

Exploring the Opportunity of Brownfield Urban Regeneration

DELIVERING MORE HOMES AND JOBS ON
PREVIOUSLY DEVELOPED LAND IN THE UK

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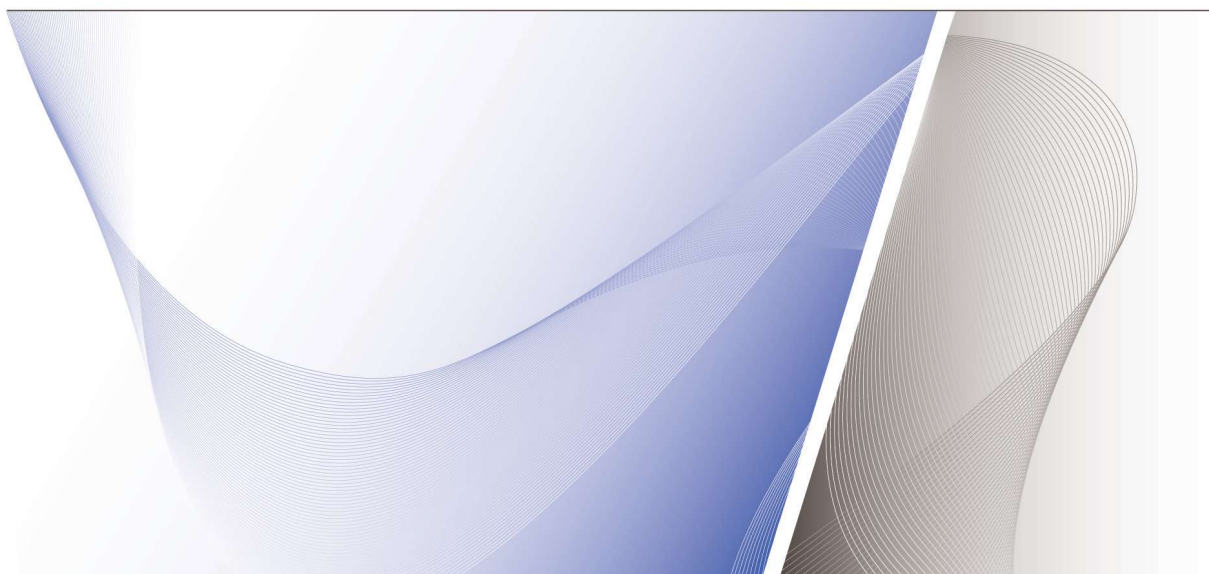


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1: Executive Summary

- 1.1 The purpose of this report is to quantify the scale of the redevelopment opportunity that is potentially available for brownfield land in the UK. The focus is on the regeneration opportunity offered by brownfield land in 16 of the largest and most dynamic urban areas in the UK, where the pressure for development is the most intense.
- 1.2 Development pressure is driven primarily by demographic change, which creates the need for land upon which to provide sufficient and affordable housing to accommodate a growing population. Much of this housing need occurs in major cities and other urban areas, influenced by natural population growth and both domestic and international migration.
- 1.3 The changing structure and needs of the business economy also creates the need for new development land, but the process of change also creates opportunities for the recycling of previously developed land that is no longer needed for its original purpose and/or its most recent use.
- 1.4 In recent decades there has been an increasing emphasis among policymakers of the need for more effective and faster transformation of redundant or under-utilised land in urban areas. For example, the urgent need for additional land for housing was recognized in the manifestoes of the major political parties in the 2019 general election, including the commitment by the Conservatives for the delivery of 300,000 homes annually by the mid-2020. While the role of housing targets has been debated and amended over the course of this Parliament, recent Government announcements alongside the Opposition's commitment to growth and to reinstate the target indicate that the need to deliver more homes quickly would be a high priority for whichever party forms the next government.
- 1.5 In much of the recent policy discussion around housing and development there are a number of themes that appear to be increasingly recognised by the major political parties in the UK:
 - Demographic change has generated a growing need for more housing, and that a failure to address this need is creating difficulties for our society, manifested in declining housing affordability, and living standards.
 - Opportunities offered by the redevelopment of brownfield land have a significant role to play in addressing regional inequalities.
 - A failure to provide sufficient housing is increasingly causing problems for the efficient functioning of labour markets, especially as the growth in population has not been matched by investment in transport infrastructure, leading to more congestion and overcrowding on road and rail networks. This failure is likely to be a contributing factor in the UK's continuing struggle to reach levels of productivity growth achieved by many of our major international competitors.
 - The increasing knowledge-intensity of business activity means that there is a particular requirement to facilitate growth in clusters of activity, especially in larger cities and other places (such as Oxford and Cambridge) that possess world-leading universities and other knowledge-economy assets.

- Brownfield land is a resource that should be used more effectively in addressing housing need and also in facilitating economic growth, social mobility, and delivering more equitable outcomes for the UK and for its various communities, especially in larger urban areas.
 - Nevertheless, increasing environmental concerns including the climate emergency, biodiversity, and flood risk means that there is also an imperative to encourage as great a share as possible of the required development to occur in the most sustainable locations, on land that has been previously developed.
- 1.6 The analysis undertaken in this report confirms that the redevelopment potential of the brownfield land resource in the UK's urban areas is enormous, with around 14,500 hectares of brownfield land currently available for redevelopment located within the 16 urban areas covered by the assessment, including around 2,650 hectares located in London.
- 1.7 The scale of the redevelopment potential offered by the existing and expected future arising brownfield land resource in urban areas is substantial. With respect to employment land, the development potential offered in the 16 urban areas covered by the assessment could deliver, by 2035:
- over 1.14 million jobs located on brownfield sites; and
 - nearly £185 billion of additional Gross Value Added directly – i.e. from business activities occurring on the sites.
- 1.8 With respect to housing development on brownfield land, under a more aspirational scenario considered in this report, nearly 1.03 million new dwellings could be built by 2035 on brownfield land located in the 16 urban areas included in this study.
- 1.9 However, there is the potential for a more stretching scenario with greater average housing development densities yielding a more efficient re-use of the anticipated brownfield resource, developed in line with the government's proposed focus on increasing housing targets in England's 20 largest cities and urban areas.
- 1.10 Under this more aspirational scenario, it is envisaged that around 1.33 million new dwellings could be built on the same area of previously developed land by 2035, as well as meeting all employment land needs expected to arise in the 16 urban areas assessed in this report.

2: Introduction

Background

- 2.1 Over the past two decades the United Kingdom has been facing a major pressure to provide housing for a rapidly growing population. Between 2001 and 2018 alone, the estimated population of the country grew by around 7.32 million persons, an increase of 12.4%. The average rate of population growth of over this period was just over 430,000 per annum.
- 2.2 The trend for growth in population is set to continue. Current Government population projections expect that the UK's population will reach 70 million by 2031, and that by 2035 the population will reach 70.86 million. This equates to an average annual projected increase of just under 250,000 per annum which, however, is notably lower than the average rate that actually occurred over the 2001-2021 period.
- 2.3 Rapid population growth provides challenges for Government in a number of domains. Firstly, there is the challenge of providing sufficient housing to meet the needs of a growing number of families and others with housing need. A failure to provide sufficient housing of the right type will, over time, contribute to the rising cost of housing, both in terms of house prices and also rental costs for those cannot afford to buy or who prefer to rent.
- 2.4 Rapidly increasing population also creates challenges for the delivery of public services, including healthcare, education for children, and the provision of infrastructure including for transport, energy, and water supply.
- 2.5 Another aspect of the challenge facing the UK is that population growth is not evenly distributed. It is fairly well known that the largest pressure on population growth occurs in London and the South East. Altogether, those two regions plus the East of England accounted for 48% of all of the population growth occurring in the UK between 2001 and 2018.
- 2.6 It is also important to recognise that there are major sources of population growth occurring outside of London and the adjacent regions of the South East and East of England. Notable examples include:
 - Bristol and the other three authorities that together comprise the West of England Combined Authority (CA) area: this area experienced growth of population of 17% between 2001 and 2018, which was a faster rate of growth than the South East region (14%)
 - The West Midlands CA area, whose population grew by 14% over the 2001-2018 period: and
 - Greater Manchester, where the population grew by 12% over the same period.
- 2.7 The increase in the number of jobs in the economy is a further source of need for development land. Again, focusing on the data for the UK as a whole, the total number of workforce jobs increased by around 4.8 million (nearly 16%) between 2001 and 2018.

- 2.8 Although nearly half of this employment growth occurred in London and the two adjacent regions, it is worth noting that some other regions also increased their employment base at above national average rates, including the South West (with an 18% increase in employment) and Wales (17%).
- 2.9 The opportunity to increase the supply of housing is recognised by the UK Government as a mechanism both to boost economic growth and also support the levelling up agenda. For example, the ‘Build Back Better’ plan for economic growth published in 2021 identified that investment in housing boosts both short-to-medium term economic activity and also supports longer term productivity growth. The strategy also specifically cited the need to unlock development potential on brownfield land in major cities as a mechanism to help address regional growth disparities in the UK.¹ More recently, the Levelling Up Secretary, Michael Gove, set out a ‘long-term plan for housing’ focused on regeneration, inner-city densification and housing delivery.
- 2.10 Meanwhile, the Labour Party has said that if elected it wants to reintroduce the Government’s previous target of building 300,000 houses per year in order to meet housing need and secure the highest sustained growth in the G7.
- 2.11 Although rising population and workforce numbers increase the need for development land to accommodate growth, at the same time there has also been pressure on government from other groups to restrict the extent to which urban areas are spreading. Arguments against increasing urban sprawl include concerns about impacts on landscape, damage to biodiversity, and the loss of the UK’s most productive agricultural land. Sacrificing farmland to accommodate housing has become a particularly acute issue in recent years, as the UK has faced rising food price inflation as a consequence of disruptions to trade linked to both Brexit and the effects of the Russian invasion of Ukraine.
- 2.12 Various concerns about urban areas spreading further into agricultural land and/or areas with a high landscape value has tended to reinforce the policy imperative to make the best possible use of previously developed land to help accommodate current and future development linked to a rising population and/or economic development needs. While it may not be possible to accommodate all future development needs on previously used land, it is generally accepted that making better use of the redevelopment potential offered by existing previously developed land – plus already developed land that may in future become available for redevelopment – will be important in helping to address the future development needs of urban areas in the UK.

Purpose of the Report

- 2.13 Given all this background, the purpose of this report is to quantify the scale of the redevelopment opportunity that is potentially available for previously developed land in the UK. The main focus is on the regeneration opportunity offered by previously developed land in some of the largest and dynamic urban areas where the pressure for development is often the greatest.
- 2.14 The areas that are the particular focus for assessment in this report are the following city regions and Combined Authority (CA) area:

¹ UK Government, *Build Back Better*, March 2021

- the London city region
- Greater Manchester
- the Liverpool city-region
- the West Yorkshire CA area
- the Sheffield city region
- the North East CA area
- the East Midlands CA area
- the West Midlands CA area
- the West of England CA area.

2.15 The city region and CA areas that are the focus of this study are summarised and defined (in terms of local authority geographies) in the table below:

Table 2-1: Study areas : urban areas (city regions, etc.)

Urban area	Local authority areas included
London	All 33 local authority areas in the London standard region
Greater Manchester	All 10 local authorities in Greater Manchester
Liverpool	Liverpool, Sefton, St Helens, Knowsley, Wirral, and Halton
West Yorkshire	Leeds, Bradford, Calderdale, Kirklees, and Wakefield
Sheffield	Sheffield, Barnsley, Doncaster, and Rotherham
North East	Newcastle upon Tyne, Sunderland, Gateshead, North Tyneside, South Tyneside, Northumberland; Durham
East Midlands	Derby, Derbyshire, Nottingham, Nottinghamshire
West Midlands	Birmingham, Coventry, Solihull, Dudley, Sandwell, Walsall, and Wolverhampton
West of England	Bristol, Bath and North East Somerset, North Somerset, and South Gloucestershire

2.16 In addition to the above, a number of individual local authority areas were also included in the study, as follows: Cambridge and South Cambridgeshire; Portsmouth and Southampton; Oxford; Cardiff; Glasgow; and Belfast.

Data sources

2.17 Various datasets and forecasts were used in quantifying likely future demand for and supply of previously developed land. The principal datasets used covered the following themes:

- Official population and household projections published by the Office for National Statistics (ONS)
- Local area employment data based on datasets published by the ONS
- The same employment data was also utilised by Development Economics to generate future projections for employment growth

- Housing development density data based on historic datasets published by UK Government
- Commercial development density assumptions based on guidance notes published by Homes England plus evidence extracted from various strategic planning documents
- Land availability data including data published by the respective local authorities in the urban regions covered by the study.

Structure of Report

2.18 The remainder of the report is structured as follows:

- Chapter 3: identifies and describes the economic and demographic drivers that are a principal source of demand for development land in urban areas of the UK.
- Chapter 4: assesses the scale of likely future unconstrained demand for development land for housing and employment purposes in each of the urban areas covered by the study.
- Chapters 5: introduces three alternative scenarios for the potential scale of housing and commercial workspace development that could take place on previously developed land in some of the UK's larger urban areas. The chapter sets out the estimated quantity of employment and housing land that could be accommodated on previously developed land.
- Chapter 6: presents a summary of main findings and offers some conclusions.

3: Economic and demographic drivers

- 3.1 As noted in the Introduction, a series of factors are driving the growing need to increase and accelerate the re-use of previously developed land. This chapter provides an overview of some of the key factors, starting with demographic changes.

Housing demand

- 3.2 The principal source of demand for development land in the UK is the need for land to accommodate additional housing and associated community infrastructure. Increasing demand for housing is driven in part by population growth, but there are also other demographic factors that contribute to surging demand, such as smaller average household size, divorce rates, and the changing age structure of the population.
- 3.3 As noted in the previous chapter, population growth in the UK has been strong and sustained for the past few decades and has so far shown little sign of slowing down. Alongside growth in population there has also been a sustained increase in the number of households. For example, in England the number of households increased by around 2.75 million (13.5%) between 2001 and 2018.
- 3.4 Current Government forecasts produced by the UK Government and devolved administrations predict that household numbers will continue to increase, as summarised in the table below.

Table 3-1: Household forecast in the UK, 2018-2035

Country	2018 households ('000s)	2035 households ('000s)	Change ('000s)	Change (%)
England	23,204	25,889	2,684	11.6%
Wales	1,359	1,452	94	6.9%
Scotland	2,477	2,657	180	7.3%
Northern Ireland	733	800	68	9.2%
United Kingdom	27,773	30,798	3,026	10.9%

Sources: Household formation tables published by respective UK and devolved governments. All projections are 2018-based except for Northern Ireland, which are 2016-based.

- 3.5 Overall, slightly over 3 million households are expected to form between 2018 and 2035, a rise of nearly 11%. A substantial proportion of the UK's population and household growth has been occurring in larger cities. This phenomenon is starkest in London: around 22% of the overall population increase occurring in the UK between 2001 and 2018 occurred in the Greater London region. However, other larger cities have also experienced substantial growth over the same period, including Birmingham, Manchester, and Bristol.
- 3.6 Based on current population forecasts and household projections published by the UK and devolved governments, the urban areas that are the focus of this study will continue to experience strong levels of growth over the period to 2035. For example, between 2018 and 2035 there are expected to be an additional 1.22 million households formed across the 87 local authority areas covered by the study.

Housing affordability

- 3.7 Over the past few decades the UK has largely struggled to deliver sufficient new housing to keep pace with demand. One manifestation of under-delivery has been the sustained real increase in the cost of housing over this period. Moreover, the rate of increase in the cost of housing has tended to outpace the growth in average earnings over the same period, meaning that for many housing has become less affordable. This is especially the case for those attempting to join the housing ladder.
- 3.8 A widely used measure of housing affordability is to divide the median price of a house in any given area by the median income earned by residents of the same area. According to Government data, across England as a whole, the ratio of median house prices to median earnings rose from 3.6 in 1997 to 8.2 by 2022.² In Wales, the ratio rose from 3.0 to 6.2 over the same period.
- 3.9 Essentially, whilst average earnings in England and Wales have doubled over the 1997-2022 period, average house prices have increased by around 4.5 times.
- 3.10 The deterioration of housing affordability over the past 20 years has been most acute in London and adjacent areas of the South East and East of England regions. However, affordability ratios in most many urban areas – such as Greater Manchester, Bristol, Oxford, and Cambridge – have also deteriorated significantly over the past 20 years or so.

Employment growth

- 3.11 Another principal driver of the demand for land is employment growth. Across the UK as a whole, the number of workforce jobs increased by over 5.2 million between March 2011 and March 2023, a rise of around 16.5%.³ Whilst some of the job growth is directly linked to the increase in population (for example, in providing education and healthcare services to an expanding human population) a significant proportion of growth is driven by the expansion of the trading economy and the emergence of modern industries. For example, the fastest growth in employment has occurred in sectors such as Information & Communications technologies and Professional services: each of these sectors has experienced overall growth of around 40% in their employment base since 2011.
- 3.12 Another feature of the job growth trajectory occurring in the UK economy has been the disproportionate share of the increase experienced in the larger cities, especially London. The city region of London accounted for around one-third (32.3%) of the overall increase in UK employment occurring between 2011 and 2023 – a total of 1.69 million jobs. Overall, between 2011 and 2023 the number of jobs in London grew by 35, compared to 17% for the UK as a whole: thus, the rate of job growth in London is running at around twice the national (UK) rate.
- 3.13 Other major urban areas in the UK have also experienced above-average growth in employment. For example, between 2011 and 2021 Greater Manchester experienced a 22% increase in its employment base. The rates of job growth in other urban areas such as West Yorkshire, the West Midlands CA area, and the West of England CA area (centred on Bristol) were also notably high.

² [Housing affordability in England and Wales - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/housing/affordability)

³ Source: overall and sector-based trends in ONS Workforce jobs, March 2011-March 2023

- 3.14 Although the jobs growth in major cities is linked in part to population growth, it also reflects the growing importance of these cities as centres for knowledge-intensive business clusters, including those clustered around leading universities and other sources of technological innovation. In some cases the 'knowledge intensity effect' extends outside of major cities, For example, the rate of job growth in the combined Cambridge and South Cambridgeshire area (a major epicentre for high technology industry, including biotechnology and pharmaceutical R&D) increased by nearly 22% between 2011 and 2021.
- 3.15 Cities offer also competitive advantages by being able to access large and highly developed labour markets offering a wide range of highly qualified and skilled staff. Major cities also have other advantages, such as the availability of the fastest telecommunications services and access to national and international airports and rail infrastructure.
- 3.16 Apart from the overall net growth in the number of jobs, changes in technology and changes in industrial practices means that there will always be a proportion of workplace premises that are no longer required or are insufficiently efficient. The process of technology change and restructuring means that there will always be a need for new buildings on new sites, but this process also creates a pipeline of redundant or underutilised sites that are suitable for redevelopment for various purposes. While some of these sites may be best suited for redevelopment for commercial purposes, others may be located in places that are more suited for housing redevelopment or a mix of employment and residential accommodation.
- 3.17 The chapter that follows examines the growth potential that is potentially available on sites that are no longer required for their original or most recent purpose and could therefore be potentially available for re-development.

4: Scale of opportunity

Introduction

- 4.1 The purpose of this chapter is to explore the potential scale of the development opportunity from the re-use of previously developed land in major urban areas of the UK. The chapter assesses the potential scale of demand for housing and employment land in each of the urban area included in this study, and then assesses the potential scale of future demand for employment land in each of these areas.

Housing land demand

- 4.2 The starting point is to estimate the potential future scale of housing land requirements in the urban areas. This assessment takes into account the following demographic and economic variables that are expected to occur between 2019 and 2035:
- Expected levels of household formation
 - Expected future changes in working age population
 - Expected future changes in the number of workforce jobs
 - Commuting patterns identified by national population censuses.
- 4.3 The table below sets out indicative levels of future housing land that is required, based on recently achieved development densities.

Table 4-1: Summary of expected homes and housing land required, 2019-2035

Area	Additional homes required ('000s)	Additional housing land required, (ha)	Additional housing land per annum (ha)
London	943	13,714	807
Greater Manchester	301	9,249	544
Liverpool city region	144	4,290	252
West Yorkshire CA	157	4,725	278
Sheffield city region	93	3,283	193
North East CA	141	4,848	285
East Midlands CA	177	4,540	267
West Midlands CA	189	5,317	313
West of England CA	130	3,553	209
Cambridge & S. Cambridgeshire	33	856	50
Portsmouth	13	390	23
Southampton	5	99	6
Oxford	8	156	9
Cardiff	34	929	55
Glasgow	54	1,264	74
Belfast	30	808	48
Area total	2,598	61,681	3,628

Source: *Development Economics estimates*

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- 4.4 Demographic change expected across the urban areas included in the study is expected to lead to growth in demand for just under 2.6 million dwellings between 2019 and 2035. Meeting future housing need – as well as addressing some of the backlog in housing supply that had occurred in previous years – was a driver for the Conservative’s 2019 election manifesto pledge to continue progress towards the delivery of 300,000 new homes each year to the mid-2020s.
- 4.5 The land needed to accommodate an additional 2.6 million dwellings would amount to around 61,000 hectares based on recently achieved development densities.
- 4.6 London alone is expected to require around 943,000 additional homes between 2019 and 2035, an average of around 55,500 per annum. Based on current average development densities achieved in each of the respective London Boroughs, a total of around 13,700 hectares of development land would be needed to provide for this housing, an average of 807 ha per annum.
- 4.7 Apart from London, the largest other requirement for housing land is expected to occur in Greater Manchester, where just over 300,000 additional homes are predicted to be required between 2019 and 2035 to accommodate the growing population and provide for the needs of a growing economic base. Based on the current average development densities achieved in each of the 10 local authorities that comprise Greater Manchester, this growth would be expected to drive a need for an additional 9,249 hectares of housing land in total, equivalent to an average of 544 hectares per year.

Employment land demand

- 4.8 The expected future requirement for additional employment land over the 2019-2035 period was also estimated for each of the local areas.
- 4.9 The approach taken was based on expected future employment growth in each area over the period, focusing in particular on employment growth in sectors that drive demand for business activities that occur in offices, factories, workshops, and warehouses. (Jobs found in other types of buildings – such as shops, restaurants, leisure facilities, schools, healthcare facilities, etc. – were not included in this assessment).
- 4.10 Employment in the included categories found in each local authority area was allocated to each of the three categories of premises as follows:
- Offices: Jobs in Professional, Financial and Business support services, plus a proportion of job in Information Technology, Property services, Public Administration and Other services
 - Factories and workshops: Jobs in Manufacturing, plus a small proportion of jobs in Utilities, Construction and Transport
 - Logistics: a proportion of jobs in Transportation & Storage, plus a small proportion of jobs in Wholesale & retail distribution.
- 4.11 Estimates of future employment trends for each local authority area have been developed based on trajectories of growth revealed by medium term historic data obtained from the Office for National Statistics, using a 2019 baseline to avoid disruption linked to the 2020-2021 Covid pandemic and associated lockdowns.

- 4.12 The table below sets out the summary results for expected future additional employment land in each of the urban areas included in this study. Overall, across all areas a total of around 2,370 ha is expected to be needed, at an average rate of around 140 ha per annum over the 2019-2035 period.

Table 4-2: Summary of expected employment land required, 2019-2035

Area	Land for offices (ha)	Land for industry (ha)	Land for logistics (ha)	Overall land required (ha)	Average land required p.a. (ha)
London	147	96	298	540	31.8
Greater Manchester	94	125	236	455	26.8
Liverpool city region	34	50	95	179	10.5
West Yorkshire CA	31	74	82	187	11.0
Sheffield city region	17	41	45	103	6.0
North East CA	22	48	42	112	6.6
East Midlands CA	35	78	63	176	10.3
West Midlands CA	57	108	110	274	16.1
West of England CA	39	43	63	146	8.6
Cambridge & S. Cambridgeshire	19	18	8	45	2.6
Portsmouth	4	8	8	20	1.2
Southampton	4	3	12	18	1.1
Oxford	4	3	4	11	0.7
Cardiff	12	8	9	29	1.7
Glasgow	10	13	16	38	2.3
Belfast	10	13	22	45	2.7
Area total	540	728	1,110	2,378	139.9

Source: Development Economics estimates

- 4.13 Overall, London is expected to require 540 hectares of additional employment development land between 2019 and 2035, averaging 31.8 hectares per annum. The greatest contributor to the overall demand for employment land is expected to arise from expected expansion of land needed to accommodate logistics activities: this source is expected to contribute 297 ha (55%) of the overall expected employment land demand in London. The next largest source of demand for workspace in London is expected to be linked to office developments, amounting to 147 hectares in total.
- 4.14 Outside London, in other urban areas the largest requirement for additional employment land up to 2035 is expected to occur in Greater Manchester. There, around 455 hectares are estimated to be required, with 236 ha of this (52%) expected to be for logistics development.
- 4.15 Apart from Greater Manchester, the other areas exhibiting the strongest anticipated demand for employment land include:
- the West Midlands CA area (c.274 ha)
 - the West Yorkshire CA area (c.187 ha)
 - the Liverpool city region (c.179 ha).

Overview of demand for land

- 4.16 The table below brings together the summary results of estimated future need for housing development and employment land needed in each of the study areas between 2019 and 2035.

Table 4-3: Summary of additional development land needed, 2019-2035

Area	Additional housing land needed (ha)	Average additional housing land per annum (ha)	Overall employment land needed (ha)	Average employment land needed p.a. (ha)	Overall development land needed (ha)	Average development land needed p.a. (ha)
London	13,714	807	540	32	14,254	838
Greater Manchester	9,249	544	455	27	9,704	571
Liverpool city region	4,290	252	179	10	4,469	263
West Yorkshire CA	4,725	278	187	11	4,912	289
Sheffield city region	3,283	193	103	6	3,386	199
North East CA	4,848	285	112	7	4,960	292
East Midlands CA	4,540	267	176	10	4,716	277
West Midlands CA	5,317	313	274	16	5,591	329
West of England CA	3,553	209	146	9	3,699	218
Cambridge & S. Cambridgeshire	856	50	45	3	901	53
Portsmouth	390	23	20	1	410	24
Southampton	99	6	18	1	117	7
Oxford	156	9	11	1	167	10
Cardiff	929	55	29	2	958	56
Glasgow	1,264	74	38	2	1,302	77
Belfast	808	48	45	3	853	50
Area total	61,681	3,628	2,378	141	60,399	3,553

Source: *Development Economics estimates*

- 4.17 In the UK context, London dominates the need for additional development land, with just over 14,250 hectares required over the 2019-2035 period out of a national total of around 60,400 ha.
- 4.18 In London, the need for additional housing land provides the majority of the overall quantum of land required for either residential or employment-hosting development: in London, this proportion is around 96%, but in all areas considered the proportion lies between 91% and 98%.

4.19 It is also relevant to estimate the potential increment to economic output – measured in terms of Gross Value Added (GVA) that would be associated with the accommodation of anticipated future job growth in categories that correspond to the various employment land designation types used here.

4.20 The approach taken to this task was as follows:

- Various Office for National Statistics (ONS) datasets were referenced to determine regional average levels of GVA per employee job in each of the sectors relevant to each land use type. The datasets used were the ONS Business Register and Employment Survey and the ONS Annual Business Survey.
- Relevant regional averages were used in the assessment. For example, for Cambridge regional estimates for employment by sector and aggregate GVA by sector were obtained for the East of England region.
- Estimates were initially generated in terms of 2019 prices. Then, an adjustment was made for potential future productivity increases over the period to 2035 using regional trend data sourced from regional Output per Job by Industry statistics produced by the ONS for the 2012-2019 period.

4.21 Based on assumptions derived from the data sources mentioned above, the value of potential future annual levels of GVA that would be expected to be delivered on brownfield land in each area by year 2035 are set out below.

Table 4-4: Additional annual GVA associated with employment growth by 2035 (£millions, 2019 prices)

Area	B1 land	B2 land	B8 land	Total of B1, B2, B8 land
London	132,978	4,254	8,264	145,497
Greater Manchester	7,412	1,517	1,174	10,103
Liverpool city region	2,153	634	473	3,259
West Yorkshire CA	2,608	663	377	3,649
Sheffield city region	959	416	206	1,581
North East CA	1,222	613	191	2,026
East Midlands CA	1,941	739	263	2,943
West Midlands CA	4,295	1,028	534	5,857
West of England CA	2,355	475	265	3,095
Cambridge & S. Cambridgeshire	1,299	227	47	1,573
Portsmouth	430	100	57	588
Southampton	375	37	85	497
Oxford	376	40	32	448
Cardiff	645	105	42	792
Glasgow	1,025	135	85	1,245
Belfast	984	458	267	1,710
Area total	161,058	11,442	12,363	184,862

Source: Development Economics estimates

4.22 Across all urban areas the overall total amount of GVA associated with the development of brownfield land for employment uses could be expected to generate additional direct GVA worth around £185 billion per annum by 2035. This figure excludes additional upstream and downstream effects associated with domestic supply chains and income multipliers. Of this total:

- 87% is associated with business activities associated with office-based activities

- 79% would be expected to occur in workplaces located in the London region.⁴

Scale of current and future previously developed land in each area

- 4.23 Having established the potential scale of future demand for development land, the next step is to arrive at estimates for the potential scale of the regeneration land resource in each study area. This is defined as land that has been previously developed but is capable of development for housing or employment purposes.
- 4.24 In addition, it is also necessary to make assumptions about the scale of potential additional previously developed land that is likely to become available for redevelopment for residential or employment purposes over the 2019-2035 period.
- 4.25 In order to assess the current stock of developable brownfield land and future arisings, a review was undertaken of local information and data sources. This included local authority brownfield land registers providing estimates of previously developed land. The review also gathered available information on the likely development capacity of this land, and any information that was available on the average local rate of new previously developed land becoming available for redevelopment for housing or mixed use development. Local information was also gathered on the proportion of previously developed land available for redevelopment that is in public or mixed ownership.
- 4.26 The table below presents summary estimates of the current scale of previously developed land (PDL) resource that is considered realistically available for redevelopment between 2019 and 2035. The table also provides an estimate of the additional developable PDL that could arise over the period to 2035, and the overall scale of the resource that would be potentially available if the new arisings appear as per the estimates presented here.

Table 4-5: Current and expected future previously developed land available for redevelopment, 2019-2035

Area	PDL currently available for redevelopment (ha)	Potential future arisings to 2035 (ha)	Potential PDL resource 2019-2035 (ha)
London	2,653	106	2,759
Greater Manchester	1,467	103	1,571
Liverpool city region	628	44	673
West Yorkshire CA	1,043	78	1,121
Sheffield city region	708	53	760
North East CA	1,246	100	1,346
East Midlands CA	1,226	74	1,300
West Midlands CA	1,624	114	1,738
West of England CA	539	27	565
Cambridge & S. Cambridgeshire	838	17	854
Portsmouth	140	14	154
Southampton	72	4	76
Oxford	144	6	150
Cardiff	150	15	165
Glasgow	848	68	916
Belfast	324	45	369
Area total	13,649	867	14,516

Source: *Development Economics estimates*

⁴ The high share of GVA occurring in London reflects in part the influence of an above-average proportion of companies that operate from headquarters located in the capital.

- 4.27 For example, in London there is estimated to be currently just over 2,650 hectares of previously developed land that is suitable and likely to be available for redevelopment over the period to 2035. In addition, a further 106 ha net could arise over the period to 2035.

Implications

- 4.28 The UK is facing large-scale and sustained pressures to house a growing population. Much of the pressure for development is concentrated in larger urban areas such as London, Manchester, Birmingham, Leeds, and Glasgow. There is also additional pressure for development land to support the need for employment growth in offices, factories and workshops, and logistics facilities.
- 4.29 In recent decades there has been growing pressure for policy-makers and the development industry for a greater proportion of future development needs to be met by recycling and intensifying development occurring on unused (or under-utilised land) that has been previously developed. However, there remains a large volume of land of this type that has yet to be developed and, of course, each year there are new arisings of land that become available for re-use.
- 4.30 Even in London – which has seen the most intensive pressure for development in the UK – there is expected to be around 2,750 hectares of previously developed land available for redevelopment for housing and employment purposes over the period to 2035.
- 4.31 The purpose of the remainder of this report is to identify the scale of housing and workspace development that could be accommodated on the land that is available in the large urban areas. The scale of potential development depends, however, on assumptions about the intensity of development on the available land. Because of that, several alternative scenarios are introduced that are based on successively more ambitious assumptions regarding the intensity of development on previously developed land, particularly with respect to housing schemes.

5: Development scenarios

Introduction

- 5.1 This chapter introduces several future development scenarios focusing on the development potential of the previously developed land resource in major urban areas included in this study. The scenarios focus on previously developed land that is suitable for redevelopment for housing development and explore alternative assumptions for the density of housing development. The emphasis on housing land is justified because future housing land need is expected to account for at least 90% of future land need in the urban areas included in this study.
- 5.2 The scenarios introduced in this chapter are predicated on assumptions that have varying degrees of ambition.
- Scenario 1 is a reference case scenario that assumes the continuation of existing levels of housing density for housing in each local authority area. That is, Scenario 1 is a ‘business as usual’ scenario that assumes that current residential development densities continue to be reflected in new developments over the remainder of the 2019-2025 period.
 - Scenario 2 is a more aspirational scenario, where average rates of development density in local authority areas included in the study are increased to match the highest rates achieved in comparable urban areas in the same region (if available), otherwise the average density is increased by 10% compared to levels assumed in Scenario 1.
 - Scenario 3 is more stretching still. Under this Scenario, development densities across all urban areas are increased in line with the Government’s proposed uplift in housing targets across England’s 20 largest cities and urban areas announced in December 2020. However, in some larger cities – including London – development densities are increased further, with densities used reflecting strategic aspirations revealed in planning strategy documents published by the Greater London Authority and others.
- 5.3 The reference case scenario (Scenario 1) is based upon the current estimated residential development density within each individual local authority area included in the sub-regional areas covered by the study. The quantum of housing development that is capable of being delivered by 2035 is based on current average development densities as evidenced by central government datasets.⁵ Average density rates under Scenario 1 therefore reflect the current situation rather than future aspirations.
- 5.4 Demand for employment land and the development density for employment land is assumed to be the same in each scenario. The approach taken is to assume that demand for employment land is satisfied by the availability of previously developed land in each urban area. The residual previously developed land is then used to satisfy in part demand for housing land in the same urban area.

⁵ Source: DHLUC Land Use Change Statistics, Live Table 331: data accessed 31st July 2023

Housing land development assumptions

- 5.5 The table below summarises the average residential development density assumed to be achieved under each scenario across each of the urban areas included in the study.

Table 5-1: Average housing development densities used in each scenario (dwellings per hectare)

Area	Scenario 1	Scenario 2	Scenario 3
London Inner	121	136	231
London Outer	52	103	138
Greater Manchester	43	82	113
Liverpool city region	40	66	93
West Yorkshire CA	35	125	156
Sheffield city region	32	77	98
North East CA	31	70	76
East Midlands CA	35	68	92
West Midlands CA	36	99	118
West of England CA	36	109	117
Cambridge & S. Cambridgeshire	38	49	50
Portsmouth	66	73	100
Southampton	48	53	100
Oxford	43	50	55
Cardiff	37	50	100
Glasgow	37	50	55
Belfast	37	50	80

Source: *Development Economics assumptions*

- 5.6 Assumptions with respect to the current quantum of previously developed land and expected future arising of such land are the same across all three scenarios.

Employment land development assumptions

- 5.7 Estimation of expected future development potential for workspace requires assumptions about the average development density of land and the efficiency of workspace occupation. The table below sets out the assumptions regarding the average amount of workspace per hectare of office development for each of the three scenarios.

Table 5-2: Employment land use assumptions (sqm per hectare): offices

Area or sub-area	Scenario 1	Scenario 2	Scenario 3
Central London (CAZ)	77,000	84,700	96,250
Elsewhere in Inner London	36,000	39,600	43,200
Outer London	25,000	26,900	28,000
City centres of major regional cities (e.g., Manchester, Birmingham, Leeds, Glasgow)	25,000	26,800	28,200
Other areas included in the study	10,700	11,500	12,000

Source: *Development Economics assumptions*

- 5.8 For other types of floorspace, assumptions development densities are generally the same for each scenario. The specific assumption made is that for industrial and logistics development an average of 6,500 sqm per hectares of floorspace could be developed per hectare, except in core urban areas (such as Inner London, central Manchester, central Birmingham, etc.) where it is assumed that between 13,000 sqm and 27,000 sqm per hectare could be developed.

5.9 Assumptions with respect to the average level of floorspace occupancy for each type of development are as follows:

- Office development: 12 sqm per FTE worker, except in Central London where it is assumed that 10 sqm per worker is achieved
- Industrial development (including light industry workshops): 36 sqm per worker
- Logistics development: 77 sqm per worker, except in London where it is assumed that the average density is 47 sqm per worker.

Scenario 1 results

5.10 The table below sets out the estimated results of the first Scenario. The table sets out results for development achieved on all previously developed land (PDL) as well as the proportion of this brought forward on land that is publicly owned under Scenario 1.

Table 5-3: Scenario 1: Housing accommodated on previously developed land, 2019-2035

Area	PDL developed for Employment by 2035 (Ha)	Jobs accommodated on PDL land by 2035 ('000s)	PDL developed for Housing by 2035 (Ha)	Housing units developed on PDL by 2035 ('000s)	Proportion of 2019-2035 housing requirement met on PDL land (%)
London Inner	104	468.1	803	89.5	28.3%
London Outer	436	96.0	1,416	74.5	11.9%
London Total	540	564.1	2,219	164.0	17.4%
Greater Manchester	455	145.6	1,116	53.2	17.7%
Liverpool CR	179	47.3	494	19.1	13.3%
West Yorkshire CA	187	59.7	934	33.9	21.7%
Sheffield CR	107	26.2	653	22.6	10.7%
North East CA	112	31.7	1,234	37.6	26.7%
East Midlands CA	176	50.5	1,124	33.6	18.9%
West Midlands CA	274	87.9	1,464	55.4	21.7%
West of England CA	146	48.1	419	13.9	10.7%
Cambridge area	45	21.2	809	18.8	57.1%
Portsmouth	20	6.0	134	8.8	54.5%
Southampton	18	4.9	58	2.8	21.7%
Oxford	11	4.3	139	6.0	75.4%
Cardiff	29	13.0	136	5.0	14.7%
Glasgow	38	18.7	878	32.0	59.8%
Belfast	45	13.6	324	11.8	40.2%
Area total	2,382	1,142.9	12,134	518.6	21.1%

Source: Development Economics estimates

5.11 A total of 2,382 hectares of employment land could be developed in the urban areas selected for this study. Based on the expected split of employment land developed for offices, factories and workshops, and logistics facilities in each area and the respective development densities assumed to occur in each area, the development of brownfield land across the areas could support over 1.14 million jobs by 2035.

5.12 In addition, based on conservative assumptions regarding capacity for development on current and expected future arisings of previously used land suitable for development, for Scenario 1 it is estimated that a total of over 518,000 dwellings could be built on previously developed land across the various UK urban areas included in the study. This quantum of development would contribute just over 21% of the overall expected housing need arising in these areas by 2035.

- In London, under Scenario 1 it is estimated that 164,000 dwellings could be developed on previously developed land. This would amount to over 17% of the capital's anticipated requirement over the 2019-2035 period. In addition, over 564,000 jobs could be hosted on redeveloped land in the capital over the same period.
- In Greater Manchester, over 145,000 jobs could be hosted on brownfield land as well as over 53,000 dwellings provided.
- In the West Midlands CA area, in addition to nearly 88,000 jobs a total of around 55,000 dwellings could be accommodated on PDL sites. This would meet around 22% of the area's anticipated need for housing by 2035.
- In a number of areas – such as Oxford, Cambridge, and Glasgow – it is anticipated that under conservative Scenario 1 assumptions at least 50% of future housing need up to 2035 could be accommodated on previously developed land.

Scenario 2 results

5.13 Whereas the first scenario is based on a continuation of recent development densities on previously developed land, the second scenario is predicated on a more intensive use of the same previously land resource. The development assumptions built into Scenario 2, therefore, represent a more aspirational scenario in terms of the efficient use of the brownfield land resource compared to what has been achieved in some local authority areas in recent years. Essentially, in Scenario 2 average rates of development density in local areas are increased to match the highest rates achieved in comparable urban areas in the same region (if available), otherwise the average density is increased by 10% compared to levels assumed in Scenario 1

5.14 The table below sets out the anticipated results for development achieved on all previously developed land (PDL) under Scenario 2.

Table 5-4: Scenario 2: Housing accommodated on previously developed land, 2019-2035

Area	PDL developed for Employment by 2035 (Ha)	Jobs accommodated on PDL land by 2035 ('000s)	PDL developed for Housing by 2035 (Ha)	Housing units developed on PDL by 2035 ('000s)	Proportion of 2019-2035 housing requirement met on PDL land (%)
London Inner	104	468.1	665	101.1	32.0%
London Outer	436	96.0	1,554	148.7	23.7%
London Total	540	564.1	2,219	249.8	26.5%
Greater Manchester	455	145.6	1,116	101.2	33.6%
Liverpool CR	179	47.3	494	28.2	19.6%
West Yorkshire CA	187	59.7	934	101.5	64.8%
Sheffield CR	107	26.2	653	57.9	27.1%
North East CA	112	31.7	1,234	83.2	59.0%
East Midlands CA	176	50.5	1,124	89.8	50.6%
West Midlands CA	274	87.9	1,464	160.6	64.8%
West of England CA	146	48.1	419	35.3	27.1%
Cambridge area	45	21.2	809	32.5	98.4%
Portsmouth	20	6.0	134	9.8	60.3%
Southampton	18	4.9	58	3.1	24.0%
Oxford	11	4.3	139	6.9	87.7%
Cardiff	29	13.0	136	6.8	20.1%
Glasgow	38	18.7	878	43.9	81.9%
Belfast	45	13.6	324	16.2	55.1%
Area total	2,382	1,142.9	12,134	1,026.7	41.7%

Source: *Development Economics estimates*

- 5.15 As with Scenario 1, the second scenario assumes that 2,382 hectares of brownfield land is used for the purpose of meeting employment land need. This land is also assumed to host over 1.14 million jobs by 2035.
- 5.16 Under Scenario 2 assumptions it is estimated that a total of around 1.027 million dwellings could be built on the current and expected future previously developed land resource, amounting to nearly 42% of the overall expected housing need arising in the urban areas included in the study by 2035. Examples of development that could be accommodated on PDL in major urban areas include the following:
- In the London region it would be expected that nearly 250,000 dwellings could be developed on previously developed land, which is over 26% of the expected arising need.
 - In the West Midlands CA area, over 160,000 dwellings could be built, which would be around 65% of expected housing need up to 2035.
 - In Greater Manchester, around 101,000 dwellings could be built, which would be around one-third of the expected arising by year 2035.

Scenario 3 results

- 5.17 The third scenario is based on a stretching set of assumptions regarding future residential development densities on previously developed land. Compared to the average density rates assumed for Scenario 2, in some cases it will be possible to achieve even greater densities of development: for example, by including a greater proportion of apartments, reducing average unit size, or by increasing the height of apartment schemes.
- 5.18 Many high quality examples of the types of scheme envisaged for Scenario 3 already exist. For example, Landsec's recently consented O2 masterplan in Camden has a development density of 300 homes per hectare, while still providing 50% public realm. Berkeley's Grand Union scheme is delivering 376 units per hectare, also while providing 50% public realm as well as re-providing 260,000 sqft of industrial space. Similarly British Land's Canada Water Masterplan will deliver a development density of up to 200 homes per hectare, alongside a significant amount of new commercial space, a new town centre, park, and public realm.
- 5.19 The table below sets out the estimated outcomes for the third, most ambitious development Scenario.

Table 5-5: Scenario 3: Housing accommodated on previously developed land, 2019-2035

Area	PDL developed for Employment by 2035 (Ha)	Jobs accommodated on PDL land by 2035 ('000s)	PDL developed for Housing by 2035 (Ha)	Housing units developed on PDL by 2035 ('000s)	Proportion of 2019-2035 housing requirement met on PDL land (%)
London Inner	104	468.1	665	160.9	50.9%
London Outer	436	96.0	1,554	197.3	31.4%
London Total	540	564.1	2,219	358.1	38.0%
Greater Manchester	455	145.6	1,116	137.1	45.6%
Liverpool CR	179	47.3	494	38.0	26.4%
West Yorkshire CA	187	59.7	934	153.7	98.2%
Sheffield CR	107	26.2	653	73.8	32.0%
North East CA	112	31.7	1,234	86.6	61.4%
East Midlands CA	176	50.5	1,124	97.3	54.9%
West Midlands CA	274	87.9	1,464	199.3	98.2%
West of England CA	146	48.1	419	41.8	32.0%
Cambridge area	45	21.2	809	32.5	98.4%
Portsmouth	20	6.0	134	13.4	82.6%
Southampton	18	4.9	58	5.8	45.3%
Oxford	11	4.3	139	7.6	96.5%
Cardiff	29	13.0	136	13.6	40.3%
Glasgow	38	18.7	878	48.3	90.1%
Belfast	45	13.6	324	25.9	88.1%
Area total	2,382	1,142.9	12,134	1,332.9	54.2%

Source: *Development Economics estimates*

- 5.20 As per Scenarios 1 and 2, the third scenario assumes that 2,382 hectares of brownfield land is used for the purpose of meeting employment land need. This land is assumed to host over 1.14 million jobs by 2035.

5.21 However, based on the stretching ambition assumptions regarding capacity for development that are used in Scenario 3, it is estimated that a total of over 1.33 million dwellings could be built. This amount of development would provide around 54% of the anticipated housing need arising in these urban areas by 2035.

5.22 With respect to the scale of development that could be enabled on brownfield land in urban areas under the more ambitious scenario:

- in London it is estimated that around 358,000 dwellings could be provided on PDL sites by 2035, equivalent to 38% of the housing need expected to be arise by 2035.
- In the West Midlands CA, around 199,000 dwellings could be provided on such sites, equivalent to 98% of the anticipated housing need.
- In West Yorkshire, nearly 154,000 dwellings could be built, also around 98% of the anticipated need.
- In Manchester, 137,000 dwellings could be built, equivalent to nearly 46% of expected need.

6: Conclusions

- 6.1 The UK faces substantial pressures for additional development land, driven by both demographic change and by economic growth. Much of this growth is likely to occur in major cities and other urban areas, influenced by both underlying population growth but also the needs of businesses and the economy.
- 6.2 In recent decades there has been growing recognition by policymakers of the need for more effective and faster transformation of redundant or under-utilised land in urban areas to accommodate a growing population and workforce. Moreover, in the UK's urban areas there remains a large and under-utilised brownfield land resource. The estimates arrived at in this report indicates there could be around 14,500 hectares of brownfield land currently available for redevelopment located within the 16 urban areas covered by the assessment. This figure includes around 2,650 hectares located in London where the development pressure is the most intense. In addition, the ongoing process of economic change and restructuring means that new sources of brownfield land continue to become available.
- 6.3 The scale of the redevelopment potential offered by the brownfield land resource in urban areas is substantial. With respect to employment land, the development potential offered by the existing and expected future arising stock of brownfield land in the 16 urban areas covered by the assessment could deliver, by 2035:
- Over 1.14 million jobs located on brownfield sites
 - Nearly £185 billion of additional GVA directly – i.e. from business activities occurring on the sites.
- 6.4 Of course, additional economic benefits would also occur off-site as a result of business supply chain activities and income multiplier effects, but these effects have not been included in the estimates presented here.
- 6.5 With respect to housing development on brownfield land, under a moderately aspirational scenario (i.e., Scenario 2) considered in this report, around 1.03 million new homes by 2035 could be built on the current and expected future arising brownfield land resource located in the urban areas covered by this study. The construction of upwards of 1 million homes under this scenario would make a further macroeconomically material GVA contribution, in and of itself. This contribution would be in addition to the new economic activity that then occurs on these reinvigorated sites which is cited above.
- 6.6 However, there is the potential for a more ambitious scenario with greater average housing development densities yielding a more efficient re-use of the anticipated brownfield resource. Under this more aspirational scenario, it is envisaged that around 1.33 million new dwellings could be built on the same area of previously developed land, as well as meeting employment land needs in the same urban areas. For example, around:
- 358,000 dwellings could be built in London on previously developed sites
 - 199,000 dwellings could be built in the West Midlands CA area
 - 154,000 dwellings could be built in the West Yorkshire CA area
-

- 137,000 dwellings could be built in Greater Manchester.
- 6.7 The third development scenario reflects the direction of travel for current Government policy – including the proposed 35% uplift in housing targets in England’s 20 largest cities and urban areas. The housing development that could be delivered under Scenario 3 is very substantial and would go a long way towards meeting the country’s pressing need to deliver more homes for a growing population.
- 6.8 It is worth noting, moreover, that the previously developed land included in this study does not cover residential estate regeneration. All estate regeneration and related densification would therefore provide an additional development opportunity beyond what is captured by this analysis. Small windfall sites are also not included, so there may be further opportunity for brownfield delivery on these sites.
- 6.9 The residential densities used in this report are based on what has already been achieved in local areas and in many cases could be increased further if desired. The decision to do this however would be a political decision to be taken locally on a case by case basis. Of course, the increase in development density assumed in Scenario 3 may not be appropriate or desirable in every urban setting considered – so it will be for local authorities and developers to define the most appropriate balance of land uses and densities in each location to meet their needs.
- 6.10 It is accepted that greenfield development will continue to form part of a successful national housing policy – because although the opportunity presented by brownfield urban regeneration is large, it cannot solve the housing crisis on its own. The extent to which greenfield or Greenbelt land is required will, however, be influenced by the decisions taken on how far local authorities and communities want to intensify the use of their previously developed land.
- 6.11 As the Scenario figures show, a significant amount of the UK’s future development needs can be delivered through urban regeneration. More land will be required to meet the projected needs in every urban location considered but the political and plan-making process to achieve this is likely to be slow and contested. By contrast, the brownfield urban regeneration opportunity can be realised quickly, and with the potential to significantly reduce pressure on what else will be needed to support the UK’s growth ambitions.