloitte study for the OLS in 2015 found that London was home to 14% of UK genomics companies, second only to Cambridge in terms of the size of its cluster⁶⁹⁷. The same study pointed out that the Golden Triangle is responsible for a significant amount of genomics research, in terms of both securing translational research grant funding and conducting clinical trials. London is home to three Genomics England Genomic Medicine Centres, and London universities are significant contributors to research in precision medicine. UCL launched its Institute for Precision Medicine in 2018, and Queen Mary University of London and Barts Health NHS Trust have partnered with King's College London, UCLPartners and others in the East London Genes and Health Programme, designed to better understand disease in the Bangladeshi and Pakistani community⁶⁹⁸.
 - **Advanced therapies:** London is Europe's leading centre for Advanced Therapies research, with London AHSCs conducting approximately 80% of the UK's clinical trials in advanced therapies. This activity spans UCL, King's and Imperial and partner NHS Trusts⁶⁹⁹. MedCity, working in partnership with King's, Imperial and UCL, has launched the Advanced Therapies Network to promote collaborative research and commercial partnerships in this area⁷⁰⁰. According to MedCity, there are over 130 advanced therapies companies in the UK, with 60% residing in the Greater South East of England⁷⁰¹.
 - **Digital health:** According to the OLS, London is responsible for 24% of UK employment in digital health – the largest of any single region in the UK⁷⁰². MedCity and London's three Academic Health Centres are delivery partners in DigitalHealth.London – a programme that aims to speed up the development and scaling of digital innovations across health and care, and pioneer their adoption by the NHS⁷⁰³.
 - **AI in healthcare:** King's College London and its consortium members are developing the London Medical Imaging and AI Centre for Value-Based Healthcare. The new centre will train sophisticated AI algorithms from NHS medical images and patient data, to provide clinicians with tools to speed up and improve diagnosis and care across a dozen pathways including dementia, heart failure and cancer. In East London, teams from Barts NHS Health Trust and Queen Mary University of London are supporting a London SME to deliver a pioneering AI research programme, CAP-AI, which aims to deliver innovative healthcare and services to improve outcomes for patients and create a new product that can be commercialised.

⁶⁹⁵ Department of Health and Social Care (2013), ['Top NHS and university alliances recognized by Department of Health'](#).

⁶⁹⁶ MedCity. ['About us'](#)

⁶⁹⁷ Deloitte (2015), ['Genomics in the UK: an industry study for the Office for Life Sciences'](#).

⁶⁹⁸ MedCity. ['The Genomics Revolution'](#).

⁶⁹⁹ King's College London, by email.

⁷⁰⁰ MedCity. ['Advanced Therapies Network'](#).

⁷⁰¹ MedCity. ['Advanced Therapies Network'](#).

⁷⁰² Office for Life Sciences (2019), ['Bioscience and Health Technology Sector Statistics 2018'](#).

⁷⁰³ [Digital Health.London](#).

- **Neuroscience:** London has clear research strengths in the field of neuroscience. UCL is ranked number one in Europe for neuroscience research, and second in the world⁷⁰⁴. It has also been selected as the 'hub' of the national Dementia Research Institute. In other examples, King's has recently constructed the Maurice Wohl Clinical Neuroscience Institute, one of Europe's largest centres for interdisciplinary neuroscience excellence⁷⁰⁵. The Knowledge Quarter Science and Innovation Audit identified dementias as a clear area of specialism in the London life sciences sector⁷⁰⁶.

3.3 Future opportunities for the sector to seize

- **Populations in the UK and around the world are ageing.** According to the ONS, around 16% of the UK population was aged 65 or over in 1997, compared to over 18% in 2017 and projected to reach 24% by 2037⁷⁰⁷. Contributing to the Government's Ageing Society Grand Challenge, which sets the goal of extending healthy life expectancy by at least 5 years by 2035 and narrowing health inequalities, is an important opportunity for London's life sciences sector, given its strength in neuroscience, particularly dementia, and other areas relevant to the health of an older population.
- **There is significant support for the application of genomics in medicine,** as articulated by the Life Sciences Industrial Strategy⁷⁰⁸ and the Chief Medical Officer for England⁷⁰⁹, among others. This hints at a substantial market opportunity for London's genomics companies and researchers.
- **The scope to apply digital technologies and data to healthcare is significant.** Deloitte identify a range of ways in which new technologies have the potential to transform healthcare in the near term⁷¹⁰, creating significant opportunities for London to build on its strengths in digital health and data-driven technologies including AI. DigitalHealth.London, working in partnership with MedCity and London's AHSCs, aims to support the NHS to find digital solutions, and build the capability of innovators⁷¹¹. MedCity is also increasingly involved in data science and companies that use techniques such as AI and machine learning to derive new insights, products and services⁷¹².

3.4 Rationale for public sector support for the life science sector in London

- The Life Sciences Industrial Strategy produced for the Government by Sir John Bell called for the Government to continue to invest in the sector to ensure the UK retains its global competitive advantage⁷¹³.
- The London life sciences sector has a crucial role to play in responding to the Ageing Society Grand Challenge.
- Life sciences innovation has the potential to generate substantial social value in terms of improved health outcomes. As a positive externality, this is not accounted for in the investment decisions of private sector actors.
- The existence of market failures in the provision of patient capital, given the long lead time of much life sciences innovation.

⁷⁰⁴ Thomson Reuters Essential Science Indicators, Neuroscience, cited in MedCity. [‘The Neuroscience Network’](#).

⁷⁰⁵ MedCity. [‘The Neuroscience Network’](#).

⁷⁰⁶ Knowledge Quarter (2018), [‘Knowledge Quarter Science and Innovation Audit’](#).

⁷⁰⁷ Office for National Statistics (2018), [‘Overview of the UK population: November 2018’](#).

⁷⁰⁸ Bell, J. [‘Life Sciences Industrial Strategy – a report to the Government from the life sciences sector’](#).

⁷⁰⁹ Department of Health and Social Care (2017), [‘Chief Medical Officer annual report 2016: generation genome’](#).

⁷¹⁰ Deloitte (2017), [‘The future awakens: life sciences and healthcare predictions 2022’](#).

⁷¹¹ [Digital Health.London](#).

⁷¹² MedCity (2019), [‘Connecting and Collaborating’](#).

⁷¹³ Bell, J. [‘Life Sciences Industrial Strategy – a report to the Government from the life sciences sector’](#).

- The ability of the public sector to address other well-established barriers to growth for the sector, including access to talent, data and collaboration and R&D space.
- The responsibility of the public sector in driving innovation across the health and social care sectors, including the NHS.

4 Cultural and creative industries

4.1 Definition

We follow the Department for Culture, Media and Sport's (DCMS) definition of the creative industries, which encompasses many cultural activities:

“those industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property”⁷¹⁴.

The DCMS definition is a UK definition based on international industrial codes. It includes the following sub-sectors: Advertising and marketing; architecture; crafts; design and designer fashion; film, TV, video, radio and photography; IT, software and computer services; publishing; museums, galleries and libraries; and music, performing and visual arts.

4.2 Key strengths of the London cultural and creative industries

- **London's creative and cultural industries are economically significant for the city and for the UK as a whole.** The creative industries accounted for 12% of total GVA in London in 2017, while over half of the UK creative industries' total GVA was generated in London in that year⁷¹⁵.
- **The creative industries in London are fast-growing.** Between 2010 and 2017 the GVA of the creative industries in London increased by 73.3%, that fastest of any region of the UK⁷¹⁶.
- **London's creative industries are highly productive,** particularly in film, TV, video, radio and photography; publishing; and IT, software and computer services. Overall GVA per workforce job (as a proxy for productivity) was equal to £71,400 in 2015. This was 22.2% higher than the average across all sectors of the London economy, and 35.5% higher than for the creative industries in the UK as a whole⁷¹⁷.
- **Research by Nesta points to the strengths of London as a creative cluster across a range of metrics.** Importantly, this research finds that networking among those employed in the creative industries is high in London⁷¹⁸, which could point to strong channels for knowledge diffusion.
- **London is home to leading universities and further education institutions specialising in teaching and research in creative subjects.** These include: The Royal College of Music, the Royal Academy of Music, Ravensbourne University, University of the Arts London, the Royal Academy of Dramatic Art, the Central School for Speech and Drama, Trinity Laban and the Royal College of Art, the top-ranked art and design school in the world for five years running.
- **Strong and emerging cultural and creative clusters are present across London.** These include the UK's first six Creative Enterprise Zones (Croydon, Tottenham, Hounslow, Brixton, Deptford and New

⁷¹⁴ Department for Digital, Culture, Media and Sport (2019), '[DCMS Sectors Economic Estimates 2017 \(provisional\): Regional Gross Value Added \(GVA\)](#)'.

⁷¹⁵ Department for Digital, Culture, Media and Sport (2019), '[DCMS Sectors Economic Estimates 2017 \(provisional\): Regional Gross Value Added \(GVA\)](#)'.

⁷¹⁶ Department for Digital, Culture, Media and Sport (2019), '[DCMS Sectors Economic Estimates 2017 \(provisional\): Regional Gross Value Added \(GVA\)](#)'.

⁷¹⁷ GLA Economics (2017), '[London's creative industries – 2017 update](#)'.

⁷¹⁸ Nesta (2016), '[The Geography of Creativity in the UK](#)'.

Cross and Hackney Wick and Fish Island), the Royal Docks, Dagenham Studios, Fashion District in East London, the Old Oak Park Royal development and the cluster of assets in the Knowledge Quarter.

- **Important cultural institutions and creative businesses are based in London**, including major museums and galleries, ballet and contemporary dance companies, broadcasters, film studios and VFX production companies and music venues.
- **London has particularly pronounced strengths in film and screen industries, broadcasting, fashion, advertising and design.**
 - **Film and screen industries and broadcasting:** London accounted for over three quarters of GVA generated by the 'film, TV, video, radio and photography' sub-sector in the UK in 2017⁷¹⁹. London has a very high index of specialisation (6.79)⁷²⁰ in the sub-sector 'motion picture, video and television programme activities'. Similarly, it has an index of specialisation of 7.96 in radio broadcasting and of 19.36 in television programming and broadcasting activities⁷²¹. These scores indicate that London is highly specialised in these activities compared to the rest of Great Britain.
 - **Fashion:** London is a top fashion capital, hosting the major annual events London Fashion Week and London Fashion Week: Men's. The London showcases for womenswear and menswear generate circa £112m in sales per year⁷²².
 - **Advertising:** 1 in 18 jobs in London are in the advertising sector⁷²³. London has an index of specialisation of 4.26 in advertising, evidencing a clear specialisation⁷²⁴. Nesta finds that advertising is one of the fastest-growing creative sub-sectors in the UK⁷²⁵.
 - **Design:** The UK design economy generated £85.2bn in GVA in 2016, equivalent to 7% of UK GVA. One in three design firms are based in London, with one in five design workers also operating in the capital⁷²⁶. Nesta finds that the design sub-sector is growing particularly rapidly in the UK⁷²⁷.

4.3 Future opportunities for the sector to seize

- **Government is backing the UK's cultural and creative industries** via the Creative Industries Sector Deal, with the aim of ensuring they retain their pre-eminent global status⁷²⁸.
- **New technologies, particularly immersive technologies, are opening up opportunities for the development of new creative content**⁷²⁹. According to PWC, London already has very pronounced strengths in AR/VR (augmented reality/virtual reality); home to 244 of the UK's 463 AR/VR companies⁷³⁰. The majority of these are producing AR/VR content.
- **Investment in major new creative assets in London**, including plans for large-scale, state-of-the-art creative and cultural production centres as part of the development of the Thames Estuary Production Corridor and East Bank. The development of new film studios at Dagenham East is already underway as a part of this vision as well as Fashion District in East London.

⁷¹⁹ Department for Digital, Culture, Media and Sport (2019), '[DCMS Sectors Economic Estimates 2017 \(provisional\): Regional Gross Value Added \(GVA\)](#)'.

⁷²⁰ An index of specialisation is a calculation which looks at the relative importance of a sector based on the number of jobs in one area as compared to another geographic area. For this analysis London is compared to the rest of Great Britain. Any score over 1 indicates that London is more specialised in terms of jobs than the rest of Great Britain; a score less than one indicates the opposite.

⁷²¹ GLA Economics (2016), '[Economic Evidence Base for London 2016](#)'.

⁷²² British Fashion Council, GLA monitoring and reporting.

⁷²³ Advertising Association. '[Advertising Pays 6: World class talent, world class advertising](#)'.

⁷²⁴ GLA Economics (2016), '[Economic Evidence Base for London 2016](#)'.

⁷²⁵ Nesta (2016), '[The Geography of Creativity in the UK](#)'.

⁷²⁶ Design Council (2018), '[The Design Economy 2018 Report](#)'.

⁷²⁷ Nesta (2016), '[The Geography of Creativity in the UK](#)'.

⁷²⁸ Department for Digital, Culture, Media and Sport (2018), '[Creative Industries Sector Deal launched](#)'.

⁷²⁹ UK Research and Innovation. '[Audience of the future](#)'

⁷³⁰ Dalton, J. (2017), '[VR/AR interactive UK map](#)'.

4.4 Rationale for public sector support for the cultural and creative industries in London

- The wider economic and social benefits generated by the sector, including attracting tourism and high-skilled workers to the city, supporting regeneration and improving the quality of life of Londoners.
- The central role of the public sector in addressing Brexit-related uncertainty, which significantly threatens the cultural and creative industries given their reliance on international workers, tourism and export demand from EU markets.
- The ability of the public sector to address other well-established barriers to growth for the sector, including the lack of affordable creative workspace and access to finance and start-up capital.
- The social imperative of addressing low pay, which remains a significant issue in many parts of the sector.
- The Mayor has a statutory requirement to deliver a Culture Strategy.
- Investment in arts and culture at both a local authority and Government level has been decreasing, particularly in London where Arts Council funding has been at a standstill since 2015.
- The cultural and creative industries face coordination challenges due to their SME/freelance structure, which can impact on the provision of skills and training and access to business advice and support.

5 Low carbon and environmental goods and services (LCEGS)

5.1 Definition

Work commissioned by the GLA to define and measure the low carbon and environmental goods and services sector in London defines the sector as comprising 24 sub-sectors. These sub-sectors are grouped into three broad categories; environmental, renewable energy and low carbon⁷³¹.

5.2 Key strengths of the London LCEGS sector

- **London is home to a strong LCEGS cluster.** In 2017/18 there were 13,906 LCEGS businesses located in London employing over 246,000 workers. This represents 19.2% of all of the LCEGS businesses in the UK (72,478), and 19.6% of employees (1,257,182)⁷³².
- **The London LCEGS sector has experienced strong growth over the last decade.** In terms of sales, the sector grew by 90% in London between 2007/08 and 2017/18, compared to growth of 80% in the UK as a whole. The low carbon category exhibited the strongest growth over this period, growing by 108%, compared to growth of 88% in the UK⁷³³.
- **London is the UK's pre-eminent centre for carbon finance.** The sub-sector, which includes carbon finance trading houses and consultancies, generated sales of £12.77bn in 2017/18, 32% of the total value of sales from the London LCEGS sector in that year (£39.7bn). 97% of UK carbon finance activity is based in London, and much of this within the City of London⁷³⁴.
- **Wind, geothermal, building technologies, alternative fuels and photovoltaics are all also important sub-sectors in London.** All generate more than £2bn annually in sales, and London has the highest market shares of any region in the UK in photovoltaic (26%), geothermal (24%) and wind (16%) sub-sectors, and the second highest share in building technologies (15%)⁷³⁵.
- **London has higher education strengths in low carbon technologies,** including the Grantham Institute for Climate Change and the Environment at Imperial, and the Energy Institute at UCL.

⁷³¹ Greater London Authority (2019), ['London Low Carbon Market Snapshot \(2019\)'](#).

⁷³² Greater London Authority (2019), ['London Low Carbon Market Snapshot \(2019\)'](#).

⁷³³ Greater London Authority (2019), ['London Low Carbon Market Snapshot \(2019\)'](#).

⁷³⁴ Greater London Authority (2019), ['London Low Carbon Market Snapshot \(2019\)'](#).

⁷³⁵ Greater London Authority (2019), ['London Low Carbon Market Snapshot \(2019\)'](#).

- **London Government is innovating in low carbon approaches via the London Waste and Recycling Board**, which works with the Mayor of London and London Councils to improve waste and resource management in London.
- London is home to specialist incubators and accelerators for LCEGS start-ups.

5.3 Future opportunities for the sector to seize

- **International commitments to take action on climate change**, such as the Paris Agreement, mean the market for low carbon goods and services is growing. Analysis for the Committee on Climate Change found that the UK low carbon economy could grow from around 2% of UK total output in 2015 to 8% by 2030, and around 13% by 2050⁷³⁶.
- **The Government's Clean Growth Grand Challenge** reinforces the UK's commitment to developing low carbon technologies and promoting greater resource efficiency.
- **The market for low carbon services might be a particular opportunity for the UK, and London especially**. Specialist services in climate finance, insurance, consultancy, accountancy and law are likely to be in increased demand worldwide⁷³⁷, services in which London is already highly specialised.
- According to the City of London Corporation's Green Finance Initiative, **London can play an important role in helping to internationalise the green finance sector**⁷³⁸. There are already 90 Green Bonds listed on the London Stock Exchange in 7 currencies⁷³⁹.

5.4 Rationale for public sector support for the low carbon and environmental goods and services sector in London

- The need for coordination to address the disjointed and incoherent nature of the sector in London.
- The potential for public procurement, regulation and policy to create demand for low carbon, circular goods and services, responding to the broader challenge of climate change.
- Market failures in the provision of patient capital across the technology lifecycle.
- The ability of the public sector to address other barriers to growth for the sector, including lack of affordable workspace and the lack of tailored business support.
- The role of the sector in responding to the Clean Growth Grand Challenge.

⁷³⁶ Committee on Climate Change (2017), '[UK business opportunities of moving to a low carbon economy](#)'.

⁷³⁷ Committee on Climate Change (2017), '[UK business opportunities of moving to a low carbon economy](#)'.

⁷³⁸ Green Finance Initiative. '[London as a global centre for green finance](#)'.

⁷³⁹ Green Finance Initiative. '[Facts and Figures](#)'.

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