Oxfordshire Councils
Growth Needs Assessment:

Executive Summary
Phase 1 Report
Phase 2 Report
Covid Addendum

July 2021

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Oxfordshire Councils

Oxfordshire Growth Needs Assessment

Executive Summary

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Final Report

March 2021

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1 Introduction and Purpose

The Oxfordshire Growth Needs Assessment

The Oxfordshire Councils[1] are working together to prepare the Oxfordshire Plan which will set out a development strategy for Oxfordshire to 2050.

To support the preparation of the Plan, the Oxfordshire Councils have commissioned Cambridge Econometrics and Iceni Projects to prepare the Oxfordshire Growth Needs Assessment (OGNA). The OGNA is intended to provide an integrated evidence base to help the Oxfordshire Councils identify the appropriate level and distributions of housing and employment over the period to 2050. The core objectives of the OGNA are:

- To identify a strategic level, long-term, robust and transparent methodology for assessing Oxfordshire's housing needs over the period to 2050
- To provide a detailed commentary (including the baseline position) on Oxfordshire's housing and employment market, including demographic and economic dynamics and any other key drivers of housing need and how this may change in the period to 2050.
- To identify a range of credible and robust housing need scenarios for Oxfordshire.
- To establish an informed understanding of the implications for sustainable housing growth in Oxfordshire, of the Oxford-Cambridge Arc and of any other strategically significant infrastructure and growth strategies, including proposals for strategic growth in other areas which are likely to have a significant impact in Oxfordshire.
- To identify an appropriate functional economic market area and provide an assessment of employment land requirements.
- To advise on how the Oxfordshire Plan should respond to the uncertainty associated with long-term planning for strategic housing and employment provision.

The methodology adopted, which considers scenarios for future growth in Oxfordshire, responds to this and in particular the strategic and long-term nature of the Oxfordshire Plan.

Context and nature of the Assessment

The Oxfordshire Plan will be a joint statutory spatial plan which covers a 30-year plan period from 2020 to 2050. The Plan is intended to be strategic, focusing on matters such as an overall spatial strategy for development, the integration of new development and investment in infrastructure, and how these can help to improve the quality of life for everyone.

[1] The commissioning authorities comprise Cherwell District Council, Oxford City Council, South Oxfordshire District Council, Vale of White Horse District Council and West Oxfordshire District Council.

The Plan differs from those being prepared in many other areas across England, in particular:

- The Oxfordshire Plan is a strategic plan which is being prepared on a cross-boundary basis spanning the county of Oxfordshire;
- It is looking at a much longer timeframe – a 30-year period to 2050 - than many Local Plans which typically look 15-20 years into the future. This raises issues regarding the reliability of traditional approaches to assessing development needs in some instances;
- It considers the inter-relationship between the economy and spatial planning activities;
- Oxfordshire falls within the Oxford-Milton-Keynes-Cambridge Arc which has been identified by the National Infrastructure Commission and supported by Government. There is a need for the Oxfordshire Plan to consider the strategic context provided by this, including the emerging spatial framework for the Arc, along with other Government growth initiatives and policy. Preparation of the Oxfordshire Plan also provides the opportunity to influence the Arc and shape the future strategy for this strategic corridor.

In addition, one of the major advantages of looking long-term and strategically at the strategy for development and growth is the ability to properly coordinate new development and infrastructure investment and consider what strategic infrastructure might be needed to support growth in the long-term.

These particular circumstances provide a background to the OGNA to which the Assessment seeks to respond.

This report

To ensure the preparation and analysis of an integrated evidence base that effectively addresses the core objectives of the OGNA, the Assessment has been divided into three complementary reports, broadly corresponding to three phases of work, starting with:

- **The Phase 1 Report**, which addresses housing need, economic growth and employment land requirements for Oxfordshire, and appraises the high-level commuting and affordability implications;
- Following on from this, **The Phase 2 Report** defines and characterises the Oxfordshire Functional Economic Market Area, which is used to develop and test scenarios for the distribution of Phase 1 housing need and employment growth *within* Oxfordshire;
- Finally, to reflect the emergence of the Covid-19 pandemic during the development of the OGNA, a **Covid-19 Impacts Addendum** has been produced to sense-check, contextualise, and update the results of the Phase 1 and Phase 2 Reports in light of these developments.

A stand-alone **Executive Summary** report, presented here, has been provided to highlight and bring together the key observations and messages from the three respective reports. The following summary is structured according to these three phases of work, starting with a summary of the *Phase 1 Report*.

2 The Phase 1 Report

Introduction and purpose

The **Phase 1 Report** provides overall growth need figures for housing and employment in Oxfordshire to 2050. It profiles local housing market, demographic, economic and commercial property market dynamics, all within the strategic policy environment.

These factors are then brought together to provide trajectories for future housing and employment land needs, and resultant high-level implications for commuting and affordability.

The following summary highlights and draws out the key findings of the *Phase 1 Report* regarding housing need, economic growth and employment land requirements, and accompanying high-level commuting and affordability implications.

Oxfordshire today

Oxfordshire, like many parts of the greater South East, is characterised by high housing costs and particular affordability pressures. Median house prices have risen from £100,000 to £350,000 in the county over the last 20 years. Whilst current low interest rates mean that mortgage finance is currently relatively cheap, lenders undertake stress testing and the absolute cost of homes to buy means that there are households that need significant savings to be able to buy a home.

Across Oxfordshire the median cost of a home was 10.4 times income in 2019, and Oxford has been ranked as one of the UK's least affordable cities. Influenced by the high cost of homes to buy and rent, there is a very significant need for affordable housing which the OGNA has estimated as being almost 3,200 affordable homes per year across Oxfordshire to 2030.

It is clear that affordability issues are having a real impact not just on young people in Oxfordshire, but also its business community. If left unaddressed this could hold back future economic growth potential. Poor housing affordability can provide a deterrent to young professionals hoping to live and work in Oxfordshire, which affects the ability of businesses to recruit staff to fill positions, including in high-tech and innovative business sectors.

These issues are partly a function of Oxfordshire's economic success. Oxfordshire has been one of the country's fastest growing economies in recent years, and sustained jobs growth of around 6,000 per year over the 2010-18 period. It has notable strengths in research-intensive activities including media and technology, science and healthcare, and public services. Whilst employment growth has been strong, productivity improvements have however stalled in recent years. The ability of companies to recruit and retain skilled staff is one component of this.

The evidence suggests that whilst rates of housing delivery have been rising, jobs growth over the 2010-18 period outpaced growth in housing and labour supply in Oxfordshire. Between 2011-18 the working-age population age 16-64 increased by just 1% (7,800 persons). A supply-demand imbalance for housing has resulted, contributing to both house price growth and growth in net in-commuting into Oxfordshire.

The minimum local housing need

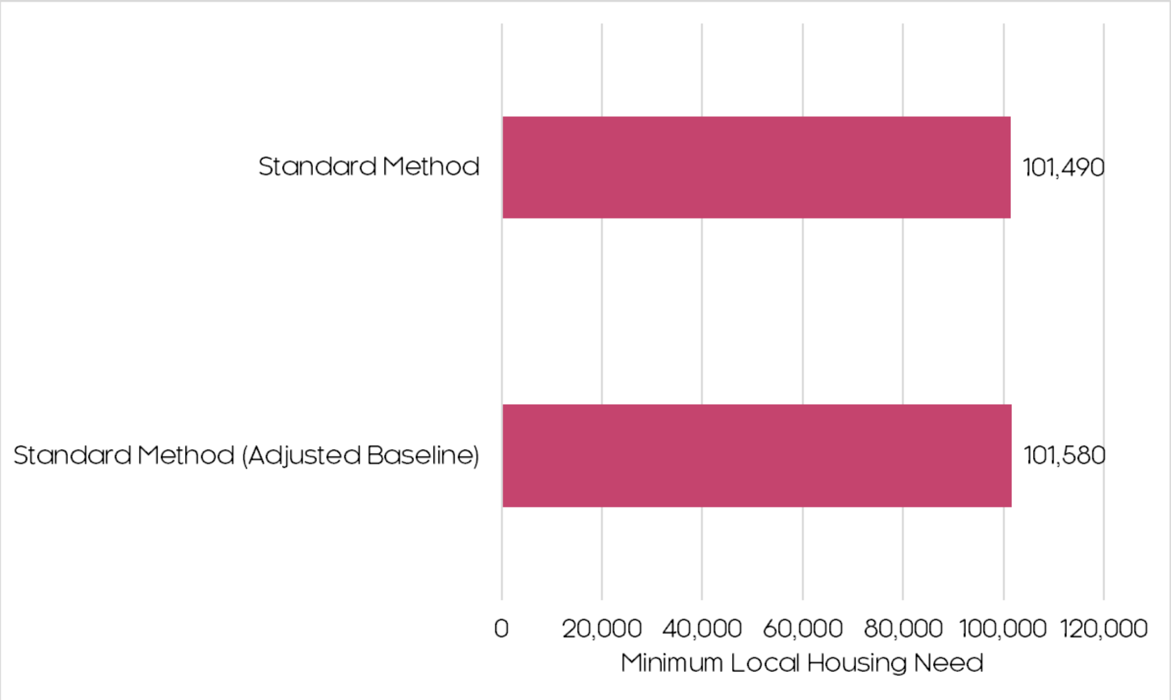
Government's National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG) sets out a *"Standard Method"* for calculating the minimum local housing need taking projected household growth and then applying an upward adjustment to improve affordability based on the median house price-to-income ratio.

The Standard Method calculation, following the Planning Practice Guidance at the time of preparation of the OGNA, indicated a minimum local housing need for Oxfordshire of 3,383 dwellings per annum which would equate to a baseline level of provision of 101,490 homes over the 2020-50 plan period. This is based on 2014-based Household Projections.

The review of demographic data undertaken as part of the OGNA indicates that it is likely that Oxford's population has been under-estimated. To address these issues, revised demographic projections have been developed to provide a revised baseline assessment of the demographic need for housing informed by past population trends.

With appropriate assumptions on household formation, the revised demographic projections presented in the OGNA result in a marginally higher need for 3,386 dwellings per annum equivalent to 101,580 homes over the plan period (as shown in Figure 2.1 below).

Figure 2.1: Standard Method minimum local housing need for Oxfordshire, and with an adjusted demographic baseline, 2020-50



Source: Justin Gardner Consulting, Iceni Projects.

This level of housing provision would support population growth of 25.4% across Oxfordshire over the 30-year plan period (equivalent to an additional 183,000 persons).

The Standard Method local housing need changes over time, and the latest data for 2021 (analysis of this revision is appended to the *Phase 1 Report*) shows a slightly lower need for 3,358 dwellings per annum (using the 2014-based Household Projections) and 3,291 dwellings per annum (using the adjusted projections). The latter would equate to a need for 98,730 homes over the period to 2050.

Oxfordshire's economic trajectories

Government policy sets out that the conditions where other growth levels should be considered, and which are relevant to the preparation of the Oxfordshire Plan. Extensive evidence considered as part of the OGNA in particular demonstrates an important inter-relationship between economic performance and growth potential and housing need.

Resultantly, the OGNA has modelled three alternative economic trajectories to 2050 to consider potential housing and employment land need:

- **Standard Method (adjusted) trajectory:** backwards calculated from the Standard Method calculation of housing need, with an adjustment for the revised demographic baseline.
- **Business as usual trajectory:** this trajectory represents a continuation of Oxfordshire's recent (pre-Covid) economic performance, taking particular account of the robust growth delivered during the recovery from the 2008-09 recession.
- **Transformational trajectory:** this trajectory is broadly the equivalent of the Oxfordshire Local Industrial Strategy's (LIS) aspirational *"go for growth"* scenario, but updated and adjusted to 2020.

All of the trajectories have a baseline of 2018, the latest available year of data at the time of writing.

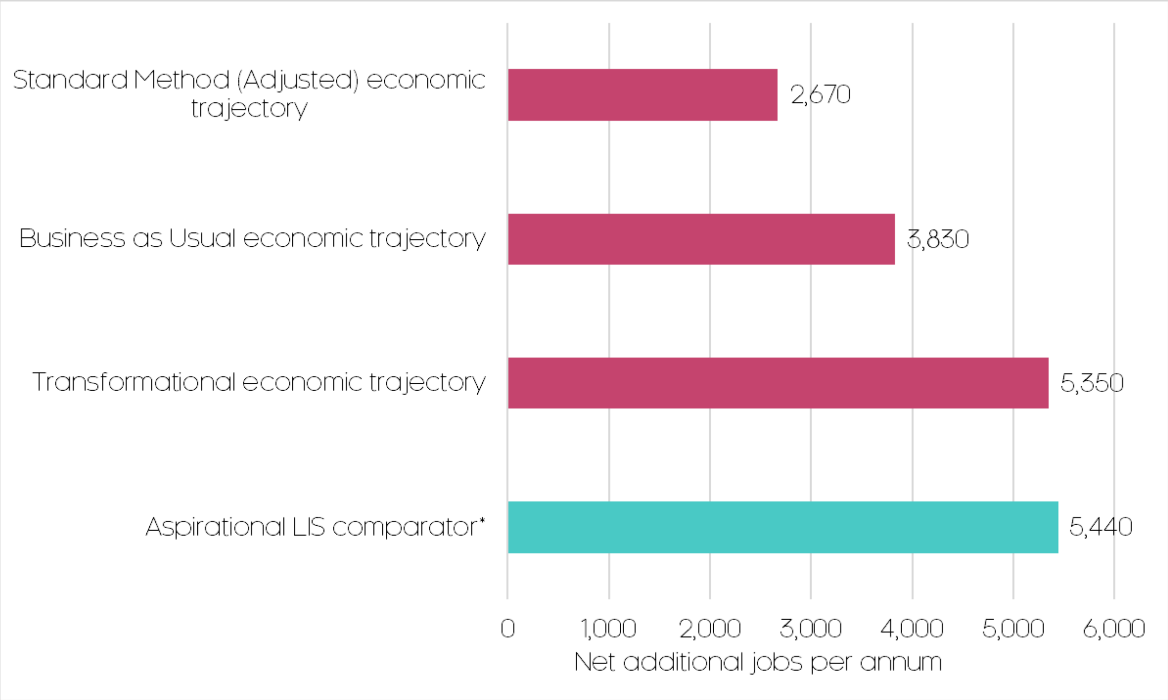
From this baseline, the Standard Method (adjusted) trajectory shows 85,400 additional jobs in Oxfordshire by 2050, modelling the level of economic activity that could be expected to be supported by delivery of housing in line with the Standard Method calculations (using the adjusted baseline demographic assumptions).

The business as usual projection models a continuation of Oxfordshire's recent (pre-Covid) robust growth. This shows 122,500 additional jobs in Oxfordshire over the period to 2050. At this pace of growth, Oxfordshire is expected to have continued along its recent growth trajectory, and achieved some its LIS-related ambitions.

The highest scenario, the transformational trajectory, models the equivalent of delivering many of the aspirations set out in the Oxfordshire LIS, and results in 171,200 additional jobs in Oxfordshire over the period to 2050. The Oxfordshire LIS sets out an ambitious vision for Oxfordshire to be one of the top three global innovation systems by 2040.

The results of the three economic trajectories, shown in terms of additional jobs per annum, are presented in Table 2.1 and Figure 2.2 below (the latter of which includes the Oxfordshire LIS' jobs aspiration as a comparator, shaded in turquoise). They present alternative assumptions of how Oxfordshire's economy might perform.It's per annum not gros

Figure 2.2: Employment (jobs) trajectories for Oxfordshire, 2018-50



Source: Cambridge Econometrics, PwC. Note: * LIS comparator corresponds to 2017-40 only.

Table 2.1: Employment (jobs) trajectories for Oxfordshire

	Employment (jobs) at 2018 (baseline)	2030	2040	2050	Net additional employment (jobs), 2018-50	Net additional employment (jobs) p.a., 2018-50
Standard Method (adjusted) economic trajectory	410,066	434,538	464,179	495,555	85,489	**2,672**
Business as usual economic trajectory	410,066	451,742	490,234	532,517	122,451	**3,827**
Transformational economic trajectory	410,066	466,804	520,636	581,254	171,188	**5,350**

Source: ONS, Cambridge Econometrics. p.a. = per annum.

Despite the application of a robust methodology and evidence base, there are clearly uncertainties associated with predicting the future economic performance of a local area, which heightens as the forecasts look further into the future.

However, the growth trajectories considered are reasonable parameters for growth when set against Oxfordshire's historic economic performance and employment growth trends over previous economic cycles, with Oxfordshire displaying particularly robust growth over the most recent economic cycle.

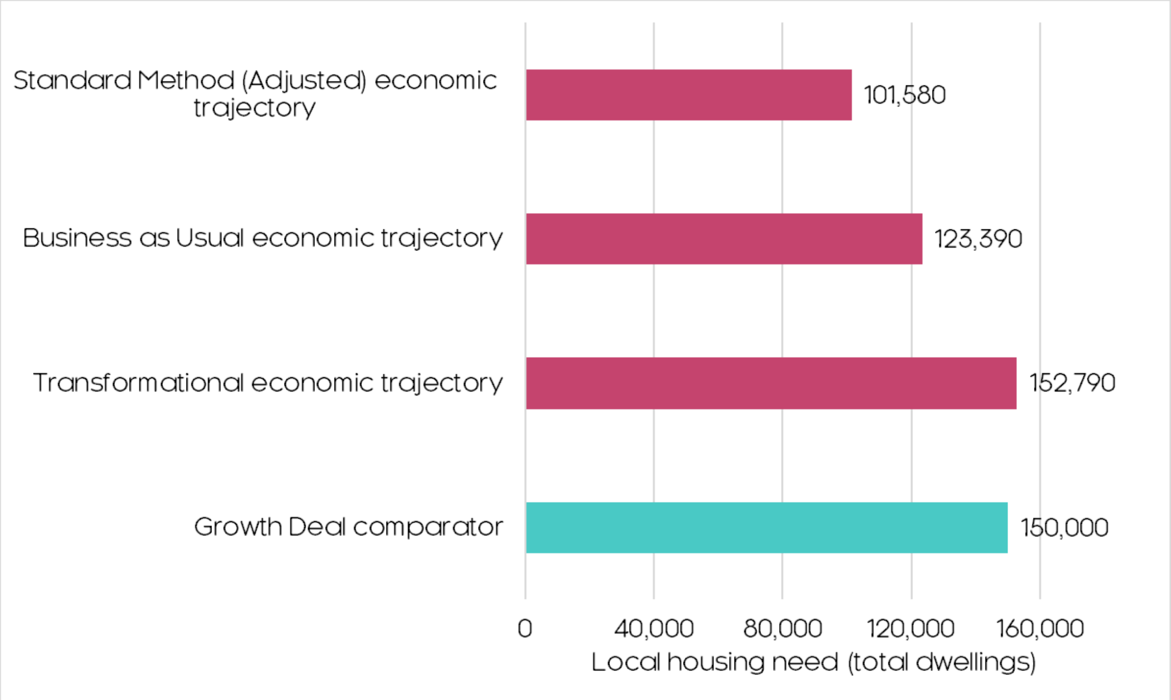
Building on this analysis, the OGNA has proceeded to model what level of housing provision might be needed to accommodate these levels of growth, taking into account factors such as the changes in the age structure of the population and the proportion of people of different ages in work.

The results of the housing need accompanying the economic trajectories are shown in Table 2.2 and Figure 2.3 below (the latter of which includes the Oxfordshire Housing and Growth Deal housing aspiration as a comparator, shaded in turquoise. The Deal provides funding for affordable housing and infrastructure improvements to support the ambition of building 100,000 homes between 2011-31 to address the county's severe housing shortage and support economic growth).

The analysis shows that to meet the Standard Method (adjusted) level of need over 2020-50, Oxfordshire would require around 3,400 dwellings each year; with the business as usual level of growth this increases to 4,100 dwellings per annum, with a transformational figure approaching 5,100 dwellings per annum, dependent on the realisation of LIS-related ambitions.

These figures can be compared with the Standard Method housing need (unadjusted, across the whole of Oxfordshire) of 3,400 dwellings per annum over the period 2020-50.

Figure 2.3: Projected housing need in Oxfordshire from the economic trajectories, 2020-50



Source: Justin Gardner Consulting, Iceni Projects. Note: the Oxfordshire Housing and Growth Deal however only runs to 2031 however, and has been extrapolated using per annum rates of delivery.

Table 2.2: Projected housing need in Oxfordshire from the economic trajectories, 2020-50

	Households at 2020	Households at 2050	Change in households, 2020-50	Change in households p.a., 2020-50	Local housing need (dwellings) p.a., 2020-50
Standard Method (adjusted) economic trajectory	288,999	387,591	98,592	3,286	**3,386**
Business as usual economic trajectory	288,999	408,806	119,807	3,994	**4,113**
Transformational economic trajectory	288,999	437,328	148,329	4,944	**5,093**

Source: ONS, Justin Gardner Consulting, Iceni Projects. p.a. = per annum.

For the purposes of the Oxfordshire Plan, planning for higher levels of housing provision than the Standard Method provides greater potential both to support economic growth and deliver affordable housing; and a greater likelihood of improving the affordability of market housing over the plan period to 2050.

The OGNA does not however recommend one trajectory over another but provides a set of parameters for growth. In determining the appropriate strategy and how much development to plan for, the evidence in the assessment needs to be brought together with broader factors including the capacity to accommodate growth and environmental consequences of different levels of growth.

Employment land provision

There is a healthy market for commercial property in Oxfordshire. Office take-up and availability is generally concentrated in Oxford and southwards along the 'Knowledge Spine', including Milton Park and Harwell Campus. Take-up and availability of industrial floorspace is more spread out across Oxfordshire, with noticeable amounts of speculative developments to the northeast of the county where there is good access to the M40.

It is evident that there are short-term supply constraints in the office market, particularly in the Oxford area and for Grade A space. Many of the area's science and business parks are at capacity. The evidence also points to a healthy market for industrial space.

The OGNA has modelled the implications of the jobs growth arising in each of the employment projections for employment land and floorspace. This has been compared to projections of past employment floorspace completions based on trends over the 2011-18 period.

For the purposes of considering the amount of land to allocate for employment uses, it is sensible to group together Office and Research and Development uses. These types of activities typically take place on business and science parks within Oxfordshire and can also take place in central parts of towns and cities including town and city centres.

Equally it is sensible to group together more general industrial land which can cater for both light and heavy industrial uses (Classes EG(iii) and B2) as well as storage and distribution (Use Class B8) which are less likely to take place in central areas.

Table 2.1 below brings together the results of the labour demand modelling and the projections of gross floorspace completions on this basis. This includes an allowance for replacement of losses and some supply-side flexibility.

Table 2.3: Gross additional employment land needs (total hectares, ha) in Oxfordshire, 2020-50

	Office, R&D and Education need (ha), 2020-50	Industrial, Warehousing & Other need (ha), 2020-50	Total employment land (ha) needed, 2020-50
Standard Method (adjusted) economic trajectory	149	296	**445**
Business as usual economic trajectory	185	369	**555**

Transformational economic trajectory	233	444	**677**
Completions projection	162	645	**807**

Source: Iceni Projects.

For office, R&D and education uses the OGNA concludes that labour demand trajectories provide an appropriate basis for considering the level of employment land provision which should be made within the Oxfordshire Plan. This demonstrates a need for provision of between 149-233 ha of land for these uses to 2050 (depending on the growth trajectory taken forwards).

However, for the broad industrial use category, there is a weaker relationship between jobs and floorspace or land requirements given productivity improvements and demand arising for replacement of older dated stock.

The OGNA therefore considers that greater weight should be afforded to the completions projection scenario for industrial land (which is based on past gross development trends) which suggests a need for almost 650 ha of industrial land for the 30 year plan period.

Overall, the evidence suggests that the scale of employment land needed across Oxfordshire could be up to 807 ha. The precise scale will be influenced by decisions on what growth scenario to take forward in the Plan.

Commuting and affordability implications

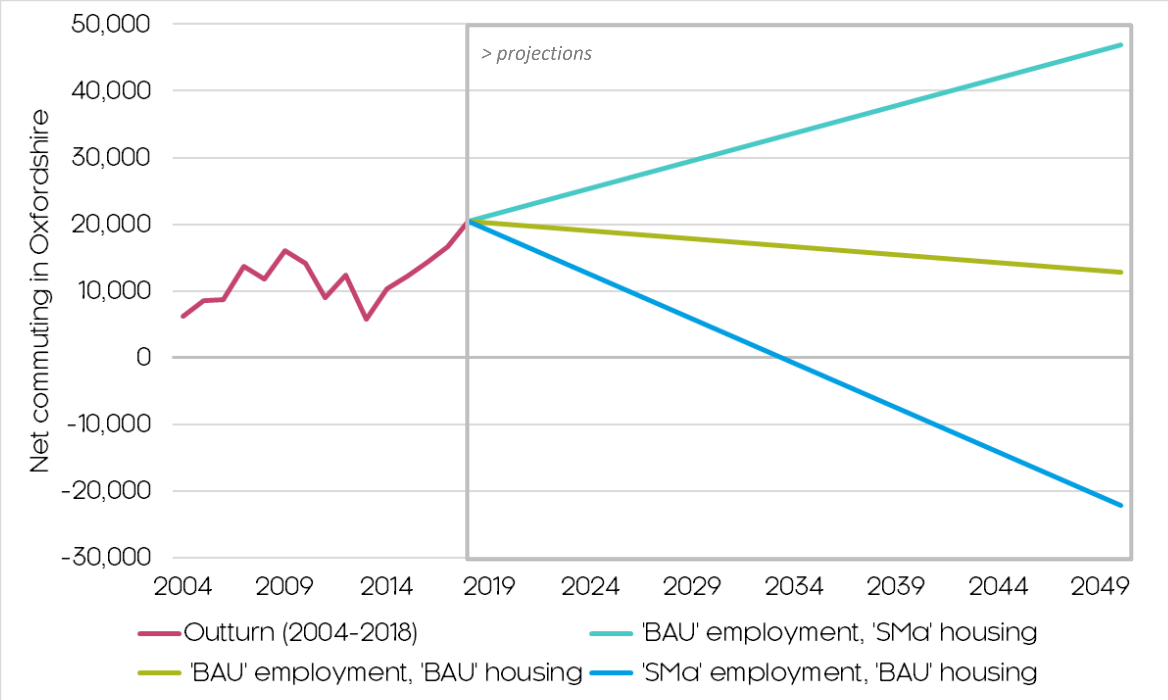
Over the past decade, relative to the supply of housing, employment growth has accelerated in Oxfordshire. This has had implications for both net commuting and housing affordability, which have both increased significantly in the county over this time. OGNA analysis has identified a statistically significant relationship between the balance of housing and employment growth in local areas, and the implications for commuting levels and affordability.

The analysis shows housing delivery above that required to sustain the associated level of employment growth will likely result in a reduction of net commuting and an improvement in housing affordability within Oxfordshire. Yet housing delivery below that required to sustain the associated level of employment growth will likely result in an increase in net commuting and a deterioration in housing affordability.

The intention of the three economic and housing trajectories is to ensure the delivery of employment and housing growth in Oxfordshire will become more aligned. The trajectories address this by incorporating a lowering of the ratio between the number of jobs relative to the number of dwellings in Oxfordshire, demonstrating how a balance of future housing and economic growth can stabilise and lower affordability and commuting pressures.

Such outcomes are increasingly desirable given the high welfare and inequality costs of unaffordable housing, and the growing strain on Oxfordshire's transport network from increased commuting (and associated externalities, notably, environmental and emissions effects, particularly in light of the desire to attain net zero).

Figure 2.4: Current and potential net commuting flows in Oxfordshire

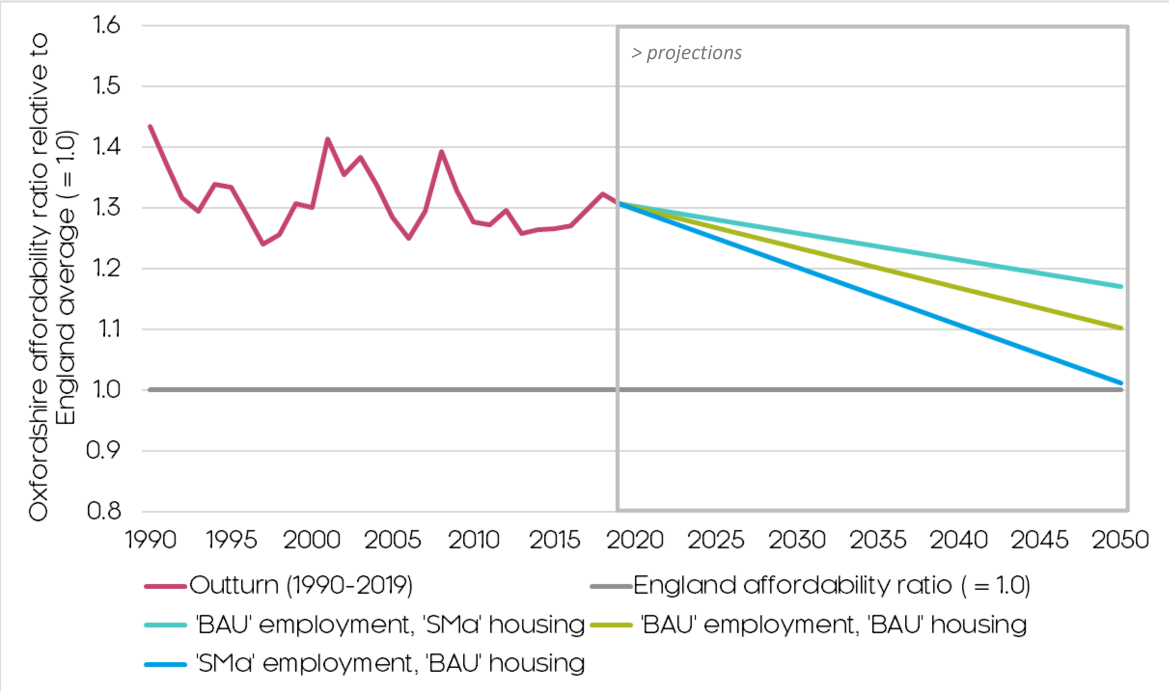


Source: ONS, Cambridge Econometrics.

Figure 2.4 above demonstrates how the balance of future housing and economic growth can impact upon net commuting in Oxfordshire:

- A lower employment growth trajectory relative to higher housing growth (the blue line) could see a reduction in Oxfordshire's net commuting, potentially below historic (pre-1991) levels. This would mean there are more residents than jobs in the county, so residents commute out for work.
- A higher employment growth trajectory relative to lower housing growth (the turquoise line) could see an increase in Oxfordshire's net commuting, above current record-highs. This would mean there are more jobs than residents in the county, so out of county residents commute in for work.
- A similar employment and housing growth trajectory (the green line) would see a steady decline in Oxfordshire's net commuting as it returns to 'normal' levels. The number of jobs is still marginally higher than the number of residents in the county, reflecting Oxfordshire's historically higher commuting ratio.

Figure 2.5: Current and potential house price affordability in Oxfordshire, relative to the England average



Source: ONS, Cambridge Econometrics. Note: a ratio of 1.0 would equate to an affordability ratio exactly the same as the England average.

Figure 2.5 above demonstrates how the balance of future housing and economic growth can impact upon affordability (relative to the England average) in Oxfordshire:

- A lower employment growth trajectory relative to higher housing growth (the blue line) would see a significant reduction in Oxfordshire's affordability ratio relative to the England average. This could result in housing in Oxfordshire being as affordable as elsewhere in the country.
- A higher employment growth trajectory relative to lower housing growth (the turquoise line) would see a steadier reduction in Oxfordshire's affordability ratio relative to the England average. Housing would still be around 1.2x less affordable in Oxfordshire than elsewhere in the country though.
- A similar employment and housing growth trajectory (the green line) would still see a notable reduction in Oxfordshire's affordability ratio relative to the England average. This could result in housing in Oxfordshire being marginally less affordable than elsewhere in the country.

Covid-19 and the Phase 1 Report

The development of the *Phase 1 Report* coincided with the Covid-19 pandemic of 2020 and 2021. It is clear that the pandemic and some of its long-lasting effects have the potential to impact upon the findings of *Phase 1* of the OGNA, not least those relating to commuting trends, and housing and employment land needs. As such additional consideration has been given to this question. This analysis is summarised by the *Covid-19 Impacts Addendum* below.

3 The Phase 2 Report

Introduction and purpose

Following on from the *Phase 1 Report*, the **Phase 2 Report** considers a range of high-level scenarios for the spatial distribution of housing and employment need across Oxfordshire.

The purpose of this is to aid decision-makers in understanding of the implications of alternative spatial choices. It does not seek to identify specific options or priorities for development, but rather explores the potential scale and implications of different approaches.

The following summary highlights and draws out the key findings of the *Phase 2 Report* regarding the definition and characteristics of the Oxfordshire FEMA, the scenarios for the distribution of housing need and employment growth, and their resultant implications for commuting and transport use.

The Oxfordshire Functional Economic Market Area (FEMA)

Figure 3.1: Spatial levels of the Oxfordshire FEMA

Source: Cambridge Econometrics.

Functional Economic Market Areas (FEMAs) are designed to capture the extent and spatial distribution of a local economic market more accurately than administrative boundaries, which rarely reflect the true scale and reach of local economic markets and accompanying economic flows.

The OGNA has sought to identify the extent and characteristics of the Oxfordshire FEMA, to enable a more precise and in-depth exploration of potential spatial distributions of economic growth and housing need in Oxfordshire.

The analysis of several economic, demographic, and social markets and indicators showed that the county of Oxfordshire is a reasonable approximation for the Oxfordshire FEMA, with Oxford at its centre. Further spatial levels ('Zones') have also been identified within the FEMA, each with their own distinct characteristics and economic attributes. Presented in Figure 3.1 above, these include:

- **Oxford City Centre**: the area with the highest concentration of economic activity, as well as central urban amenities, with a strong and growing services-led economy.
- **Oxford City Fringe**: the area surrounding the City Centre, characterised by a high degree of integration with and connectivity to the City Centre, and the presence of important urban fringe sites, such as science parks and large suburb, as well as the undeveloped Green Belt. An area of diverse and fast-growing economic activity.
- **The Knowledge Spine***:* an area of globally-recognised knowledge activity that runs through the centre of the FEMA, largely along the A34 corridor. Straddling the City and Centre and Fringe, it comprises a **Northern** and a **Southern** part. Both areas have seen robust economic and housing growth of late.
- **The Wider County**: areas that remain outside both the Knowledge Spine and City Centre and Fringe. They comprise three roughly equal parts of comparable economic activity and functionality: **County East**, **County West** and **County North**. Pockets of high economic and housing growth can be found within these predominantly rural areas.

As emphasised in the *Phase 2 Report*, these Zones are purely hypothetical, to allow for a better spatial understanding of housing need in relation to economic trends, and they should not be regarded as specific options or priorities for the distribution of development.

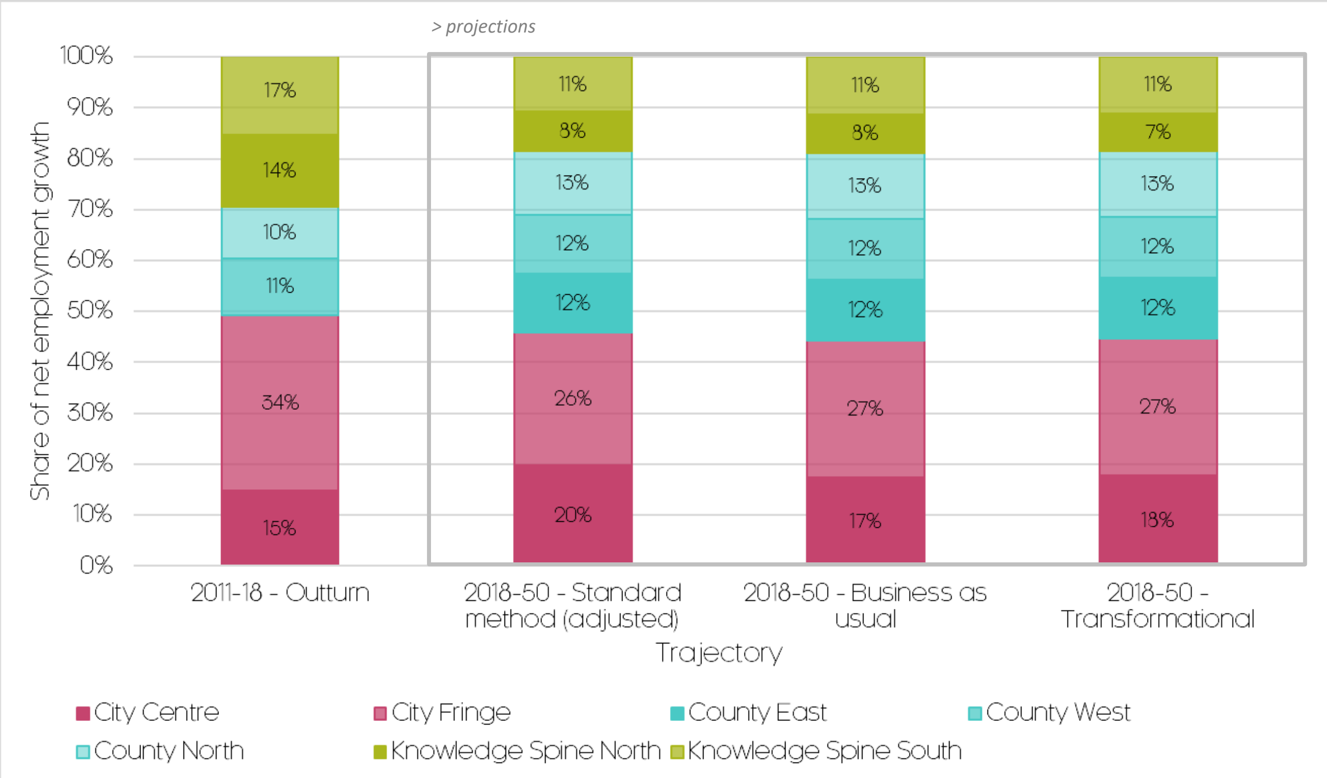
Employment and housing need distributions to 2050

Understanding the potential spatial scale and pattern of employment growth is important for informing, testing and illustrating contrasting distributions for housing need. Drawing on the definition of the Oxfordshire FEMA and its constituent spatial levels ('Zones'), the OGNA has explored the potential spatial distribution of the three Oxfordshire-wide employment trajectories to 2050 (as prepared and presented in the *Phase 1 Report*).

The distributions for employment growth are summarised in Figure 3.2 below. Over the longer timeframe of the *Phase 1* employment trajectories (to 2050), there is the potential for a more spatially balanced growth picture to emerge compared to recent (2011-18) trends.

Central Oxfordshire, encompassing the Knowledge Spine (including Oxford City and Fringe), is expected to remain a significant driver of economic activity, accounting for a potential two-thirds of net additional jobs in the FEMA to 2050.

Figure 3.2: Spatial scenarios for Zonal distribution of additional employment (jobs) growth, 2011-18 and 2018-50



Source: ONS, Cambridge Econometrics. County East excluded from 2011-18 outturn due to negative employment growth. Percentage shares relate to Zones proportion of FEMA-wide jobs growth to 2050.

Having considered the scale and pattern of potential economic growth within the Oxfordshire FEMA, the OGNA proceeds to illustrate a range of spatial distribution scenarios for the FEMA-wide housing need to 2050 (as prepared and presented in the *Phase 1 Report*.)

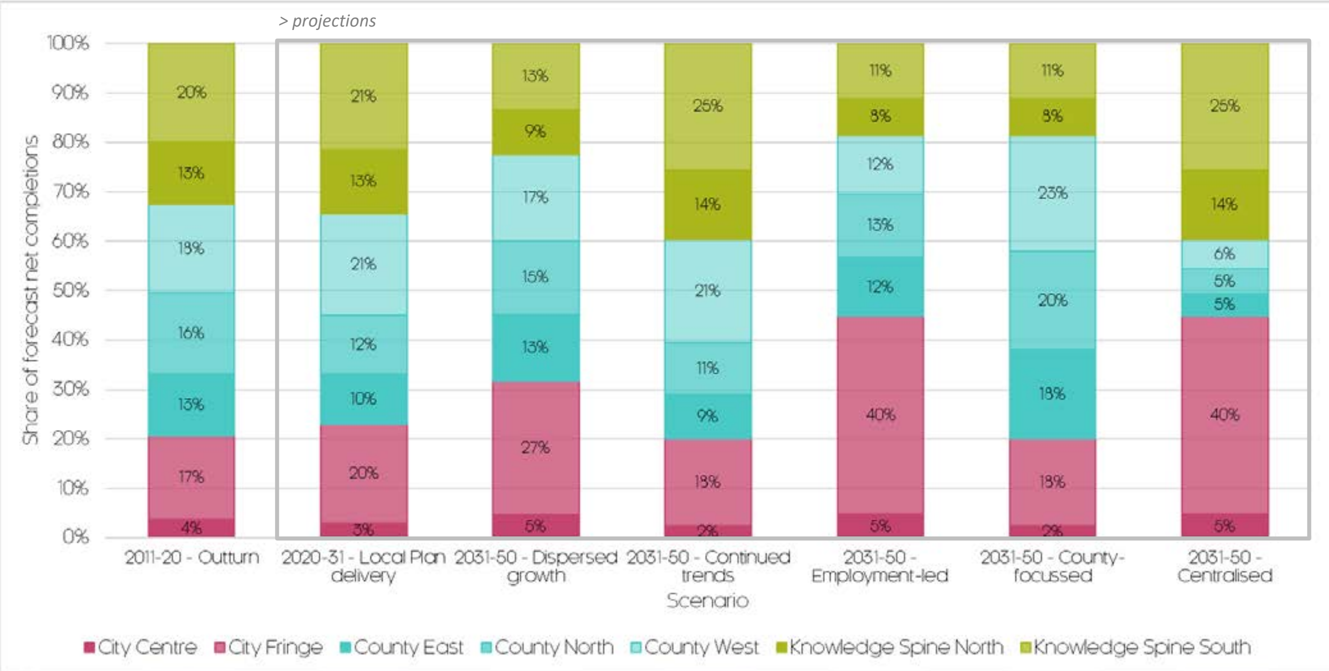
By taking the opportunity to quantify and test a range of different scenarios for housing distribution, the potential implications and trade-offs of different development choices can be identified and contrasted at a high-level.

The distributions of housing need have been informed by a set of robust and contrasting housing scenarios, with the results presented in Figure 3.3 below. The scenarios cover a variety of contrasting development choices for need after the 2020-31 period of Local Plan forecast completions. The scenarios include:

1. **An evenly dispersed scenario** – which sees housing need allocated at an even *percentage rate* (not quantity) across the FEMA.
2. **A continued trends scenario** – mirrors current concentrations of forecast net completions in Local Plans (which cover 2020-31), extrapolating them over the additional 2031-50 period.

3. **An employment-led scenario** – sees need matched to the distribution of projected Zonal employment growth, including growth in LIS-outlined key employment locations.
4. **A County-focussed scenario** – focuses need on the Wider County, resulting in the lowest proportion of need allocated to Oxford City Centre and Fringe and the Knowledge Spine.
5. **A centralised scenario** – focuses need on central Oxfordshire, incorporating Oxford City Centre and Fringe and the Knowledge Spine. This results in the lowest proportion of need allocated to the Wider County.

Figure 3.3: Spatial scenarios for Zonal distribution of housing need, 2011-20 and 2020-50



Source: MHCLG, Cambridge Econometrics. Note: percentage shares are an average of distributions across the three employment trajectories. Percentage shares relate to Zones proportion of FEMA-wide housing need to 2050.

As Figure 3.3 (above) shows, the distribution scenarios cover a variety of contrasting development choices, ranging from an economic-led focus on distribution in central Oxfordshire (Oxford and the Knowledge Spine), to a more evenly dispersed approach across the county, to an emphasis on market towns in Wider County areas.

As it allocates housing growth rates equally across Zones, the **evenly dispersed** scenario sees housing distributed the most evenly between the Zones post-2031. The Wider County still has the highest absolute level of growth, as it starts with the highest number of initial dwellings at 2031.

The **continued trends** scenario, extrapolating 2020-31 Local Plan forecasts to 2050, sees significantly greater distribution to the Knowledge Spine, and marginally less allocated to the Wider County and City Centre and Fringe.

The **employment-led** scenario sees much greater distribution to Oxford City (specifically the City Fringe), and comparatively lower levels allocated to the Wider County and Knowledge Spine.

The **County-focussed** scenario combines the low City Centre and Fringe distribution from the *continued trends* scenario with the low distribution to Knowledge Spine from the *employment led* scenario. This scenario results in a very high relative allocation to the Wider County.

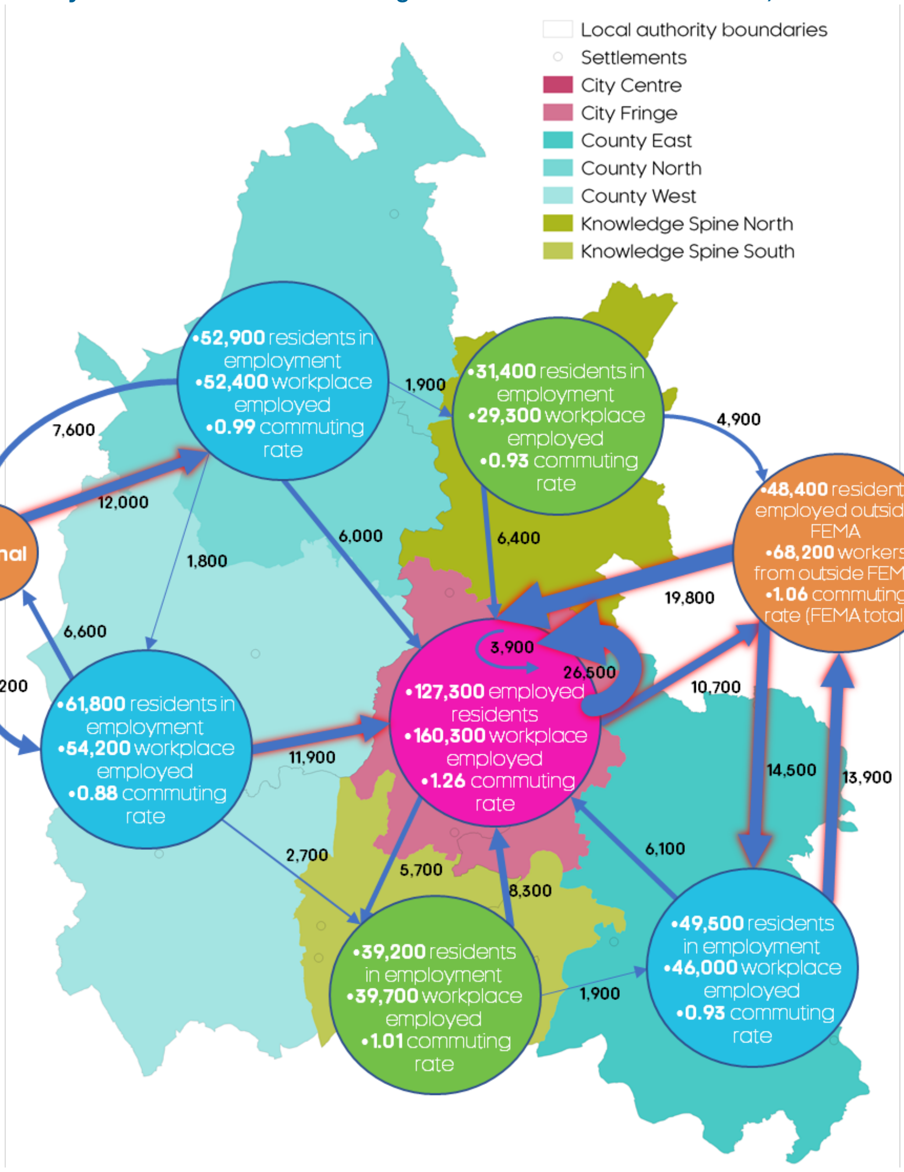
The **centralised** scenario reverses this process, with the high City Centre and Fringe distribution from the *employment-led* scenario paired with the high Knowledge Spine allocation from the *continued trends* scenario. This scenario results in a very low relative distribution to the Wider County.

It should be emphasised that these scenarios do not reflect preferred options or priorities for economic growth or housing delivery, but are rather hypothetical distributions to better understand the implications and trade-offs of different development choices at a high level. It should also be noted that these scenarios do not take into account specific site constraints, phased need, or development sites outside of the Local Plan period (2020-31).

Implications for commuting

By taking the opportunity to quantify and test a range of different housing distributions, potential implications and trade-offs can be identified and contrasted. The OGNA has specifically focussed on understanding the

Figure 3.4: Stylized overview of commuting flows in the Oxfordshire FEMA, 2018



Source: ONS, Cambridge Econometrics.

consequences for commuting trips, modal share and private vehicle miles within the FEMA, particularly given their important role in attaining net zero ambitions for the county.

Analysis of recent trends has shown that, as a result of employment growth accelerating relative to the supply of housing, commuting into the Oxfordshire FEMA has more than doubled over the past decade. This means more people are commuting – and commuting further, typically using private transport - to work in the FEMA, exacerbating congestion and environmental effects. Oxfordshire's current commuting profile is summarised in Figure 3.4 (above).

Though the scale of potential employment and housing growth in Oxfordshire will increase the absolute number of commuting trips within the FEMA, the OGNA has found that, given certain development choices, there is the potential for the length of these trips to decrease, for modal share to shift towards greener, more sustainable forms of transport, and for millions of private vehicles miles to be taken off Oxfordshire's roads by 2050.

Such outcomes are increasingly desirable given the growing pressure on Oxfordshire's transport network, associated externalities (notably, environmental and emissions effects), and the desire to attain net zero, and should therefore be considered in the appraisal of any future spatial development options for the FEMA.

Covid-19 and the Phase 2 Report

The development of the *Phase 2 Report* coincided with the Covid-19 pandemic of 2020 and 2021. It is clear that the pandemic and some of its long-lasting effects have the potential to impact upon the findings of *Phase 2* of the OGNA, not least those relating to the size and structure of the FEMA, and commuting trends and patterns. As such additional consideration has been given to this question. This analysis is summarised by the *Covid-19 Impacts Addendum* below.

4 Covid-19 Impacts Addendum

Introduction and purpose

During the course of the OGNA development in 2020, it became clear the Covid-19 pandemic could have significant, long-term impacts that may be relevant to the scope of the study, in terms of the prospects of different sectors locally, the demand for housing within the county, and the interaction between housing and employment location and transport demand given remote work.

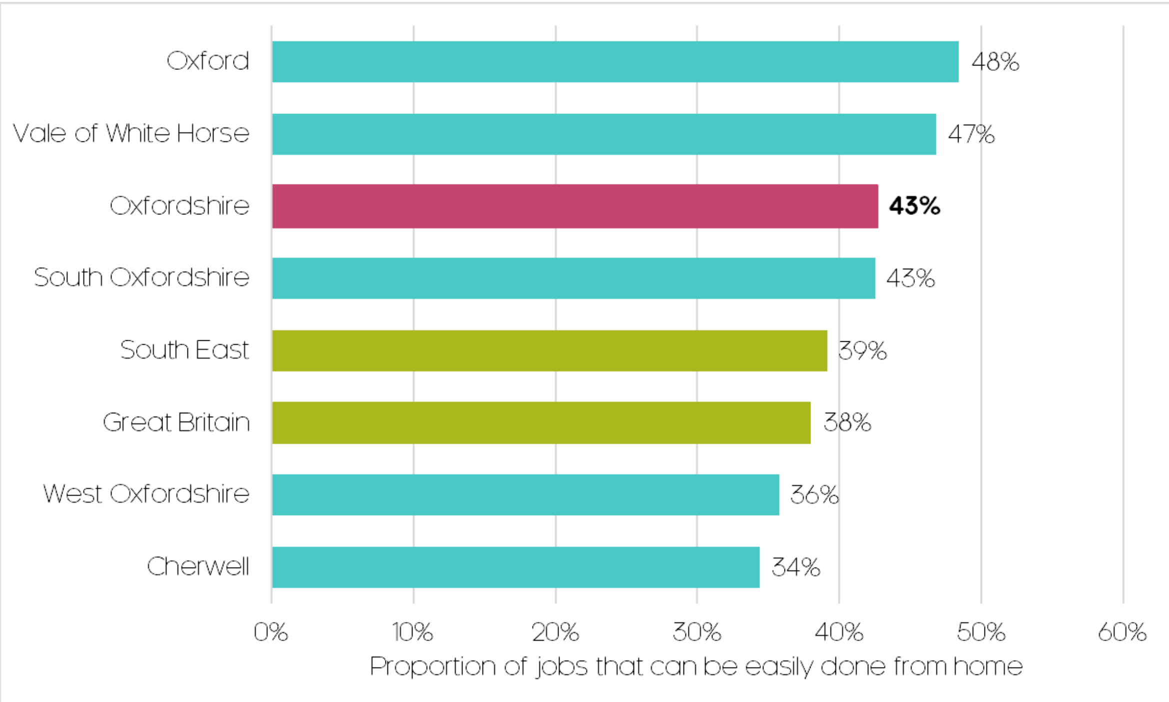
To reflect the emergence of the Covid-19 pandemic during the development of the OGNA, this short report - the **Covid-19 Impacts Addendum** - was therefore commissioned to sense-check, contextualise, and update the results of the *Phase 1* and *Phase 2 Reports* in light of these developments.

The Addendum draws heavily on and supplements the extensive analysis and research undertaken for Oxfordshire LEP's *Economic Recovery Plan (ERP)*, which was produced by Steer ED in conjunction with CE over 2020-21 in response to the pandemic. The following summary highlights and draws out the key findings and observations from the Covid-19 Impacts Addendum.

The legacy of the Covid-19 pandemic

Drawing on the latest theory and evidence, the addendum has sought to gauge the potential legacy of the Covid-19 pandemic over the longer timeframe of the Oxfordshire Plan (to 2050). Particular attention has been given to the durability and legacy of the Covid-induced shift to remote working ('homeworking'), which as Figure 4.1 below shows has the potential to be a much more prevalent within parts of Oxfordshire's labour market.

Figure 4.1: Homeworking potential across Oxfordshire



Source: Dingel & Neiman (2020), ONS, Cambridge Econometrics.

Beyond the short- and medium-term economic impact, the addendum appraises the longer-term potential for the pandemic to trigger and accelerate substantive economic, social and behavioural change in Oxfordshire and beyond, particularly in terms of matters associated with the thematic areas identified in the OGNA, such as:

- demography and housing (e.g. by changing the attractiveness of urban living, or people revising their need to reside close to work);
- sectors and employment land needs (e.g. by shifting/reducing demand for retail, leisure and office space, or accelerating the shift to online shopping), and;
- commuting and transport (e.g. by shifting/reducing the volume, mode and distance of commuting trips).

Yet in many instances, the pandemic has simply brought to the fore trends that were already in place and likely to be significant by 2050 anyway (and were typically considered, if not accounted for, within the original OGNA evidence base). Rather than changing the direction of travel, the pandemic has accelerated these trends, whilst, crucially, bringing them to the attention of a wider audience.

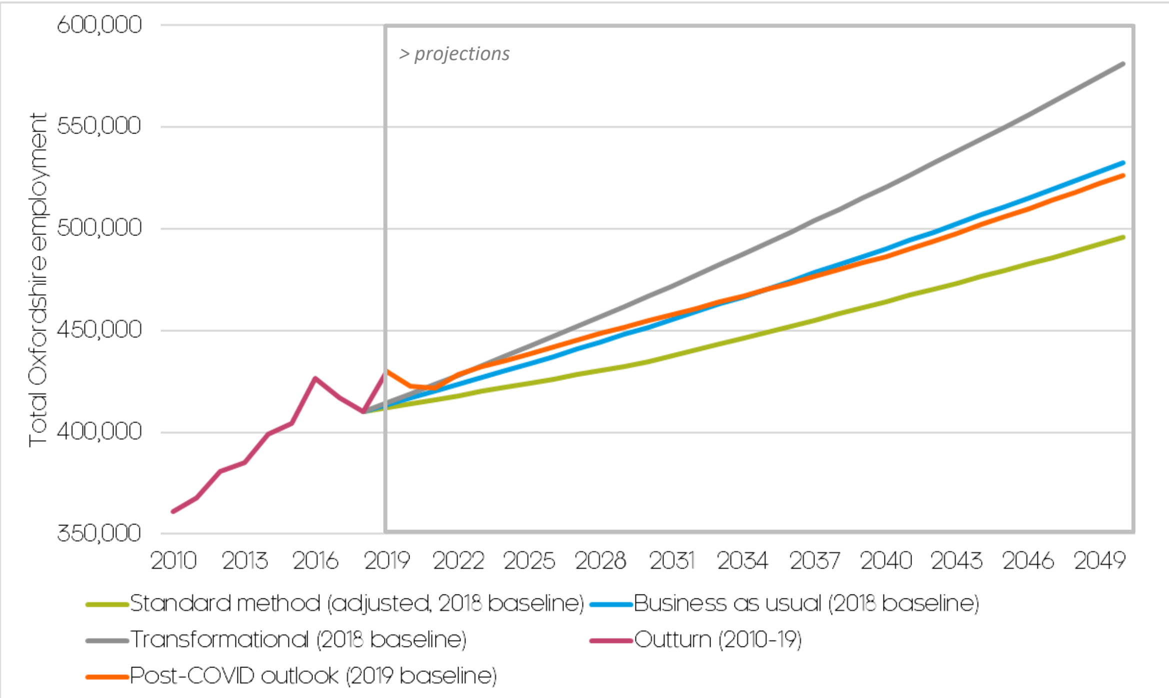
Likewise, for many workers and residents and Oxfordshire, it is important to note that the pandemic may have little to no impact relative to their pre-Covid routine; for instance, even during strict lockdown measures, the majority of workers were still reporting that they had never worked from home.

Although the negative short-term impacts of the pandemic have undoubtedly been severe within Oxfordshire, and will continue to be felt for several years to come, some of the Covid-induced trends, such as homeworking and localism, should be seen not as a threat but a significant opportunity to reshape Oxfordshire's economic geography and transport systems, particularly in the context of the urgent need to reduce emissions.

Robustness of the Phase 1 trajectories

Informed by updated forecasts and evidence incorporating the impact of the pandemic and its accompanying trends (presented in Figure 4.3.2 below, with post-Covid forecasts shown as the orange line), the addendum appraises the longer-term robustness of the OGNA's original economic trajectories.

Figure 4.2: Oxfordshire's post-Covid outlook to 2050, relative to the OGNA trajectories



Source: Oxfordshire ERP, ONS, Cambridge Econometrics.

Given Oxfordshire's intrinsic resilience and recoverability to economic shocks, it is expected the short-run impact from the pandemic will be less pronounced in Oxfordshire, whilst Oxfordshire's recovery will also outperform the national average, resulting in a smaller shortfall relative to pre-Covid trends.

Resultantly, as far as Oxfordshire is concerned, the addendum considers that the analysis underpinning the *Phase 1* and *Phase 2 Report* remains current and valid, though there is undoubtedly a need for the planning system to build in an increased level of flexibility.

As Figure 4.2 and Table 4.1 show, the range of feasible trajectories for employment growth and subsequent housing need are still well represented by the three trajectories depicted in the *Phase 1 Report*. Similarly, the five housing distribution scenarios outlined in the *Phase 2 Report* are still a suitable means of exploring the implications – in terms of commuting and affordability - between different approaches.

Table 4.1: Oxfordshire's post-Covid outlook to 2050, relative to the OGNA trajectories

	Jobs, baseline	Jobs, 2050	Jobs growth, baseline-2050	Jobs growth per annum, baseline-2050
Post-Covid outlook (2019 baseline)	**430,100**	**526,500**	**96,400**	**3,100**
Standard Method (adjusted, 2018 baseline) trajectory	410,100	495,600	85,500	2,700
Business as usual (2018 baseline) trajectory	410,100	532,500	122,500	3,800
Transformational (2018 baseline) trajectory	410,100	581,300	171,200	5,300

Source: Oxfordshire ERP, ONS, Cambridge Econometrics.

What may change is how policy makers calculate these implications, depending upon which version of the future they think is most likely to occur, as captured by the three post-Covid scenarios presented in this addendum. The scenarios, which look ahead to 2050, cover a range of feasible and contrasting behavioural changes as a result of the pandemic:

- *Scenario 1: a 'relative' return to normal* – a conservative scenario for the adoption and durability of remote working.
- *Scenario 2: a new normal* – a more likely scenario of a popular and widespread adoption of a 'hybrid' model of remote working.
- *Scenario 3: a step change* – an ambitious scenario assuming a positive step change in the adoption and durability of remote working.

Drawing on these scenarios, and flexibly incorporating any other relevant trends and indicators that emerge, policy makers are better placed to understand and appraise the scale and distribution of housing and employment space needed, and accompanying implications for commuting and affordability.

For instance, the original OGNA identifies a need for 560 hectares of employment land to 2050 under the central outlook of the business as usual trajectory. However, under the more extreme behavioural scenarios (i.e. scenarios 2 and 3) rather than maximising land allocations, local policy makers may wish to make more flexible allocations for employment land.

Post-Covid monitoring and review

When planning for the Oxfordshire of 2050, there is an increased emphasis on planning for a vision that is both feasible and desirable; the "forced experiment" of the pandemic has provided us with incredibly valuable information as to what that might look like.

For instance, the geography of Oxfordshire's residents has both expanded and contracted during the pandemic: expanded, by the reduced need for daily commuting, which has increased the range of feasible employment or residential options; contracted, by the increased opportunity and willingness to engage with and increase dependence on local communities and amenities.

Moving forward, there is a need for the planning system to continue to monitor such trends and build in additional flexibility and responsiveness, particularly given there is still an unprecedented amount of uncertainty when it comes to estimating the scale and durability of the pandemic's longer-term impacts.

Building on the opportunities provided by the pandemic – such as increased active travel, and reduced commuting - there is also a need for additional analysis on how best to join up spatial planning with infrastructure delivery sequencing, to reach net zero carbon targets whilst maintaining an innovative and prosperous economy.

Oxfordshire Growth Board

Oxfordshire Growth Needs Assessment

Phase 1 Report

Final Report

March 2021

Cambridge Econometrics
Cambridge, UK

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Contents

1 Introduction and Purpose

The Oxfordshire Councils[1] are working together to prepare the Oxfordshire Plan which will set out a development strategy for Oxfordshire to 2050.

To support the preparation of the Plan, the Oxfordshire Councils have commissioned Cambridge Econometrics and Iceni Projects to prepare the Oxfordshire Growth Needs Assessment (OGNA). The OGNA is intended to provide an integrated evidence base to help the Oxfordshire Councils identify the appropriate level and distributions of housing and employment over the period to 2050. The core objectives of the OGNA are:

- To identify a strategic level, long-term, robust and transparent methodology for assessing Oxfordshire's housing needs over the period to 2050
- To provide a detailed commentary (including the baseline position) on Oxfordshire's housing and employment market, including demographic and economic dynamics and any other key drivers of housing need and how this may change in the period to 2050.
- To identify a range of credible and robust housing need scenarios for Oxfordshire.
- To establish an informed understanding of the implications for sustainable housing growth in Oxfordshire, of the Oxford-Cambridge Arc and of any other strategically significant infrastructure and growth strategies, including proposals for strategic growth in other areas which are likely to have a significant impact in Oxfordshire.
- To identify an appropriate functional economic market area and provide an assessment of employment land requirements.
- To advise on how the Oxfordshire Plan should respond to the uncertainty associated with long-term planning for strategic housing and employment provision.

The methodology adopted, which considers scenarios for future growth in Oxfordshire, responds to this and in particular the strategic and long-term nature of the Oxfordshire Plan.

1.1 Context and nature of the Assessment

The Oxfordshire Plan will be a joint statutory spatial plan which covers a 30-year plan period from 2020 to 2050. The Plan is intended to be strategic, focusing on matters such as an overall spatial strategy for development, the integration of new development and investment in infrastructure, and how these can help to improve the quality of life for everyone.

[1] The commissioning authorities comprise Cherwell District Council, Oxford City Council, South Oxfordshire District Council, Vale of White Horse District Council and West Oxfordshire District Council.

The Plan differs from those being prepared in many other areas across England, in particular:

- The Oxfordshire Plan is a strategic plan which is being prepared on a cross-boundary basis spanning the county of Oxfordshire;
- It is looking at a much longer timeframe – a 30-year period to 2050 - than many Local Plans which typically look 15-20 years into the future. This raises issues regarding the reliability of traditional approaches to assessing development needs in some instances;
- It considers the inter-relationship between the economy and spatial planning activities;
- Oxfordshire falls within the Oxford-Milton-Keynes-Cambridge Arc which has been identified by the National Infrastructure Commission and supported by Government. There is a need for the Oxfordshire Plan to consider the strategic context provided by this, including the emerging spatial framework for the Arc, along with other Government growth initiatives and policy. Preparation of the Oxfordshire Plan also provides the opportunity to influence the Arc and shape the future strategy for this strategic corridor.

In addition, one of the major advantages of looking long-term and strategically at the strategy for development and growth is the ability to properly coordinate new development and infrastructure investment and consider what strategic infrastructure might be needed to support growth in the long-term.

These particular circumstances provide a background to the OGNA to which the Assessment seeks to respond. These are explored in more detail in the following chapter (*Chapter 2*).

1.2 This report

To ensure the preparation and analysis of an integrated evidence base that effectively addresses the core objectives of the OGNA, the Assessment has been divided into three complementary reports, broadly corresponding to three phases of work.

The **Phase 1 Report**, presented here, provides overall growth need figures for housing and employment in Oxfordshire to 2050. It profiles local housing market, demographic, economic and commercial property market dynamics, all within the strategic policy environment. These factors are then brought together to provide trajectories for future housing and employment land needs, and resultant high-level implications for commuting and affordability.

Following on from this, the **Phase 2 Report** considers a range of high-level scenarios for the distribution of housing and employment across Oxfordshire. The purpose of this is to aid decision-makers in understanding of the implications of alternative spatial choices. It does not seek to identify specific options or priorities for development, but rather explores the potential scale and implications of different approaches.

Finally, to reflect the emergence of the Covid-19 pandemic during the development of the OGNA, a **Covid-19 Impacts Addendum** has been produced. The Addendum gauges the probable impact and legacy of the pandemic on Oxfordshire, and the resultant implications for the evidence and observations presented in the OGNA (which largely predate the pandemic).

Therefore, it is recommended that the analysis presented in this report is read alongside the other supporting documentation of the OGNA, given their complementary coverage and interconnectedness.

In addition, a stand-alone **Executive Summary**, which highlights and brings together the key observations and messages from the three respective reports, has also been produced.

1.3 Report structure

The remainder of this report is structured as follows.

Part A: Oxfordshire Today, looking at;

- Oxfordshire's current strategic policy environment
- demographic trends
- the housing market, including a consideration of affordability and other key issues
- economic characteristics and commercial market dynamics

Part B: Exploring Oxfordshire's Future Growth Needs, which builds on this initial analysis and considers;

- the application of the Standard Method of local housing need
- analysis of the Oxfordshire Local Industrial Strategy, and development of associated economic trajectories
- commercial space analysis and implied employment space under the economic trajectories
- implied housing need under the economic trajectories and comparison with results of the Standard Method
- consideration of affordable housing needs and the influence of different levels of growth on affordable housing delivery.
- the potential high-level commuting and affordability implications of the economic trajectories and implied housing need

Part C: Conclusions and Appendices, which includes;

- concluding remarks, and a summary of the key issues and options for housing and employment needs
- a full list of referenced resources, and associated report appendices

Part A: Oxfordshire Today

2 Strategic Policy Environment

2.1 Introduction

This chapter addresses some of the strategic policy influences on planning for housing and economic development needs. This includes national planning policies and guidance, the area's location within the Cambridge-Milton Keynes-Oxford Arc and economic policy documents.

Oxfordshire is located in the South East region of the UK. It sits between the UK's two largest cities – London and Birmingham – and is linked to them by both road and rail. The M4 and M40 and A40, together with the rail network, connects Oxford to London, Birmingham and Bristol and through the Cotswolds to Cheltenham, Gloucester and Worcester. The A34 runs north/south through the county linking the Midlands to the Port of Southampton. Oxfordshire is also in relatively close proximity to the UK's largest airport, Heathrow.

2.2 National Planning Policies and guidance

Government has set out national planning policies in the National Planning Policy Framework (NPPF). The latest version of the NPPF was published on 19th February 2019 and is relevant to the preparation of the Oxfordshire Plan as one of the 'soundness' tests against which the Plan in due course will be assessed is one of the consistency with policies in the Framework.[2]

The NPPF is clear that the purpose of the planning system is to contribute to the achievement of sustainable development (Para 7) within which there are economic, social and environmental components. It sets out a presumption in favour of sustainable development which, for plan making, means that plans should positively seek opportunities to meet the development needs of their areas and be sufficiently flexible to adapt to rapid change; and should include strategic policies which – as a minimum – provide for objectively assessed needs for housing and other uses, as well as needs that cannot be met within neighbouring areas, unless the application of policies that protect areas or assets of particular importance provide a strong reason for restricting the scale, type or distribution of development[3]; or the adverse impacts of doing so would significantly and demonstrably outweigh the benefits (Para 11).

The NPPF is clear that the planning system is intended to be 'plan-led' with plans providing the basis for the determination of planning applications. It expects plans to set out strategic policies which articulate the overall strategy for the pattern, scale and quality of development, and make sufficient provision for housing, employment and other forms of commercial

[2] NPPF Paragraph 35.

[3] Areas or assets of particular importance within this context in Oxfordshire include the Cotswolds Area of Outstanding Natural Beauty, the Chilterns Area of Outstanding Natural Beauty, the North Wessex Downs Area of Outstanding Natural Beauty, SSSI, SACs, local green space, Green Belt, areas at risk of flooding, irreplaceable habitats and designated heritage assets including Oxfordshire's only World Heritage Site at Blenheim Palace.

development, infrastructure, community facilities and the enhancement of the natural, built and historic environment.

The OGNA seeks to consider the need for housing and employment development in Oxfordshire. In developing the Plan, the Councils will draw this together with consideration of wider sustainability issues including the need to conserve and enhance the natural, built and historic environment, and ensure that new development is supported by necessary infrastructure.

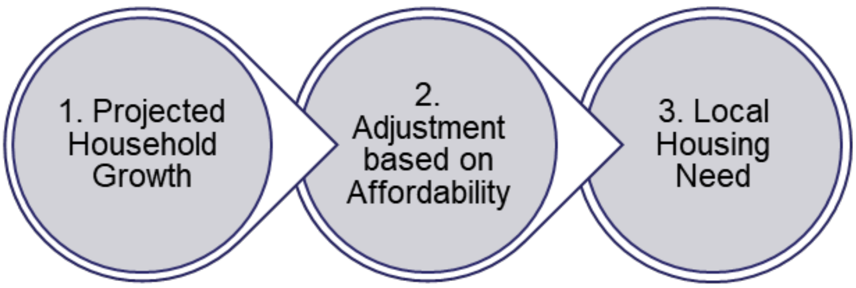
Assessing housing needs

The 2019 NPPF sets out that to determine the minimum number of homes needed, strategic policies should be informed by a local housing needs assessment, conducted using the 'Standard Method' in national planning guidance – unless exceptional circumstances justify an alternative approach which also reflects current and future demographic trends and market signals (Para 60).

The 'Standard Method' was introduced by Government in 2018 and uses a formulaic approach to calculate a minimum level of housing need. Government's Planning Practice Guidance sets out that housing need is an **unconstrained** assessment of the number of homes needed in an area, and is the first step in the process of deciding how many homes to be planned for. It should be assessed separately from assessing land availability, establishing a housing requirement figure (i.e. how many homes to plan for) and preparing policies to address this.[4] In this context, this report considers unconstrained 'housing need' – it does not consider what level of homes should be planned for.

The Standard Method uses Government's 2014-based Household Projections to calculate the average annual household growth over the next 10 years, then applies a percentage uplift to this based on the extent to which an area's median house price-to-earnings ratio is above 4 to calculate a minimum annual housing need figure. A cap is applied to the affordability uplift in generating the minimum figure in some circumstances to ensure the figures derived are deliverable. For some cities and larger urban centres, a further uplift is now applied – but this does not affect authorities in Oxfordshire. The methodology is considered in greater detail in *Chapter 7*.

Figure 2.2.1: Overview of the Standard Method for calculating local housing need



Source: Iceni Projects.

[4] Planning Practice Guidance Para ID: 2a-001-20190220

The Planning Practice Guidance is clear that where plans cover more than one area, as is the case for the Oxfordshire Plan, housing need for the defined area should be at least the sum of the local housing need for each Local Planning authority within the area. It will be for the Councils to distribute the total housing requirement which is then arrived at across the plan area.[5]

The Standard Method provides a minimum starting point for assessing housing need. As explained in *Chapter 7* in this report, Para 60 in the NPPF and the associated Planning Practice Guidance[6] indicate that use of the Standard Method is not mandatory, however exceptional circumstances must be demonstrated to justify a housing need figure *lower* than that identified using the Standard Method, and such figures must be based on realistic assumptions on demographic growth and market signals. The Planning Practice Guidance outlines that more recent household projections (such as the 2016- and 2018-based projections) do not provide an appropriate basis for use in the Standard Method.[7]

In contrast, where planning authorities can show that an alternative approach identifies a need *higher* than using the Standard Method, and that it adequately reflects current and future demographic trends and market signals, the Planning Practice Guidance outlines that the approach can be considered sound as it will have exceeded the minimum starting point.

Planning Practice Guidance in Para 2a-010[8] sets out that there will be circumstances where it is appropriate to consider whether actual housing need is higher than the Standard Method indicates:

> *"The government is committed to ensuring that more homes are built and supports ambitious authorities who want to plan for growth. The Standard Method for assessing local housing need provides a minimum starting point in determining the number of homes needed in an area. It does not attempt to predict the impact that future government policies, changing economic circumstances or other factors might have on demographic behaviour. Therefore, there will be circumstances where it is appropriate to consider whether actual housing need is higher than the Standard Method indicates.*
>
> *This will need to be assessed prior to, and separate from, considering how much of the overall need can be accommodated (and then translated into a housing requirement figure for the strategic policies in the plan). Circumstances where this may be appropriate include, but are not limited to situations where increases in housing need are likely to exceed past trends because of:*
>
> - *growth strategies for the area that are likely to be deliverable, for example where funding is in place to promote and facilitate additional growth (e.g. Housing Deals);*
> - *strategic infrastructure improvements that are likely to drive an increase in the homes needed locally; or*

[5] Planning Practice Guidance ID 2a-013-20190220

[6] Planning Practice Guidance Para ID 2a-015-20190220

[7] Planning Practice Guidance Para ID 2a-015-20190220

[8] Planning Practice Guidance, Para ID: 2a-010-20190220

- *an authority agreeing to take on unmet need from neighbouring authorities, as set out in a statement of common ground.*

There may, occasionally, also be situations where previous levels of housing delivery in an area, or previous assessments of need (such as a recently produced Strategic Housing Market Assessment) are significantly greater than the outcome from the Standard Method. Authorities will need to take this into account when considering whether it is appropriate to plan for a higher level of need than the Standard Method suggests."

As addressed further in this report, many of the circumstances identified in this part of the PPG are applicable in Oxfordshire, in that there is a Housing and Growth Deal in place providing funding to facilitate growth to 2031 (which covers the initial part of the period of the Oxfordshire Plan); Oxfordshire sits within a wider Oxford-Milton Keynes-Cambridge Arc which has been designated by Government effectively as a growth area; and major new strategic infrastructure is being considered including East-West Rail and proposals for an Oxford-Cambridge Expressway (currently on hold).

Recent Local Plans in Oxfordshire, including those in Oxford City and South Oxfordshire, which have assessed housing need as being above the Standard Method have been found to be sound at independent examination.

The Standard Method thus provides an important starting point in establishing the minimum level of housing need. The Growth Needs Assessment however then considers whether there is robust evidence to suggest that housing need could be higher or lower than the Standard Method suggests; and address the points in the box above.

This report takes account of evidence and Government policy/guidance available at the time of its preparation. Further evidence may however need to be prepared prior to submission of the Plan to take account of updated data, or changes in methodology or Government policy. The Government's recent consultation on Changes to the Current Planning System[9] and the Planning White Paper may for instance in due course lead to revisions to legislation, policy and guidance influencing plan-making which the Councils would need to have regard to.

Assessing economic development needs

The NPPF is clear that planning policies and decisions should help create the conditions in which businesses can invest, expand and adapt; and that significant weight should be placed on the need to support economic growth and productivity, taking into account local business needs and wider opportunities for development (Para 80). It is clear that this is particularly important where Britain can be a global leader in driving innovation and in areas with high levels of productivity, which would include Oxfordshire.

Planning policies are expected to set out an economic vision and strategy which positively and proactively encourages sustainable economic growth, having regard to Local Industrial Strategies and other local policies; which identifies strategic sites for local and inward investment; addresses barriers to investment and is sufficiently flexible to accommodate needs not anticipated in the plan (Para 81).

[9] MHCLG (Aug 2020) *Changes to the Current Planning System*

Planning Practice Guidance sets out that assessments of employment land needs may need to be undertaken on a cross-boundary basis where functional economic market areas cross administrative boundaries, as this Growth Needs Assessment shows is the case in Oxfordshire.

The Guidance sets out that considerations in assessing business needs include the existing stock of land in employment use, the pattern of employment land supply and loss, market evidence and consultation with relevant organisations. It outlines a range of data that needs to be brought together to assess future needs including employment forecasts/projections, assessments of future labour supply, projections of past take-up of employment space and other studies addressing changing business trend/models. [10] It also advises that the specific locational requirements of specialist or new sectors may need to be considered. This report provides a quantitative assessment and forecasts of future employment land needs across Oxfordshire.

The Cambridge-Oxford Arc

There is an important strategic context to the consideration of growth needs in Oxfordshire, which is influenced by policies and strategies at national, regional and sub-regional levels. This includes Oxfordshire's location within the Cambridge-Milton Keynes-Oxford Arc.

The National Infrastructure Commission's Partnering for Prosperity Report set out the case for strategic growth and infrastructure investment across the Cambridge-Oxford-Milton Keynes Arc. This is explored further below.

2.3 National Infrastructure Commission: Partnering for Prosperity

The National Infrastructure Commission's ('the NIC Report'), titled 'Partnering for Prosperity – A New Deal for the Cambridge-Milton Keynes-Oxford Arc'[11] argued that the Cambridge-Milton Keynes-Oxford Arc must be a national priority.

Underpinned by a range of detailed research, it outlined how the Arc is home to some of the country's strongest economies, that this has fuelled demand for homes, but that this has not been matched by housing supply.

It found the Arc is at the heart of the UK's knowledge economy, which reflects the concentration of world-leading universities and research facilities, internationally significant business clusters, a track record in innovation and entrepreneurship and the skills of its workforce. In Oxfordshire, this reflects the presence of Oxford University which is one of the top four in the world; the John Radcliffe and Churchill teaching hospitals, which drive internationally-significant clinical and medical developments; and the broader clustering in the area known as Science Vale (in and around Oxford, Didcot and Abingdon) of bioscience and medical technologies; physical sciences; telecommunications, computer hardware and software; and engineering and electronics.

This area is the location of long-established companies such as Oxford Instruments (founded in 1959), high profile companies such as Williams F1;

[10] Planning Practice Guidance ID 2a-027-20190220

[11] Published in November 2017.

relatively new companies experiencing very rapid growth (e.g. Immunocore) and developing technologies which could have global impact. Oxfordshire, and in particular the 'knowledge spine' which runs north-south through the centre of the county – is thus host to substantive high-tech science and innovation cluster.

The NIC report sets out that the number of patent applications in 2015 in Oxford was four times greater than the UK average; and the City is one of only two UK cities in the European top 20 for innovation. A strong enterprise culture together with the track record of the universities supports research and innovation, and the commercialisation of this.

The report outlines that fundamental to this success has been the skills of the workforce; describing Oxford for instance as having the most highly qualified workforces in the country with more than 60% of workers qualified to degree level or higher. Indeed, Centre for Cities has identified Oxford as having one of the highest concentration of highly skilled residents in Europe.[12]

The combination of innovation, enterprise and a highly-skilled workforce has supported Oxford (as well as Cambridge and Milton Keynes) to be amongst the most productive and fastest growing of main towns and cities across the UK. The NIC found, based on Centre for Cities research, that the contribution of places such as Oxford to UK economic performance, trading accounts and tax revenues is both significant and increasing.

The NIC stated strong economic assets and enterprise culture have supported strong economic performance, fuelling a demand for homes across the Arc which has not been matched by supply.

These issues underpinned the conclusion reached in the NIC report that rates of housebuilding across the Arc as a whole would need to double if the Arc is to achieve its economic potential. It sets out that this needs to form part of a package of investment – including in infrastructure; skills development; science, research and innovation; business infrastructure and the continued development of the Arc's world-leading sectors.

The report goes on to state a clear spatial vision for the Arc over the next 50 years should be articulated. This should be jointly owned and led by local stakeholders, and by Government. It should provide an expression of the Arc's long-term economic, physical and social development, as well as identify locations for growth and investment and enabling strategic infrastructure.

2.4 Government's response to the NIC report

Following the publication of the NIC's report in November 2017, the Government issued a detailed response to the NIC's recommendations in October 2018. This is relevant to the preparation of Local Plans across the Arc, as the NPPF in Paragraph 6 is clear that endorsed recommendations of the NIC may be material when preparing plans or deciding applications.

In responding to the NIC report, the Government welcomed it and its recommendations; recognising that:

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[12] Centre for Cities (2016), Competing with the Continent.

> *"With the right interventions and investment, we believe there is a transformational opportunity to amplify the Arc's position as a world-leading economic place and support the government's Industrial Strategy aim to boost the productivity and earning power of people across the UK".*[13]

The Government acknowledged that the Arc is a globally significant place and has the potential to become even greater. In order to achieve this, the Government has designated the Arc as a key economic priority and recognised that a step change in housing delivery would be required to support this.

Since 2018, Government has been considering the delivery of transformational infrastructure projects to improve east-west connectivity across the Arc, most notably by completing the £1bn East West Rail scheme as well as potential road infrastructure projects. Proposals for an Oxford-Cambridge Expressway are however currently on hold.

The Government also recognised in its response that to build the one million new homes between 2016-2050 – what the NIC identified as the potential of the Arc - and deliver its full economic potential of the Arc, the planning and delivery of business, housing and infrastructure should be coordinated across the Arc.

In its 2020 budget, the Government announced plans to develop a long-term Spatial Framework to support strategic planning in the OxCam Arc, setting out that this would support the area's future economic success and the delivery of the new homes required by this growth up to 2050 and beyond. There is clear potential for the Oxfordshire Plan to influence the development of the Spatial Framework (and vice-versa).

In the context of Oxfordshire's location within the Oxford-Milton Keynes-Cambridge Arc and the Government's ambitions for the Arc, it is reasonable for the Oxfordshire Plan to consider and test the inter-relationship between economic growth and housing need.

The Ox-Cam Arc reports do not however provide any specific guidance on how to calculate what level of housing provision should be planned for, or what share of the 1 million homes ambition might be delivered in Oxfordshire. This is for the Oxfordshire Plan to consider.

2.5 Oxfordshire Housing and Growth Deal

The six Oxfordshire councils (Cherwell District Council, Oxford City Council, Oxfordshire county Council, South Oxfordshire District Council, Vale of White Horse District Council and West Oxfordshire District Council) and the Oxfordshire Local Enterprise Partnership announced a Housing and Growth Deal with Government on 22nd November 2017.

The deal is relevant in establishing a joint commitment to:

- The preparation, submission and adoption, subject to the examination process, of a joint statutory spatial plan covering all six local authorities in Oxfordshire ('the Oxfordshire Plan');

[13] HM Treasury (2018) Cambridge-Milton Keynes-Oxford Arc Study: government response, p. 1

- Planning for and supporting the delivery of 100,000 new homes between 2011 and 2031 – backed up with a credible plan for delivery, outlining interim milestones and targets as agreed with the HCA and Government.
- Funding of up to £215m funding from Government to support growth, which comprises £60m for affordable housing, £150m for infrastructure improvements and £5m resource funding to get a joint plan in place and support housing delivery.

The commitment to deliver 100,000 homes to 2031 has informed the preparation of the current round of Local Plans across the 5 Oxfordshire authorities, which collectively plan to meet this.[14]

The Oxfordshire Plan, which this report has been prepared to inform, is principally looking at longer-term strategic development beyond these timeframes to 2050; not least as major strategic growth which is being considered now through the Oxfordshire Plan is unlikely to deliver significant new development on the ground by 2031.

The Growth Deal does not specify what rate of development should be planned for in Oxfordshire beyond 2031. This will be for the Oxfordshire Plan to consider.

2.6 Housing and Infrastructure Fund (HIF)

Linked to the Housing and Growth Deal, Oxfordshire county Council has secured £218 million of funding from the Housing and Infrastructure Fund to support the delivery of the Didcot Garden Town. This will contribute to the delivery of:

- A4130 widening from A34 Milton Interchange towards Didcot;
- A new *"Science Bridge"* over the A4130, Great Western Railway Line and Milton Road into the former Didcot A Power Station site;
- A new Culham to Didcot river crossing between the A415 and A413; and
- A Clifton Hampden Bypass.

In November 2019, £102 million of Housing Infrastructure Funding was also secured to make major improvements to the A40 and ease congestion including the dualling of the A40 between Witney and the proposed Eynsham Park and Ryde; and delivery of a westbound bus lane from Oxford to Eynsham.

This infrastructure investment is intended to support the delivery of housing and employment development schemes in the existing round of Local Plans (either adopted or emerging).

2.7 Oxfordshire Local Industrial Strategy (LIS)

The Oxfordshire Local Industrial Strategy (LIS) was published by the Government in July 2019, responding to the UK Industrial Strategy. The NPPF

[14] South Oxfordshire's Local Plan and the Partial Review of the Cherwell Local Plan are at Examination at the time of writing. Plans in Oxford, Vale of White Horse and West Oxfordshire have been adopted.

states in Para 81 that plan-making should have regard to local industrial strategies in setting out an economic vision and strategy for the area.

The LIS builds upon the significant business investment over recent years through the Oxfordshire Local Enterprise Partnership. Over £600m worth of government and European funds have been secured through Growth Deals, a City Deal, European Structural Investment Funds and Infrastructure Funds – all part of an overall investment programme in Oxfordshire worth £2.2bn.

The LIS sets out an ambitious economic strategy up to 2040 with the aim of positioning Oxfordshire as one of the top three innovation ecosystems in the world and as a leading science and technology cluster. The important economic sectors, assets and growth opportunities identified in the strategy are spread across the whole of Oxfordshire with the main towns forming important parts of the economy. These include motorsport technologies around Banbury, Bicester and Grove; life sciences and creative industries around Milton Park and Didcot; and smart living technologies at the Oxfordshire Cotswolds Garden Village.

The Oxfordshire LIS presents a long-term framework against which private and public sector investment decisions can be assessed, grouped around the five foundations of productivity:

- Places - Develop Oxfordshire as a living laboratory to help solve the UK’s grand challenges
- Business environment - Become a powerhouse for commercialising transformative technologies
- Infrastructure - Enable greater connectivity and accessibility especially across key growth locations
- Ideas - Establish a globally connected innovation economy
- People - Develop a more responsive skill system creating better opportunities for all

The Oxfordshire LIS will also partly inform future local authority-level industrial strategies, such as the Cherwell Industrial Strategy which is currently being prepared as a 10-year strategy to facilitate a supportive business environment, help encourage enterprise and continued economic prosperity.

A detailed review of the Oxfordshire LIS and associated sector growth trajectories is provided later in this report in *Chapter 8*.

2.8 Conclusions

There are important national and sub-regional policy influences which are relevant in considering housing and economic development needs in Oxfordshire.

National policy sets out that the Standard Method set out in Planning Practice Guidance is the starting point for considering housing needs. The Housing and Growth Deal agreed between the Oxfordshire Councils and Government sets out that higher levels of growth will be planned for to 2031; but does not address the period beyond 2031 – this will be for the Oxfordshire Plan to consider.

Wider influences on considering the need for housing and employment land include Oxfordshire's economic dynamics, potential strategic infrastructure investment, and the county's location within the Cambridge-Milton Keynes-Oxford Arc.

The National Infrastructure Commission has recognised Oxfordshire's economic dynamism and growth potential, and provision of sufficient housing and employment land are relevant considerations if its growth potential is to be realised. There is an opportunity for the Oxfordshire Plan to influence and shape the forthcoming Spatial Framework for the Arc.

3 Demographic Trends

3.1 Introduction

This chapter considers recent demographic trends in Oxfordshire, in particular focussing on population size and age structure, as well as an understanding of how this has changed over time. Demographic dynamics are an input to the consideration of overall housing need within the Standard Method and the analysis in this chapter therefore informs the assessment of housing need in *Chapter 7*.

The latest official data about population change in Oxfordshire is contained within ONS mid-year population estimates (MYE) up to mid-2018 (published in 2019). The 2018 Mid-Year Population Estimates were the latest available at the time when this report was drafted.

Table 3.1.1 below shows the estimated population in each local authority and the proportion of the Oxfordshire total this amounts to. As of mid-2018, the population of Oxfordshire was estimated to be 687,500, with Oxford and Cherwell being the largest local authorities (and West Oxfordshire the smallest).

Table 3.1.1: Estimated population by local authority, 2018

	Estimated population, 2018	% of population, 2018
Cherwell	149,161	21.7%
Oxford	154,327	22.4%
South Oxfordshire	140,504	20.4%
Vale of White Horse	133,732	19.5%
West Oxfordshire	109,800	16.0%
Oxfordshire	**687,524**	**-**

Source: ONS.

3.2 Age structure

Table 3.2.1 below shows Oxfordshire's population age structure in five-year age bands compared to the regional and national profile. The data shows a similar age structure in Oxfordshire to the South East and to England, although there is a particular spike in the 20-24 age group which is likely to be related to the student population of Oxford.

Table 3.2.1: Population profile in Oxfordshire, the South East and England, 2018

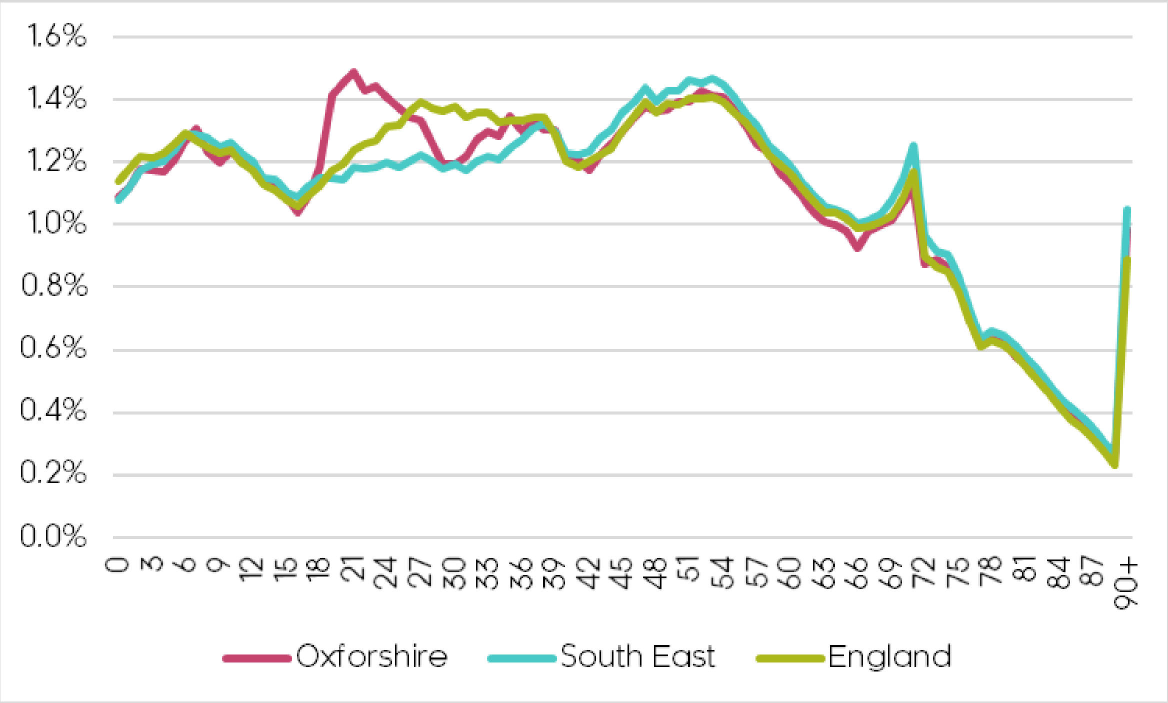
	Oxfordshire		South East	England
	Population	% of population	% of population	% of population
0-4	39,398	**5.7%**	5.8%	6.0%
5-9	42,783	**6.2%**	6.3%	6.3%
10-14	40,453	**5.9%**	6.0%	5.8%
15-19	40,021	**5.8%**	5.6%	5.5%
20-24	49,678	**7.2%**	5.9%	6.3%
25-29	44,772	**6.5%**	6.0%	6.8%
30-34	43,131	**6.3%**	6.0%	6.8%
35-39	45,310	**6.6%**	6.4%	6.6%

40-44	41,766	**6.1%**	6.3%	6.1%
45-49	46,432	**6.8%**	7.0%	6.8%
50-54	48,411	**7.0%**	7.3%	7.0%
55-59	43,672	**6.4%**	6.6%	6.4%
60-64	36,270	**5.3%**	5.5%	5.4%
65-69	33,692	**4.9%**	5.2%	5.0%
70-74	33,070	**4.8%**	5.2%	4.9%
75-79	23,221	**3.4%**	3.5%	3.3%
80-84	17,597	**2.6%**	2.7%	2.5%
85+	17,847	**2.6%**	2.8%	2.4%
All Ages	687,524	**-**	-	-

Source: ONS.

The differences between Oxfordshire and other areas can more clearly be seen in Figure 3.2.1 below which considers the age structure by single year of age. This shows for ages up to about 15 and from about 40 onwards that the profile of the county is relatively similar to that seen in the South East and England as a whole. A higher proportion of Oxfordshire's population is however aged between 18-25 than is the case nationally; and there are more people in the late 20s and early 30s relative to the profile across the South East region. This influences the effects of affordability pressures within the county, which particularly affect younger households who are less likely to own a home.

Figure 3.2.1: Population profile in Oxfordshire, the South East and England, 2018

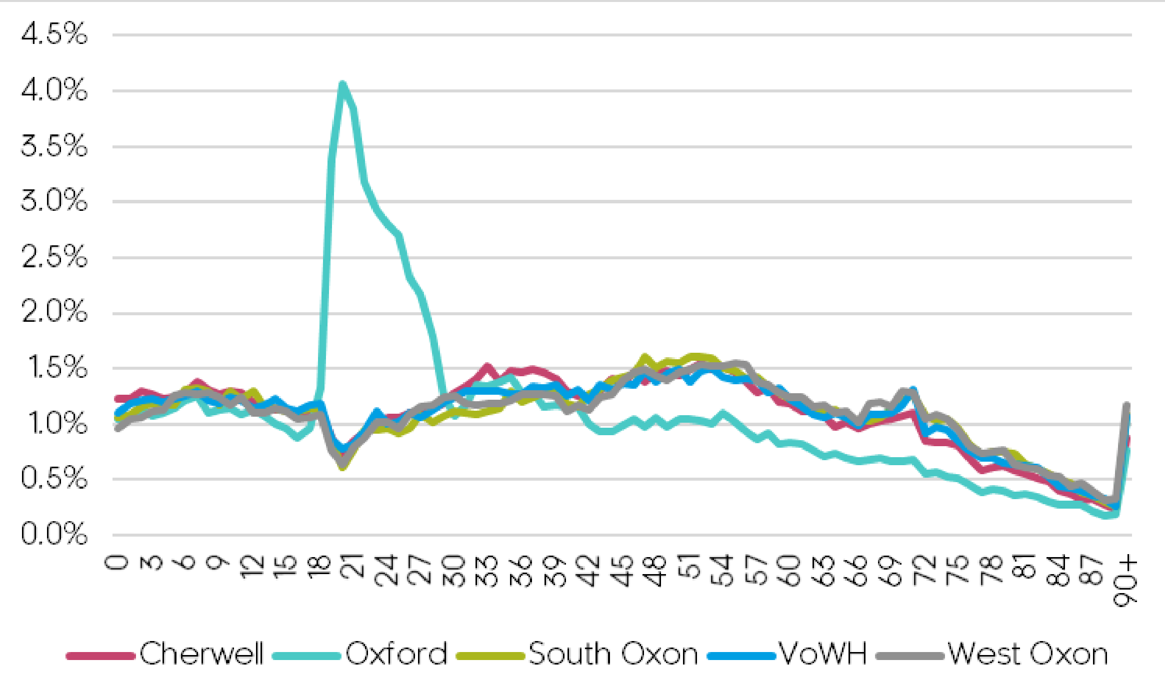


Source: ONS, Justin Gardner Consulting.

The spike for student age groups can more clearly be seen when looking at individual local authorities (Figure 3.2.2. Note: South and West Oxfordshire abbreviated to South and West Oxon. Vale of White Horse abbreviated to VoWH). Oxford has a notably higher population in all age groups from about 18/19 up to 28/29. Outside of Oxford, the four authorities show a slight dip in population around age 20 which will be related to people in these areas leaving to go to university in other areas.

The five local authorities have very similar population structure, with Oxford having a notably lower proportion of people aged over about 40, due to higher numbers in key student age groups. Cherwell has slightly higher numbers of people aged 29-39 but aside from this, the population structure in these four authorities is relatively similar.

Figure 3.2.2: Population profile of local authorities in Oxfordshire, 2018



Source: ONS, Justin Gardner Consulting.

The analysis in Table 3.2.2 summarises the above information by assigning population to three broad age groups: a) children (0-16), b) working-age (16-65) and c) pensionable age (65+). This analysis shows that, compared with the region and national position, Oxfordshire has a broadly similar age structure.

Table 3.2.2: Summary age bands in Oxfordshire, the South East and England, 2018

	Oxfordshire		South East	England
	Population	% of population	% of population	% of population
Under 16	130,136	18.9%	19.2%	19.2%
16-64	431,961	62.8%	61.5%	62.6%
65+	125,427	18.2%	19.3%	18.2%
All Ages	687,524	-	-	-

Source: ONS, Justin Gardner Consulting.

However, if this analysis is repeated for individual authorities it is again clear that the age profile in Oxford is somewhat different (Table 3.2.3). In particular, the proportion of people aged 65 and over is only 12%, compared with 18% across the county and up to 22% in West Oxfordshire. With Oxford also having a slightly lower proportion of people aged under 16, it is the case that a high proportion of the population age within the 16-64 age band (70% of Oxford's population, compared with 63% across the county).

Table 3.2.3: Summary age bands of local authorities in Oxfordshire, 2018

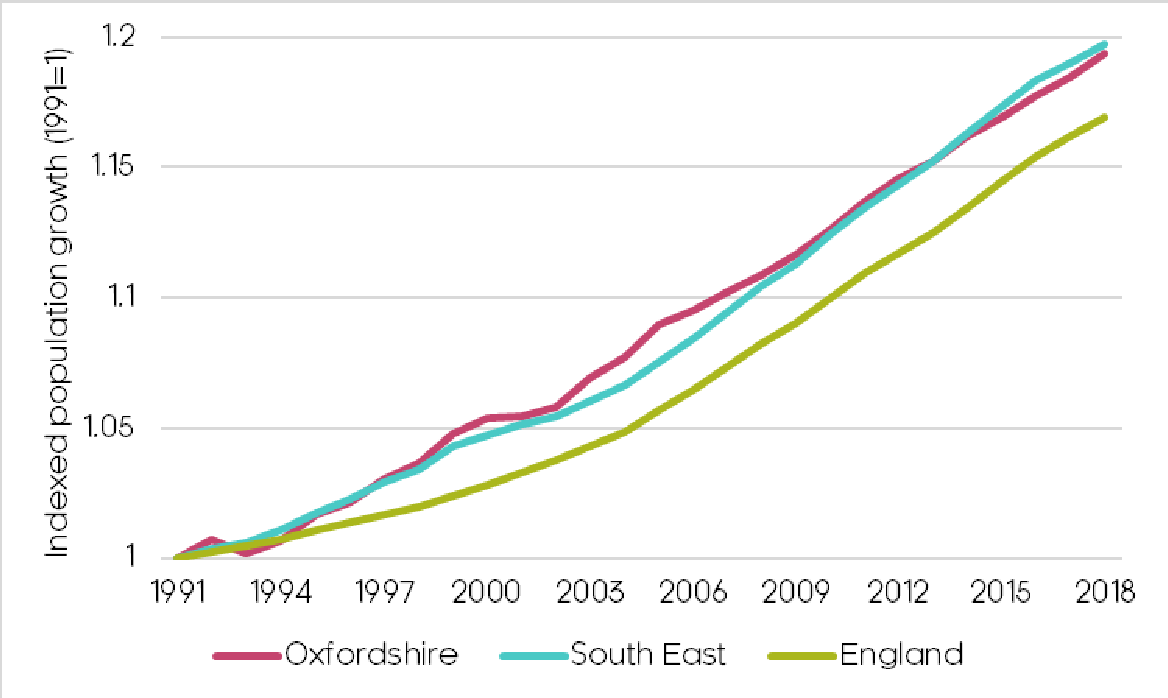
	Cherwell	Oxford	South Oxon	VoWH	West Oxon
Under 16	20.0%	17.7%	19.2%	19.3%	18.5%
16-64	62.0%	70.2%	59.9%	60.7%	59.9%
65+	18.1%	12.2%	20.9%	20.0%	21.5%

Source: ONS, Justin Gardner Consulting.

3.3 Past population growth

Figure 3.3.1 below appraises population growth in the period from 1991 to 2018. Over this period the population of Oxfordshire has been rising, broadly tracking changes seen regionally. Population growth has however been above that seen for England as a whole. It is estimated that the population of the county had risen by 19% from 1991 levels, which compares to a 20% rise across the region and a 17% increase nationally.

Figure 3.3.1: Indexed population change in Oxfordshire, the South East and England, 1991-2018

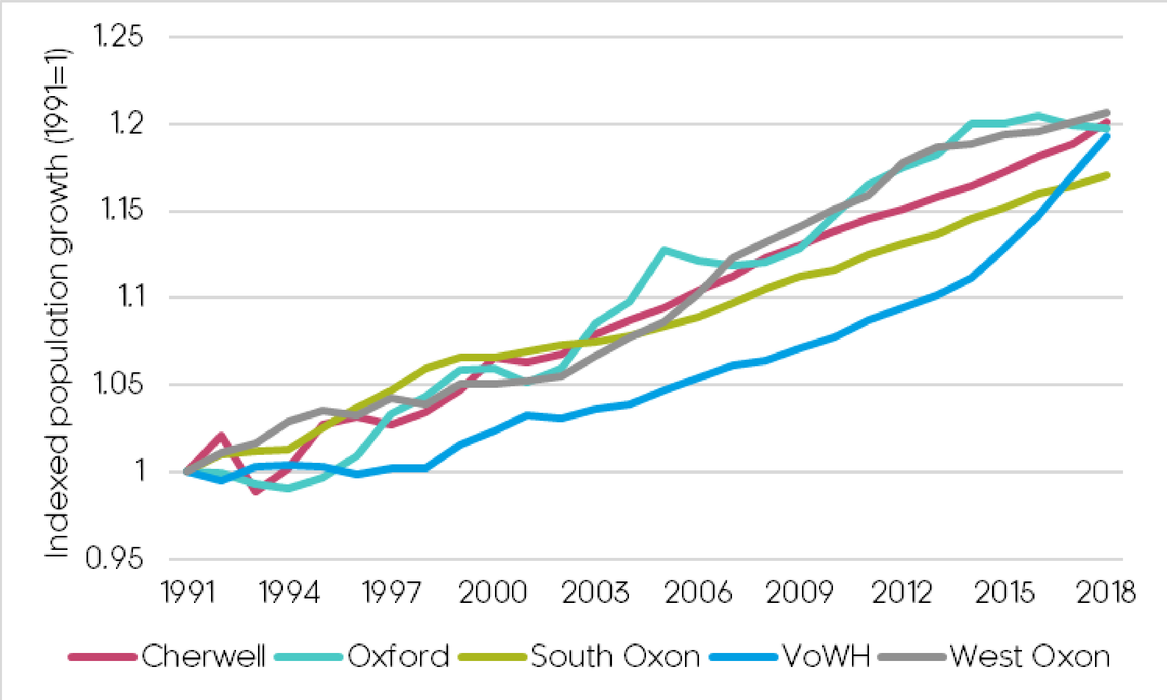


Source: ONS, Justin Gardner Consulting.

When looking at individual local authorities a slightly different picture emerges. As shown in Figure 3.3.2, population growth varies modestly from 17% in South Oxfordshire up to 21% in West Oxfordshire over the 1991-2018 period. However, the changes to population have been far from uniform. Of particular note are the strong growth seen in Vale of White Horse over the past few years along with little change observed in Oxford City (based on published ONS data)[15]. These differentials are influenced in part by planning policies and capacity for new housing, with the recent upturn in housing delivery in Vale of the White Horse for instance influenced by its adoption of a new Local Plan planning for higher housing growth in December 2016.

[15] Alternative measure of population in Oxford are considered later in this section.

Figure 3.3.2: Indexed population change for local authorities in Oxfordshire, 1991-2018



Source: ONS, Justin Gardner Consulting.

This analysis is taken forward by looking at population changes in more recent years over the 2011-18 period (Table 3.3.1). The starting point being chosen as it is the last date from which population data has been consolidated with a 'known' source (i.e. the 2011 Census). The 2011-18 period also allows for comparison with Patient Register data, which provides an alternative source for considering changes to the size and structure of the population.

Over the 7-year period (2011-18), the MYE data suggests that the population of the county has risen by 5%. Within this there is an increase of 10% in Vale of White Horse and a much smaller increase for Oxford (less than 3%).

Table 3.3.1: Population change for local authorities in Oxfordshire, 1991-2018

	Population (2011)	Population (2018)	Change	% change
Cherwell	142,252	149,161	6,909	4.9%
Oxford	150,245	154,327	4,082	2.7%
South Oxon	134,961	140,504	5,543	4.1%
VoWH	121,891	133,732	11,841	9.7%
West Oxon	105,442	109,800	4,358	4.1%
Oxfordshire	654,791	687,524	32,733	5.0%
South East	8,652,784	9,133,625	480,841	5.6%
England	53,107,169	55,977,178	2,870,009	5.4%

Source: ONS, Justin Gardner Consulting.

Table 3.3.2 below shows population change by age (again for the 2011-18 period). This generally identifies the greatest increases to be in older age groups (aged 65 and over) along with some notable population increases in the 50-54 and 55-59 age groups. The county also saw some population declines, particularly those aged 40-44.

Table 3.3.2: Population change by 5-year age bands in Oxfordshire, 1991-2018

	Population (2011)	Population (2018)	Change (2011-18)	% change (2011-18)
0-4	41,150	39,398	-1,752	-4.3%
5-9	36,257	42,783	6,526	18.0%
10-14	37,303	40,453	3,150	8.4%
15-19	41,788	40,021	-1,767	-4.2%
20-24	47,641	49,678	2,037	4.3%
25-29	46,654	44,772	-1,882	-4.0%
30-34	43,991	43,131	-860	-2.0%
35-39	43,545	45,310	1,765	4.1%
40-44	47,869	41,766	-6,103	-12.7%
45-49	48,424	46,432	-1,992	-4.1%
50-54	41,605	48,411	6,806	16.4%
55-59	35,992	43,672	7,680	21.3%
60-64	37,933	36,270	-1,663	-4.4%
65-69	30,761	33,692	2,931	9.5%
70-74	24,163	33,070	8,907	36.9%
75-79	19,828	23,221	3,393	17.1%
80-84	15,021	17,597	2,576	17.1%
85+	14,866	17,847	2,981	20.1%
All Ages	654,791	687,524	32,733	5.0%

Source: ONS, Justin Gardner Consulting.

This information has been summarised into three broad age bands in Table 3.3.3 to ease comparison between areas. Table 3.3.3 is for the whole county. This shows an increase in the number of children living in the county (increasing by about 6%) along with a small increase in the 'working-age' population (1%). The key driver of population growth has therefore been in the 65 and over age group, which between 2011 and 2018 saw a population increase of about 20,800 people: this age group increasing in size by 20% over the 7-year period. The modest growth in the core working-age population is a potential constraint on economic performance.

Table 3.3.3: Population change by broad age group in Oxfordshire, 2011-18

	Population (2011)	Population (2018)	Change (2011-18)	% change (2011-18)
Under 16	122,334	130,136	7,802	6.4%
16-64	427,818	431,961	4,143	1.0%
65+	104,639	125,427	20,788	19.9%
All ages	654,791	687,524	32,733	5.0%

Source: ONS, Justin Gardner Consulting.

Table 3.3.4 below shows the same information for each local authority. All areas have seen a notable increase in the population aged 65 and over, most notably in Cherwell (23% increase). Vale of White Horse saw the largest increases in the number of people aged under 16 and also in the 16-64 age group – this will be linked to this area seeing the highest overall increase in housing delivery and associated population since 2011. In contrast, both Oxford and West Oxfordshire saw small declines in the number of people aged 16-64 although the data does suggest a notable increase (of about 9%) in the population aged under 16 in the City.

Table 3.3.4: Population change by broad age group for local authorities, 2011-18

	Cherwell	Oxford	South Oxon	VoWH	West Oxon
Under 16	4.7%	8.6%	3.3%	11.3%	4.3%
16-64	0.6%	-0.1%	0.0%	5.7%	-1.0%
65+	22.9%	12.4%	19.1%	22.0%	21.4%
All ages	4.9%	2.7%	4.1%	9.7%	4.1%

Source: ONS, Justin Gardner Consulting.

3.4 Comparing estimates of population growth

The analysis above has focussed on using data from the ONS mid-year population estimates. It is worthwhile comparing estimates of population change with those from an alternative source (the Patient Register (PR)). The PR data is provided by ONS with their MYE releases by way of a comparator tool spreadsheet.

It should be noted that it is not recommended to use the PR data to establish the size of the population at a point in time: this is because this source does tend to overstate population as some people may be registered with a GP in more than one location – this tends to particularly impact on areas with larger numbers of younger people and student populations. However, the PR data can be a useful cross-checking tool in looking at the likely accuracy of population change as shown in the MYE. Table 3.4.1 shows estimated population change from each of these sources over the 2011-18 period.

Table 3.4.1: Comparison of ONS MYE with population estimates from the Patient Register

		2011	2018	Change	% change
Cherwell	MYE	142,270	149,150	6,880	4.8%
	Patient Register	*146,750*	*160,410*	*13,660*	*9.3%*
Oxford	MYE	150,300	154,340	4,040	2.7%
	Patient Register	*173,730*	*198,220*	*24,490*	*14.1%*
South Oxon	MYE	134,970	140,540	5,570	4.1%
	Patient Register	*138,630*	*147,620*	*8,990*	*6.5%*
VoWH	MYE	121,890	133,740	11,850	9.7%
	Patient Register	*125,250*	*137,950*	*12,700*	*10.1%*
West Oxon	MYE	105,460	109,770	4,310	4.1%
	Patient Register	*105,900*	*111,660*	*5,760*	*5.4%*
Oxfordshire	MYE	654,890	687,540	32,650	5.0%
	Patient Register	*690,260*	*755,860*	*65,600*	*9.5%*
South East	MYE	8,652,820	9,133,630	480,810	5.6%
	Patient Register	*8,937,030*	*9,602,900*	*665,870*	*7.5%*
England	MYE	53,107,200	55,977,180	2,869,980	5.4%
	Patient Register	*55,312,750*	*59,456,460*	*4,143,710*	*7.5%*

Source: ONS, Justin Gardner Consulting.

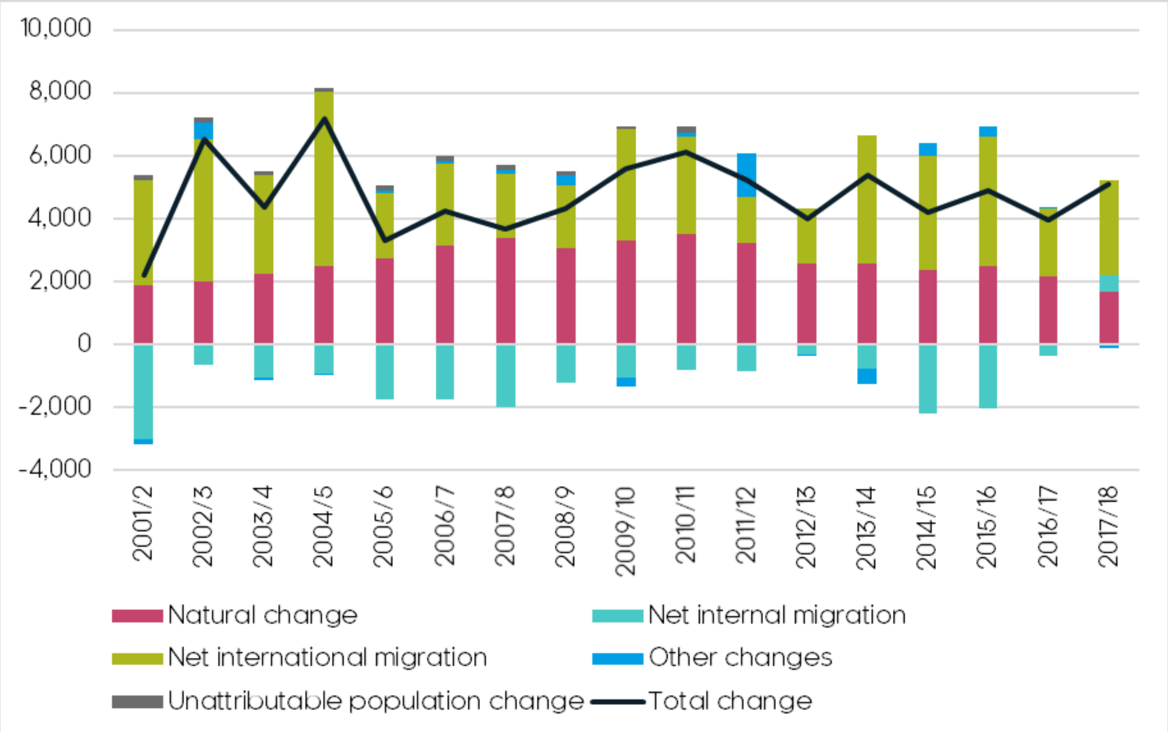
Initially focussing on Oxfordshire, the MYE data has estimated a population growth of 5%, however the PR data puts this at closer to 10%, this may suggest that the MYE data has underestimated past population growth to some extent. It does however need to be noted for both the South East and nationally that the PR data does suggest a much higher level of population growth (albeit a lower difference between sources than shown in Oxfordshire) meaning that the patient register data is likely to over-estimate overall population growth (as some people move away from the area and do not re-reregister doctors).

When looking at individual local authorities, the differences between the sources are more notable. In particular, it can be observed that whilst the MYE showed population growth of 3% in Oxford (the lowest in the county) the PR data shows an increase of 14% (the highest in the county). In Vale of White Horse, which had the highest population increase in the MYEs, the difference between MYE and PR changes is relatively small. The high degree of difference in Oxford in particular suggests that Oxford's population growth could have been under-estimated in the MYEs.

3.5 Components of population change

Population change is largely driven by natural change (births minus deaths) and migration, although within ONS data there is also a small 'other changes' category (mainly related to armed forces and prison populations) and an 'unattributable population change' (UPC) category. UPC is an adjustment made by ONS to mid-year population estimates where Census data suggests that population growth had either been over- or under-estimated in the period between the 2001 and 2011 Census. Because UPC links back to Census data, a figure is only provided for 2001 to 2011.

Figure 3.5.1: Components of population change in Oxfordshire, 2001-18



Source: ONS, Justin Gardner Consulting.

As shown in Figure 3.5.1 above and Table 3.5.1 below, natural change has been positive in Oxfordshire throughout the period, averaging a positive growth of around 2,400 people over the past 7-years. However, natural change has been falling over this period, due to a combination of both a reduction in the number of births and an increase in deaths. This is influenced by changes in the population age structure.

International migration is positive for all years studied and can be quite variable over time. For the past 7-years net international migration has averaged 2,900 people per year. In contrast, internal (domestic) migration has generally been negative, in other words more people move from Oxfordshire to other parts of the Country than move to Oxfordshire. It is notable that the last year for which data exists (2017-18) is the only year to show a positive net domestic migration.

Table 3.5.1: Components of population change in Oxfordshire, 2001-18

Year	Natural change	Net internal migration	Net international migration	Other changes	Other (un-attributable)	Total population change
2001/2	1,895	-3,016	3,338	-163	160	**2,214**
2002/3	1,981	-659	4,543	530	145	**6,540**
2003/4	2,249	-1,056	3,117	-66	137	**4,381**
2004/5	2,496	-926	5,517	-54	123	**7,156**
2005/6	2,715	-1,730	2,091	96	133	**3,305**
2006/7	3,142	-1,758	2,608	87	142	**4,221**
2007/8	3,397	-2,004	2,038	99	160	**3,690**
2008/9	3,058	-1,208	2,014	307	140	**4,311**
2009/10	3,297	-1,052	3,564	-288	72	**5,593**
2010/11	3,513	-807	3,088	125	184	**6,103**
2011/12	3,223	-851	1,467	1,379	0	**5,218**
2012/13	2,566	-318	1,756	-15	0	**3,989**
2013/14	2,567	-753	4,071	-506	0	**5,379**
2014/15	2,366	-2,189	3,644	392	0	**4,213**
2015/16	2,507	-2,018	4,075	330	0	**4,894**
2016/17	2,157	-374	2,176	1	0	**3,960**
2017/18	1,673	544	2,985	-122	0	**5,080**

Source: ONS, Justin Gardner Consulting.

Other changes are quite small and variable over time, whilst the data shows a modest (and positive) level of UPC. The positive UPC suggests that previous ONS components of change data may have under-estimated population growth in the county between 2001-11, although the numbers involved are not substantial (and they are also now somewhat historic). Similar tables have been produced for the individual local authorities in Oxfordshire. These can be found in *Appendix A: Components of Population Change by Local Authority.*

As noted above, there was also a considerable amount of movement within Oxfordshire. Table 3.5.2 shows a matrix of moves between the different local authorities in the county (on a per annum basis for the 5-year period to mid-2018), while Table 3.5.3 summarises this into overall in- and out-flows for each local authority. Table 3.5.2 shows for example that an average of 1,168 people moved from Oxford to Cherwell in the period, with 493 moving in the other direction (net migration to Cherwell of 675 people).

When the matrix data is summarised (Table 3.5.3), it can be seen that there is a substantial net out-migration from Oxford to other parts of the county (also a more modest net out-migration from South Oxfordshire). Net migration was strongest to Vale of White Horse and Cherwell.

Table 3.5.2: Origin and destination of population moving local authority within Oxfordshire, 2013-18

		Origin				
		Cherwell	Oxford	South Oxon	VoWH	West Oxon
Destination	Cherwell	-	1,168	290	278	503
	Oxford	493	-	557	778	314
	South Oxon	207	939	-	790	124
	VoWH	261	1,641	1,109	-	361
	West Oxon	566	647	160	433	-

Source: ONS, Justin Gardner Consulting.

Table 3.5.3: Moves to and from each local authority in Oxfordshire (moves within Oxfordshire only), 2018

	Origin	Destination	Net moves to LA
Cherwell	1,527	2,239	712
Oxford	4,394	2,141	-2,253
South Oxon	2,116	2,060	-56
VoWH	2,279	3,371	1,092
West Oxon	1,301	1,806	504

Source: ONS, Justin Gardner Consulting.

A similar analysis can be carried out using 2011 Census data. This has the advantage of being a more complete data set, but the disadvantage that the information is more dated. Generally, the patterns of migration are the same, with net movements from Oxford and South Oxfordshire, along with net moves to the other three local authority areas. The volume of moves shown in the Census is slightly somewhat lower than recorded by ONS in the 2013-18 period.

Table 3.5.4: Origin and destination of population moving local authority within Oxfordshire, 2011

		Origin				
		Cherwell	Oxford	South Oxon	VoWH	West Oxon
Destination	Cherwell	-	959	232	263	464
	Oxford	614	-	706	950	372
	South Oxon	215	667	-	612	161
	VoWH	185	1,078	841	-	370
	West Oxon	443	556	199	422	-

Source: ONS, Justin Gardner Consulting.

Table 3.5.5: Moves to and from each local authority in Oxfordshire (moves within Oxfordshire only) 2011

	Origin	Destination	Net moves to LA
Cherwell	1,457	1,918	461
Oxford	3,260	2,642	-618
South Oxon	1,978	1,655	-323
VoWH	2,247	2,474	227
West Oxon	1,367	1,620	253

Source: ONS, Justin Gardner Consulting.

Using the Census source, it is also possible to look at the origins and destinations of migrants to and from Oxfordshire. Table 3.5.6 below shows moves to/from the county from neighbouring authorities plus details for all regions in the United Kingdom. In the period considered in the Census (2010-11) it can be seen that migration was virtually in balance (30,081 people moved to Oxfordshire and 30,082 moved out).

Table 3.5.6: Locations of migrants moving to and from Oxfordshire, 2011

Local authorities	Moved from Oxfordshire to…	Moved to Oxfordshire from…	Net migration to Oxfordshire
Cotswold	430	369	-61
Swindon	712	410	-302
Stratford-on-Avon	334	340	6
South Northamptonshire	561	497	-64
Aylesbury Vale	846	843	-3
Reading	689	656	-33
West Berkshire	558	566	8
Wokingham	284	351	67
Wycombe	479	693	214
Regions and other	Moved from Oxfordshire to…	Moved to Oxfordshire from…	Net migration to Oxfordshire
East	1,934	2,609	675
Rest of East Midlands	1,911	1,718	-193
London	5,709	5,301	-408
North East	482	479	-3
North West	1,278	1,407	129
Northern Ireland	156	217	61
Scotland	736	955	219
Rest of South East	4,214	4,977	763
Rest of South West	4,374	3,522	-852
Wales	1,024	897	-127
Rest of West Midlands	2,199	2,068	-131
Yorkshire and The Humber	1,172	1,206	34
Total UK moves	30,082	30,081	-1
Moved from abroad	N/A	11,537	N/A

Source: ONS, Justin Gardner Consulting.

Looking locally, the data suggests a relatively strong move of people to Swindon and stronger net in-migration from Wycombe. The analysis tends to show an east/west population movement – i.e. people generally moving from authorities to the east and moving out to the west. Looking more widely, the analysis shows quite a strong net migration from the East of England region and also the rest of the South East (i.e. excluding neighbouring authorities). The main net out migration is to the rest of the South West region, and there was also a modest level of net migration to London.

Analysis of the Census data also show (as per earlier components of change data) that the vast majority of international migrants move to Oxford City (58% of all in-migrants). Generally, the profile of the countries people come from is similar in different locations although the data does show a number of trends:

- A high proportion of Polish and American (USA) migrants to Cherwell

- A high level of international migrants to Oxford, from a range of international locations
- A high proportion of German migrants to Vale of White Horse

In interpreting this data it does need to be remembered that the information is from 2011 and could well have changed slightly in more recent years, it is also possible that there could be further changes impacting on the study area such as Global Talent Research Visas. Levels of international migration should therefore be monitored, including through any new releases of data from ONS.

Table 3.5.7: Previous location of international migrants to Oxfordshire, 2011

	Cherwell	Oxford	South Oxon	VoWH	West Oxon	Oxfordshire
Ireland	35	151	36	35	17	**274**
France	45	416	71	117	63	**712**
Germany	110	443	58	304	38	**953**
Italy	26	172	32	16	12	**258**
Spain	70	281	65	49	60	**525**
Poland	172	199	71	25	41	**508**
Other EU	200	857	210	227	151	**1,645**
Other Europe	39	394	48	50	23	**554**
Africa	85	334	62	96	39	**616**
Middle East	38	226	50	54	37	**405**
China	28	324	14	13	16	**395**
Other Eastern Asia	33	325	29	38	20	**445**
India	75	262	29	29	6	**401**
Other Southern Asia	35	231	24	44	14	**348**
South-East Asia	49	404	54	58	41	**606**
USA	259	840	114	112	57	**1,382**
Canada	16	252	21	42	30	**361**
Other North/Central/South America/Caribbean	20	223	34	39	15	**331**
Australia	65	295	70	102	68	**600**
New Zealand	25	105	26	27	19	**202**
Other Australasian/Oceania	6	5	0	4	1	**16**
Total	**1,431**	**6,739**	**1,118**	**1,481**	**768**	**11,537**

Source: ONS, Justin Gardner Consulting.

Table 3.5.8: Previous location of international migrants to Oxfordshire (% of total), 2011

	Cherwell	Oxford	South Oxon	VoWH	West Oxon	**Oxfordshire**
Ireland	2.4%	2.2%	3.2%	2.4%	2.2%	**2.4%**
France	3.1%	6.2%	6.4%	7.9%	8.2%	**6.2%**
Germany	7.7%	6.6%	5.2%	20.5%	4.9%	**8.3%**
Italy	1.8%	2.6%	2.9%	1.1%	1.6%	**2.2%**
Spain	4.9%	4.2%	5.8%	3.3%	7.8%	**4.6%**
Poland	12.0%	3.0%	6.4%	1.7%	5.3%	**4.4%**
Other EU	14.0%	12.7%	18.8%	15.3%	19.7%	**14.3%**
Other Europe	2.7%	5.8%	4.3%	3.4%	3.0%	**4.8%**

Africa	5.9%	5.0%	5.5%	6.5%	5.1%	**5.3%**
Middle East	2.7%	3.4%	4.5%	3.6%	4.8%	**3.5%**
China	2.0%	4.8%	1.3%	0.9%	2.1%	**3.4%**
Other Eastern Asia	2.3%	4.8%	2.6%	2.6%	2.6%	**3.9%**
India	5.2%	3.9%	2.6%	2.0%	0.8%	**3.5%**
Other Southern Asia	2.4%	3.4%	2.1%	3.0%	1.8%	**3.0%**
South-East Asia	3.4%	6.0%	4.8%	3.9%	5.3%	**5.3%**
USA	18.1%	12.5%	10.2%	7.6%	7.4%	**12.0%**
Canada	1.1%	3.7%	1.9%	2.8%	3.9%	**3.1%**
Other North/Central/South America/Caribbean	1.4%	3.3%	3.0%	2.6%	2.0%	**2.9%**
Australia	4.5%	4.4%	6.3%	6.9%	8.9%	**5.2%**
New Zealand	1.7%	1.6%	2.3%	1.8%	2.5%	**1.8%**
Other Australasian/Oceania	0.4%	0.1%	0.0%	0.3%	0.1%	**0.1%**
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: ONS, Justin Gardner Consulting.

3.6 Relationship between housing and migration

The final analysis in this chapter considers the relationship between housing completions and net migration. Logically, additional homes would enable increased migration into an area and so there might be expected to be some relationship between the two. Table 3.6.1 and Table 3.6.2 below look at completions and migration over the 7-year period 2011-18.

They show the number of completions in each area and net migration (as recorded by MYE and to include both internal and international migration) respectively. Overall, it can be seen that net additions to the stock are definitely in an upward direction, with net migration also being generally upward (although with some year-on-year variation).

Table 3.6.1: Housing completions (net additions to dwelling stock) 2011-18

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Cherwell	356	340	410	946	1,425	1,102	1,387
Oxford	228	213	215	332	440	435	373
South Oxon	508	475	484	600	608	722	936
VoWH	346	268	578	740	1,133	1,615	1,573
West Oxon	359	278	186	395	246	518	556
Oxfordshire	**1,797**	**1,574**	**1,873**	**3,013**	**3,852**	**4,392**	**4,825**

Source: Oxfordshire councils, Justin Gardner Consulting.

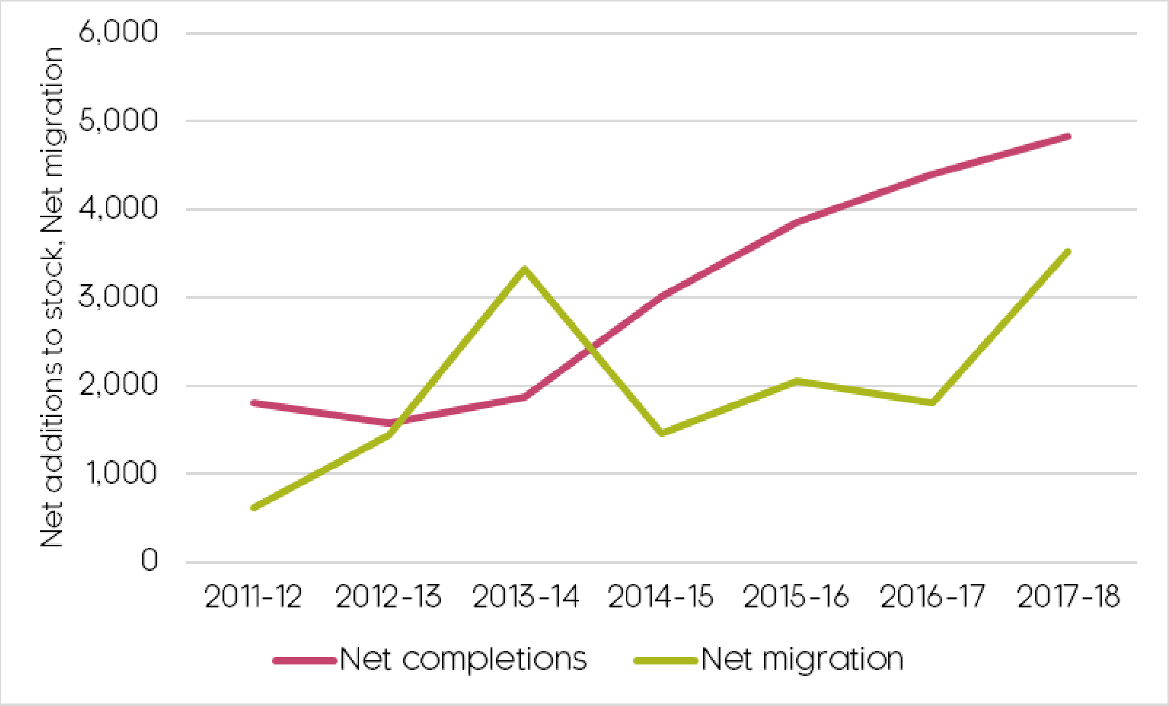
Table 3.6.2: Net migration by local authority, 2011-18

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Cherwell	-141	57	409	182	271	402	1,039
Oxford	96	-45	1,180	-853	-401	-1,492	-936
South Oxon	247	377	648	455	507	303	630
VoWH	5	633	892	1,505	1,695	2,101	2,190
West Oxon	409	416	189	166	-15	488	606
Oxfordshire	**616**	**1,438**	**3,318**	**1,455**	**2,057**	**1,802**	**3,529**

Source: ONS, Justin Gardner Consulting.

Figure 3.6.1 shows the same data in graphical form (for the whole of the county). Whilst the relationship between completions and migration is far from perfect, it is clear that both are generally in an upwards trend. Were the local authorities continue to provide additional dwellings at the higher levels seen recently, then migration could also be expected to run at a higher level than typically seen in the past. This could be expected to support resident workforce growth (i.e. residents in employment).

Figure 3.6.1: Housing completions and net migration in Oxfordshire, 2011-18



Source: Oxfordshire Councils, ONS, Justin Gardner Consulting.

3.7 Official population projections

Having studied a range of data about past trends, the next stage is to consider future projections. The latest (2018-based) set of subnational population projections (SNPP) were published by ONS in March 2020. The projections provide estimates of the future population of local authorities, assuming a continuation of recent local trends in fertility, mortality and migration which are constrained to the assumptions made in the ONS 2018-based national population projections.

The 2018-based SNPP contain a number of assumptions that have been changed from the 2016-based version, these assumptions essentially filter down from changes made at a national level. The key differences are:

- ONS' long-term international migration assumptions have been revised upwards to 190,000 per annum compared to 165,000 in the 2016-based projections. This is based on a 25-year average;
- The latest projections assume that women will have fewer children, with the average number of children per woman expected to be 1.78 compared to 1.84 in the 2016-based projections; and

- Life expectancy increases are less than in the 2016-based projections as a consequence of the continued limited growth in life expectancy over the last two years.

Table 3.7.1 below shows projected population growth from 2018 to 2043[16] in Oxfordshire and a range of comparator areas. The data shows that the population of the county is projected to increase by around 9%; this is slightly higher than projected across the South East but below the national average growth (10%) – this is despite past trends typically showing similar patterns across these three areas. The average level of population growth in the projections is an increase of about 2,500 people per annum; substantially lower than seen over the past 7-years (average growth recorded by MYE of 4,700 people per annum).

Table 3.7.1: Projected population growth in Oxfordshire, 2018-43 (2018-based SNPP)

	Population, 2018	Population, 2043	Change in population, 2018-43	% change in population, 2018-43
Oxfordshire	687,524	750,634	63,110	9.2%
South East	9,133,625	9,933,760	800,135	8.8%
England	55,977,178	61,744,108	5,766,930	10.3%

Source: ONS, Justin Gardner Consulting.

The equivalent figures for individual Oxfordshire authorities are shown in Table 3.7.2 below. This also shows the projected population growth to 2050.

Table 3.7.2: Projected population growth in Oxfordshire, 2018-50 (2018-based SNPP)

	2018	2020	2043	2050	% change, 2018-43	% change, 2020-50
Cherwell	149,161	150,862	162,278	165,325	8.8%	9.6%
Oxford	154,327	153,580	147,326	147,005	-4.5%	-4.3%
South Oxon	140,504	141,840	149,938	152,581	6.7%	7.6%
VoWH	133,732	137,175	156,825	160,545	17.3%	17.0%
West Oxon	109,800	110,391	114,068	115,483	3.9%	4.6%
Oxfordshire	**687,524**	**693,848**	**730,435**	**740,939**	**6.2%**	**6.8%**

Source: ONS, Justin Gardner Consulting.

As well as providing a principal projection, ONS has developed a number of variants. In all cases the projections use the same fertility and mortality rates with differences being applied in relation to migration. The key variants in terms of this assessment can be described as:

- principal projection
- an alternative internal migration variant
- a 10-year migration variant

In the principal projection, data about internal (domestic) migration uses data for the past 2-years and data about international migration from the past 5-years. The use of 2-years data for internal migration has been driven by ONS changing their methodology for recording internal moves, with this data being available from 2016 only. In particular the change in methodology seeks to

[16] The ONS 2018-based SNPP run to 2043.

better account for the moves of graduates when they finish studying at university.

The alternative internal migration variant uses data about migration from the last 5-years (2013-18), as well as also using 5-years of data for international migration. This variant is closest to replicating the methodology used in the 2016-based SNPP although it does mean for internal migration that data used is collected on a slightly different basis.

The 10-year migration variant (as the name implies) uses data about trends in migration over the past decade (2008-18). This time period is used for both internal and international migration.

Table 3.7.3 below shows a comparison of the projected levels of population growth in each of these variants. For comparison data has also been provided from the last SNPP (2016-based). The data looks at a 23-year period from 2018-41 as this is the longest period for which data is available from both projections. This shows that there is a notable difference in the projected level of growth depending on the variant studied; the principal projection showing the highest projected growth. The 2016-based SNPP also showed a lower level of projected growth than the principal variant, but a level in line with the 2018-based alternatives.

Table 3.7.3: Projected population growth in Oxfordshire, 2018-41

	Population, 2018	Population, 2041	Change in population, 2018-41	% change in population, 2018-41
2016-based	684,300	728,100	43,800	6.4%
2018 (principal)	687,524	746,578	59,054	8.6%
2018 (alternative internal)	687,524	727,497	39,973	5.8%
2018 (10-year trend)	687,524	732,058	44,534	6.5%

Source: ONS, Justin Gardner Consulting.

3.8 Developing an adjusted baseline

An adjusted baseline projection has been developed by JGC taking account of the demographic analysis above. In particular this recognises the analysis from the Patient Register that suggests the population of Oxford may have been substantially underestimated over the past 7-years (2011-18). Given the potential under-estimation, this would imply that there has been an underestimate of the level of migration to the City (and to a lesser extent other areas).

To develop an adjusted baseline the following key assumptions have been made.

- Base population from the 2018-based subnational population projections (SNPP) – the alternative internal migration variant. This has been chosen as it is considered that the principal SNPP has too short a data period when looking at internal migration whilst the 10-year alternative is not thought likely to reflect recent changes seen in Oxfordshire such as a general uplift in housebuilding;
- Projections run from 2020 to 2050 to align with the timeframes of the Oxfordshire Plan;

- Population data for 2018 fixed by reference to estimates made from mid-year population estimates (MYE) and Patient Register (PR) data. Given previous analysis, both the MYE and PR are taken into account with population levels essentially assumed to be around the average growth in these two sources applied to 2011 MYE data (which was informed by the 2011 Census);
- Population to 2020 derived from estimating potential population change given the number of net housing completions (2018-20);
- Fertility and mortality rates (by age and sex) as per the 2018-based SNPP – where rolled forward from 2043 to 2050 this assumes a continuation of any trends identified in the SNPP;
- The migration profile (by age and sex) in the same proportions as the 2018-based SNPP – where rolled forward from 2043 to 2050 this assumes a continuation of any trends identified in the SNPP; and
- Future migration is estimated based on the likely uplift in migration needed to achieve the level of population estimated for 2018.

Table 3.8.1 below shows the estimated level of population growth with this adjusted baseline and how it compares with the last official projections (2018-43) – this period being used as 2043 is the latest date for which SNPP data is available to allow the results to be compared with the published SNPP data.

This shows that the adjusted baseline projection has population growth which is some way above any of the variants, showing a population growth over the 2018-43 period of 15%. The resultant Oxfordshire population grows to 796,400 in 2043 compared to 750,600 in the 2018-based SNPP. It will also be noted that the adjustments to the base population for 2018 increases the estimated number of people by around 5,600.

Table 3.8.1: Projected population growth in Oxfordshire – adjusted baseline, 2018-2043

	Population, 2018	Population, 2043	Change in population, 2018-43	% change in population, 2018-43
2018 (principal)	687,524	750,633	63,109	9.2%
2018 (alternative internal)	687,524	730,436	42,912	6.2%
2018 (10-year trend)	687,524	735,435	47,911	7.0%
Adjusted baseline total	693,082	796,380	103,299	14.9%

Source: ONS, Justin Gardner Consulting.

The resultant population growth in Oxfordshire, and its constituent local authority areas, to 2043 and 2050 in the adjusted baseline projections are shown in Table 3.8.2 below.

Table 3.8.2: Projected population growth in Oxfordshire – adjusted baseline, 2018-2050

	2018	2020	2043	2050	% change, 2018-43	% change, 2020-50
Cherwell	150,263	156,459	175,226	180,217	16.6%	15.2%
Oxford	160,483	163,856	189,401	199,061	18.0%	21.5%
South Oxon	140,752	147,161	159,186	162,471	13.1%	10.4%
VoWH	132,048	138,745	153,570	155,100	16.3%	11.8%
West Oxon	109,535	114,339	118,997	120,171	8.6%	5.1%
Oxfordshire	**693,082**	**720,560**	**796,380**	**817,020**	**14.9%**	**13.4%**

Source: ONS, Justin Gardner Consulting.

3.9 Age structure changes

With the overall change in the population will also come changes to the age profile. The tables below summarise findings for key (5 year) age groups with the 2018-based SNPP (principal projection) and also the adjusted baseline.

Looking at the SNPP it is clear that the largest growth will be in people aged 65 and over; in 2043 it is projected that there will be 189,800 people aged 65 and over, this is an increase of 64,400 from 2018, representing growth of 51%. The population aged 85 and over is projected to increase by an even greater proportion, 109%. Looking at the other end of the age spectrum the data shows that there is projected to be a reduction in the number of children (those aged Under 15), with increases or decreases shown for other age groups.

Table 3.9.1: Population change 2018-2043 by five-year age bands in Oxfordshire (2018-based SNPP)

	Population, 2018	Population, 2043	Change in population, 2018-43	% change in population, 2018-43
Under 5	39,398	38,927	-471	-1.2%
5-9	42,783	38,634	-4,149	-9.7%
10-14	40,453	39,049	-1,404	-3.5%
15-19	40,021	42,984	2,963	7.4%
20-24	49,678	50,579	901	1.8%
25-29	44,772	47,044	2,272	5.1%
30-34	43,131	45,953	2,822	6.5%
35-39	45,310	42,745	-2,565	-5.7%
40-44	41,766	39,916	-1,850	-4.4%
45-49	46,432	42,886	-3,546	-7.6%
50-54	48,411	44,309	-4,102	-8.5%
55-59	43,672	44,008	336	0.8%
60-64	36,270	43,798	7,528	20.8%
65-69	33,692	39,114	5,422	16.1%
70-74	33,070	41,252	8,182	24.7%
75-79	23,221	39,893	16,672	71.8%
80-84	17,597	32,277	14,680	83.4%
85+	17,847	37,260	19,413	108.8%
Total	687,524	750,634	63,110	9.2%

Source: ONS, Justin Gardner Consulting.

Using the adjusted baseline, there is still a significant ageing of the population but the increase in the population aged under 65 is more notable. The change in the under 65 age group relative to older groups reflects the migration assumptions, migration being largely concentrated in typical working-age groups (and their associated children).

Table 3.9.2: Population change 2018-2043 by five-year age bands in Oxfordshire (adjusted baseline)

	Population, 2018	Population, 2043	Change in population, 2018-43	% change in population, 2018-43
Under 5	39,670	41,173	1,503	3.8%
5-9	41,428	41,257	-171	-0.4%

10-14	40,220	42,482	2,262	5.6%
15-19	41,442	47,175	5,733	13.8%
20-24	50,025	56,350	6,325	12.6%
25-29	48,427	50,805	2,379	4.9%
30-34	46,135	47,551	1,416	3.1%
35-39	45,990	45,062	-928	-2.0%
40-44	43,130	44,941	1,811	4.2%
45-49	47,163	46,132	-1,031	-2.2%
50-54	47,762	49,220	1,458	3.1%
55-59	42,693	47,657	4,964	11.6%
60-64	36,832	44,803	7,971	21.6%
65-69	33,567	40,674	7,107	21.2%
70-74	31,458	42,255	10,797	34.3%
75-79	22,702	39,653	16,952	74.7%
80-84	17,137	31,656	14,519	84.7%
85+	17,302	37,535	20,234	116.9%
Total	693,082	796,380	103,299	14.9%

Source: ONS, Justin Gardner Consulting.

Table 3.9.3 below compares population change in each of the 2018-based SNPP and the adjusted baseline. This confirms that the key differences between the projections are higher numbers of younger people in the adjusted baseline – notably in the 30-44 age groups.

Table 3.9.3: Population change 2018 to 2043 by five-year age bands, Oxfordshire (2018-based SNPP and adjusted baseline)

	2018-based SNPP (principal) population change, 2018-43	Adjusted baseline population change, 2018-43	Difference in population change, 2018-43
Under 5	-471	1,503	1,974
5-9	-4,149	-171	3,978
10-14	-1,404	2,262	3,666
15-19	2,963	5,733	2,770
20-24	901	6,325	5,424
25-29	2,272	2,379	107
30-34	2,822	1,416	-1,406
35-39	-2,565	-928	1,637
40-44	-1,850	1,811	3,661
45-49	-3,546	-1,031	2,515
50-54	-4,102	1,458	5,560
55-59	336	4,964	4,628
60-64	7,528	7,971	443
65-69	5,422	7,107	1,685
70-74	8,182	10,797	2,615
75-79	16,672	16,952	280
80-84	14,680	14,519	-161
85+	19,413	20,234	821
Total	63,110	103,299	40,189

Source: ONS, Justin Gardner Consulting.

3.10 Household formation

Household projections are developed by applying age/ sex specific household representative rates (HRRs) to the projected growth in population. HRRs can be described in their most simple terms as the number of people who are counted as heads of households (or in this case the more widely used Household Reference Person, HRP).

The latest HRRs are as contained in the ONS 2016-based Subnational Household Projections (SNHP) which were published in September 2018. In these latest projections, the HRR is projected for different age/sex cohorts based on trends seen between 2001 and 2011. Trends over this period are projected forwards to 2021, with the HRR then held constant at the 2021 level thereafter.

The methodology used is different to that in previous sets of household projections, which had projected trends in household formation (by age/sex) based on trends arising since the 1971 Census. ONS have set out that the change of HRP definition means it is no longer possible to use the 1971, 1981 and 1991 Census data used in the previous methodology in the production of the 2016-based household projections. Household data from these previous censuses used the eldest male definition of HRP, therefore, to include data from them in the methodology would require complex adjustments to be made to derive projections.

It would be fair to say that the 2016-based SNHP have come under some criticism, largely because they are based only on data in the 2001-11 Census period, using just two data points, and they arguably build in the suppression of household formation experienced in that time being based on a period in which housing affordability deteriorated relatively rapidly restricting in particular the ability of younger households to form.

Because of the criticisms of the 2016-based SNHP, and the fact that these have driven the Government to consult on reviewing their use in Standard Method, it is considered prudent in this report to look at both the 2016-based and 2014-based figures (the 2014-based figures being of the set of projections which the Government advises should be used in the Standard Method).

Figure 3.10.1 below compares HRRs in the 2014-based and 2016-based SNHP. The trends show essentially the proportion of a particular age group that is considered to be the ‘head of household’ (HRP as described above). The analysis shows that for many age groups the two projections are really quite different. When looking at some of the younger age groups (particularly 25-34) it is notable that the HRRs in the 2014-based projections are somewhat higher. This does suggest in Oxfordshire (as nationally) that there may be some degree of suppression being built into the 2016-based projections, or certainly not a positive improvement in the formation rates of younger people.

The Government’s advice that the 2014-based Household Projections should be used in the Standard Method takes this into account; the Government having set out[17]that the lower household formation in more recent projections has been influenced by housing supply constraints which have inhibited households from forming and there is a case for public policy to support

[17] MHCLG (2018) *Technical consultation on updates to national planning policy and guidance*

housing delivery in excess of the household projections, with the ONS itself indicating that if more homes are built, the increased availability of homes may result in more household forming.[18]

The 2016-based projections are also notable for showing an increasing formation rate in the 75-84 age group, and also for people aged 85+. Given improvements to life expectancy, it might be expected in reality that these rates would go down (as people live together as couples for longer). A decreasing rate was projected in the 2014-based projections and this is a further reason why the 2014-based figures might be considered as more robust.

Figure 3.10.1 below also shows the same information from the 2008-based SNHP. Generally, for younger age groups these older projections show a more positive level of household formation and whilst they are quite dated, they are a source that is regularly used to develop scenarios with a more positive view about household formation of younger people.

[18] ONS (2018) *What our household projections really show*

Figure 3.10.1: Projected Household Representative Rates by age of head of household in Oxfordshire, 2001-2041

Source: ONS, Justin Gardner Consulting.

Taking into consideration the significant difference between the household formation assumptions in the 2014- and 2018-based SNHP, the reports has modelled scenarios which examine the implications of both sets of assumptions.

3.11 Household growth and housing need

Table 3.11.1 and Table 3.11.2 below show estimates of household growth with each of the HRR scenarios, as well as the estimate of the number of additional dwellings expected to be needed. The figures firstly link to population growth in the 2018-based SNPP (alternative internal migration variant) and then using the adjusted baseline.

To convert households into dwellings the analysis includes an uplift to take account of vacant homes. For the purposes of analysis, it has been assumed that the number of vacant homes in new stock would be 3% higher than the number of occupied homes (which is taken as a proxy for households) and hence household growth figures are uplifted by 3% to provide an estimate of housing need. This figure is a fairly standard assumption when looking at vacancy rates in new stock and will allow for movement within the housing stock.

When linked to the 2018-based SNPP, the analysis shows an overall housing need for 1,453 dwellings per annum across the county when using the 2016-based SNHP as the underlying household projection. This figure increases to 1,552 dwellings per annum with the previous (2014-based) HRR figures.

Linked to the adjusted baseline the figures are somewhat higher with a need for 2,522 dwellings per annum based on the 2014-based household representative rates.

Table 3.11.1: Projected housing need for Oxfordshire associated with 2018-based SNPP with alternative Household Representative Rate assumptions

	Households, 2018	Households, 2043	Change in households, 2018-43	Change in households p.a., 2018-43	Dwellings needed p.a., 2018-43
2016-SNHP HRRs	272,301	307,565	35,264	1,411	1,453
2014-SNHP HRRs	276,216	313,887	37,670	1,507	1,552

Source: ONS, Justin Gardner Consulting.

Table 3.11.2: Projected housing need for Oxfordshire associated with adjusted population baseline with alternative Household Representative Rate assumptions

	Households, 2018	Households, 2043	Change in households, 2018-43	Change in households p.a., 2018-43	Dwellings needed p.a., 2018-43
2016-SNHP HRRs	273,752	332,100	58,348	2,334	2,404
2014-SNHP HRRs	277,537	338,754	61,217	2,449	2,522

Source: ONS, Justin Gardner Consulting.

Iceni has taken into account that the Government has expressed significant reservations regarding the 2016-based Household Projections in its Technical consultation on updates to national planning policy and guidance (MHCLG, Oct 2018) and the Statement released from ONS on these projections which outlined that:

> *"They [the 2016-based Household Projections] do not take account of how many people may want to form new households, but for whatever reason aren't able to, such as young adults wanting to move out of their parents' house, or people wanting to live on their own instead of in a house share. Therefore, household projections are not a measure of how many houses would need to be built to meet housing demand; they show what would happen if past trends in actual household formation continue."*
>
> *"Although the latest household projections are lower than the previously published projections, this does not directly mean that fewer houses are needed in the future than thought. This is because the projections are based on recent actual numbers of households and are not adjusted to take account of where homes have been needed in recent years but have not been available. Therefore, if more homes are built, the increased availability of homes may result in more households forming. The opposite is also true – if fewer homes are built then fewer households are able to form."*

The 2018-based SNHP adopt a consistent methodology to household formation as the 2016-based set of projections.

ONS similarly state alongside the release of the 2018-based Household Projections that:

> "*Household projections are not a prediction or forecast of how many houses should be built in the future. Instead, they show how many additional households would form if assumptions based on previous demographic trends in population growth and household formation were to be realised*."

Given these criticisms of the methodology used in the 2016- and 2018-based SNHP it is considered that drawing conclusions about the level of housing need linked to official population projections are more robustly based on looking at the previous (2014-based) set of SNHP. These earlier projections looked at longer term trends in household formation and are therefore less likely to build in any of the suppression/constraints faced by households since the early 1990s. This is consistent with the approach recommended by the Government in its Planning Practice Guidance which specifically advocates the use of the 2014-based projections in the Standard Method.

When considering alternative scenarios for housing need based on economic trends, there is a case for adjusting household formation amongst younger households to ensure that Government's ambitions to improve affordability are realised. This is considered further later in the report in modelling the demographic implications of alternative scenarios for housing need.

3.12 Conclusions

Oxfordshire has a population of 687,500 in 2018 and has a higher proportion of young people than wider benchmarks. It has seen population growth over the 2011-18 period which has been below the regional and national average; and has resulted in a virtually unchanged position in terms of the core working age population aged 16-64 which has grown by just 1% over this period.

The latest official projections, which are 2018-based, project substantially lower population growth than has been seen in Oxfordshire in recent years.

The review of demographic data undertaken indicates that it is likely that Oxford's population has been under-estimated. This has been recognised in previous evidence base documents in Oxfordshire which have considered housing need.

To address these issues, revised demographic projections have been developed to provide a revised baseline assessment of the demographic need for housing informed by past population trends. These show population growth of 14.9% between 2018-43 compared to 9.2% in the ONS 2018-based SNPP, with the county's population growing to 817,000 in 2050.

The analysis shows that to ensure the calculations are not projecting forward suppressed formation of households seen in recent years, the headship rates from the 2014-based Household Projections should be applied to this in projecting household growth. These revised projections feed into the analysis of the starting point Local Housing Need in *Chapter 7*, the economic implications of which are also considered in *Chapter 8*.

4 Oxfordshire's Housing Market

4.1 Introduction

Oxfordshire's housing market is dynamic and complex. This chapter explores housing market dynamics and affordability in Oxfordshire, with a view to understanding key drivers of the housing market. It considers dynamics in the sales market, private renting and the affordable housing sector. This understanding of market dynamics and affordability pressures provides an important grounding for considering future housing need.

Housing demand over the plan period is likely to be influenced particularly by population and economic trends: changes in the size and structure of the population directly influence the need for housing; whilst factors such as how Oxfordshire's economy performs and the growth in its universities can be expected to influence the movement of people in and out of the county.

At a more local level, the relative demand and pricing of homes in different places will be influenced by factors such as the existing housing stock, quality of place and accessibility to employment centres. Places with concentrations of higher paid jobs – such as Oxford City – typically have higher house prices, as both demand for housing is stronger, and earnings influence what people can afford.

Changes in housing costs over time tell us about the supply/demand balance for housing. When supply is not keeping pace with effective demand, prices rise (and visa-versa). Demand is influenced by both macro-economic factors such as the wider economic outlook (which influences buyers' investment decisions) and interest rates (which affect the affordability of mortgage repayments), but also by local factors including the levels of employment growth in an area.

Oxfordshire constitutes a single functional housing market area.[19] As such there are inter-relationships between dynamics in different parts of the county and people move home across administrative boundaries within Oxfordshire. This chapter thus seeks to understand dynamics across Oxfordshire, but also in different parts of the county.

4.2 Trends in house prices and sales

Trends in house prices

As of June 2019, the median house price in Oxfordshire was £350,000. This is 9% higher than South East England (£322,000) and 46% higher than across England (£240,000).[20]

As Figure 4.2.1 shows, although house prices in Oxfordshire have been above the regional and national average, there has been a relative increase in the house price differential over recent years. This is indicative of stronger comparative demand and a more substantive supply/demand imbalance than is the case nationally. Iceni's analysis indicates that:

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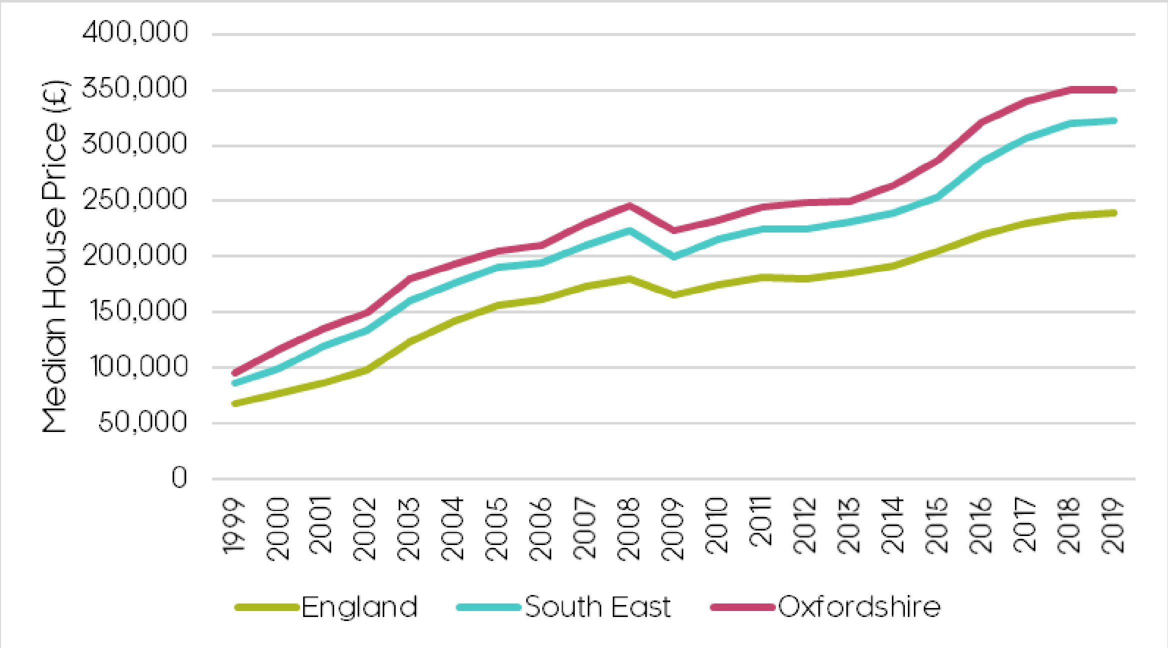
[19] The evidence base for this is set out in the 2014 Oxfordshire Strategic Housing Market Assessment

[20] ONS (2019) – HPSSA Dataset 9.

- Median house prices in Oxfordshire have grown by a substantial £126,000 over the last decade (2009-2019).
- This has substantially outstripped house price growth over this period at a national level (£75,000) and indeed is slightly above the growth seen across the SE region (£122,000);
- Median house prices in Oxfordshire at £350,000 are now £250,000 (249%) above where they were in 1999 with the growth in prices driving a notable deterioration in the affordability of market housing;
- There has been particularly sharp recent house price growth, with the median house price increasing by £86,000 over just a five year period between 2014-19, influenced by an upturn in demand. The evidence suggests that strong economic performance plus Government support for the housing market have driven demand in this period, and what whilst supply has increased over this period it did not fully meet demand at an Oxfordshire level.

Figure 4.2.1: Median house prices, 1999-2019



Source: ONS, Iceni Projects.

As identified in the Local Industrial Strategy (LIS) Baseline Economic Review[21], price dynamics can be segmented into three phases: the first from 2000 to early 2007 when prices grew rapidly fuelled by a strong national economy, high levels of real wage growth, strong mortgage finance availability and a growing population.

Between early 2008 and late 2013 the market was generally flat influenced by the global financial crisis and weakened mortgage finance availability. Between 2013-19 the market picked up, but it is notable that price performance in Oxfordshire has diverged notably from the national average over this period.

[21] Section 3.7.

This aligns with strong economic performance in Oxfordshire, which the evidence suggests has driven the divergence from wider trends at a regional/ national level, together with a period of increased mortgage availability and Government support for the market through the Help-to-Buy Scheme. Uncertainties associated with Brexit and affordability issues led to some weakening of house price growth in 2018-19.

The Covid-19 pandemic is likely to impact further on market housing demand in the short-medium term, particularly with the emergence of increasing unemployment, some reduction in the range and choice of mortgage deals and weakening market sentiment. Further consideration to the impacts of the pandemic are addressed in the *Covid-19 Impacts Addendum*.

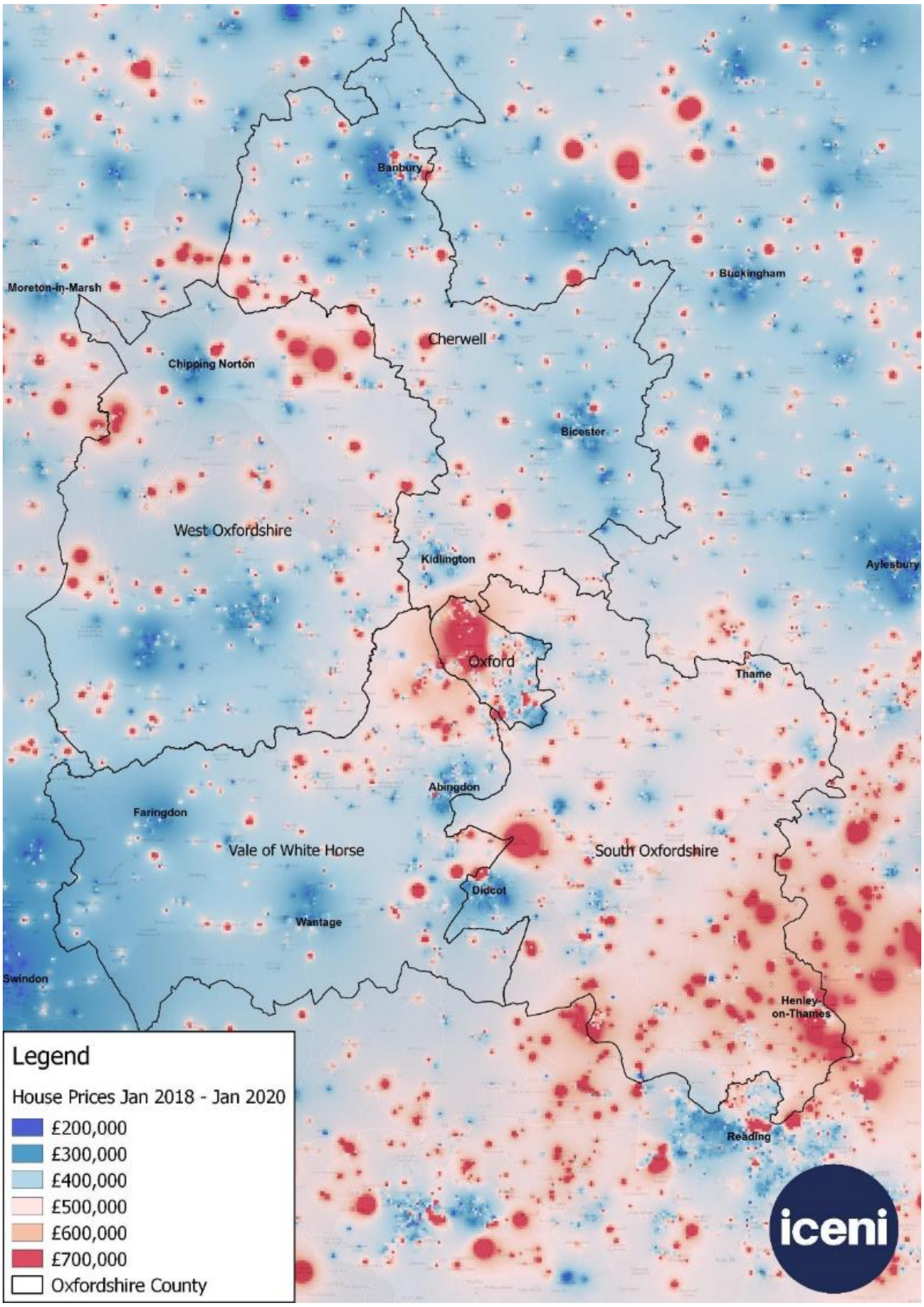
Table 4.2.1: Median house price changes, 1999-2019

	1999	2004	2009	2014	2019
Oxfordshire	£96,000	£193,000	£224,000	£264,000	£350,000
Growth in Previous 5 Years		*£97,000*	*£31,000*	*£40,000*	*£86,000*
South East	£86,000	£176,000	£200,000	£240,000	£322,000
Growth in Previous 5 Years		*£90,000*	*£24,000*	*£40,000*	*£82,000*
England	£68,750	£142,000	£165,000	£191,995	£240,000
Growth in Previous 5 Years		*£73,250*	*£23,000*	*£26,995*	*£48,005*

Source: ONS, Iceni Projects.

Figure 4.2.2 plots the house price geography across Oxfordshire. It shows there are variations across the county and within local authority areas, with a concentration of higher values in Oxford, in areas close to the A34 *"Knowledge Spine"* running through the centre of the county, and in the southern part of South Oxfordshire including within settlements located in the North Wessex Downs and Chiltern Hills AONBs. This is influenced by the geography of and accessibility to employment opportunities; and also by differences in the profile of sales (with higher sales of larger and more expensive homes in rural areas).

Figure 4.2.2: Oxfordshire median house price heat map, 2018-20



Source: ONS, Iceni Projects.

As the composition and mix of sales is an influence on average prices, consideration is given to the prices for similar products. This provides a clearer view of house price differentials between areas. HM Land Registry data on average prices and sales volumes across Oxfordshire in 2019 are shown in Table 4.2.2. It shows that the greatest proportion of all sales of homes in local authorities outside of Oxford City was of detached houses.

- For houses (as opposed to flats), sales values are highest in Oxford itself by some margin. Beyond Oxford, South Oxfordshire has relatively high values, followed by West Oxfordshire then Vale of White Horse; with the lowest values for houses in Cherwell.

- For flats, the highest values achieved are in South Oxfordshire and Oxford (over £315,000); with values of between £200,000 - £230,000 in West Oxfordshire and Vale of White Horse; and of nearing £170,000 in Cherwell.

Table 4.2.2: Mean sale price and volume of sales in Oxfordshire, 2019

	Cherwell	Oxford	South Oxon	VoWH	West Oxon	Oxfordshire Total
Detached	£457,029	£831,369	£689,509	£503,146	£532,381	**£550,617**
No. of sales	*681*	*89*	*618*	*801*	*497*	***2,686***
Semi-det	£307,734	£521,208	£391,985	£332,395	£355,757	**£370,983**
No. of sales	*533*	*336*	*516*	*561*	*391*	***2,337***
Terraced	£274,382	£486,222	£352,640	£288,436	£317,905	**£337,489**
No. of sales	*486*	*315*	*361*	*318*	*309*	***1,789***
Flat/Mais	£168,978	£316,467	£345,444	£229,831	£201,585	**£257,457**
No. of sales	*161*	*225*	*187*	*241*	*158*	***972***
Total average	**£341,652**	**£490,656**	**£487,682**	**£383,449**	**£393,932**	**£411,095**
Total sales	***1,861***	***965***	***1,682***	***1,921***	***1,355***	***7,784***

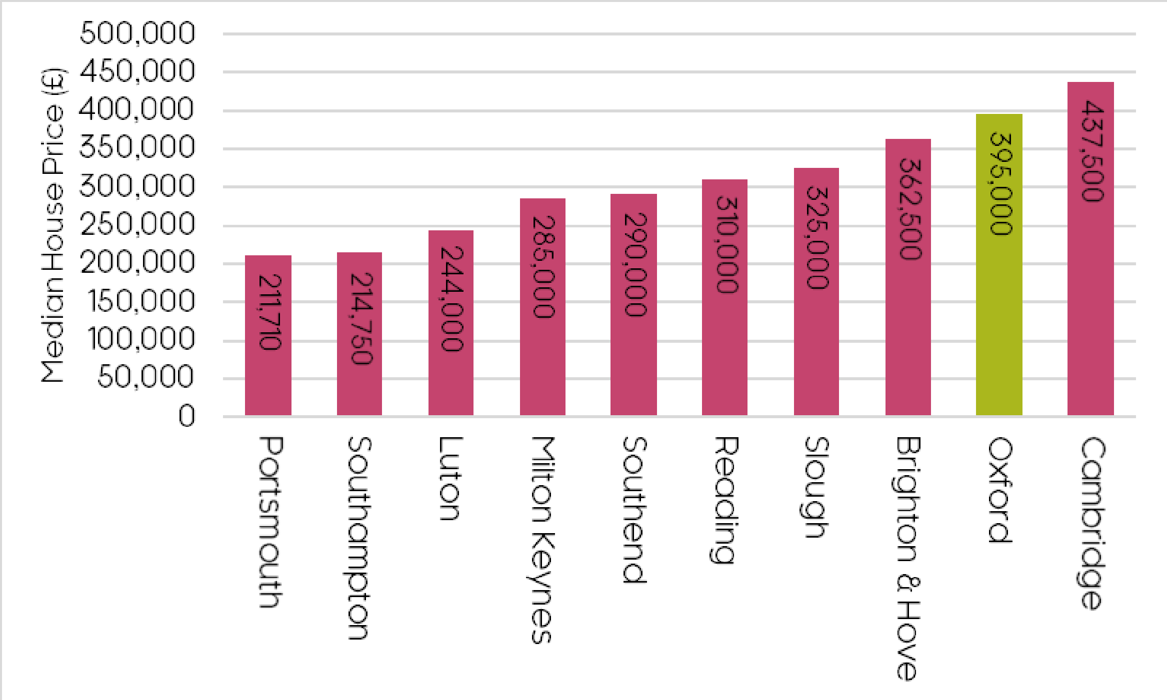
Source: HM Land Registry, Iceni Projects.

The premium in Oxford compared to Oxfordshire is 51% for detached houses, 40% for semi-detached, 44% for terraced and 23% for flats/maisonettes. This contrasts with Cherwell where house prices are between 17-19% below the Oxfordshire average for houses and 34% lower for flats/maisonettes.

Median house prices in Oxford compared to other towns in the Greater South East are set out in Figure 4.2.3 below benchmarks median house prices in Oxford City compared to other large towns and cities across the Greater South East with a population of over c. 150,000. Cambridge and Oxford have the highest median house prices.

Over the last 20 years, house price growth has been strongest in absolute terms in Oxford and South Oxfordshire, with values increasing by over £280,000 (Figure 4.2.4). In the other Oxfordshire authorities, values have increased by between £230,000 - £240,000. Growth in values was strongest over the 1999-2004 period, supported by economic stability and increased availability of mortgage finance; and in the more recent 5 year period from 2014-19.

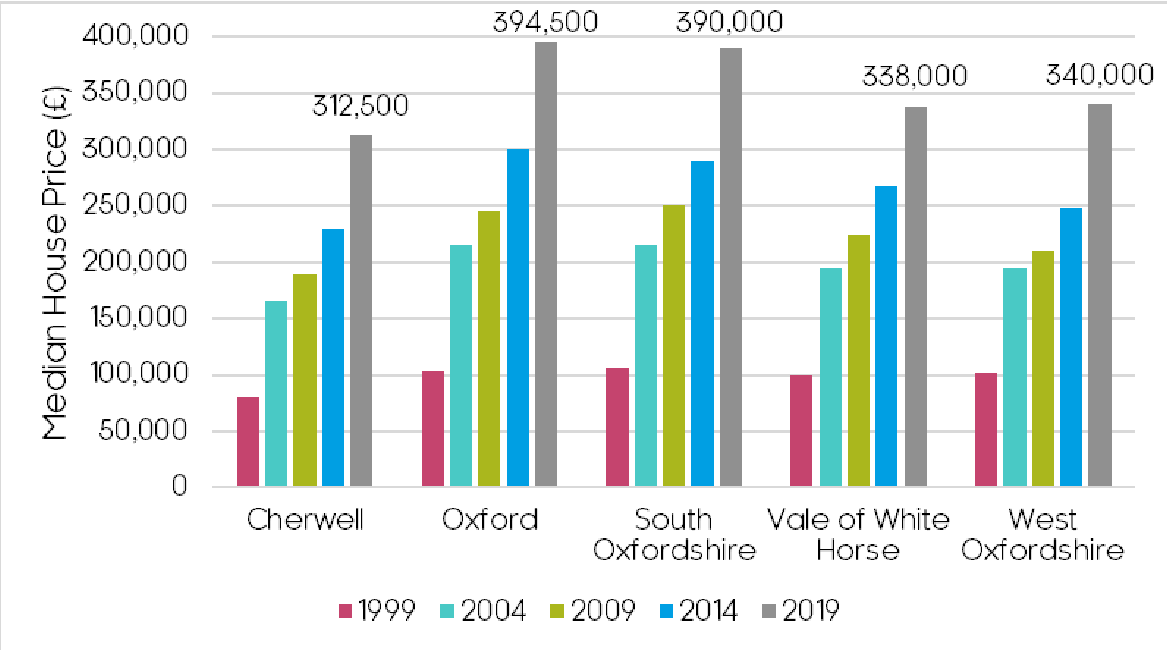
Figure 4.2.3: Median house prices in Oxford compared to other towns in the Greater South East, 2019



Source: ONS, Iceni Projects.

Growth in this more recent period has been supported by an improvement in the availability of mortgage finance following the credit crunch, low interest rates, and the Government's Help-to-Buy scheme together with the strong performance of the Oxfordshire economy (as considered in *Chapter 5*). The impact of Covid-19, both directly on the housing market and on the wider economy, is likely to influence price dynamics in the short-term moving forwards.

Figure 4.2.4: 5-yearly house price change by local authority in Oxfordshire, 1999-2019



Source: ONS, Iceni Projects.

Table 4.2.3: Median house prices by local authority in Oxfordshire, 1999-2019

	1999-2004	2004-2009	2009-2014	2014-2019	Total increase 1999-2019
Cherwell	+£87,000 (+109%)	+£22,500 (+14%)	+£41,125 (+22%)	+£82,375 (+36%)	**+£233,000 (+293%)**
Oxford	+£112,000 (+109%)	+£30,000 (+14%)	+£54,999 (+22%)	+£94,501 (+32%)	**+£291,500 (+283%)**
South Oxfordshire	+£109,000 (+103%)	+£35,000 (+16%)	+£40,000 (+16%)	+£100,000 (+34%)	**+£284,000 (+268%)**
Vale of White Horse	+£95,050 (+95%)	+£30,000 (+15%)	+£42,000 (+19%)	+£71,000 (+27%)	**+£238,050 (+238%)**
West Oxfordshire	+£93,000 (+91%)	+£15,000 (+8%)	+£37,950 (+18%)	+£92,050 (+37%)	**+£238,000 (+233%)**
Oxfordshire	**+£97,000 (+101%)**	**+£31,000 (+16%)**	**+£40,000 (+18%)**	**+£86,000 (+33%)**	**+£254,000 (+265%)**
South East England	+£90,000 (+104%)	+£24,000 (14%)	+£40,000 (+20%)	+£82,000 (+34%)	+£236,000 (+274%)

Source: ONS, Iceni Projects.

If a comparison is undertaken of changes in median house prices since the 2014 Strategic Housing Market Assessment (SHMA) was prepared, a growth in house prices across Oxfordshire of £100,000 (28.5%) is evident over a period of 6-7 years.

The strongest total house price growth has been in Oxford (+£104,500) closely followed by South Oxfordshire (+£103,025), with notably weaker growth seen in Vale of White Horse (+£68,000). When compared with new housing delivery over this period, it is notable that there have been stronger levels of housing delivery in Vale of White Horse, with lower relative housing delivery in Oxford.

Table 4.2.4: Changes in median house prices since the 2014 SHMA, 2012-19

	Year to June 2019	Year to Sept 2012 (SHMA Table 7)	Absolute difference, 2012-19
Cherwell	£312,500	£216,500	£96,000
Oxford	£394,500	£290,000	£104,500
South Oxfordshire	£390,000	£286,975	£103,025
Vale of White Horse	£338,000	£270,000	£68,000
West Oxfordshire	£340,000	£245,000	£95,000
Oxfordshire	**£350,000**	**£250,000**	**£100,000**

Source: ONS, 2014 Oxfordshire SHMA, Iceni Projects.

The absolute growth in house prices in this period has been similar to that seen across the South East region (where the median price has increased by £97,000 over the period June 2012 - June 2019) and much higher than the price growth seen nationally (which have increased by £60,000 over the period June 2012 - June 2019).

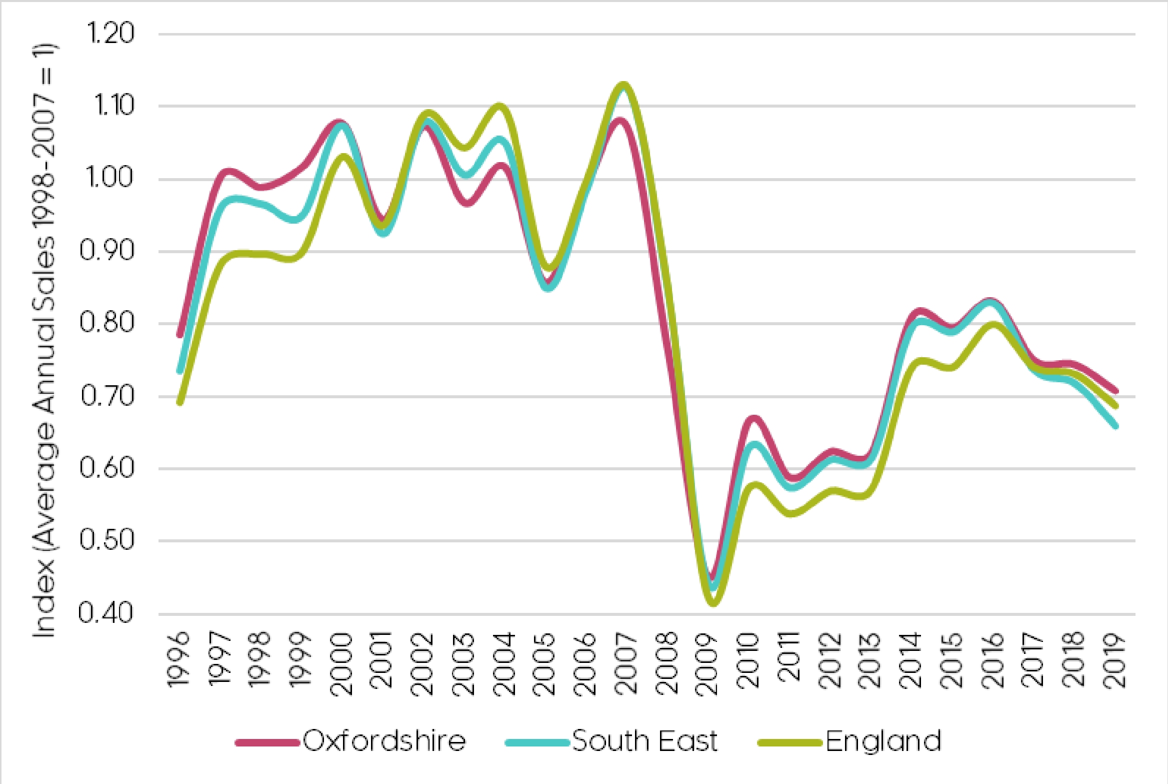
Trends in house sales

Iceni has analysed sales trends over time in the Oxfordshire local authorities and compared these to trends over the pre-recession decade (1998-2007) to understand the timing and pace of market recovery from the last recession (Figure 4.2.5).

The analysis highlights the impact of macro-economic factors on the housing market. It indicates how an increase in interest rates dampened demand in 2005. In 2008-9 it shows the very substantial impact of the credit crunch and subsequent recession on demand, which resulted in a fall of sales volumes to 45% of the pre-recession average in 2009.

A substantive recovery in sales did not really kick-in until late 2013, with sales in Oxfordshire recovering to almost 80% of the pre-recession average by 2016. However since 2016 housing market activity has been affected by economic uncertainties associated with the nature of future relationship with the EU as the UK's largest existing trading partner.

Figure 4.2.5: Indexed analysis of sales trend, 1996-2019



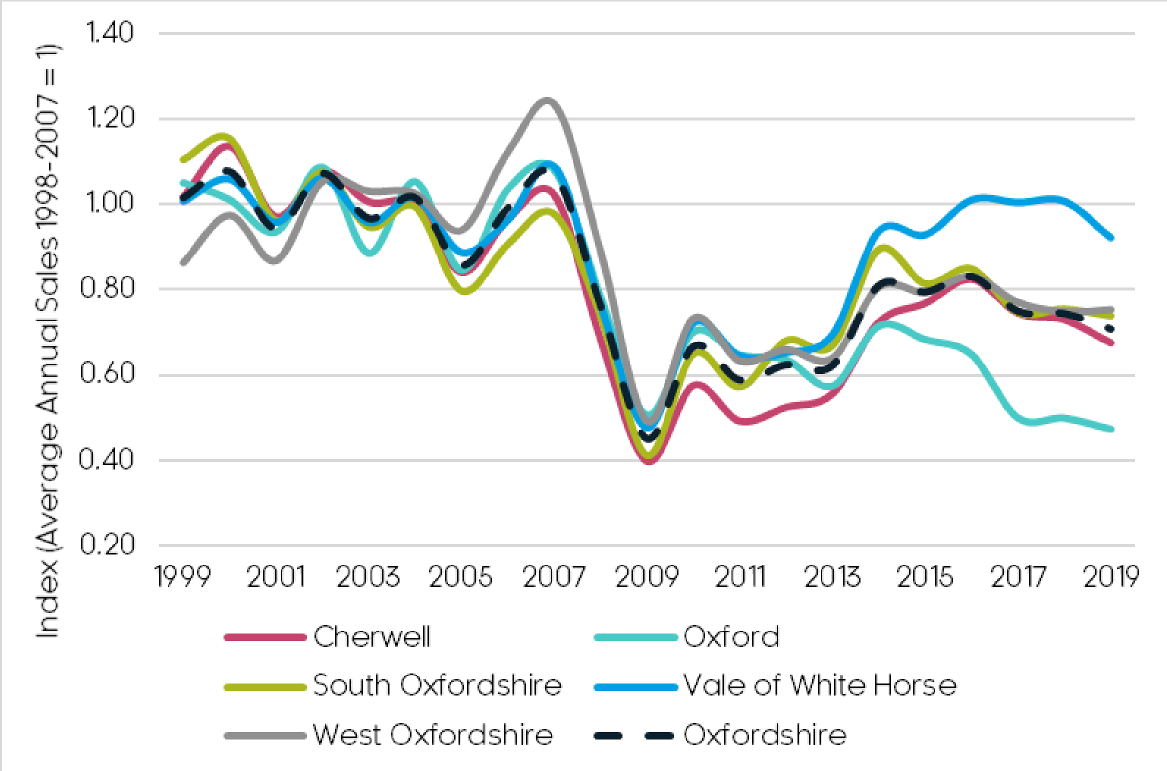
Source: ONS, Iceni Projects.

The data points to sales volumes in Oxfordshire over the year to June 2019 of 71% of the pre-recession average; a level of performance which exceeds that at a regional (66%) or national (69%) level.

Undertaking a similar analysis for the individual Oxfordshire authorities (Figure 4.2.6) shows an interesting pattern whereby a recent divergence from wider trends is observed in Vale of White Horse and Oxford in particular. Sales volumes in Oxford did not recover as strongly as other areas between 2012-14 with sales volumes remaining well below (47%) the pre-recession trend. This is likely to have been influenced in part by the higher relative affordability pressures.

Sales volumes in the Vale of White Horse are notable in having been affected to a lesser degree than other areas – this correlates with lower average sales values and higher new-build supply. Sales volumes over the year to June 2019 were 92% of the pre-recession average, substantially out-performing other areas. The evidence shows that strong levels of new-build development in the Vale have contributed to this.

Figure 4.2.6: Indexed analysis of sales trends in Oxfordshire, 1999-2019



Source: ONS, Iceni Projects.

The subdued housing market activity over much of the last decade is notable. There are a complex set of factors which appear to have contributed to this, including: a low inflation environment such that inflation is not reducing the value of debt in real terms as it did in previous decades (pre-2000); longer mortgage terms; an ageing population who typically move infrequently; and a policy focus on caring for older persons in their home (resulting in fewer moves).

Added to this have been increasing transactional costs of moving, particularly associated with the costs of Stamp Duty, which have affected both home owners and investors (with 3% additional Stamp Duty applicable to investment purchases from April 2016). These transactional costs have affected higher value markets to a greater degree and act as disincentive for households to move. They have influenced sales trends in Oxford to a greater extent than other areas. These are structural issues with the market which mean that it is unlikely there will be a return to sales volumes achieved in the 1998-2007 decade in the short-term.

4.3 Trends in the affordability of home ownership

The Government has clearly articulated its view that housing supply needs to increase in order to improve housing affordability. There is clear evidence that rising house prices have contributed to declining home ownership –

particularly amongst younger households – and Government has set out its ambition to address this.[22]

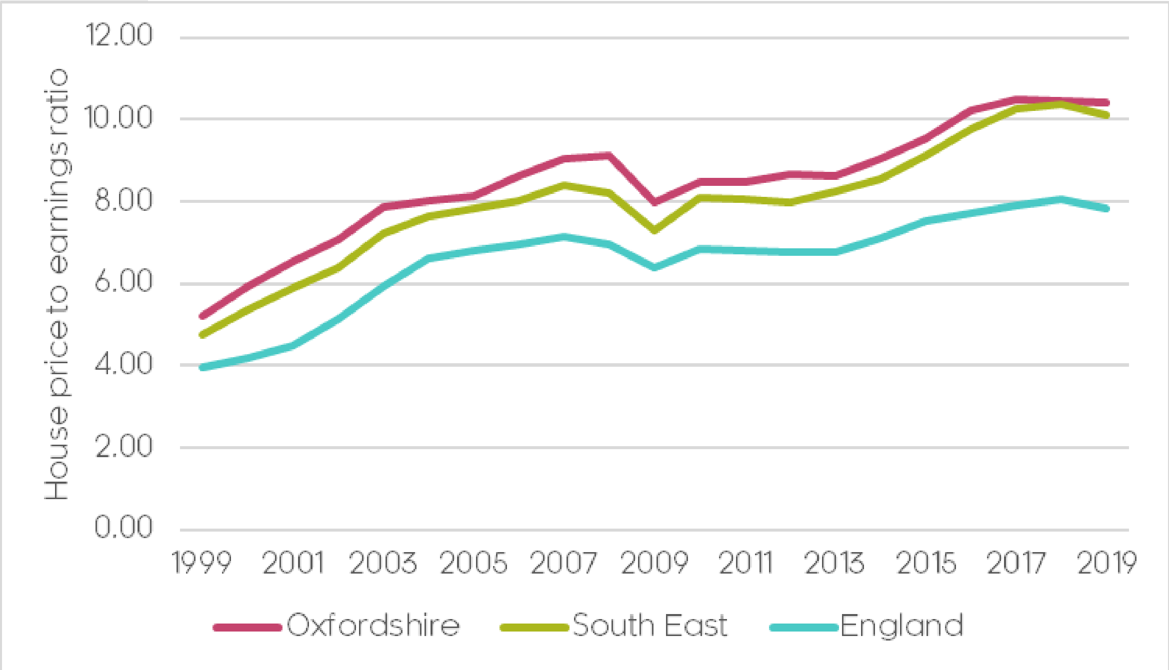
The most common measure of affordability issues is house price to earnings ratios. These ratios form an input to the Standard Method for calculating local housing need, with the theory behind this being that new housing provision should be responsive to 'market signals' of which relative affordability is a key indicator.

Affordability ratios are calculated by dividing house prices by the annual workplace-based earnings. Lower ratios indicate greater affordability with higher ratios indicating lower affordability.

Figure 4.3.1 below shows that median affordability ratios stood at 10.42 times workplace-based earnings in Oxfordshire in 2019[23], compared with 10.12 in South East England and 7.83 times in England.[24] Although Oxfordshire has both above average prices and above average earnings, this points to significant affordability pressures across the county. Oxfordshire is the 6th worst county in England for affordability and 5th worst affordability ratio in the region behind Surrey (12.43), Buckinghamshire (11.73), West Sussex (11.27) and East Sussex (10.49).

Research undertaken by Centre for Cities indicates that as of 2019, the housing affordability ratio for the Oxford Principal Urban Area (which extends beyond Oxford's administrative boundary) is significantly worse at 17.23.[25]

Figure 4.3.1: Median house price to workplace-based earnings ratios, 1999-2019)



Source: ONS, Iceni Projects.

[22] HM Government (2017) *Housing White Paper* and HM Government (2020) *Planning for the Future*

[23] These were the latest available figures at the time of writing. Figures for 2020 (released March 2021) are provided in *Appendix E: Standard Method Appendix*.

[24] ONS (2019) House price to workplace-based earnings ratio.

[25] Available at https://www.centreforcities.org/city/oxford/ This uses the HM Land Registry mean house prices for Jan-Nov 2019 and ASHE workplace-based earnings for individuals

There is a clear correlation between trends in affordability in Oxfordshire and those across the wider South East region. Affordability deteriorated rapidly over the decade to 2008, improved over the subsequent recession and was relatively stable over the period to 2013. It then deteriorated over the period from 2013-17 and has remained relatively stable from 2017-19. Over the 2013-17 period, affordability in Oxfordshire and the South East more widely has deteriorated to a greater degree than nationally.

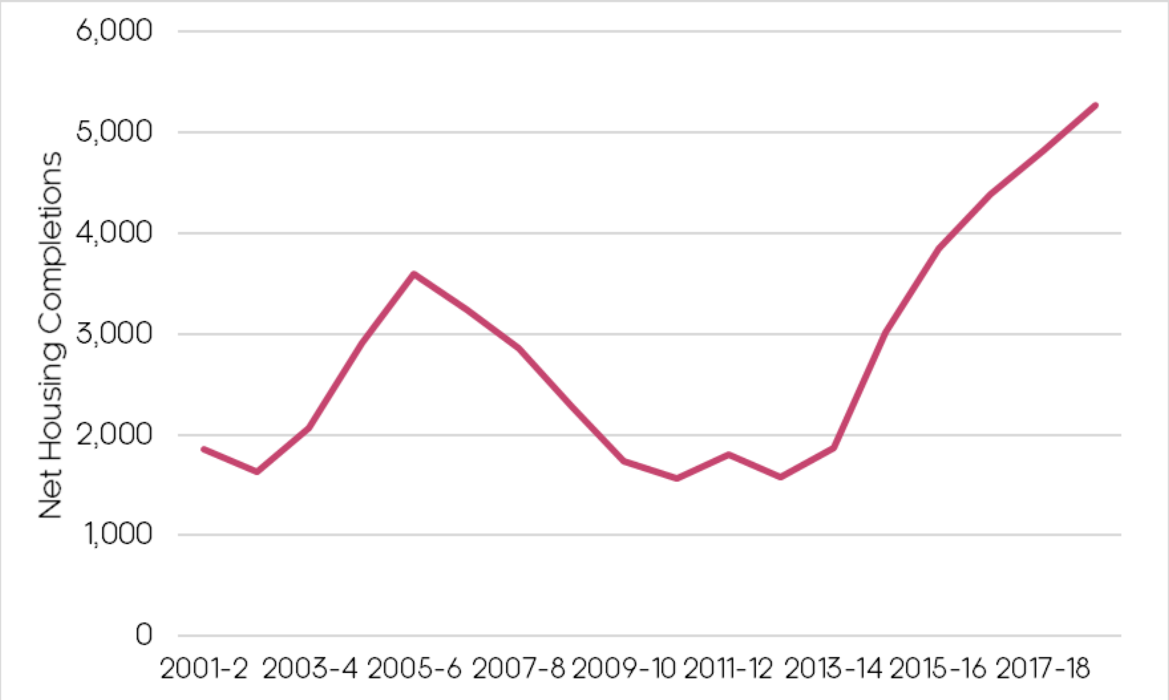
The deterioration in affordability over the 2013-17 period has been driven by growth in house prices relative to wages. Price growth over this period has been influenced by improved availability of mortgage finance, low interest rates, and Government support for the housing market through the Help-to-Buy Scheme. These factors helped to stimulate demand; with a time-lag before housing supply could respond which has driven house price growth over this period.

The evidence, in respect of the similarity between price trends in Oxfordshire and the wider South East region, indicates that housing costs are influenced by wider regional housing market dynamics.

Figure 4.3.2 below shows, net housing completions in Oxfordshire have increased rapidly over the period since 2017. However the 2014 SHMA identified a need for 5,000 homes per annum across Oxfordshire to meet demand and the evidence in *Chapter 5* indicates that the period between 2013-16 saw particularly strong growth in employment in Oxfordshire.

It is only in 2018/19 that this level of housing provision has been achieved; and set against this it is quite reasonable to have seen affordability deteriorate over the 2014-17 period as both the SHMA and house price trend point to a supply/demand imbalance over this period.

Figure 4.3.2: Net housing completions in Oxfordshire, 2001-18



Source: LPA Completions Data, Iceni Projects.

As Table 4.3.1 shows, out of the five Oxfordshire local authorities, South Oxfordshire had the highest median affordability ratio at 12.36 times workplace-based earnings in 2018. Cherwell had the lowest lower quartile affordability ratio standing at 9.73.

The largest deterioration in affordability (i.e. increase in affordability ratio) over the 15 years up to 2018 has been in South Oxfordshire where the ratio increased from 7.82 in 2003 to 12.36 in 2018.

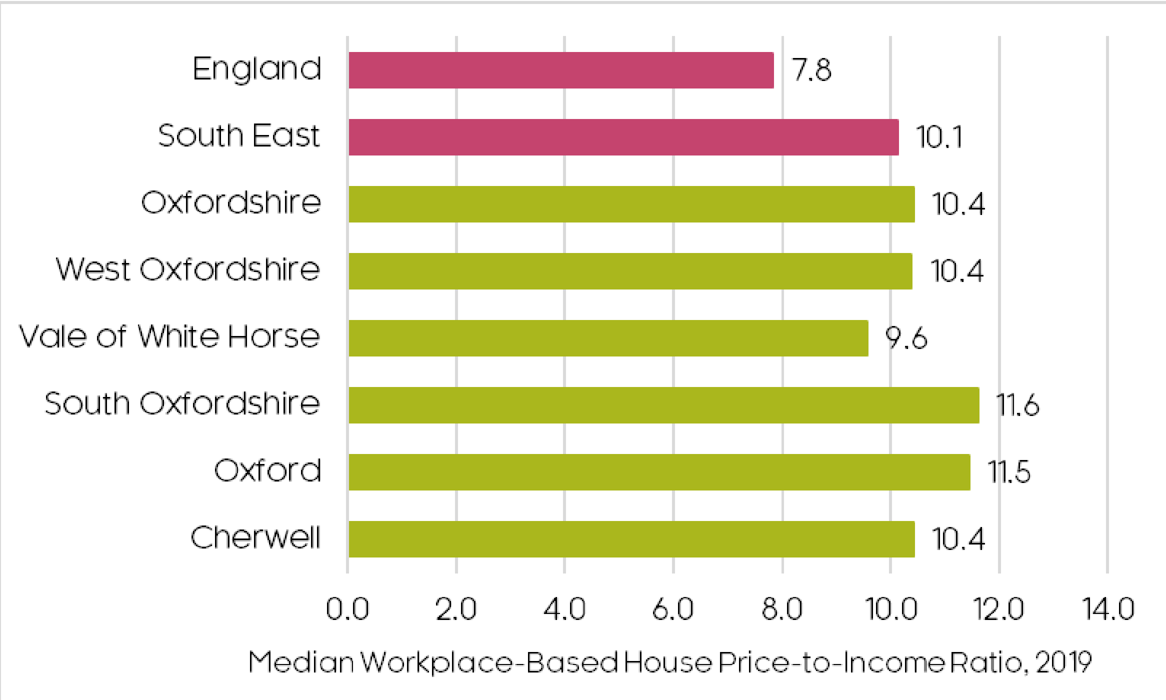
Table 4.3.1: Median affordability ratios, 2003-18

	2003	2008	2013	2018	Increase, 2003-2018
England	5.91	6.96	6.76	8.00	+2.09
South East	7.22	8.22	8.26	10.38	+3.16
Oxfordshire	**7.85**	**9.10**	**8.61**	**10.44**	**+2.59**
Cherwell	*7.06*	*8.54*	*8.46*	*9.73*	*+2.67*
Oxford	*8.84*	*9.69*	*9.69*	*11.12*	*+2.28*
South Oxfordshire	*7.82*	*9.71*	*10.49*	*12.36*	*+4.54*
Vale of White Horse	*7.49*	*8.35*	*7.50*	*9.85*	*+2.36*
West Oxfordshire	*8.48*	*9.35*	*9.36*	*11.56*	*+3.08*

Source: ONS house price to workplace-based earnings ratios, Iceni Projects.

Data for 2019 was released in March 2020 and shows a modest improvement with the median affordability ratio across Oxfordshire between 2018-19, with the median house price-to-income ratio declining slightly to 10.42. The 2019 data is shown in Figure 4.3.3.

Figure 4.3.3: House price-to-workplace-based earnings ratio, 2019



Source: ONS, Iceni Projects.

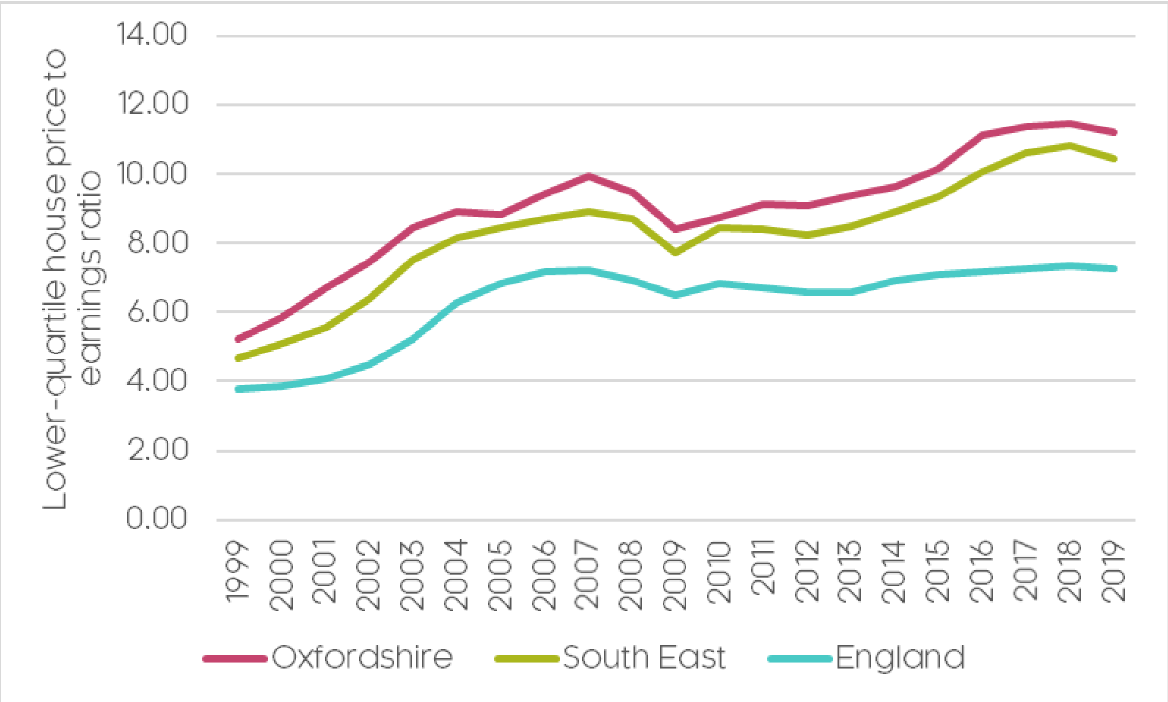
Affordability on this metric is similar to those in other similar locations in the Greater South East, but is below those in Inner Home Counties areas such as Surrey, Hertfordshire or Buckinghamshire which are closer to London.

Other data sources highlight particular affordability issues in Oxford. Research by Lloyds Banking Group identifies average house prices of £460,000 in Oxford in 2018 based on the Halifax House Price database which was 12.6 times average annual earnings, making Oxford the UK's least affordable city. This compares to an average ratio of 10.3 in Greater London. The difference between this and the ONS data above is the source of the house price data.

Iceni has also considered ONS data on lower quartile affordability ratios (illustrated in Figure 4.3.4), which appraise the cost of entry-level housing relative to earnings of younger households. Lower quartile affordability ratios are now 11.47 times workplace-based earnings in Oxfordshire, compared with 10.81 in South East England and 7.29 times in England. Out of the local authorities, South Oxfordshire again has the highest lower quartile affordability ratio, standing at 13.93 times workplace-based earnings. Cherwell has the lowest lower quartile affordability ratio standing at 11.14.

The lower quartile affordability ratio of 11.2 in 2019 represents a notable further worsening of the position relative to when the SHMA was prepared, which recorded a figure of 9.0 for 2012. This is as a result of house prices growing more strongly than earnings for the reasons explained above. There has been a modest improvement between 2018-19.

Figure 4.3.4: Lower quartile house price to workplace-based earnings ratios, 1999-2019



Source: ONS, Iceni Projects.

The workplace-based house price to income ratio is the preferred metric considered in this report as it considers affordability for people working within an area. In Oxfordshire, the affordability of housing for residents is generally better than that for workers (as some higher paid residents commute out of the area to work).

As shown in Table 4.3.2, Oxford is the exception where the median residence-based affordability ratio is higher than the median workplace-based affordability ratio, albeit the difference is not substantive. South Oxfordshire has the greatest difference between the two ratios (likely influenced by its stronger accessibility to the M4 Corridor and London). The residence-based measure reflects earnings of those living in Oxfordshire rather than those working within it.

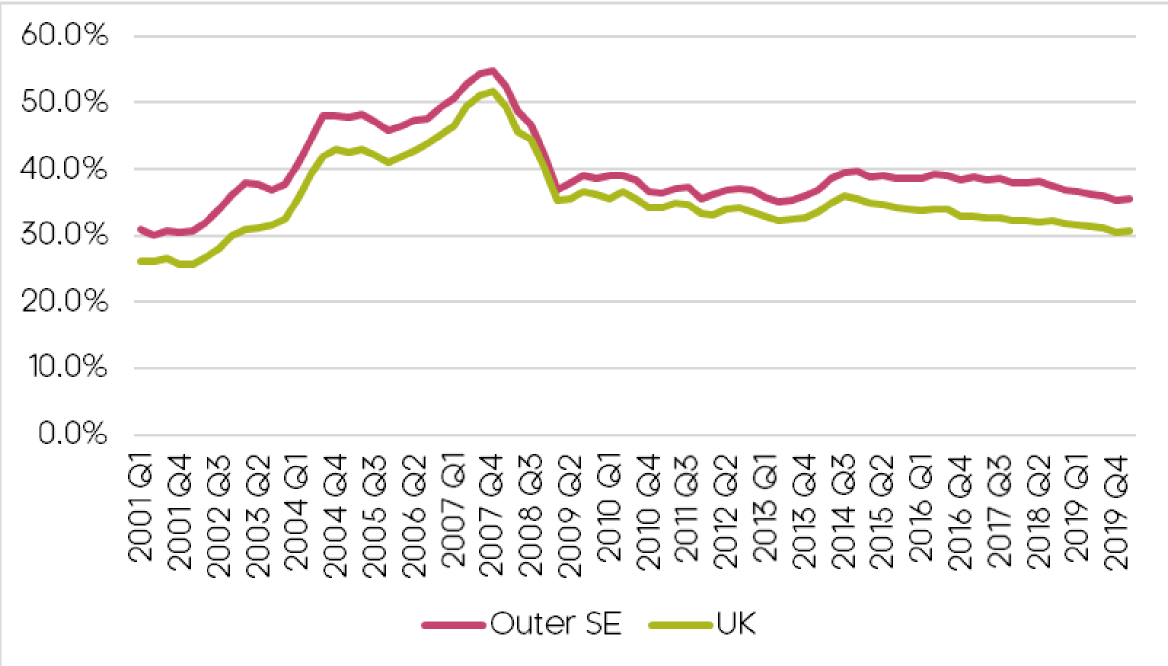
Table 4.3.2: Difference between median workplace-based and residence-based affordability ratios, 2019[26]

	Workplace-based ratio[27]	Residence-based ratio[28]	Absolute difference
England	7.83	7.70	013
South East England	10.12	9.74	0.38
Oxfordshire	**10.42**	**10.11**	**0.31**
Cherwell	*10.43*	*10.16*	*0.27*
Oxford	*11.45*	*12.55*	*1.19*
South Oxfordshire	*11.60*	*10.16*	*1.44*
Vale of White Horse	*9.57*	*9.06*	*0.51*
West Oxfordshire	*10.38*	*9.75*	*0.63*

Source: ONS, Iceni Projects.

Affordability ratios provide an indication of the affordability of market housing to buy. However households ability to buy is also influenced by their savings/ equity, interest rates and the ability to access mortgage finance. Nationwide publishes data first-time buyer affordability, considering the cost of mortgage payments as a percentage of mean take home pay. In 2019 the average first time buyer was spending 36% of take-home pay on mortgage costs in the Outer South East. Whilst this is below towards the peak of the last market cycle, it is notably above the England average of 31%.

Figure 4.3.5: Mortgage payments for first-time buyers as a % of mean take-home pay



Source: Nationwide, Iceni Projects.

[26] Workplace-based earnings refer to the earnings recorded for the area in which the employee works, whereas the residence-based earnings refer to the area in which the employee lives.

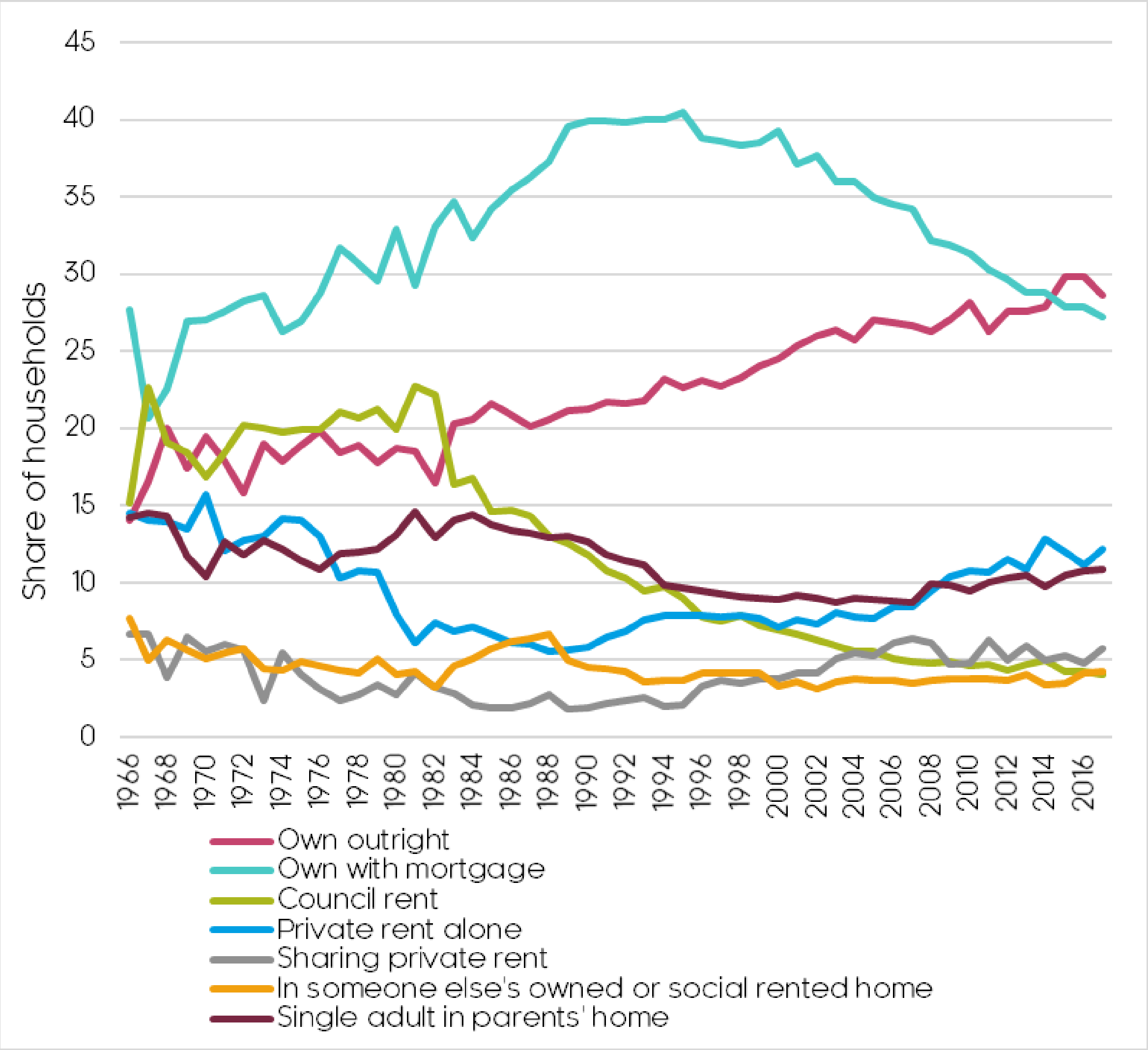
[27] ONS (2020) House price to workplace-based earnings ratio.

[28] ONS (2020) House price to residence-based earnings ratio.

Many younger households who may be able to afford mortgage repayments however find that that the 'stress testing' now undertaken in applying for mortgages; and the deposit requirements necessary to secure a home are particular barriers. With lower quartile house prices in Oxfordshire standing at £275,000 in 2019, households would need savings of £27,500 to put down a 10% deposit. Many younger households do not have this level of savings.

The effects of affordability pressures are real and significant. Research by the Resolution Foundation has tracked trends in households living arrangements by region, shown in Figure 4.3.6. Home ownership in the South East region peaked at 64% in 2003 but has since fallen to a figure of 56% in 2017 (an 8-percentage point drop).

Figure 4.3.6: Share of households by living circumstances (1966-2017) – South East England



Source: Resolution Foundation.

The number of households living alone in the Private Rented Sector has increased over this period by 5 percentage points, as has those sharing homes in the sector (up from 4.1% to 5.7% over this period). 10.9% of households now comprise single adults living within their parents' home. Whilst comparable data is not available at an Oxfordshire level, given the similarity in price and affordability trends, a similar picture is likely.

Poor housing affordability can provide a deterrent to young professionals hoping to live and work in Oxfordshire, and the ability of businesses to recruit staff to fill positions including in high-tech and innovative business sectors. This was identified as a particular issue in the LIS Economic Review which identified that it could weaken Oxfordshire's competitiveness.

The results of the stakeholder engagement undertaken as part of the Economic Review are summarised in appendices of that report, and state that:

> *"Stakeholders are confident that Oxfordshire's attractiveness as a place to work (and for postgraduate research) has been constrained by the high cost of living.*
>
> *The evidence around Oxfordshire's cost of living challenge is well documented in this review and other local reports. Oxfordshire now has an unwanted reputation as being one of the most expensive places to live in the UK. Stakeholders have clearly voiced that they felt this is a factor which is having a material impact on their research and business activities in Oxfordshire. Stakeholders have suggested that this is deterring individuals from considering local roles – and in turn in impacting innovation, research and productivity levels (and therefore, ultimately Oxfordshire's GVA and future growth potential. Individual organisations, such as the University of Oxford, are now seeking to explore putting in place their own measures which help to address this challenge for their key personnel (in this case, postgraduate researchers).*
>
> *Stakeholders have also suggested that this problem (to date) has not been taken seriously enough in planning and policy discussions at a local and national level."*[29]

It is clear that affordability issues are having a real impact not just on young people in Oxfordshire, but also its business community; and unaddressed this could hold back future economic growth potential.

4.4 Trends in the private rental market

For the year to 31 March 2019, the overall median rent across Oxfordshire was £1,000 per calendar month (PCM)[30]. This is 44% higher than the median rent in England (£695) and 14% higher than the median rent in the South East of England (£875). This points to strong relative rental demand and suggests particular affordability pressures within both the sales and rental markets.

Since 2014, median rents have increased by £105 PCM or 12% in Oxfordshire (Figure 4.4.1). This growth rate is lower than the regional and national averages which have both grown by 17% over the same period, but rents remain above wider benchmarks.

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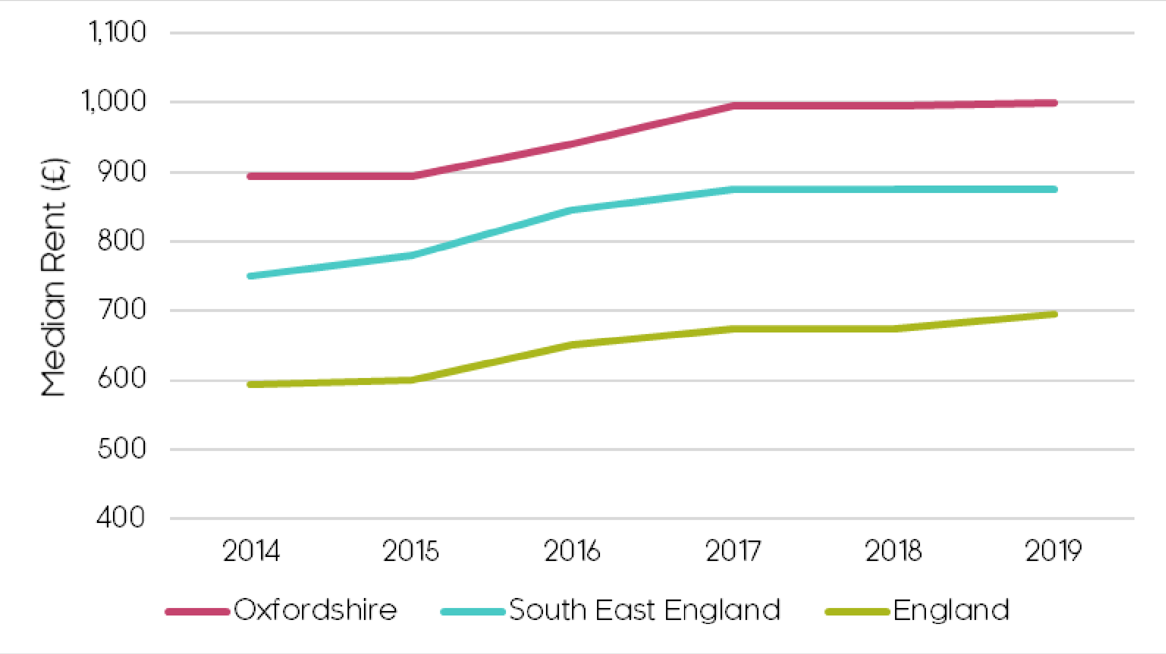
[29] LIS 2018 Economic Review: Baseline, p. 63

[30] VOA (2019) - Private rental market summary statistics: April 2018 to March 2019

Figure 4.4.1: Median rental costs, 2014-19



Source: VOA, Iceni Projects.

Table 4.4.1 compares rental costs by property size at the local authority, county, regional and national levels and Figure 4.4.2 shows the average rent for all property types. Monthly rents at an Oxfordshire level are on average 14% above the South East average. Indicatively based on current rental costs, households would need to earn over £32,000 annually to afford the average 2-bed property in Oxfordshire without financial support.

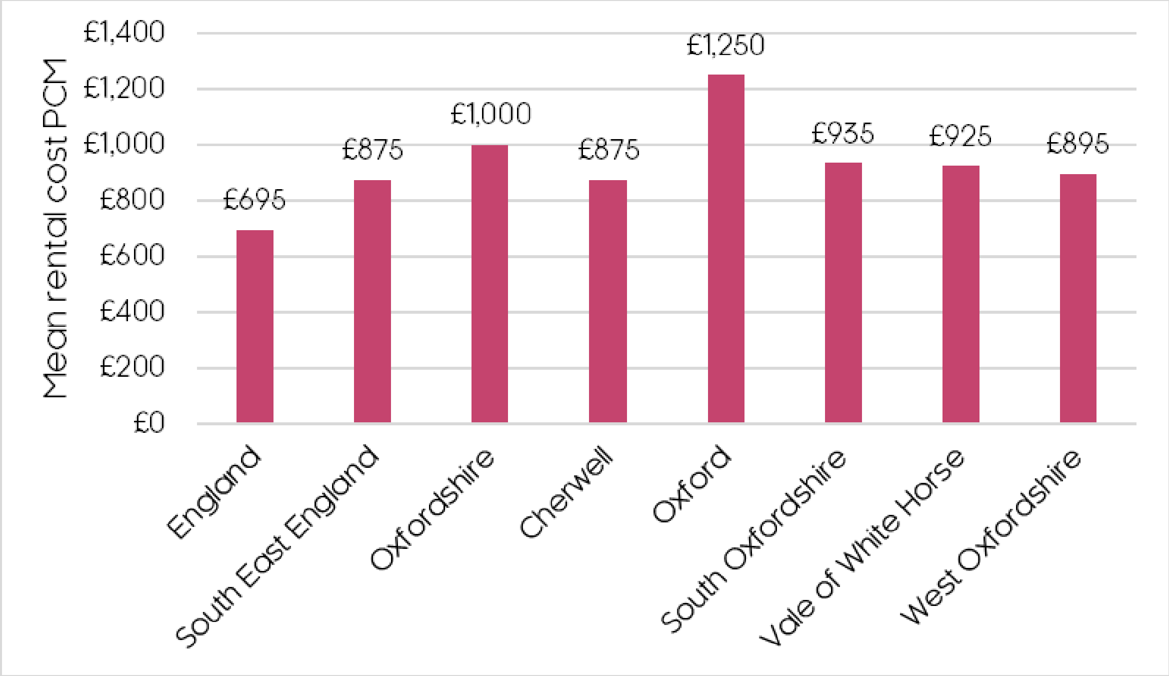
Oxford City has significantly higher rental costs than the other local authorities, with Cherwell having the lowest in Oxfordshire. Rental costs in each of the local authorities for all property sizes are higher than the national averages, and mostly higher than the regional averages. Oxford, South Oxfordshire and Vale of White Horse are the authorities with rents much higher than the regional average – in Oxford's case the average rent is a substantial 42% above the South East average. Rents in West Oxfordshire are also above the regional average.

Table 4.4.1: Median rental cost by property size, 2019

	Room	Studio	One-Bed	Two-Bed	Three-Bed	Four+ Bed	All
England	£390	£575	£615	£675	£760	£1,320	£695
South East England	£412	£570	£700	£875	£1,095	£1,650	£875
Oxfordshire	**£550**	**£606**	**£800**	**£953**	**£1,225**	**£1,950**	**£1,000**
Cherwell	*£450*	-	*£725*	*£875*	*£1,000*	*£1,395*	*£875*
Oxford	*£600*	*£765*	*£950*	*£1,200*	*£1,400*	*£2,250*	*£1,250*
South Oxfordshire	-	*£600*	*£750*	*£925*	*£1,250*	*£1,750*	*£935*
Vale of White Horse	*£625*	-	*£790*	*£900*	*£1,175*	*£1,800*	*£925*
West Oxfordshire	*£430*	*£595*	*£748*	*£875*	*£1,098*	*£1,575*	*£895*

Source: VOA Private Rental Market Statistics, Iceni Projects.

Figure 4.4.2: Median rental cost (all property types), 2019



Source: VOA, Iceni Projects.

4.5 Conclusions

Oxfordshire, like many parts of the greater South East, is characterised by high housing costs and particular affordability pressures. Median house prices have risen from £100,000 to £350,000 in the county over the last 20 years. Affordability issues appear particularly acute in Oxford, followed by South Oxfordshire. Whilst current low interest rates means that mortgage finance is currently relatively cheap, lenders undertake stress testing and the absolute cost of homes to buy means that there are households need significant savings to be able to buy a home. These affordability issues have influenced levels of first-time buyers.

More broadly, transactions volumes have been affected by the high levels of Stamp Duty payable on many transactions in Oxfordshire; wider demographic issues with a growing older population which is less likely to move and more likely to receive care – if they need it – at home; and the additional Stamp Duty applicable to investment purchases from April 2016. High Stamp Duty costs appear to have particularly affected the Oxford market.

Against this context, the Government’s Help-to-Buy Scheme has been important in helping to support the market in recent years; and the short-term Stamp Duty holiday introduced by Government in July 2020 will help to support the market.

The long-term structural issue is however of a need to improve affordability, both to address the Government’s ambitions to support homeownership and to increase fluidity in the wider market enabling households to move home to a property that better suits their needs. Additional housing supply will be important to enabling this.

It is clear that affordability issues are having a real impact not just on young people in Oxfordshire, but also its business community. If left unaddressed this could hold back future economic growth potential. Poor housing affordability can provide a deterrent to young professionals hoping to live and work in Oxfordshire, which affects the ability of businesses to recruit staff to fill positions, including in high-tech and innovative business sectors which are significant in the Oxfordshire economy. The effect of these issues on development needs are explored in *Part B* of this report.

5 Recent Economic Performance

5.1 Introduction

This chapter provides a concise overview of Oxfordshire's recent economic performance. It considers the headline economic trends that are shaping the Oxfordshire economy, and how local performance compares to comparator areas and the national average.

This provides a foundation for Part B's *Chapter 8*, which explores Oxfordshire's potential growth trajectories and implications for economic development and housing need. The below summary supplements the extensive evidence reviewed for the Oxfordshire Local Industrial Strategy (LIS), which goes into much greater detail on the Oxfordshire economy.

5.2 Overview of Recent Growth and its Drivers

The Oxfordshire LIS emphasises Oxfordshire's status as *"a trailblazer for the UK economy"* and *"one of the strongest economies"* in the country. This is largely reinforced by the data, as Figure 5.2.1 shows; nationally, Oxfordshire's economy was one of the fastest growing (3rd, of 38 Local Enterprise Partnership, LEP, areas) during the recovery from the 2008-09 recession.[31]

Alongside this, Oxfordshire's robust labour market has been creating jobs at an unprecedented pace; since 2010, on average more jobs had been created in Oxfordshire than any other equivalent period in the last 50 years (approximately 6,000 per annum). As of 2018, the Oxfordshire economy contributes an estimated £21.2 billion to UK plc, and supports some 410,000 jobs and 37,000 businesses.

According to the LIS, Oxfordshire's growth performance has been driven by its *"significant assets in research and development ('R&D') being home to the top performing university in the world, the University of Oxford, as well as Oxford Brookes, a leading university in the UK for teaching and research. These anchor institutions support an international brand that draws talent and investment."*

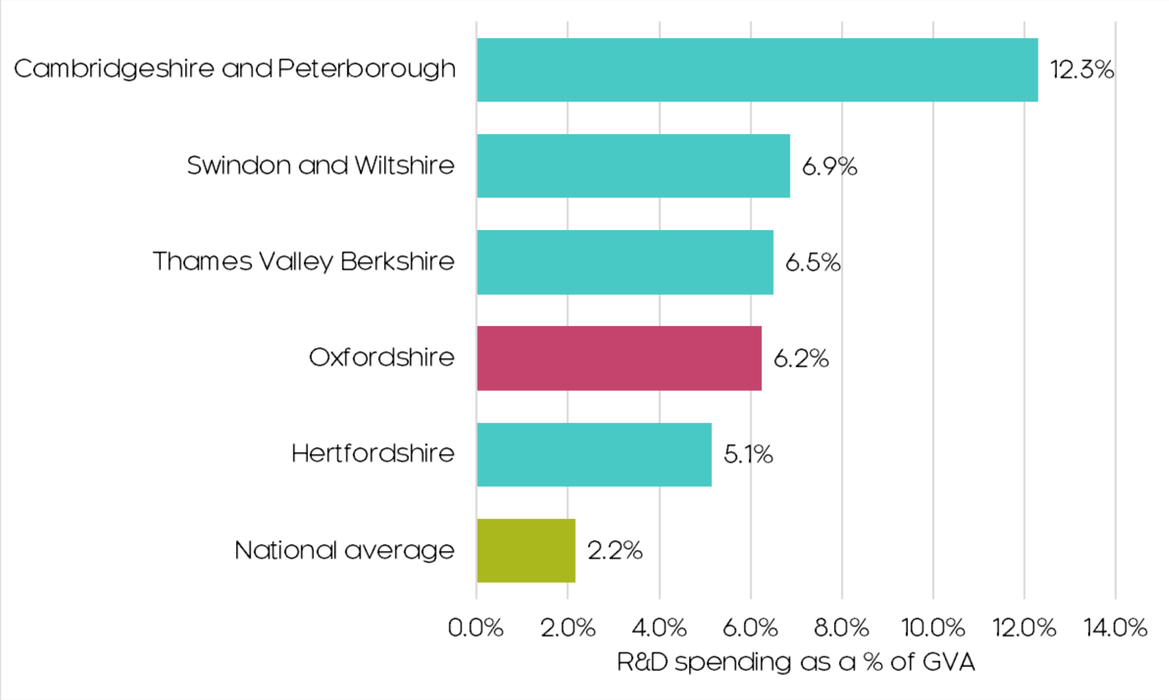
[31] As measured by balanced Gross Valued Added, GVA(b), in real terms (2016 prices)

Figure 5.2.1: Overview of Oxfordshire's recent GVA (above) and jobs (below) growth

Source: ONS, Cambridge Econometrics.

Figure 5.2.2 highlights Oxfordshire's knowledge-intensive economy, with its research capacity – measured by R&D spend as a proportion of GVA - amongst the highest (4th, of 38 LEP areas) in the country, and indeed within Europe.

Figure 5.2.2: Oxfordshire's research intensity compared to peers, 2017

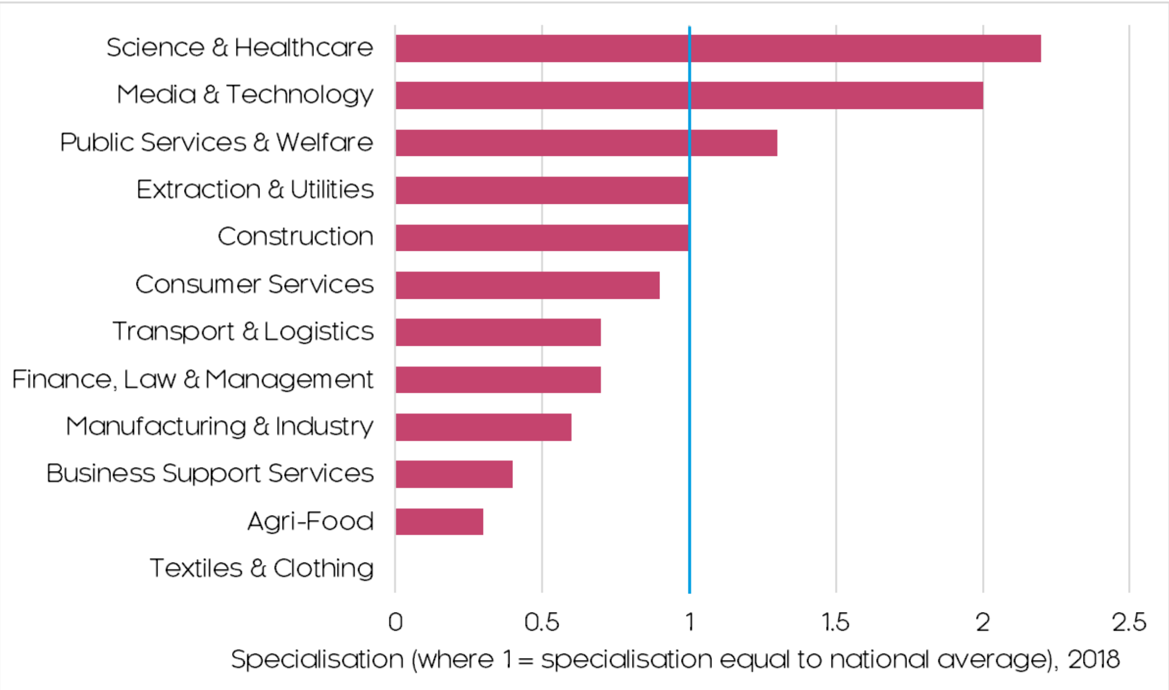


Source: ONS, Cambridge Econometrics.

It also refers to the role played by Oxfordshire's *"vibrant sectoral mix"* and the *"dynamic nature of companies"* in the county. Figure 5.2.3 Oxfordshire's current sub-sectoral specialisations relative to the national average; notable strengths and concentrations are evident within media & technology, science & healthcare and public services & welfare.

When looking only at research-intensive industries, Oxfordshire has the 5th highest sectoral specialised diversity in the country. This diverse but research-

Figure 5.2.3: Oxfordshire's sub-sectoral specialisations (relative to the national average), 2018

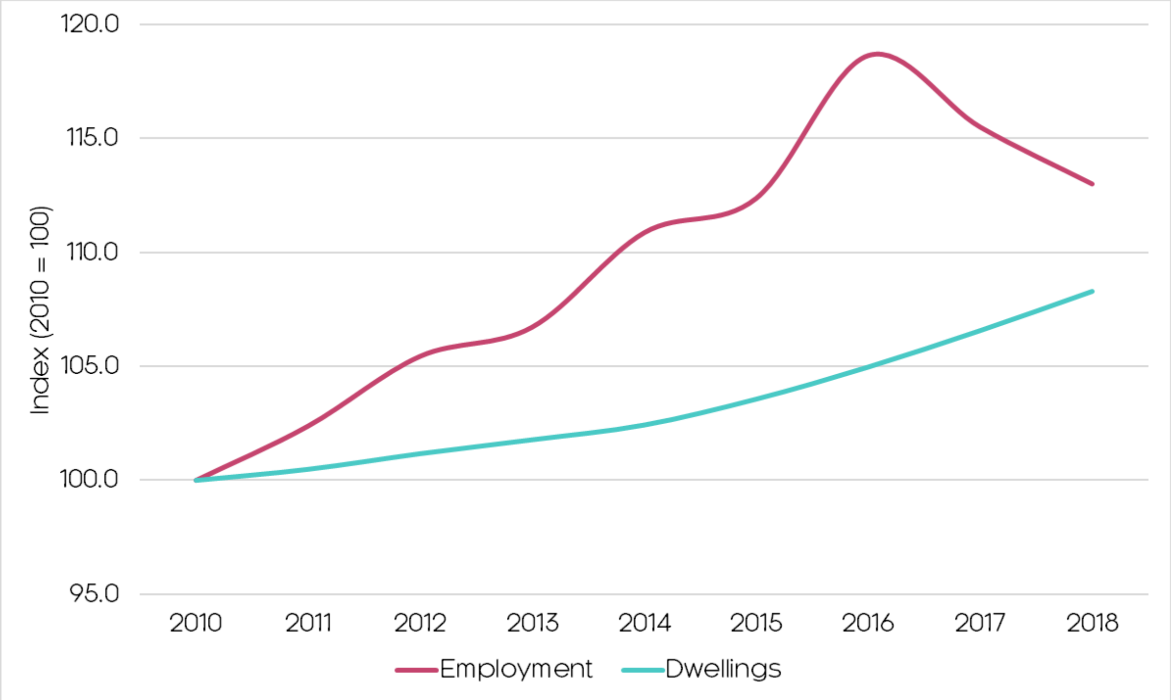


Source: ONS, Cambridge Econometrics.

focussed sectoral mix has underpinned Oxfordshire's research-driven growth performance.

Yet the LIS also acknowledges *"despite Oxfordshire's many strength's"* it does have some recognised weaknesses, such as "*low productivity relative to many peers"*, and an increasing *"strain on the county's infrastructure. Housing is becoming increasingly unaffordable and rail, road and energy infrastructure are not sufficient to meet rising demand."*

Figure 5.2.4: Oxfordshire's employment growth relative to net dwelling completions, 2010-18 (indexed, 2010 = 100)



Source: MHCLG, ONS, Cambridge Econometrics.

For instance, Figure 5.2.4 shows Oxfordshire's dwelling stock has not necessarily kept pace with economic growth over recent years. Pre-recession, the growth in Oxfordshire's dwelling stock rarely diverged by more than 1.5x the growth in employment; since 2010, the average divergence has been 6.5x – that is, employment growth has on average been 6.5x the growth in dwellings.

Also notable from Figure 5.2.4 is a pronounced easing in Oxfordshire's employment growth, from 2016 onwards. Some of this will be attributable to the UK's decision to leave the European Union ('Brexit'), though it is unlikely to be exclusively responsible as a trend of such magnitude has not been observed in other EU-dependent areas.

Rather, the fact local (i.e. sub-regional) employment trends, based on survey-derived data (from the ONS[32]), can be volatile and noisy, means this dip is likely being overestimated, if being estimated correctly at all. In fact, when accounting for the relative confidence intervals, it could be that pre-2016 growth was being overestimated, whilst post-2016 has been underestimated.

[32] Specifically, ONS Business Register and Employment Survey (BRES)

And when scrutinizing the 'dip' further, it is apparent that it is being driven by notoriously volatile and hard to measure parts of local economies, with notable falls in the self-employed and double-jobbers in Oxfordshire over this time. By taking a longer-term perspective (such as decade averages shown in Figure 5.2.1) a more reflective and informative trend of employment growth be inferred, rather than volatile year to year movements.

And to help explain what has driven Oxfordshire's longer-term growth performance, the change in an areas GVA – when adjusted for population i.e. GVA per capita/head - can be broken down into drivers of interest to help articulate the longer run determinants and drivers of growth within an area. Specifically, it can be decomposed using the following identity:

$$\frac{GVA_{wp}}{Population_{res}} = \frac{GVA_{wp}}{Jobs_{wp}} x \frac{Workers_{res}}{WAP_{res}} x \frac{Jobs_{wp}}{Workers_{res}} x \frac{WAP_{res}}{Population_{res}}$$

GVA per capita = Labour Productivity x Employment Rate x Jobs per Worker x Working-Age Share

Table 5.2.1: Composition of GVA per capita growth, 1992-2018

	Oxfordshire	UK
GVA per capita, 2018 (£2016 prices)	**£29,800**	£27,500
GVA per capita growth pa, 1992-2018, of which attributable to:	**1.4%**	1.8%
Labour Productivity	***58.5%***	*79.3%*
Jobs per Worker	***9.8%***	*7.8%*
Employment Rate	***44.6%***	*16.4%*
Working-Age Share	***-12.9%***	*-3.6%*

Source: ONS, Cambridge Econometrics.

Table 5.2.1 applies this analysis and shows the change in GVA per capita and its drivers between 1992-2018 in Oxfordshire and the UK (i.e. the national average). As the data shows, GVA per capita – which is regarded as a broad indicator of an areas prosperity and living standards – is much higher (some 8%) in Oxfordshire than the national average, though growth has been marginally slower over recent years.

For Oxfordshire, productivity growth has accounted for the majority (two-thirds) of growth in its GVA per capita. This share however is much lower than the national average, where over three-quarters of growth in GVA per capita has been driven by productivity improvements. This reflects, as the LIS identified, Oxfordshire's comparatively weaker productivity performance.

Instead, Oxfordshire has been much more dependent on wider labour market improvements to support its growth, especially in terms of residents entering and staying in employment. In fact, the share of growth attributable to jobs per worker and the employment rate in Oxfordshire has been almost twice that of the national average, reflecting the robustness of the local labour market.

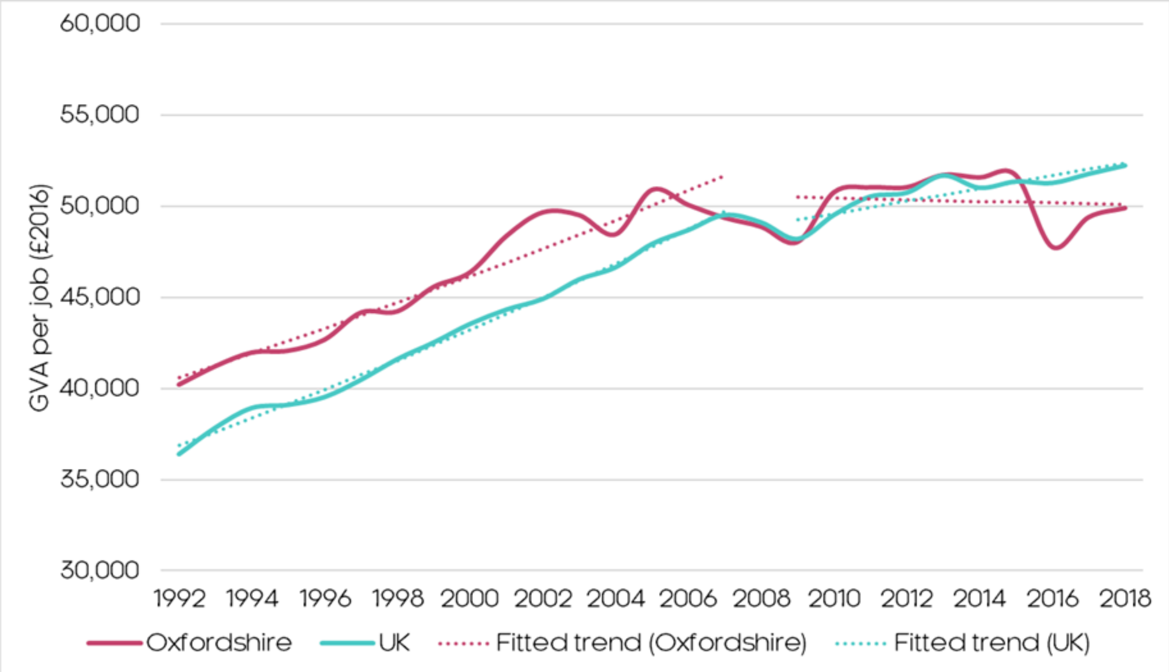
Both Oxfordshire and the rest of the country have failed to benefit from a 'demographic dividend', as reflected in growth attributable to its working age population. Given the potentially negative fiscal, labour market and consumer effects of a declining working age population, such factors appear to be acting as a stronger drag on growth in Oxfordshire than elsewhere in the country.

The rest of this chapter looks in more detail at some of these factors and what may be driving their higher-level trends.

5.3 Productivity in Oxfordshire

Analysis in Table 5.2.1 showed productivity (specifically in this case labour productivity, represented by; GVA / Jobs) is an important determinant of longer-term growth, yet according to the LIS Oxfordshire's "workers are not particularly productive. Output is high, but so are the number of hours worked."

Figure 5.3.1: Productivity (GVA per job) trends in Oxfordshire and the UK, 1992-2018



Source: ONS, Cambridge Econometrics.

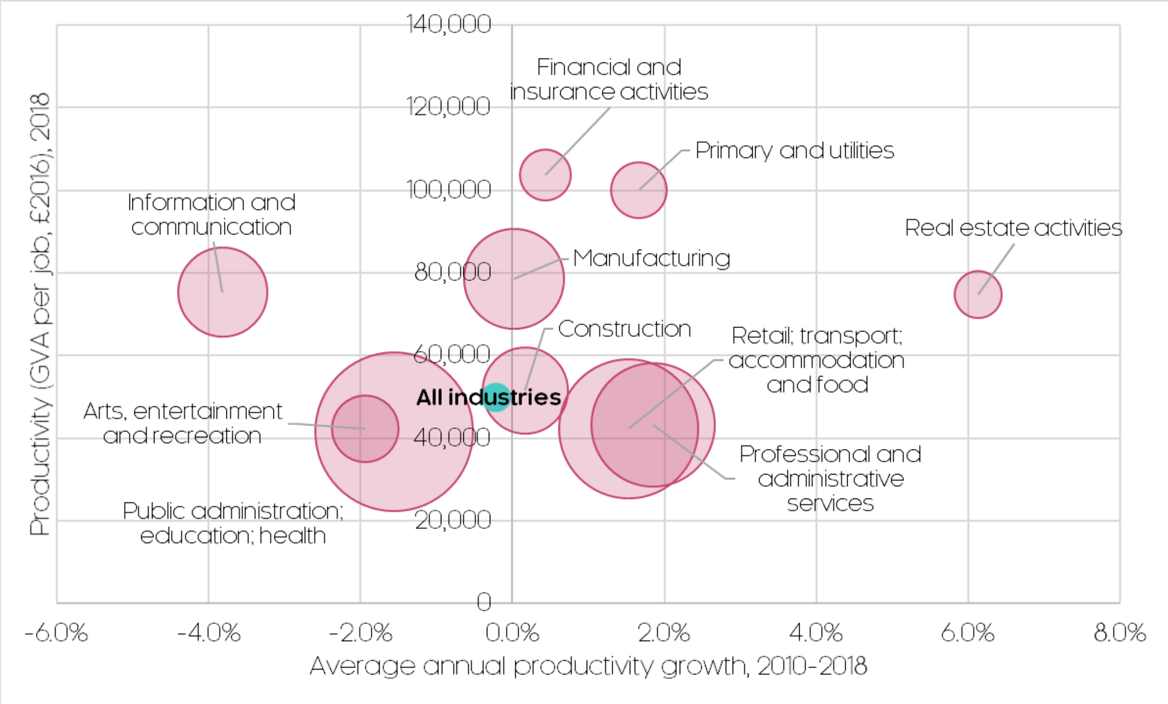
As Figure 5.3.1 shows, this is a relatively new phenomena, having only really been an occurrence following the 2008/09 recession, where productivity growth in Oxfordshire has slowed and since stalled in comparison to the national average and historic trends.

This wider slowdown in productivity has been popularly referred to as a 'productivity puzzle', and though affecting many advanced economies across the world – including that of the UK - it is evidently being more keenly felt within Oxfordshire.

The cost of this 'puzzle' is significant and increasing; if the average Oxfordshire worker had followed their pre-recession trend rate of productivity growth, productivity would be almost 18% higher than what it is now, increasing GVA by an additional £3.7 billion.

Figure 5.3.2 shows the broad impact of the 'puzzle' at the headline sectoral level. As with the rest of the UK, there is no clear or overriding factor behind Oxfordshire's productivity slowdown, although service-based sectors appear to be the most affected.

Figure 5.3.2: Headline sectoral productivity trends in Oxfordshire (note: size of bubble corresponds to sectors current share of GVA), 2010-18



Source: ONS, Cambridge Econometrics.

Oxfordshire's LIS analysis of the five foundations of productivity reveals its comparative strengths and weaknesses in a productivity context though. The five foundations are the thematic areas of the UK economy that underpin the Government's ambition to boost productivity through its National and Local Industrial Strategies:

1. Ideas: the world's most innovative economy
2. People: good jobs and greater earning power for all
3. Infrastructure: a major upgrade to the UK's infrastructure
4. Business Environment: the best place to start and grow a business
5. Places: prosperous communities across the UK

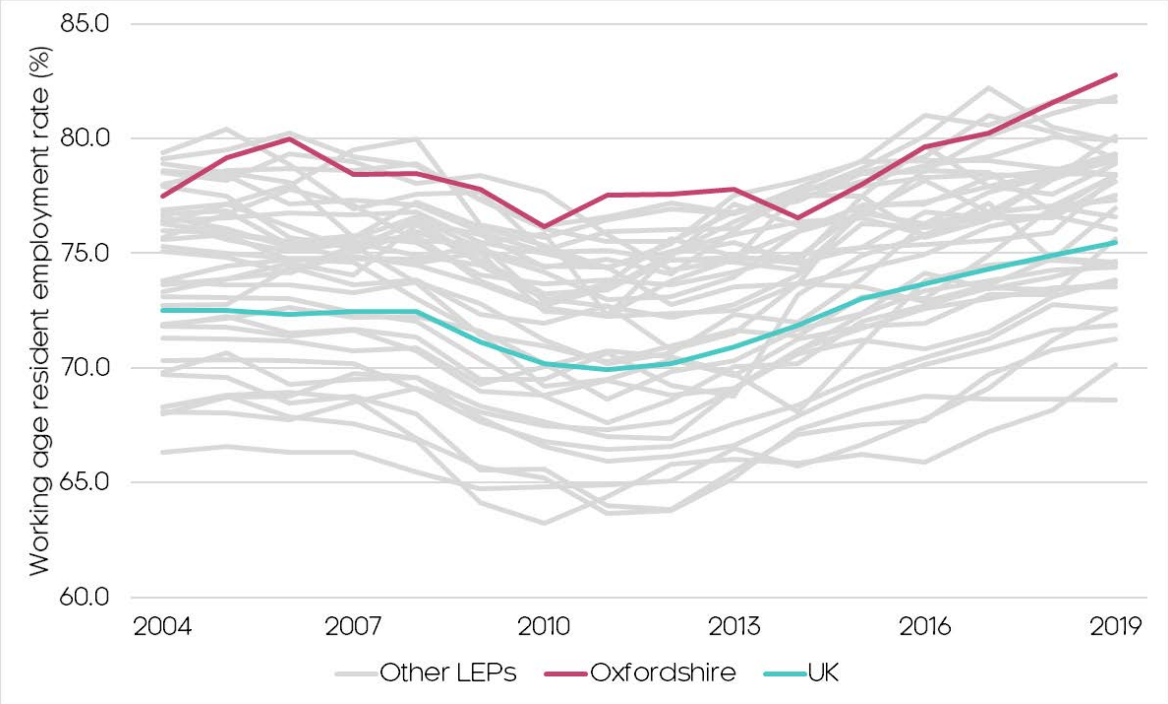
LIS analysis showed Oxfordshire performed strongly and had recognised assets across most of the foundations, particularly Ideas, Business Environment and People. Infrastructure and Places had a more mixed performance though (the latter, particularly in terms of housing affordability), which may be impacting on productivity, whilst even Oxfordshire's more positive foundations may not be representative of the whole theme or area e.g. pockets of deprivation and wage disparity.

Recognising Oxfordshire's poor recent productivity performance, the LIS acknowledges that *"the ultimate objective of this Local Industrial Strategy is to raise productivity."*

5.4 Oxfordshire's labour market

Oxfordshire has one of the strongest labour markets in the country; according to the most recent data (2019), Oxfordshire currently has the highest employment rate out of 38 LEP areas (see Figure 5.4.1), with some 82.8% of working age residents in active employment, comfortably eclipsing the national average of 75.5%.

Figure 5.4.1: Working age employment rate across 38 LEP areas, 2004-19



Source: ONS, Cambridge Econometrics.

Oxfordshire's unemployment rate meanwhile is estimated to be as low as 1.6%, compared to the national average of 4.1%. Since 2010, an additional 32,900 residents have entered work, whilst some 26,500 residents have moved out of unemployment or economic inactivity.

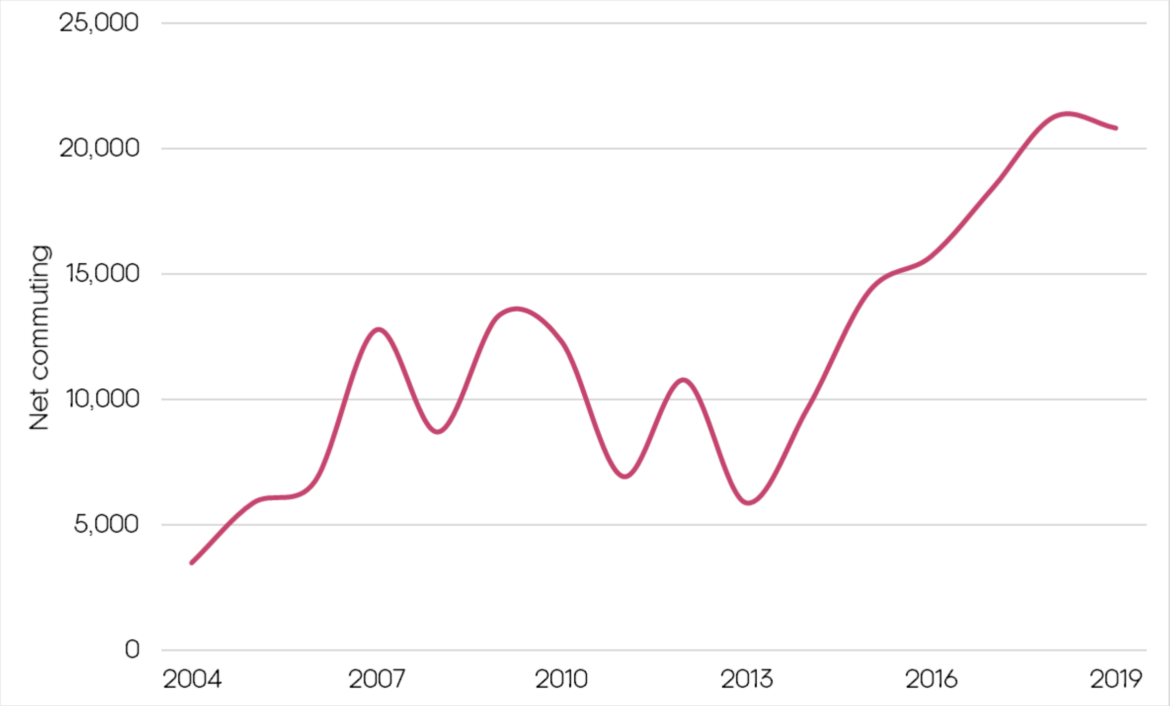
Though a high and increasing share of those in employment are in full-time work (78.1% in Oxfordshire, national average 75.3%), Oxfordshire does have a slightly higher incidence of residents in non-permanent (including 'zero hours') employment than the national average (6.2% in Oxfordshire, national average 4.5%).

Census data shows most residents (85%) work in the county, though this may now be higher given the tightness of the local labour market, which has also seen an increase in people commuting into Oxfordshire.

Figure 5.4.2 shows Oxfordshire's net commuting has rapidly increased over recent years (its highest since records began in 1981) as people working in the county exceeds residents in employment; since 2010, the number of people working in Oxfordshire has increased by 41,400, whilst the number of residents in work has increased by only 32,900.

This is a factor which is likely to have influenced house price growth; the relationship between commuting and affordability is explored in greater detail in *Chapter 12 Commuting and Affordability Implications.* Likewise, with more people travelling into Oxfordshire, and travelling further, this has likely had implications for journey times, congestion and emissions in Oxfordshire.

Figure 5.4.2: Oxfordshire's net commuting flows, 2004-19



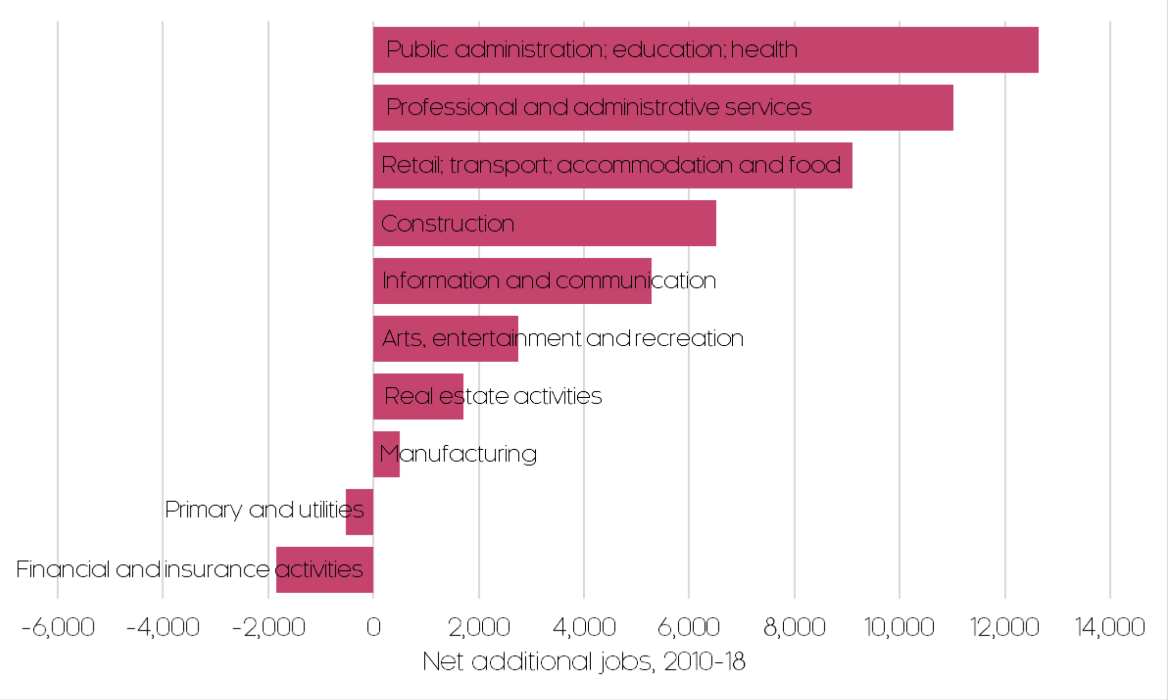
Source: ONS, Cambridge Econometrics.

This trend has been driven by the high and unprecedented rates of job creation as highlighted previously in Figure 5.2.1. Since 2010, an estimated 47,200 additional jobs have been created by employers in Oxfordshire.[33] As Figure 5.4.3 shows, at the headline sectoral level growth has been dominated by business and consumer services, which have accounted for around 86% of all additional jobs.

Only a handful of sectors have failed to show positive headline jobs growth over this time; the cyclical agriculture and primary industries, and the recession-impacted finance and insurance sectors. In contrast to many areas in the South East, Oxfordshire's manufacturing workforce has marginally grown.

[33] The number of jobs exceeds to the number of people working in Oxfordshire because a person can have more than one job ("double-jobbers")

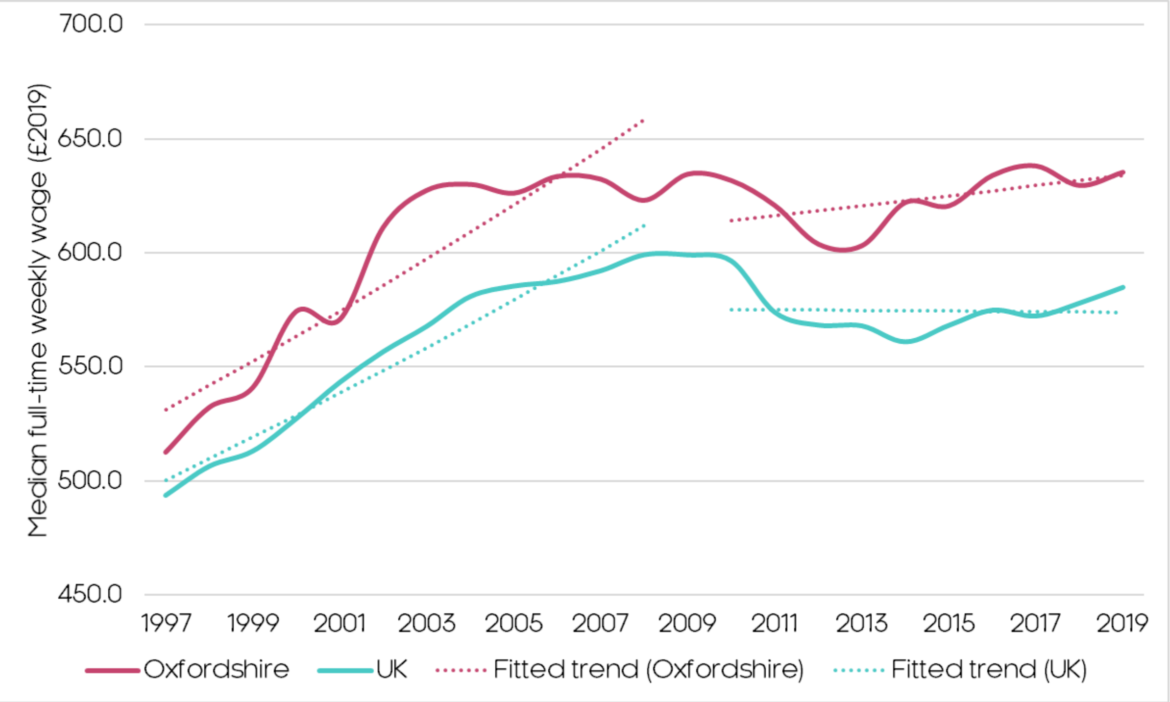
Figure 5.4.3: Sectoral composition of jobs growth in Oxfordshire 2010-2018



Source: ONS, Cambridge Econometrics.

This buoyant labour market performance has however been against a backdrop of subdued wage growth. As Figure 5.4.4 shows, after peaking in 2006 median full-time wages in Oxfordshire had contracted by 4.8% in real terms by 2013. Positively wage growth has since started to accelerate, averaging 0.9% since 2013, almost double the national average of 0.5%, though it took almost a decade for the median wage to pass its pre-recession peak.

Figure 5.4.4: Real wage trends for full-time workers in Oxfordshire and the UK



Source: ONS, Cambridge Econometrics.

When looking at the distribution of earnings, the gap between the highest and lowest-earners in Oxfordshire is marginally lower than the national average, though since 2013 low earners in Oxfordshire have seen slower real wage growth than equivalents elsewhere (4.7% in Oxfordshire, 6.4% national average), and the median for the county.

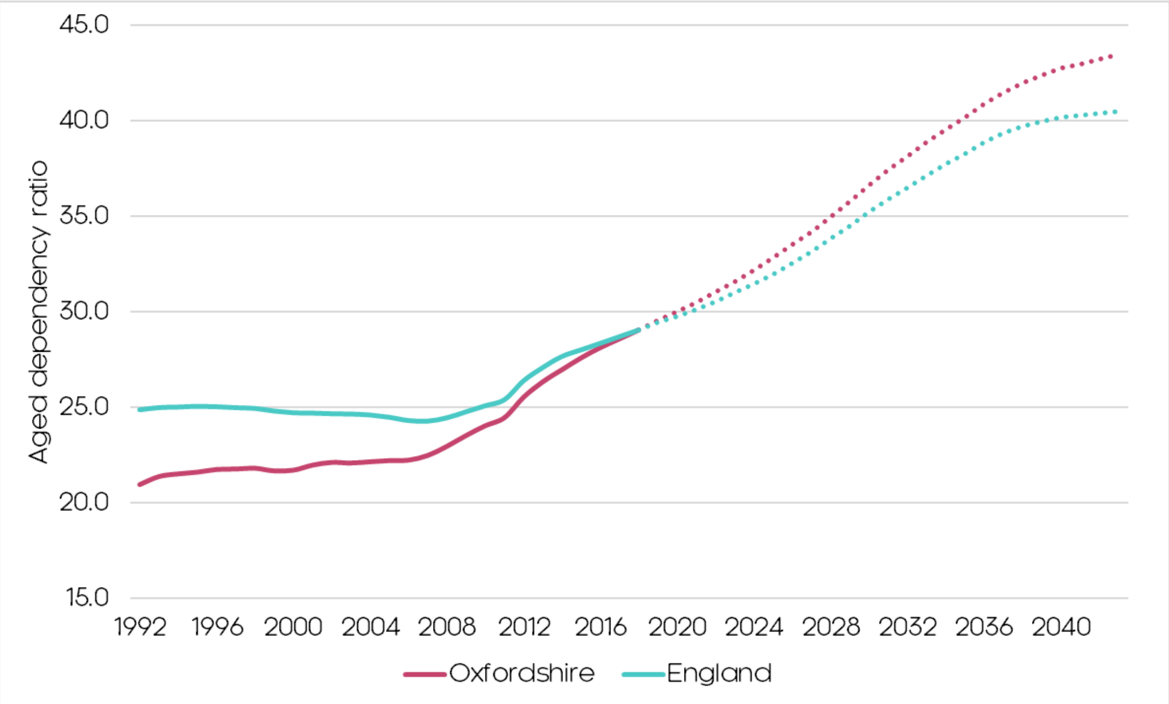
As explored in *Chapter 4*, this challenging environment for wage growth post-recession has been against a backdrop of a resurgent housing market, adding to affordability pressures in Oxfordshire.

5.5 Oxfordshire's working age population

Since 2008, Oxfordshire's working age population share (currently 62.8%, compared to a national average of 62.6%) has decreased by 3.5 percentage points (p.p.), and is expected to decrease further to 58.5% by 2050. The aged dependency ratio[34] highlights the scale of such trends and their potential impact on the local economy.

As the ratio narrows, *it "places increasing pressure on those of working age to provide for those not in work – whether directly or through taxes."*[35] It can also restrict labour supply and exacerbate skills gaps and shortages,[36] not least in an already tight labour market like Oxfordshire's.

Figure 5.5.1: Aged dependency trends in Oxfordshire and the UK (note: dotted line denotes forecasts, from 2018-based SNPP), 1992-2040



Source: ONS, Cambridge Econometrics.

Figure 5.5.1 shows the aged dependency ratio in Oxfordshire and England overtime. Though the current ratio of 29 dependents per 100 working age

[34] The ratio of aged dependents (those aged 65+) for every 100 working age persons (those aged 16-64)

[35] World Economic Forum (2015), What are the economic implications of ageing populations?

[36] CIPD (2015), Labour supply and the ageing workforce

residents is the 14th lowest of 38 LEP areas, it is rising quickly and diverging from the national average.

In fact, by 2040 the ratio is expected to increase at an unbridled pace to 43 dependents per 100 working age residents, higher than the national average of 40. At this point, it is expected 1 in 4 of Oxfordshire's residents will be of retirement age. This clearly has implications for the sustainability of local government finances.

5.6 Conclusions

Oxfordshire has been one of the country's fastest growing economies in recent years, and sustained jobs growth of some 6,000 per year over the 2010-18 period. It has notable strengths in research-intensive activities including media and technology, science and healthcare, and public services. Whilst employment growth has been strong, productivity improvements have however stalled in recent years.

The evidence suggests that jobs growth over the 2010-18 period has outpaced growth in housing in Oxfordshire, and set against strong levels of economic participation, in-commuting to the county has therefore increased. Drawing together the analysis in *Chapters 4* and *5*, it is clear that Oxfordshire's strong economic performance has led to a supply/demand imbalance which has supported a further deterioration in housing affordability.

6 Commercial Market Dynamics

6.1 Introduction

This chapter gives consideration to commercial property market dynamics in Oxfordshire, focusing on dynamics for the types of uses – offices, research and development, industrial and warehouse/distribution development – and related employment activities which typically take place on 'employment sites'.

By reviewing recent trends in floorspace, rents and take-up changes, it provides greater understanding of supply and demand issues specific to Oxfordshire. This chapter also summarises views of commercial agents regarding the local commercial property market. The analysis then informs the consideration of future employment land needs which is addressed in *Chapter 11*.

However, it is important to note that there is significant employment in Oxfordshire, which would ordinarily fall within use class E(g)(i) Office or E(g)(ii) Research but where associated planning permissions are for use class D1 Non-Residential Institutions. This is particularly the case with the economy of Oxford, where there has been significant jobs growth in hospitals and universities.

6.2 Stock of commercial property

There is a total of 6.5 million sq.m of commercial floorspace in Oxfordshire as at March 2019 (Table 6.2.1). Industrial floorspace makes up 54% of the total, retail and office each make up 17% whilst 11% is accounted for by other commercial floorspace (which includes amongst others education, health and utilities).

Table 6.2.1: Stock of commercial floorspace (sq.m), 2019

	Retail	Office	Industrial	Other	Total
Oxfordshire	**1,134,000**	**1,134,000**	**3,532,000**	**700,000**	**6,500,000**
% of total stock	***17%***	***17%***	***54%***	***11%***	***100%***
Cherwell	338,000	192,000	1,215,000	172,000	1,917,000
% county total	*30%*	*17%*	*34%*	*25%*	*29%*
Oxford	360,000	370,000	317,000	168,000	1,215,000
% county total	*32%*	*33%*	*9%*	*24%*	*19%*
South Oxfordshire	160,000	192,000	589,000	124,000	1,065,000
% county total	*14%*	*17%*	*17%*	*18%*	*16%*
Vale of White Horse	144,000	274,000	850,000	127,000	1,395,000
% county total	*13%*	*24%*	*24%*	*18%*	*21%*
West Oxfordshire	132,000	106,000	560,000	110,000	908,000
% county total	*12%*	*9%*	*16%*	*16%*	*14%*

Source: VOA, Iceni Projects.

Oxford has almost a third of retail and office floorspace in the county. Vale of White Horse also stands out as having a larger concentration of office floorspace than other areas at 274,000 sq.m likely influenced by the significant concentration at Milton Park, Didcot. The proportion of office and retail floorspace in West Oxfordshire is comparatively modest.

Of the total 3.5 million sq.m of industrial floorspace, the largest concentration is in Cherwell (34%) influenced by the location of its main towns close to the M40. This is followed by Vale of White Horse; with Oxford having a notably low level of industrial floorspace. The level of industrial floorspace in Cherwell is more than twice that in South Oxfordshire or West Oxfordshire.

The stock of commercial floorspace in Oxfordshire has grown by 339,000 sq.m over the last 15 years, as shown in Table 6.2.2. However, there has been relatively modest growth in both industrial floorspace (+ 51,000 sq.m) and office floorspace (+ 63,000 sq.m) over this time.

Over the last five years, industrial floorspace has grown by 63,000 sq.m and office floorspace by a modest 3,000 sq.m influenced by losses through Permitted Development Rights (PDR) changes of use to residential.

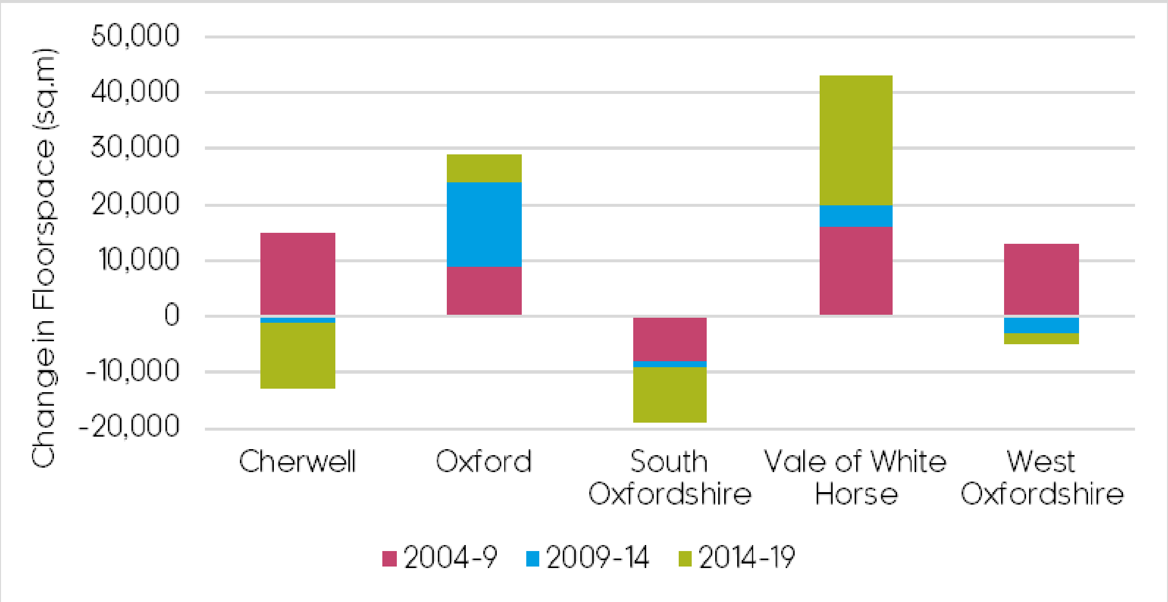
Table 6.2.2: Net change in commercial floorspace (sq.m) in Oxfordshire, 2004-19

	2004-09	2009-14	2014-19	Total	% Change, 2004-19	% Change, 2014-19
Industrial	-26,000	14,000	63,000	51,000	1.5%	1.8%
Office	45,000	15,000	3,000	63,000	5.9%	0.3%
Retail	21,000	22,000	58,000	101,000	9.8%	5.4%
Other	66,000	12,000	46,000	124,000	21.5%	7.0%

Source: VOA, Iceni Projects.

Vale of White Horse and Oxford have seen the strongest growth in office floorspace, as illustrated in Figure 6.2.1. In contrast, the recent trend over the last decade has been of a decline in net terms in office floorspace in the other Oxfordshire local authorities.

Figure 6.2.1: Changes in office floorspace in Oxfordshire, 2004-2019

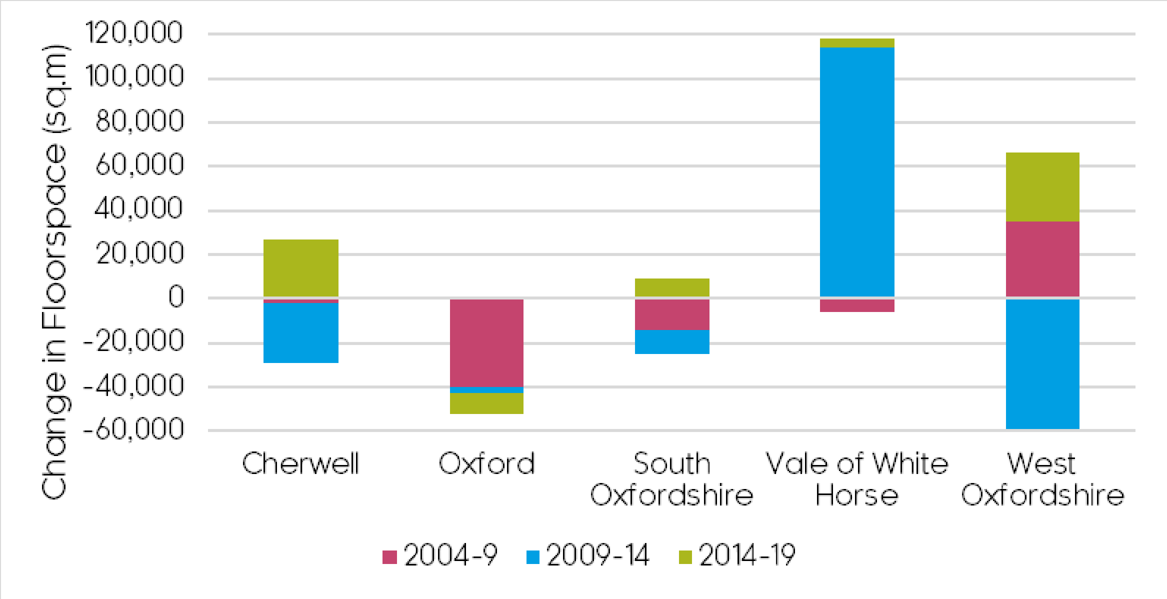


Source: VOA, Iceni Projects.

A similar analysis for industrial floorspace, presented in Figure 6.2.2, points to the strongest overall growth of 112,000 sq.m (2004-19) being in Vale of White Horse. West Oxfordshire has seen modest growth over the 15-year period (7,000 sq.m) whilst in the other authorities, the quantum of industrial floorspace has fallen in net terms.

The more recent trend (2014-19) has seen of growth in industrial floorspace in West Oxfordshire and Cherwell in particular, the floorspace quantum increasing by 31,000 sq.m and 27,000 sq.m respectively. Modest growth of 9,000 sq.m has been seen in Vale of White Horse and 4,000 sq.m in South Oxfordshire; with a decline of -9,000 sq.m seen in Oxford.

Figure 6.2.2: Changes in industrial floorspace in Oxfordshire, 2004-19



Source: VOA NDR Business Floorspace Tables, Iceni Projects.

6.3 Oxfordshire's office market

Iceni has reviewed office market dynamics in Oxfordshire, taking account of published research by local and national surveys; together with additional analysis of take-up and availability based on Estates Gazette data (EGi) and CoStar.

Oxfordshire has been highly resilient to wider economic uncertainty in recent years, in part due to the county's focus on the knowledge sectors which have been driving demand for commercial property. Analysis by Carter Jonas suggests the main constraints on recent take-up have been on the supply side rather than demand[37], which have adversely impacted on transaction levels in the office and research & development (R&D) sector.

The latest commercial property market updated by VSL[38] indicates that transactions across Oxfordshire in the office and industrial market have fallen significantly from the high levels recorded in 2017 (Figure 6.3.1). A total of 28 office transactions were recorded in 2019 compared with 52 in 2017.

Reflecting a shortage of supply, headline rents across the county have increased. Prime office rents have reached highs of £40 per sq.ft in central Oxford and £35 per sq.ft around the Oxford Ring Road. Rents have also increased over the last 5 years in Milton Park and Abingdon (as shown below)

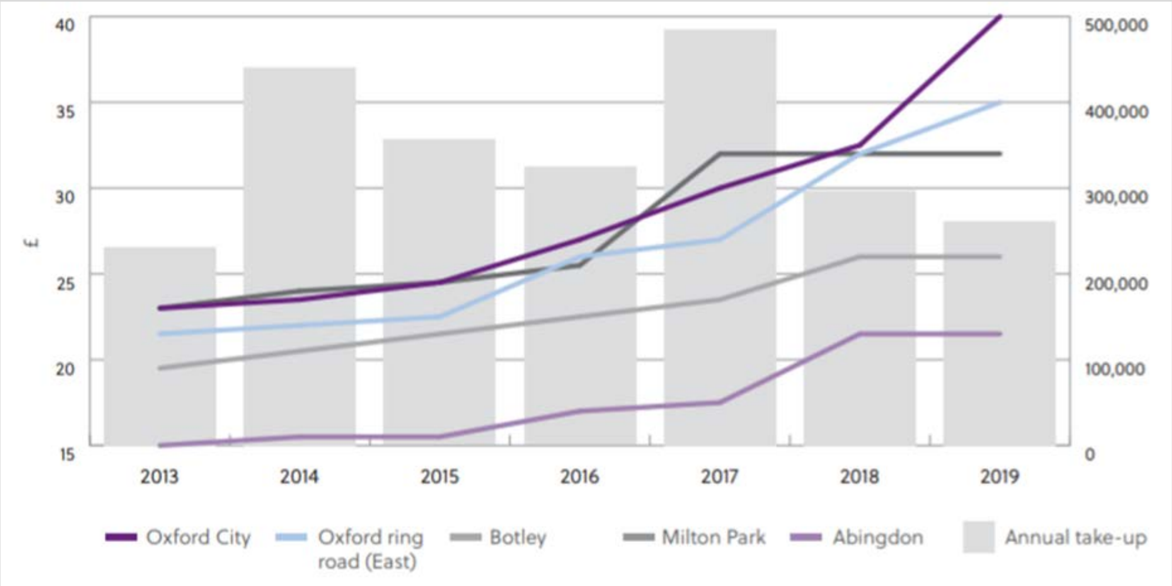
[37] Carter Jonas (2019) Commercial Edge Oxfordshire

[38] VSL (2019) Oxfordshire A34 Commercial Property Market Update 2019

but fall below those in Oxford. Rising rents are indicative of a supply/demand imbalance.

VSL predict that rental levels will rise further as the availability of the best office space continues to shrink.

Figure 6.3.1: Headline office rents and office floorspace take-up in Oxfordshire, 2013-19



Source: VSL.

VSL's Market Update indicates that the supply of office space has remained static and there is little speculative development expected to come forwards in 2020. As a result, existing refurbished office stock will continue to support the market.

Notwithstanding this, the office market sentiment in Oxfordshire is relatively strong, evidenced for instance by Legal & General's £4 billion investment with the University of Oxford to deliver a series of science & innovation districts with modern workspace and research facilities over the next decade.

In December 2019 Oxford City Council also approved the Oxford North planning application for the Northern Gateway area around the intersection of the A40 and A34, which is set to provide up to 87,300 sq.m of B1 floorspace providing 4,500 new jobs (including high quality workspace for start-ups), 480 new homes as well as shops, bars and restaurants.

An optimistic office market outlook was shared by Savills in Autumn 2019.[39] Their 2019 research cites expected growth of 8-9% growth in 'professional, scientific & tech' employment over the next 5 years. The top three office sectors in Oxford are identified as Technology, Media & Telecoms (28% of floorspace take-up), Energy & Utilities (18%), Biosciences (18%). Savills suggest that Oxford is poised to deliver significant new commercial floorspace in the coming years, which will drive prosperity.

However, the challenge will be accommodating companies in buildings they aspire to be in. As such, the City will need to provide the best quality and quantum of commercial floorspace. They cite that availability of office-type

[39] Savills (2019) Spotlight: Oxford Offices - https://www.savills.co.uk/research_articles/229130/288957-0

space (including laboratories) has been on a downward trend for the past decade. As the market had moved towards a (pre-Covid) 'new normal' of 500,000 sq.ft take-up pa in the past few years, the current supply level of around 900,000 sq.ft shows less than two years of supply in the market.

Savills Oxford Offices Spotlight, prepared in September 2020[40], indicates that despite lower take-up in the 1st half of 2020 and the effects of a shift towards home-working driven by the Covid-19 pandemic, there is a good pipeline of supply under offer in Q3, particularly of laboratory space, and a continuing contraction in the level of available space. They expect prime office rents in Oxford to rise to £45 per sq.ft in 2020 commenting:

> *"Occupier appetite is strong and will continue to strengthen. If the supply was available, particularly in the city centre, take-up would be much higher. The resulting effect has been a doubling of rents in the past six years and they are expected to top £45 this year and grow going forward. Tenant incentives have also come under downward pressure."*

As a result take-up in the Oxford market in 2020 is forecast at 380,000 sq.ft, similar to the 2019 outturn. Take-up continues to be dominated by science- and technology-related occupiers. Set against this, the availability of space has continued to contract and stood at 65,000 sq.ft in Q2 2020 equating to less than 1.5 years' supply based on recent trends. This can be expected to provide further rental growth.

Whilst Covid-19 has had notable effects on office markets in other areas, the science and R&D focus in Oxfordshire has had different effects. Oxfordshire has been at the forefront of work to find a vaccine for Covid-19, both in terms of research and manufacturing, with plans for a 7,500 sq.m footprint Vaccines Manufacturing and Innovation Centre (VMIC) at Harwell Campus fast-tracked to help deliver this.

Iceni has undertaken its own analysis of office floorspace take-up and availability based on Estates Gazette (EGi) data on recorded deals and available space which is currently being marketed.

Figure 6.3.2 below shows the spatial distribution of office take-up across Oxfordshire based on the occupational deals available through EGi for January 2015 to January 2020.[41] It shows a strong concentration of office and R&D market activity in/around Oxford, and along the *"Knowledge Spine"* stretching from Banbury in the north to Didcot/Milton Park in South Oxfordshire. There is a notable lack of office take-up in Bicester and Witney.

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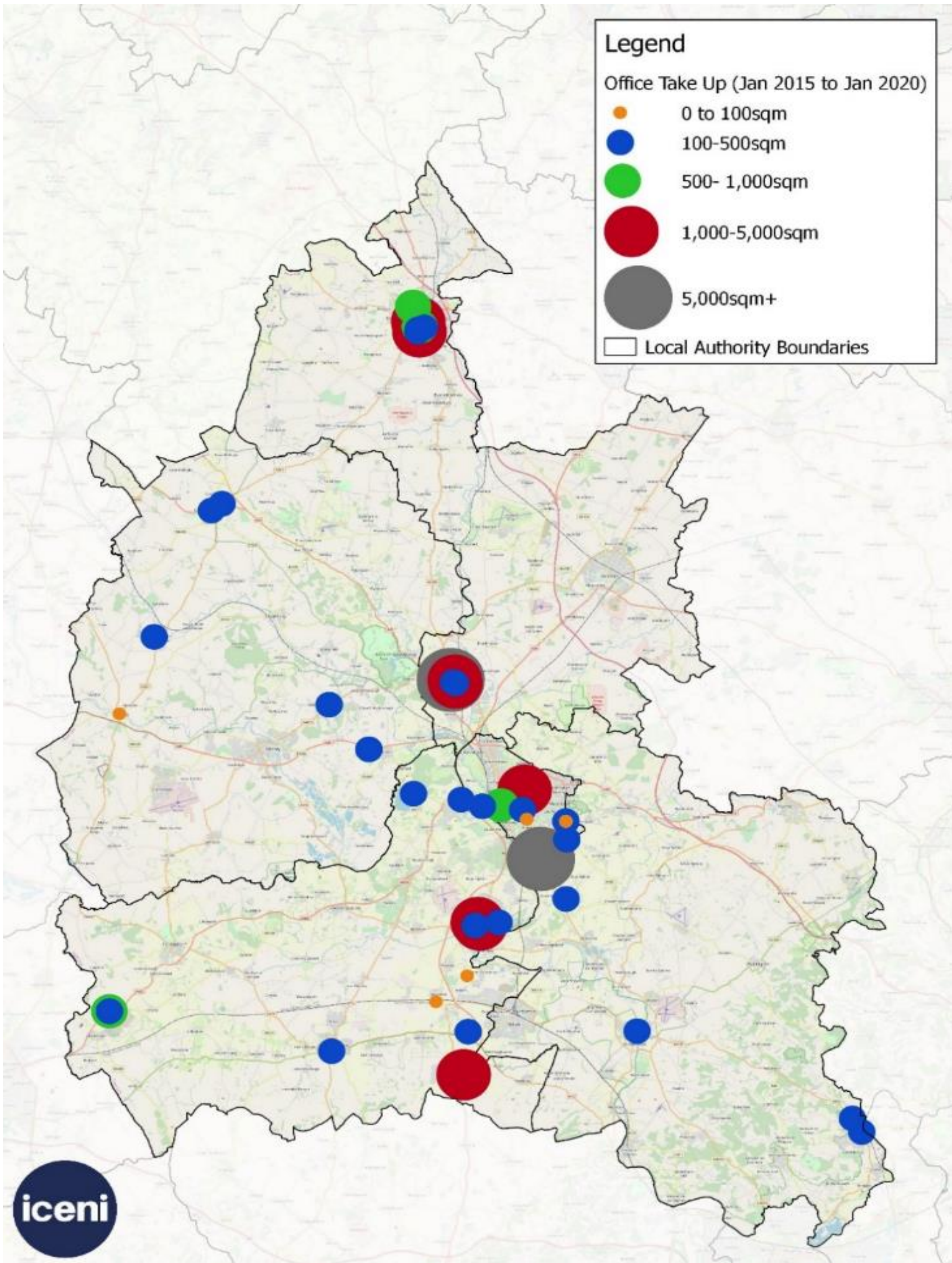
[40] Savills (2019) Spotlight: Oxford Offices. Available at https://www.savills.co.uk/research_articles/229130/304865-0

[41] Egi - Radius Data Exchange

Figure 6.3.2: Office take-up across Oxfordshire, 2015-20



Source: EGi, Iceni Projects.

Turning to availability, as of January 2020, there were 541 available office premises as recorded by EGi Radius within Oxfordshire.[42] The size and spatial distribution of these premises are illustrated on Figure 6.3.3 below. It is notable that the spatial distribution shows a strong level of supply around Oxford and in the southern parts of Oxfordshire. However, it is worth noting there is limited supply of Grade A office space in Oxford[43].

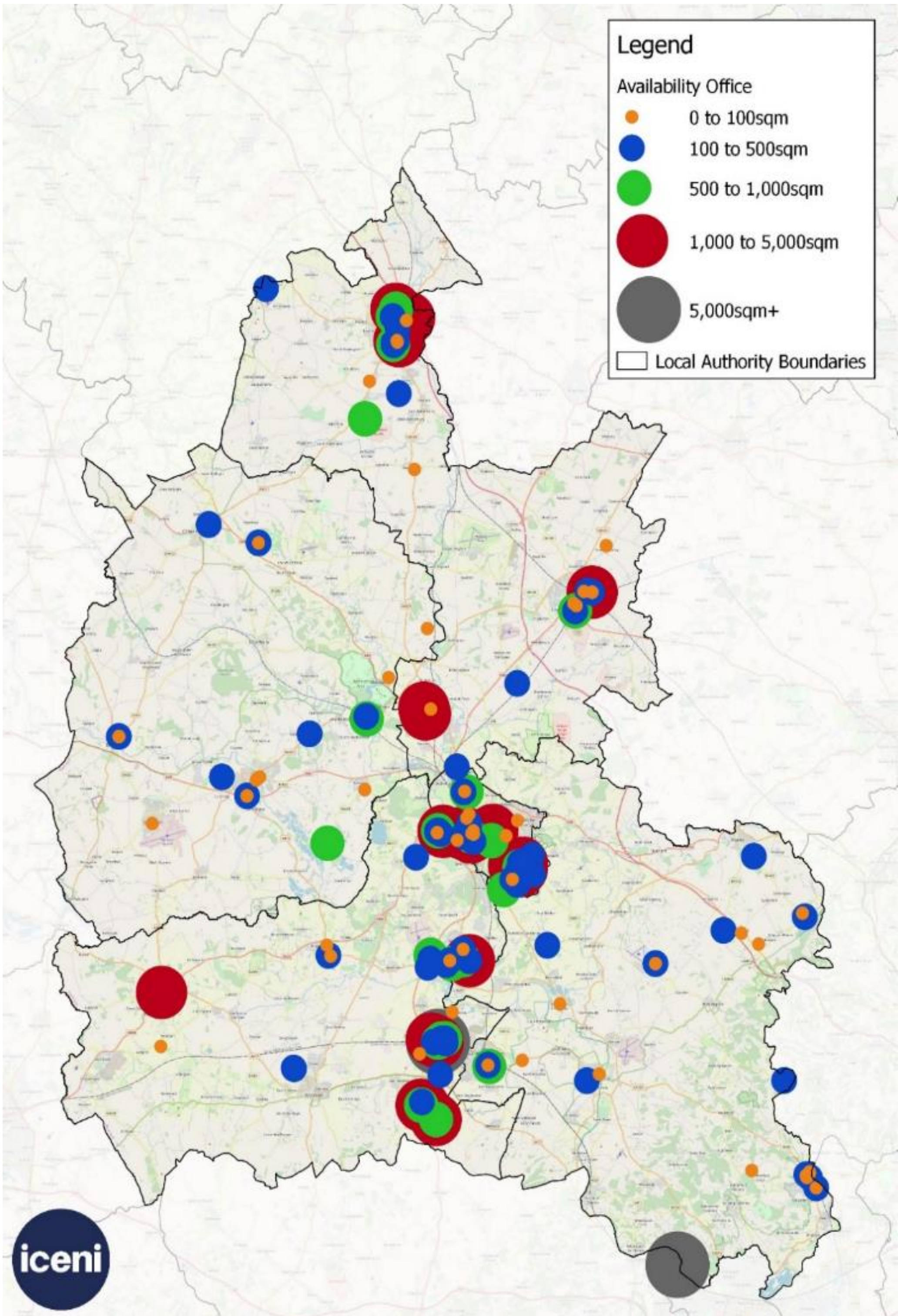
Larger office premises of over 1,000sqm are available in both town centres and along the A34 corridor (broadly corresponding to the ‘Knowledge Spine’

[42] EGi, Radius Data Exchange

[43] Savills (2019) Spotlight: Oxford Offices - https://www.savills.co.uk/research_articles/229130/288957-0

outlined in the Oxfordshire Local Industrial Strategy), with numerous smaller office premises below 500sqm spread across the county.

Figure 6.3.3: Office availability across Oxfordshire, January 2020



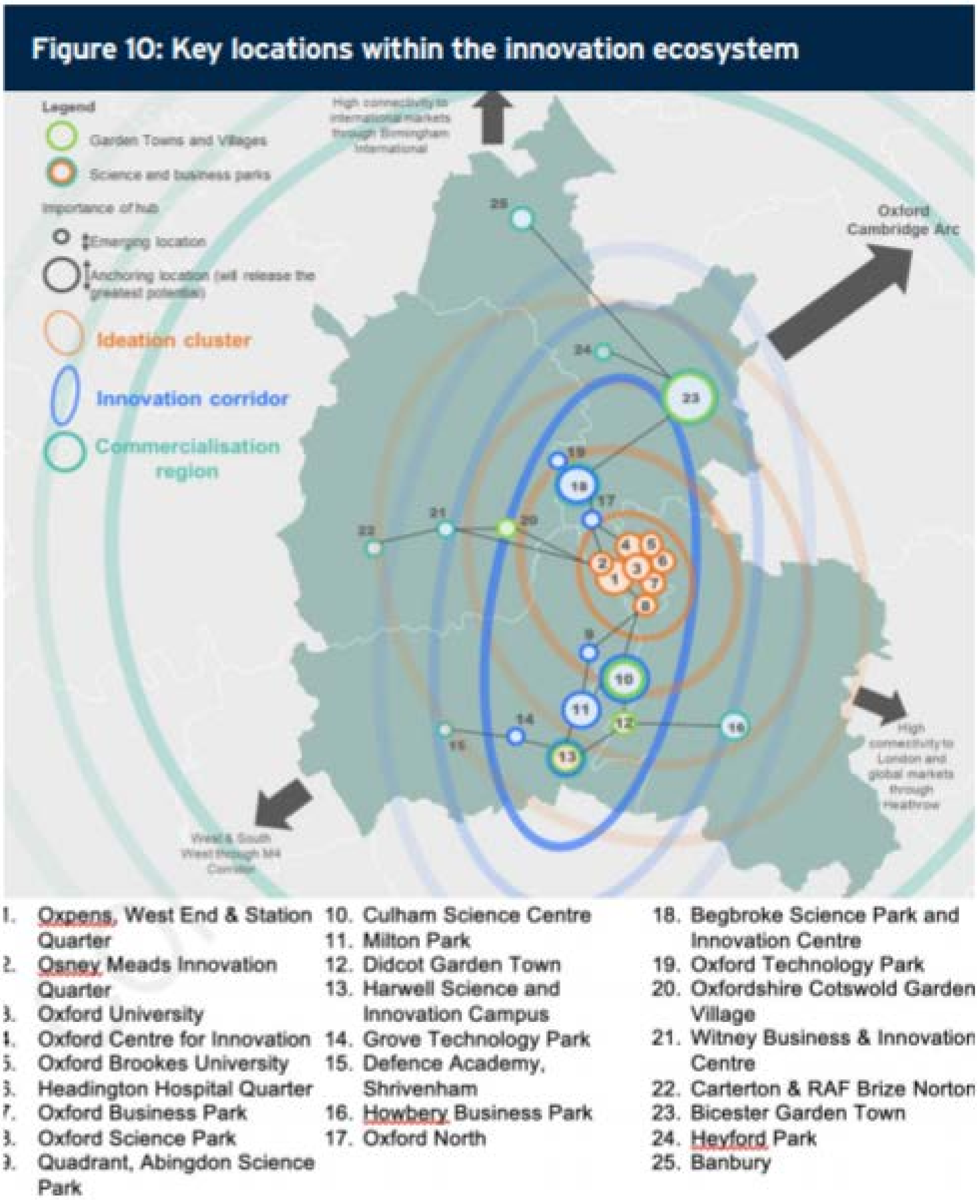
Source: EGi, Iceni Projects.

Figure 6.2.2 shows office take-up in both town/ city centre and business park locations. Demographics, working practices and staff preferences pre-Covid were reinforcing the appeal of town and city centres as locations which were amenity rich and supported social activity. However business parks have continued to play an important role, and research by Knight Frank has shown that they have accounted for three quarters of space acquired by pharmaceutical, manufacturing and technology firms across the South East since 2000. These are important sectors to Oxfordshire's economy.

The business park model has also been changing, with newer schemes seeking to design places which enable social and creative interactions through provision of amenities and investment in creating business eco-systems.

As the Oxfordshire Local Industrial Strategy[44] highlights, the county has one of the highest concentrations of innovation assets in the World with a strong concentration of science, technology and business parks. The majority of knowledge intensive economic activity is clustered in/ around Oxford and along the Knowledge Spine. Key existing science and business park locations are provided in Figure 6.3.4 below.

Figure 6.3.4: Key science and business parks in Oxfordshire



Source: Oxfordshire Local Industrial Strategy (LIS).

[44]Oxfordshire Local Industrial Strategy (2019) Oxfordshire Local Enterprise Partnership

Despite this strong existing stock of science and business parks, Oxfordshire faces a challenge with constraints on innovation space. Many of the science and business parks across the region are at capacity, particularly new laboratory facilities, clean rooms and flexible science working spaces.

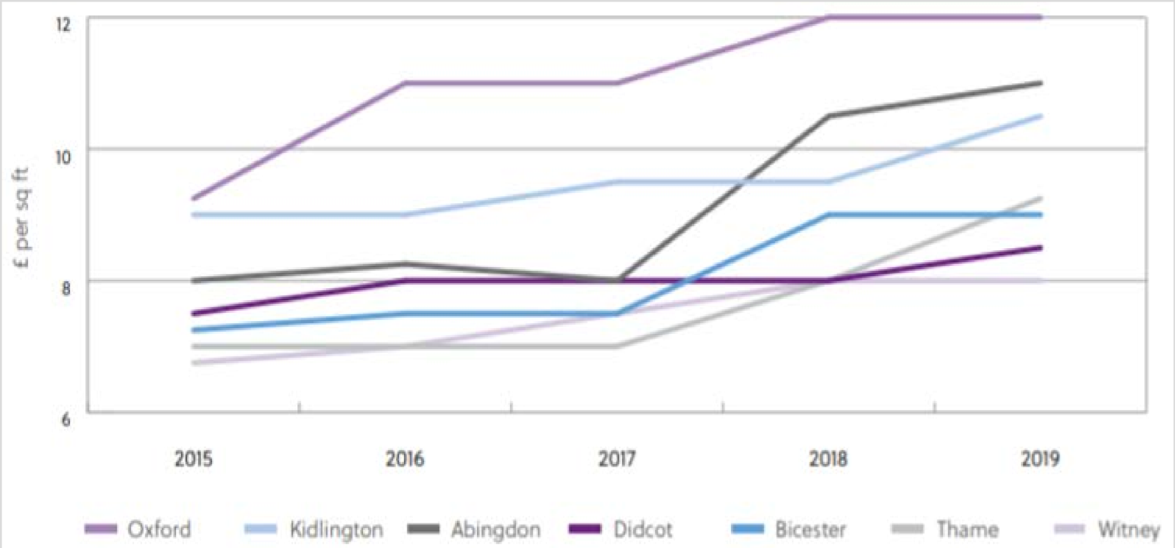
6.4 Oxfordshire's industrial market

The industrial market geography within Oxfordshire differs from that for office/ R&D space, with Bicester and Banbury sitting within an M40 market (and Banbury relating in part towards the South Midlands); alongside an Oxford market which includes major manufacturers such as BMW Mini's Cowley plant. There are also local concentrations of activity elsewhere, including in Witney.

Prime industrial rents in Oxfordshire have remained on an upwards trajectory albeit at more subdued levels than in recent years, as shown in Figure 6.4.1. A lack of development opportunities and supply shortages have partly driven rents, with activity now increasingly focused on the second-hand market[45]. 2019 saw a lower volume of industrial transactions at 35 relative to the 49 deals in 2017.

Bicester has recorded sustained rents over £8 per sq.ft for the first time with the letting of 120,000 sq.ft to Arrival Ltd, whilst prime science and technology industrial rents generally remaining between £15 and £16 per sq.ft. VSL's statistics for industrial prime rents across Oxfordshire are replicated below[46]. Oxford sees the strongest rents (followed by Abingdon) indicative of stronger comparative demand.

Figure 6.4.1: Industrial prime rents in Oxfordshire, 2015-19



Source: VSL.

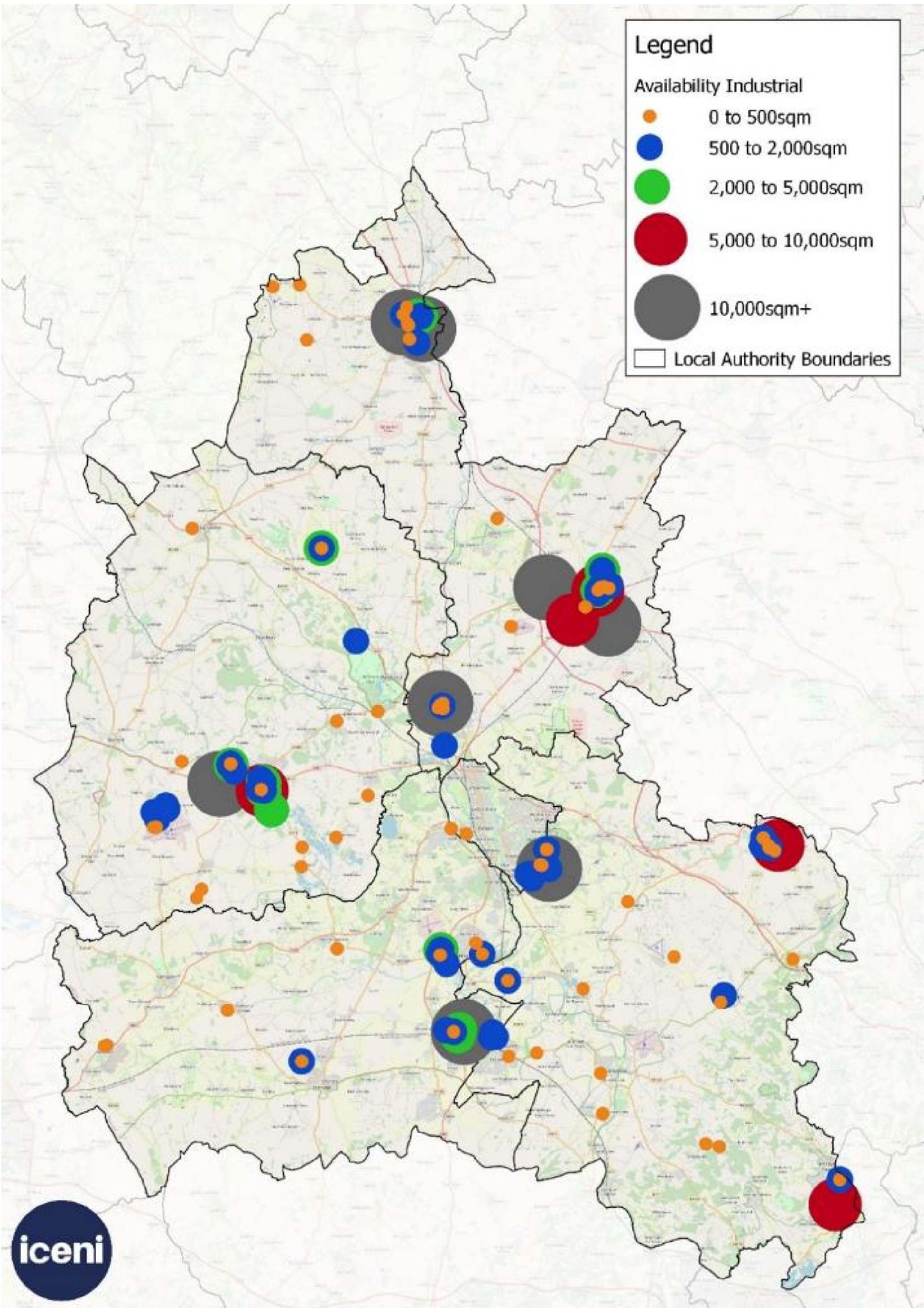
VSL's market update states industrial supply has increased by 64% with speculative development set to accelerate in 2020 which will further add to the available industrial supply.

[45] Carter Jonas (2019) Commercial Edge Oxfordshire

[46] VSL (2019) Oxfordshire A34 Commercial Property Market Update 2019

In terms of industrial premises, the occupational deals available through EGi for January 2015 to January 2020[47] are shown in Figure 6.4.3 below. The take-up of larger premises (5,000sqm+) were focussed on Didcot, Bicester and Banbury which are located closer to the M40 and M4 motorways. There is a noticeable lack of larger industrial take-up around Oxford, with smaller premises occupied in the surrounding towns across the centre of Oxfordshire.

Figure 6.4.2: Availability of industrial floorspace across Oxfordshire, 2015-20

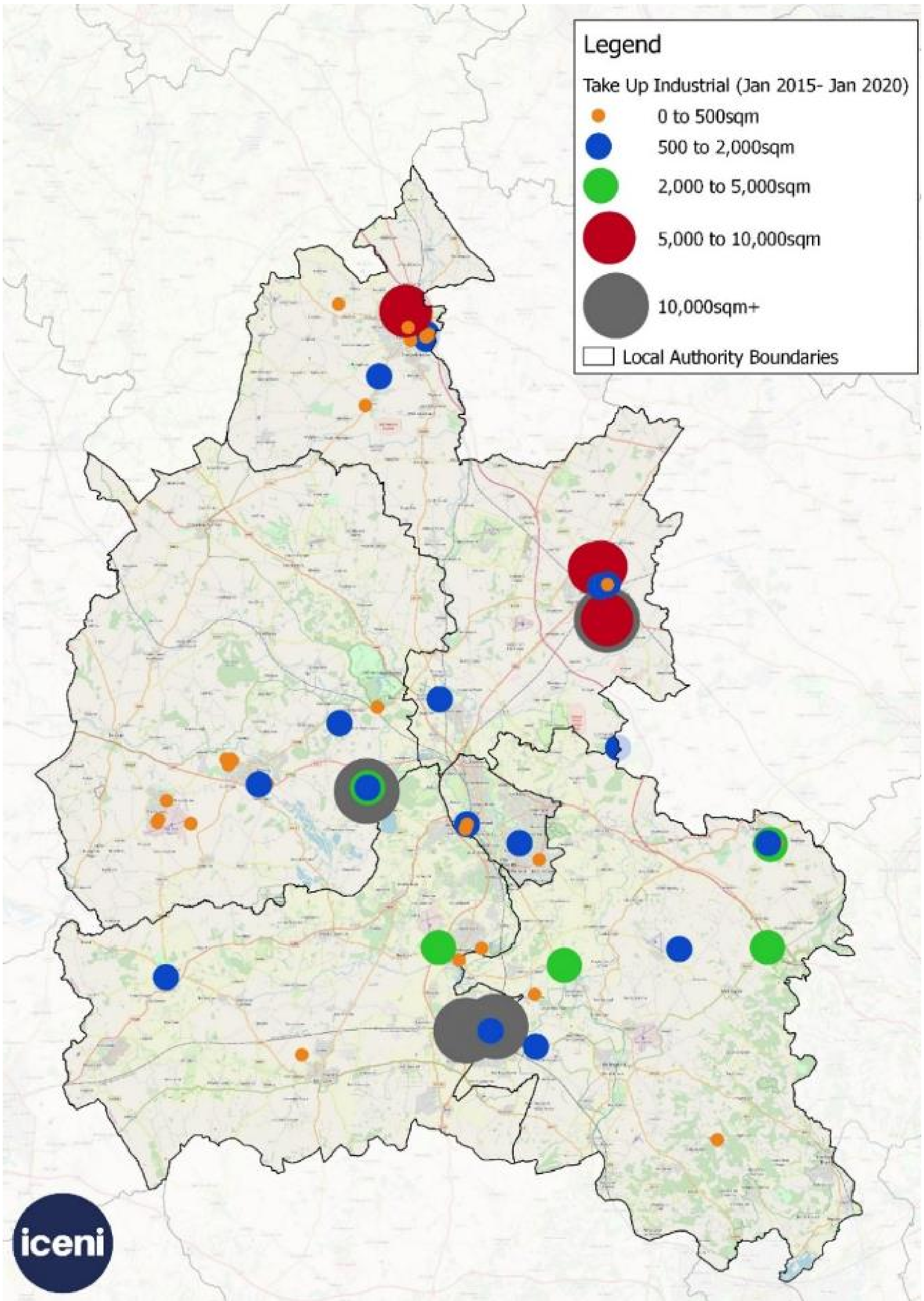


Source: EGi, Iceni Projects.

[47] EGi, Radius Data Exchange

The spatial distribution of identified industrial supply (Figure 6.4.2) is not too dissimilar to the geography of past take-up. However, it is notable that larger industrial units are available towards the eastern boundary of Oxfordshire in Henley-on-Thames and Thame, as well as Witney. Also noticeable is the large amount of industrial speculative development taking place due to the release of land in Bicester.

Figure 6.4.3: Industrial floorspace take-up across Oxfordshire, 2015-20



Source: EGi, Iceni Projects.

6.5 Conclusions

Analysis in this chapter has shown office take-up and availability is generally concentrated in Oxford and southwards along the ‘Knowledge Spine’, including Milton Park. Take-up and availability of industrial floorspace is more spread out across Oxfordshire, with noticeable amounts of speculative developments to the northeast of the county where there is good access to the M40.

Looking forwards, commercial agents are generally optimistic about the future of the local commercial property market. It is evident that there are short-term supply constraints in the office market, particularly in the Oxford area and for Grade A space, which is likely to drive further rental growth. Many of the area’s science and business parks are at capacity. The evidence also points to a healthy market for industrial space.

The demand analysis forms part of the evidence base which should be used to develop the strategy for employment land provision in the Oxfordshire Plan. This includes in *Chapter 11*, which provides a forward-looking overview of the quantitative scale of employment land needs in Oxfordshire.

Part B: Exploring Oxfordshire's Future Growth Needs

7 Oxfordshire's Housing Need Using the Standard Method

7.1 Introduction

Government's National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG) sets out a *"Standard Method"* for calculating the minimum local housing need for a local authority.

This is intended to provide a minimum local housing need figure *("a minimum baseline"*) using an approach which is simpler, quicker and more transparent than previous methods; and in doing so has removed much of the scope for professional judgement or debate about the minimum level for future housing provision.

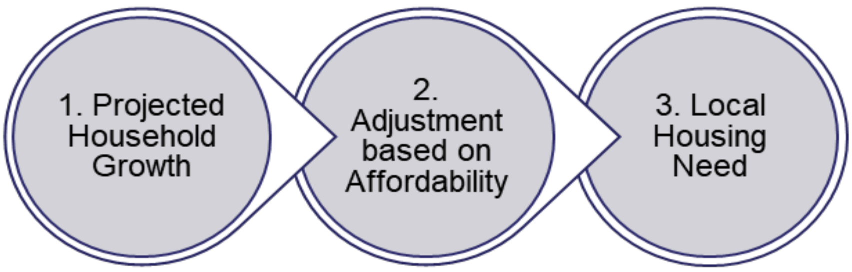
In this chapter, Iceni has set out the current Standard Method calculations for Oxfordshire.

Note that the calculations presented here were estimated utilising affordability data for 2019 (released March 2020). Consideration of more recent affordability data (for 2020, released March 2021) is provided in *Appendix E: Standard Method Appendix*.

7.2 Standard Method minimum local housing need

The Standard Method is structured around three core stages, as illustrated in Figure 7.2.1:

Figure 7.2.1: Overview of the Standard Method (2018) for calculating local housing need



Source: Iceni Projects.

The first step in the Standard Method takes the projected household growth from trend-based household projections over the next 10 years. Given the Oxfordshire Plan period begins in 2020, household growth over the period from 2020-2030 has been used. For Oxfordshire the Government's official (2014-based) household projections show growth of 2,387 households per year, adding together the figures for the five local authorities.[48]

[48] The Standard Method was designed around the use of 2014-based Household Projections. Whilst a 2016-based set of household projections were published in 2018 and a 2018-based set in 2020, these adopt a different methodology and show a notably lower level of housing need across England. Government

The second stage applies an uplift to this to take account of affordability based on the latest house price to income ratio figure. The detailed calculations are set out in Figure 7.1.2, with the adjustments applied to the household growth separately for each local authority based on its affordability position as published by the Office for National Statistics (ONS).[49]. The combined effect of this across Oxfordshire is to increase the housing need by 42% relative to the household projections, generating an (uncapped) need for 3,383 homes a year across Oxfordshire.

In the third step in the Standard Method the affordability uplift is capped in some circumstances which reduces the minimum number generated by the method, but does not reduce housing need itself. The cap was designed to ensure that the method produces figures which were 'as deliverable as possible.' Where a plan has been adopted or reviewed in the last five years, the cap is set at 40% above the relevant housing requirement figure set out in existing policies. Where there is not an up-to-date plan, the cap is set at either 40% above the household growth projected, or 40% above the housing requirement, whichever is the higher.

Of the Oxfordshire authorities, it is only Oxford's figures which are affected by the cap which is set at 40% above the projected household growth. The effect of this is to reduce the minimum figure for local housing need which might be applied in the short-term (to 3,348 homes a year).

Planning Practice Guidance however sets out that the cap does not affect the underlying level of housing need and areas which progress plans based on the cap would need to be reviewed in the short-term *"to ensure that any housing need above the capped level is planned for as soon as is reasonably possible."* Given that the Oxfordshire Plan is looking to 2050, Iceni consider that the cap has a limited bearing on considering how many homes to plan for on this basis.

The fourth step in the methodology, introduced in late 2020, applies a cities and urban centres uplift to the top 20 local authorities (ranked by population size) across England. This does not include Oxford or any other Oxfordshire authorities and therefore does not affect figures for Oxfordshire.

Planning Practice Guidance[50] states that the Standard Method generates an annual number, based on a 10-year baseline, which can be applied to the whole plan period. Table 7.2.1 below shows the implications of doing this. The Standard Method generates a minimum local housing need for 33,350 homes over the 2020-2030 period.

The uncapped need would be slightly higher at 33,830 homes to 2030. If notionally the Standard Method was applied to the whole plan period to 2050, it would generate a need for 101,490 homes; however most plans do not have a 30 year timeframe instead looking 15-20 years into the future.

has indicated that the use of the 2016-based Household Projections in the Standard Method is not consistent with its aims to deliver 300,000 homes a year by the mid-2020s and revised Planning Practice Guidance in February 2019 to indicate that the 2014-based Household Projections should be used in the Standard Method. The same position would apply to the 2018-based Household Projections.

[49] ONS house price to workplace-based earnings ratio data, published March 2020

[50] ID: 2a-012-20190220

Table 7.2.1: Standard Method local housing need for Oxfordshire

	2020-30	2030-40	2040-50	2020-50
Local housing need (uncapped)	33,830	33,830	33,830	101,490
Minimum uncapped need (capped)	33,350			

Source: Iceni Projects.

The detailed calculations are shown in the Table 7.2.2 below. Local authority level figures are used as building blocks to generate the baseline housing need at an Oxfordshire level. It is for the Oxfordshire Plan to consider how housing provision is distributed within the county.

Table 7.2.2: Standard Method local housing need for Oxfordshire (2014 Household Projections)

	Cherwell	Oxford	South Oxon	Vale of White Horse	West Oxon	**Oxfordshire**
Step 1: Setting the Baseline						
Households 2020	62,135	61,621	58,246	54,642	47,462	**284,106**
Households 2030	67,526	67,046	62,369	59,545	51,489	**307,975**
Change in households	5,391	5,425	4,123	4,903	4,027	**23,869**
Per annum change	539	543	412	490	403	**2,387**
Step 2: Affordability Adjustment						
Affordability ratio, 2019	10.43	11.45	11.6	9.57	10.38	**-**
Adjustment factor	40%	47%	48%	35%	40%	**-**
Step 2 housing need figure (dwellings per annum)	756	795	608	661	563	**3,383**
Step 3: Capping						
40% above household growth	755	760	577	686	564	**3,342**
40% above plan requirement	1,142	762	766	1,439	924	**-**
Cap figure to be applied	1,599	762	766	1,439	924	**-**
Cap applicable	No	Yes	No	No	No	**-**
Minimum local housing need (dwellings per annum)	**756**	**762**	**608**	**661**	**563**	**3,350**

Source: Justin Gardner Consulting, Iceni Projects.

The Standard Method is sensitive to both the household projections and annual changes in affordability. Plan-making authorities are expected to review the figures on the release of new data; and thus the figures generated by the Standard Method may well change between now and the point of submission of the Oxfordshire Plan. Planning Practice Guidance states that the figures are then fixed and can be relied upon for a period of 2 years from the submission of the Plan.[51]

7.3 Implications of the adjusted demographic baseline projections

The Standard Method figures set out above, which use the 2014-based Household Projections, form a starting point for considering housing need. The analysis undertaken in *Chapter 2* of this report however indicated that there are notable issues with the demographic data for Oxford in particular, where past population growth appears to have been under-estimated.

It is reasonable that these revised demographic projections which are based on a more detailed interrogation of demographic trends in Oxfordshire and have been prepared to provide a more reasonable trend-based analysis of demographic growth should be used as a baseline in the Standard Method.

If these 'adjusted baseline' demographic projections are fed into the Standard Method, the resultant local housing need rises slightly to 3,386 dwellings per annum. The calculations for individual authorities are set out in Table 7.3.1 below. The district-level breakdown is set out for illustrative purposes only to show how the Oxfordshire total is derived.

Table 7.3.1: Standard Method local housing need in Oxfordshire (adjusted demographic baseline projections)

	Cherwell	Oxford	South Oxon	VoWH	West Oxon	Oxfordshire
Households 2020	64,191	59,992	60,150	56,834	47,832	**288,999**
Households 2030	70,227	64,969	64,554	62,668	50,506	**312,923**
Change 2020-30	6,036	4,976	4,404	5,834	2,674	**23,924**
Change 2030-30 per annum	604	498	440	583	267	**2,392**
Affordability ratio (2019)	10.43	11.45	11.6	9.57	10.38	**-**
Affordability Uplift	40%	47%	48%	35%	40%	**-**
Local Housing Need	846	729	650	786	374	**3,386**

Source: Justin Gardner Consulting, Iceni Projects.

Applied over a 30-year period (2020-50), these would show these would show a notional need for 101,580 homes.

7.4 The demographic implications of the standard method

Having established the projected household growth from the Standard Method, a projection has been developed by JGC and Iceni where the population and number of households increases such that these dwellings would be filled. The purpose of this is to consider with this level of housing provision, what level of workforce and economic growth would be supported. It uses the figures set out in Table 7.4.2 above based on the 'adjusted baseline' demographic projections.

[51] ID: 2a-008-20190220

The methodology adopted essentially takes the latest 2018-based subnational population projections ('SNPP') as a start point along with data about household formation from the 2014-based subnational household projections ('SNHP') – this latter source is used as it is considered that the 2016-based SNHP may include an increased degree of supressed household formation, something the Standard Method is specifically designed to address.

Adjustments are also made to the 2014-based SNHP data to reflect any suppression within that source through modelling a 'part return to trend' towards those in the (pre-recession) 2008-based Household Projections for those aged 25-34 and 35-44. This approach was widely used prior to the publication of the ONS 2016-based Household Projections and was recommended by the Local Plans Expert Group to Government in its 2016 Report.[52]

The method used is considered to be consistent with suggestions in the PPG which is clear that the increase in household growth implied by the Standard Method will arise due to both a) increases in household formation (where this is constrained by supply) and b) the possibility that people are not able to live in a particular area due to a lack of housing. The wording of the PPG (2a-006) is as follows:

> *"An affordability adjustment is applied as household growth on its own is insufficient as an indicator of future housing need because:*
>
> - *household formation is constrained to the supply of available properties – new households cannot form if there is nowhere for them to live; and*
> - *people may want to live in an area in which they do not reside currently, for example to be near to work, but be unable to find appropriate accommodation that they can afford.*
>
> *The affordability adjustment is applied in order to ensure that the Standard Method for assessing local housing need responds to price signals and is consistent with the policy objective of significantly boosting the supply of homes. The specific adjustment in this guidance is set at a level to ensure that minimum annual housing need starts to address the affordability of homes."*

Within the modelling, migration assumptions have been changed so that across the county (and individual local authorities) the increase in households matches the Standard Method local housing need (including a 3% vacancy allowance). Household formation assumptions have also been raised to support improved household formation as affordability improves.

The changes to migration have been applied on a proportionate basis; the methodology assumes that the age/sex profile of both in- and out-migrants is the same as underpins the 2018-based SNPP (alternative internal migration assumptions) with adjustments being consistently applied to both internal

[52] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/508345/Local-plans-report-to-governement.pdf

(domestic) and international migration. Adjustments are made to both in- and out-migration (e.g. if in-migration is increased by 1% then out-migration is reduced by 1%). In summary the method includes the following assumptions:

- Base population from the 2018-based subnational population projections (SNPP) – the alternative internal migration variant
- Projections run from 2020 to 2050
- Population data for 2018 fixed by reference to estimates made from mid-year population estimates (MYE) and Patient Register (PR) data
- Population to 2020 derived from estimating potential population change given the number of net housing completions (2018-20)
- The migration profile (by age and sex) in the same proportions as the 2018-based SNPP – where rolled forward from 2043 to 2050 this assumes a continuation of any trends identified in the SNPP
- Fertility and mortality rates (by age and sex) as per the 2018-based SNPP – where rolled forward from 2043 to 2050 this assumes a continuation of any trends identified in the SNPP
- Household Representative Rates (HRRs) from the 2014-based subnational household projections (SNHP) and a part-return to trend method for the 25-34 and 35-44 age groups
- Vacancy rate of 3% to convert households into dwellings

Table 7.4.1 below shows how the population might be expected to change under this scenario (for the whole of the county). This shows particularly strong changes in older age groups and more modest increases for younger groups. However, when compared with the 2018-based SNPP as published (and rolled forward to 2050) there is projected to be notably higher growth in younger age groups (see further analysis below). Overall, it is projected that the population would grow by around 25% in the 30-year period (an additional 183,000 people in total).

Table 7.4.1: Population change in Oxfordshire, by five-year age bands under the Standard Method (adjusted baseline), 2020-50

	Population, 2020	Population, 2050	Change in population, 2020-50	% change in population, 2020-50
Under 5	40,380	49,394	9,014	22.3%
5-9	42,576	49,462	6,886	16.2%
10-14	42,281	49,069	6,788	16.1%
15-19	42,962	52,258	9,296	21.6%
20-24	53,436	62,246	8,810	16.5%
25-29	50,449	56,950	6,501	12.9%
30-34	47,097	54,747	7,650	16.2%
35-39	48,447	56,046	7,599	15.7%
40-44	44,329	53,804	9,474	21.4%
45-49	46,513	50,010	3,498	7.5%
50-54	48,298	52,300	4,001	8.3%
55-59	45,919	52,647	6,727	14.7%
60-64	38,988	50,052	11,064	28.4%

65-69	33,591	47,391	13,801	41.1%
70-74	33,453	42,152	8,699	26.0%
75-79	24,871	40,815	15,943	64.1%
80-84	18,386	37,131	18,746	102.0%
85+	18,583	47,086	28,503	153.4%
Total	720,560	903,558	182,998	25.4%

Source: Justin Gardner Consulting.

Table 7.3.1 below compares the projected population growth in the 2018-based SNPP (as rolled forward to 2050) with the data above. It can be seen that by linking to the Standard Method there is a much higher level of population growth projected and that this additional growth is within some of the younger age groups.

Table 7.4.2: Population change in Oxfordshire, by five-year age bands, comparing the 2018-based SNPP with the Standard Method (adjusted baseline), 2020-50

	2018-based SNPP	Standard Method (adjusted baseline)	Absolute difference
Under 5	337	9,014	8,677
5-9	-3,322	6,886	10,208
10-14	-3,153	6,788	9,942
15-19	999	9,296	8,297
20-24	1,140	8,810	7,669
25-29	-1,279	6,501	7,780
30-34	668	7,650	6,982
35-39	46	7,599	7,553
40-44	791	9,474	8,684
45-49	-6,217	3,498	9,715
50-54	-7,359	4,001	11,360
55-59	-4,263	6,727	10,990
60-64	2,647	11,064	8,416
65-69	8,023	13,801	5,778
70-74	3,743	8,699	4,956
75-79	11,750	15,943	4,193
80-84	16,266	18,746	2,480
85+	26,276	28,503	2,226
Total	47,093	182,998	135,905

Source: ONS, Justin Gardner Consulting.

For individual local authorities, Table 7.4.3 below shows the overall population growth projected in each of the 2018-based SNPP and when linking delivery to the Standard Method. This shows in all cases that there is a substantial difference between the two figures. This is particularly the case for Oxford where the difference in population growth over the 30-year period is approaching 50,000 people.

Of particular significance to considering the inter-relationship between housing and economic growth is what level of economic growth these levels of housing provision might support. These issues are considered further in *Chapter 10*.

Table 7.4.3: Population change in Oxfordshire, comparing the 2018-based SNPP with the Standard Method and Standard Method (adjusted baseline), 2020-50

		Population, 2020	Population, 2050	Change in population, 2020-50	% change in population, 2020-50
Cherwell	*2018-SNPP*	150,862	165,325	14,463	9.6%
	Standard Method	156,459	194,088	37,629	24.1%
	Standard Method (adjusted)	156,459	200,694	44,235	28.3%
Oxford	*2018-SNPP*	153,580	147,005	-6,575	-4.3%
	Standard Method	163,856	206,811	42,954	26.2%
	Standard Method (adjusted)	163,856	204,506	40,649	24.8%
South Oxon	*2018-SNPP*	141,840	152,581	10,741	7.6%
	Standard Method	147,161	179,394	32,233	21.9%
	Standard Method (adjusted)	147,161	182,666	35,505	24.1%
VoWH	*2018-SNPP*	137,175	160,545	23,371	17.0%
	Standard Method	138,745	173,336	34,591	24.9%
	Standard Method (adjusted)	138,745	183,421	44,675	32.2%
West Oxon	*2018-SNPP*	110,391	115,483	5,093	4.6%
	Standard Method	114,339	146,795	32,455	28.4%
	Standard Method (adjusted)	114,339	132,272	17,933	15.7%
Oxfordshire	***2018-SNPP***	**693,847**	**740,940**	**47,093**	**6.8%**
	Standard Method	**720,560**	**900,423**	**179,863**	**25.0%**
	Standard Method (adjusted)	**720,560**	**903,558**	**182,998**	**25.4%**

Source: ONS, Justin Gardner Consulting

7.5 Conclusions

The Government's Standard Method provides a minimum assessment of an area's local housing need. The minimum local housing need generated applying Government Planning Practice Guidance is for 3,350 dwellings per annum in Oxfordshire. The figures for Oxford are however subject to a cap. The uncapped need is for 3,383 dwellings per annum which notionally equates to 101,490 dwellings if applied over the 30-year plan period for the Oxfordshire Plan (2020-50).

The demographic analysis in this report identified issues with an under-counting of historical population growth, particularly in Oxford. An 'adjusted baseline' demographic projection was this developed which if used within the Standard Method formula generates a moderately higher need for 3,386 dwellings per annum. Iceni would advise that the minimum or baseline level of provision to be considered for the Oxfordshire Plan would be the 'uncapped need' for 3,386 dwellings per annum or notionally 101,580 homes over the plan period to 2050.

8 Oxfordshire's Economic Trajectories

8.1 Introduction

As noted in previous chapters, there is evidence to suggest that the particular economic characteristics and wider strategic context of Oxfordshire are such that additional consideration is required to assess the compatibility of the Standard Method of housing need assessment with wider growth ambitions for the sub-region, or whether significant differences exist.

This chapter therefore identifies the economic ambition for Oxfordshire, as laid out in Oxfordshire's Local Industrial Strategy (LIS), updated for 2020 with CE's own local sectoral modelling, using additional years of data and updated assumptions about UK national and regional growth potential.

This then provides the basis for an appraisal of a realistic economic ambition for Oxfordshire, its implications for employment demand, and the subsequent level of commercial space and residential property development that would be required to facilitate such growth.

This chapter is not intended to judge the desirability of any particular growth path, but simply quantify these differences between different visions for the county in a robust and transparent manner.

Starting with an overview and interrogation of the LIS and its sectoral vision, the chapter outlines CE's modelling assumptions and approach, before presenting three potential economic trajectories for Oxfordshire.

8.2 The Oxfordshire LIS and its sectoral vision

Oxfordshire's LIS sets out an ambitious economic strategy for the county up to 2040. Innovation-led and sector driven, it outlines how and where Oxfordshire LEP's (OxLEP's) sectoral ambitions and growth aspirations will be delivered.

To inform and enable robust, policy-aligned projections up to 2050, CE has scrutinised and interrogated the information presented in the LIS and its supporting evidence base, specifically sector-based projections of employment, output and productivity.

One of the recurring themes of the Oxfordshire LIS is to *"position Oxfordshire as one of the top three global innovation ecosystems by 2040".* This has driven the adoption of eight ***"breakthrough sectors"*** in the LIS, adapted from activities previously outlined in the Oxfordshire Science and Innovation Audit. The eight sectors are:

- Quantum computing
- Life sciences and digital health
- Space-led data applications
- Robotics and Autonomous Systems
- Automotive and motorsport
- Creative and digital
- Cryogenics
- Energy

According to the LIS, these breakthrough sectors are currently *"shaping the twenty first century and expect rapid growth in the coming decades"* and will *"provide jobs for generations, providing a sustainable economic base for Oxfordshire and the country".*

The use of *"breakthrough"* terminology to define these sectors reflects analysis from the LIS evidence base, which utilised detailed business analytics to segment Oxfordshire businesses into two distinct but interrelated groups:

- Cornerstone businesses *"are the backbone of the economy and provide the platform for economic growth"* (e.g. public administration, education, construction)
- Breakthrough businesses *"are riskier, operate in markets where innovation is critical for survival and have the potential to become world leaders in their industry"* (e.g. those activities outlined in the LIS)

Table 8.2.1: Employment (jobs) in LIS sectors within Oxfordshire, 2018

	Employee jobs[53], 2018	% of total Oxfordshire employee jobs	Employee jobs growth, 2009-2018	Employee jobs % growth, 2009-2018	Location quotient (LQ), 2018	aGVA[54] (2016, £m), 2018
Robotics and Autonomous Systems	17,050	4.7%	5,600	48.9%	3.1	£1,000
Life sciences and digital health	11,700	3.2%	5,900	101.7%	1.5	£245
Space-led data applications	825	0.2%	695	534.6%	0.6	£27
Quantum computing	8,095	2.2%	1,685	26.3%	4.4	£251
Automotive and motorsport	10,125	2.8%	1,855	22.4%	1.5	£635
Creative and digital	26,420	7.2%	2,370	9.9%	1.2	£1,822
Energy	3,700	1.0%	660	21.7%	0.9	£321
Total 'breakthrough sectors'[55]	*60,070*	*16.5%*	*12,860*	*27.2%*	*1.4*	*£3,305*
Total 'cornerstone sectors'	*304,485*	*83.5%*	*35,360*	*13.1%*	*0.9*	-
Total Oxfordshire economy	**364,555**	**-**	**48,220**	**15.2%**	**-**	**-**

Source: Source: Oxfordshire LIS, ONS, Cambridge Econometrics

As Table 8.2.1 shows, the sectoral narrative within the LIS is well-founded; across almost all breakthrough sectors[56] Oxfordshire displays high degrees of specialisation and growth potential. Currently, the activity of breakthrough businesses in Oxfordshire supports some 60,100 highly skilled jobs and £3.5bn of approximate GVA (aGVA). This equates to 17% of all jobs within Oxfordshire, significantly higher than the 12% average elsewhere in the country.

This breakthrough business base is also more vibrant in Oxfordshire than elsewhere in the country; its jobs growth of 27% since 2009 (equating to some 12,900 additional jobs) eclipses the national average of 20%. It is also double

[53] Employee jobs exclude the self-employed, armed forces personnel and government supported trainees

[54] Approximate GVA. It is a measure of the income generated by businesses less their expenditure. Data for Oxfordshire is available here.

[55] Not a sum of totals as excludes the double-counting of activities included in more than one sector

[56] Data for cryogenics cannot be estimated using currently available data. At a nationwide level, the sector supports some £324 of GVA, whilst cryogenic technologies underpin around 17% of the UK economy (Source: Oxfordshire LIS)

the growth (13%) of the *"cornerstone"* business sector in Oxfordshire, with a quarter of all additional jobs in Oxfordshire since 2009 being within breakthrough sectors.

Drawing on this baseline evidence, the LIS goes on to present two sector-led, spatially considerate growth trajectories for the county, relating to contrasting scenarios for the Oxfordshire economy:

- **A *"do nothing"* scenario**, which *"outlines key outcomes in a future where the economy continues on its baseline trajectory without the implementation of the Oxfordshire Industrial Strategy or other initiatives to manage the growth trajectory".*
- **A *"go for growth"* scenario**, that *"assess[es] the impact of future policy interventions in Oxfordshire's economy from now until 2040 to identify what Oxfordshire's economy might look like in the future. This highlights the potential for Oxfordshire to double its GVA by 2040 to be worth £46 billion".*

The scenarios, and associated projections were prepared independently for the LIS by external consultants PwC utilising a Computable General Equilibrium (CGE) model. Importantly, PwC's assumptions for the *"go for growth"* scenario *"incorporate the planned interventions outlined in the final Oxfordshire Industrial Strategy document which are expected to bring about a step-change in economic growth".* This includes interventions and longer-term trends related to infrastructure, connectivity, housing, labour markets and innovation, as presented in the final LIS document.

Under this scenario, PwC outlines that the Oxfordshire economy could grow at an average annual rate of 2.9% in real terms until 2040, some 0.9p.p. higher than its baseline trajectory (what PwC calls its 'do nothing' scenario), equivalent to Oxfordshire's economy doubling in size (+£23 billion). This growth will be innovation-led, driven by a 2% increase in productivity per annum as well as 108,000 new jobs.

The LIS expects businesses within both categories to drive this *"go for growth"*; *"growth will be driven by innovation and higher productivity – both in those emerging sectors which will harness transformative technologies, and in sectors that have historically driven the economy".* Spatially, the vision emphasises a *"polycentric network of innovation clusters"* (as highlighted in Figure 6.3.4/Figure 10 in the LIS) that *"illustrates the preferred spatial pattern of growth that should take place over the next decades."*

The evidence and ambitions presented in the LIS, which have been agreed by key stakeholders and endorsed by Government, should be a central consideration of any spatial vision for Oxfordshire. In the following chapters, this is taken one step further with the evidence and accompanying methodology – specifically PwC's sectoral trajectories of jobs, GVA and employment – scrutinized to ensure robustness and alignment with policy expectations and CE's understanding of Oxfordshire's economic drivers.

8.3 Approaches to modelling economic growth

CE utilised its bespoke Local Economy Forecasting Model (LEFM) component of its MDM-E3 model to provide sector-led baseline and aspirational projections of employment, GVA and productivity for Oxfordshire. In terms of basic structure, purpose and coverage, there are broad similarities between PwC's CGE model and CE's equivalent MDM-E3 model.

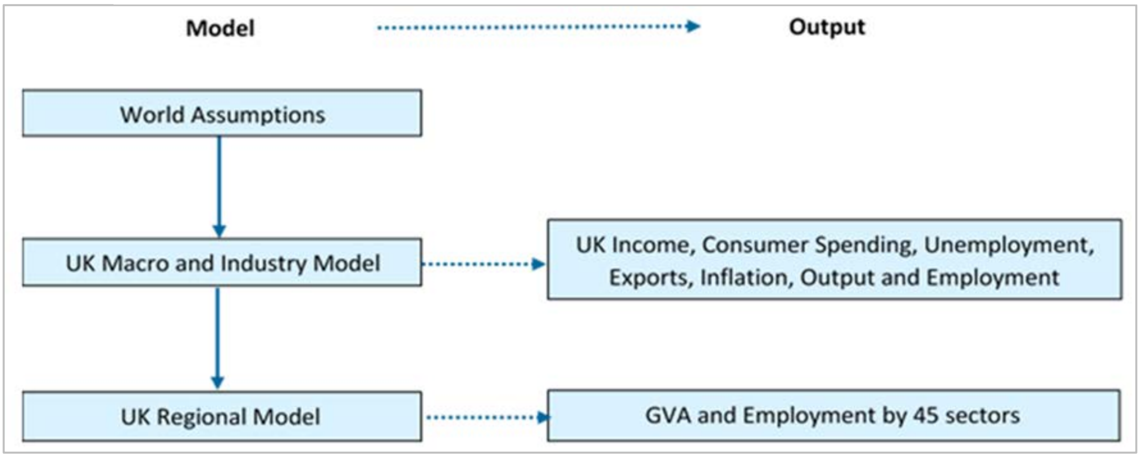
For instance, both are based on a consistent national accounting framework and make use of similar data sources and structure. However, beneath the surface there are substantial differences in modelling approach, and it is important to be aware of this when interpreting model results.

The two types of model come from distinct economic backgrounds; while generally consistent in their accounting, identity balances, they differ substantially in their treatment of behavioural relationships. Ultimately this comes down to assumptions about optimisation. The CGE model favours fixing behaviour in line with economic theory, by assuming that individuals act instantaneously and rationally in their own self-interest, allowing markets to clear; in this way demand automatically adjusts to meet potential supply.

Within the LIS, PwC acknowledges that this is an issue with the CGE approach to modelling; *"in the Oxfordshire housing market we know that this [supply meeting demand] is not true. In fact, it is not true in any of the key markets in Oxfordshire."* In contrast, models such as CE's MDM-E3 interrogate historical data sets to try to determine behavioural factors on an empirical basis.

This means CE's MDM-E3 can fully assess both short and long-term impacts and is not limited by many of the restrictive assumptions common to CGE models, allowing for more robust and integrated projections. For instance, CE's MDM-E3 does not assume optimising behaviour and full utilisation of resources. It therefore includes real-world features such as involuntary unemployment, 'endogenous money', and the adoption of new technologies. This has important practical implications for scenario analysis.

Figure 8.3.1: Links between Cambridge Econometrics' suite of models



Source: Cambridge Econometrics.

Another important feature of this modelling approach is the link to CE's wider modelling suite, ensuring any local area forecasts are consistent with CE's world, UK national and UK regional forecasts and assumptions, as Figure 8.3.1 shows. This modelling suite is typically updated twice annually; the most recent update available for the OGNA, in July 2019, incorporates the impact of the UK's decision to leave the European single market ('Brexit').

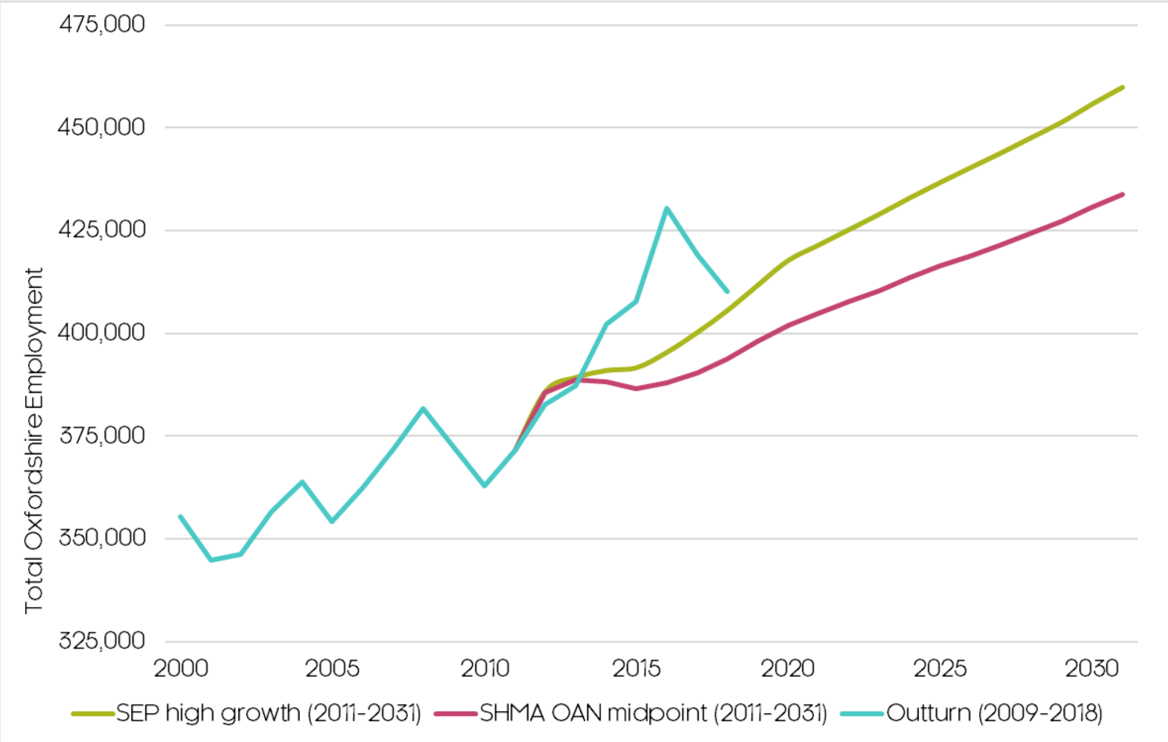
Therefore, CE's headline UK forecasts are developed within the context of the changing nature of the UK's trading relationship with the European Union. These national level impacts are then systematically distributed to regions and local areas, based on historic sectoral relationships. Resultantly, the forecasts that have been developed for the OGNA account for the potential impact of Brexit on Oxfordshire's sectors and economy.

8.4 Oxfordshire's past growth projections

In developing its projections, CE also interrogated Oxfordshire's performance against previous growth projections, such as those presented in its 2014 Strategic Housing Market Assessment (SHMA) and 2014/16 Strategic Economic Plan (SEP, also prepared by OxLEP). This has enabled CE to produce empirically sound trajectories for the area, by gauging Oxfordshire's ability to deliver against – and in some cases go beyond - previous policy aspirations and baseline projections.

Figure 8.4.1 depicts the SHMA Committed Economic Growth Scenario employment projection produced by CE in 2014 (pink line) on which the conclusions on objectively assessed housing need were primarily based. The out-turn (i.e. actual data) is shown in light blue.

Figure 8.4.1: Oxfordshire's employment (jobs) projections under previous strategies



Source: Oxfordshire strategic documents, Cambridge Econometrics.

As of the most recent year of data in 2018, the outturn exceeds the SHMA Committed Economic Growth Scenario from 2014 (by around 16,200 additional jobs), and in fact more closely aligns with the SEP's higher growth scenario. As such, Oxfordshire's economy has demonstrated an ability to generate employment at an accelerated rate, and this performance could provide a suitable indication of the Oxfordshire's central trajectory for future employment growth.

8.5 Oxfordshire's economic trajectories

CE has prepared three sector-led growth trajectories for the Oxfordshire economy (set within its MDM-E3 macroeconomic model). One of these trajectories, the **business as usual** trajectory, is the extension of Oxfordshire's recent trend of accelerated growth, as observed in Figure 8.4.1.

The **Standard Method (adjusted)** trajectory presents an estimate of the level of employment growth enabled by the level of housing growth calculated using the Standard Method, adjusted for the revised demographic baseline explored in *Chapter 3 Demographic Trends*.

The **transformational** trajectory is a straightforward update to the LIS *"go-for-growth"* trajectory. The latter two projections sit either side of the **business as usual** trajectory, representing relatively more constrained or unconstrained versions of future growth prospects.

The three trajectories, and the broad assumptions underpinning them (a detailed modelling methodology is provided in *8.3*), are as follows:

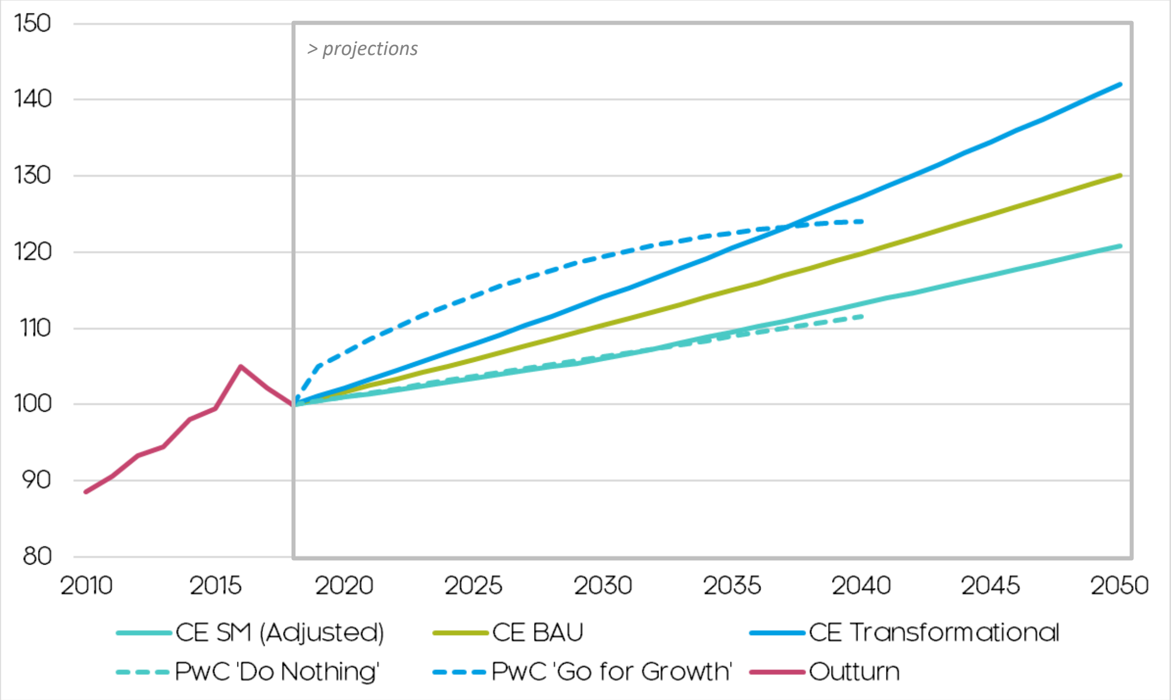
- **Standard Method (adjusted) trajectory:** backwards calculated from the Standard Method calculation of housing need, with an adjustment for the revised demographic baseline. The Standard Method calculation of future housing need has been converted to the level of employment facilitated (backwards calculated), by making a number of assumptions relating to economic activity rates, commuting, double jobbing and unemployment. The detailed modelling assumptions are explained in *Chapter 9*.
- **Business as usual trajectory:** this trajectory represents a continuation of Oxfordshire's recent economic performance, taking particular account of the growth delivered during the recovery from the 2008-09 recession (see Figure 8.4.1). It represents a best approximation as to the future rate at which Oxfordshire will be able to deliver employment growth based on the latest trend data.
- **Transformational trajectory:** this trajectory is broadly the equivalent of the LIS *"go for growth"* scenario, but updated and adjusted for 2020. Certain targeted sectors are assumed to see strong growth, others grow as a result of anticipated corresponding population growth and increased economic activity.

Employment

Figure 8.5.1 shows the headline employment (jobs) projections produced by CE (derived from the June 2019 run of MDM-E3) and PwC (as utilised in the LIS, published in July 2019). To allow for convenient comparisons across the two projections, the employment level is indexed to the base year of 2018, which is also the baseline for PwC's projections. It should be noted that CE's projections extend to 2050 to cover the Oxfordshire Plan period, beyond PwC's 2040 forecast horizon.

At this headline level CE's and PwC's baseline employment projections share an almost identical trajectory to 2040. This shows both models broadly agree on Oxfordshire's fundamental characteristics, and its likely trajectory under a 'baseline' context. Likewise, the additional growth in PwC's *"go for growth"* scenario does not look unrealistic and again aligns reasonably well with CE's aspirational trajectories. The unusual shape of this growth curve, however, is difficult to explain, even when reconciled with LIS aspirations.

Figure 8.5.1: Employment (jobs) projections for Oxfordshire (2010=100)



Source: ONS, Cambridge Econometrics, PwC.

In particular, the expected sudden and rapid acceleration away from recent trends over the next five years (at a time of anticipated uncertainty in the national economy and an already tight and easing labour market in Oxfordshire), followed by a levelling off over the period 2030-2040 appears unlikely and is not necessarily reflective of Oxfordshire's recent economic performance and short-term policy landscape.

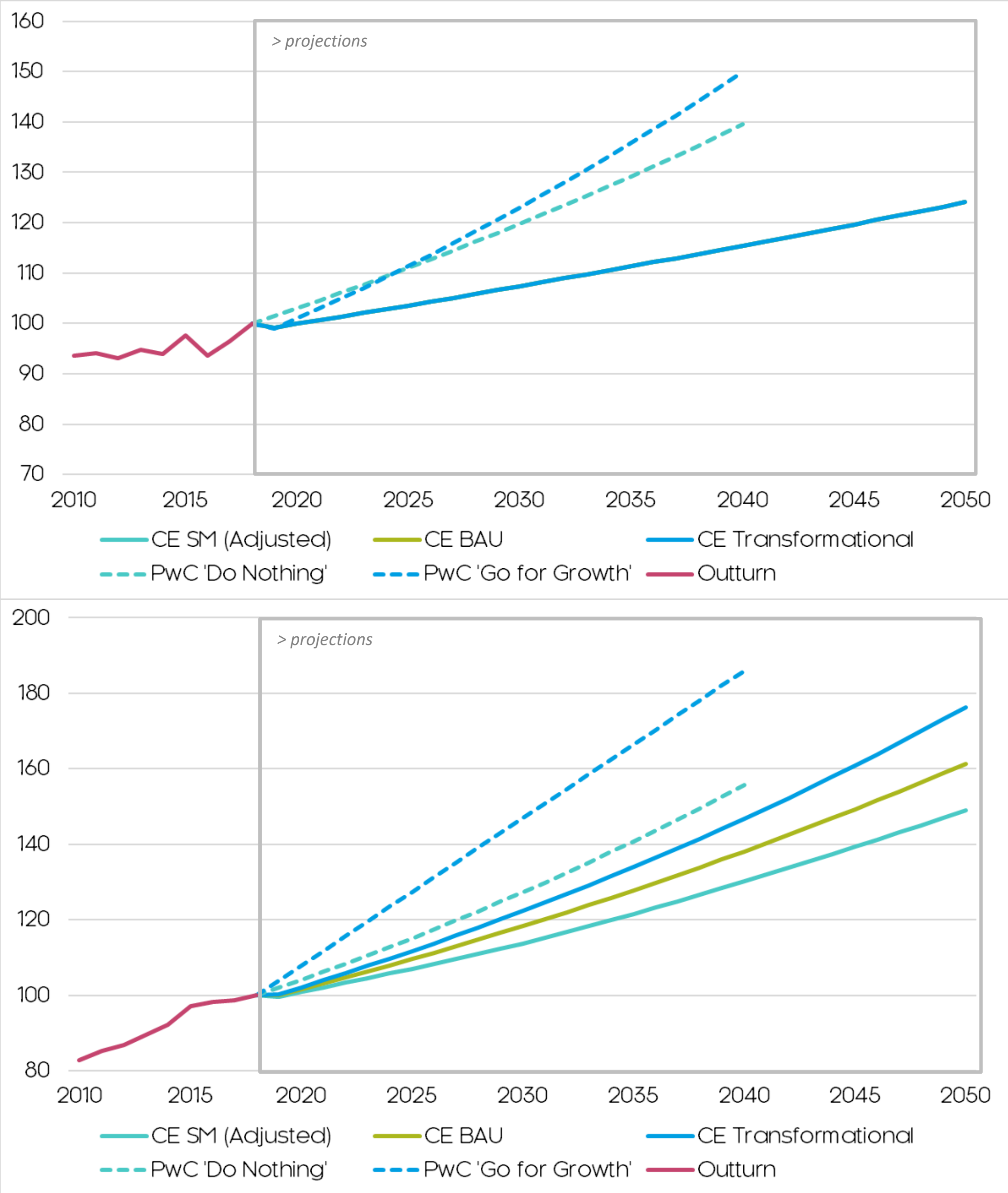
Instead, an initially slow divergence from the baseline scenario may be anticipated – as Oxfordshire's labour market continues to grow, albeit slowly due to its relative tightness (Figure 5.4.1 showed Oxfordshire currently has the highest employment rate in the country) - followed by greater divergence in the 2030s - as local, regional and national policy interventions (including those outlined in the LIS and other strategic policy documents e.g. East-West Rail, Garden Towns) begin to take effect. This is the approach that CE has taken to develop its above-baseline trajectories, utilising the LIS and its associated evidence base as a foundation.

As observed and interrogated in *Chapter 5,* the outturn in Figure 8.5.1 shows a decline in Oxfordshire's employment between 2016-18. Though partially attributable to Brexit, the analysis in *Chapter 5* concluded the volatile nature of survey-derived employment estimates means this drop has probably been overestimated. CE does not regard this as a longer-term trend, though easing labour market performance is likely over the latter part of the 2010's/early 2020's. This raises further questions over the anticipated quick ascent in employment under the PwC *"go for growth"* scenario.

Productivity and GVA

Although the main focus of this chapter, and indeed the wider study, is employment, CE has also provided updated projections for productivity, and subsequently GVA (in real terms, £2016 prices). These are shown in Figure 8.5.2.

Figure 8.5.2: Productivity (above) and GVA (below) projections for Oxfordshire (2010=100)



Source: ONS, Cambridge Econometrics, PwC.

The left-hand chart shows how CE's projection for productivity is significantly below that of both trajectories from the LIS, which emphasise unprecedented levels of productivity growth in Oxfordshire. Due to the so-called *"productivity puzzle"*, bullish projections of upswings in productivity growth made over the past decade have repeatedly proven to be inaccurate, to the extent that both ONS and the Bank of England now consider a national productivity baseline growth rate of 0.7% p.a. to be a realistic guide.

Although Oxfordshire has the potential to outperform the national productivity growth rate, this is unlikely to be maintained at a greater than standard deviation rate above national performance, not least given the greater incidence of the *"productivity puzzle"* locally, as seen in the *Chapter 5 Recent Economic Performance.*

For these reasons, and for wider ease of interpretation, CE has adopted only one productivity trajectory across the three trajectories. Even then, this expectation remains optimistic, and is reliant on the productivity-boosting realisation of LIS-related initiatives.

For GVA, CE's relative downgrading of productivity growth potential over the time period leads to some quite pronounced differences between the trajectories, as shown in Figure 8.5.2. For instance, even PwC's *"Do Nothing"* GVA trajectory exceeds CE's higher trajectories.

CE anticipates a gentler upward trend to both productivity and GVA, but with stronger growth built into the higher trajectories. This stronger growth reflects the potential delivery of LIS related ambitions, particularly those related to innovation, which typically have a longer-term effect and realisation on productivity and growth.

Sector growth trajectories

CE's trajectories for employment, productivity and GVA have all been prepared on an individual sector-by-sector basis, to best capture the sectoral ambitions of the LIS and reflect the sectoral impact of current and projected macroeconomic trends, such as automation, demographic pressures and environmental change.[57]

At the sectoral level, the differences between the shape of CE's and PwC's trajectories become increasingly noticeable, largely due to the different assumptions and modelling approaches (particularly relating to individual sectors).

One-page summaries of these sector trajectories are provided in *Appendix B: Oxfordshire's Sector Growth Trajectories,* which include a detailed overview of CE's results along with an interrogation and comparison with PwC's scenarios. A brief overview is provided for each sector below (note that these overviews include interactive links to the detailed one-page summaries in the Appendix):

1. **Employment in primary and utilities:** Oxfordshire's long-term decline in primary sector employment is set to ease and totals will remain roughly constant moving forward, though automation may result in lower-skilled employment losses. GVA growth is to be driven by improvements to productivity and the adoption of innovative technologies, supporting higher-skilled employment growth.
2. **Employment in manufacturing:** automation, digitisation and outsourcing will likely continue the decline in Oxfordshire's manufacturing workforce, particularly for lower and mid-skilled workers, though new technologies and innovations could fuel growth in the

[57] CE's detailed sectoral modelling assumptions and results for the UK are presented and summarised in *Working Futures 2017-2027: Long-run labour market and skills*, which provides detailed overview of such factors individual sector impacts; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/863886/Working_Futures_Headline_Report.pdf

higher trajectories. GVA growth will be driven by productivity improvements, underpinned by the adoption of frontier technologies.

3. **Employment in construction:** continued economic growth alongside ambitious policy aspirations around housing delivery, infrastructure and commercial space will see Oxfordshire's construction workforce grow strongly over coming decades. Though this may be tempered by skills-shortages, an aging workforce and migration pressures. Productivity growth will remain stable given the sectors SME-dominated business population.
4. **Employment in retail; transport; accommodation and food:** given strong projected economic and household growth in Oxfordshire, the demand for consumer services is expected to increase, and as such employment and GVA will continue to grow strongly. Productivity growth will be driven by automation and digitisation, though consequently this may cause some employment losses and shifting.
5. **Employment in information and communication:** underpinned by a strong research base and skilled workforce, this sector has been an engine for employment growth and this is expected to continue. Though at the forefront of the *"productivity puzzle",* productivity growth is expected to rebound with the development and adoption of new technologies (which will also diffuse through the wider economy).
6. **Employment in financial and insurance activities:** the ongoing contraction in the sectors workforce, driven largely by automation, digitisation and out-sourcing, is anticipated to continue over both the short and long term. High productivity will continue to improve, driven by fintech innovations, supporting wider GVA growth.
7. **Employment in real estate activities:** the sector's workforce has grown strongly over the past decade, partly reflecting Oxfordshire active resident and commercial property markets. This rate of growth should continue given the need to expand to manage and oversee an expected increase in residential and commercial property demand.
8. **Employment in professional and administrative services:** Oxfordshire has shaped a strong comparative advantage in this sector, particularly around science and R&D, and there is an expectation of further growth. Accounting for a quarter of all *"breakthrough"* jobs, strong employment growth is expected, especially in the higher trajectories. This will drive strong GVA growth, whilst productivity should also improve after subdued growth.
9. **Employment in public administration, education and health:** amongst Oxfordshire's most resilient sectors, demand and thus employment is anticipated to rise further over the next few decades, particularly in the heath (aging population) and education sector (demand for high-level and technical skills). Opportunities for health-related innovation and a higher-value education offer could drive much needed productivity growth.
10. **Employment in arts, entertainment and recreation:** the sector largely depends on activity in the wider economy, particularly that related to households and incomes. Relatively strong employment

growth is therefore expected, with the sectors labour-intensive nature and consumer dependency making it more resilient to automation and associated changes.

8.6 What the trajectories mean for employment in Oxfordshire

Table 8.6.1 and Figure 8.6.1 outline the potential impact on total employment (jobs) in Oxfordshire under CE's three respective trajectories.

Figure 8.6.1: Employment (jobs) projections for Oxfordshire under the different trajectories

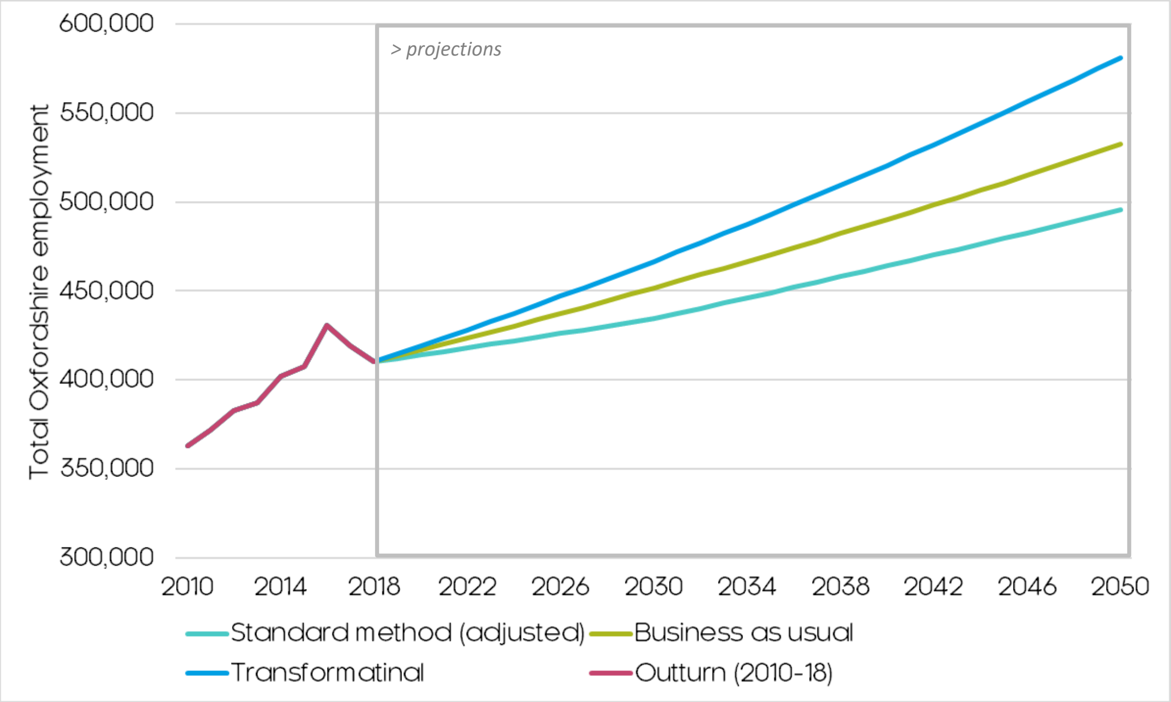


Table 8.6.1: Employment (job) projections for Oxfordshire under the different trajectories

	Employment at 2018 (baseline)	2030	2040	2050	Change in employment, 2018-50	Change in employment p.a., 2018-50
Standard Method (adjusted)	410,066	434,538	464,179	495,555	85,489	**2,672**
Business as usual	410,066	451,742	490,234	532,517	122,451	**3,827**
Transformational	410,066	466,804	520,636	581,254	171,188	**5,350**

Source: ONS, Cambridge Econometrics.

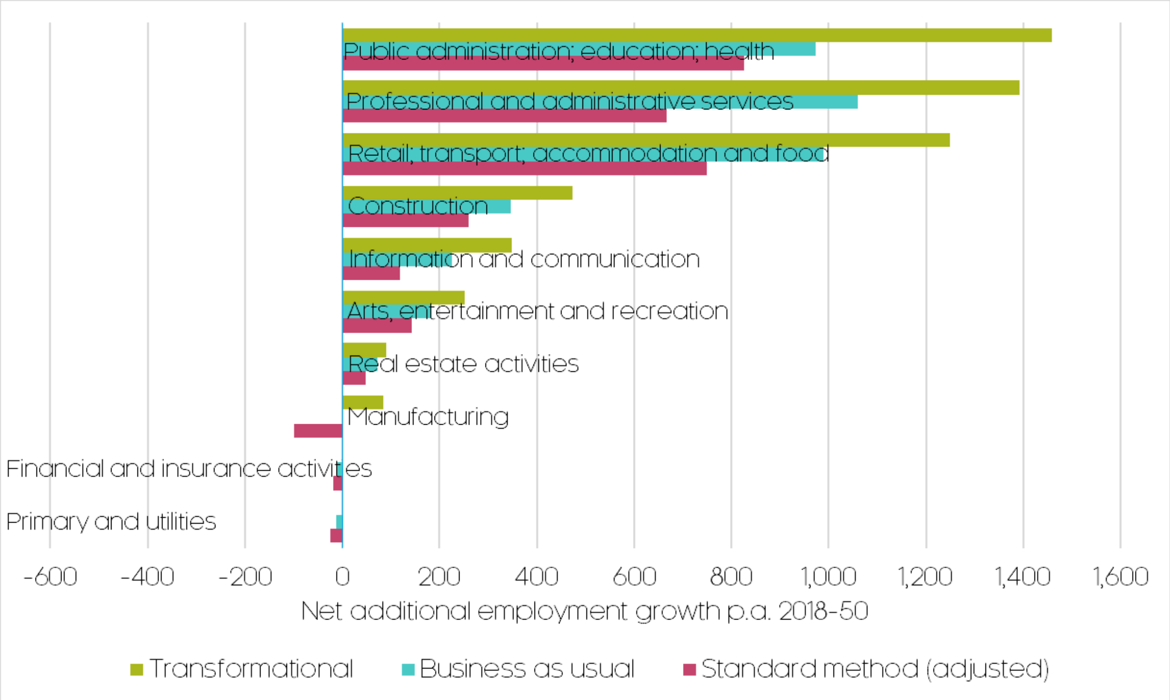
Under the adjusted Standard Method approach, CE expects just over 85,400 net additional jobs to be created in Oxfordshire between 2018 and 2050, equating to an average increase of 2,700 per annum. This would result in a total of 495,600 jobs in the county by 2050. This could be regarded the 'minimum' level of growth Oxfordshire should aspire to under current conditions.

At the business as usual level, the rate of delivery increases to 122,500 additional jobs by 2050, an increase of some 3,800 per annum. At this pace of growth, Oxfordshire will have continued along its past high-growth trajectory, as outlined in its 2014 SHMA and SEP, and achieved some its LIS-related ambitions.

And at the transformational level, delivery accelerates to over double that of the Standard Method (adjusted), with a potential 171,200 additional jobs to be created between 2018 and 2050, equating to an average increase of 5,400 per annum. This transformational level of growth assumes many of the aspirations outlined in the LIS are achieved and have their desired effect.

Figure 8.6.2 provides an overview of the sectoral composition of the projections. Rather than being constant and scaled to the trajectory total, they vary across the respective trajectories, largely reflecting the realisation of LIS-related ambitions in the higher trajectories.

Figure 8.6.2: Sectoral composition of employment projections for Oxfordshire under the different trajectories



Source: ONS, Cambridge Econometrics

For instance, under baseline (standard method adjusted) projections, manufacturing employment is expected to decline, yet under the transformational trajectory - dependent on the realisation of LIS aspirations and interventions - manufacturing employment has the potential to grow.

A more detailed interrogation of sector trajectories (covering employment, GVA and productivity) and accompanying assumptions are provided in *Appendix B: Oxfordshire's Sector Growth Trajectories.*

The following chapters proceed with these employment figures and consider the potential county-wide implications for commercial space and housing if the prospective employment trajectory were achieved. This will help to inform and calculate the commercial space requirements and local housing need for Oxfordshire's growth ambitions, including those outlined and presented in the LIS.

8.7 Conclusions

The Oxfordshire LIS has set out a vision for Oxfordshire to be one of the top three global innovation systems by 2040, to be driven by Oxfordshire's *"breakthrough"* sectors and assets. This chapter has scrutinized and explored a range of supporting economic trajectories for growth of the Oxfordshire economy.

The Standard Method (adjusted) trajectory shows the potential for 85,400 additional jobs between 2018-50, modelling the employment growth that could be expected to be supported by delivery of housing in line with the Standard Method calculations (using the adjusted baseline demographic assumptions).

The business as usual trajectory models a continuation of Oxfordshire's recent economic performance over the robust growth period of the past decade. This would support 122,500 additional jobs over the period to 2050.

The highest scenario, the transformational trajectory, models the equivalent of the achieving many of the aspirations set out in the Oxfordshire Local Industrial Strategy, and would see 171,200 additional jobs over the period to 2050.

The three scenarios present alternative visions of how Oxfordshire's economy might perform. In all scenarios, employment growth is expected to be concentrated in service-based activities, but with the potential for more sectorally diverse growth under the higher trajectories.

9 Economic-led Scenarios for Housing Need

9.1 Introduction

The following analysis takes the employment-led growth trajectories prepared by Cambridge Econometrics in the preceding *Chapter 8* and seeks to test what level of population and housing growth might be needed so that the resident labour-supply increases sufficiently for the employment (jobs) figures to be met.

The analysis also considers what change to the resident labour-supply (economically active population) might be expected under different demographic scenarios, this can then be compared with changes need to meet economic (jobs) growth.

The analysis aims to calculate projected housing need based on the various employment-led growth trajectories. This can then be compared to the need shown by the Standard Method.

The inter-relationship between economic growth and housing need is influenced by a number of factors including:

- The scale of economic growth envisaged, and growth in productivity which will influence the relationship between growth in GVA and jobs;
- The relationship between jobs and people, taking into account that some people have more than one job;
- What proportion of people are in employment, including growth in women in the workforce and increases in older persons in employment taking account of improved health and changes to State Pension age; and
- The spatial relationship between where people live and work, as borne out in commuting dynamics.

The economic trajectories set out in *Chapter 8* already build in assumptions that productivity improvements are achieved moving forwards. Productivity improvements, which moderate the need for workers, are thus built into each of the trajectories considered.

The analysis in this chapter then models improvements in economic participation; albeit it is notable that economic participation in Oxfordshire was already relatively strong at the base point of the modelling in 2018.

The modelling in this chapter also seeks to achieve a balanced position between those living and working in Oxfordshire to limit the need to travel, consistent with wider planning policy objectives, modelling commuting to return to the balance in Oxfordshire in 2011.

Whilst there is potential for commuting to flex (as it has done in Oxfordshire recently, as seen in Figure 5.4.2), given changing working patterns and the inter-relationship between where people live and work is unclear, in preparing the Oxfordshire Plan the Councils need to plan for an approach which facilitates a balance between jobs and homes. Any assumption of increased in-commuting to Oxfordshire in relative terms would impact the housing need in surrounding areas and would therefore need to be agreed with them.

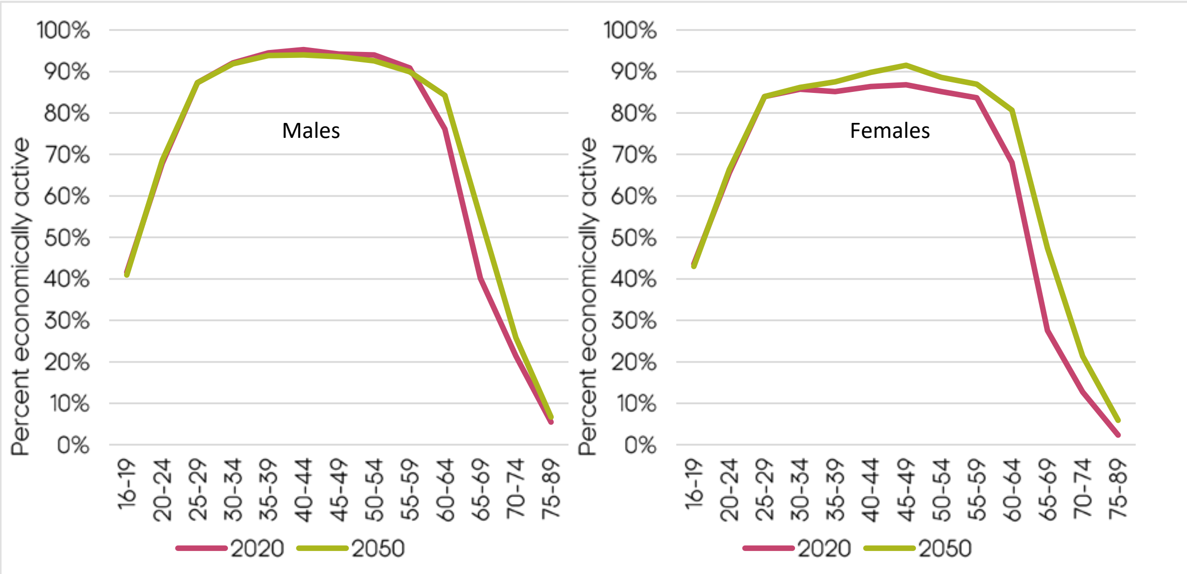
9.2 Economic participation assumptions

The first principal consideration is how economic participation is likely to change amongst people in different age groups.

The approach taken in this report is to derive a series of age and sex specific economic activity rates and use these to estimate how many people in the population will be economically active as projections develop. This is a fairly typical approach with data being drawn in this instance from the Office for Budget Responsibility (OBR) July 2018 Fiscal Sustainability Report.

Figure 9.2.1 and Table 9.2.1 below illustrate the assumptions made. The analysis shows that the main changes to economic activity rates are projected to be in the 60-69 age groups – this will to a considerable degree link to changes to State Pension age, as well as general trends in the number of older people working for longer (which in itself is linked to general reductions in pension provision). Growth in women in work is also assumed.

Figure 9.2.1: Projected changes to economic activity rates (2020 and 2050) in Oxfordshire



Source: Justin Gardner Consulting (based on OBR and Census (2011) data).

Table 9.2.1: Projected changes to economic activity rates in Oxfordshire, 2020-50

	Male economic activity rate			Female economic activity rate		
	2020	2050	Change	2020	2050	Change
16-19	41.6%	40.9%	-0.7%	43.6%	43.0%	-0.5%
20-24	67.9%	68.6%	0.7%	65.6%	66.3%	0.8%
25-29	87.3%	87.3%	0.0%	83.9%	84.0%	0.0%
30-34	92.1%	91.9%	-0.2%	85.7%	86.2%	0.4%
35-39	94.5%	93.8%	-0.6%	85.2%	87.5%	2.3%
40-44	95.3%	94.0%	-1.3%	86.4%	89.8%	3.4%
45-49	94.2%	93.6%	-0.6%	86.8%	91.5%	4.7%
50-54	94.0%	92.6%	-1.4%	85.2%	88.6%	3.4%
55-59	90.9%	89.9%	-1.0%	83.7%	86.9%	3.2%
60-64	76.1%	84.2%	8.1%	68.1%	80.7%	12.6%

65-69	40.1%	54.9%	14.8%	27.6%	47.4%	19.8%
70-74	21.4%	25.8%	4.4%	12.8%	21.4%	8.6%
75-89	5.5%	6.7%	1.2%	2.4%	5.9%	3.5%

Source: OBR, ONS, Justin Garden Consulting.

9.3 Linking employment growth and changes to the resident labour force

The number of resident and non-resident workers required to support the change in employment (jobs) will differ depending on three main factors:

- Commuting patterns – where an area sees more people out-commute for work than in-commute it may be the case that a higher level of increase in the economically active population would be required to provide a sufficient workforce for a given number of jobs (and vice versa where there is net in-commuting);
- Double jobbing – some people hold down more than one job and therefore the number of workers required will be slightly lower than the number of jobs; and
- Unemployment – if unemployment were to fall then the growth in the economically active population would not need to be as large as the growth in jobs (and vice versa).

Commuting patterns

Table 9.3.1 below shows summary data about commuting to and from Oxfordshire from the 2011 Census. Overall, the data shows that the county sees a small level of out-commuting for work with the number of people resident in the area who are working being about 3% higher than the total number who work in the area. This number is shown as the commuting rate in the final row of the table and is calculated as the number of people living in an area (and working) divided by the number of people working in the area (regardless of where they live).

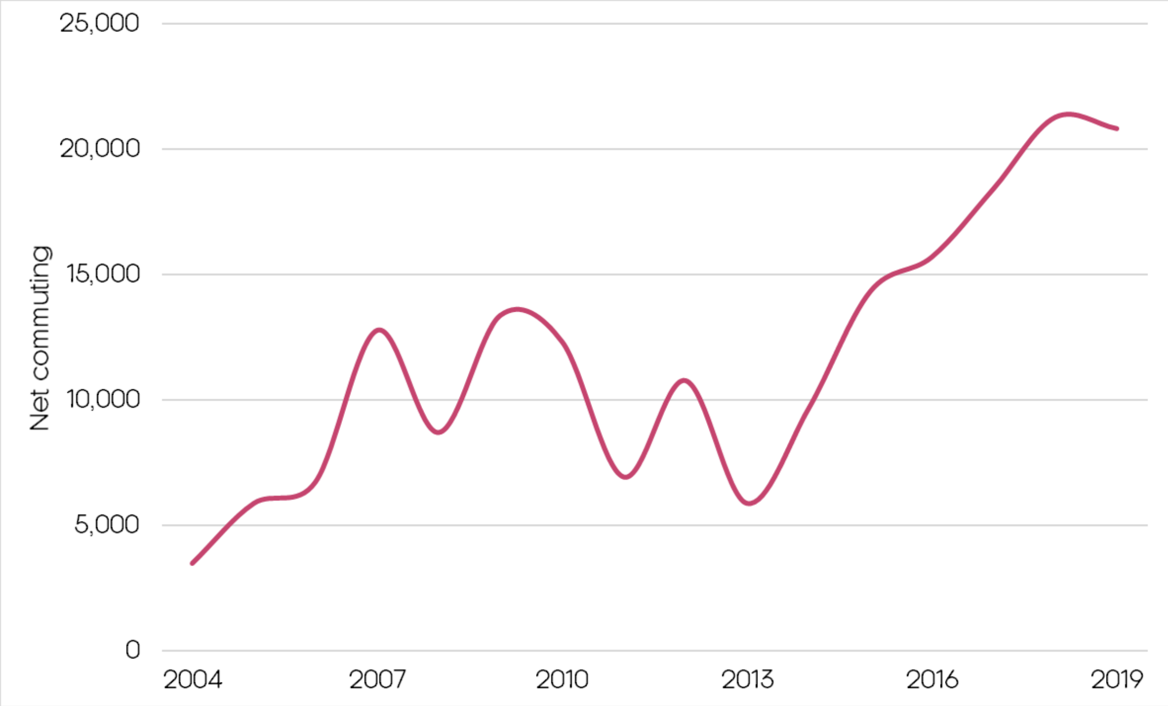
Table 9.3.1: Commuting patterns in Oxfordshire, 2011

	Number of people
Live and work in county	221,160
Home workers	42,738
No fixed workplace	24,862
In-commute	57,447
Out-commute	48,170
Total working in county	346,207
Total living in county (and working)	336,930
Commuting rate	1.03

Source: ONS, Justin Gardner Consulting.

More recent data drawn from the Annual Population Survey (APS, as seen in Figure 9.3.1) does however suggest that this commuting rate may have increase slightly (up to about 1.06). This means that more people (in net terms) are now commuting into Oxfordshire for work. Whilst the APS data should be treated with some degree of caution due to error margins, a consistent upward trend in net commuting into Oxfordshire is quite apparent.

Figure 9.3.1: Oxfordshire's net commuting flows, 2004-19



Source: ONS, Cambridge Econometrics.

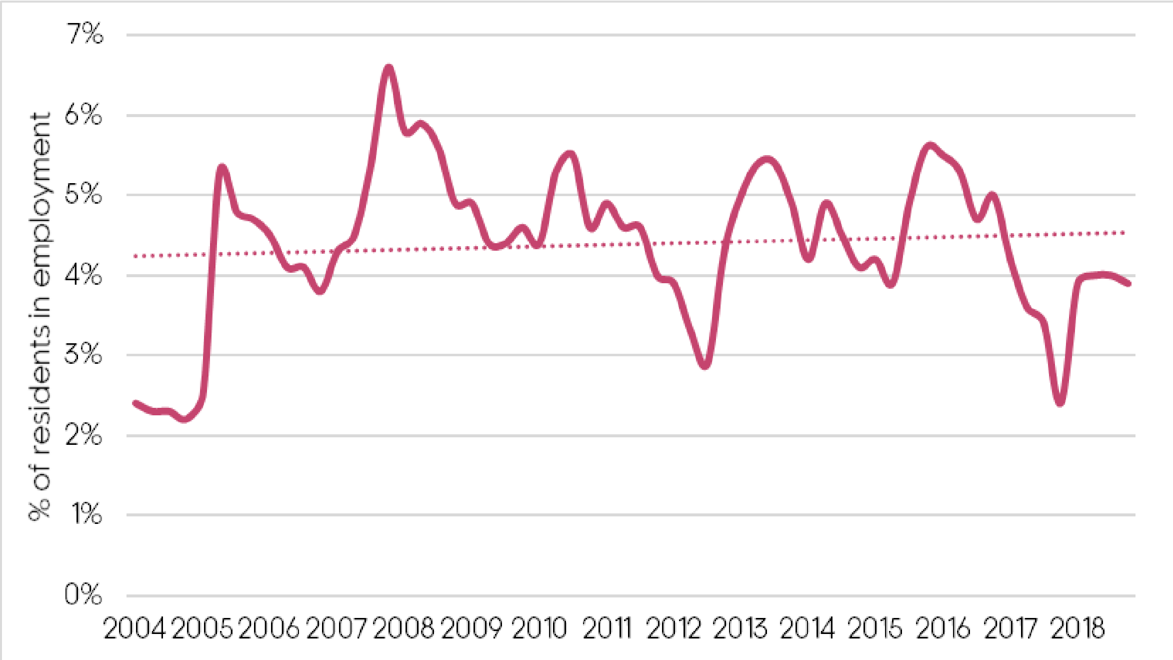
The evidence presented thus far in the Growth Needs Assessment indicates that there has been an imbalance between economic growth and housing delivery in recent years, influenced by the very strong economic growth which has been seen in Oxfordshire. The commuting data indicates that this has led to a growth in net-commuting into Oxfordshire. This relationship between commuting and housing is explored in greater detail in *Chapter 12 Commuting and Affordability Implications.*

It is appropriate however to look to address the imbalance which has arisen. The modelling therefore assumes that that the commuting rate starts at 1.06 (the current estimate) before falling back to 1.03 (the Census figure) by 2030. After 2030, it has been assumed that the ratio remains at 'normal levels' of 1.03. Returning the rate back to the Census figure will essentially reduce net commuting and bring back a greater degree of balance between where people work and where they live.

Double-jobbing

The analysis also considers that a number of people may have more than one job (double-jobbing). This can be calculated as the number of people working in an area divided by the number of jobs in that area. Data from the APS (Figure 9.3.2) suggests across the county typically between about 4.5% of workers have a second job – levels of double jobbing have been variable over time (mainly due to the accuracy and volatility of data at a local level) although the data does appear to point in a very slightly upward direction.

Figure 9.3.2: Percentage of all Oxfordshire residents in employment who have a second job, 2004-18



Source: ONS, Justin Gardner Consulting.

For the purposes of this assessment it has been assumed that around 4.5% of people will have more than one job moving forward. A double jobbing figure of 4.5% gives rise to a ratio of 0.955 (i.e. the number of jobs supported by the workforce will be around 4.5% higher than workforce growth). It has been assumed in the analysis that the level of double jobbing will remain constant over time, although the apparent upward slight trend should be noted.

Unemployment

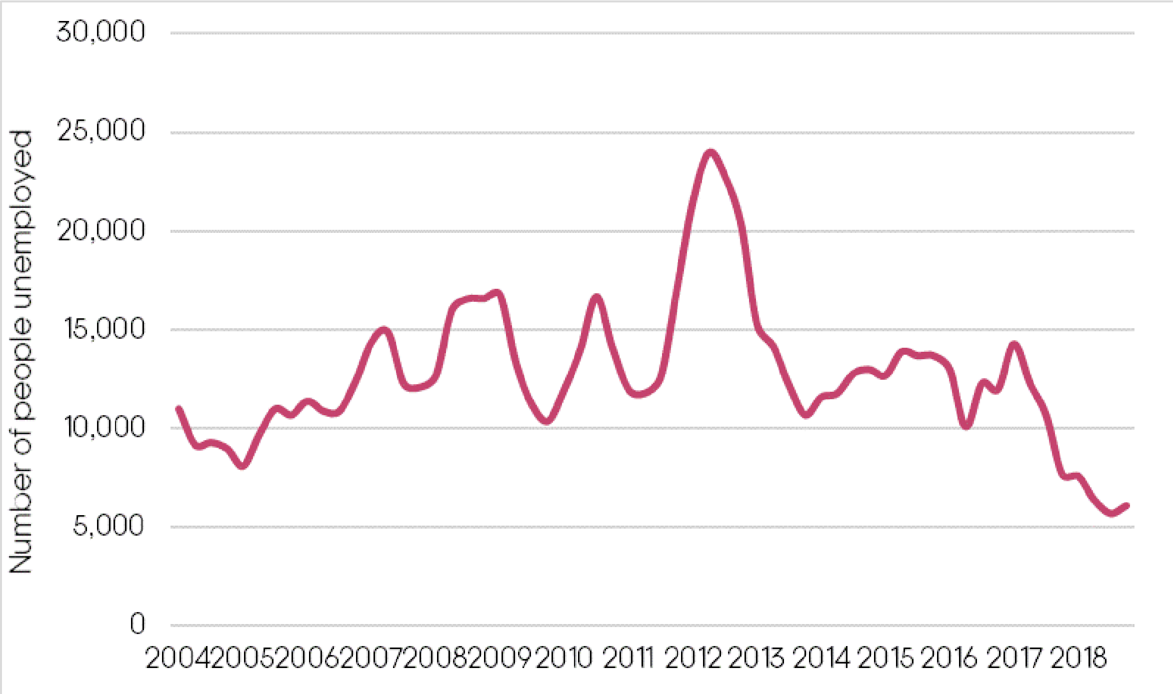
The final element of the analysis is to consider whether there is potential to reduce unemployment from the position in the base year, and for this to contribute to accommodating employment growth. Essentially, this is considering if there is any latent labour force that could move back into employment to take up new jobs.

Figure 9.3.3 below shows the number of people who are unemployed and how this has changed since 2004. The analysis shows a clear increase in unemployment from 2004 to 2012 and that since 2012, the number of people unemployed has dropped notably – by 2018, the number of unemployed people was lower than the level observed in 2004.

Unemployment clearly changes throughout an economic cycle. The analysis would indicate that there may be limited scope for further improvements in unemployment relative to the base position in 2018 and for the purposes of analysis in this report it has been assumed that there are no changes to the number of people who are unemployed moving forward from 2020 to 2050.

While unemployment may rise in the short-term over the projection period as a result of the economic shock provided by the Covid-19 pandemic, considered over the period modelled the key issue is whether there is scope for a reduction in unemployment at the base point in 2018 to reduce and for unemployed persons to therefore contribute to addressing the net jobs growth over the period modelled. The tight labour market conditions and low unemployment in 2018 suggest little potential for this.

Figure 9.3.3: Number of people unemployed in Oxfordshire, 2004-18



Source: ONS, Justin Gardner Consulting.

9.4 Required change to resident labour supply

Bringing together the assumptions on jobs growth, the proportion of people with more than one job and commuting, Table 9.4.1 to Table 9.4.3 below set out what growth in resident labour supply would be needed to support each of the economic trajectories set out in *Chapter 8*.

Taking the first table as an example, it can be seen that the number of jobs is forecast to increase by 81,600. Given that some people will have more than one job the labour supply needed reduces this number to around 77,900.

However, because it is assumed that commuting will return to 2011 (Census) levels the resident labour supply needed is higher than this (at around 86,500 people). Therefore, to meet jobs growth of 81,600, the modelling assumes that the number of economically active residents needs to increase by 86,500 people.

Table 9.4.1: Estimated jobs and economically active residents under the Standard Method (adjusted) trajectory, 2020-50

	2020	2030	2040	2050	Change, 2020-50
Jobs	413,970	434,538	464,179	495,555	81,585
Double-jobbing adjustment	395,341	414,984	443,291	473,255	77,913
Commuting adjustment	372,964	402,897	430,379	459,471	86,507

Source: Cambridge Econometrics, Justin Gardner Consulting.

Table 9.4.2: Estimated jobs and economically active residents under the business as usual trajectory, 2020-50

	2020	2030	2040	2050	Change, 2020-50
Jobs	416,872	452,633	491,462	533,622	116,751
Double-jobbing adjustment	398,113	432,265	469,347	509,609	111,497
Commuting adjustment	375,578	419,674	455,676	494,766	119,188

Source: Cambridge Econometrics, Justin Gardner Consulting.

Table 9.4.3: Estimated jobs and economically active residents under the transformational trajectory, 2020-50

	2020	2030	2040	2050	Change, 2020-50
Jobs	419,162	467,762	521,997	582,520	163,358
Double-jobbing adjustment	400,300	446,713	498,507	556,307	156,007
Commuting adjustment	377,642	433,702	483,988	540,104	162,462

Source: Cambridge Econometrics, Justin Gardner Consulting.

9.5 Housing need linked to Oxfordshire's economic trajectories

Table 9.5.1 and Figure 9.5.1 below show the estimates of implied housing need set against the employment (job) trajectories presented in *Chapter 8*. For clarity, the key assumptions used in modelling are as follows:

- Base population from the 2018-based subnational population projections (SNPP) – the alternative internal migration variant
- Projections run from 2020 to 2050
- Population data for 2018 fixed by reference to estimates made from mid-year population estimates (MYE) and Patient Register (PR) data
- Population to 2020 derived from estimating potential population change given the number of net housing completions (2018-20)
- Household Representative Rates (HRRs) from the 2014-based subnational household projections (SNHP) and a part-return to trend method for the 25-34 and 35-44 age groups
- Vacancy rate of 3% to convert households into dwellings
- Office for Budget Responsibility (OBR) economic activity rates (adjusted for local situation in Oxfordshire (from 2011 Census data) – July 2018 Fiscal Sustainability Report figures
- Commuting rate from Annual Population Survey analysis and the 2011 Census. The modelling assumes a commuting rate of 1.06 in 2020, returning to 1.03 by 2030 and remaining at 1.03 thereafter;
- Double jobbing ratio from the Annual Population Survey (APS) – ratio of 0.955 used
- Assume no changes to unemployment from 2020 onwards

The demographic model is re-run with these assumptions. It includes upward adjustments to household formation amongst those aged 25-44 on the assumption that affordability improves; and adjustment to net migration to Oxfordshire to support the trajectories for economic growth.

Figure 9.5.1: Projected housing need in Oxfordshire from the economic trajectories, 2020-50

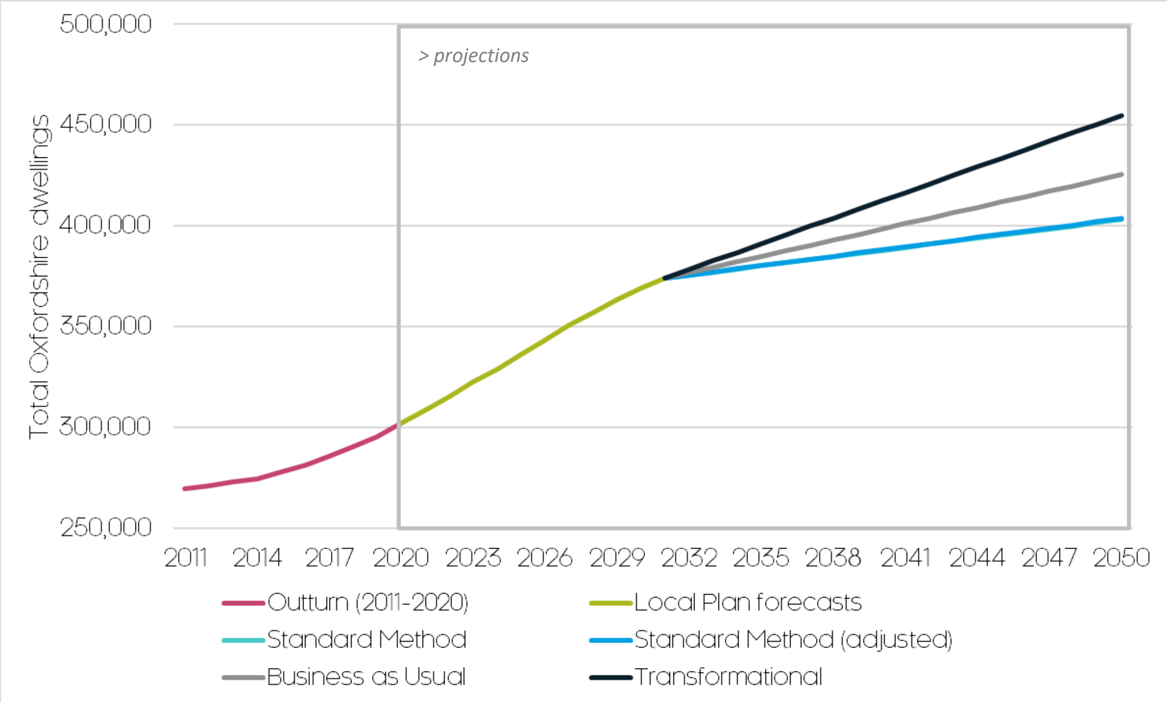


Table 9.5.1: Projected housing need in Oxfordshire from the economic trajectories, 2020-50

	Households, 2020	Households, 2050	Change in households, 2020-50	Change in households p.a., 2020-50	Dwellings required p.a., 2020-50
Standard Method (adjusted)	288,999	387,591	98,592	3,286	3,386
Business as usual	288,999	408,806	119,807	3,994	4,113
Transformational	288,999	437,328	148,329	4,944	5,093

Source: Cambridge Econometrics, Iceni Projects, Justin Gardner Consulting

The analysis shows that to support the Standard Method (with the adjusted demographic baseline) trajectory, a total housing provision of 101,580 dwellings (3,386 dwellings per annum) would be required between 2020-50.

The business as usual trajectory would require housing provision of 123,390 dwellings (4,113 dwellings per annum) between 2020-50, whilst to support the higher transformational trajectory housing provision of 152,790 dwellings (5,093 dwellings per annum) would be required between 2020-50.

Note that until 2031, the modelling assumes the same path of housing need (regardless of the trajectory). This ensures alignment with the forecast net completions outlined in Oxfordshire local authorities' Local Plans. These forecasts are available for all local authorities in a consistent format and approach for the 2020-31 period, and have been aggregated to a county-wide level.[58]

After 2031, the projections follow the modelled rate of remaining forecast need, according to the respective economic trajectory. The modelling assumes an even path of housing delivery throughout the period 2031-50, and does not specifically take account of the phasing of housing delivery or other constraints.

The modelling undertaken focuses on C3 housing needs. It does not assume any growth in absolute terms in the population aged under 75 living in institutions, but assumes that the proportion of those aged over 75 living in institutions remains stable (but allows for growth in the absolute numbers) consistent with the approach in MHCLG's 2014-based Household Projections.

9.6 Conclusions

This chapter of the report has appraised the implications of Oxfordshire's potential trajectories for employment growth on housing need. The baseline position (from the Standard Method, adjusted, trajectory) is of a need for 101,580 homes over the plan period (3,386 dwellings per annum). The modelling indicates that could be expected to support employment growth of around 81,600 (0.6% pa CAGR) over the 30-year plan period.

The business as usual trajectory, which would see employment grow by 116,800 over the plan period, would require provision of 123,390 homes (4,113 dwellings per annum). This is around 21% higher than the Standard Method figures.

And under a transformational trajectory of the Oxfordshire's economy, which is aligned to the Local Industrial Strategy, higher housing provision of 152,790 homes would be required over the 2020-50 plan period (5,093 dwellings per annum). This is around 50% greater than the Standard Method minimum housing need, but is relatively similar to the 20 year requirement of 100,000 homes (equivalent to 5,000 dwellings per annum) which underpins the Oxfordshire Housing and Growth Deal and currently adopted Local Plans in Oxfordshire.

Despite the application of a robust methodology and evidence base, there are clearly uncertainties associated with predicting the future economic performance of a local area, which heightens as the forecasts look further into the future.

However, the growth trajectories considered are reasonable parameters for growth when set against Oxfordshire's historic economic performance and employment growth trends over previous economic cycles, with Oxfordshire displaying particularly robust growth over the most recent economic cycle.

[58] Local authorities in Oxfordshire forecast 72,100 net additions to the dwelling stock over 2020-31 (6,600 net additions p.a.) Source: Oxford City Council, Cherwell District Council, West Oxfordshire District Council, Vale of White Horse District Council, South Oxfordshire District Council

10 Affordable Housing Need

10.1 Introduction

This chapter proceeds to consider the scale of need for affordable housing in Oxfordshire.

Affordable housing is defined in the NPPF as housing for sale or rent, for those who need are not met by the market, including housing which provides a subsidised route to home ownership and/or is for essential local workers. It includes affordable housing for rent, including at both social rents and affordable rents, discounted market sale homes – which would include First Homes – as well as other forms of low cost market housing, including shared ownership housing and affordable private rented housing.

Both the Standard Method and (economic-led) trajectories for housing need presented in *Chapter 9* relate to the need for all types of homes including both market and affordable housing.

These show that housing need could vary from between 123,390 homes, based on the (adjusted) Standard Method, and 152,790 homes to 2050 if the authorities plan to deliver the transformational level of growth. A consideration for the Councils in appraising what level of housing provision to plan for within this spectrum if the how different levels of housing provision will contribute to the delivery of affordable housing.

Affordable housing delivery is influenced by both public funding available to support delivery, including through both the Oxfordshire Housing and Growth Deal and the Government's Affordable Homes Programme; and the level of overall housing development in a context in which much affordable housing is secured through Chapter 106 Agreements on mixed-tenure development sites. Taking account of the latter, the Planning Practice Guidance outlines that:

> *" The total affordable housing need can then be considered in the context of its likely delivery as a proportion of mixed market and affordable housing developments, taking into account the probable percentage of affordable housing to be delivered by eligible market housing led developments. An increase in the total housing figures included in the plan may need to be considered where it could help deliver the required number of affordable homes."*[59]

In these terms, the effect on the delivery of affordable housing is a consideration for the Oxfordshire authorities in deciding whether to plan for higher housing provision than the minimum level indicated by the Standard Method.

In this chapter, Iceni therefore consider what scale of affordable housing need there is in Oxfordshire; and what impact different scenarios for overall housing provision might have on affordable housing delivery.

The analysis herein should be read alongside *Chapter 12* which considers the implications of different potential scenarios for housing provision on the

[59] Reference ID: 2a-024-20190220

affordability of market housing in Oxfordshire over the period to 2050. As the affordability of market housing influences the scale of affordable housing need, it is important that these are considered together.

10.2 Stock of affordable housing

The evidence suggests that despite worsening affordability of market housing (as shown in *Chapter 4*), the stock of affordable housing (comprising local authority owned, registered providers and other public sector housing) has been declining in absolute terms across Oxfordshire over the last decade (2009-2018), with a net growth in stock seen only in Cherwell District (Figure 10.2.1 and Table 10.2.1).

Figure 10.2.1: Trends in social housing stock in Oxfordshire, 2009-18

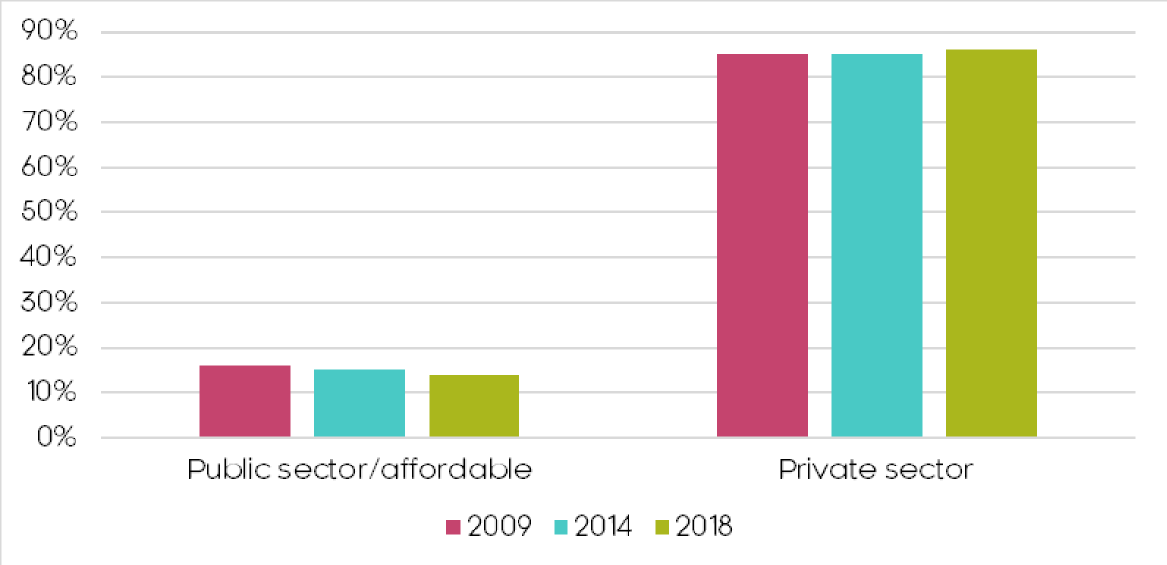


Table 10.2.1: Trends in social housing stock in Oxfordshire, 2009-18

	2009	2014	2018	Change, 2009-18	% change, 2009-18
Cherwell	7,457	7,840	8,520	1,063	14%
Oxford	13,737	13,240	12,750	-987	-7%
South Oxfordshire	7,036	7,300	7,020	-16	0%
Vale of White Horse	7,675	6,590	7,420	-255	-3%
West Oxfordshire	6,426	6,440	5,870	-556	-9%
Oxfordshire	**42,331**	**41,400**	**41,570**	**-761**	**-2%**
England	4,088,589	4,140,000	4,174,000	85,411	2%

Source: MHCLG, Iceni Projects.

10.3 Housing waiting lists

The limited available affordable housing stock has resulted in a significant build-up of those with an affordable housing need, as shown in Table 10.3.1. There are substantial numbers of households (almost 9,600) on Council housing waiting lists across Oxfordshire as of April 2019. This potentially under-estimates the affordable housing need as households do not register for housing where there is limited prospect of them being allocated a home. The housing registers are also focused on those seeking rented affordable housing, and there will be additional households who have an affordable housing need who aspire to home ownership but require support to do so. [60]

As of March 2019, West Oxfordshire has the highest total number of households on the housing waiting list with 2,684, whilst Cherwell has the lowest with 1,179. These differences may however reflect differences in how waiting lists are managed as opposed to the true underlying relative need.

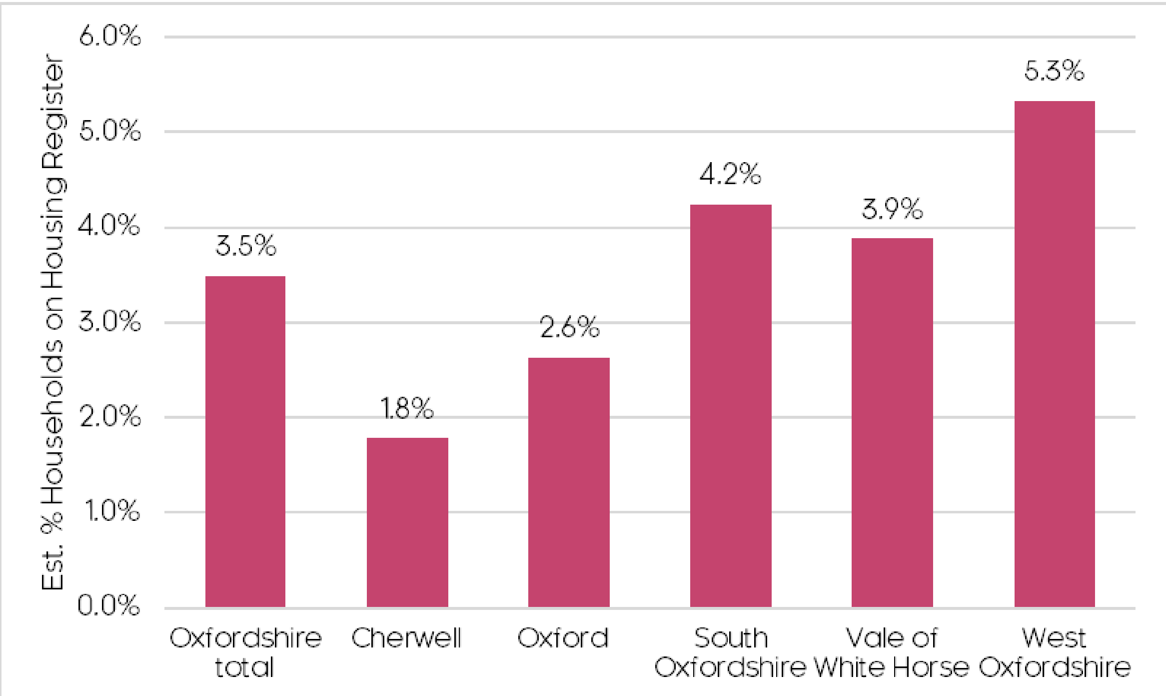
Table 10.3.1: Housing waiting lists in Oxfordshire, April 2019

	Total households on the housing waiting list	How many bedrooms did these households require?				
		1 bedroom	2 bedrooms	3 bedrooms	3+ bedrooms	Unspecified or those on the register more than once
Oxfordshire	**9,589**	**4,991**	**2,888**	**1,238**	**469**	**3**
Cherwell	1,084	550	315	165	54	0
Oxford	1,421	648	441	249	80	3
South Oxfordshire	2,421	1,303	708	307	103	0
Vale of White Horse	2,175	1,178	630	248	119	0
West Oxfordshire	2,488	1,312	794	269	113	0

Source: Local Authority Housing Statistics (LAHS), Iceni Projects.

Figure 10.3.1 below provides an estimate of the proportion of households in each Oxfordshire local authority on the Housing Register. It is lowest in relative terms in Cherwell and highest in West Oxfordshire; but the differentials potentially highlight differences in how the housing register is managed in each authority rather than the underlying needs position.

Figure 10.3.1: Estimated proportion of households on the Housing Register, 2019



Source: Local Authority Housing Statistics (LAHS), Iceni Projects.

[60] MHCLG (2019) Local authority housing data

10.4 Need for affordable housing

Households have traditionally been identified as having an affordable housing need where they cannot afford to rent *or* buy housing without support – this has been termed here as a 'narrow' definition of the need for affordable housing. This would align with the approach used in the 2014 Oxfordshire SHMA.

The 2019 NPPF has widened the definition of affordable housing need, essentially to include households who can afford to rent a home but aspire to buy, and need support to do so. The analysis here therefore assesses the wider need for affordable housing responding to the 2019 NPPF definition, which includes households who for instance might be able to rent privately without financial support, but aspire to buy a home and need support to do so. This widened definition thus fully captures the need for affordable home ownership products.

Iceni's analysis shows a need for 3,200 affordable homes per year across Oxfordshire over the period to 2030 adopting this wider definition to align with the 2019 NPPF.

The method for assessing affordable housing need, as set out in Planning Practice Guidance, is a point-in-time assessment which is influenced by the relationship between housing costs and incomes at the point of the assessment and the available supply of affordable housing. The assessment uses a 2018 baseline, as it takes account of the current need and the relationship between housing costs and incomes at that point. Needs have been considered over the period to 2030, as shown in Table 10.4.1.

Table 10.4.1: Affordable housing need in Oxfordshire, 2018-30

	Per Annum	Total, 2018-30
Narrow definition	1,714	22,269
NPPF-19 definition	3,198	41,574

Source: Iceni Projects.

The detailed analysis used to build up the assessment of the need for affordable housing in Oxfordshire is set out in *Appendix C: Affordable Housing Need Appendix*. This follows the methodology set out in Planning Practice Guidance.

10.5 Interpreting the affordable housing need

The evidence within this Growth Needs Assessment has pointed to particular issues with the affordability of market housing in Oxfordshire; and a situation in which this has deteriorated in recent years as housing demand – influenced by strong employment growth - have exceeded housing supply. This deterioration in market housing costs will have contributed to a growing number of households in need of affordable housing.

The need is also influenced by the existing supply of affordable housing, which in turn has been influenced by the availability of funding for affordable housing provision in recent decades together with losses, such as through right-to-buy sales.

These factors together have led to a situation where a significant affordable housing need exists. It is clear that the scale of affordable housing need is significant, with the total need shown notionally equating to 94% of the overall housing need identified in the Standard Method or 63% of the overall need shown in the transformational trajectory.

To deliver the annualised affordable housing need in full assuming 40% affordable housing provision would notionally require total housing provision of 7,995 homes a year in Oxfordshire; whilst at 50% affordable housing provision, it would require almost 6,400 homes a year to meet the affordable housing need in full.

It is clear therefore that the extent to which affordable housing need will be met will be sensitive to both the proportion of homes delivered as affordable housing, which is influenced by funding availability and what level of provision is viable on mixed tenure schemes; together with what overall housing requirement is set and the ability of the market to deliver this.

Over the past 15 years, affordable housing delivery in the county has fluctuated greatly (Table 10.5.1).[61] On average, the lowest rates of affordable housing delivery as a proportion of total dwellings has been in Vale of White Horse and West Oxfordshire with an average of 23% over the past 15 years. The highest average rates were in South Oxfordshire with 27% of all dwellings delivered as affordable, whilst the greatest affordable housing delivery in absolute terms has been in Cherwell with 2,937 affordable homes delivered between 2003-19.

Table 10.5.1 below however shows the total number of affordable housing completions have increased in recent years, particularly in Cherwell, Vale of White Horse and South Oxfordshire. This demonstrates how higher housing requirements can positively influence the delivery of affordable housing.

Table 10.5.1 Affordable housing delivery in Oxfordshire, 2003-19

	Oxford		Cherwell		Vale of White Horse		South Oxfordshire		West Oxfordshire	
	Affordable completions	% of total delivery	Affordable completions	% of total delivery	Affordable completions	% of total delivery	Affordable completions	% of total delivery	Affordable completions	% of total delivery
2003/04	141	26	84	21	50	17	80	41	75	13
2004/05	186	28	32	5	20	3	40	21	53	8
2005/06	167	18	61	6	90	14	30	14	218	30
2006/07	267	33	166	19	30	6	30	18	113	14
2007/08	73	14	133	29	100	22	150	29	186	22
2008/09	231	35	87	20	10	3	40	16	94	16
2009/10	192	75	97	22	N/A	N/A	70	37	22	6
2010/11	105	53	96	26	198	59	40	19	163	38
2011/12	18	8	204	57	63	18	194	38	181	50
2012/13	90	42	113	33	143	53	143	30	28	10
2013/14	0	0	140	34	67	12	187	39	41	22
2014/15	17	5	191	20	250	34	114	19	103	26
2015/16	164	37	322	23	326	29	180	30	75	37
2016/17	20	5	278	25	336	21	172	24	123	24
2017/18	27	7	426	31	311	19	259	28	158	28
2018/19	105	30	507	34	392	31	382	28	N/A	N/A
Total	1803	26	2937	25	2386	23	2111	27	1633	23

[61] Annual Monitoring Reports (where available), MHCLG (2019) Housing supply: net additional dwellings.

Source: Annual Monitoring Reports, MHCLG.

In deciding on what level of housing provision should be planned for in the Oxfordshire Plan, the contribution to the delivery of affordable housing is clearly therefore a relevant consideration.

As the affordable housing needs model, as set out in the Planning Practice Guidance, is very sensitive to the relationship between housing costs and incomes, and to what supply of affordable housing is available to meet needs, it is not really suitable for considering affordable housing needs in the longer-term beyond 2030.

Furthermore the affordable housing needs evidence considers not just the needs arising from overall growth in households, but also the needs of existing households in unsuitable housing, such as current households who require an alternative size or tenure of home (such as overcrowded households or those in the private rented sector who are identified as having an affordable housing need). Such households do not need additional housing per se. Instead the modelling thus partly indicates an imbalance between the current tenure profile and that needed (see *Appendix C: Affordable Housing Need Appendix*).

Given the length of the plan period, Iceni consider that it is important that the inter-relationship between affordable need and overall housing delivery is therefore not looked at solely in a mechanistic or numerical way. The affordable housing need figures are sensitive to changes in the relationship between housing costs and incomes over time. The evidence in this report has shown that market housing affordability has worsened in recent years as demand (driven by economic growth) exceeded housing delivery.

However housing delivery performance has been increasing rapidly in recent years, and as Local Plans have progressed in recent years, there are strong prospects for significant levels of housing delivery – amongst some of the highest in the South East region - to be sustained in the short- and medium-term through to 2031. This could in time affect housing affordability.

For the purposes of the Oxfordshire Plan, planning for higher levels of housing provision provides greater potential both to deliver affordable housing; and a greater likelihood of improving the affordability of market housing over the plan period to 2050. This is considered further as part of the analysis in *Chapter 12*. The solution to increasing affordable housing delivery is however not just about overall housing numbers.

Within Oxfordshire, the Housing and Growth Deal includes funding elements specifically to increase affordable housing delivery, including £60 million funding from the Government for affordable homes. The Oxfordshire Affordable Housing Programme is to deliver a programme that, over time, will make a significant contribution and the initial programme aims to deliver at least 1,320 affordable units by March 2021.

There are also other initiatives which could be considered to boost affordable housing delivery. A research paper published by the Association for Public Service Excellence[62] discusses how the government must help councils return to their historic role as a provider of homes, recognising that the private sector alone cannot meet the shortfall of housing supply. The report outlines 10

[62] APSE (2018) Delivering affordable homes in a changing world

recommendations for unlocking the potential of local authority house building and partnership delivery, which include redirecting existing subsidies for private market housing towards supply-side measures, enabling councils to retain 100% of their Right to Buy receipts to reinvest into building new affordable housing and ensuring *“councils have the confidence, backed by a comprehensive package of tools, in order to deliver that step change in the provision of social and affordable housing”*.

A 2016 report by the Local Government Association[63] sets out recommendations for how local and national government can work together to build more homes and includes many similar themes. Some of the recommendations include developing routes for councils to *“directly deliver new homes of all tenures through innovative delivery vehicles, including joint delivery vehicles across areas”,* using surplus public land strategically and provide additional powers to speed up land assembly.

Oxford City Council’s wholly owned delivery vehicle Oxford City Housing Limited, plans to provide 530 affordable homes between 2019 and 2023. Similarly, Build! was created by Cherwell District Council in 2012 to look at alternative ways for delivering affordable homes. To date Build! has provided over 260 homes across Cherwell and more homes are in the pipeline. This shows the impacts which specific Council initiatives can have. Vale of White Horse District Council has set out an ambition to explore a council-owned holding company/vehicle in its Corporate Plan 2020-24.

It is however clear that a concerted effort is needed both to improve both affordable housing delivery and affordability of market housing (which in turn will reduce the affordable need). These are relevant considerations, alongside capacity and environmental impacts of different levels of development, in determining what level of housing provision should be planned for.

10.6 Conclusions

The evidence points to a very significant scale of need for affordable housing in Oxfordshire whereby almost 3,200 affordable homes would be required each year to 2030 to meet affordable housing needs in full. This includes needs arising from both additional households and from existing households who require a different size or tenure of accommodation.

The scale of affordable housing need has built up over time and is sensitive to the market housing costs and the available supply of affordable housing. The scale of need shown points to a need to significantly boost the delivery of affordable housing. For the purposes of the Oxfordshire Plan, planning for higher levels of housing provision than the Standard Method provides greater potential both to deliver affordable housing; and a greater likelihood of improving the affordability of market housing over the plan period to 2050. This is considered further as part of *Chapter 12*.

The solution to increasing affordable housing delivery is however not just about overall housing numbers and the creation of public sector delivery vehicles, use of public sector land can also contribute to supporting delivery

[63] LGA (2016) Building our homes, communities and future

and funding support from Central Government can also contribute to boosting affordable housing supply.

11 Employment Land Requirements

11.1 Introduction

In this chapter the report moves on to consider future employment land needs across Oxfordshire over the period from 2020-2050, using an approach which responds to the Planning Practice Guidance in considering different modelling techniques to consider future employment land needs, including past development trends and modelling of what the economic trajectories (as set out in *Chapter 8*) would imply regarding the need for employment land.

There are relative benefits and disbenefits of different forecasting approaches which need to be understood in interpreting modelling results. For example, economic forecasts are based on predictions of trends in jobs, but do not take account of the need for better quality floorspace or replacement of out-dated stock. Past take-up trends tell us about the actual delivery of employment development in the past, but do not tell us whether these trends have been constrained by supply (for instance acknowledging Green Belt constraints around Oxford) or tell us about the implications of future economic dynamics.

Productivity improvements may also change the relationship between floorspace needs and job numbers in a way which is difficult to accurately predict. For some sectors this may mean that forecasts can over-state future needs; whilst for others it may under-estimate them. For office floorspace in particular, changing working patterns and growth in home-based working, a trend which has been accelerated by the Covid-19 pandemic, may also influence the demand for office space but it is difficult to precisely quantify the impacts at the current time. Additional consideration has been given to this question in the *Covid-19 Impacts Addendum*.

It is thus important to consider different forecasting approaches, to consider forecasts alongside ‘market signals’ as explored earlier in this report, and to ensure that there is a clear framework for the ongoing monitoring and review of market dynamics and employment land policies.

11.2 Labour demand modelling approach

The labour demand modelling considers the employment land implications of the business as usual and transformational economic trajectories. The Standard Method (adjusted) trajectory is a labour-demand scenario and does not have a specific profile of employment growth by sector associated with it.

The economic trajectories developed provide forecasts for growth in employment at a 10-sector level across Oxfordshire to 2050. The following key steps have been used to calculate employment land needs:

1. Forecasting growth in full-time equivalents

The first stage involves converting forecasts for total jobs into numbers for ‘full-time equivalent’ employment as standard employment densities are based on this metric. To estimate FTE employment, Iceni has examined the split between full-time and part-time employment in Oxfordshire using 2018 BRES data at a 3-digit SIC level and then aggregated this to the 10 sectors used in the forecasts. This generates a ratio of full-time to total employment which varies from 80% for distribution, transport, accommodation and food to 98%

for construction. This is then applied to the forecasts for total employment to generate FTE figures.

2. Relating economic sectors to use classes

The second stage in the modelling involves estimating the proportion of employment in each sector which is likely to take place on employment land. Iceni's modelling looks at the following different use classes:

- Office and R&D (Classes E(g)(i) and E(g)(ii))
- F1a Education
- Industrial (Class EG(iiii) light industrial and B2 General Industrial)
- Warehousing (Class B8 Storage and Distribution)
- Other Industrial Activities

The inclusion of the F1 sector takes into account the specific potential in Oxfordshire for employment growth in research and development activities associated with the universities and science sector.

Other industrial activities include utilities, waste and recycling, trade counter uses, motor vehicle sale and repair, which typically take place on employment sites but may fall outside of the B-class uses.

Iceni has calibrated its employment land model to reflect the specific nature of the Oxfordshire economy. For each of the 10 sectors the proportion of jobs which are likely to take place in each of the above use class categories has been estimated. This is informed by consideration of baseline employment at a 3-digit SIC level using 2018 BRES employment data. By applying the ratios of the estimated proportion of jobs by use class in each sector to the sectoral forecasts, forecast of jobs by use to 2050 has been calculated.

3. Applying employment densities

The next stage of the modelling is to apply employment densities to estimate the net change in floorspace by use class for each of the economic trajectories. Employment densities describe the typical level of floorspace per FTE employee. The following employment density assumptions have been applied:

- Office: 12 sqm GEA per FTE job
- Education/Training: 40 sqm GEA per FTE job
- Industrial: 40 sqm GEA per FTE job
- Warehouse: 74 sqm GEA per FTE job

These are blended figures derived from the HCA Employment Densities Guide (3rd Edition, Nov 2015). They include conversion, where appropriate, of densities for net internal areas to Gross External Area (GEA) figures.

The employment densities are average figures, and there will clearly be instances where the density of use of space is both above and below the average.

By applying the density assumptions to the forecasts of employment by use class, the modelling generates estimates of the net change in floorspace to 2050.

4. Adjustments for losses of employment land

The data provided by Oxfordshire local authorities indicates that there have been losses on average of 26,900 sq.m of employment space per annum over the 2011-18 period. Part of this will be due to redevelopment of vacant employment space; but there will also be some businesses which are displaced through redevelopment of employment space.

It is assumed that it is appropriate to replace 50% of the space lost and use this to model future gross requirements for new employment floorspace. There is some potential for changes made by Government to what constitutes permitted development to influence future losses. Trends in losses (and committed losses) will need to be monitored over time and this may require reconsideration of what replacement provision is necessary if there is a significant variance from the past trends shown herein.

5. Margin to provide flexible supply of land

The final stage of the modelling has been to include a margin to ensure that a flexible supply of employment land is maintained. The inclusion of this takes into account:

- The potential error margin associated with the forecasting process. Econometric forecasting is not an 'exact science';
- The need to provide a choice of sites both to take into account that business needs are not homogenous (i.e. different businesses have different requirements in terms of location and site characteristics) and to facilitate competition between developers in a heathy functioning property market;
- The need to ensure flexibility in land of allow for delays in individual sites coming forward; and
- The need to facilitate movement within the property market including the replacement of aged property through development of existing employment premises to provide more modern commercial floorspace. Net forecasts for employment to not take account of this ongoing level of property market churn.

Iceni consider that it is normally reasonable to make provision for a 5-year margin based on past (gross) employment land take-up over a typical 20-year plan period. The longer-term nature of the Oxfordshire Plan would justify a higher margin, and have therefore made provision for a margin of 7.5 years.

11.3 Labour demand forecasts for employment land

The level of FTE employment expected in different use class activities is shown in Table 11.3.1 below. Around 41% of employment growth is expected to occur in activities which typically take place on employment land under the Standard Method trajectory, rising to 48% in business as usual and transformational trajectories.

In all cases, a significant proportion of employment growth is expected to occur in other parts of the economy, such as in education, health, accommodation and food, and other service activities.

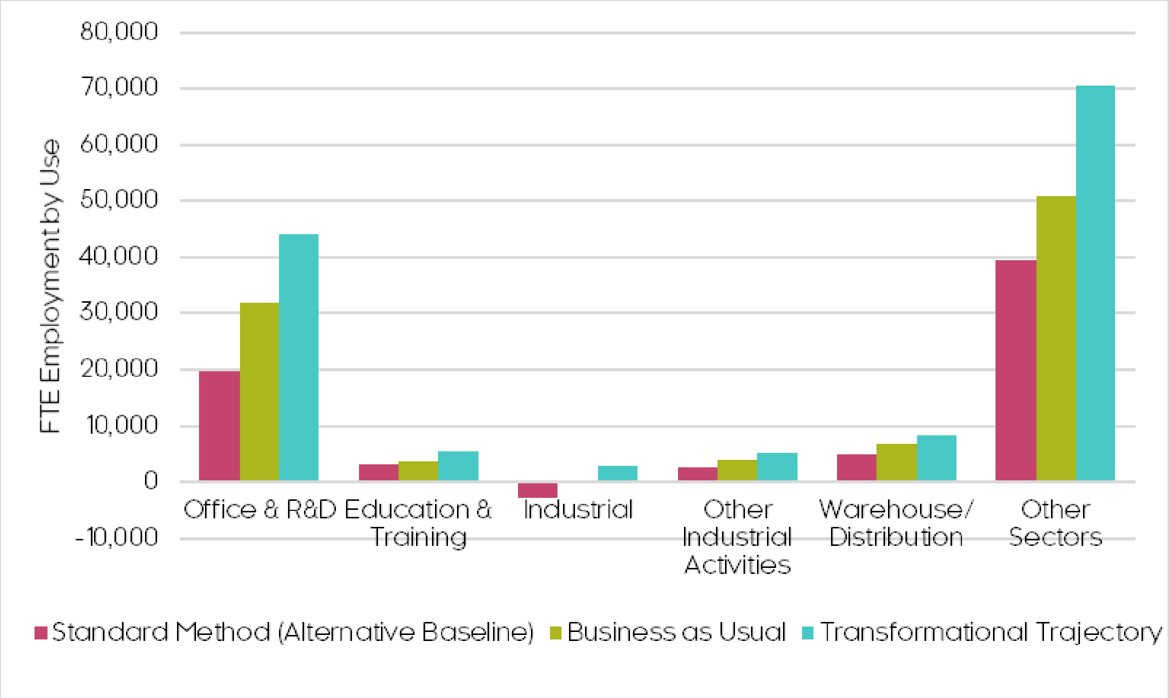
Table 11.3.1: Forecast FTE employment (jobs) by use class in Oxfordshire, 2020-50

	Office	D1 Education & Training	B1c/B2 Industrial	Other Industrial Activities	B8 Warehouse	Other Sectors	Total
Standard Method (adjusted)	19769	3090	-2709	2710	5056	39526	67442
Business as usual	31,960	3,626	188	3,848	6,646	50,802	97,070
Transformational	44,013	5,433	2,746	5,161	8,412	70,675	136,440

Source: Cambridge Econometrics, Iceni Projects.

As can be seen from Figure 11.3.1 below, the strongest growth is expected to be in office-based activities. A decline in industrial employment is forecast in the Standard Method (adjusted) trajectory, but employment is expected to grow under the business as usual and transformational trajectories.

Figure 11.3.1: Forecast change in FTE employment by use class in Oxfordshire, 2020-50



Source: Cambridge Econometrics, Iceni Projects.

Applying employment density assumptions to this (Figure 11.3.2 and Table 11.3.2), Iceni forecasts a net change in employment floorspace of 1.22 million sq.m in the business as usual trajectory and 1.74 million sq.m in the transformational trajectory. Reflecting relatively high employment densities, the greatest need shown is for B8 warehousing floorspace, followed by office and R&D floorspace.

Figure 11.3.2: Forecast net floorspace change in floorspace in Oxfordshire, 2020-50

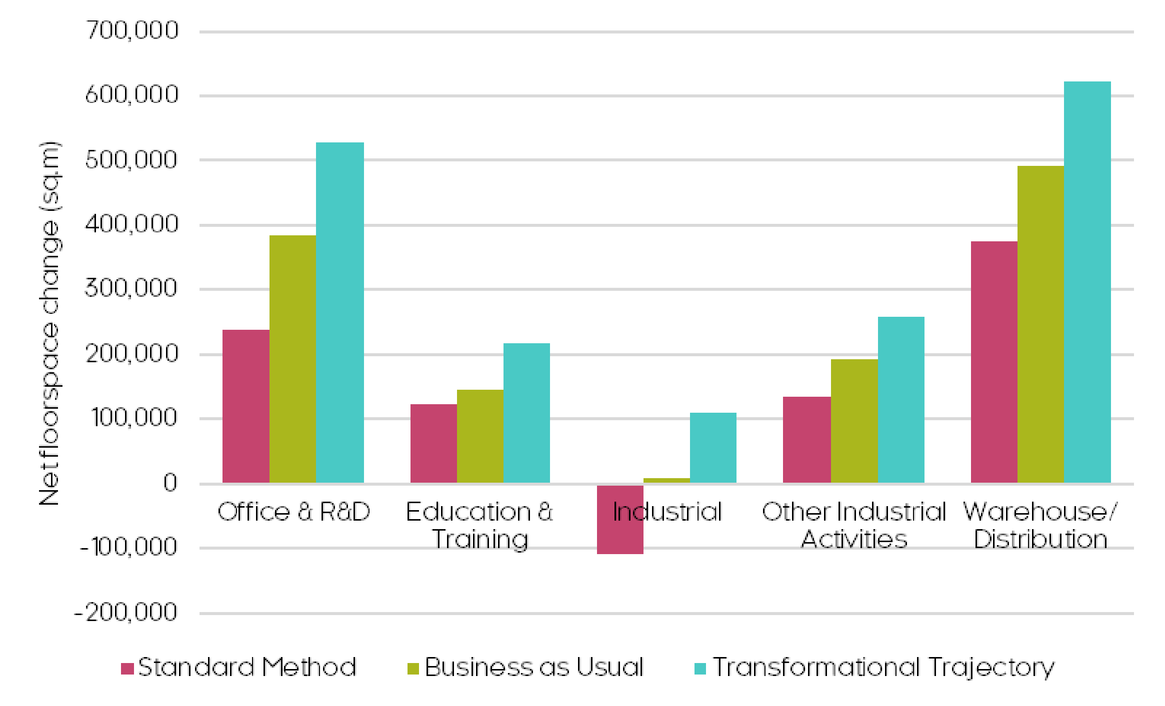


Table 11.3.2: Forecast net floorspace change in floorspace in Oxfordshire, 2020-50

	Office & R&D	Education & Training	Industrial (B1c/B2)	Other Industrial Activities	Warehouse	Total
Standard Method (adjusted)	237,231	123,598	108,366	135,476	374,137	762,076
Business as usual	383,522	145,047	7,502	192,401	491,772	1,220,244
Transformational	528,154	217,315	109,820	258,069	622,501	1,735,859

Source: Cambridge Econometrics, Iceni Projects.

To these figures, Iceni consider that it would be appropriate to add an allowance for losses. As set out previously, this is based on an expectation of losses in line with recent trend data (2011-18) and a replacement rate of 50%. Also included is a margin for choice and flexibility of supply, based on 7.5 years' gross take-up, again based on trends seen over the 2011-18 period.

The resultant levels of gross employment land arising are shown in Table 11.3.3 to Table 11.3.5 below. This assumes a 0.4 plot ratio for industrial and warehouse development. For office and R&D floorspace, it assumes 40% of space is delivered at town centre development densities at a plot ratio of 2; with 60% delivered on business and science parks with a plot ratio of 0.4. It stands at almost 780 ha in the business as usual trajectory and just over 1,000 ha in the transformational trajectory.

Table 11.3.3: Gross employment floorspace and land needs in Oxfordshire – Standard Method (adjusted) trajectory, 2020-50

	Office & R&D	Education & Training	Industrial	Other Industrial Activities/ Mixed B-Class	Warehouse/ Distribution	Total
Net employment floorspace growth	237,231	123,598	-108,366	135,476	374,137	762,076

Replacement of losses (sq.m)	92,008	42,711	104,297	8,892	155,391	403,299
Margin for Choice & Flexibility (sq.m)	163,429	16,321	145,923	250,866	119,349	695,888
Gross Floorspace Requirement (sq,m)	492,668	182,631	141,855	395,234	648,876	1,861,262
Land Requirement (ha)	108	40	35	99	162	445

Source: Cambridge Econometrics, Iceni Projects.

Table 11.3.4: Gross employment floorspace and land needs in Oxfordshire – business as usual trajectory, 2020-50

	Office & R&D	Education & Training	Industrial	Other Industrial Activities/ Mixed B-Class	Warehouse/ Distribution	Total
Net employment floorspace growth	383,522	145,047	7,502	192,401	491,772	1,220,244
Replacement of losses (sq.m)	92,008	42,711	104,297	8,892	155,391	403,299
Margin for Choice & Flexibility (sq.m)	163,429	16,321	145,923	250,866	119,349	695,888
Gross Floorspace Requirement (sq,m)	638,959	204,079	257,723	452,159	766,511	2,319,431
Land Requirement (ha)	141	45	64	113	192	555

Source: Cambridge Econometrics, Iceni Projects.

Table 11.3.5: Gross employment floorspace and land needs in Oxfordshire – transformational trajectory, 2020-50

	Office & R&D	Education & Training	Industrial	Other Industrial Activities/ Mixed B-Class	Warehouse/ Distribution	Total
Net employment floorspace growth	528,154	217,315	109,820	258,069	622,501	1,735,859
Replacement of losses (sq.m)	92,008	42,711	104,297	8,892	155,391	403,299
Margin for Choice & Flexibility (sq.m)	163,429	16,321	145,923	250,866	119,349	695,888
Gross Floorspace Requirement (sq,m)	783,591	276,347	360,041	517,827	897,240	2,835,046
Land Requirement (ha)	172	61	90	129	224	677

Source: Cambridge Econometrics, Iceni Projects.

11.4 Past completions projections

Iceni has also modelled a projection of past gross completions of employment floorspace. Oxfordshire local authorities have provided data on gross employment floorspace completions seen by local authority over the 2011-18 period. This is shown in Table 11.4.1 below.

Table 11.4.1: Gross completions of employment floorspace in Oxfordshire, 2011-18

	B1 Business	B1a offices	B1b R&D	B1c Light Industrial	B2 Industrial	B8 Storage & Distribution	Mixed B-Class	D1	Total
West Oxon.	10,546	3,389	117	7,626	749	3,478	111	-	26,016

South Oxon	-	3,779	9,999	8,508	8,188	34,095	13,100	-	77,669
VoWH	0	32,320	31,011	6,040	12,777	26,536	32,823	-	141,507
Oxford	7,755	13,136	3,928	1,356	544	2,851	-	15,233	44,803
Cherwell	6,025	28,652	1,877	21,304	69,103	167,181	65,358	-	359,500
Oxfordshire	**24,326**	**81,276**	**46,932**	**44,834**	**91,361**	**234,141**	**111,392**	**15,233**	**649,495**

Source: Oxfordshire local authorities, Iceni Projects.

For the purposes of developing a projection, B1 and B1a categories have been joined together to provide figures for Offices; B1b and D1 figures to provide figures for R&D and education floorspace, and B1c and B2 figures which relate to industrial floorspace (Table 11.4.2). Also included is a consistent margin to the labour demand scenarios to provide flexibility of supply.

Table 11.4.2: Trend-based assessment of gross employment floorspace & land needs in Oxfordshire, 2020-50

	Office	R&D & Education	Industrial	B8 Storage and Distribution	Mixed B-Class	Total
Gross completions p.a.	15,086	8,881	19,456	33,449	15,913	92,785
Floorspace Projection 2020-50 (sq.m)	452,579	266,421	583,693	1,003,463	477,394	2,783,551
Floorspace Projection with 7.5yr Margin	565,724	333,027	729,616	1,254,329	596,743	3,479,438
Land Requirement (ha)	102	60	182	314	149	807

Source: Iceni Projects.

11.5 Drawing the evidence together

For the purposes of considering what volume of land to allocate for employment uses, Iceni consider that it is sensible to group together Office and R&D Uses (Classes E(g)(i) and E(g)(ii) and R&D activities associated with education which might fall within Use Class F1a. These types of activities typically take place in town and city centres, and on business and science parks within Oxfordshire.

Equally it is sensible to group together more general industrial land which can cater for both light and heavy industrial uses (Classes EG(iii) and B2) as well as storage and distribution (Use Class B8). Table 11.5.1 below brings together the results of the labour demand modelling and the projections of gross floorspace completions on this basis.

Table 11.5.1: Comparison of land requirements (total hectares, ha) in Oxfordshire, 2020-50

	Office, R&D and Education	Industrial, Warehousing & Other	Total
Standard Method (adjusted)	149	296	445
Business as usual	185	369	555
Transformational	233	444	677
Completions projection	162	645	807

Source: Iceni Projects.

Iceni consider that for office, R&D and education uses the labour demand trajectories provide an appropriate basis for considering the level of employment land provision which should be made within the Oxfordshire Plan.

However for the broad industrial use category, there is a weaker relationship between jobs and floorspace or land requirements. This reflects a range of factors including productivity improvements and the need for additional floorspace to replaced out-dated existing premises. Put simply, whilst a manufacturing business could grow and require additional space but driven by productivity improvements, its employee headcount could be falling.

Equally for warehousing and distribution, a significant proportion of the gross need is likely to arise from replacement of older dated warehousing stock together with changes in the size of units required (with a shift towards larger units which can provide greater economies of scale). Iceni consider that greater weight should therefore be afforded to the completions projection scenario which suggests a need for almost 650 ha of industrial land for the 30-year plan period.

11.6 Conclusions

Iceni has considered the implications of different forecasting techniques on the demand for employment space. In drawing conclusions, Iceni consider that greater weight should be given to the labour demand modelling for office and R&D activities, and that greater weight should be given to past completions trends in considering future requirements for industrial land.

On this basis, the modelling indicates a need for between 149 – 233 ha of land for office and R&D floorspace to 2050, but that provision should be made for almost 650ha of industrial land.

12 Commuting and Affordability Implications

12.1 Introduction

Having explored the potential scale of economic growth (*Chapter 8*) and housing delivery (*Chapter 9*) in Oxfordshire, this chapter brings the two together to consider the resultant implications for both commuting and housing affordability in the county.

Given the externalities related to the increasing strain on Oxfordshire's transport network, and growing affordability pressures in local markets, it is increasingly important that local policymakers are able to understand the potential payoffs and implications of particular development paths and growth trajectories.

The following analysis begins with an overview of the interaction between employment, housing and commuting in Oxfordshire, and how this could change over the trajectories. It then takes a nationwide analysis of local affordability and its drivers, before scrutinizing and applying an approach to appraise the affordability implications of Oxfordshire's growth trajectories.

12.2 The relationship between employment, housing and commuting in Oxfordshire

Employment (i.e. jobs) and housing growth can act as relative push and pull factors for commuting by facilitating potential change in the number of employed persons working (workplace employed) and living (employed residents) in an area. Within commuting analysis, it is important to distinguish the difference between these employment identities:

- *Workplace employed:* refers to employed persons by the location of their workplace, regardless of the location of their residence (e.g. someone working in Oxford but living in Reading). This measure is closely related to the number of jobs in an area, but is typically lower because a person can have more than one job (*"double-jobbing"*).
- *Employed residents:* refers to employed persons by the location of their residence, regardless of the location of their work (e.g. someone living in Bicester but working in London). When reflected as the proportion of the population, this is known as the employment rate.

Generally, the number of workplace employed in an area is informed by the amount and concentration of economic activity in that area (which will correspond to the number of businesses and jobs in an area). The number of employed residents meanwhile will be shaped by the availability of housing and other labour market and demographic factors (e.g. labour market activity/inactivity rates).

At the intersection of these two variables is the concept of net commuting, which is simply:

$$net\ commuting = workplace\ employed - employed\ residents$$

Therefore, areas with a higher number of workplace employed relative to employed residents will experience net in-commuting (i.e. a positive net commuting value); consider for instance areas with town/city centres, business parks and other large employment sites.

Meanwhile, areas with a higher number of employed residents relative to workplace employed will experience net out-commuting (i.e. a negative net commuting value); consider for instance suburban estates, villages/dormitory settlements and other housing-led settlements.

12.3 Implications of the growth trajectories for commuting

As Table 12.3.1 shows, Oxfordshire currently has a net commuting inflow of 20,500 people (that is, 20,500 additional people commute into Oxfordshire for work relative to residents that commute out of Oxfordshire for work). This reflects the strength and attractiveness of Oxfordshire's labour market and its high employment density.

As noted in *Chapter 5*, this number has rapidly increased over recent years as people reporting to work in the county continues to exceed the number of employed residents. With more people commuting into the county, and commuting a further distance, this has had implications for journey times, congestion and emissions in Oxfordshire.

Between 2011 and 2018, the number of people working in Oxfordshire is estimated to have increased by 36,100, whilst the number of employed residents increased by only 25,200. With some 82.8% of working age residents in active employment (the highest employment rate in the country), Oxfordshire's already tight labour market has been reliant on workers residing outside the county to sustain its economic growth.

Resultantly, net commuting has more than doubled over this timeframe, from 9,000 to 20,500 daily inward commuters.

Table 12.3.1: Current and potential net commuting flows in Oxfordshire

		Employed residents (linked to housing growth)					
			2011	2018	2050 - SMa	2050 - BAU	2050 - Trans
Workplace employed (linked to employment growth)		-	*336,900*	*361,700*	*449,600*	*483,700*	*527,900*
	2011	*345,900*	**9,000**	-	-	-	-
	2018	*382,200*	-	**20,500**	-	-	-
	2050 - SMa	*461,600*	-	-	**12,000**	-22,100	*-66,300**
	2050 - BAU	*496,600*	-	-	47,000	**12,900**	-31,300
	2050 - Trans	*541,900*	-	-	*92,300**	58,300	**14,100**

Source: ONS, Cambridge Econometrics. Note: * denotes unlikely combinations.

As discussed in *Chapter 9*, the calculation of housing demand across the three trajectories ('Standard Method adjusted' – 'SMa', 'business as usual' – 'BAU', and 'transformational' – 'Trans') includes an assumption that the housing provision should be sufficient that the proportion of Oxfordshire workers living outside the county returns to previous levels.

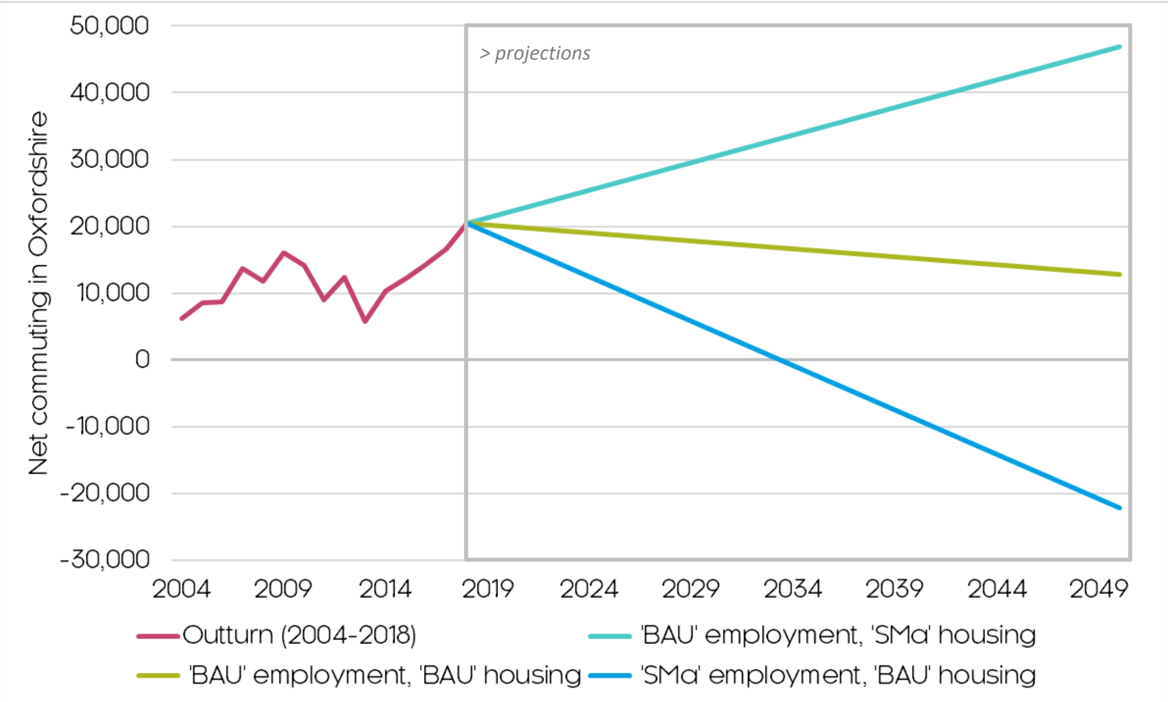
Therefore, under each of the matched projections (highlighted in bold in Table 12.3.1) there is a notable reduction in the number of net in-commuters by 2050, despite growing employment, fulfilling the realisation of this assumption. For instance, even the transformational level of employment growth, if matched with the accompanying transformational housing delivery, could see net commuting decline to approximately 14,100 by 2050.

Although employment growth is strongly linked to housing delivery – whereby housing delivery both facilitates and encourages employment growth – this relationship is not exact. The off-diagonal elements explore the net-commuting implications of a 'mis-match' between housing delivery and employment growth, including some less likely combinations of employment and housing.

For instance, the results show that if housing supply remains constrained whilst employment growth continues to grow at pace, then rather than shrinking, net in-commuting to the county will continue to grow, with the possibility of net inward commuting figures doubling or even tripling from current levels. These numbers are shown in red. These projections would broadly be a continuation of Oxfordshire's recent trends.

Conversely, if growth in employment is lower than anticipated and housing supply grows strongly, then net commuting may fall further, and even turn negative – meaning Oxfordshire becomes a net exporter of workers to neighbouring regions. Historic data (the 1981 and 1991 Census) shows this was a position Oxfordshire once fulfilled. These numbers are shown in blue. In reality, it is unlikely many of the additional dwellings under such a trajectory would be built, given the comparatively low employment growth.

Figure 12.3.1: Current and potential net commuting flows in Oxfordshire



Source: ONS, Cambridge Econometrics.

Figure 12.3.1 further illustrates some of the hypothetical commuting scenarios to 2050 suggested in Table 12.3.1, given the associated trajectory-mix, and how this relates to Oxfordshire's recent net commuting trajectory. For instance:

- A lower employment growth trajectory relative to higher housing growth (the blue line) could see a reduction in Oxfordshire's net commuting, potentially below historic (pre-1991) levels. This would mean there are more residents than jobs in the county, so residents commute out for work.
- A higher employment growth trajectory relative to lower housing growth (the turquoise line) could see an increase in Oxfordshire's net commuting, above current record-highs. This would mean there are more jobs than residents in the county, so out of county residents commute in for work.
- A similar employment and housing growth trajectory (the green line) would see a steady decline in Oxfordshire's net commuting as it returns to 'normal' levels. The number of jobs is still marginally higher than the number of residents in the county, reflecting the built-in assumptions explored in *Chapter 9*.

12.4 Affordability implications: summary of approach

As with net commuting levels and directions, a 'mis-match' between housing delivery and employment growth also has implications for changes to house prices and housing affordability. This is consistent with the analysis in *Chapter 4* and the exploration of affordable housing need in *Chapter 10*.

As part of its approach to appraise the affordability implications of Oxfordshire's economic trajectories and implied housing need, CE has undertaken a detailed, nationwide analysis of local house price and affordability dynamics to inform and build a robust methodology and accompanying model.

This approach has been scrutinized and developed as part of CE's national research agenda into housebuilding and affordability, utilising CE's novel long-run series which contains more than 50 years' worth of local housing market related data.

The main methodology has been built around the identification of a statistically and economically significant relationship between the ratio of employment growth to housing delivery at a functional spatial level, and the subsequent impact the interaction of these variables has on house prices and affordability. In summary, it finds that:

- housing delivery above that required to sustain the associated level of employment growth will likely result in an improvement in housing affordability.
- housing delivery below that required to sustain the associated level of employment growth will likely result in a deterioration in housing affordability.

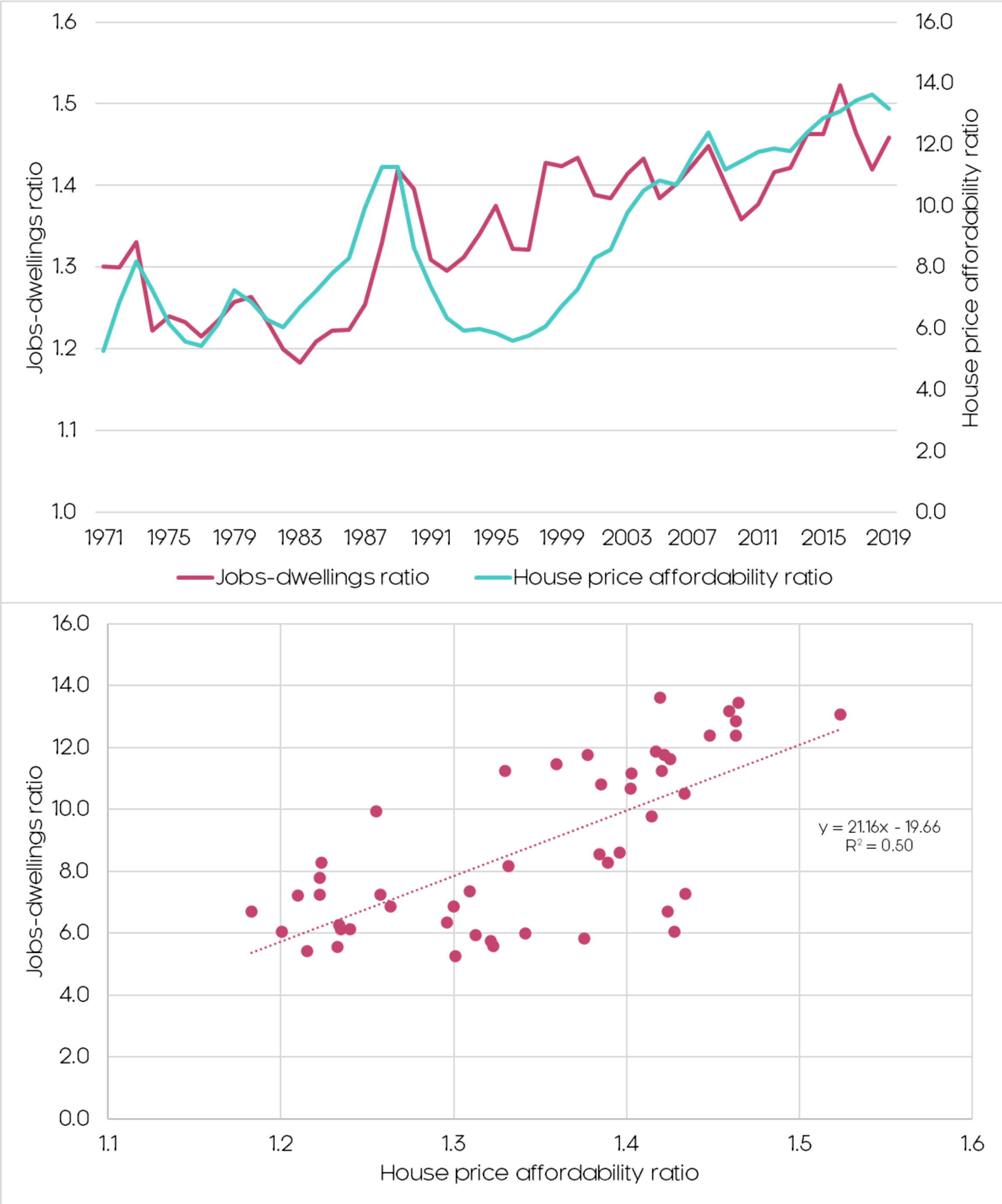
A detailed summary of the methodology and supporting analysis is provided in *Appendix D: Approach to Understanding Affordability Implications*, which should be read alongside this analysis.

The rest of this analysis scrutinizes and applies this approach for Oxfordshire to gauge the potential affordability implications of its growth trajectories and the accompanying housing need.

12.5 Designing a methodology for Oxfordshire

The analysis in *Appendix D: Approach to Understanding Affordability Implications* – having reviewed almost 50 years of local housing market data - identified a clear and significant causal relationship between the interaction of local employment growth and housing delivery in contributing to the affordability of local housing markets.

Figure 12.5.1: Jobs-dwellings ratio and house price affordability ratio in Oxfordshire, 1971-2019



Source: ONS, MHCLG, Cambridge Econometrics.

This chapter aims to build on this evidence and the identified relationship to articulate and refine an empirically-sound methodology that can be applied for Oxfordshire.

As Figure 12.5.1 above shows, within Oxfordshire the relationship between the interaction of employment growth and housing delivery (the jobs-dwellings ratio; that is the number of jobs relative to the number of dwellings) in contributing to affordability in the county is highly significant.

And this relationship holds overtime; as the scatter plot shows (where each plot equates to a year), between 1971 and 2019, in years when Oxfordshire had a higher job to dwellings ratio, its housing affordability ratio was resultantly higher (i.e. housing was less affordable). This relationship can be captured using the following identity:

$$Y = f(L/K)$$

Where:

- Y = local housing affordability
- L = local employment growth
- K = local housing delivery

As the above equation simplifies, housing affordability in Oxfordshire can therefore be broadly defined and modelled as a function of the interaction between local housing growth and employment growth (i.e. its jobs-dwellings ratio). Of course, this is a conscious oversimplification – as observed in *Appendix D: Approach to Understanding Affordability Implications* previously other local and non-local factors can impact an areas affordability.

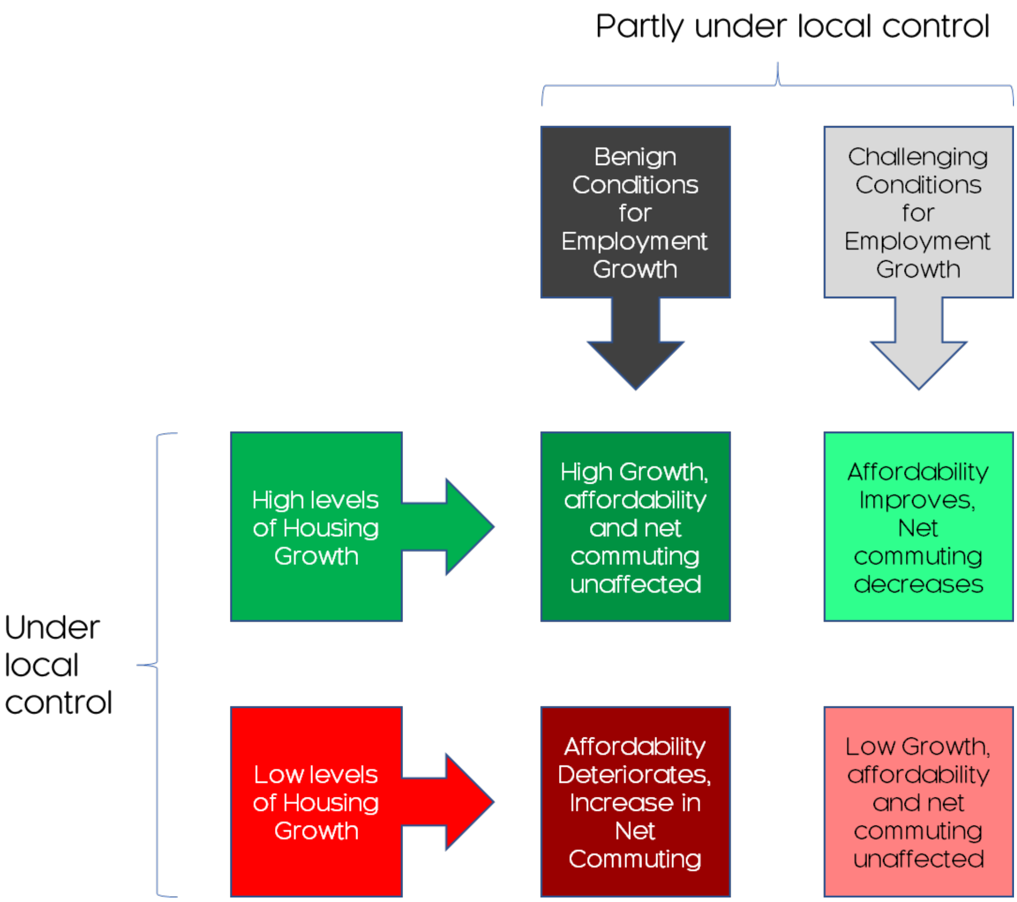
Amenity values, for instance – capturing locally-specific factors such as school quality, transport, air quality, natural landscape etc. - may not always be represented in the aforementioned variables, but are acknowledged as significant house price, and thus affordability, determinants. Likewise, exogenous factors, such as interest rates, will also determine current and future prices.

However, it is prudent to consider such factors are already captured in local prices and their share can be assumed to hold constant over a longer timeframe. Likewise employment growth, already included in the methodology, is often highly correlated with both amenity values and interest rates.

To help consider the impact of this relationship, Figure 12.5.2 presents a simplified framework for addressing affordability and housing need in local areas. It reiterates the importance of considering both the role of housing and economic development in addressing local affordability, but also the relatively limited control local policymakers may have over the economic drivers. This emphasises the importance of a sound evidence and understanding of local economic conditions to inform effective housing delivery.

It also notes the relationship between local affordability and net commuting, which implicitly arises through the interaction of the jobs-dwellings ratio; for instance, areas with a higher jobs-dwelling ratio (and thus lower affordability) typically experience high net commuting, as an increasing number of workers have to live further from their place of work. Additional research on this subject has also highlighted the relationship between house prices and the quality and cost of (particularly public) transport infrastructure; for some high performing areas, house prices have continued to rise despite transport costs not falling.[64]

Figure 12.5.2: Illustrative housing delivery and affordability framework



Source: Cambridge Econometrics.

12.6 Implications of the growth trajectories for affordability

Having reviewed the evidence and prepared a concise and empirically-sound methodology for appraising local affordability, this chapter aims to apply this approach to Oxfordshire's economic trajectories.

Table 12.6.1: Current and potential jobs-dwelling ratios in Oxfordshire

	Employment (columns)	2019 - baseline	2050 -SMa	2050 -BAU	2050 -Trans
Dwellings (rows)	-	*429,100*	*495,600*	*532,500*	*581,300*
2019 - baseline	*295,500*	**1.45**	-	-	-
2050 - SMa	*403,600*	-	**1.23**	1.32	*1.44**
2050 - BAU	*425,400*	-	1.16	**1.25**	1.37
2050 -Trans	*454,800*	-	*1.09**	1.17	**1.28**

Source: ONS, MHCLG, Iceni Projects, Justin Gardner Consulting, Cambridge Econometrics.
Note: * denotes unlikely combination.

Table 12.6.1 provides a recap of the potential mix of employment and dwelling trajectories for Oxfordshire to 2050, and the resulting implications for jobs-

[64] See research by Miles (2018) for instance

dwellings ratios. Notably, across the three matched trajectories for employment and housing growth (‘Standard Method adjusted’ – ‘SMa’, ‘business as usual’ – ‘BAU’, and ‘transformational’ – ‘Trans’), there is expected to be a moderate decline in Oxfordshire’s jobs-dwelling ratio.

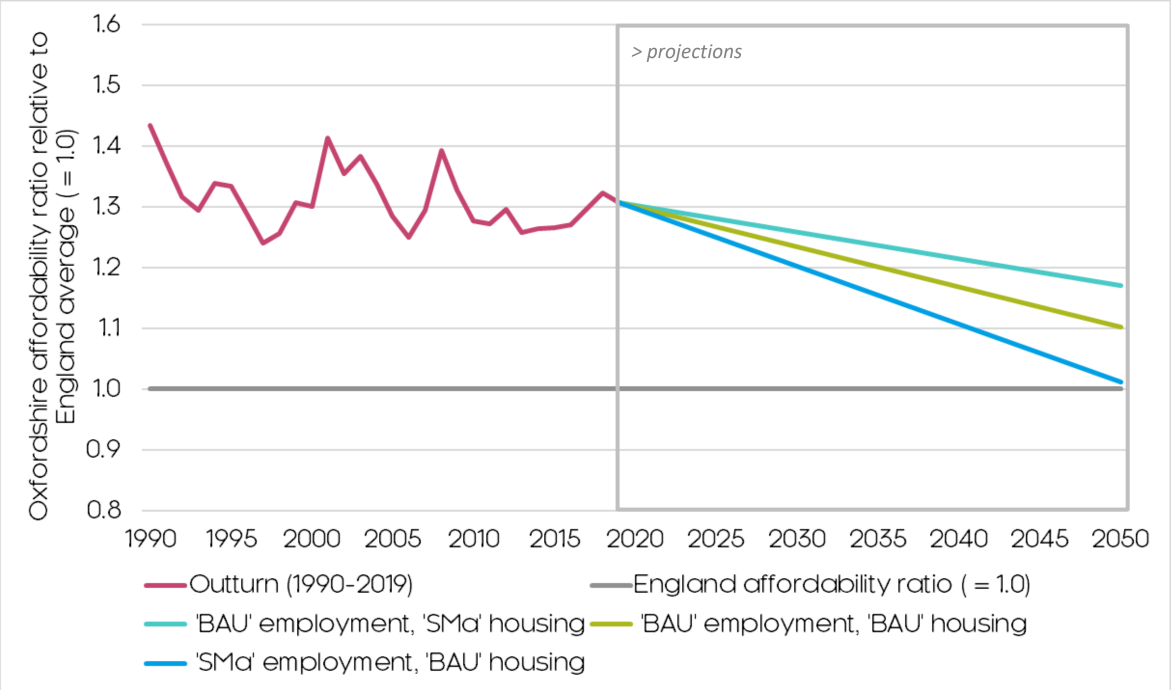
In these ‘matched’ outcomes (highlighted in bold), Oxfordshire’s jobs-dwelling ratio could decline from its current near-record high of 1.45 to a more sustainable value of around 1.23 -1.28 by 2050 – a level last consistently maintained in the 1970’s and 1980’s. This is a result of the deliberate decisions taken in *Chapter 9* to provide sufficient housing delivery to accompany each employment growth trajectory to reduce the necessity of wide-scale net in-commuting into the county.

Of course, this varies given the potential outcome-mix, but in all but one of the combinations is Oxfordshire expected to see a significant decline in its jobs-dwellings ratio relative to current totals. The off-diagonal elements explore the implications of a ‘mis-match’ between housing delivery and employment growth, including some less likely combinations of employment and housing.

For instance, the results show that if housing supply remains constrained whilst employment growth continues to grow at pace, then the jobs-dwellings ratio will decrease (shown in red, i.e. there will be fewer jobs relative to housing). Conversely, if growth in employment is lower than anticipated and housing supply grows strongly, then the jobs-dwellings ratio will increase (shown in blue i.e. there will be more jobs relative to housing).

Taking this analysis, Figure 12.6.1 and Table 12.6.2 present estimates of Oxfordshire’s house price affordability ratio (relative to the England average[65]) to 2050 given the potential mix of employment and dwelling trajectories for the

Figure 12.6.1: Current and potential house price affordability in Oxfordshire, relative to the England average



[65] Where the England average = 1.0. Currently (2019), affordability in Oxfordshire relative to the England average is 1.31; that is, Oxfordshire’s affordability ratio (13.2) is .31x higher than the England average (10.1).

Table 12.6.2: Current and potential house price affordability in Oxfordshire, relative to the England average

	Employment (columns)	2019 - baseline	2050 -SMa	2050 -BAU	2050 -Trans
Dwellings (rows)	-	*429,100*	*495,600*	*532,500*	*581,300*
2019 - baseline	*295,500*	**1.31**	-	-	-
2050 - SMa	*403,600*	-	**1.08**	1.17	1.29*
2050 - BAU	*425,400*	-	1.01	**1.10**	1.22
2050 -Trans	*454,800*	-	0.93*	1.02	**1.13**

Source: ONS, Cambridge Econometrics. Note: * denotes unlikely combination.

county. These estimates of affordability have been calculated using the methodology and approach outlined in *12.5 Designing a methodology for Oxfordshire*.

Utilizing this approach, it is expected that across the three matched trajectories for employment and housing growth (‘Standard Method adjusted’ – ‘SMa’, ‘business as usual’ – ‘BAU’, and ‘transformational’ – ‘Trans’) Oxfordshire could become notably more affordable relative to the national average.

Currently, Oxfordshire’s house price affordability ratio is 1.3x the national average, yet under each of the ‘matched’ outcomes (highlighted in bold) this is expected to decline to an average of approximately 1.1x by 2050. For instance, even the transformational level of employment growth, if matched with the accompanying transformational housing delivery, could see Oxfordshire’s relative affordability ratio decline to approximately 1.13x by 2050.

Though this means housing in Oxfordshire will remain less affordable than the national average (though the last time housing affordability was less than 1.2x the national average in Oxfordshire was the early 1970’s) there is the potential for this gap to close given the right policy combination. Under a hypothetical mix of high (‘transformational’) housing growth and comparatively lower (‘business as usual’) employment growth, affordability could almost match the national average in Oxfordshire.

Conversely, current affordability pressures could be maintained, but this is only evident under one policy combination; a hypothetical mix of high (‘transformational’) employment growth and comparatively lower (‘Standard Method adjusted’) housing growth. Positively, none of the policy-combinations point towards a further deterioration in affordability in Oxfordshire. To summarise, the results show that:

- A lower employment growth trajectory relative to higher housing growth (the blue line in Figure 12.6.1) would see a significant reduction in Oxfordshire’s affordability ratio relative to the England average. This could result in housing in Oxfordshire being as affordable as elsewhere in the country.
- A higher employment growth trajectory relative to lower housing growth (the turquoise line) would see a steadier reduction in Oxfordshire’s affordability ratio relative to the England average. Housing would still be around 1.2x less affordable in Oxfordshire than elsewhere in the country though.

- A similar employment and housing growth trajectory (the green line) would still see a notable reduction in Oxfordshire's affordability ratio relative to the England average. This could result in housing in Oxfordshire being marginally less affordable than elsewhere in the country.

It should be emphasised that these indicative affordability distributions are intended to be high-level only and are effectively 'policy neutral' because the analysis does not take into account specific constraints, policy interventions or development sites related to affordable development in Oxfordshire.

12.7 Conclusions

As observed in previous chapters, over the past decade, relative to the supply of housing, employment growth has accelerated in Oxfordshire. This has had implications for both net commuting and housing affordability. Analysis presented in this chapter has identified a statistically significant relationship between the balance of housing and employment growth in local areas, and the implications for commuting levels and affordability.

The analysis shows housing delivery above that required to sustain the associated level of employment growth will likely result in a reduction of net commuting and an improvement in housing affordability within Oxfordshire. Yet housing delivery below that required to sustain the associated level of employment growth will likely result in an increase in net commuting and a deterioration in housing affordability.

The intention of the three economic and housing trajectories is to ensure the delivery of employment and housing growth in Oxfordshire will become more aligned. The trajectories address this by incorporating a lowering of the ratio between the number of jobs relative to the number of dwellings in Oxfordshire, demonstrating how a balance of future housing and economic growth can stabilise and lower affordability and commuting pressures.

Such outcomes are increasingly desirable given the high welfare and inequality costs of unaffordable housing, and the growing strain on Oxfordshire's transport network from increased commuting (and associated externalities, notably, environmental and emissions effects, particularly in light of the desire to attain net zero).

Part C: Conclusions and Appendices

13 Conclusions

This conclusions chapter seeks to highlight and draw out the key findings and observations presented in the Phase 1 Report, particularly those regarding housing need, economic growth and employment land requirements, alongside accompanying high-level commuting and affordability implications.

Oxfordshire today

Oxfordshire, like many parts of the greater South East, is characterised by high housing costs and particular affordability pressures. Median house prices have risen from £100,000 to £350,000 in the county over the last 20 years. Whilst current low interest rates mean that mortgage finance is currently relatively cheap, lenders undertake stress testing and the absolute cost of homes to buy means that there are households that need significant savings to be able to buy a home.

Across Oxfordshire the median cost of a home was 10.4 times income in 2019, and Oxford has been ranked as one of the UK's least affordable cities. Influenced by the high cost of homes to buy and rent, there is a very significant need for affordable housing which the has been estimated here as being almost 3,200 affordable homes per year across Oxfordshire to 2030.

It is clear that affordability issues are having a real impact not just on young people in Oxfordshire, but also its business community. If left unaddressed this could hold back future economic growth potential. Poor housing affordability can provide a deterrent to young professionals hoping to live and work in Oxfordshire, which affects the ability of businesses to recruit staff to fill positions, including in high-tech and innovative business sectors.

These issues are partly a function of Oxfordshire's economic success. Oxfordshire has been one of the country's fastest growing economies in recent years, and sustained jobs growth of around 6,000 per year over the 2010-18 period. It has notable strengths in research-intensive activities including media and technology, science and healthcare, and public services. Whilst employment growth has been strong, productivity improvements have however stalled in recent years. The ability of companies to recruit and retain skilled staff is one component of this.

The evidence suggests that whilst rates of housing delivery have been rising, jobs growth over the 2010-18 period outpaced growth in housing and labour supply in Oxfordshire. Between 2011-18 the working-age population age 16-64 increased by just 1% (7,800 persons). A supply-demand imbalance for housing has resulted, contributing to both house price growth and growth in net in-commuting into Oxfordshire.

The minimum local housing need

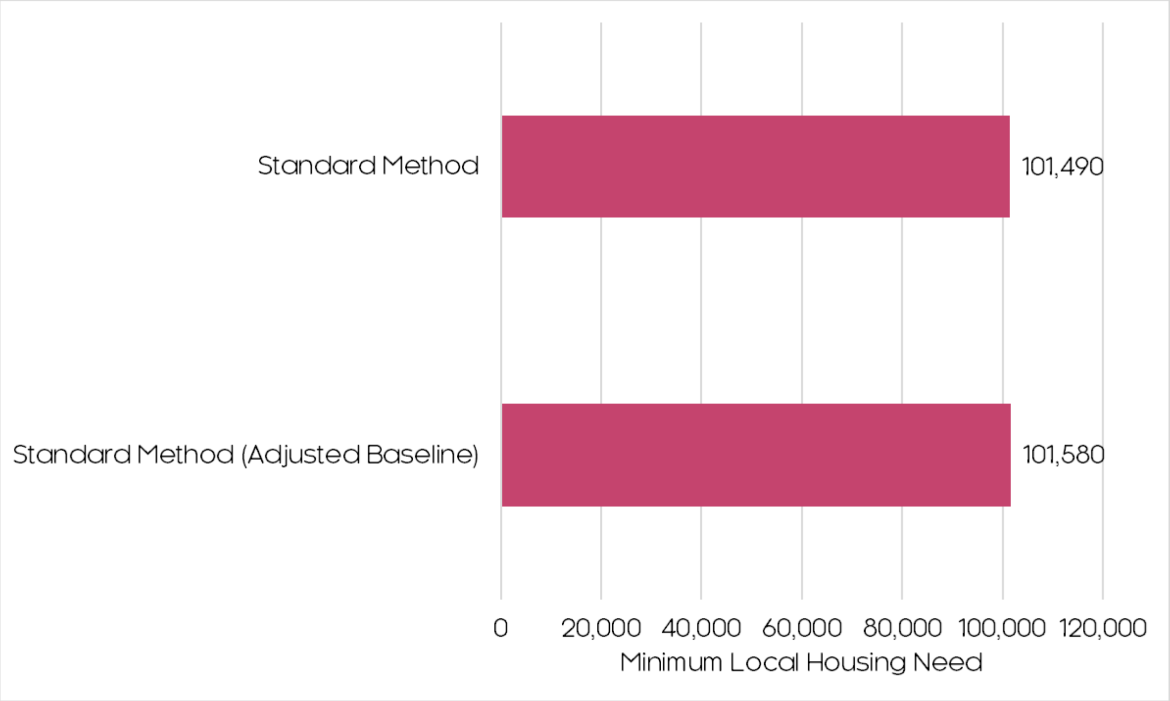
Government's National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG) sets out a *"Standard Method"* for calculating the minimum local housing need taking projected household growth and then applying an upward adjustment to improve affordability based on the median house price-to-income ratio.

The Standard Method calculation, following the Planning Practice Guidance at the time of preparation of this report, indicated a minimum local housing need for Oxfordshire of 3,383 dwellings per annum which would equate to a baseline level of provision of 101,490 homes over the 2020-50 plan period. This is based on 2014-based Household Projections.

The review of demographic data undertaken as part of this report indicates that it is likely that Oxford's population has been under-estimated. To address these issues, revised demographic projections have been developed to provide a revised baseline assessment of the demographic need for housing informed by past population trends.

With appropriate assumptions on household formation, the revised demographic projections presented in the report result in a marginally higher need for 3,386 dwellings per annum equivalent to 101,580 homes over the plan period (as shown in Figure 12.7.1 below).

Figure 12.7.1: Standard Method minimum local housing need for Oxfordshire, and with an adjusted demographic baseline, 2020-50



Source: Justin Gardner Consulting, Iceni Projects.

This level of housing provision would support population growth of 25.4% across Oxfordshire over the 30-year plan period (equivalent to an additional 183,000 persons).

The Standard Method local housing need changes over time, and the latest data for 2021 (as explored in *Appendix E: Standard Method Appendix*) shows a slightly lower need for 3,358 dwellings per annum (using the 2014-based Household Projections) and 3,291 dwellings per annum (using the adjusted projections). The latter would equate to a need for 98,730 homes over the period to 2050.

Oxfordshire's economic trajectories

Government policy sets out that the conditions where other growth levels should be considered, and which are relevant to the preparation of the Oxfordshire Plan. Extensive evidence considered in this report in particular demonstrates an important inter-relationship between economic performance and growth potential and housing need.

Resultantly, the report has modelled three alternative economic trajectories to 2050 to consider potential housing and employment land need:

- **Standard Method (adjusted) trajectory:** backwards calculated from the Standard Method calculation of housing need, with an adjustment for the revised demographic baseline.
- **Business as usual trajectory:** this trajectory represents a continuation of Oxfordshire's recent (pre-Covid) economic performance, taking particular account of the robust growth delivered during the recovery from the 2008-09 recession.
- **Transformational trajectory:** this trajectory is broadly the equivalent of the Oxfordshire Local Industrial Strategy's (LIS) aspirational *"go for growth"* scenario, but updated and adjusted to 2020.

All of the trajectories have a baseline of 2018, the latest available year of data at the time of writing.

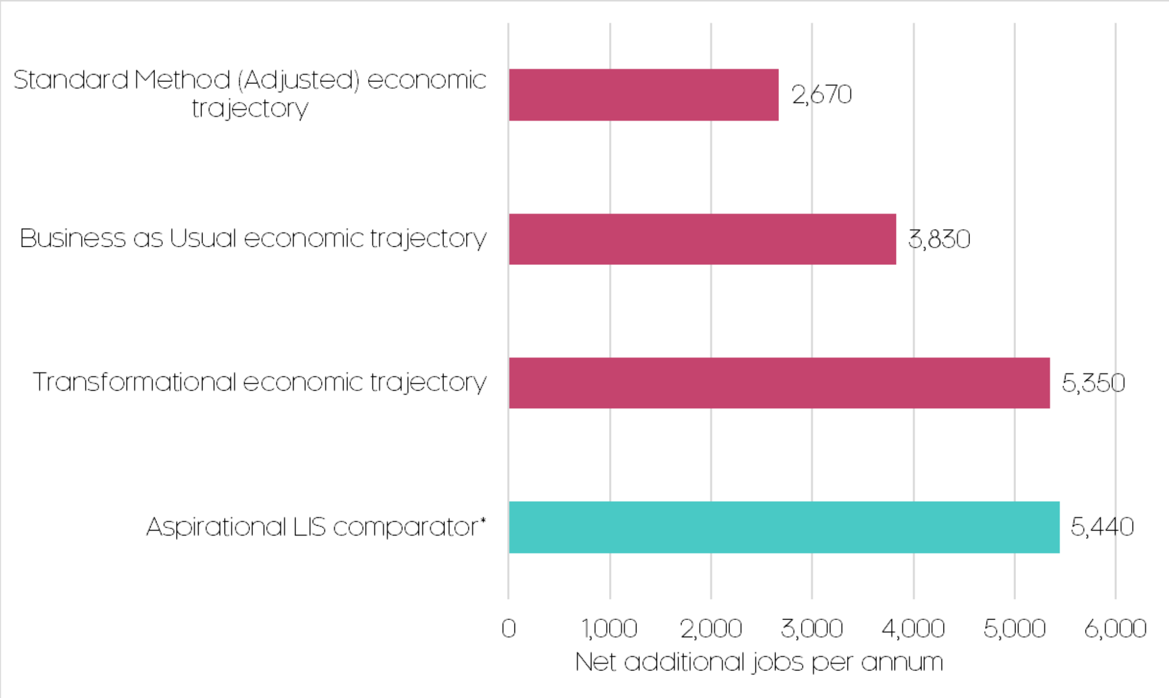
From this baseline, the Standard Method (adjusted) trajectory shows 85,400 additional jobs in Oxfordshire by 2050, modelling the level of economic activity that could be expected to be supported by delivery of housing in line with the Standard Method calculations (using the adjusted baseline demographic assumptions).

The business as usual projection models a continuation of Oxfordshire's recent (pre-Covid) robust growth. This shows 122,500 additional jobs in Oxfordshire over the period to 2050. At this pace of growth, Oxfordshire is expected to have continued along its recent growth trajectory, and achieved some its LIS-related ambitions.

The highest scenario, the transformational trajectory, models the equivalent of delivering many of the aspirations set out in the Oxfordshire LIS, and results in 171,200 additional jobs in Oxfordshire over the period to 2050. The Oxfordshire LIS sets out an ambitious vision for Oxfordshire to be one of the top three global innovation systems by 2040.

The results of the three economic trajectories, shown in terms of employment, are presented in Table 12.7.1 and Figure 12.7.2 below (the latter of which includes the Oxfordshire LIS' jobs aspiration as a comparator, shaded in turquoise). They present alternative assumptions of how Oxfordshire's economy might perform.

Figure 12.7.2: Employment (jobs) trajectories for Oxfordshire, 2018-50



Source: Cambridge Econometrics, PwC. Note: * LIS comparator corresponds to 2017-40 only.

Table 12.7.1: Employment (jobs) trajectories for Oxfordshire

	Employment (jobs) at 2018 (baseline)	2030	2040	2050	Net additional employment (jobs), 2018-50	Net additional employment (jobs) p.a., 2018-50
Standard Method (adjusted) economic trajectory	410,066	434,538	464,179	495,555	85,489	**2,672**
Business as usual economic trajectory	410,066	451,742	490,234	532,517	122,451	**3,827**
Transformational economic trajectory	410,066	466,804	520,636	581,254	171,188	**5,350**

Source: ONS, Cambridge Econometrics.

Despite the application of a robust methodology and evidence base, there are clearly uncertainties associated with predicting the future economic performance of a local area, which heightens as the forecasts look further into the future.

However, the growth trajectories considered are reasonable parameters for growth when set against Oxfordshire's historic economic performance and employment growth trends over previous economic cycles, with Oxfordshire displaying particularly robust growth over the most recent economic cycle.

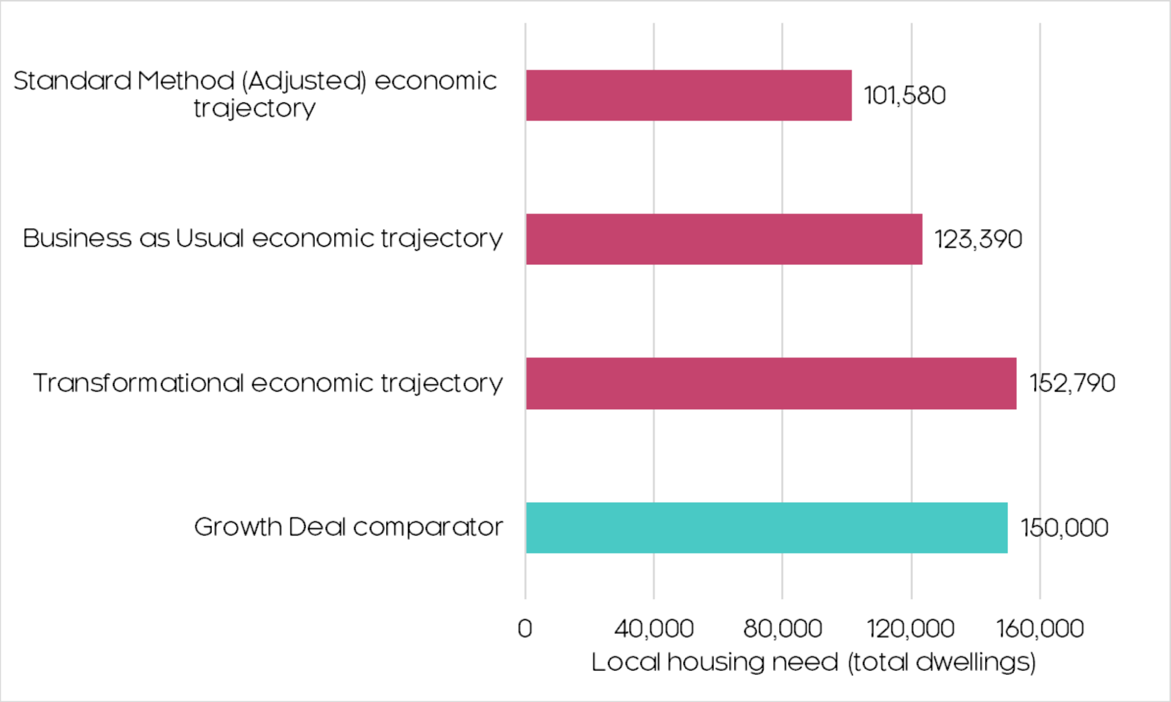
The report has then proceeded to model what level of housing provision might be needed to accommodate these levels of growth, taking into account factors such as the changes in the age structure of the population and the proportion of people of different ages in work.

The results of the housing need accompanying the economic trajectories are shown in Table 12.7.2 and Figure 12.7.3 below (the latter of which includes the Oxfordshire Housing and Growth Deal housing aspiration as a comparator, shaded in turquoise. The Deal provides funding for affordable housing and infrastructure improvements to support the ambition of building 100,000 homes between 2011-31 to address the county's severe housing shortage and support economic growth).

The analysis shows that to meet the Standard Method (adjusted) level of need over 2020-50, Oxfordshire would require around 3,400 dwellings each year; with the business as usual level of growth this increases to 4,100 dwellings per annum, with a transformational figure approaching 5,100 dwellings per annum, dependent on the realisation of LIS-related ambitions.

These figures can be compared with the Standard Method housing need (unadjusted, across the whole of Oxfordshire) of 3,400 dwellings per annum over the period 2020-50.

Figure 12.7.3: Projected housing need in Oxfordshire from the economic trajectories, 2020-50



Source: Justin Gardner Consulting, Iceni Projects. Note: the Oxfordshire Housing and Growth Deal however only runs to 2031 however, and has been extrapolated using per annum rates of delivery.

Table 12.7.2: Projected housing need in Oxfordshire from the economic trajectories, 2020-50

	Households at 2020	Households at 2050	Change in households, 2020-50	Change in households p.a., 2020-50	Local housing need (dwellings) p.a., 2020-50
Standard Method (adjusted) economic trajectory	288,999	387,591	98,592	3,286	**3,386**
Business as usual economic trajectory	288,999	408,806	119,807	3,994	**4,113**
Transformational economic trajectory	288,999	437,328	148,329	4,944	**5,093**

Source: ONS, Justin Gardner Consulting, Iceni Projects.

For the purposes of the Oxfordshire Plan, planning for higher levels of housing provision than the Standard Method provides greater potential both to support economic growth and deliver affordable housing; and a greater likelihood of improving the affordability of market housing over the plan period to 2050.

This report however does not however recommend one trajectory over another but provides a set of parameters for growth. In determining the appropriate strategy and how much development to plan for, the evidence in the assessment needs to be brought together with broader factors including the capacity to accommodate growth and environmental consequences of different levels of growth.

Employment land provision

There is a healthy market for commercial property in Oxfordshire. Office take-up and availability is generally concentrated in Oxford and southwards along the 'Knowledge Spine', including Milton Park and Harwell Campus. Take-up and availability of industrial floorspace is more spread out across Oxfordshire, with noticeable amounts of speculative developments to the northeast of the county where there is good access to the M40.

It is evident that there are short-term supply constraints in the office market, particularly in the Oxford area and for Grade A space. Many of the area's science and business parks are at capacity. The evidence also points to a healthy market for industrial space.

The report has modelled the implications of the jobs growth arising in each of the employment projections for employment land and floorspace. This has been compared to projections of past employment floorspace completions based on trends over the 2011-18 period.

For the purposes of considering the amount of land to allocate for employment uses, it is sensible to group together Office and Research and Development uses. These types of activities typically take place on business and science parks within Oxfordshire and can also take place in central parts of towns and cities including town and city centres.

Equally it is sensible to group together more general industrial land which can cater for both light and heavy industrial uses (Classes EG(iii) and B2) as well as storage and distribution (Use Class B8) which are less likely to take place in central areas.

Table 12.7.1 below brings together the results of the labour demand modelling and the projections of gross floorspace completions on this basis. This includes an allowance for replacement of losses and some supply-side flexibility.

Table 12.7.3: Gross additional employment land needs (total hectares, ha) in Oxfordshire, 2020-50

	Office, R&D and Education need (ha), 2020-50	Industrial, Warehousing & Other need (ha), 2020-50	Total employment land (ha) needed, 2020-50
Standard Method (adjusted) economic trajectory	149	296	**445**
Business as usual economic trajectory	185	369	**555**

Transformational economic trajectory	233	444	**677**
Completions projection	162	645	**807**

Source: Iceni Projects.

For office, R&D and education uses the report concludes labour demand trajectories provide an appropriate basis for considering the level of employment land provision which should be made within the Oxfordshire Plan. This demonstrates a need for provision of between 149-233 ha of land for these uses to 2050 (depending on the growth trajectory taken forwards).

However, for the broad industrial use category, there is a weaker relationship between jobs and floorspace or land requirements given productivity improvements and demand arising for replacement of older dated stock.

The report therefore considers that greater weight should therefore be afforded to the completions projection scenario for industrial land (which is based on past gross development trends) which suggests a need for almost 650 ha of industrial land for the 30 year plan period.

Overall, the evidence suggests that the scale of employment land needed across Oxfordshire could be up to 807 ha. The precise scale will be influenced by decisions on what growth scenario to take forward in the Plan.

Commuting and affordability implications

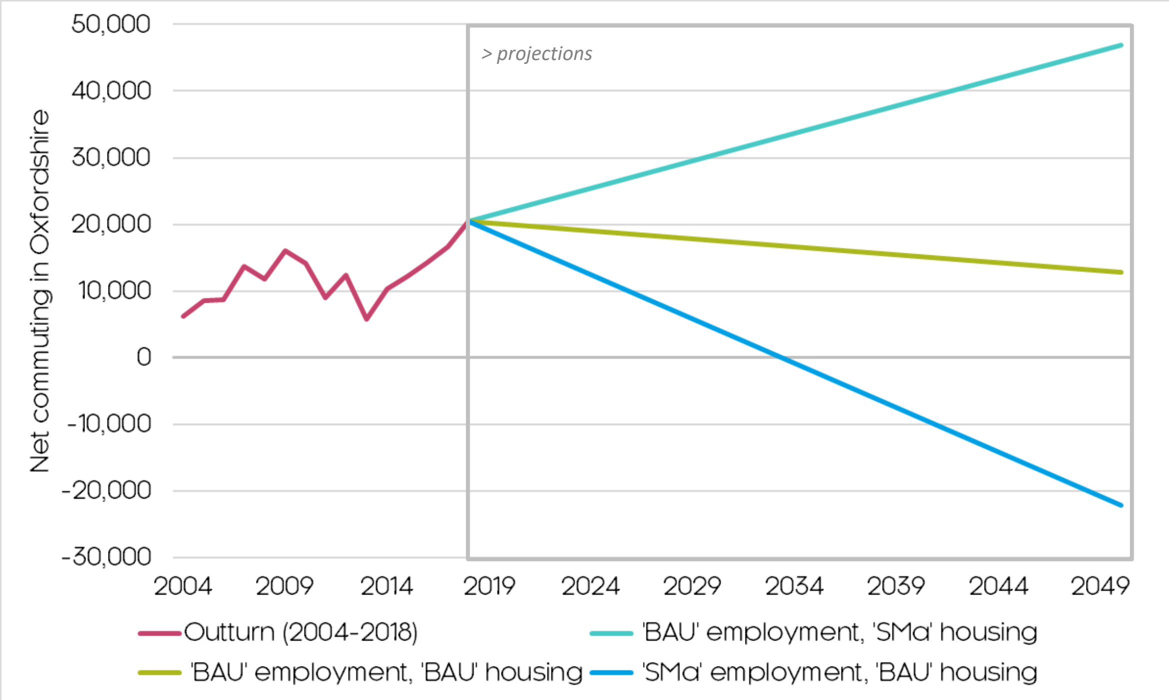
Over the past decade, relative to the supply of housing, employment growth has accelerated in Oxfordshire. This has had implications for both net commuting and housing affordability, which have both increased significantly in the county over this time. Analysis presented in this report has identified a statistically significant relationship between the balance of housing and employment growth in local areas, and the implications for commuting levels and affordability.

The analysis shows housing delivery above that required to sustain the associated level of employment growth will likely result in a reduction of net commuting and an improvement in housing affordability within Oxfordshire. Yet housing delivery below that required to sustain the associated level of employment growth will likely result in an increase in net commuting and a deterioration in housing affordability.

The intention of the three economic and housing trajectories is to ensure the delivery of employment and housing growth in Oxfordshire will become more aligned. The trajectories address this by incorporating a lowering of the ratio between the number of jobs relative to the number of dwellings in Oxfordshire, demonstrating how a balance of future housing and economic growth can stabilise and lower affordability and commuting pressures.

Such outcomes are increasingly desirable given the high welfare and inequality costs of unaffordable housing, and the growing strain on Oxfordshire’s transport network from increased commuting (and associated externalities, notably, environmental and emissions effects, particularly in light of the desire to attain net zero).

Figure 12.7.4: Current and potential net commuting flows in Oxfordshire

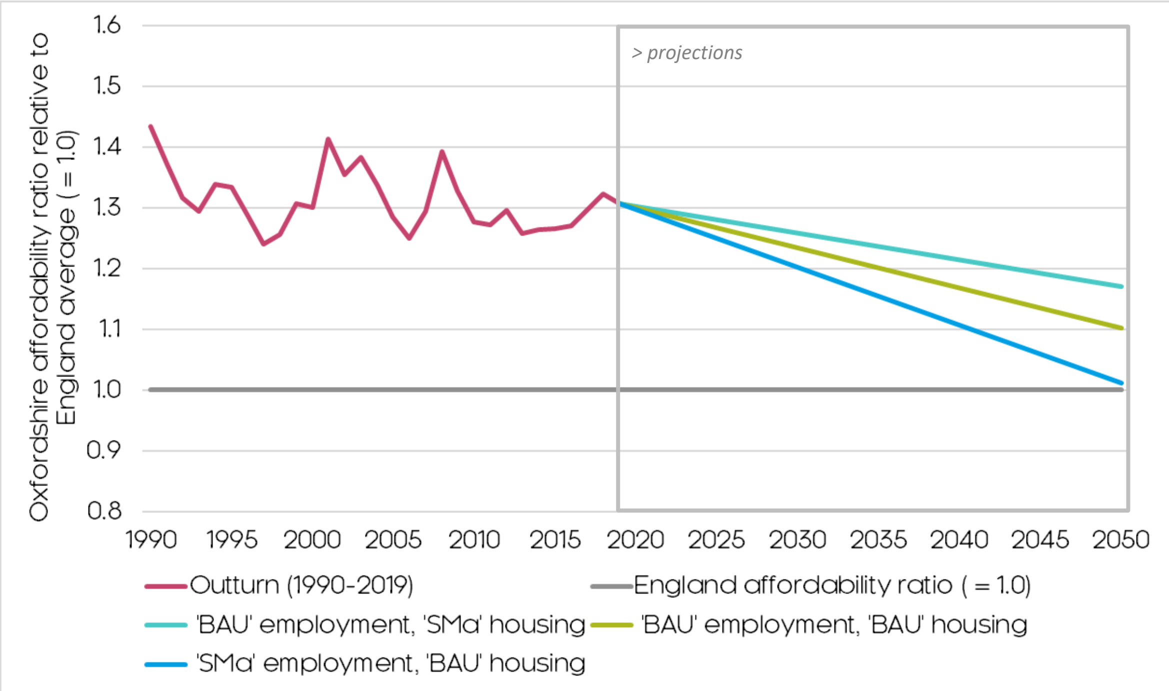


Source: ONS, Cambridge Econometrics.

Figure 12.7.4 above demonstrates how the balance of future housing and economic growth can impact upon net commuting in Oxfordshire:

- A lower employment growth trajectory relative to higher housing growth (the blue line) could see a reduction in Oxfordshire's net commuting, potentially below historic (pre-1991) levels. This would mean there are more residents than jobs in the county, so residents commute out for work.
- A higher employment growth trajectory relative to lower housing growth (the turquoise line) could see an increase in Oxfordshire's net commuting, above current record-highs. This would mean there are more jobs than residents in the county, so out of county residents commute in for work.
- A similar employment and housing growth trajectory (the green line) would see a steady decline in Oxfordshire's net commuting as it returns to 'normal' levels. The number of jobs is still marginally higher than the number of residents in the county, reflecting Oxfordshire's historically higher commuting ratio.

Figure 12.7.5: Current and potential house price affordability in Oxfordshire, relative to the England average



Source: ONS, Cambridge Econometrics. Note: a ratio of 1.0 would equate to an affordability ratio exactly the same as the England average.

Figure 12.7.5 above demonstrates how the balance of future housing and economic growth can impact upon affordability (relative to the England average) in Oxfordshire:

- A lower employment growth trajectory relative to higher housing growth (the blue line) would see a significant reduction in Oxfordshire's affordability ratio relative to the England average. This could result in housing in Oxfordshire being as affordable as elsewhere in the country.
- A higher employment growth trajectory relative to lower housing growth (the turquoise line) would see a steadier reduction in Oxfordshire's affordability ratio relative to the England average. Housing would still be around 1.2x less affordable in Oxfordshire than elsewhere in the country though.
- A similar employment and housing growth trajectory (the green line) would still see a notable reduction in Oxfordshire's affordability ratio relative to the England average. This could result in housing in Oxfordshire being marginally less affordable than elsewhere in the country.

Links to other OGNA work

Following on from the analysis and evidence presented in this report, the **Phase 2 Report** proceeds with the next stage of the OGNA. The second phase of the OGNA broadly comprises three stages of work:

- The first involves identifying and assessing the Oxfordshire Functional Economic Market Area (FEMA), including the definition of functionally meaningful sub-areas. This will allow for more precise, in-depth exploration and illustration of employment and housing distributions to accompany the *Phase 1 Report* trajectories.

- The second stage seeks to provide this analysis, distributing the Oxfordshire-wide employment projections (derived and presented here in the *Phase 1 Report*) by functional sub-area to 2050. For housing, five theoretical spatial scenarios, informed by the functional sub-areas, have also been developed and tested to distribute the housing need presented here in the *Phase 1 Report*.
- Finally, the third stage, bringing together the evidence and analysis of the previous stages, considers the implications for commuting and transport use (including differences in modal share and private vehicle trips) of the employment and housing distribution scenarios.

The period of the construction of this report has also coincided with the Covid-19 pandemic of 2020 and 2021. It is clear that the pandemic and some of its long-lasting effects have the potential to impact upon the findings of this report, and as such additional consideration has been given to this question. This analysis can be found in the **Covid-19 Impacts Addendum** that accompanies this report.

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Appendix A: Components of Population Change by Local Authority

The tables below provide data on international migration trends for individual local authorities, as referenced in *Chapter 3 Demographic Trends*.

Of note is the observation that the four authorities excluding the City tend to see a level of net domestic in-migration, whereas the City constantly sees notable levels of net out-migration.

However, the City does see substantial international in-migration when compared with any of the other locations. This pattern is characteristic of cities and larger urban areas with a younger population structure.

Table 12.7.1: Components of population change (2001-18) – Cherwell

Year	Natural change	Net internal migration	Net international migration	Other changes	Other (un-attributable)	Total change
2001/2	569	-110	427	-40	-248	**598**
2002/3	642	152	447	390	-240	**1,391**
2003/4	612	279	264	69	-254	**970**
2004/5	805	-58	443	-16	-245	**929**
2005/6	875	-83	762	-17	-254	**1,283**
2006/7	871	-422	771	-32	-227	**961**
2007/8	951	-97	665	27	-226	**1,320**
2008/9	767	-354	526	116	-194	**861**
2009/10	804	-68	502	-8	-194	**1,036**
2010/11	950	-316	430	-17	-132	**915**
2011/12	829	-263	122	-4	0	**684**
2012/13	702	-145	202	127	0	**886**
2013/14	511	-5	414	-222	0	**698**
2014/15	583	-245	427	269	0	**1,034**
2015/16	690	-292	563	120	0	**1,081**
2016/17	512	284	118	53	0	**967**
2017/18	560	766	273	-40	0	**1,559**

Source: ONS, Justin Gardner Consulting.

Table 12.7.2: Components of population change (2001-18) – Oxford

Year	Natural change	Net internal migration	Net international migration	Other changes	Other (un-attributable)	Total change
2001/2	436	-1,966	2,313	-12	345	**1,116**
2002/3	568	-1,218	3,557	52	333	**3,292**
2003/4	578	-1,653	2,468	-51	334	**1,676**
2004/5	750	-1,340	4,038	-10	352	**3,790**
2005/6	855	-1,951	-128	-7	361	**-870**
2006/7	851	-1,991	455	-10	370	**-325**
2007/8	1,051	-1,830	662	-7	369	**245**
2008/9	1,116	-1,650	1,216	7	356	**1,045**
2009/10	1,069	-1,547	2,590	-22	339	**2,429**
2010/11	1,195	-1,316	2,102	17	340	**2,338**
2011/12	1,136	-1,123	1,219	0	0	**1,232**
2012/13	963	-1,544	1,499	11	0	**929**
2013/14	1,067	-1,570	2,750	11	0	**2,258**
2014/15	897	-3,075	2,222	8	0	**52**
2015/16	971	-2,765	2,364	6	0	**576**
2016/17	821	-2,827	1,335	-39	0	**-710**
2017/18	681	-3,082	2,146	0	0	**-255**

Source: ONS, Justin Gardner Consulting.

Table 12.7.3: Components of population change (2001-18) – South Oxfordshire

Year	Natural change	Net internal migration	Net international migration	Other changes	Other (un-attributable)	Total change
2001/2	387	-205	106	-27	186	**447**
2002/3	415	-410	-13	-10	184	**166**
2003/4	457	-186	-2	-17	187	**439**
2004/5	398	-240	365	10	158	**691**
2005/6	497	-530	499	-1	161	**626**
2006/7	493	-299	563	29	164	**950**
2007/8	605	51	177	-10	162	**985**
2008/9	420	244	-26	52	165	**855**
2009/10	520	-235	117	-119	166	**449**
2010/11	530	141	-58	255	178	**1,046**
2011/12	431	212	35	83	0	**761**
2012/13	306	397	-20	-77	0	**606**
2013/14	408	418	230	93	0	**1,149**
2014/15	322	218	237	-77	0	**700**
2015/16	369	170	337	103	0	**979**
2016/17	330	121	182	-22	0	**611**
2017/18	180	472	158	-73	0	**737**

Source: ONS, Justin Gardner Consulting.

Table 12.7.4: Components of population change (2001-18) – Vale of White Horse

Year	Natural change	Net internal migration	Net international migration	Other changes	Other (un-attributable)	Total change
2001/2	346	-807	392	-34	-104	**-207**
2002/3	220	8	429	12	-100	**569**
2003/4	359	-189	310	-33	-106	**341**
2004/5	426	52	537	1	-101	**915**
2005/6	326	-123	643	63	-90	**819**
2006/7	555	-366	633	62	-99	**785**
2007/8	454	-464	362	25	-87	**290**
2008/9	450	145	192	54	-99	**742**
2009/10	527	191	283	-62	-142	**797**
2010/11	516	163	529	-36	-104	**1,068**
2011/12	439	-58	63	375	0	**819**
2012/13	304	528	105	-150	0	**787**
2013/14	405	429	463	-173	0	**1,124**
2014/15	350	985	520	58	0	**1,913**
2015/16	406	1,187	508	18	0	**2,119**
2016/17	460	1,725	376	13	0	**2,574**
2017/18	299	1,895	295	16	0	**2,505**

Source: ONS, Justin Gardner Consulting.

Table 12.7.5: Components of population change (2001-18) – West Oxfordshire

Year	Natural change	Net internal migration	Net international migration	Other changes	Other (un-attributable)	Total change
2001/2	157	72	100	-50	-19	**260**
2002/3	136	809	123	86	-32	**1,122**
2003/4	243	693	77	-34	-24	**955**
2004/5	117	660	134	-39	-41	**831**
2005/6	162	957	315	58	-45	**1,447**
2006/7	372	1,320	186	38	-66	**1,850**
2007/8	336	336	172	64	-58	**850**
2008/9	305	407	106	78	-88	**808**
2009/10	377	607	72	-77	-97	**882**
2010/11	322	521	85	-94	-98	**736**
2011/12	388	381	28	925	0	**1,722**
2012/13	291	446	-30	74	0	**781**
2013/14	176	-25	214	-215	0	**150**
2014/15	214	-72	238	134	0	**514**
2015/16	71	-318	303	83	0	**139**
2016/17	34	323	165	-4	0	**518**
2017/18	-47	493	113	-25	0	**534**

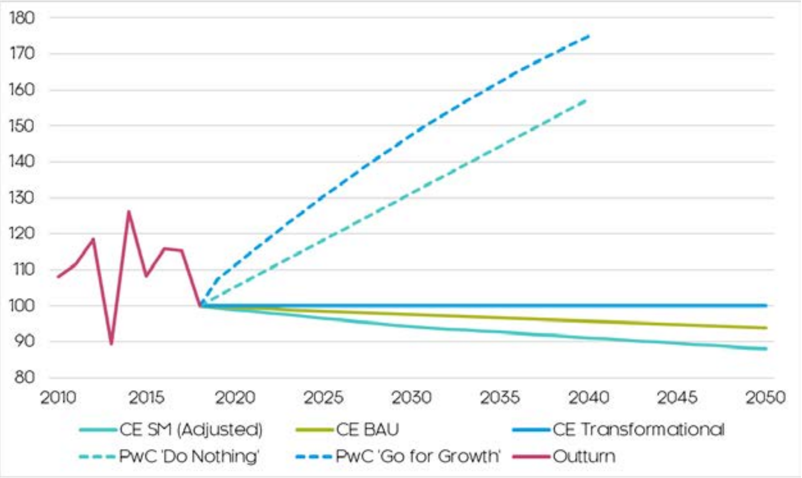
Source: ONS, Justin Gardner Consulting.

Appendix B: Oxfordshire's Sector Growth Trajectories

Primary and utilities

Employment in agriculture, mining, and utilities has been on a downward trend in Oxfordshire over the past decade, and at the national level this is expected to continue in light of consumer, environmental and economic pressures, with the sector also having significant potential for future automation.

Figure 12.7.1: Employment in primary and utilities

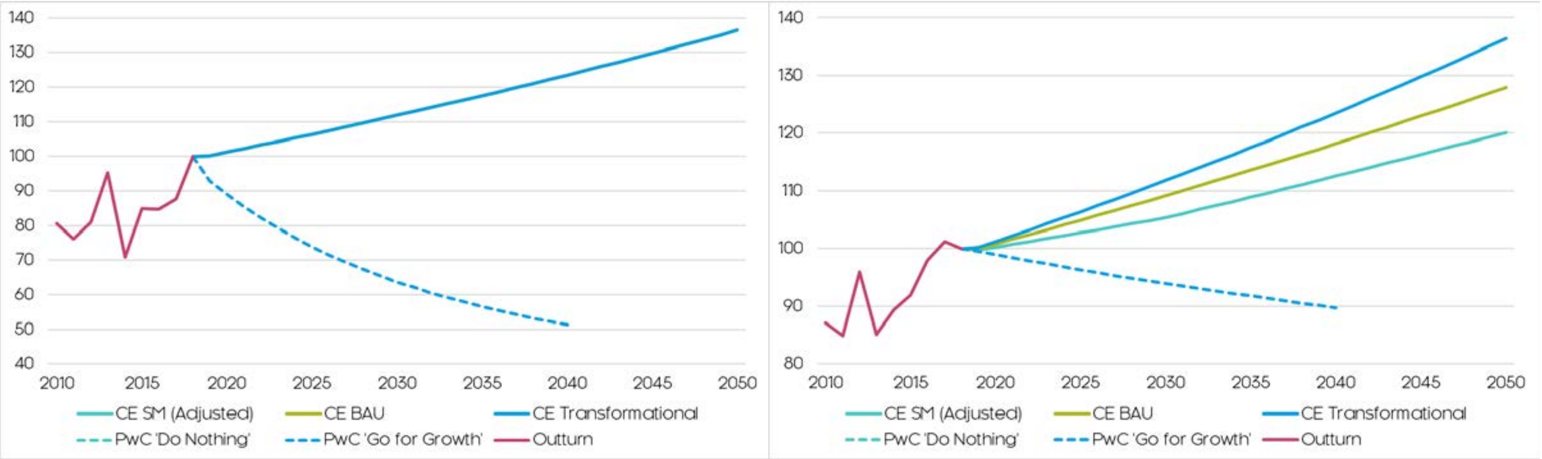


Source: ONS, Cambridge Econometrics, PwC.

It is unlikely Oxfordshire would reverse this trend, yet both PwC's projections point towards robust growth for the sector. Though Energy is a *"breakthrough sector"*, the LIS notes Oxfordshire's greatest strengths/assets are in energy-related research, ideation and consultancy, rather than the front-end generation/distribution captured here. Therefore, CE expects employment in the sector to either decline or remain roughly constant over the long term.

For productivity, PwC assumes a dramatic and sudden decline, in contrast to CE's upward trajectory. Combined with easing employment, CE therefore expects a steady increase in GVA at the baseline but accelerating growth in other trajectories, driven by improved productivity and innovation take-up.

Figure 12.7.2: Productivity (left) and GVA (right) in primary and utilities

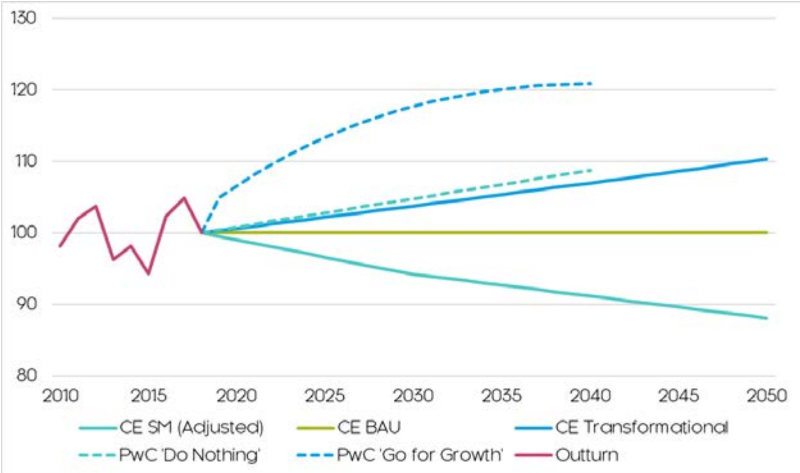


Source: ONS, Cambridge Econometrics, PwC.

Manufacturing

With the ongoing expansion of globalisation, automation and digitisation, the manufacturing workforce in the UK is expected to continue to decline in the long term, even as GVA and productivity increase. It is likely that the sector in Oxfordshire either follows this trend, or otherwise remains at current levels. However, if aspirations outlined in the LIS are realised, then positive employment growth could be seen. Both PwC's baseline and *"go for growth"* scenarios outline strong employment growth for the sector.

Figure 12.7.3: Employment in manufacturing

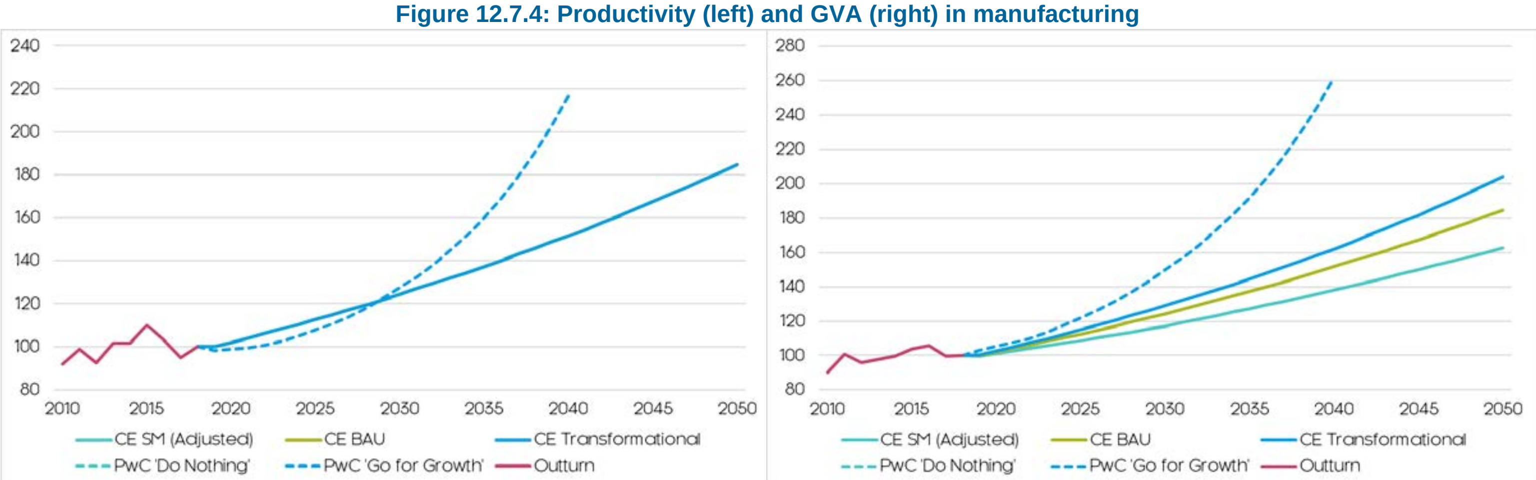


Source: ONS, Cambridge Econometrics, PwC.

Though the LIS correctly emphasises Oxfordshire's manufacturing specialisms - such as robotics, automotive and quantum computing - and their growth potential, CE's view is that even with ambitious growth in such sub-sectors, manufacturing as a whole is unlikely to grow its workforce with such rapidity (in fact, *"breakthrough sectors"* currently account for only a quarter of the manufacturing workforce).

However, as such activities form a central and justified part of the LIS, we build in moderate employment growth into the higher trajectories. Productivity growth, underpinned by the adoption of frontier technologies (e.g. 3D printing, plastic electronics) will continue to be robust and drive GVA, though not as rapid as PwC's, which expects productivity to more than double by 2040.

Figure 12.7.4: Productivity (left) and GVA (right) in manufacturing

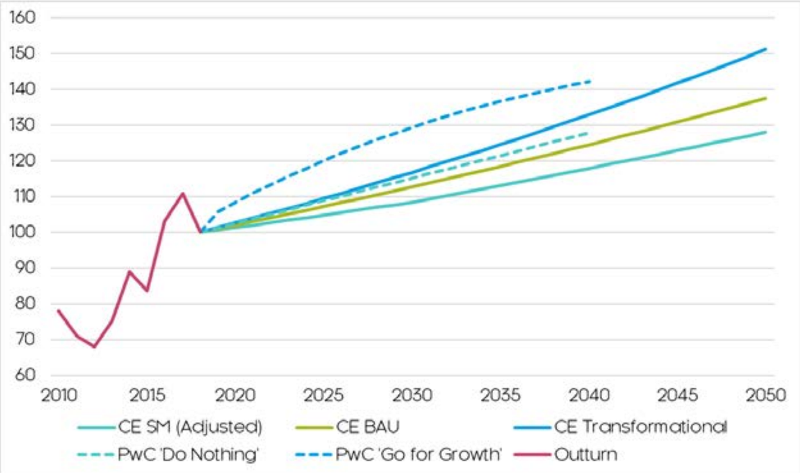


Source: ONS, Cambridge Econometrics, PwC.

Construction

The performance of the construction sector is largely dependent on the amount of activity in the wider economy. When combined with ambitious policy aspirations around housing delivery (e.g. Garden Towns) infrastructure (e.g. East-West rail) and commercial space (e.g. Culham Science Centre, Milton Park, Oxford North and Oxford Science Park etc.), it is likely demand for construction workers in Oxfordshire's will continue to grow strongly over the coming decades.

Figure 12.7.5: Employment in construction

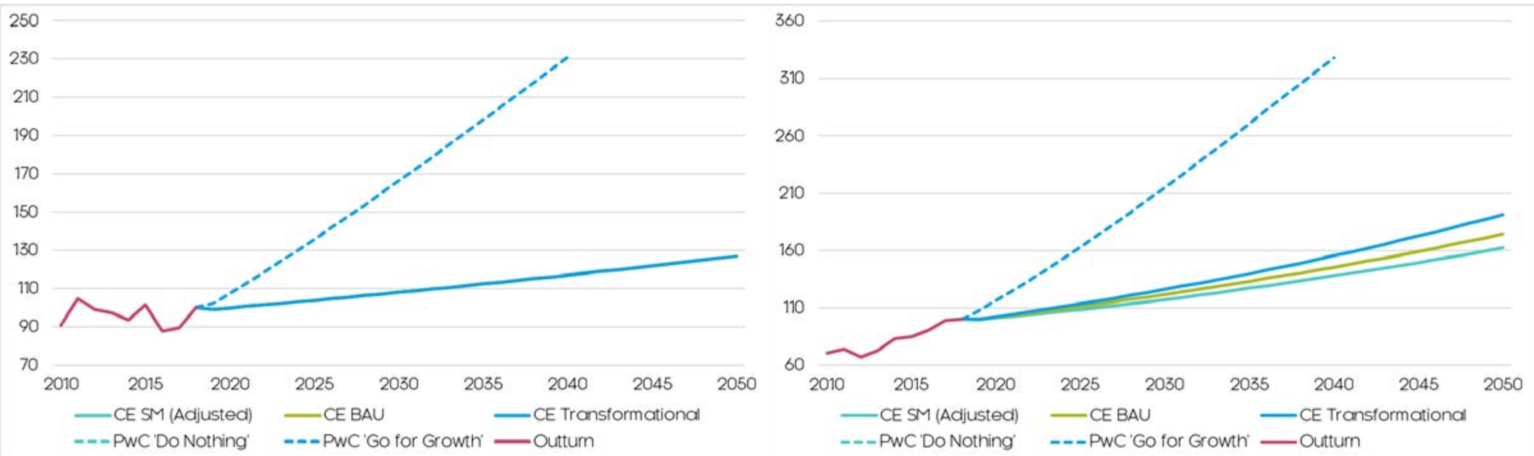


Source: ONS, Cambridge Econometrics, PwC.

There are however some potential restraints to this growth, which has been factored into CE's slightly more modest projection. For instance, skills shortages are prevalent and could be exacerbated by an aging workforce and restrictions on migration. Alongside employment, PwC also expects sector productivity to surge, doubling by 2040, which is ambitious given its sluggish performance over the past decade due to low levels of investment and skills shortages.

Although it is possible that offsite manufacturing methods will significantly improve the productivity of new build construction, a significant component of this sector will remain small firms and self-employed contractors. CE therefore expects more stable productivity, and thus GVA, growth in the long term, but with the potential for faster growth in the higher trajectories.

Figure 12.7.6: Productivity (left) and GVA (right) in construction

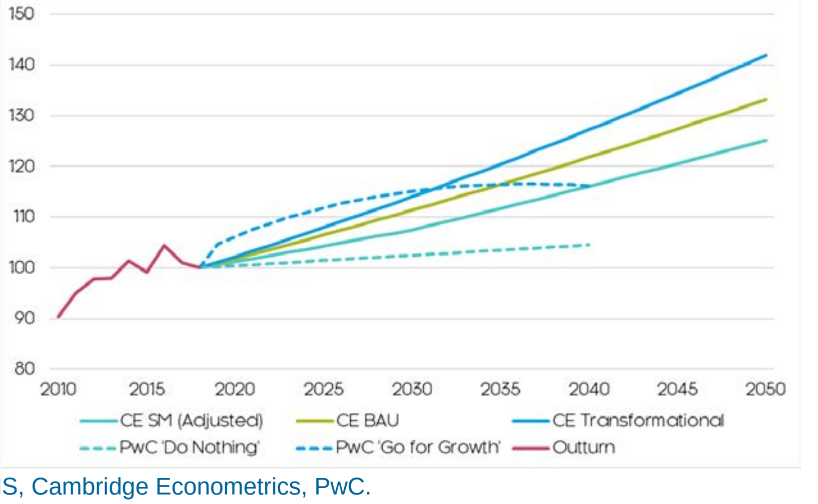


Source: ONS, Cambridge Econometrics, PwC.

Retail; transport; accommodation and food

Although diverse in composition, the demand for consumer services (i.e. retail; transport; accommodation and food) is largely dependent on the amount of activity in the wider economy. Given strong projected economic and household growth in Oxfordshire, the demand for consumer services, and therefore employment, is expected to increase.

Figure 12.7.7: Employment in retail; transport; accommodation and food

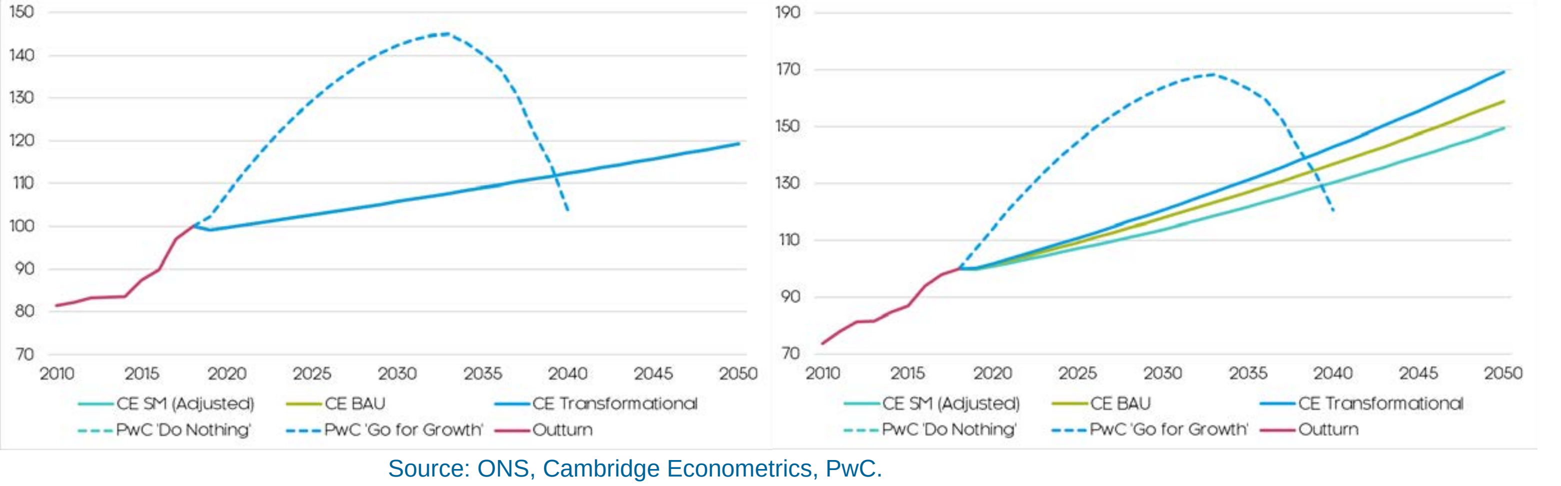


Source: ONS, Cambridge Econometrics, PwC.

There is significant uncertainty as to the extent automation will impact on labour demand, which may be reflected in PwC's slightly less-optimistic employment projections, particularly at the baseline. Likewise, changing consumer patterns (e.g. online shopping) will cause some employment displacement and shifting within the sector.

CE expects sector productivity to grow at a constant increasing trend overtime, as it has done over the past decade. In contrast, PwC emphasises very strong (potentially automation-led) productivity growth over the next decade, before a surprising levelling off and then decline in the mid-2030's. This is also reflected in the overall GVA projection, which in contrast CE expects to maintain a steady upward trend.

Figure 12.7.8: Productivity (left) and GVA (right) in retail; transport; accommodation and food

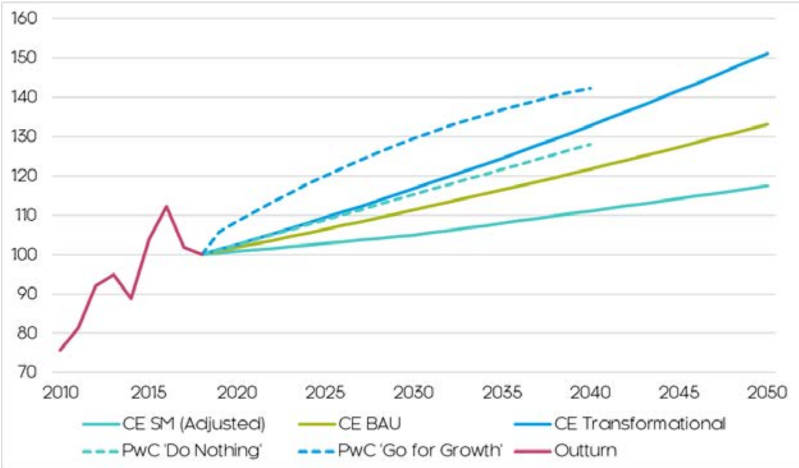


Source: ONS, Cambridge Econometrics, PwC.

Information and communication

As outlined in the LIS, Oxfordshire has a clear comparative advantage within information and communications, particularly relating to Digital and Creative, which accounts for almost half of all *"breakthrough"* activity in Oxfordshire. Underpinned by a strong research base and a skilled workforce, the sector has been an engine for employment growth over recent decades and is expected to continue creating highly-value employment opportunities.

Figure 12.7.9: Employment in information and communication

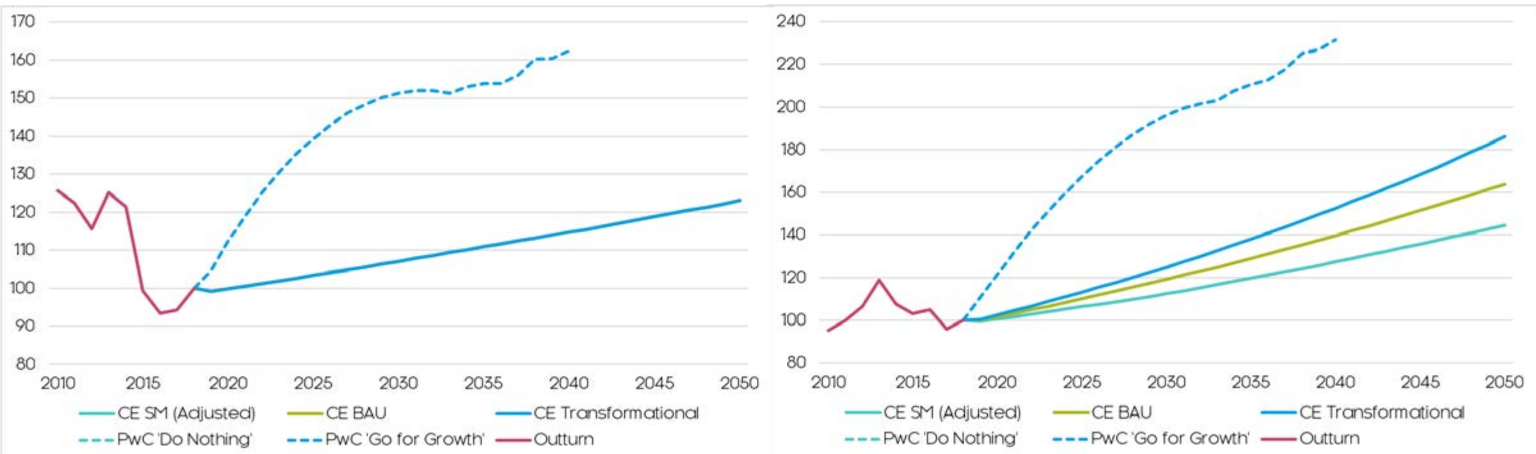


Source: ONS, Cambridge Econometrics, PwC.

There are however potential restraints to growth, including skills shortages, labour supply pressures (especially relating to migration), and investment uncertainty. Because of this, CE's baseline projection for employment is somewhat lower than PwC's, but with the potential for faster growth in the higher trajectories.

Though sectoral productivity growth has been disappointing over the past decade, CE does expect this to rebound with the development and adoption of new technologies (which will also diffuse throughout the wider economy). Though this growth is not to the extent envisaged by PwC, which expects a doubling of GVA by 2040.

Figure 12.7.10: Productivity (left) and GVA (right) in information and communication

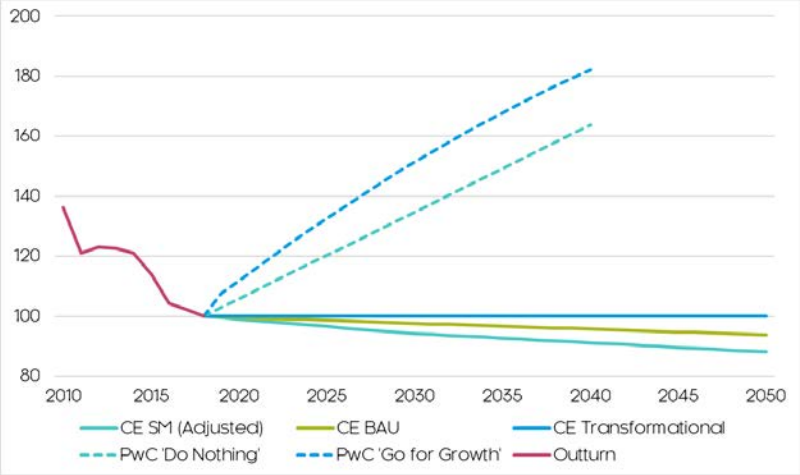


Source: ONS, Cambridge Econometrics, PwC.

Financial and insurance activities

The finance and insurance sector has experienced an ongoing contraction in its workforce both nationally and locally over the past decade, driven largely by automation, digitisation and out-sourcing, which accelerated given pressures post-2008/09 recession. This trend is anticipated to continue over both the short and long term.

Figure 12.7.11: Employment in financial and insurance activities

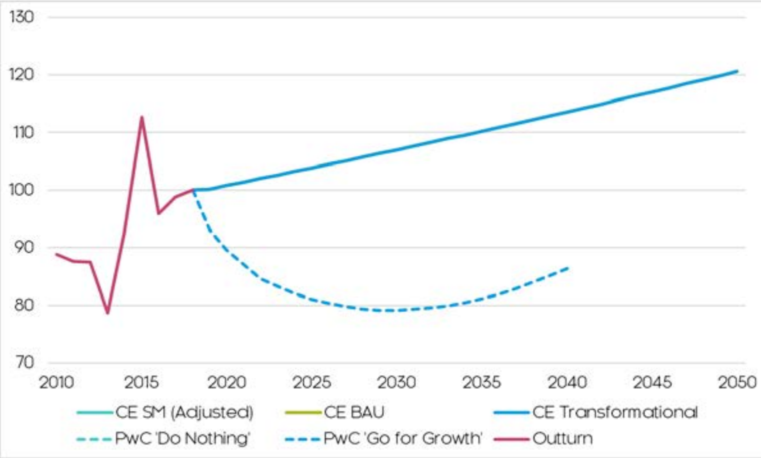


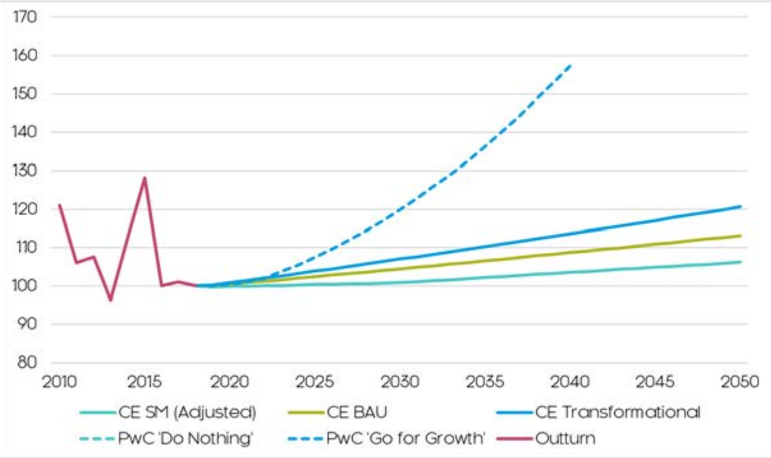
Source: ONS, Cambridge Econometrics, PwC.

Alongside these pressures, uncertainty surrounding the position of the financial services and investment banking sector post-Brexit makes it difficult to predict a sudden upsurge in employment, either locally or nationally, as suggested by PwC, even under its baseline.

Despite this decline in employment, already high sector productivity is expected to grow strongly in future, driven by fintech and associated technological innovations. This contributes to relatively robust GVA growth. Though this aligns with PwC's projections for GVA, they place the emphasis on employment-led growth due to declining productivity, which is largely counter to trends of the past decade.

Figure 12.7.12: Productivity (left) and GVA (right) in financial and insurance activities



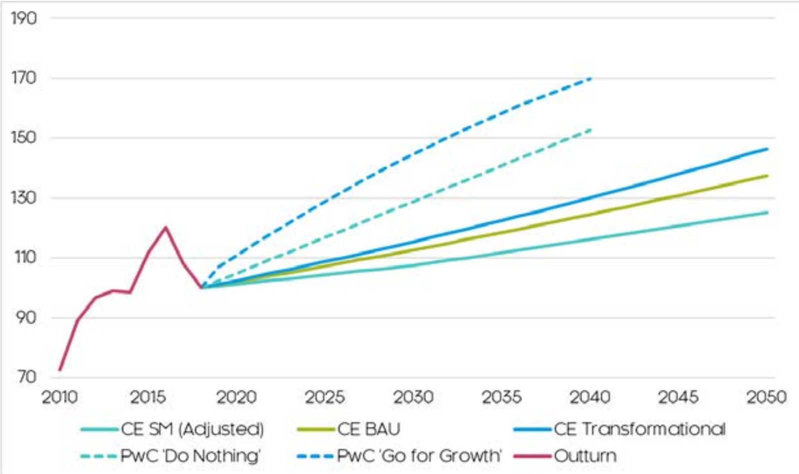


Source: ONS, Cambridge Econometrics, PwC.

Real estate activities

The demand for real estate services is closely related to the activity of the construction sector as well as the health of the broader financial and insurance markets. Given both are expected to grow output strongly, it is likely the real estate workforce in Oxfordshire will need to expand to manage and oversee such an increase in demand.

Figure 12.7.13: Employment in real estate activities

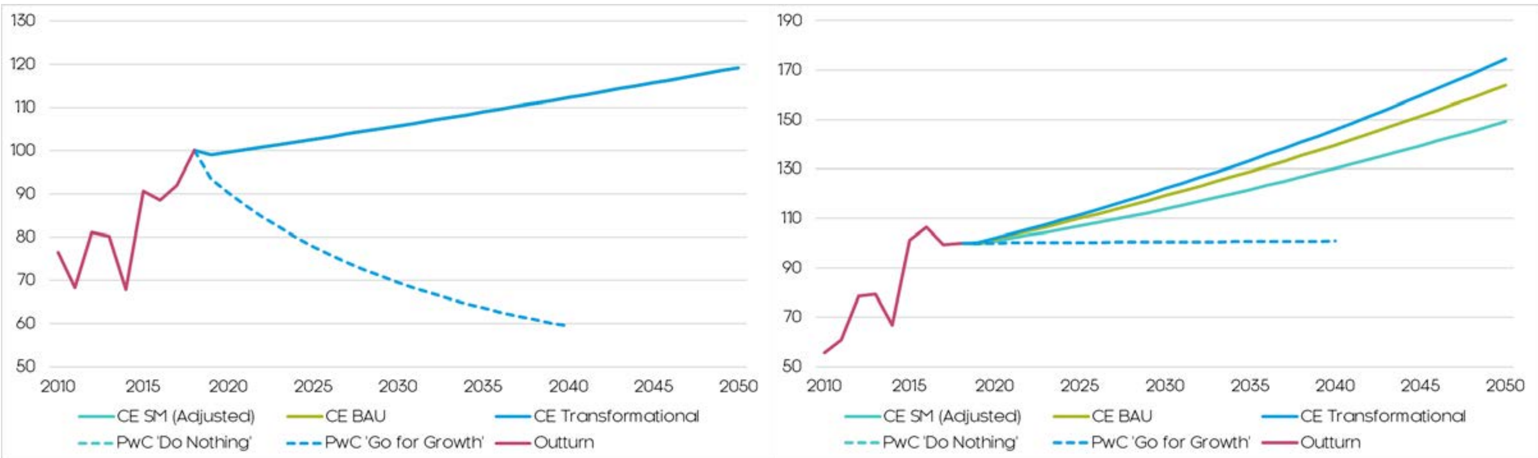


Source: ONS, Cambridge Econometrics, PwC.

The sector's workforce has grown strongly over the past decade, partly reflecting Oxfordshire active resident and commercial property markets, and PwC expects this rate of growth to continue even under its baseline scenario. CE meanwhile expects a slightly lower pace of growth, but with the potential for accelerating growth under the higher trajectories.

The sector's productivity growth has been robust over the past decade, and CE expects this to continue moving forward, as its workforce becomes increasingly high-skilled, and the process of real estate marketing and selling becomes increasingly digitised. PwC however expects a pronounced contraction in sectoral productivity, contributing to a flatlining of GVA to 2040.

Figure 12.7.14: Productivity (left) and GVA (right) in real estate activities

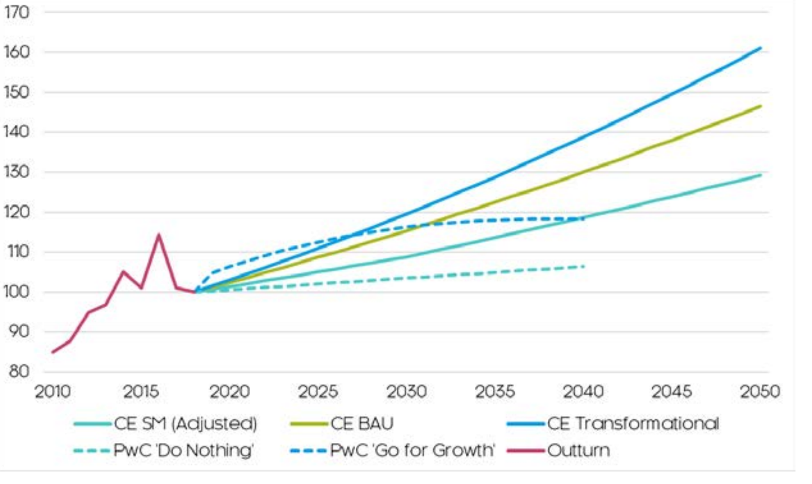


Source: ONS, Cambridge Econometrics, PwC.

Professional and administrative services

Professional and administrative services cover a wide range of activities, from lawyers, engineers and research scientists, to cleaners and security guards. Over the past decade, there has been significant growth in the sector, with the UK and indeed Oxfordshire shaping a strong comparative advantage, and there is an expectation of further growth to come.

Figure 12.7.15: Employment in professional and administrative services

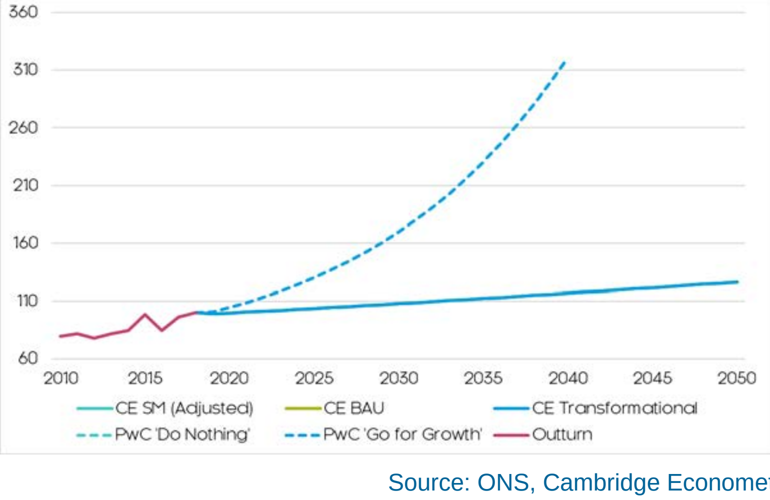


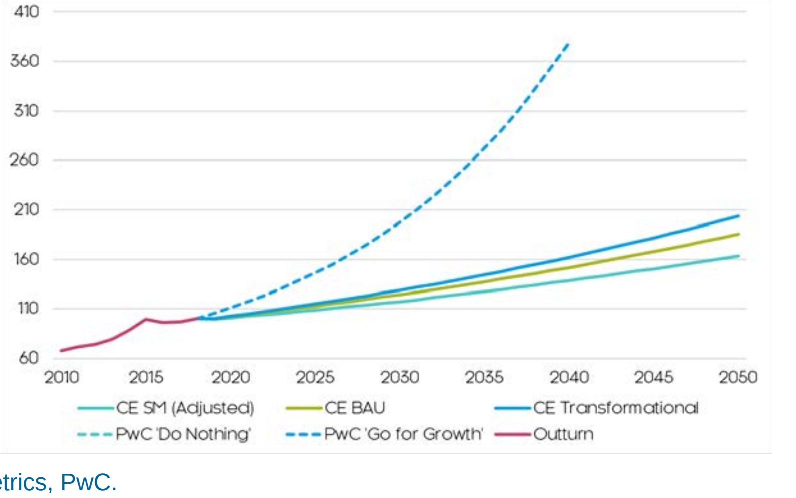
Source: ONS, Cambridge Econometrics, PwC.

Some of these activities correspond to or closely compliment LIS *"breakthrough"* specialisms, which account for a quarter of all jobs in the sector. Likewise, the sector is an important enabler of growth, representing valued *"cornerstone"* activities. As such, we anticipate strong growth in employment demand in high trajectories.

In contrast, PwC expects lower employment growth, but productivity to treble by 2040, which is ambitious compared to historic trends and CE's outlook. In fact, CE expects more stable productivity growth, which given strong employment growth, results in robust (rather than PwC's exponential) GVA growth.

Figure 12.7.16: Productivity (left) and GVA (right) in professional and administrative services



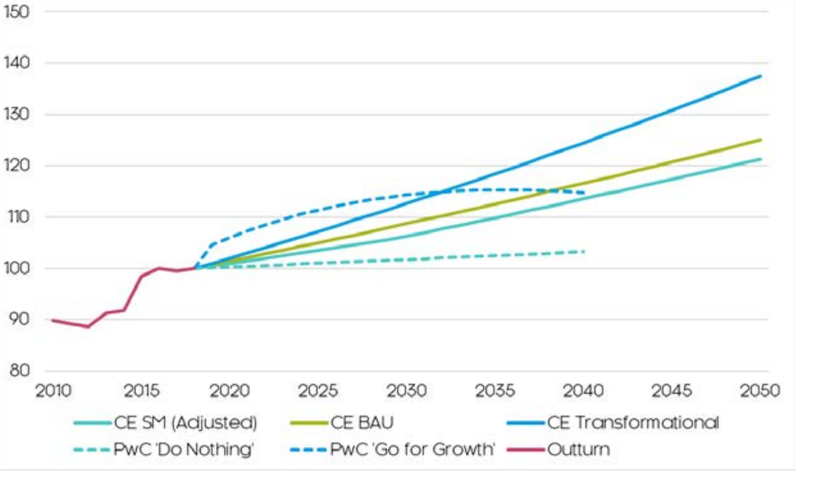


Source: ONS, Cambridge Econometrics, PwC.

Public administration, education and health

Public administration, education, and health are amongst Oxfordshire's most resilient sectors, and demand is anticipated to rise further over the next few decades, particularly in the heath (aging population) and education sector (demand for high-level and technical skills).

Figure 12.7.17: Employment in public administration, education and health

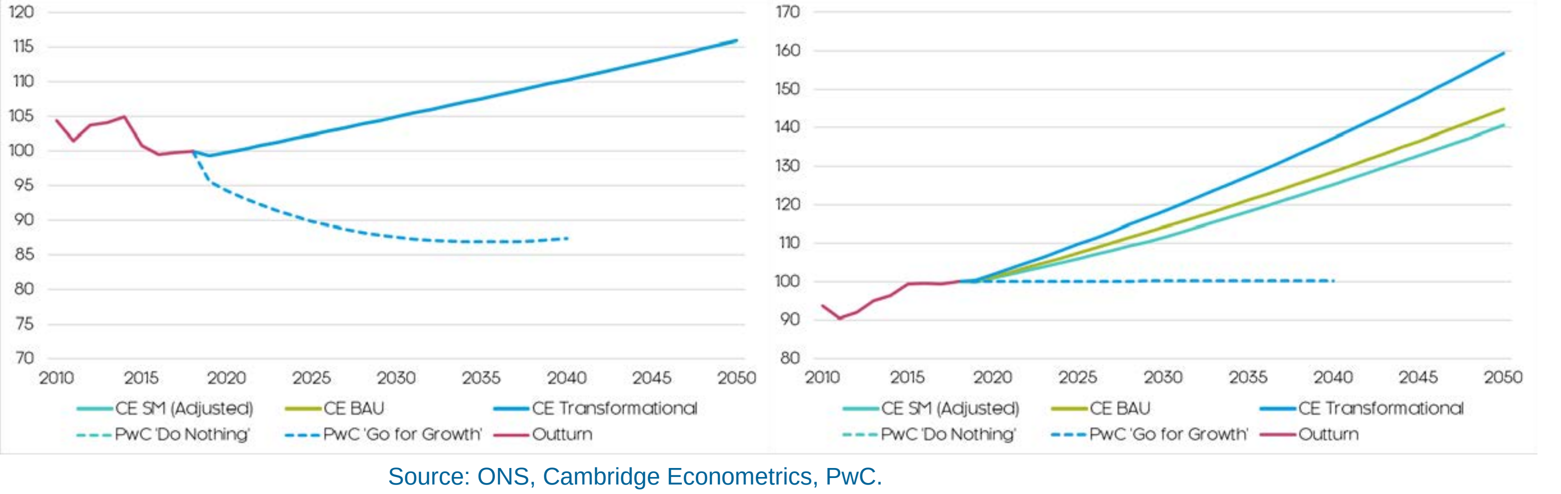


Source: ONS, Cambridge Econometrics, PwC.

CE therefore expects a slightly higher baseline rate of employment growth than that suggested by PwC, which remains low given historic trends (even when accounting for fiscal austerity post-2010). And even a potential decline in public administration will likely be offset by growth in Oxfordshire's education (given its two universities' growth plans) and health sectors.

Alongside sluggish employment growth, PwC also expects declining productivity in the sector, resulting in a near flatling of GVA. Though this reflects the poor productivity growth in the sector over the past decade, given the opportunities for health-related innovation and a higher-value education offer, we believe there is potential for moderate productivity growth in this sector.

Figure 12.7.18: Productivity (left) and GVA (right) in public administration, education and health

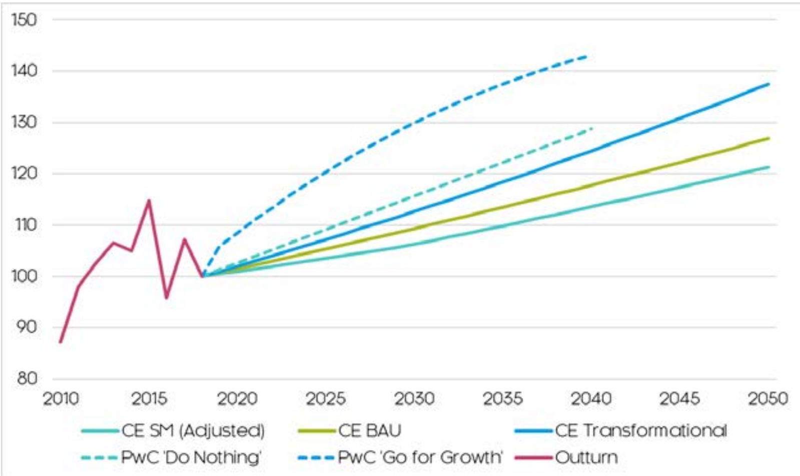


Source: ONS, Cambridge Econometrics, PwC.

Arts, entertainment and recreation

The recreation and other services sector accounts for a diverse range of activities, from tourism and culture to hairdressing and funeral parlours. Like consumer services, the sector largely depends on the amount of activity in the wider economy, particularly that related to households and their incomes. Relatively strong employment growth is therefore expected over the coming decades, with the sectors labour-intensive nature and consumer dependency making it more resilient to automation and associated changes.

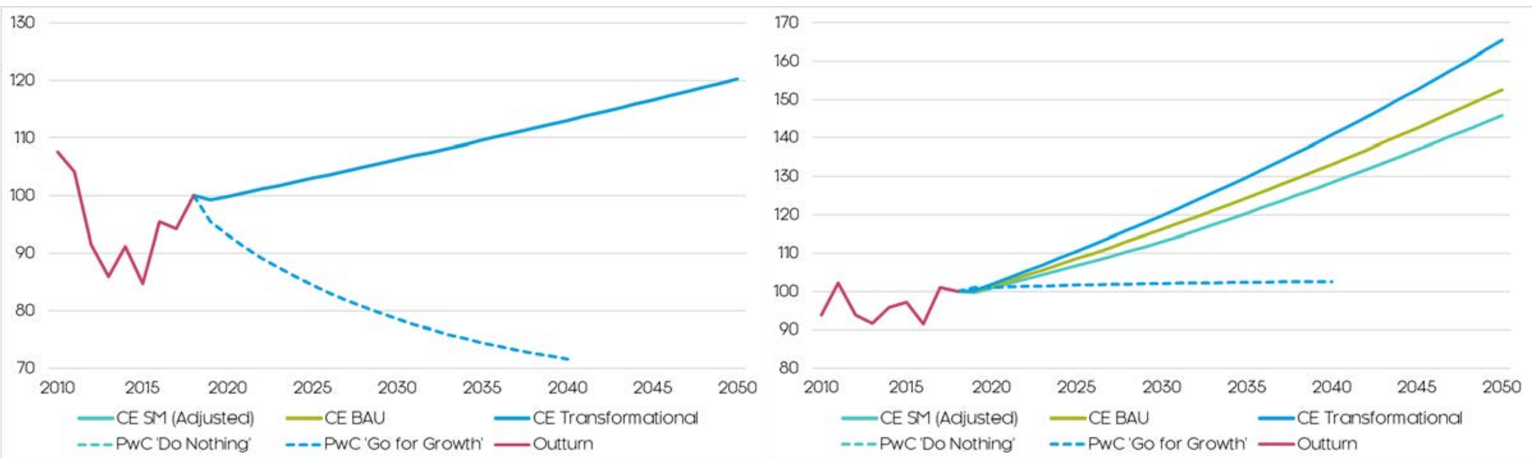
Figure 12.7.19: Employment in arts, entertainment and recreation



Source: ONS, Cambridge Econometrics, PwC.

CE expects a gentler pace of growth at its baseline, but with capacity for faster growth in higher trajectories. Productivity growth in the sector has been subdued of late, but CE expects this to return to trend over the long term, contributing to strong overall GVA growth. This is in contrast to PwC, who predict a continued, long-term decline in productivity, stunting overall GVA growth.

Figure 12.7.20: Productivity (left) and GVA (right) in arts, entertainment and recreation



Source: ONS, Cambridge Econometrics, PwC.

Appendix C: Affordable Housing Need Appendix

Provided below is a copy of the Affordable Housing Need Appendix produced by Iceni Projects Limited on behalf of the Oxfordshire Growth Board in July 2019, referenced in *Chapter 10 Affordable Housing Need.*

AFFORDABLE HOUSING NEED

Affordable housing is defined in Annex 2 of the revised National Planning Policy Framework (NPPF). The revised NPPF definition is slightly wider than the previous NPPF definition; in particular a series of 'affordable home ownership' options are considered to be affordable housing together with discounted private rents.

A methodology is set out in Planning Practice Guidance (PPG) to look at affordable need. In the analysis herein we have considered the needs of households who require support to meet their basic housing needs; and the needs of households who require support in accessing home ownership.

1. Approach and Data Sources

The method for studying the need for affordable housing has been enshrined in Strategic Housing Market Assessment (SHMA) Practice Guidance for many years, with an established approach to look at the number of households who are unable to afford market housing (to either rent or buy).

The analysis below follows the methodology and key data sources in the Planning Practice Guidance and can be summarised as:

- Current need (an estimate of the number of households who have a need now and based on a range of data modelled from local information);
- Projected newly forming households in need (based on projections developed for this project along with an affordability test to estimate numbers unable to afford the market);
- Existing households falling into need (based on studying the types of households who have needed to access social/affordable rented housing and based on study past lettings data);
- These three bullet points added together provide an indication of the gross need (the current need is divided by 13 so as to meet the need over the 2018-31 period);
- Supply of affordable housing (an estimate of the likely number of letting that will become available from the existing social housing stock – drawing on data from CoRe[66] and the Council); and
- Subtracting the supply from the gross need provides an estimate of the overall (annual) need for affordable housing

Each of these stages is described below. In addition, much of the analysis requires a view about affordability to be developed. This includes looking at house prices and private rents along with

[66] The continuous recording of lettings and sales in social housing in England (referred to as CoRe) is a national information source that records information on the characteristics of both private registered providers and local authority new social housing tenants and the homes they rent

estimates of local household incomes. The following chapters therefore look at different aspects of the analysis.

2. Local Prices and Rents

An important part of the affordable needs model is to establish the entry-level costs of housing to buy and rent. The affordable housing needs assessment compares prices and rents with the incomes of households to establish what proportion of households can meet their needs in the market, and what proportion require support and are thus defined as having an 'affordable housing need'.

The analysis below considers the entry-level costs of housing to both buy and rent across the county. The approach has been to analyse Land Registry and Valuation Office Agency (VOA) data to establish lower quartile prices and rents – using a lower quartile figure is consistent with the PPG and reflects the entry-level point into the market.

Data from the Land Registry for the year to September 2018 (i.e. Q4 of 2017 and Q1-Q3 of 2018) shows estimated lower quartile property prices in the county by dwelling type. The data shows that entry-level costs to buy are estimated to start from about £176,000 for a flat and rising to £380,000 for a detached home. Looking at the lower quartile price across all dwelling types, the analysis shows a lower quartile 'average' price of £270,000.

2.1. Lower Quartile Cost of Housing to Buy – year to September 2018 – Oxfordshire

	Lower quartile price
Flat/maisonette	£176,000
Terraced	£250,000
Semi-detached	£285,000
Detached	£380,000
All dwellings	£270,000

Source: Land Registry

A similar analysis has been carried out for private rents using Valuation Office Agency (VOA) data – this covers a 12-month period to September 2018. For the rental data, information about dwelling sizes is provided (rather than types); the analysis shows an average lower quartile cost (across all dwelling sizes) of £810 per month.

2.2. Lower Quartile Market Rents, year to September 2018 – Oxfordshire

	Lower Quartile rent, PCM
Room only	£468
Studio	£578

1-bedroom	£695
2-bedrooms	£850
3-bedrooms	£995
4-bedrooms	£1,510
All properties	£810

Source: Valuation Office Agency

A household is considered able to afford market rented housing in cases where the rent payable would constitute no more than a particular percentage of gross income. Rent levels in Oxfordshire are relatively high in comparison to those seen nationally (a lower quartile rent of £525 per month across England). Taking account of likely residual income and to reflect that the cost of living in Oxfordshire is likely to be higher than nationally, it has been estimated that a threshold of 35% would be appropriate – this is consistent with the assumption made in the Oxfordshire SHMA. This is used in assessing the ability of households to afford private rented housing.

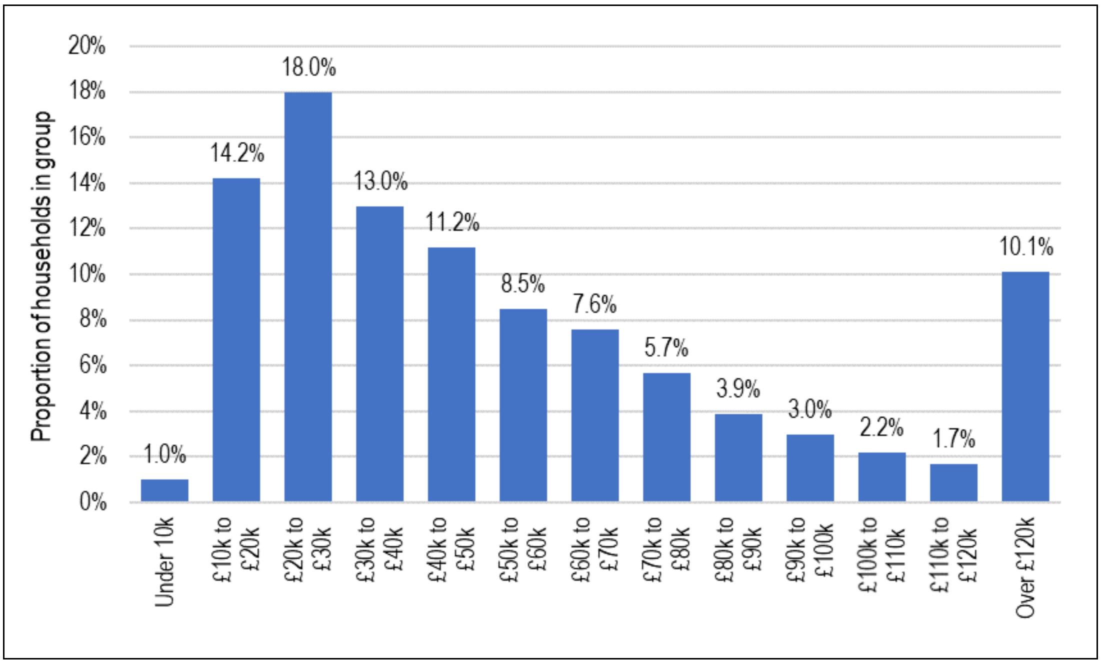
3. Income Levels and Affordability

Household incomes have been based on ONS modelled income estimates, with additional data from the English Housing Survey (EHS) being used to provide information about the distribution of incomes. The analysis indicates that around a sixth (15%) of households in Oxfordshire have incomes below £20,000 with a further third in the range of £20,000 to £40,000. Overall the average (mean) income is estimated to be around £56,800, with a median income of £43,200; the lower quartile income of all households is estimated to be £25,000.

To assess affordability in the initial analysis, a household's ability to afford private rented housing without financial support has been studied. The distribution of household incomes is then used to estimate the likely proportion of households who are unable to afford to meet their needs in the private sector without support, on the basis of existing incomes. This analysis brings together the data on household incomes with the estimated incomes required to access private sector housing.

Different affordability tests are applied to different parts of the analysis depending on the group being studied (e.g. recognising that newly forming households are likely on average to have lower incomes than existing households (this has consistently been shown to be the case in the English Housing Survey and the Survey of English Housing). Assumptions about income levels for specific elements of the modelling are the same as in previous assessments of affordable need.

Figure A3.1 Distribution of Household Incomes in Oxfordshire, mid-2018



Source: Derived from EHS and ONS data

4. Need for Social Rented and Affordable Rented Housing

An initial assessment of affordable housing need has been undertaken, considering the needs from households who require financial support to access housing to buy or rent in the market. This uses a narrow definition of affordable housing, consistent with that in the 2012 NPPF and 2014 Oxfordshire SHMA.

Current Affordable Housing Need

In line with Paragraph 2a-023 in the PPG, the current need for affordable housing has been based on considering the likely number of households with one or more housing problems. The table below sets out the categories in the PPG and the sources of data being used to establish numbers. The PPG also includes a category where households cannot afford to own despite it bring their aspiration – this category is considered separately later in this chapter.

It should be noted that there may be some overlap between categories (such as overcrowding and concealed households, whereby the overcrowding would be remedied if the concealed household moved). The data available does not enable analysis to be undertaken to study the impact of this and so it is possible that the figures presented include a small element of double counting. Additionally, some of the concealed households may be older people who have moved back in with their families and might not be considered as in need.

4.1. Main Sources for Assessing Current Unmet Need for Affordable Housing

	Source	Notes
Homeless households (and those in temporary accommodation	CLG Live Table 784	Total where a duty is owed but no accommodation has been secured PLUS the total in temporary accommodation
Households in overcrowded housing	Census table LC4108EW	Analysis undertaken by tenure and updated by reference to national changes (from the English Housing Survey (EHS))
Concealed households	Census table LC1110EW	Number of concealed families (with dependent or non-dependent children)
Existing affordable housing tenants in need	Modelled data linking to past survey analysis	Excludes overcrowded households – tenure estimates updated by reference to the EHS
Households from other tenures in need	Modelled data linking to past survey analysis	

Source: PPG Para 2a-023

The table below shows the initial estimate of the number of households within the county living in unsuitable housing. These figures are before any consideration of affordability has been made. The analysis suggests that there are currently some 19,300 households living in unsuitable housing (or without housing).

4.2. Estimated Households living in Unsuitable Housing – Oxfordshire

Category of 'need'	Households
Homeless households	177
Households in overcrowded housing	8,630
Concealed households	2,871
Existing affordable housing tenants in need	827
Households from other tenures in need	6,841
Total	19,346

Source: CLG Live Tables, Census (2011) and data modelling

From the overall number in unsuitable housing, households living in affordable housing are excluded (as these households would release a dwelling on moving and so no net need for affordable housing will arise). The analysis also excludes 90% of owner-occupiers under the assumption (which is supported by analysis of survey data) that the vast majority will be able to afford housing once savings and equity are taken into account. A final adjustment is to slightly reduce the unsuitability figures in the private rented sector to take account of student-only households – such households could technically be overcrowded/living in unsuitable housing but would be unlikely to be considered as being in affordable housing need (student households rarely qualify for affordable housing).This results in a revised estimate of households living in unsuitable housing, which is shown in Table A3.5 below.

4.3. Revised Assessment of Households in Unsuitable Housing by Tenure, Oxfordshire

	In unsuitable housing	Number to take forward for affordability testing
Owner-occupied	4,585	459
Affordable housing	3,505	0
Private rented	8,208	7,882
No housing (homeless/concealed)	3,048	3,048
Total	19,346	11,388

Source: CLG Live Tables, Census (2011) and data modelling

However, a number of these households might be able to afford market housing without the need for subsidy. An affordability test has therefore been applied. The income data has been used, with the distribution adjusted to reflect a lower average income amongst households living in unsuitable housing – for the purposes of the modelling an income distribution that reduces the level of income to 88% of the figure for all households has been used to identify the proportion of households whose needs could not be met within the market (for households currently living in housing). A lower figure of 42% has been used to apply an affordability test for the concealed/homeless households who do not currently occupy housing. These two percentage figures have been based on a consideration of typical income levels of households who are in unsuitable housing (based mainly on estimates in the private rented sector) along with typical income levels of households accessing social rented housing (for those without accommodation). These figures are considered to be best estimates, and likely to approximately reflect the differing income levels of different groups with a current housing problem.

Overall, just under half of households with a current need are estimated to be likely to have insufficient income to afford market housing and so the estimate of the total current need is of 5,100 households across the county.

4.4. Estimated Current Affordable Housing Need

	In unsuitable housing (taken forward for affordability test)	% Unable to Afford Market Housing (without subsidy)	Revised Gross Need (including Affordability)
Oxfordshire	11,388	44.8%	5,107

Source: CLG Live Tables, Census (2011), data modelling and affordability analysis

Newly-Forming Households

The number of newly-forming households has been estimated through demographic modelling with an affordability test also being applied. This has been undertaken by considering the changes in households in specific 5-year age bands relative to numbers in the age band below, 5 years previously, to provide an estimate of gross household formation.

In assessing the availability of newly-forming households to access market housing, data has been drawn from a range of survey data including the English Housing Survey at a national level. This establishes that the average income of newly-forming households is around 84% of the figure for all households. The analysis has therefore adjusted the overall household income data to reflect the lower average income for newly-forming households. The adjustments have been made by changing the distribution of income by bands such that average income level is 84% of the all household average. In doing this it is possible to calculate the proportion of households unable to afford market housing without any form of subsidy (such as LHA/HB).

The assessment suggests that overall around two-fifths of newly-forming households will be unable to afford market housing (to rent) and that a total of 1,881 new households will have a need on average in each year to 2031.

4.5. Estimated Annual Affordable Housing Need from Newly-forming Households

	No. of new households	% unable to afford	Total in need
Oxfordshire	5,016	37.5%	1,881

Source: Projection Modelling and Affordability Analysis

Existing Households Falling into Affordable Housing Need

The second element of newly arising need is existing households falling into need. To assess this, information from CoRe has been used. This looked at households who have been housed over the past three years. This group will represent the flow of households onto the Housing Register over this period. From this newly forming households (e.g. those currently living with family) have been discounted as well as households who have transferred from another social/affordable rented property. An affordability test has also been applied. This method for assessing existing households falling into need is consistent with the 2007 SHMA Guidance.

The analysis through suggests a need arising from 840 existing households each year from 2018 to 2031.

Supply of Affordable Housing

The future supply of affordable housing is the flow of affordable housing arising from the existing stock that is available to meet future need. Our initial analysis focusses on the annual supply of social/affordable rent relets.

The Practice Guidance suggests that the estimate of likely future relets from the social rented stock should be based on past trend data which can be taken as a prediction for the future. Information from the CoRe system has been used to establish past patterns of social housing turnover, along with data from the Council about past lettings (to provide sub-area estimates). The figures include general needs and supported lettings but exclude lettings of new properties and exclude an estimate of the number of transfers from other social rented homes. These exclusions are made to ensure that the figures presented reflect relets from the existing stock. We have based estimates on supply data over the last three years (2015-18).

On the basis of past trend data is has been estimated that 1,401 units of social/affordable rented housing are likely to become available each year moving forward in Oxfordshire.

4.6. Estimated Supply of Social/ Affordable Rented Housing per Annum

	General needs	Supported housing	Total
Total lettings	2,149	852	3,001
% as non-new build	69.5%	93.7%	76.4%
Lettings in existing stock	1,494	798	2,293
% non-transfers	60.7%	61.9%	61.1%
Total lettings to new tenants	907	494	1,401

Source: CoRe

The PPG model also includes the bringing back of vacant homes into use and the pipeline of affordable housing as part of the supply calculation. These have however not been included within the modelling in this report. Firstly, there is no evidence of any substantial stock of vacant homes (over and above a level that might be expected to allow movement in the stock). As of 2017, CLG data shows 238 vacant general needs homes in the county. Secondly, with the pipeline supply, it is not considered appropriate to include this as to net off new housing would be to fail to show the full extent of the need, although in monitoring it will be important to net off these dwellings as they are completed.

Net Need for Social and Affordable Rented Housing

The table below shows the overall calculation of affordable housing need. This excludes supply arising from sites with planning consent (the ‘development pipeline’). The analysis shows that there is a need for 1,700 dwellings per annum to be provided – a total of 22,300 over the 13-year period (2018-31). The net need is calculated as follows:

Net Need = Current Need + Need from Newly-Forming Households + Existing Households falling into Need – Supply of Affordable Housing

4.7. Estimated Net Annual Need for Social/ Affordable Rented Housing in Oxfordshire

	Per annum	2018-31
Current need	393	5,107
Newly forming households	1,881	24,453
Existing households falling into need	840	10,925
Total Gross Need	3,114	40,486
Re-let Supply	1,401	18,217
Net Need	1,713	22,269

5. Need for Affordable Home Ownership Housing

The above analysis points to a net need for around 1,700 homes per annum from households requiring social or affordable rented housing from households who cannot meet their own needs in the housing market. This represents the need for subsidised housing at a cost below that to access the private rented sector (i.e. for households unable to access any form of market housing without some form of subsidy).

The revised NPPF introduces a new category of household in affordable housing need and widens the definition of affordable housing (see Annex 2) to include a range of types of affordable housing which support households into home ownership. This includes shared ownership, discounted market sale housing and starter homes. This chapter considers the level of need for these types of dwellings in Oxfordshire.

The NPPF states *“Where major development involving the provision of housing is proposed, planning policies and decisions should expect at least 10% of the homes to be available for affordable home ownership, unless this would exceed the level of affordable housing required in the area, or significantly prejudice the ability to meet the identified affordable housing needs of specific groups.”* (NPPF2, para 64).

The Planning Policy Guidance of September 2018 confirms a widening definition of those to be considered as in affordable need; now also including *'households which can afford to rent in the private rental market, but cannot afford to buy despite a preference for owning their own home'*. However, at the time of writing, there is no guidance about how the number of such households should be measured.

The methodology used in this report therefore draws on the current method, and includes an assessment of current needs, projected need (newly forming and existing households) and an estimate of the supply of housing. The key difference is that in looking at affordability an estimate of the number of households in the 'gap' between buying and renting is used. To study current need, an estimate of the number of household living in the Private Rented Sector (PRS) has been established, along with the same (rent/buy gap) affordability test.

For the supply of affordable home ownership, analysis of Land Registry has been undertaken with the supply figure taken to be the number of homes sold at below lower quartile prices. However, it is the case that market housing is not allocated in the same way as social/affordable rented homes (i.e. anyone is able to buy a home as long as they can afford it and it is possible that a number of lower quartile homes would be sold to households able to afford more, or potentially to investment buyers). A broad further assumption has been used that around half of the lower quartile homes would be available to meet the needs of households with an income in the gap between buying and renting.

In looking at current need, the start point is the number of households living in private rented accommodation. As of the 2011 Census there were some 45,207 households living in the sector. Data from the Survey of English Housing (EHS) suggests that since 2011, the number of households in the PRS has risen by about 26% - if the same proportion is relevant to Oxfordshire then the number of households in the sector would now be around 56,960. Additional data from the EHS suggests that 60% of all PRS households expect to become an owner at some point (34,176 households if applied to Oxfordshire) and of these some 25% (8,544 households) would expect this to happen in the next 2-years. The figure of 8,544 is therefore taken as the number of households potentially with a need for affordable home ownership before any affordability testing. The remaining households who expect to buy, but in a period of more than 2-years are picked up in the modelling as existing households falling into need (again with an affordability test applied).

The table below shows that following the stages of analysis there is an estimated need for around 1,500 units of affordable home ownership per annum. This figure should be seen as indicating the potential demand for such accommodation, as it should be remembered that all of the households picked up in this analysis will be able to afford market housing in the Private Rented Sector without subsidy.

5.1. Estimated Need for Affordable Home Ownership Homes – Oxfordshire

	Per annum	2018-31
Current need	233	3,025
Newly forming households	1,881	24,453
Existing households falling into need	735	9,561
Total Gross Need	2,849	37,039
Re-let Supply	1,364	17,734
Net Need	1,485	19,305

Source: Range of data sources as described

It should be noted that the finding of a ‘need’ for affordable home ownership does not have a specific direct impact on the overall need for housing. As is clear from both the NPPF and PPG, the additional group of households in need is simply a case of seeking to move households from one tenure to another (in this case from private renting to owner-occupation); there is therefore no specific net change in the total number of households or the number of homes required. However, Planning Practice Guidance does require consideration of an increase in housing provision where it will help to deliver the affordable housing needed.

Appendix D: Approach to Understanding Affordability Implications

This Appendix provides the supporting methodology and outline for the analysis in *Chapter 12 Commuting and Affordability Implications.*

As part of its approach to understanding the implications for housing affordability in Oxfordshire from the economic trajectories and spatial scenarios, CE has undertaken a detailed, nationwide analysis of local house price and affordability dynamics to inform and build a robust methodology and accompanying model. This is summarised below.

Ultimately, by refining and applying this approach for Oxfordshire, CE will be able to clearly assess and test the potential affordability implications of the three economic and fifteen housing (three trajectories, each with an additional five contrasting spatial scenarios) projections.

Understanding the national affordability context

Before proceeding with the local analysis, it is beneficial to explore the national context around house prices and affordability, highlighting some its perceived determinants and drivers whilst considering the associated policy challenges and opportunities. This is increasingly important given the policy context around housing, with the UK's housing market having been referred to as *"broken"* in recent years facilitated by a *"housing crisis"* which has stymied housing delivery in many local markets.[67]

Figure 12.7.1: Population, employment and dwellings trends in England, 1971-2019

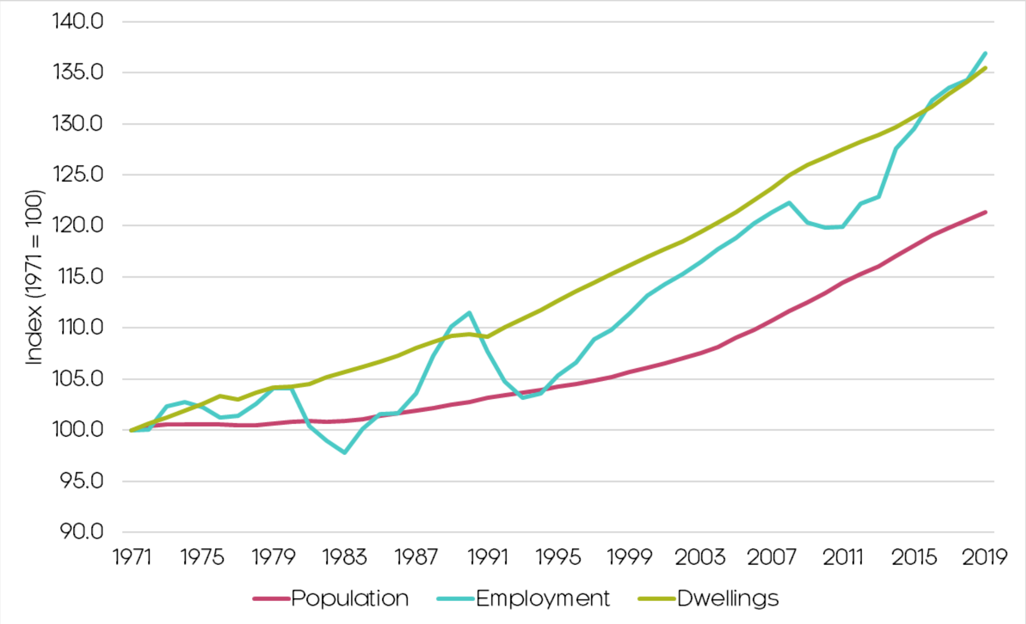


Table 12.7.1: Population, employment and dwellings trends in England, 1971-2019

	At 1971	At 2019	Change, 1971-2019	% change, 1971-2019
Population	46,412,100	56,309,300	9,897,200	21.3%

[67] See for instance the Governments housing white paper '[Fixing our broken housing market'](#) (2017)

Employment	22,237,400	30,438,700	8,201,300	36.9%
Dwellings	18,018,000	24,412,100	6,394,100	35.5%

Source: ONS, MHCLG, Cambridge Econometrics.

Figure 12.7.1 and Table 12.7.1 highlight the long run trends around three key housing market inputs: the total population, total employment (or 'jobs') and total stock of dwellings (or 'housing'). Since 1971, housing delivery[68] in England has actually grown consistently faster than its population since 1971, whilst employment – which understandably is much more sensitive to the economic cycle – has also outpaced population growth and has grown marginally faster than housing delivery.

Figure 12.7.2: Jobs per head and dwellings per head ratios in England, 1971-2019

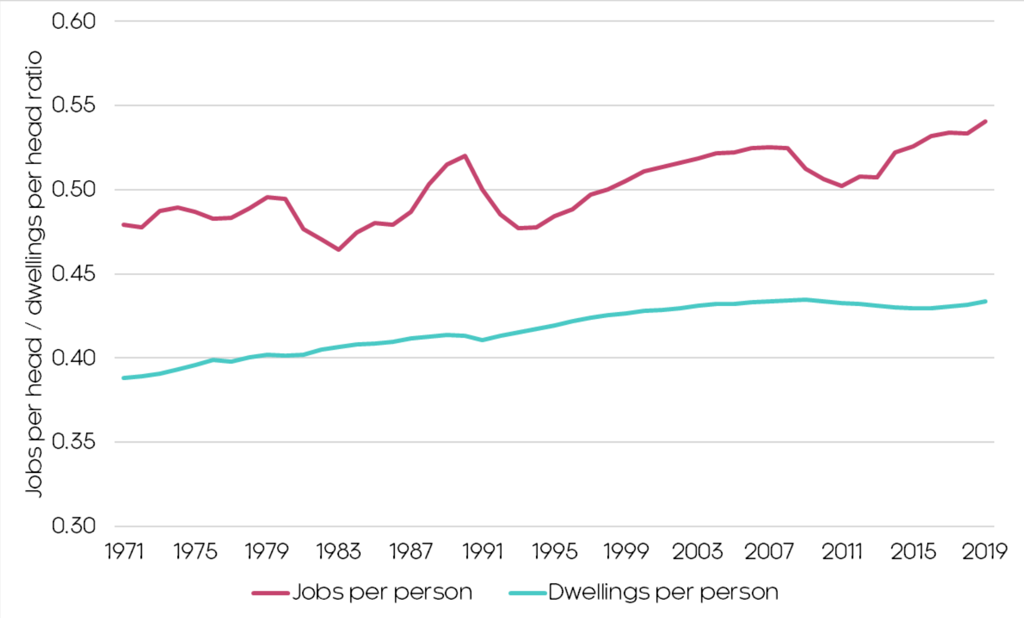


Table 12.7.2: Jobs per head and dwellings per head ratios in England, 1971-2019

	At 1971	At 2019	Change, 1971-2019	% change, 1971-2019
Jobs per head	0.48	0.54	0.06	12.8%
Dwellings per head	0.39	0.43	0.05	11.7%

Source: ONS, MHCLG, Cambridge Econometrics.

The result of this is that there are now both more homes and more jobs per person in England than ever before, as Figure 12.7.2 and Table 12.7.2 show. Again, whilst employment has trended upwards it has followed a more volatile path in line with the economic cycle. Dwellings per person has trended upwards much more smoothly, though with somewhat limited change since 2000 alongside a notable slowdown after the 2008 financial crisis.

[68] Note this particular definition refers to net additional dwellings, rather than the narrower housebuilding definition; unlike the former, the latter only considers gross dwelling additions and excludes demolitions, change of use, extensions/additions etc.

Figure 12.7.3: Earnings, rental prices and house prices in England, 1971-2019

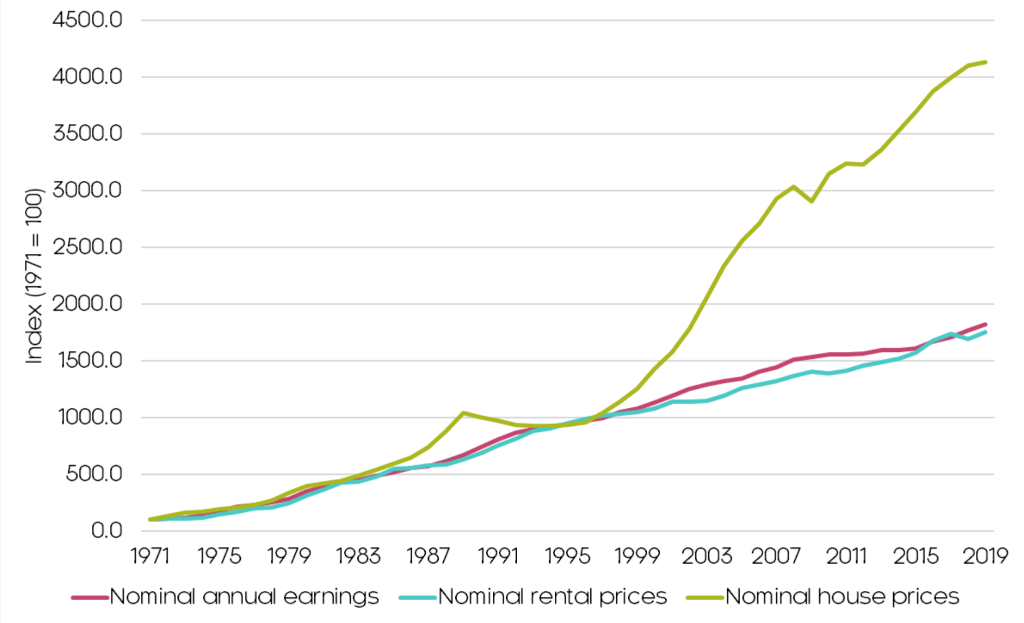


Table 12.7.3: Earnings, rental prices and house prices in England, 1971-2019

	At 1971	At 2019	Change, 1971-2019	% change, 1971-2019
Nominal average (annual) earnings	£1,700	£30,200	£28,500	1717.5%
Nominal average (annual) rental prices	£50	£860	£810	1651.0%
Nominal average house prices	£7,400	£304,500	£297,100	4026.7%

Source: ONS, Cambridge Econometrics.

Figure 12.7.3 and Table 12.7.3 consider the long run trends around the two alternative costs of housing – the cost of buying a home (house prices) and the cost of renting a home (rental prices)[69] – alongside average annual earnings. Since 1971, (nominal) house price growth has significantly outstripped (nominal) growth in rental prices. After being reasonably well aligned up to the late 1990's, the two have decoupled drastically; since 1971, the average house price has increased a substantial 40x over, more than twice the increase of the average rental price.

Wage growth and rental price growth (in nominal terms) meanwhile have been highly correlated, both increasing 17x over since 1971. The only notable decoupling of this relationship was a period during the late 1990's-2000's, where growth in wages actually eclipsed that of rental prices up until the 2008-09 recession, where it has since returned to trend. Understanding rental prices is important within housing affordability analysis, as economic theory suggests that they represent the 'true cost' of housing for consumers - and are therefore the most sensitive to changes in demand and supply.[70]

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[69] Note that these particular measures of house and rental prices are not hedonically priced, in that they do not account for changes in housing quality or composition over the time series

[70] For a summary overview of this theory and relationship see Wren-Lewis (2018). For more detailed explanations and additional references, see UK Centre for Collaborative Housing Evidence (2018) p.p. 14-18 and Oxford Economics p.p. 16-18 (2016)

Figure 12.7.4: Rental affordability (left axis) and house price affordability (right axis) in England, 1971-2019

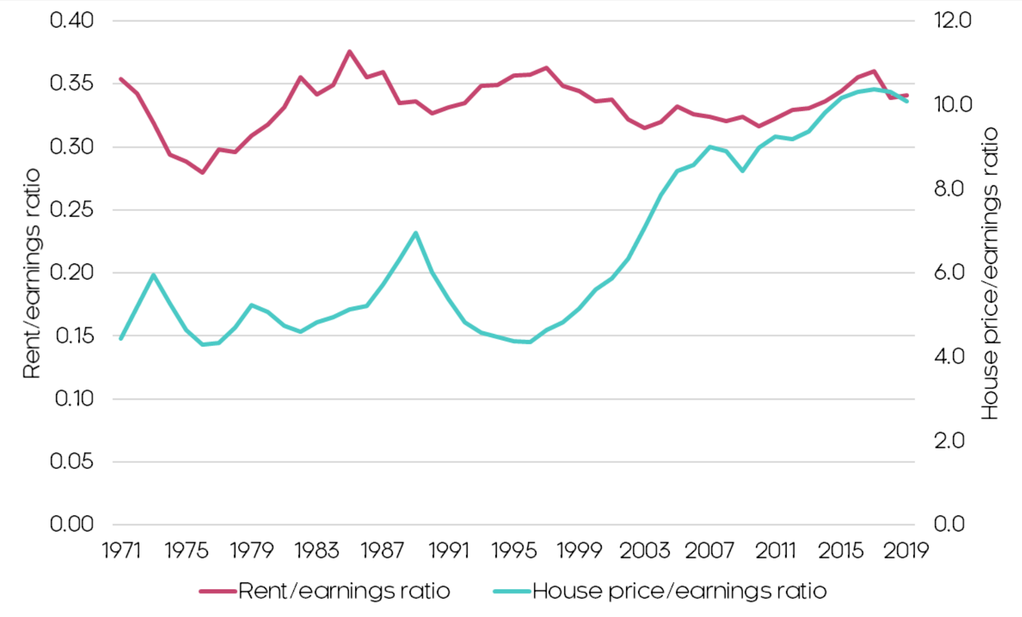


Table 12.7.4 Rental price affordability and house price affordability in England, 1971-2019

	At 1971	At 2019	Change, 1971-2019	% change, 1971-2019
Rent/earnings ratio; 'rental affordability'[71]	0.35	0.34	-0.01	-3.7%
Price/earnings ratio; 'house price affordability'[72]	4.44	10.08	5.64	127.1%

Source: ONS, Cambridge Econometrics

Bringing these three variables together, Figure 12.7.4 and Table 12.7.4 present the relative affordability ratios (price relative to earnings) for house and rental prices. Since 1971, rental affordability has stayed relatively constant at around a third of annual earnings, with few significant deviations, though it had been trending upwards for the decade after the financial crisis. Housing affordability meanwhile was relatively stable from the 1970's to 1990's at around 4x annual earnings before accelerating sharply in the 2000's to an unprecedented 10x annual earnings.

Clearly the relative growth in house prices over the past 20 years has presented a significant challenge to aspiring homeowners, and is widely considered as a candidate example of the UK's 'broken' housing market. However, when both the ratio of dwellings per person and rental affordability has stayed so consistent over this timeframe, it is hard to justify calling this a housing 'crisis' – at least at the aggregate, national level.

So what is driving the divergence in house prices and rental costs, especially considering the latter is supposed to represent the 'true cost' of housing?

[71] In line with ONS guidance, rental affordability has been calculated as; annualized average rental price / annualized average workplace earnings. Average here refers to the mean. The median is typically preferred, but data is unavailable over the timeframe required.

[72] In line with ONS guidance, house price affordability has been calculated as; average house sale price / annualized average workplace earnings. Average here refers to the mean. The median is typically preferred, but data is unavailable over the timeframe required.

Figure 12.7.5: Rent-house price ratio and real interest rates in England, 1971-2019

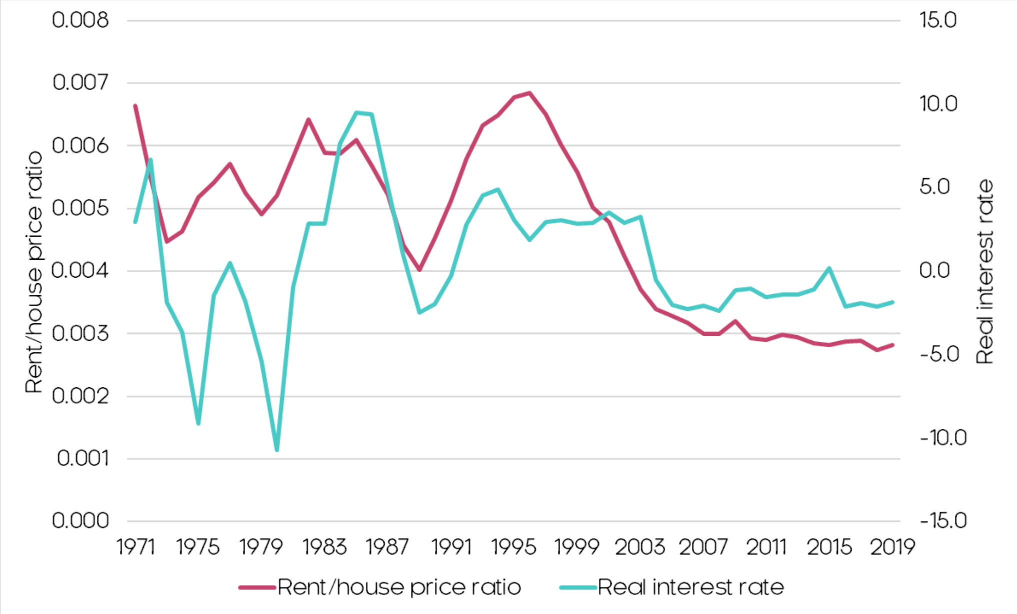


Table 12.7.5: Rent-house price ratio and real interest rates in England, 1971-2019

	At 1971	At 2019	Change, 1971-2019	% change, 1971-2019
Rent/house price ratio	0.01	0.00	0.00	-57.6%
Real interest rate	2.96	-1.86	-4.82	-162.7%

Source: ONS, Bank of England, Cambridge Econometrics

As highlighted in Figure 12.7.5 and Table 12.7.5, one candidate explanation[73] is that the persistent decline in interest rates (in both nominal and real terms) during the 1990's and early 2000's, and sharply accelerated following the 2008-09 recession, has contributed and since maintained inflated house prices whilst subduing rental prices. In theory, this can happen for a variety of reasons; in a low interest rate environment:

- Landlords have to charge less to cover their mortgage costs, **reducing rental prices**
- It is easier and more affordable for potential house buyers to get a mortgage, hence the demand for renting decreases, **reducing rental prices and increasing house prices**
- Housing becomes a better and more attractive investment option, for both consumers and investors (both domestic and international), **increasing house prices**

Of course, this has implications for price/affordability-focussed housebuilding strategies; with house prices increasingly sensitive to and determined by a centralised monetary system, even the most substantial and well targeted strategies may not deliver the desired change in prices/increase in affordability. However, this also means that the correct and effective targeting of independent, locally-specific factors becomes ever more important for local policymakers – which are considered in the next chapter.

[73] For instance, as observed by the OECD (2011) and Oxford Economics (2016)

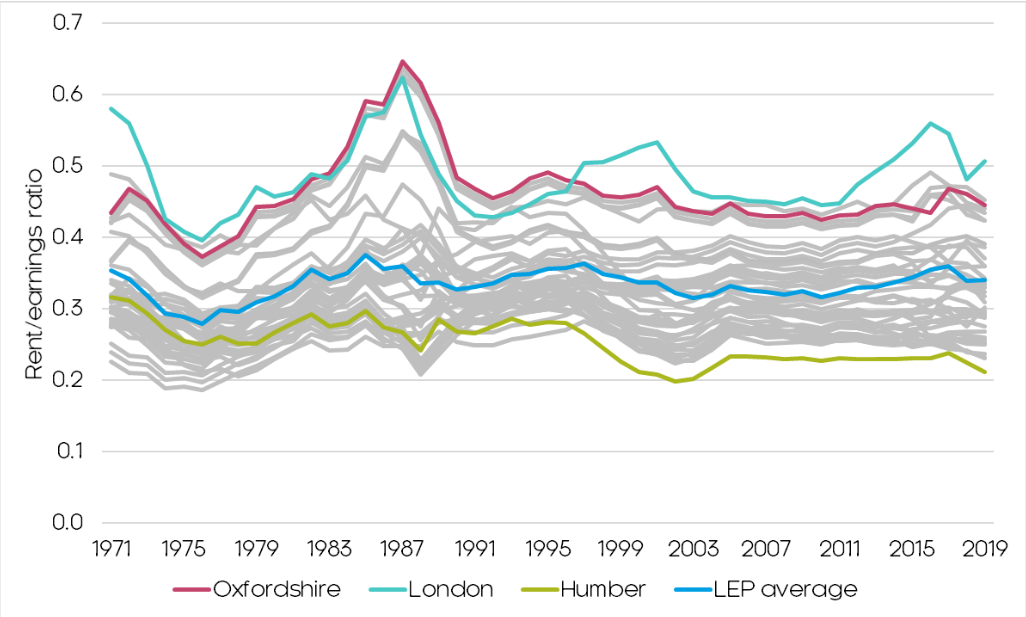
Building the local evidence

Having considered the national context and established some of the key drivers and determinants of house prices and affordability, it is important to consider how these correspond at the subnational level, and what role local effects play in determining local prices and affordability. Notably, at this level much greater variability and functionality can be seen in some of the aforementioned variables, reflecting independent, locally-specific characteristics and factors driving and determining local markets.

Though housing market data is available for regional markets (e.g. the South East NUTS1 Region), which are relatively functional and widely reported in subnational analysis, these geographies often fail to capture the unique and localised markets – and thus affordability challenges - within them; for instance, though both within the North West region, Manchester's housing market and affordability challenge is markedly different from Cumbria's.

Therefore, the following analysis considers the evidence at the Local Enterprise Partnership (LEP) level[74], which comprises 38 intra-regional areas broadly analogous to functional economic areas (which often overlay with functional housing market areas). Though more detailed geographies are available (e.g. Unitary and Local Authority areas), these often map poorly to functional housing market areas, and decrease data quality and availability.

Figure 12.7.6: Rental affordability across England, 1971-2019



Source: ONS, Cambridge Econometrics

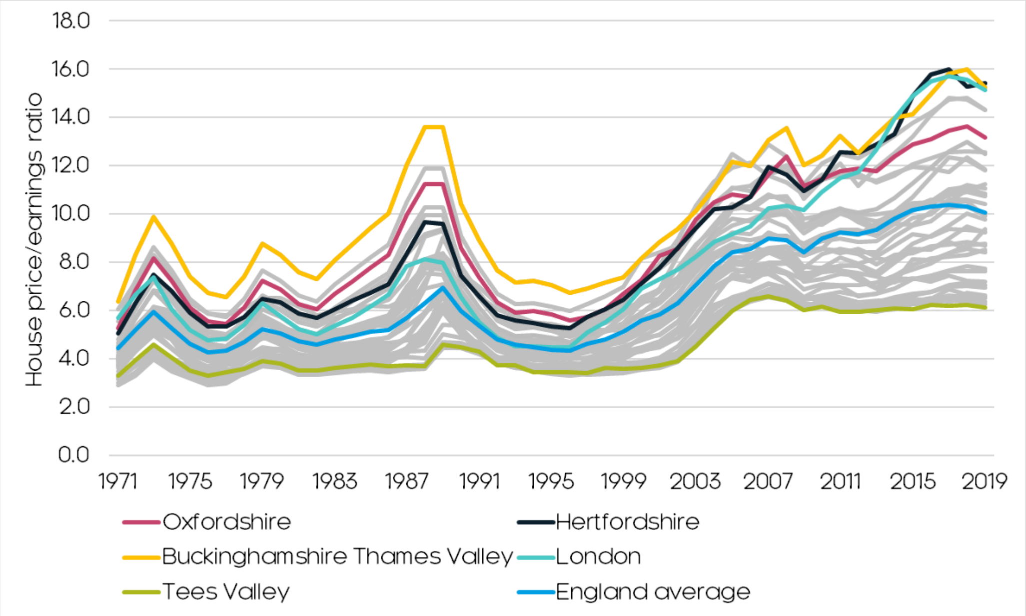
To begin with, Figure 12.7.6 considers the rental affordability ratios of the 38 LEP areas. Unsurprisingly, London is a relative outlier, with the highest rental affordability ratio (least affordable for renting) in the country; the average London worker can expect to spend at least half their gross earnings on rent. This is underscored by the Humber, which has the lowest rental affordability ratio (most affordable for renting) in the country; the average Humber worker could expect to spend only a fifth of their earnings on rent.

[74] Defined here as excluding overlap areas

However, what is most notable from the data is that for most if not all LEP areas, current rental affordability ratios are not unusually high or trending notably upwards when compared across the whole period – even London for instance had lower rental affordability in the early 1970s and mid-1980s than what it does today. Again, when considering rental costs are supposed to represent the 'true cost' of housing for consumers, it is hard to justify the current prescription of a "housing crisis", even in less affordable parts of the country such as London and the South East.

Figure 12.7.7 replicates this analysis but for housing affordability. Here we see much greater regional variance and dispersion in affordability ratios; the average worker in London, Hertfordshire, and Buckinghamshire for instance can expect to spend 15x their annual earnings on purchasing a home. For the average worker in the Tees Valley, this more than halves to 6x times annual earnings. As with rental affordability though, what is of particular interest is the movement in these ratios over time.

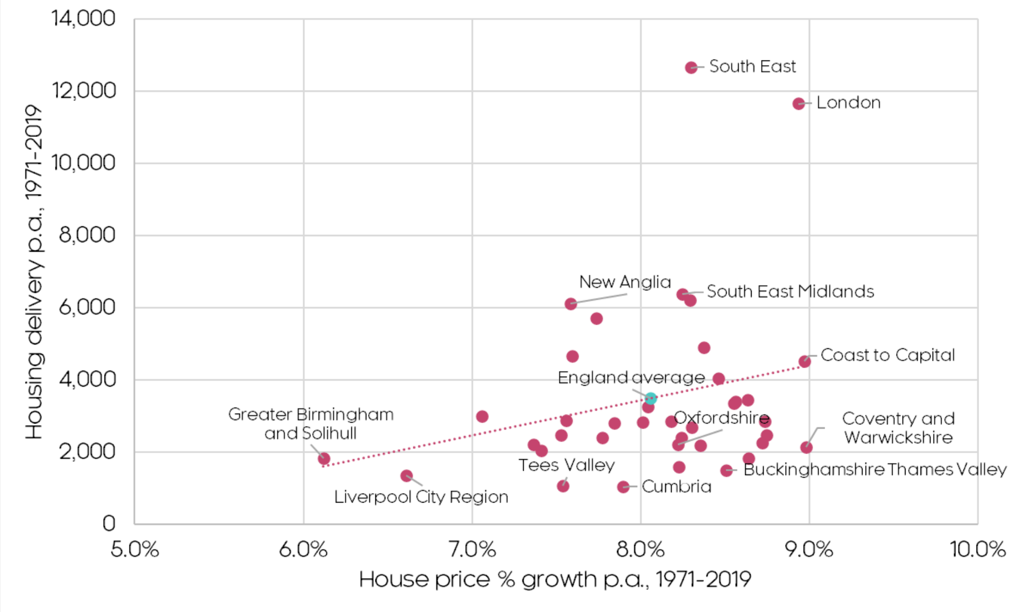
Figure 12.7.7: House price affordability across England, 1971-2019



Source: ONS, Cambridge Econometrics

Whereas a number of 'Home County' LEP areas have had persistently high housing affordability ratios, London was only mid-ranking until the early 2000's. Many areas saw their fastest increase in housing affordability ratios (i.e. a decrease in affordability) over the late 1990's to early 2000's, but since the 2008-09 financial crisis, affordability ratios have stayed stubbornly high for almost all areas (even those weaker performing economically), which is in contrast to previous recession and recoveries e.g. early 1990's recession, early 1980's recession and mid-1970's recession.

Figure 12.7.8: Housing delivery and house price growth across England, 1971-2019



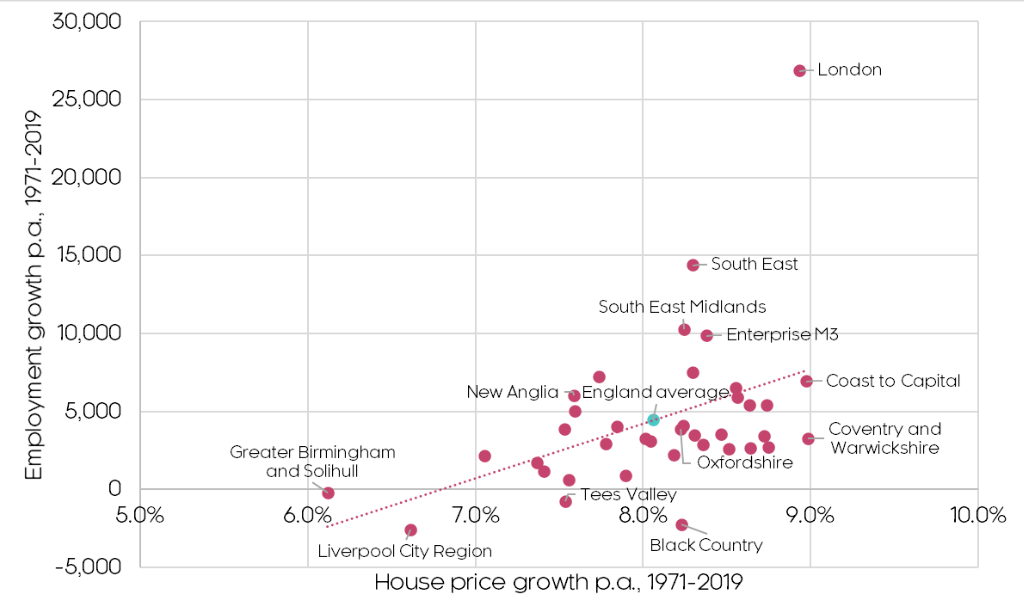
Source: ONS, MHCLG, Cambridge Econometrics

One frequently proposed solution to counteract or at least subdue rapid local house price growth and decreasing affordability is to increase local housing delivery. However, as Figure 12.7.8 shows, it should be emphasised that there is actually a positive correlation between housing delivery and house price growth: the LEP areas that have built the most houses are also amongst those to have experienced the fastest growth in house prices.

Of course, this doesn't mean that building more homes will increase the rate of house price growth and further decrease affordability - high house prices likely attract and incentivise further housing growth, though the relationship is probably bi-directional. But this doesn't help the argument that increased local housing delivery it is an effective method of reversing or even slowing it – as with many things, it is much more complicated than that.

Figure 12.7.10: Housing delivery and employment growth across England, 1971-2019

Figure 12.7.10: Employment growth and house price growth across England, 1971-2019

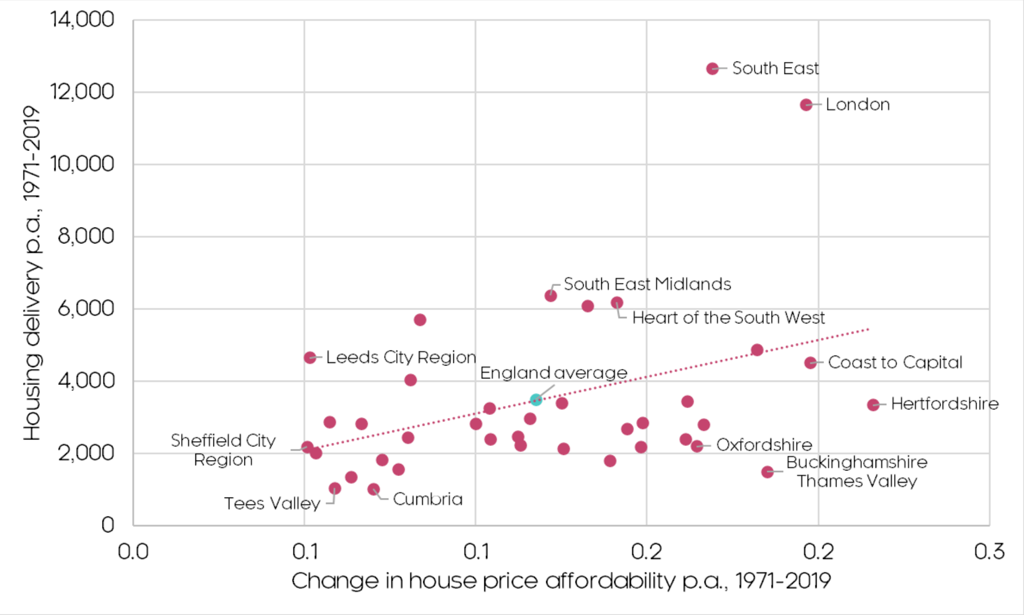


Source: ONS, MHCLG, Cambridge Econometrics

One of the reasons for this is because housing delivery tends to correlate with employment growth (as shown in Figure 12.7.10), and employment growth correlates strongly with house price growth (as shown in Figure 12.7.10). Broadly speaking, more housing means more people, leading to a growth in both labour supply and demand for local services. Both of these are then likely to stimulate additional employment growth.

For instance, when looking at the relationship between employment growth and house price growth (Figure 12.7.10) it is likely that additional employment growth drives additional demand for housing in the area, putting upward pressure on house prices. Thus the downward pressure created by additional supply coming onto market, is likely to be partly, or maybe even wholly, cancelled out by this upward pressure.

Figure 12.7.11: Housing delivery and changes in house price affordability across England, 1971-2019



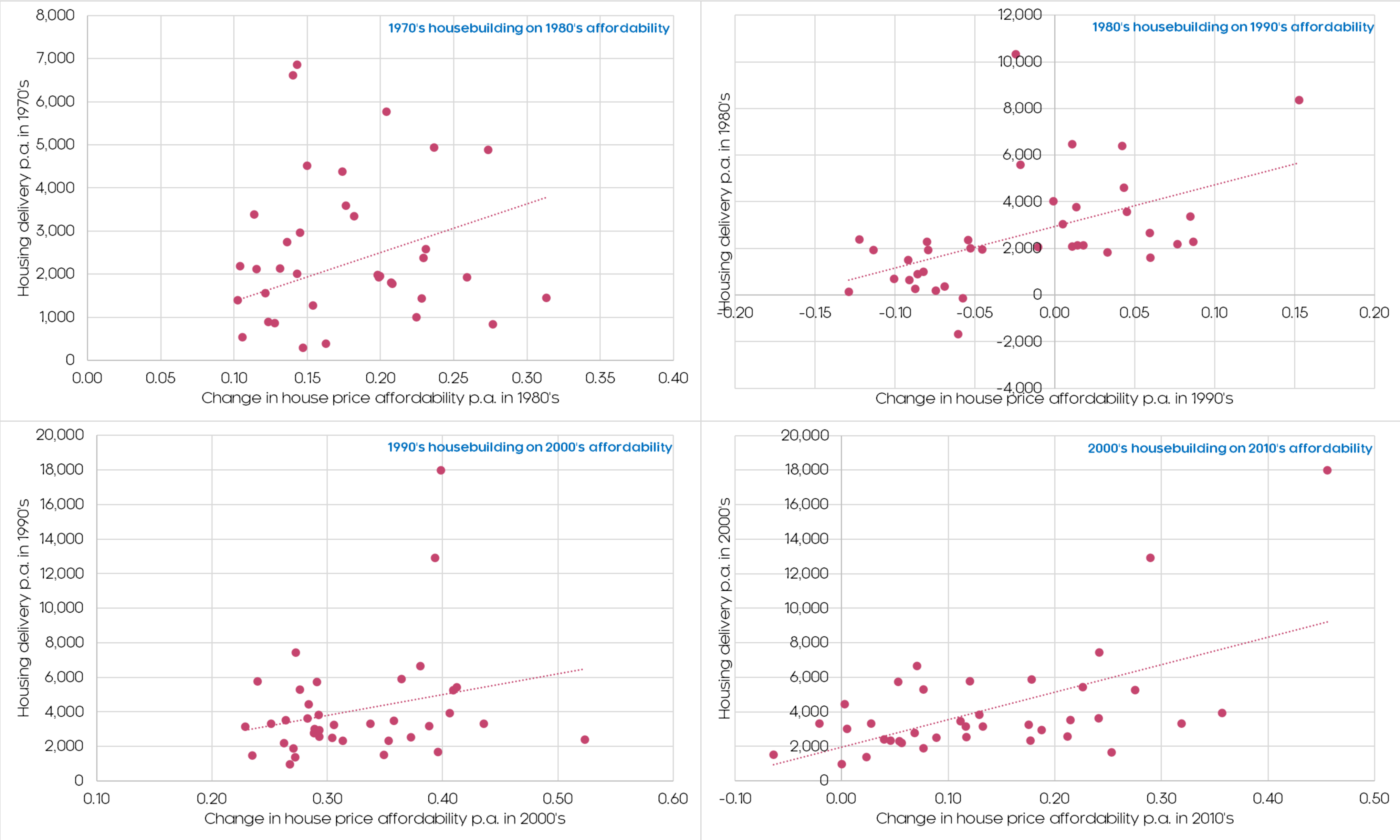
Source: ONS, MHCLG, Cambridge Econometrics

As Figure 12.7.11 shows, the same positive correlation that is seen between an areas housing delivery and house price growth is also seen between an areas housing delivery and its change in affordability (ratios); LEP areas that have built more homes have typically seen a greater increase in affordability ratios (decrease in affordability). Again, this shows us that within local areas, housebuilding alone will not be sufficient to tackle affordability pressures.

Of course, housebuilding at time *t* is not an immediate input into house prices at time *t* – there is often a lagged effect. To try and better understand potential causality of this relationship, Figure 12.7.12 (presented over the following page; 194) considers the lagged relationship between housing delivery and affordability changes a decade later – do the LEP areas that build the most houses see affordability ratios deteriorate (i.e. the area becomes more affordable) the following decade?

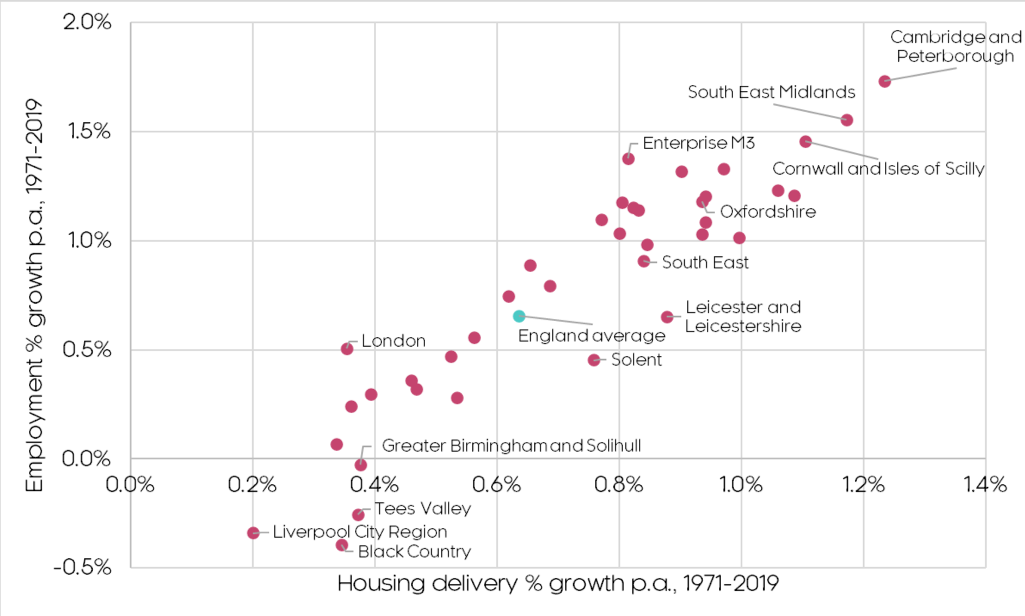
Across the time series, we continue to see a clear and positive relationship between higher housing delivery in an area and an increase in housing affordability ratios (a decrease in affordability). Generally, this relationship has also become more significant over time, though this has not been a continuous process, with the relationship weakening slightly in the 1990's and 2000's – a time where many areas saw rapid increases in their affordability ratios, as housing and financial markets became increasingly liberalised.

Figure 12.7.12: The lagged relationship between housing delivery and changes in house price affordability across England, 1970's-2010's



Source: ONS, MHCLG, Cambridge Econometrics

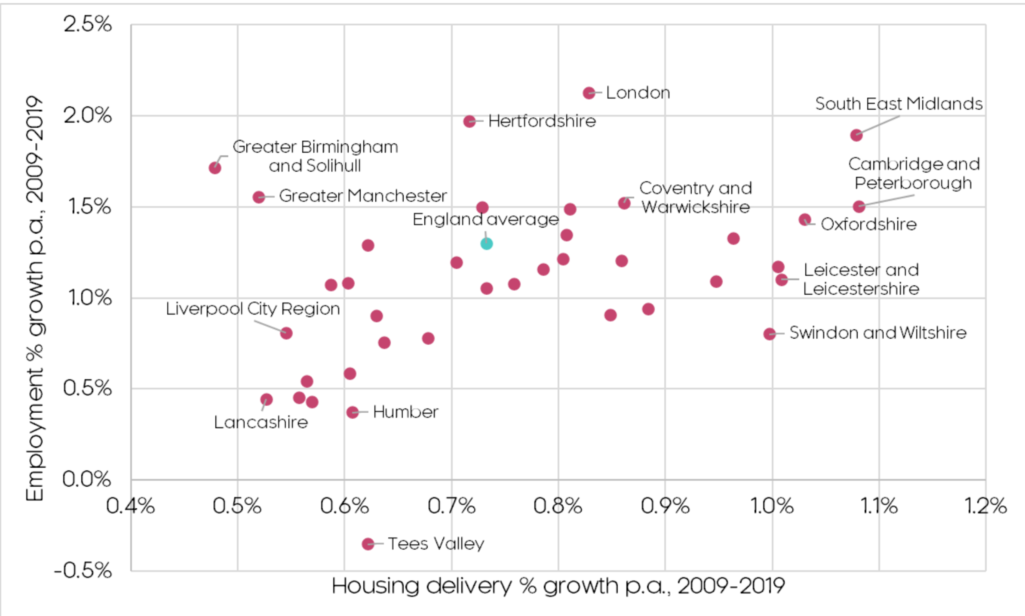
Figure 12.7.13: Employment growth and housing delivery growth across England, 1971-2019



Source: ONS, MHCLG, Cambridge Econometrics

As we have seen previously, there is a strong correlation between housing growth and employment growth. So what areas have grown the fastest since 1971, and how might this have impacted on affordability? As Figure 12.7.13 shows, Cambridge and Peterborough and neighbouring South East Midlands have emerged as the two fastest growing areas. Notably, Southern or rural LEP areas have seen faster growth than Northern or urban LEP areas, whilst London has actually grown comparatively slowly over this time period.

Figure 12.7.14: Employment growth and housing delivery growth across England, 2009-2019

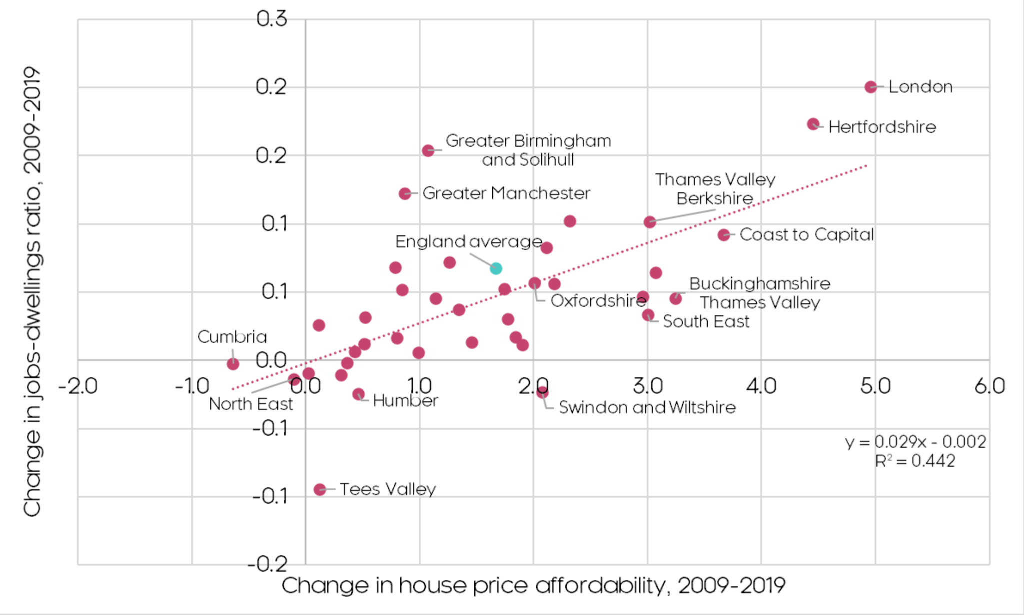


Source: ONS, MHCLG, Cambridge Econometrics

Most of these trends still hold even when looking at just look at the last decade, as shown in Figure 12.7.14. Now Cambridge and Peterborough and the South East Midlands are joined by Oxfordshire as the fastest growing LEP areas in England. Southern and rural LEP areas are still typically growing faster than Northern and urban LEP areas. Growth in London has also accelerated, particularly in employment. Some Midland and Northern LEP areas have also seen robust employment growth, but slower housing growth.

However, this scatter plot is notably less tightly bound over the shorter time period, raising the question of whether differences in the ratio of housing delivery to job creation affect affordability?

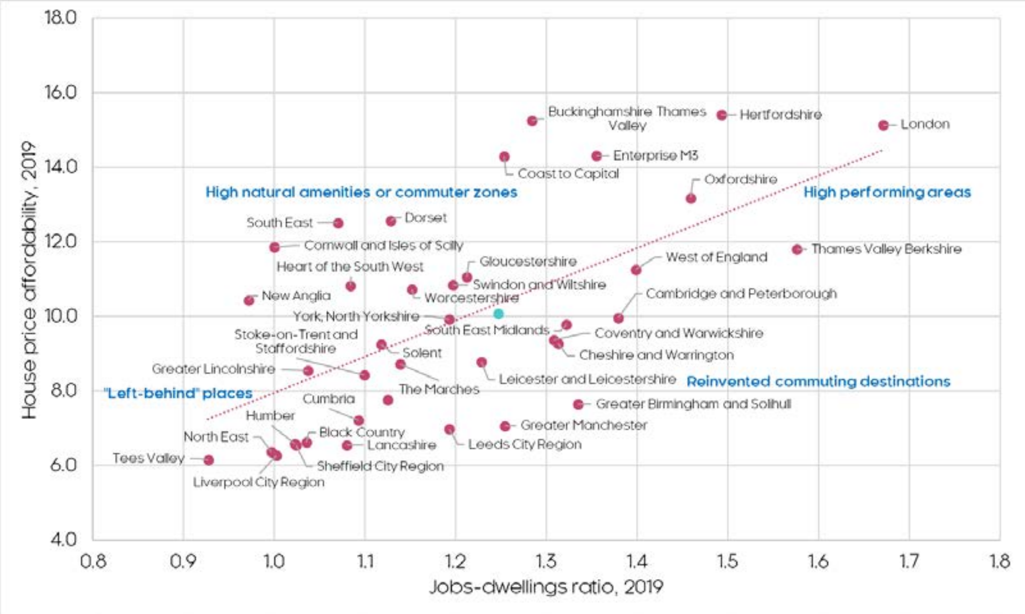
Figure 12.7.15: Changes to jobs-dwellings ratios and house price affordability across England, 2009-2019



Source: ONS, MHCLG, Cambridge Econometrics

Indeed, as shown in Figure 12.7.15, LEP areas that have created jobs faster than they have built houses over the past decade have on average seen an increase their affordability ratio (that is, a decrease in affordability). Therefore, when considering the role of local effects in determining prices, it is the interaction between employment growth and housing delivery that can contribute to determining the affordability of an area. Therefore, even given the trends identified at the national level, local economic context still matters for affordability.

Figure 12.7.16: Jobs-dwellings ratios and house price affordability across England, 2019



Source: ONS, MHCLG, Cambridge Econometrics

Reflecting the strength of this relationship, areas with similar characteristics and fundamentals also largely cluster together – as shown in Figure 12.7.16 - enabling thematic groupings to be identified:

- **'Left-behind' places**: areas experiencing long-term economic underperformance (low-growth, high unemployment, low skills), driving down prices (relative to wages) and jobs densities. Dwelling totals can appear inflated due to a higher proportion of vacant dwellings. Examples include Tees Valley, Liverpool City Region, and Humber.
- **High natural amenities or commuter zones**: typically rural and/or coastal areas with relatively low jobs densities but higher than expected prices. The latter is driven by higher local amenity values in these areas (often proxied by high tourism activity) and/or commuting proximity to major urban centres. Examples include Dorset, South East, and New Anglia.
- **Reinvented commuting destinations**: a diverse grouping of areas, historically stable or underperforming, now reinvented as leading regional economic centres with high rates of in-commuting. This results in higher jobs densities but comparatively lower – but often increasing – prices (relative to wages). Examples include Greater Manchester, Greater Birmingham and Solihull, and South East Midlands.
- **High performing areas**: areas with highly successfully and competitive economies, typically regional commuting centres, resulting in very high jobs densities. This drives substantial demand for dwellings, which alongside typically high local amenity values, results in higher prices (relative to wages). Largely found in the South, examples include London, Oxfordshire, and Hertfordshire.

Such categorisations can be beneficial for understanding local housing markets, and resultantly the effective shaping of local housing strategies.

Appendix E: Standard Method Appendix

Provided below is a copy of the Standard Method Appendix produced by Iceni Projects Limited in March 2021, referenced in *Chapter 7 Oxfordshire's Housing Need Using the Standard Method.*

OXFORDSHIRE'S MINIMUM LOCAL HOUSING NEED

The Oxfordshire Growth Needs Assessment (OGNA) has been principally prepared in 2020 and early 2021. On 25th March 2021, updated affordability ratios for 2020 were published by the Office for National Statistics. This short note explores the implications of these affordability ratios on the standard method local housing need in Oxfordshire, and the constituent authorities within it, updating the standard method calculations in the OGNA to take account of the latest data

The OGNA Phase 1 Report sets out in Section 7 that the standard method generated a minimum housing need for 3,350 dwellings per annum across Oxfordshire, and an uncapped need for 3,350 dwellings per annum (Table 7.2.2). It however identifies some issues with the input demographic projections, which result in a slight adjustment to this. It concludes on this basis by identifying a minimum need for 3,386 dwellings per annum using the adjusted baseline demographic projections in the standard method calculation (Table 7.3.1). The report then goes on to overlay scenarios for economic growth.

The local housing need figure derived from the standard method changes annually in accordance with the first two steps of the standard method calculation including (1) the 10 year period over which to assess household growth and (2) the median workplace-based affordability ratio, which is published in or around March each year. This note addresses the implications of these factors and in particular considers the effect of using the latest affordability ratio data.

The Table below sets out the latest local housing need figure for Oxfordshire using the current year to calculate the projected average annual household growth over a 10 year period - in line with step one of the standard method – and then applying the latest median workplace-based affordability ratios which were published on 25th March 2021 in line with step two.

	Cherwell	Oxford	South Ox	White Horse	West Ox	County
Step One: Setting the Baseline						
Household Growth (avg., p.a.), 2021-2031 (2014-based)	537	556	412	486	402	2,393
Step Two: Affordability Adjustment						
Median Workplace-Based Affordability Ratio, 2020	9.3	11.42	12.07	8.94	10.81	
Adjustment Factor	133%	146%	150%	131%	143%	
Minimum Local Housing Need (uncapped)	715	814	620	636	573	3,358

The standard method (using the 2014-based Household Projections) now generates a lower baseline need than that shown in the OGNA. However given the OGNA's conclusions regarding the demographic projections, greater emphasis should be given to the calculations using the adjusted baseline demographic projections. These are set out in the table below.

	Cherwell	Oxford	South Ox	White Horse	West Ox	County
Step One: Setting the Baseline						
Household Growth (avg., p.a.), 2021-2031 (Adjusted Baseline)	589	526	424	557	261	2356
Step Two: Affordability Adjustment						
Median Workplace-Based Affordability Ratio, 2020	9.3	11.42	12.07	8.94	10.81	
Adjustment Factor	133%	146%	150%	131%	143%	
Minimum Local Housing Need (uncapped)	784	769	637	729	372	3291

The OGNA Phase 1 Report treats the calculation using the adjusted demographic projections as the core standard method scenario in drawing conclusions. The updated data points to a very modest difference in the scale of need in this scenario – 3291 dwellings per annum compared to 3386 dwellings per annum, a difference of 3% - representing a scale of difference which does not represent a meaningful or statistically significant change. Iceni consider on this basis that there is no substantive impact of the latest data on the OGNA's findings.

Oxfordshire Growth Board

Oxfordshire Growth Needs Assessment

Phase 2 Report

Final Report

March 2021

Cambridge Econometrics
Cambridge, UK

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Contents

Introduction and Purpose

The Oxfordshire Councils[1] are working together to prepare the Oxfordshire Plan which will set out a development strategy for Oxfordshire to 2050.

To support the preparation of the Plan, the Oxfordshire Councils have commissioned Cambridge Econometrics and Iceni Projects to prepare the Oxfordshire Growth Needs Assessment (OGNA). The OGNA is intended to provide an integrated evidence base to help the Oxfordshire Councils identify the appropriate level and distributions of housing and employment over the period to 2050. The core objectives of the OGNA are:

- To identify a strategic level, long-term, robust and transparent methodology for assessing Oxfordshire's housing needs over the period to 2050
- To provide a detailed commentary (including the baseline position) on Oxfordshire's housing and employment market, including demographic and economic dynamics and any other key drivers of housing need and how this may change in the period to 2050.
- To identify a range of credible and robust housing need scenarios for Oxfordshire.
- To establish an informed understanding of the implications for sustainable housing growth in Oxfordshire, of the Oxford-Cambridge Arc and of any other strategically significant infrastructure and growth strategies, including proposals for strategic growth in other areas which are likely to have a significant impact in Oxfordshire.
- To identify an appropriate functional economic market area and provide an assessment of employment land requirements.
- To advise on how the Oxfordshire Plan should respond to the uncertainty associated with long-term planning for strategic housing and employment provision.

The methodology adopted, which considers scenarios for future growth in Oxfordshire, responds to this and in particular the strategic and long-term nature of the Oxfordshire Plan.

1.1 Context and nature of the Assessment

The Oxfordshire Plan will be a joint statutory spatial plan which covers a 30-year plan period from 2020 to 2050. The Plan is intended to be strategic, focusing on matters such as an overall spatial strategy for development, the integration of new development and investment in infrastructure, and how these can help to improve the quality of life for everyone.

[1] The commissioning authorities comprise Cherwell District Council, Oxford City Council, South Oxfordshire District Council, Vale of White Horse District Council and West Oxfordshire District Council.

The Plan differs from those being prepared in many other areas across England, in particular:

- The Oxfordshire Plan is a strategic plan which is being prepared on a cross-boundary basis spanning the county of Oxfordshire;
- It is looking at a much longer timeframe – a 30-year period to 2050 - than many Local Plans which typically look 15-20 years into the future. This raises issues regarding the reliability of traditional approaches to assessing development needs in some instances;
- It considers the inter-relationship between the economy and spatial planning activities;
- Oxfordshire falls within the Oxford-Milton-Keynes-Cambridge Arc which has been identified by the National Infrastructure Commission and supported by Government. There is a need for the Oxfordshire Plan to consider the strategic context provided by this, including the emerging spatial framework for the Arc, along with other Government growth initiatives and policy. Preparation of the Oxfordshire Plan also provides the opportunity to influence the Arc and shape the future strategy for this strategic corridor.

In addition, one of the major advantages of looking long-term and strategically at the strategy for development and growth is the ability to properly coordinate new development and infrastructure investment and consider what strategic infrastructure might be needed to support growth in the long-term.

These particular circumstances provide a background to the OGNA to which the Assessment seeks to respond, and are explored in greater detail in the *Phase 1 Report*.

1.2 This report

To ensure the preparation and analysis of an integrated evidence base that effectively addresses the core objectives of the OGNA, the Assessment has been divided into three complementary reports, broadly corresponding to three phases of work.

The **Phase 1 Report** provides overall growth need figures for housing and employment in Oxfordshire to 2050. It profiles local housing market, demographic, economic and commercial property market dynamics, all within the strategic policy environment. These factors are then brought together to provide trajectories for future housing and employment land needs, and resultant high-level implications for commuting and affordability.

Following on from this, the **Phase 2 Report**, presented here, considers a range of high-level scenarios for the distribution of housing and employment across Oxfordshire. The purpose of this is to aid decision-makers in understanding of the implications of alternative spatial choices. It does not seek to identify specific options or priorities for development, but rather explores the potential scale and implications of different approaches.

Finally, to reflect the emergence of the Covid-19 pandemic during the development of the OGNA, a **Covid-19 Impacts Addendum** has been produced. The Addendum gauges the probable impact and legacy of the pandemic on Oxfordshire, and the resultant implications for the evidence and observations presented in the OGNA (which largely predate the pandemic).

Therefore, it is recommended that the analysis presented in this report is read alongside the other supporting documentation of the OGNA, given their complementary coverage and interconnectedness.

In addition, a stand-alone **Executive Summary**, which highlights and brings together the key observations and messages from the three respective reports, has also been produced.

1.3 Report structure

Following on from the evidence and analysis presented in the *Phase 1 Report,* the second phase of the OGNA broadly comprises three stages of work:

- The first involves identifying and assessing the Oxfordshire Functional Economic Market Area (FEMA), including the definition of functionally meaningful sub-areas ('Zones'). This allows for more precise, in-depth exploration and illustration of employment and housing distributions to accompany the *Phase 1 Report* trajectories.
- The second stage has sought to provide this analysis, distributing the Oxfordshire-wide employment projections (derived and presented in the *Phase 1 Report*) by functional sub-area to 2050. For housing, five theoretical spatial scenarios, informed by the functional sub-areas, have also been developed and tested to distribute housing need from the *Phase 1 Report*.
- Finally, the third stage, bringing together the evidence and analysis of the previous stages, considers the implications for commuting and transport use (including differences in modal share and private vehicle trips) of the employment and housing distribution scenarios.

The remainder of this report is broadly structured around these three stages, starting with a definition and overview of the Oxfordshire FEMA and its functional sub-areas, followed by an exploration of the potential spatial distributions of economic and housing growth within the FEMA, before considering the potential implications for commuting and transport at a detailed spatial level. A summary conclusion and the accompanying appendices can be found at the end of the report.

2 The Oxfordshire Functional Economic Market Area

2.1 Introduction

Functional Economic Market Areas (FEMAs) are designed to capture the wider spatial level at which an economic market operates, given that economic activity typically extends beyond local administrative boundaries. A universal definition of FEMAs does not exist, as each local economy has different characteristics that are more relevant for inclusion in the definition of a functional economic geography.

Factors that could be considered and combined to define FEMAs include commuting patterns and the transport network; labour, housing and retail markets; supply chains; administrative areas; catchment areas of facilities providing cultural and social well-being.

This chapter presents the methodology used to define the Oxfordshire FEMA and describes the different spatial levels within it, followed by an overview of the main characteristics and trends of the FEMA. This provides a foundation for a more precise and in-depth exploration of potential spatial distributions of economic growth and housing need in Oxfordshire.

2.2 What is a Functional Economic Market Area (FEMA)?

When considering local and regional economies, one of the key features of interest is the spatial distribution of the economy, or the way in which different economic interactions are transacted at different spatial scales. There is an appetite within the economic and public policy spheres to define, measure and categorise these interactions as being associated with discrete spatial areas, and as such the notion of a *"Functional Economic Market Area"* or *"FEMA"*, originates.

The Government's Planning Practice Guidance (PPG) on FEMAs identifies no standard approach to defining a functional economic market area. However, the Department for Communities and Local Government (DCLG, now MHCLG) previously provided more complete guidance on identifying a Functional Economic Market Area[2], which they define in simple terms as being *"the area over which the local economy and its key markets operate"*.

Although this theoretical definition of a FEMA is clear, the pragmatic steps required to identify one empirically are ambiguous. As the DCLG guidance goes on to say (page 3):

> *"There is no universal approach to defining FEMAs. A city's labour market area and hospital catchment area, for example, are unlikely to have similar boundaries. Ideally, FEMAs would be defined on the basis of several markets or catchment areas which best reflect the drivers of the local economy."*

[2] Department for Communities and Local Government. (2010). Functional Economic Market Areas: An economic note

DCLG goes on to propose four key markets that need to be considered:

- Labour Markets
- Housing Markets
- Service Markets
- Firm to Firm Supply Chains

Transport networks are also identified by the DCLG as a relevant consideration. Nevertheless, there is an argument that a transport network is not an economic market and to include it would be to introduce an element of double counting of its influence – as transport networks will influence the distribution of the four primary markets, rather than contributing directly to the local economy. These thematic areas also reflect those identified in the Planning Practice Guidance.

Any definition of a regional or city-scale FEMA must be understood both within the context of the presence of nationally significant tradable sectors within the economy and their position within larger national and international markets, and also to the extent that it will necessarily contain a series of smaller clusters of activity within which more localised transactions take place.

However, there is no single spatial scale around which this can be defined in a straightforward manner, but rather as a hierarchy of scales, over which the separate spatial patterns of transactions between workers, firms and consumers play out.

In order to construct an overall spatial definition of a FEMA, a judgement call is required as to the relative weightings of the four markets and their particular spatial characteristics. In reality, all local economic areas operate within multiple economic markets simultaneously, and any solid line drawn on a map must be understood as a useful approximation within this context.

Finally, the 2010 DCLG note recognises the importance of being able to approximate FEMAs to existing administrative boundaries where possible for reasons of strategy and policy design and implementation. A further consideration is data availability and quality, which are often if not exclusively produced along administrative boundaries.

2.3 Defining the Oxfordshire FEMA

Spatial areas within Oxfordshire

Definition of the FEMA starts by identifying the economic and residential centre of the county of Oxfordshire, which constitutes two concentric spatial areas, as shown in Figure 2.3.4:

- **Oxford City Centre**: the area with the highest concentration of economic activity, as well as central urban amenities.
- **Oxford City Fringe**: the area surrounding the City Centre, characterised by moderate employment and population density, a high degree of integration with and connectivity to the City Centre, and the presence of important urban fringe sites, such as science parks and large suburbs.

The remaining portion of the County is currently shown as the *Wider County*. This is characterised as the spatial area with stronger economic links to Oxford City Centre and City Fringe than to any other neighbouring settlement, for example Reading, Swindon or Milton Keynes. The following analysis describes in more detail how the different spatial levels within Oxfordshire are defined.

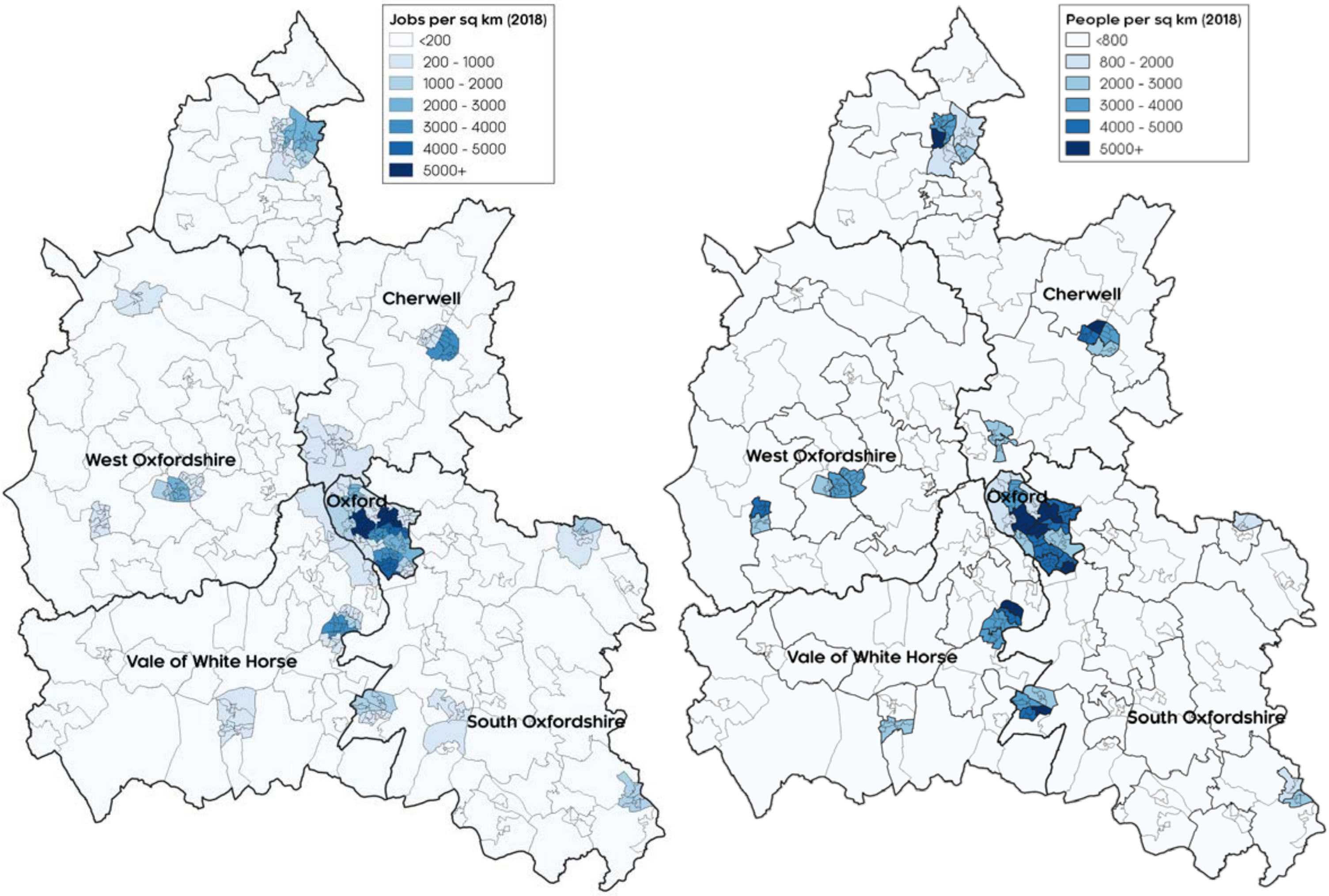
Population and employment density in Oxfordshire

Figure 2.3.1 maps population and employment density by Lower Super Output Area (LSOA – broadly equivalent to a neighbourhood[3]) in Oxfordshire. It is evident that the Oxford local authority district (LAD) is the economic and residential centre of the county, while smaller settlements with (relatively) high concentrations of either/both economic and residential activity include:

- Bicester and Banbury in Cherwell
- Witney and Carterton in West Oxfordshire
- Abingdon in the Vale of White Horse
- Didcot in South Oxfordshire[4]

Figure 2.3.1 also shows that employment is more concentrated and less evenly distributed in Oxfordshire compared to population, with fewer high-density areas outside the Oxford LAD. These are also located primarily in or close to the main urban centres listed above.

Figure 2.3.1: Population and employment density by LSOA in Oxfordshire, 2018



Source: ONS, Cambridge Econometrics.

[3] For an overview of how these geographies are defined see: ONS Census geography

[4] Note that Didcot's main employment area, Milton Park, is located in Vale of White Horse

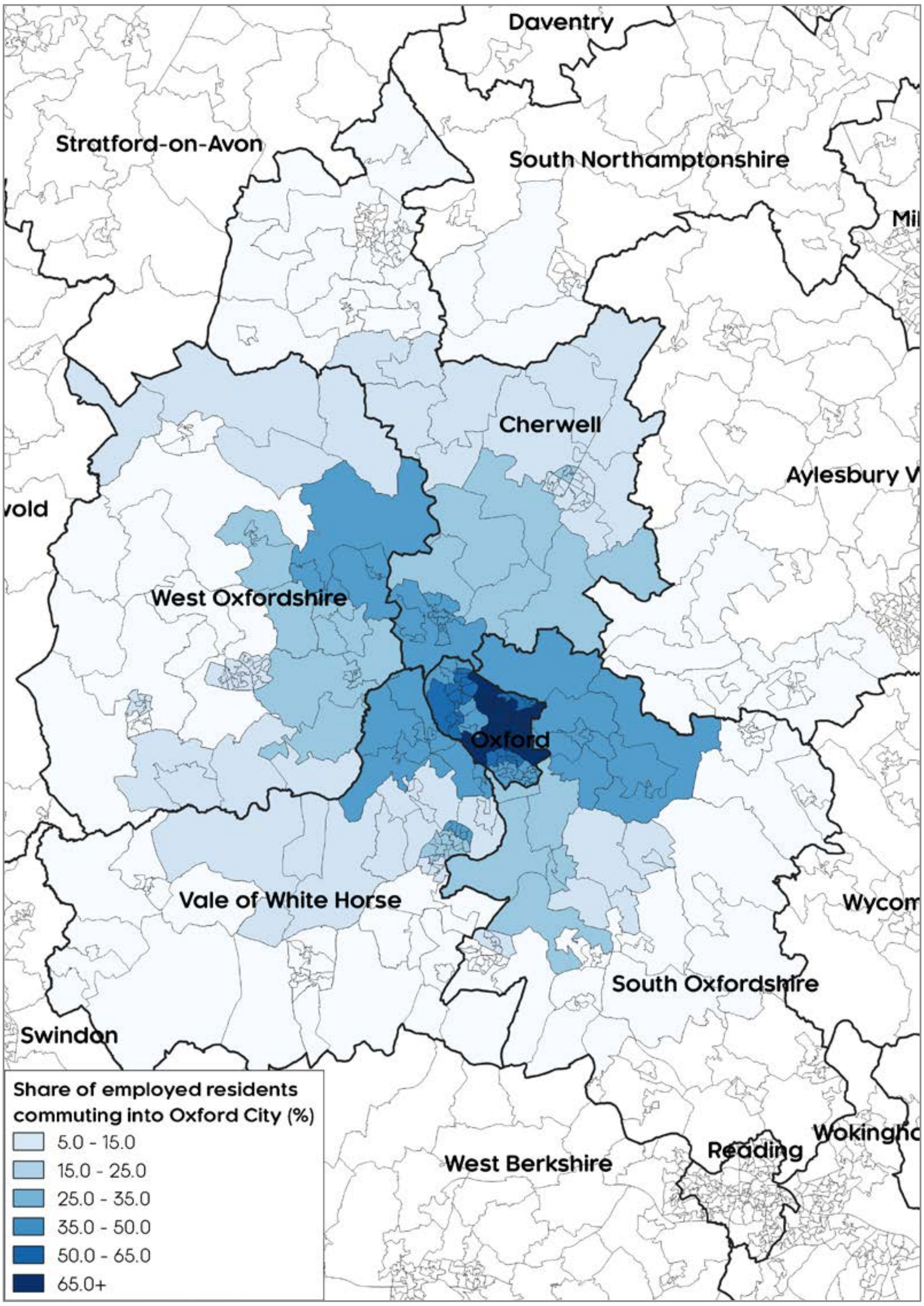
Definition of the City Centre

Based on the above analysis, the City Centre has been defined as the combination of contiguous LSOAs within the Oxford LAD with an employment density of at least 3,000 jobs per km^2. A map of the City Centre's extent is presented in Figure 2.3.4.

Definition of the City Fringe

Figure 2.3.2 shows the share of employed residents that work in the Oxford City Centre for each LSOA within Oxfordshire. This provides the baseline for defining the City Fringe, with areas of high connectivity to the City Centre – defined as LSOAs with at least 15% of employed residents commuting to the City Centre for work – providing the initial scope for the City. Note that Census 2011 data is the most recently available source of detailed origin-destination

Figure 2.3.2: Share of employed residents commuting to Oxford City Centre, 2011



Source: ONS (Census 2011), Cambridge Econometrics.

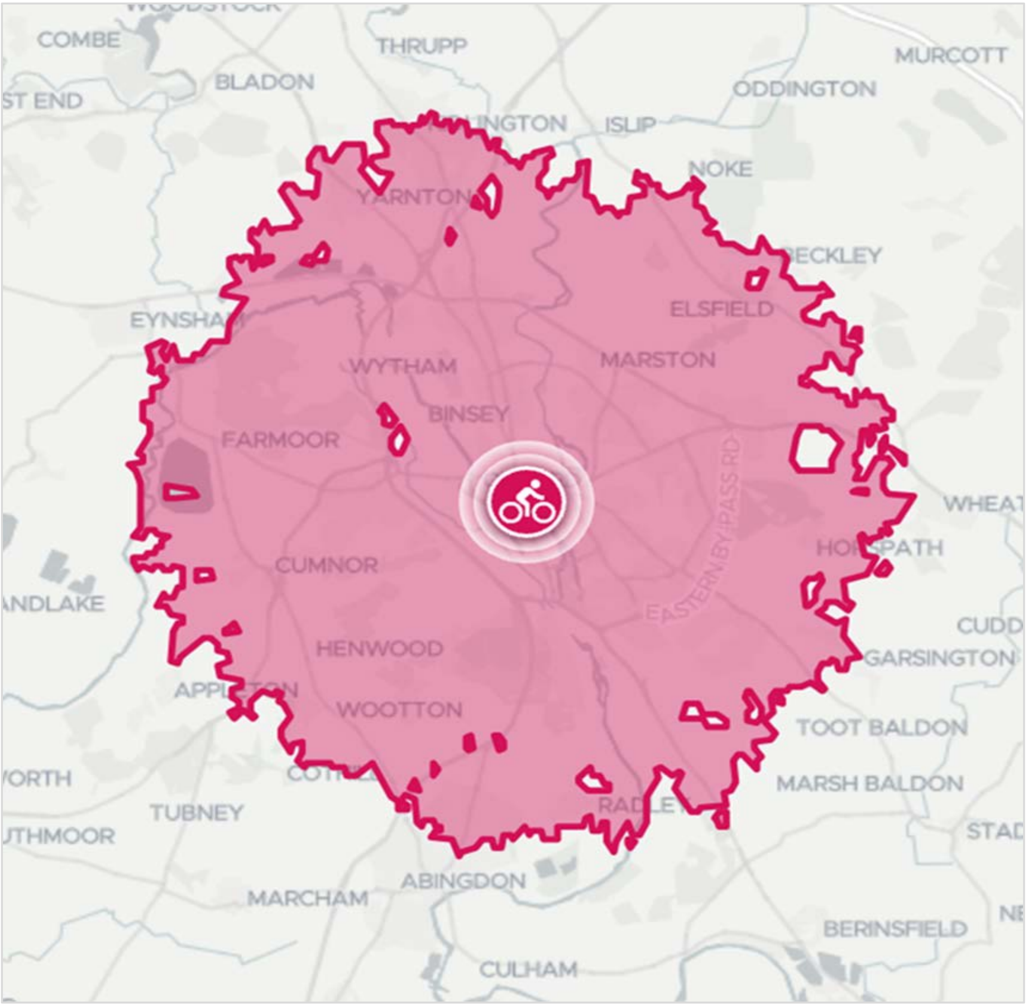
commuting data, though significant jumps or changes in the data are rare between Census years.

In order to further enhance understanding of areas with high accessibility to the central market in Oxford, Figure 2.3.3 shows the areas that are within a radius of 30 minutes cycling from the City Centre. This is a simple proxy meant to capture areas that are intrinsically close to the City Centre, rather than well-connected to it.

Notably, this area within this radius stretches beyond the contiguous urban area to include some significant portions of green belt land, alongside several important urban assets in and around Oxford City Centre, including the:

- University of Oxford
- Oxford University Hospitals (notably John Radcliffe and Churchill)
- Westgate Oxford Shopping Centre
- Oxford Railway Station
- Oxford Parkway Station
- Oxford Brookes University
- Oxford Science Park
- Oxford Business Park
- MINI Manufacturing Plant
- Begbroke Science Park
- London-Oxford Airport

Figure 2.3.3: Area within 30 minutes cycling of the centre of Oxford

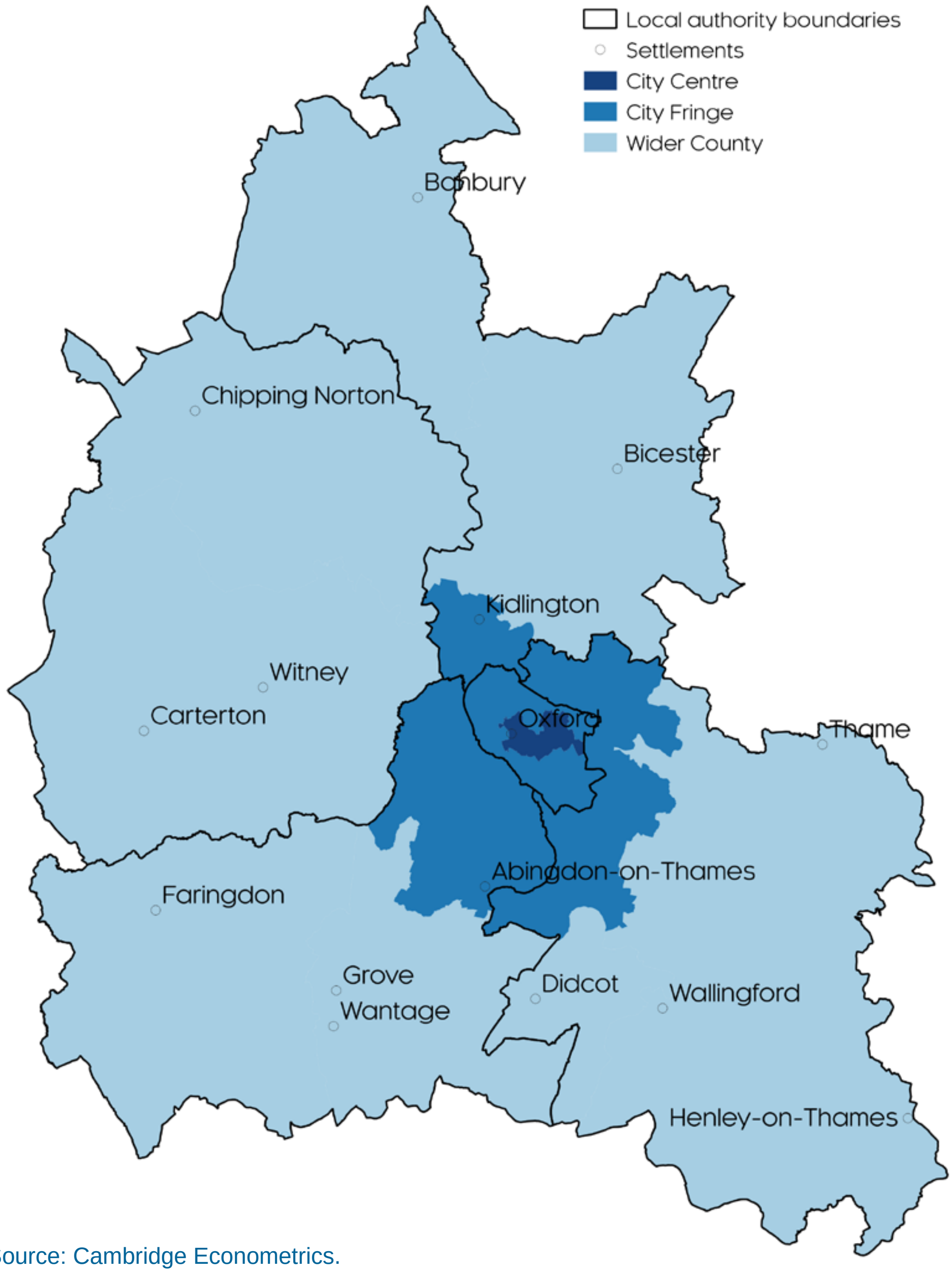


Source: Cambridge Econometrics, app.traveltimeplatform.com.

Based on Figure 2.3.3, the set of areas is expanded to include in the baseline City Fringe definition (informed by Figure 2.3.2) to include five LSOAs in the Vale of White Horse and one LSOAs in South Oxfordshire. This incorporates the wider functional urban area of the Oxford economy.

Figure 2.3.4 illustrates the primary spatial levels within Oxfordshire; the City Centre and City Fringe - as defined above - and the Wider County – encompassing the areas within Oxfordshire not included in the first two definitions. This broadly covers the dependent economic hinterland surrounding Oxford.

Figure 2.3.4: Primary spatial levels of the Oxfordshire FEMA



Source: Cambridge Econometrics.

Local markets analysis

Defining the Oxford City Centre and City Fringe has been the first step to identifying the Oxfordshire FEMA. The definition of the FEMA is also based on analysis of the local labour and housing markets, as well as the availability and distribution of public services around Oxford City, which are explored in more detail below.

Labour market

Obtaining a grasp of the extent of the local labour market is key when defining a FEMA. This can be achieved by analysing commuting flows of employees between different areas. A high level of commuting flows between areas is an indication that they belong to the same labour market.

Figure 2.3.2 illustrated commuting flows from each Oxfordshire LSOA into Oxford City. Apart from some LSOAs in the periphery parts of Oxfordshire, there is a significant degree of commuting into Oxford City from all around the county – for many areas outside the City Fringe, on average at least 1 in 10 residents commute into the City Centre. As expected, commuting numbers drop as the distance and travel time to Oxford City increases; however, the decline is quite smooth.

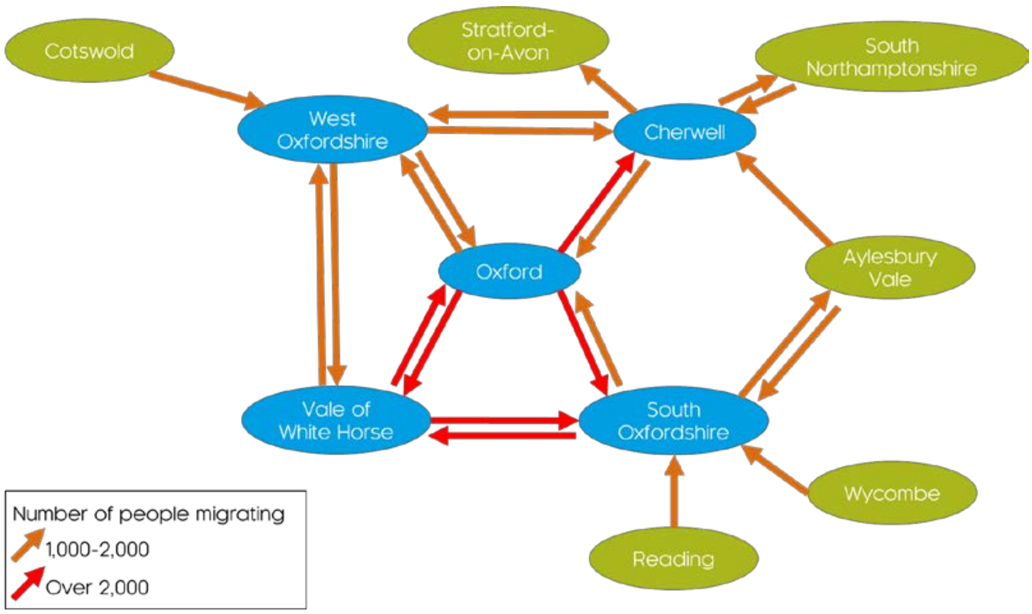
It is evident that most commuting to Oxford City occurs from within Oxfordshire, with few LSOAs having more than a 5% threshold outside the County. Hence, the Oxfordshire labour market seems to extend to most of Oxfordshire and few surrounding areas, providing an indication that the County could be a suitable approximation of the Oxfordshire FEMA.

Chapter 5 goes into greater detailed on commuting patterns within Oxfordshire, beyond that required to define the FEMA.

Housing market

High levels of migratory movements between two adjacent LADs indicates that those districts have a particularly strong functional connection as part of the same overall housing market. To gauge the extent of the housing market, consideration has been given to internal migration patterns between LADs in Oxfordshire and neighbouring LADs for the period 2016-18 – the most recently available years of data, averaged over two years to smooth any outliers and fluctuations.

Figure 2.3.5: Internal migration flows between Local Authority Districts in Oxfordshire, 2018



Source: ONS, Cambridge Econometrics.

These are depicted in Figure 2.3.5. The data shows flows (both inflows – entering Oxfordshire, and outflows – leaving Oxfordshire) between LADs within Oxfordshire are more frequent and larger in size compared to flows outside the County. This corroborates the findings from the *Phase 1 Report* migratory analysis and that of the labour market analysis, namely that a largely self-contained economic market operates within Oxfordshire.

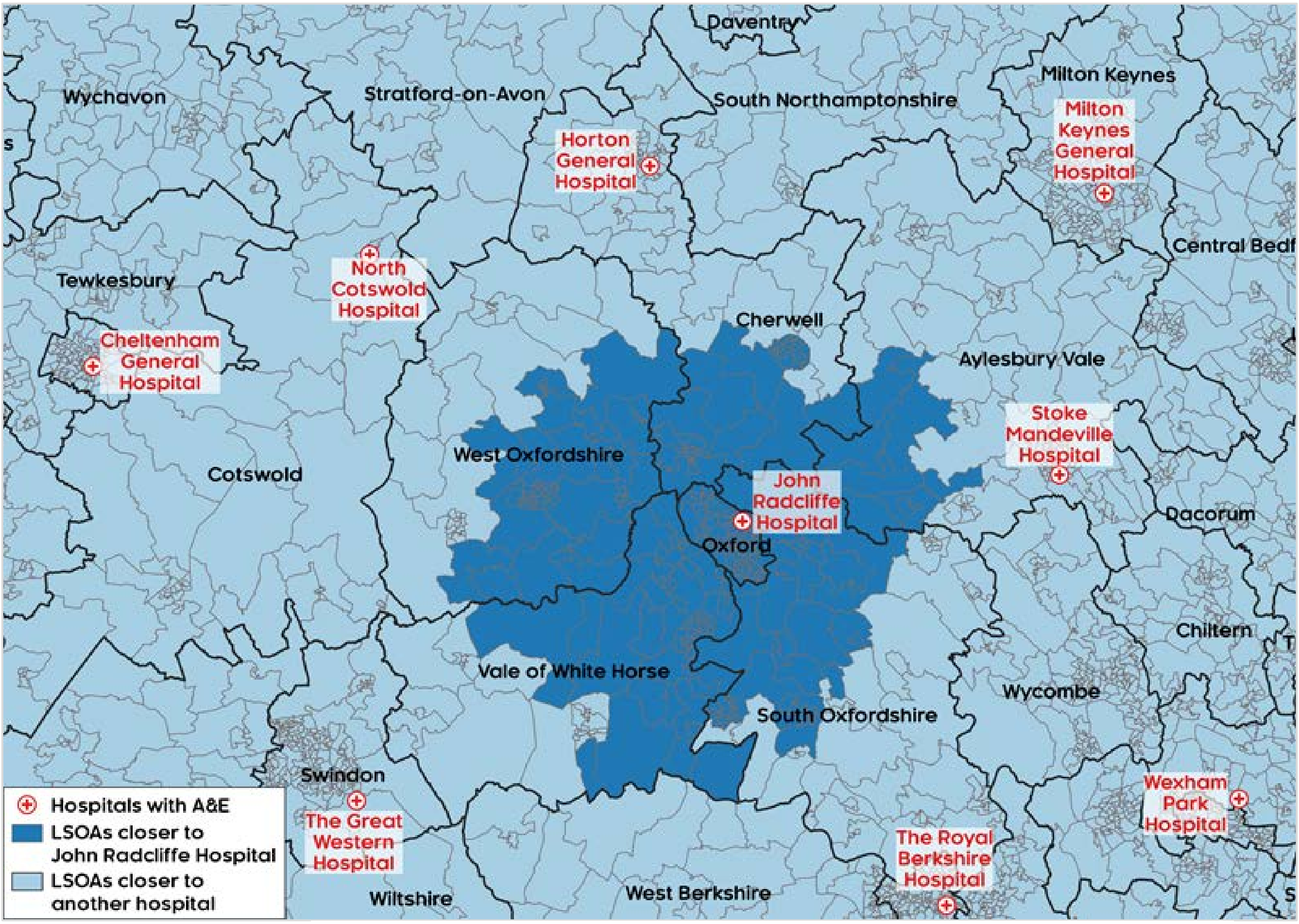
Externally to Oxfordshire, flows of greater than 1,000 people per annum were found from Cotswold, Stratford-on-Avon, South Northamptonshire, Aylesbury Vale, Wycombe and Reading – areas which typically shared a contiguous border with Oxfordshire. Other areas nearby, such as Milton Keynes or Swindon, had flows of less than 1,000 people and hence are not shown on the schematic.

Public services

Access to public services is an important tool to identifying a FEMA. As the DCLG suggests: *"Although mobility rates have increased considerably, the principle that people access services at their nearest location still largely holds. This leads to the presence of a large number of frequently used services, and a smaller number of higher order services. On this basis FEMAs can be identified by analysing travel patterns to higher order services, which have a wider catchment area"*.[5]

As a proxy for the location of higher-order services, consideration has been given to the location of hospitals with an Accident and Emergency (A&E) unit.

Figure 2.3.6: Location of hospitals with full A&E in Oxfordshire and surrounding areas



Source: Cambridge Econometrics.

[5] DCLG (2010), p. 6.

As noted above, the area near a hospital with A&E responsibility is likely to be at a well-connected centre close to other services as well, such as leisure and entertainment facilities, retail markets and other public services (particularly 'blue light' services, which themselves are typically located close to the aforementioned assets).

Figure 2.3.6 above shows the location of hospitals with a full A&E unit in Oxfordshire and surrounding areas. The dark blue shaded area consists of the LSOAs that are closer to the John Radcliffe Hospital in Oxford City rather than any other hospital and represents the hospital's catchment area. This area covers both the Oxford City Centre and Fringe, as well as many LSOAs of the Wider County, while the outer edges of the county seem to be better served by other hospitals. Furthermore, except for two LSOAs in Aylesbury Vale, most of the catchment area is included within Oxfordshire.

What is the extent of the Oxfordshire FEMA?

As also pointed out by the DCLG in the same document, economic flows and markets often overlap administrative boundaries. Hence, the Oxfordshire FEMA could extend beyond the Oxfordshire County limits. Furthermore, a degree of overlap between FEMAs may exist, as certain areas within a FEMA could have significant connections to neighbouring FEMAs as well.

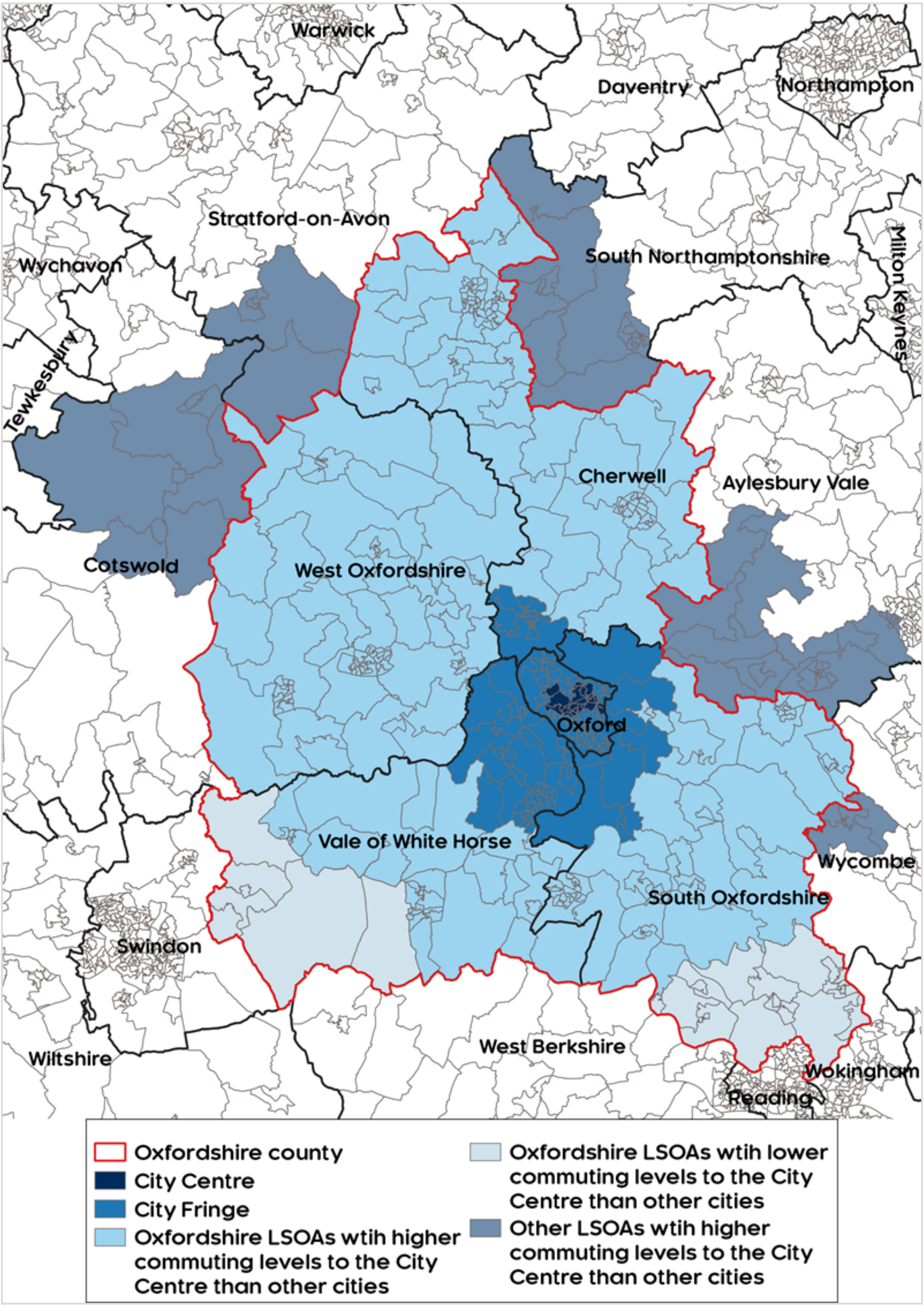
To address this, analysis has been undertaken looking at commuting patterns to/from neighbouring local authorities that contain important settlements and economic markets; namely Milton Keynes, Reading and Wokingham (combined, as they constitute a single labour market) and Swindon. These will function as proxies for the corresponding FEMAs.

Figure 2.3.7 below depicts LSOAs where the share of employed residents commuting to Oxford City is higher than the share commuting to the local authorities listed above. The vast majority of LSOAs within Oxfordshire have a higher share of their employed residents commuting into Oxford City rather than any of the neighbouring FEMAs, with the exceptions of five LSOAs in South Oxfordshire and one in the Vale of White Horse.

Furthermore, there are few LSOAs outside Oxfordshire that satisfy this condition and have at least 2% of their residents commuting into Oxford City, though the levels of commuting for these LSOAs are quite low (always less than 10%).

As Figure 2.3.7 reiterates, the local labour market of the Oxfordshire FEMA is therefore largely confined within the boundaries of the county of Oxfordshire. A small number of LSOAs strictly outside the FEMA may have more functional ties to Oxford (though this is marginal – with no more than 1 in 10 employed residents in these areas commuting into Oxford), but this is counterbalanced by a handful of LSOAs to the south of the county who overlap other FEMAs (though again, the commuting shares are marginal).

Figure 2.3.7: Areas with a higher share of employed residents commuting into Oxford City rather than neighbouring large cities, 2011



Source: ONS (Census 2011), Cambridge Econometrics.

Definition of the Oxfordshire FEMA

Based on the analysis in this chapter thus far, it can be determined that the county of Oxfordshire is an accurate proxy for the Oxfordshire FEMA. An added benefit of using this definition of the FEMA is ensuring data availability and quality for further analysis of the economic performance of the FEMA, as many indicators (critically, those relating to economic performance and welfare) are consistently available only at more aggregated spatial levels.

Functional Market areas tend to be relatively stable over time, expanding, stretching and contracting only as the result of changes in the relative growth of different urban cores or significant infrastructure interventions. The growth of the Oxfordshire FEMA is constrained in several directions by neighbouring urban centres, and in others by a lack of infrastructural provision.

The full opening of East-West Rail could see the FEMA extend further to the east into the Aylesbury Vale district; however the overall shape and size of the FEMA is unlikely to shift significantly over the coming decades. Likewise, many of the aforementioned indicators used to infer FEMA scope remain relatively stable overtime.

2.4 Spatial levels of the Oxfordshire FEMA

The three main spatial levels of the Oxfordshire FEMA identified in *2.3 Defining the Oxfordshire FEMA* were Oxford City Centre, Oxford City Fringe and the Wider County (see Figure 2.3.4). In order to obtain a more refined spatial classification and to facilitate more-detailed analysis of the FEMA, additional subdivisions (or 'Zones') have been identified and defined.

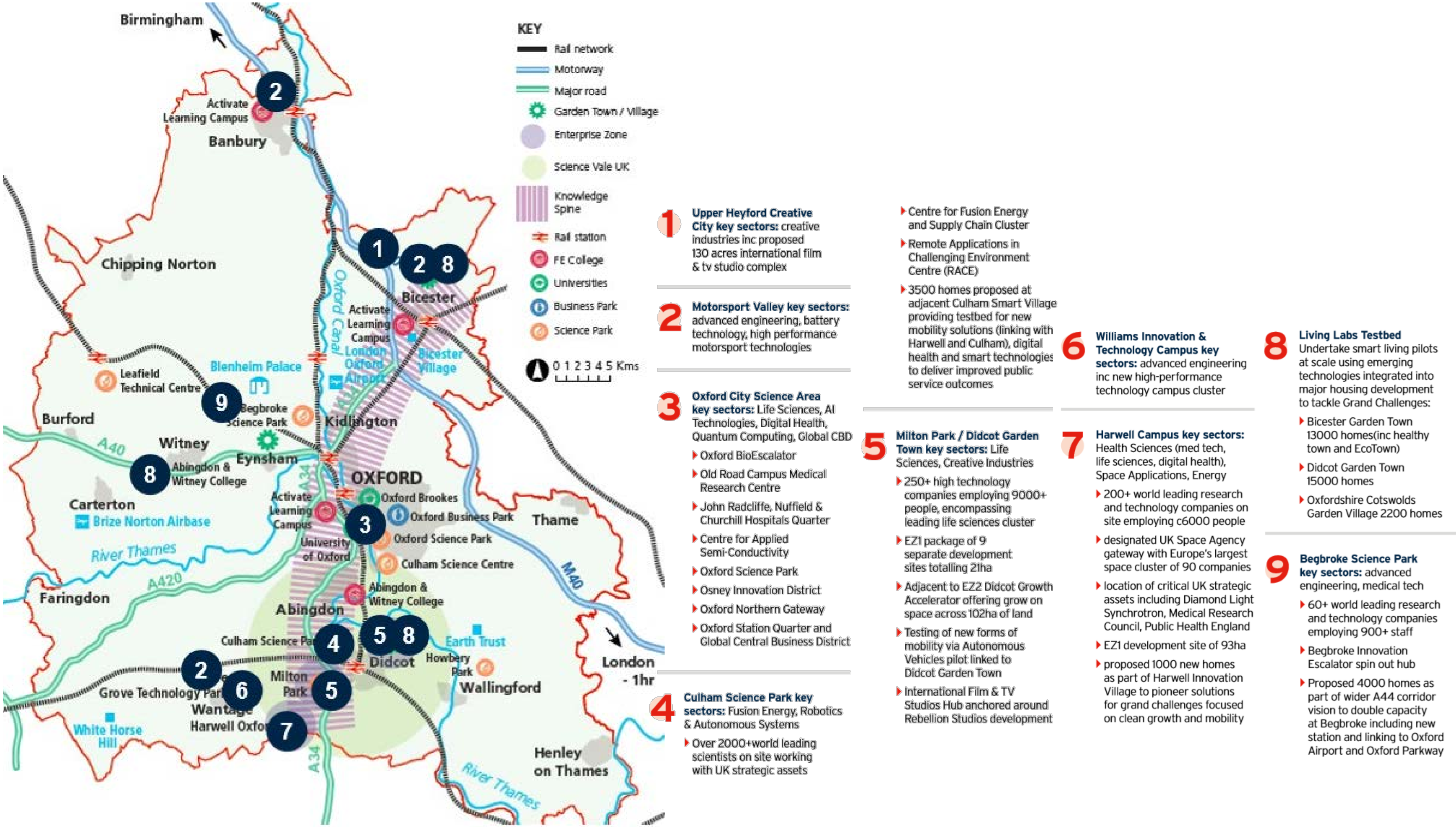
The first of these is based on the presence of the *"Knowledge Spine"* within Oxfordshire, an area of high, globally recognised innovation and knowledge activity, identified in the Oxfordshire Local Industrial Strategy (LIS).[6] This *"Knowledge Spine"* runs through the centre of the FEMA, largely along the A34 corridor, incorporating Didcot, Abingdon, Oxford, Kidlington, and finally Bicester.

The LIS regards the area as one of strategic importance for the county, being *"home to several science, innovation, technology and business parks that form a spine of knowledge intensive economic activity."*[7] Figure 2.4.1, taken directly from the LIS, highlights the distribution of the *"Knowledge Spine"* within Oxfordshire and its key knowledge assets. Over two-thirds (63%) of the FEMA's total employment is located within this *"Knowledge Spine"*.

[6] HM Government (2019), Oxfordshire Local Industrial Strategy

[7] Oxfordshire LIS (2018), Economic Baseline, p. 52

Figure 2.4.1: Knowledge activity and assets in Oxfordshire



Source: Oxfordshire Local Industrial Strategy.

Given that the Knowledge Spine covers a large and diverse part of the FEMA, and crosses the previously defined City Centre and City Fringe spatial areas, additional subdivisions have been identified. This has been achieved by drawing on the distribution of activity in Figure 2.4.1 and additional LIS analysis[8] to differentiate between its characteristic parts:

- Oxford City Centre and Fringe: This part corresponds to the Oxford City Centre and the City Fringe, with Oxford and Abingdon-on-Thames the primary settlements. It has the highest concentration of innovation and knowledge assets, including the University of Oxford, Oxford Science Park, Begbroke Science Park, Culham Science Campus and the Oxford University Hospitals.
- Knowledge Spine North: The area to the north-northeast of Oxford City, with Bicester being the largest settlement, while the Bicester Innovation Centre and the Cherwell Innovation Centre are the main knowledge assets. A key connectivity hub in Oxfordshire, this area includes access to the M40, A34/A41 and East-West rail.
- Knowledge Spine South: This part of the Spine largely corresponds to the area identified as the *"Science Vale"* in strategic documents and commercial brochures (including Local Plans and the LIS), a *"grouping of internationally-recognised science and research facilities".*[9] Didcot and Wantage are the main settlements, and knowledge assets include Milton Park, the Harwell Innovation Centre, and Grove Technology Park.

To further aid the analysis of the Oxfordshire FEMA, the Wider County that remains outside both the Knowledge Spine and City Centre and Fringe has been split into three roughly equal parts ('Zones') of comparable employment levels and economic functionality, the latter of which has been derived from commuting flows and self-containment rates. Applying this analysis, the following areas have been derived:

- County East: comprising the farthest eastern and southern parts of the county. This area includes rural areas as well as the settlements of Thame, Henley, and parts of Wallingford.
- County North: incorporating the largely rural north west of the county, including the larger settlement of Banbury, and the market towns of Chipping Norton and Charlbury.
- County West: including the settlements along the A40 to the west, such as Witney, Carterton and Burford, and the rural south west of the county, around Faringdon.

Figure 2.4.2 illustrates the different Zones of the Oxfordshire FEMA, which have been based on the methodology and approach of the previous analysis. It should be emphasised that the designation of these subdivisions are not intended to suggest these areas are fundamentally dissimilar or unconnected in any way, nor that the characteristics upon which they are based are in any way fixed.

[8] Notably *Section 5.2 The Spatial Vision* from the Oxfordshire LIS' Future State Assessment (2018)

[9] Oxfordshire LIS, Future State Assessment, p. 11

Because of this, administrative boundaries have not been taken into account (though are included in the figure for reference). It should be also be noted that these Zones are purely illustrative, to allow for a better spatial understanding of housing need in relation to economic trends, and they do not represent specific options or priorities for the distribution of development.

Figure 2.4.2: Spatial levels of the Oxfordshire FEMA

Source: Cambridge Econometrics.

2.5 Characteristics and trends within the Oxfordshire FEMA

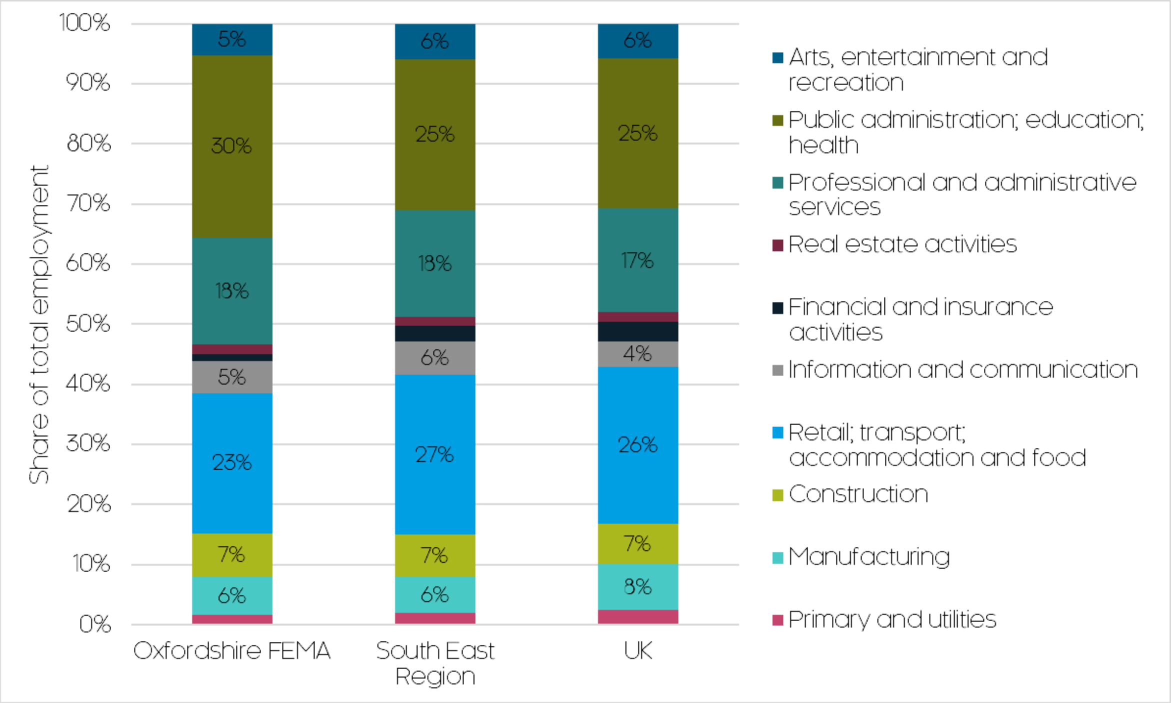
The *Phase 1 Report* goes into extensive detail on the characteristics and recent performance of the Oxfordshire economy and housing market. This analysis is presented primarily at the county level, which corresponds to the definition of the Oxfordshire FEMA explored earlier in the chapter.

The following analysis therefore provides a summary, high-level overview of the corresponding trends at the Zonal level within the Oxfordshire FEMA - to complement the extensive higher-level analysis of the *Phase 1 Report* - looking specifically at the sectoral structure, employment trends, and housing growth within the FEMAs Zones.

Sectoral structure of the FEMA

Figure 2.5.1 provides an overview of the broad sectoral structure of employment (i.e. jobs) in the Oxfordshire FEMA in 2018 (the most recently available year of data), compared to that of both regional (the South East region) and national (UK) averages.

Figure 2.5.1: Sectoral structure of the Oxfordshire FEMA, and relative to peers, 2011



Source: ONS, Cambridge Econometrics.

Of the 410,000 jobs currently located in the Oxfordshire FEMA, the majority (over two-thirds) can be found in three of these broadly defined sectors - public administration; education; health (30% of total jobs), retail; transport; accommodation and food (23%), and professional and administrative services (18%).

Beyond these three activities, no other sector surpasses a greater than 10% share of employment, with the remaining shares ranging from 2% to 7%. The four smallest sectors in terms of employment, with shares below 2%, are primary and utilities (including agriculture), financial and insurance activities, and real estate activities.

It should be noted that these broad sectoral shares are not significantly dissimilar from regional and national averages. The Oxfordshire FEMA does deviate from these averages for some sectors though. Most notable is that of public administration; education; health, which has a significantly higher employment share than both the regional and national average.

Other overrepresented activities include knowledge-intensive services, such as professional and administrative services and information and communication, as well as construction. The remaining sectors are, relatively speaking, underrepresented, with the largest shortfall within retail; transport; accommodation and food, broadly covering consumer services.

Analysis of sectoral employment trends within the Oxfordshire FEMA over the period 2011-18, presented in Table 2.5.1, show that:

- Three sectors experienced an employment decline, thereby decreasing their share of employment in the Oxfordshire FEMA. Notably, all three of these sectors declined at a faster rate than that of the regional (South East) average.
- Three sectors experienced positive employment growth, increasing their contribution to the FEMA, though this growth was slower than that of the regional average.
- Four sectors experienced further positive employment growth, increasing their contribution to the FEMA, and grew at a rate above that of the regional average.

Table 2.5.1: Changes in the sectoral structure of the Oxfordshire FEMA relative to the regional average, 2011-18

Share of FEMA employment	Change in employment (jobs)	Sector	Employment (jobs) growth rate (%)
Decreased	More than regional average	Primary and utilities	-10.4%
		Manufacturing	-2.0%
		Financial and insurance activities	-17.4%
	Less than regional average	None	-
Oxfordshire FEMA average			**10.4%**
Increased	Less than regional average	Retail; transport; accommodation and food	5.3%
		Professional and administrative services	13.9%
		Arts, entertainment and recreation	1.9%
	More than regional average	Construction	41.1%
		Information and communication	22.9%
		Real estate activities	12.4%
		Public administration; education; health	12.0%

Source: ONS, Cambridge Econometrics.

The *Phase 1 Report* goes into greater detail exploring the drivers and longer-term trends shaping Oxfordshire FEMAs changing structural structure. It also considers the future trajectory of the FEMA sectors and employment, and the potential implications for housing and employment land needs.

Sectoral structure of FEMA Zones

The analysis below replicates the previous headline analysis for each of the FEMAs respective Zones.[10] Figure 2.5.2 considers the relative Zonal sectoral structures within the FEMA, whilst Figure 2.5.3 compares the Zonal shares of

[10] Zonal employment data has been primarily derived from ONS BRES employment estimates (which are available to LSOA/LSOA), but with an adjustment for self-employment, HM Armed Forces, and government supported trainees, to align with the FEMA-wide employment estimates presented in the *Phase 1 Report*.

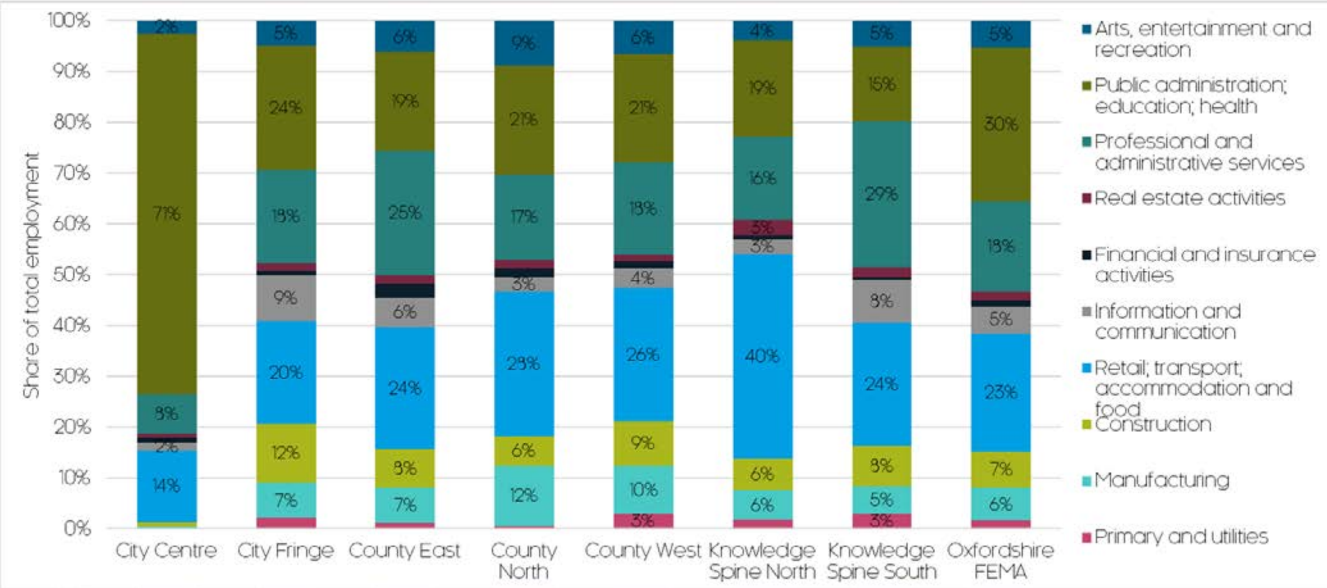
the FEMAs sectoral and total employment. Here, local sectoral specialisms become apparent. The key characteristics for each Zone are:

- **City Centre:** is dominated by public administration; education; health, which accounts for almost three-quarters (71%) of total employment in the Zone. Retail; transport; accommodation and food, and professional and administrative services are the only other sectors with shares exceeding 2%. *19% of total FEMA employment (76,500 jobs) is located in this Zone.*
- **City Fringe:** has arguably the most diverse sectoral structure, with no sector accounting for more than a quarter of employment. Public administration; education; health (24%) and retail; transport; accommodation and food (20%) account for the highest shares. Professional and administrative services (25%) form part of the sizeable KIBS[11] sector in the Zone. It also has the largest information and communication share (9%) in the FEMA. *26% of total FEMA employment (108,000 jobs) is located in this Zone.*
- **County East:** two sectors account for almost half of total employment in this Zone – professional and administrative services (25%) and retail; transport; accommodation and food (24%). Forming part of its extensive KIBS sector, the Zone also has the highest share of finance and insurance activities (3%). *12% of total FEMA employment (47,500 jobs) is located in this Zone.*
- **County North:** has high employment shares for and retail; transport; accommodation and food (28%), and public administration; education; health (21%). Notably, within the FEMA this Zone has the highest shares of manufacturing activity (12%) and of the arts, entertainment, recreation and other services (9%).*13% of total FEMA employment (55,300 jobs) is located in this Zone.*
- **County West:** has a sectoral structure that deviates the least from the FEMA-average of all Zones. Retail; transport; accommodation and food (26%), and public administration; education; health (21%) are therefore its largest sectors. Manufacturing (10%) and construction (9%) remain sizeable, whilst it also has the joint-highest share of primary (agricultural) and utilities (3%). *12% of total FEMA employment (50,400 jobs) is located in this Zone.*
- **Knowledge Spine North:** as part of the Knowledge Spine, 20% of jobs are KIBS-based. Yet the highest employment share is for the sizeable retail; transport; accommodation and food sector (40%), which is centred around Bicester Village. The share for this sector is almost twice the FEMA average. *7% of total FEMA employment (30,100 jobs) is located in this Zone.*
- **Knowledge Spine South:** encompassing the Science Vale area, an impressive two-fifths of Zonal employment is in the KIBS sector. The largest of these is professional and administrative services (29% - twice the FEMA average), followed by information and communication

[11] Knowledge Intensive Business Services. An aggregate of the *Professional, scientific and technical*, *Finance and insurance* and *Information and communication* sectors. Abbreviated as *KIBS*.

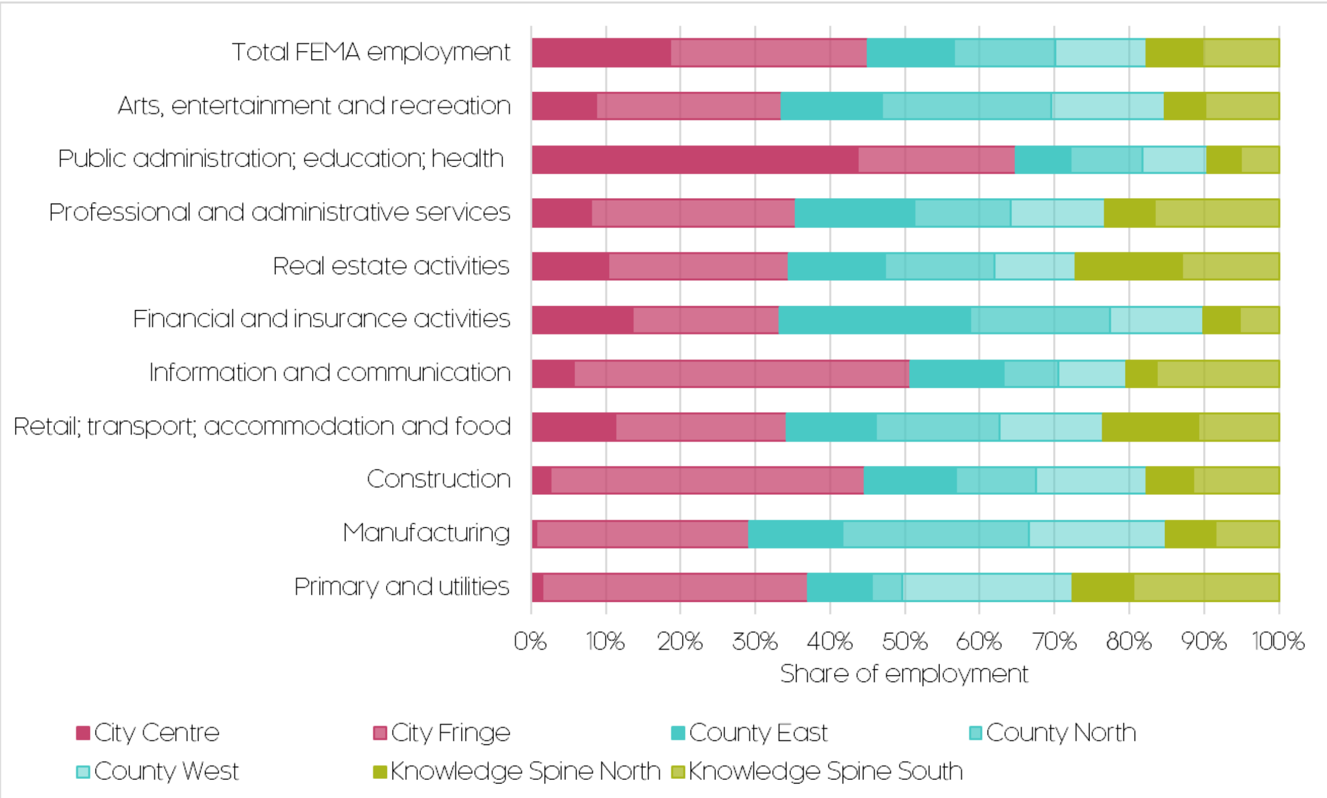
(8%). Retail; transport; accommodation and food remains significant (24%). *10% of total FEMA employment (42,300 jobs) is located in this Zone.*

Figure 2.5.2: Sectoral structure of the Oxfordshire FEMAs Zones, 2018



Source: ONS, Cambridge Econometrics.

Figure 2.5.3: Zonal shares of sectoral employment (jobs) in the Oxfordshire FEMA, 2018



Source: ONS, Cambridge Econometrics.

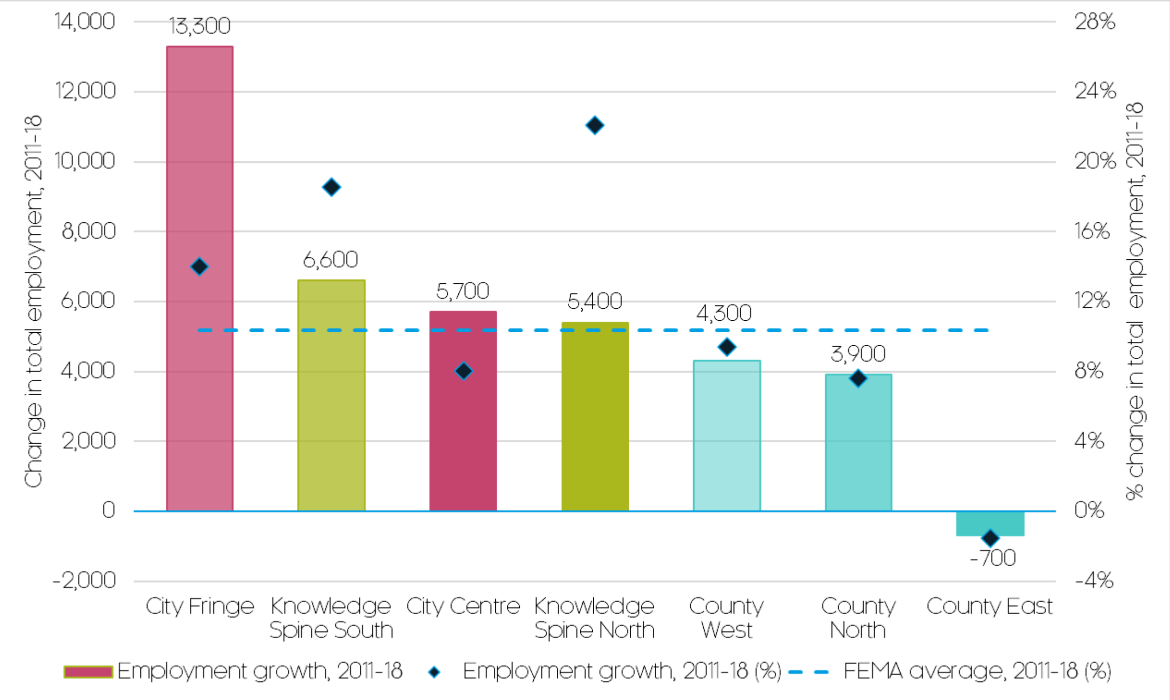
Employment trends

Figure 2.5.4 illustrates the trend in employment (jobs) growth across the FEMAs Zones over the period 2011-18. As the *Phase 1 Report* notes, this has been a period of robust employment growth across the FEMA; since 2010, on average more jobs had been created in Oxfordshire than any other equivalent period in the last 50 years (approximately 6,000 per annum), whilst (as of 2019) Oxfordshire currently has the highest employment rate out of 38 LEP areas, with some 82.8% of working age residents in active employment.

Within the FEMA, the City Fringe has driven the majority share of this robust employment growth, with a net additional 13,300 jobs created in the Zone between 2011-18. Yet the Knowledge Spine has been the fastest growing in percentage terms, with employment growth accelerating by over 20% in Knowledge Spine South. In total, a net additional 12,000 jobs were created in the two Knowledge Spine Zones.

This means that the Knowledge Spine as whole (including Oxford City Centre and Fringe) delivered some 31,000 jobs between 2011-18, the majority share of the FEMA's employment growth. County West and North saw similar levels and rates of employment growth, though both were below the FEMA average. Surprisingly, County East saw a marginal (-700) contraction in employment between 2011-18, in contrast to the wider FEMAs buoyant performance.

Figure 2.5.4: Zonal employment (jobs) trends, 2011-18



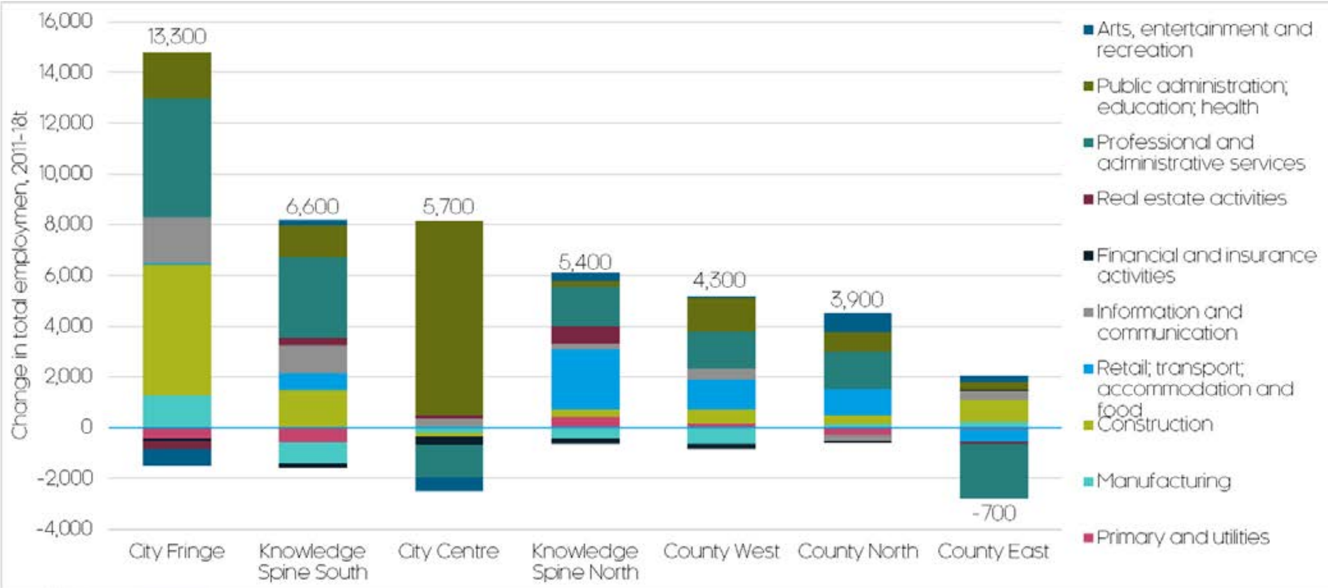
Source: ONS, Cambridge Econometrics.

Figure 2.5.5 looks at the sectoral composition and drivers of these trends. Employment growth in the City Fringe has been driven by KIBS (notably professional and administrative services), as well as construction-related activity, whilst manufacturing employment growth was the strongest in the FEMA. The City Centre's employment growth meanwhile was derived almost exclusively from its largest sector - public administration; education; health.

In Knowledge Spine South, like the City Fringe, growth was oriented around KIBS activity (information and communication particularly), alongside construction and public administration; education; health. Knowledge Spine North meanwhile saw a similar, if slightly lesser focus on KIBS activity, though it was the retail; transport; accommodation and food sector – centred on Bicester village - which drove the majority of growth.

County West and North saw similar patterns of growth, driven by professional and administrative services, and retail; transport; accommodation and food. County North also saw the FEMAs strongest growth in arts, entertainment, recreation and other services. County East did see growth in most sectors, though this was marginal beyond construction. A large drop in professional and administrative services dragged down its headline rate of employment growth, with such activity potentially shifting elsewhere in the FEMA.

Figure 2.5.5: Sectoral composition of employment (jobs) growth by Zone, 2011-18



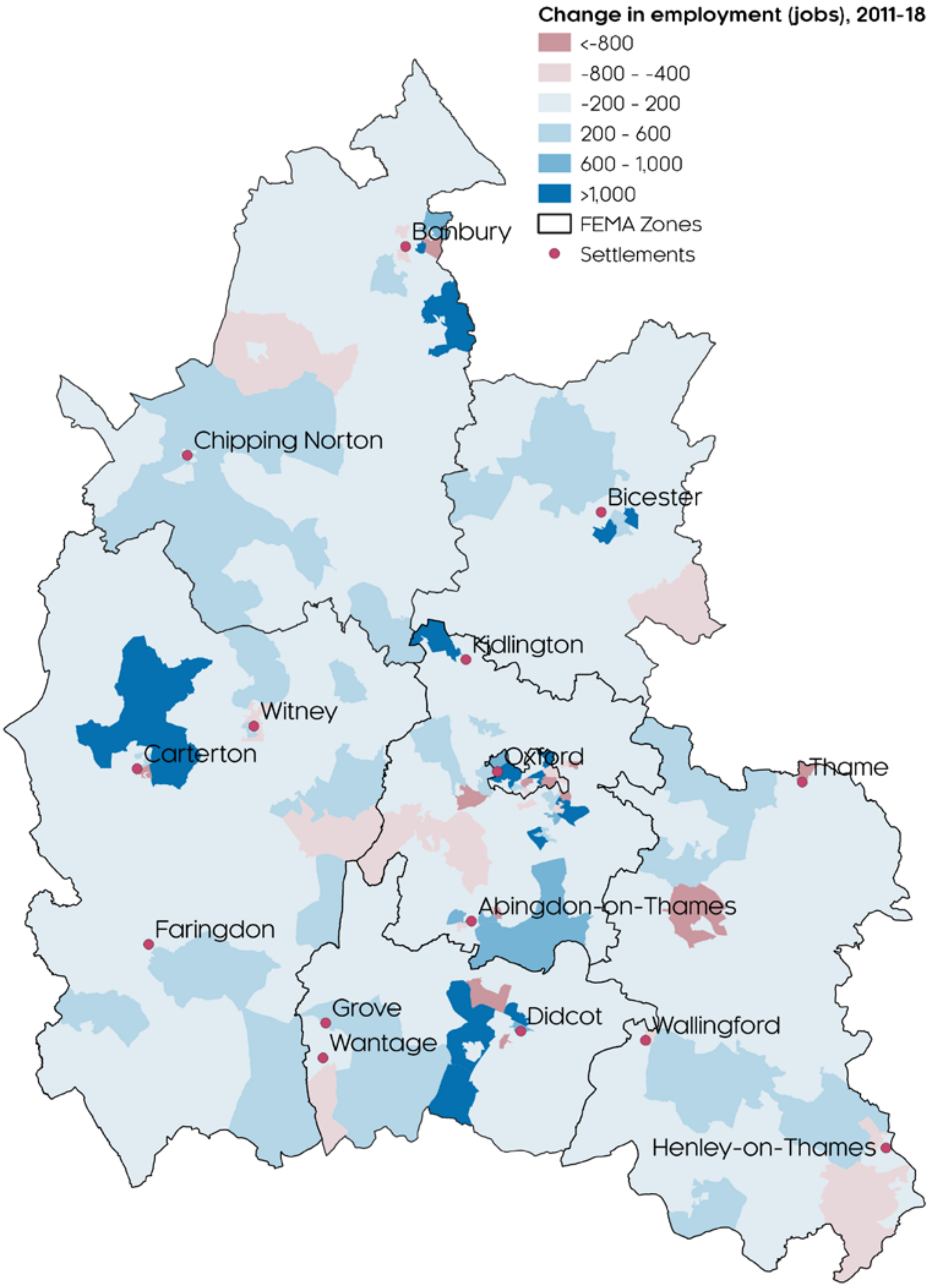
Source: ONS, Cambridge Econometrics.

Figure 2.5.6 provides a more spatially detailed overview (to LSOA level) of the employment growth within the Oxfordshire FEMA over 2011-18. Pockets of robust growth are particularly notable at either end of the Knowledge Spine, specifically around Didcot and its neighbouring science parks (comprising the *"Science Vale"*) in the south, and around Bicester to the north.

Growth has also been strong in and around Oxford, particularly at Oxford Science Park within the City Fringe. Rural and market towns have also seen pockets of strong growth, specifically in and around Banbury, Carterton and Chipping Norton in the north and west of the county. Slower or contractionary growth has however been evident around Henley and Thame in the east.

It should be noted that, at this detailed spatial level, the data – which are survey-based - can become increasingly 'noisy' and volatile, and less precise. Caution should therefore be urged when interpreting these trends.

Figure 2.5.6: Employment (jobs) trends within the Oxfordshire FEMA, 2011-18

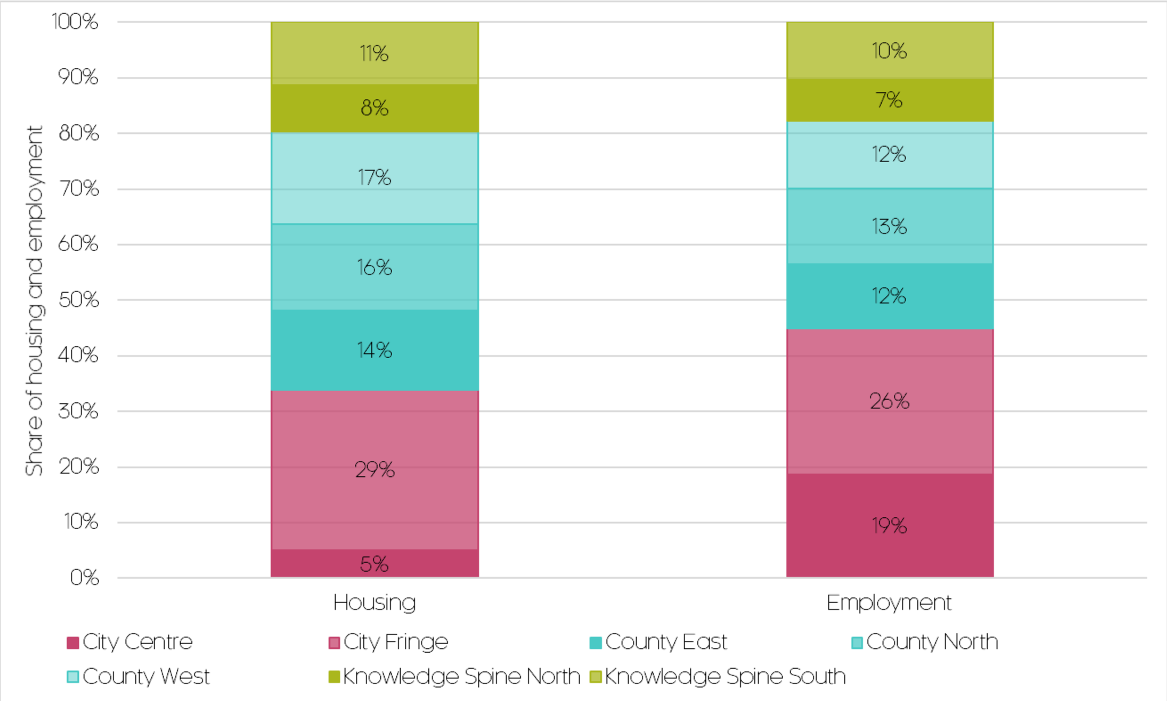


Source: ONS, Cambridge Econometrics.

Housing trends

Figure 2.5.7 illustrates the current (2020) distribution of housing across the Oxfordshire FEMA, and how this compares to the distribution of employment (in 2018). As with employment, the majority of Oxfordshire's 302,100 dwellings are located within the City Fringe (29% of total dwellings). Notably, the City Centre has a lower share of housing (5%) relative to jobs, reflecting high in-commuting. The Knowledge Spine has a similar housing share (19%) to that of employment, whilst the Wider County accounts for almost half (47%) of Oxfordshire's dwellings, higher than its share of employment, reflecting high out-commuting from these areas.

Figure 2.5.7: Zonal housing and employment (jobs) shares, 2018-20 (2020 for housing, 2018 for employment)



Source: VOA, MHCLG, ONS, Cambridge Econometrics.

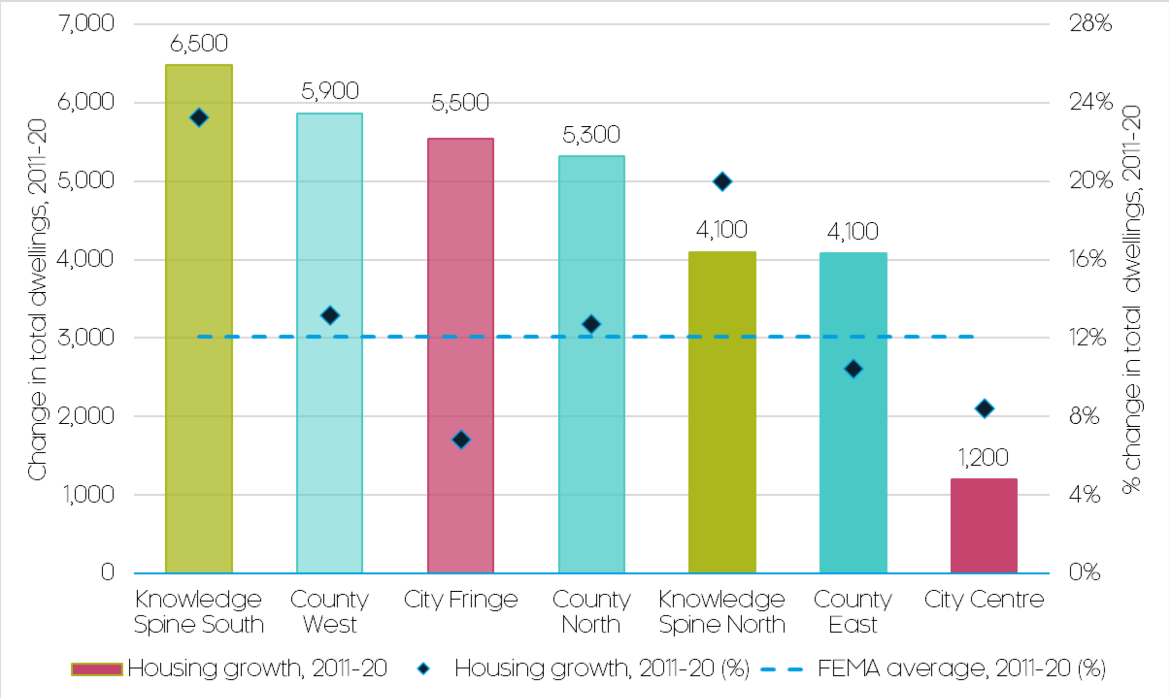
Figure 2.5.8 explores the distribution of estimated housing growth within the FEMA over the 2011-20 period.[12] As the *Phase 1 Report* noted, housing completions within the Oxfordshire FEMA have increased rapidly recently, particularly since 2017. However, with the 2014 SHMA identifying a delivery for 5,000 homes per annum, only from 2018/19 onwards has this level of housing provision been achieved.

Within the FEMA, as with employment, the Knowledge Spine has seen accelerated delivery, with a combined 10,600 net completions over 2011-20, with both areas exceeding 20% growth. Knowledge Spine South has driven the majority share, with an estimated 6,500 net completions in the Zone between 2011-20, the highest in the FEMA.

This was closely followed by County West, with 5,900 net completions, whilst County North showed an almost identical rate of delivery (13% increase), with 5,300 net completions. Alongside County East 4,100 net completions, this means the Wider County accounted for a combined 15,300 net completions over the 2011-20 period. Rates of delivery in Oxford City, including the Centre (8%) and Fringe (7%), were below the FEMA average, though there was still a combined 6,700 completions over the period.

[12] Zonal housing data has been primarily derived from the VOAs Council Tax: stock of properties housing estimates (which are available to LSOA/LSOA), but with an adjustment to align with MHCLGs Live tables on dwelling stock (including vacants), which are derived from local authority monitoring and returns (AMR's). This ensures Zonal estimates also align with the FEMA-wide housing estimates presented in the *Phase 1 Report*. Spatially detailed estimates may not precisely align with local authority AMR reporting, with deviations of 1-2% possible at the local authority level.

Figure 2.5.8: Zonal housing trends, 2011-20



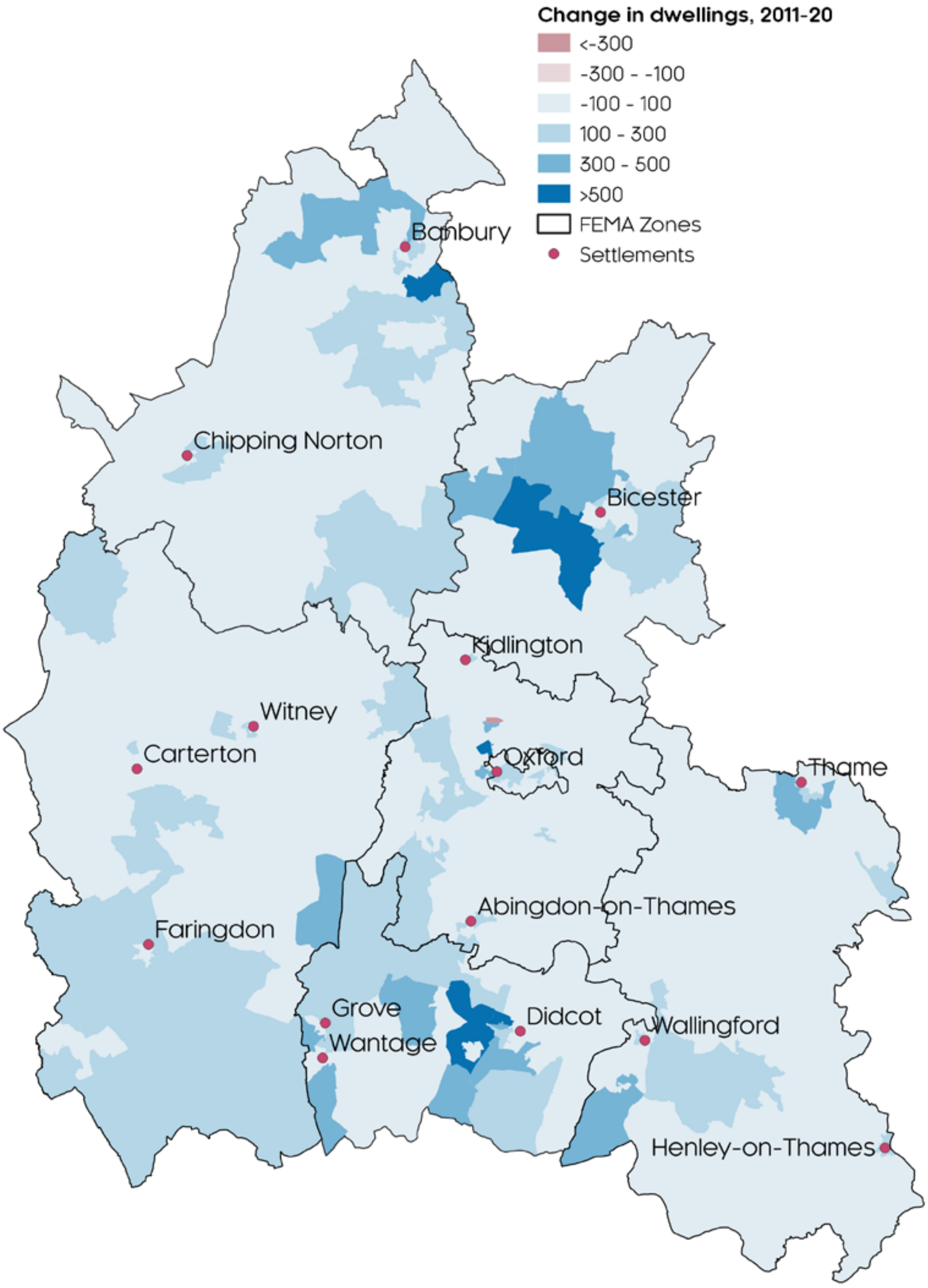
Source: VOA, MHCLG, Cambridge Econometrics.

Figure 2.5.9 provides a more spatially detailed overview (to LSOA level) of housing delivery within the Oxfordshire FEMA over the 2011-20 period. As with employment, delivery is particularly notable at either end of the Knowledge Spine, specifically around Didcot, Grove and Wantage to the south, and Bicester in the north.

Growth has also been strong within the Wider County, particularly in and around Banbury to the north, Faringdon to the west, as well as Wallingford and Thame to the east. Pockets of delivery are also evident within the City Fringe of Oxford, and to a lesser extent, the City Centre.

It should be noted that, at this detailed spatial level, the data – which are informed by the Council Tax register - can become increasingly ‘noisy’ and less precise. Caution should therefore be urged when interpreting these trends.

Figure 2.5.9: Housing trends within the Oxfordshire FEMA, 2011-20



Source: VOA, MHCLG, Cambridge Econometrics.

2.6 Conclusions

Functional Economic Market Areas (FEMAs) are designed to capture the extent and spatial distribution of a local economic market more accurately than administrative boundaries, which rarely reflect the true scale and reach of local economic markets and accompanying economic flows.

The analysis of several economic, demographic and social markets and indicators shows that the county of Oxfordshire is a reasonable approximation for the Oxfordshire FEMA, with Oxford at its centre.

Further spatial levels (‘Zones’) have been identified within the FEMA, crossing administrative boundaries. These include Oxford City Centre and Fringe, the Knowledge Spine, and the Wider County. Analysis shows the distinct characteristics and economic attributes of these areas.

The definition and understanding of the Oxfordshire FEMA provides a strong foundation for a more precise and in-depth exploration of the spatial distribution of housing need in relation to economic trends, and the accompanying implications and trade-offs.

3 The Oxfordshire FEMA and Phase 1 Employment Trajectories

3.1 Introduction

Building on the definition and analysis of the Oxfordshire FEMA and its constituent Zones in the previous chapter, this chapter proceeds to consider the spatial distribution of the three FEMA-wide employment trajectories (to 2050) prepared and presented in the *Phase 1 Report*.

Specifically, it scales projected employment growth from the *Phase 1 Report* across the FEMA's seven constituent Zones. Understanding the potential spatial scale and pattern of employment growth is important for informing and testing potential housing distributions, and resultantly seeing how these impact factors such as commuting and transport use.

The following analysis starts with a recap of the Oxfordshire-wide employment projections, followed by an overview of the methodology used to distribute this to the Zones, before presenting and analysing the results.

3.2 Recap of the Phase 1 Report employment trajectories

Figure 3.2.1 and Table 3.2.1 provide a recap of the three Oxfordshire-wide employment (jobs) trajectories from 2018 (the baseline for the projections) to 2050, as prepared and presented in the *Phase 1 Report*. Reflecting the different levels of potential growth, each trajectory has been informed by a broad set of assumptions (these are explored in more detail in the *Phase 1 Report*):

- **Standard Method (adjusted) trajectory:** backwards calculated from the Standard Method calculation of housing need (which has been adjusted for a revised demographic baseline), by making a number of assumptions relating to economic activity rates, commuting, double jobbing and unemployment.
- **Business as usual trajectory:** this trajectory represents a continuation of Oxfordshire's recent economic performance, taking particular account of the growth delivered during the recovery from the 2008-09 recession. It represents a best approximation as to the future rate at which Oxfordshire will be able to deliver employment growth based on the latest trend data.
- **Transformational trajectory:** This trajectory is broadly the equivalent of the Oxfordshire Local Industrial Strategy 'go for growth' scenario, but updated and adjusted for 2020. Certain targeted sectors are assumed to see strong growth, others grow as a result of anticipated corresponding population growth and increased economic activity.

The three scenarios present alternative visions of how Oxfordshire's economy might perform. Potential growth ranges from 85,400 net additional jobs under the Standard Method (adjusted) trajectory over the period 2018-50, to 122,500 under the central business as usual trajectory, peaking at a potential 171,200 additional jobs under the LIS-related transformational trajectory.

Figure 3.2.1: Phase 1 employment (jobs) trajectories for Oxfordshire, 2018-50

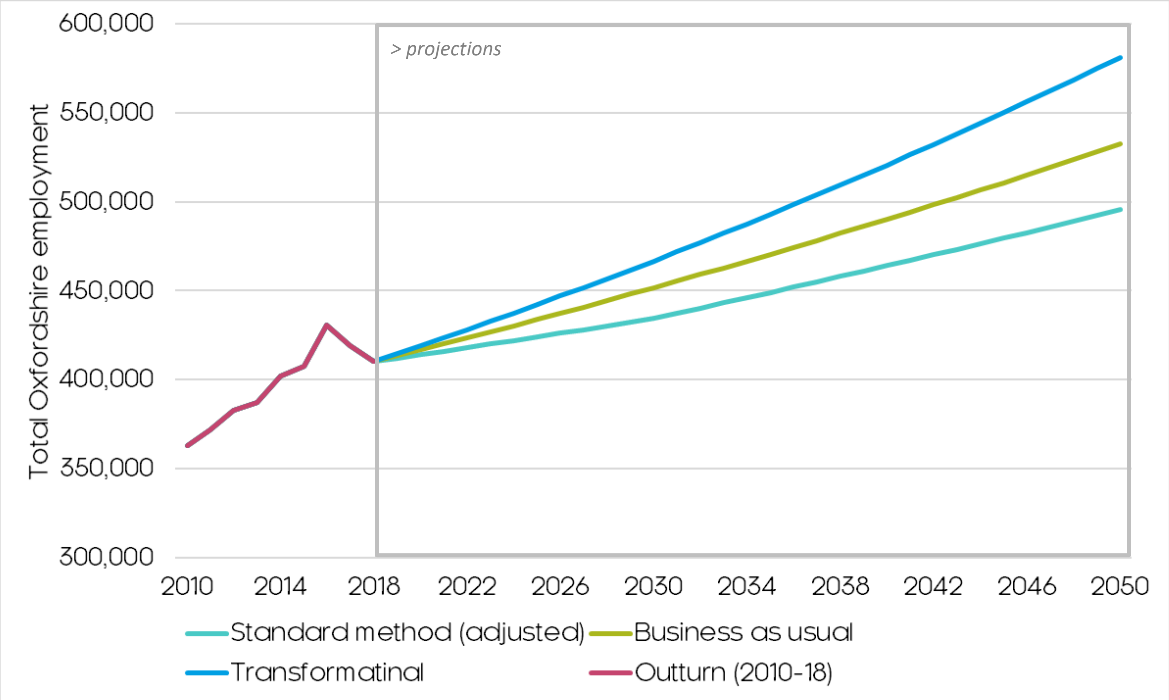


Table 3.2.1: Phase 1 Report employment (jobs) trajectories for Oxfordshire, 2018-50

	Employment (jobs) at 2018 (baseline)	Employment (jobs) at 2050	Employment (jobs) change, 2018-50	Employment (jobs) change p.a., 2018-50
Standard Method (adjusted)	410,100	495,600	85,500	2,700
Business as usual	410,100	532,500	122,500	3,800
Transformational	410,100	581,300	171,200	5,400

Source: ONS, Cambridge Econometrics.

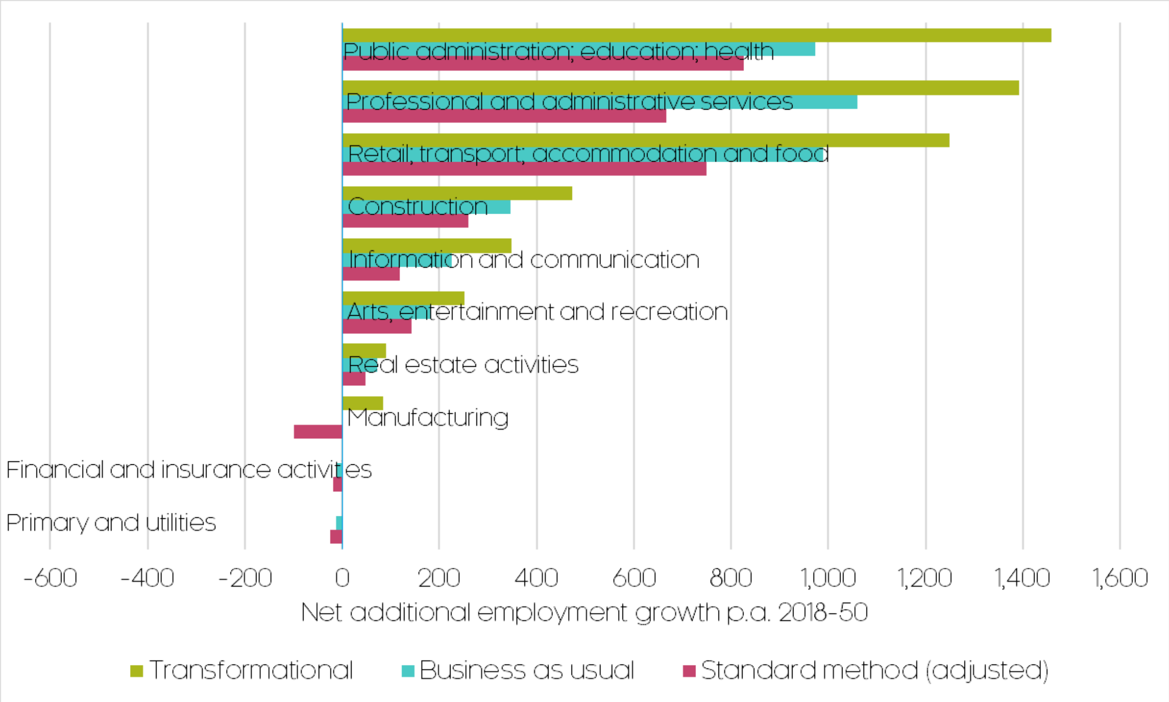
Figure 3.2.2 revisits the sectoral composition of the employment trajectories. As remarked in the *Phase 1 Report*, the LIS specifically emphasises growth in *“breakthrough sectors”*, which are typically tradeable sectors such as manufacturing, professional services and information and communication.

Therefore, rather than being a constant proportion, sectoral employment growth varies across the respective trajectories, largely reflecting the realisation of LIS-related ambitions in the higher trajectories.

For instance, under baseline (Standard Method adjusted) projections, manufacturing employment is expected to decline, yet under the transformational trajectory, dependent on the realisation of LIS aspirations and interventions, manufacturing employment has the potential to grow.

This is important for the following analysis as areas with a higher concentration of such fast-growing, tradable industries (as explored in *2.5 Characteristics and trends within the Oxfordshire FEMA*) are likely to experience faster overall employment growth in the higher trajectories.

Figure 3.2.2: Sectoral composition of the employment (jobs) trajectories, 2018-50



Source: Cambridge Econometrics, Iceni Projects, Justin Gardner Consulting.

3.3 Methodology overview

To estimate the Zonal distributions of jobs to 2050 for the three employment trajectories, the following steps were taken:

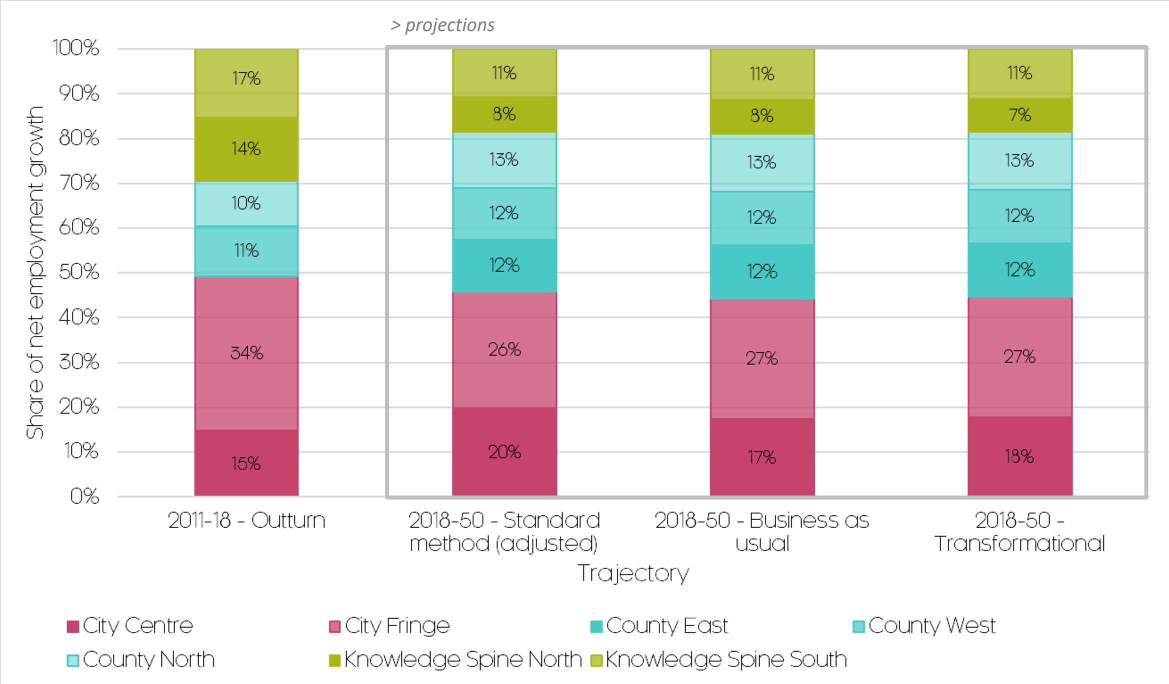
1. Firstly, LSOA-level (broadly equivalent to neighbourhood level) employee jobs data by sector (specifically, for the 10 sectors outlined in the *Phase 1 Report*) were extracted from BRES for the baseline years (2018 and 2011).
2. As BRES data excludes the self-employed (as well as HM armed forces and government supported trainees), a ratio (taken from CE's estimates of employee jobs and self-employed jobs at the county level, as used in the *Phase 1 Report*) was applied to the raw LSOA-level BRES data. This was undertaken on a sectoral basis.
3. Taking these converted and aligned employment values by LSOA and sector, these were scaled forward from 2018 to 2050 on a sectoral basis by taking sector growth rates from the FEMA-wide projections (for the three trajectories) and assuming these held for each LSOA area.
4. Therefore, the growth rate of the individual LSOA's between 2018-50 is reliant on its sectoral mix compared to the county as a whole under the respective scenarios. For the sake of simplicity, transparency, and neutrality, all sectors, regardless of Zone, are therefore assumed to grow at the same rate as the FEMA average.
5. These LSOA values are then checked to ensure they align with county wide totals, and were then summed to their respective economic Zones, which have been defined at the LSOA-level.

6. Applying these steps provides complete, aligned and annualized estimates of employment by Zone, from 2018 to 2050, for the three employment trajectories.

3.4 Spatial distribution of employment growth

Figure 3.4.1 provides an overview of the potential spatial distribution of employment growth under the three trajectories, shown as the Zones share of total additional jobs to 2050 (not to be confused with the percentage growth rates of the Zones themselves).

Figure 3.4.1: Spatial scenarios for Zonal distribution of employment (jobs) growth, 2011-18 and 2018-50



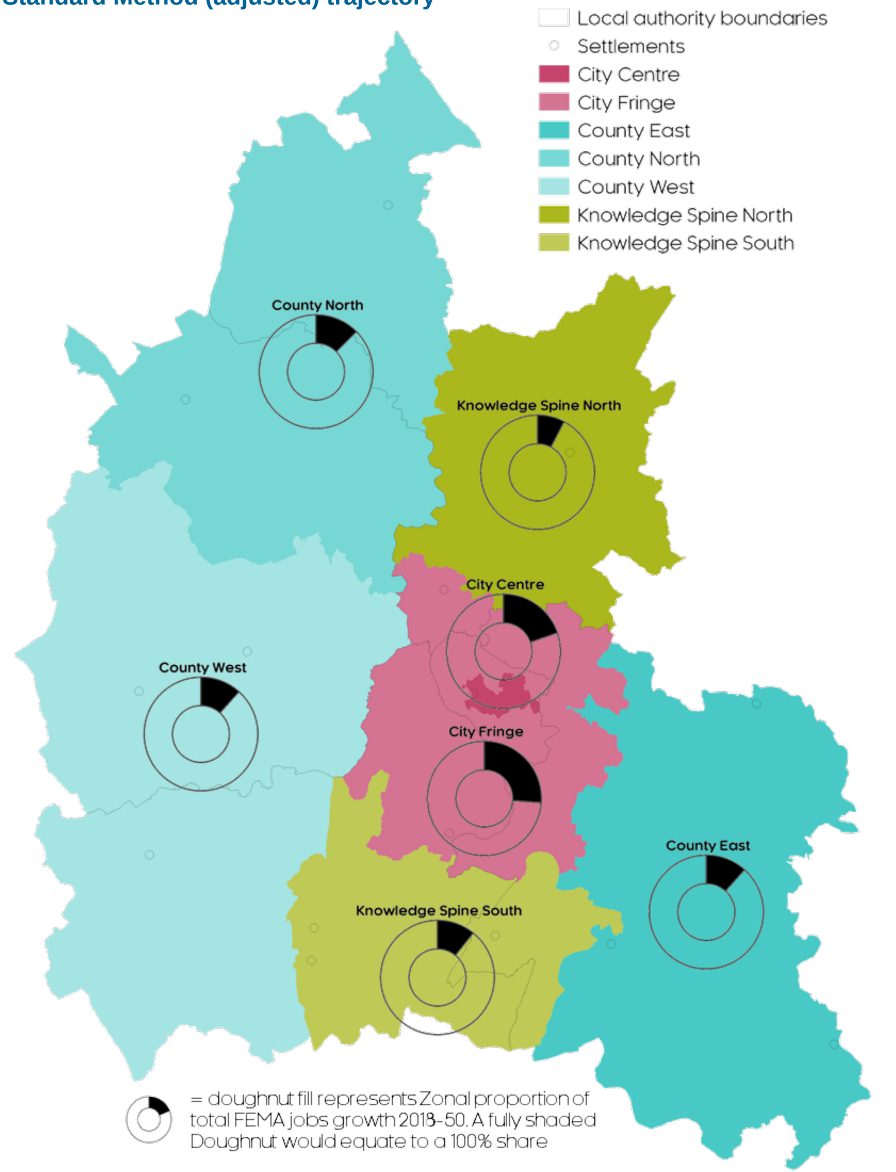
Source: ONS, Cambridge Econometrics. County East excluded from 2011-18 outturn due to negative employment growth.

The first thing to observe is the close similarity between the three different trajectories. This is a result of the FEMA-wide *Phase 1 Report* projections being scaled proportionally across existing Zonal sectoral employment shares (as explored in *3.3 Methodology overview*).

Secondly, there has been relatively spatially concentrated growth over recent years (2011-18), but assuming sectoral growth rates remain constant across the FEMA, this may not be the case over a longer timeframe, with a more spatially even pattern of growth potentially emerging.

It should be emphasised that the Zonal allocation of these trajectories does not reflect actual options or priorities for economic growth, and are hypothetical distributions. The following analysis proceeds to put absolute numbers against each of these three trajectories for the FEMA and its seven constituent Zones.

Figure 3.4.2: Stylized overview of employment (jobs) growth under the Standard Method (adjusted) trajectory



Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding.

Standard Method (adjusted) trajectory

The adjacent Figure 3.4.2 and Table 3.4.1 provide a spatial overview of Oxfordshire's employment growth under the Standard Method (adjusted) trajectory, where some 81,600 net additional jobs are expected to be created between 2018-50.

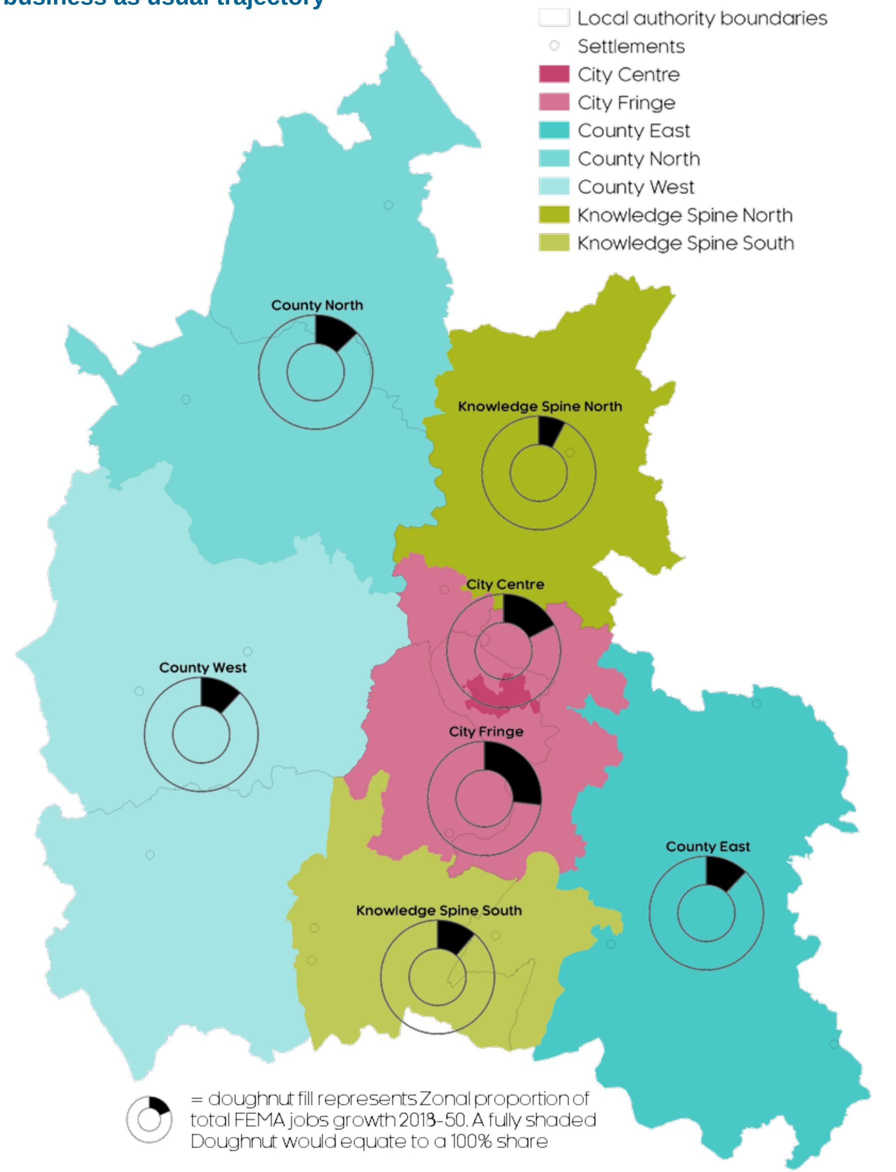
Over the timeframe of this trajectory, a more balanced growth picture emerges, with Zonal growth rates only showing minor deviations from the FEMA average. Stronger growth is still expected along the Knowledge Spine (including Oxford City and Fringe), reflecting its favourable sectoral mix and high baseline employment shares, though it is unlikely this will be maintained at the pace of 2011-18.

Growth is expected to be more apparent in the Wider County, particularly in and around market towns such as Banbury, Witney and Wallingford. The City and its Fringe is expected to remain the main driver of employment growth though, accounting for almost half (46%) of net new employment between 2018 and 2050.

Table 3.4.1: Overview of employment growth under the Standard Method (adjusted) trajectory

	Change in employment, 2018-50	Change in employment per annum, 2018-50	% share of FEMA change in employment, 2018-50
City Centre	16,800	500	19.7%
City Fringe	22,300	700	26.1%
Oxford City and Fringe	**39,200**	**1,200**	**45.8%**
County East	9,900	300	11.6%
County North	10,700	300	12.5%
County West	9,900	300	11.6%
Wider County	**30,500**	**1,000**	**35.7%**
Knowledge Spine North	6,600	200	7.7%
Knowledge Spine South	9,200	300	10.8%
Knowledge Spine	**15,800**	**500**	**18.4%**
FEMA Total	**85,500**	**2,700**	**-**

Figure 3.4.3: Stylized overview of employment (jobs) growth under the business as usual trajectory



Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding.

Business as usual trajectory

The adjacent Figure 3.4.3 and Table 3.4.2 provide a spatial overview of Oxfordshire's employment growth under the business as usual trajectory, where some 115,800 net additional jobs are expected to be created between 2018-50.

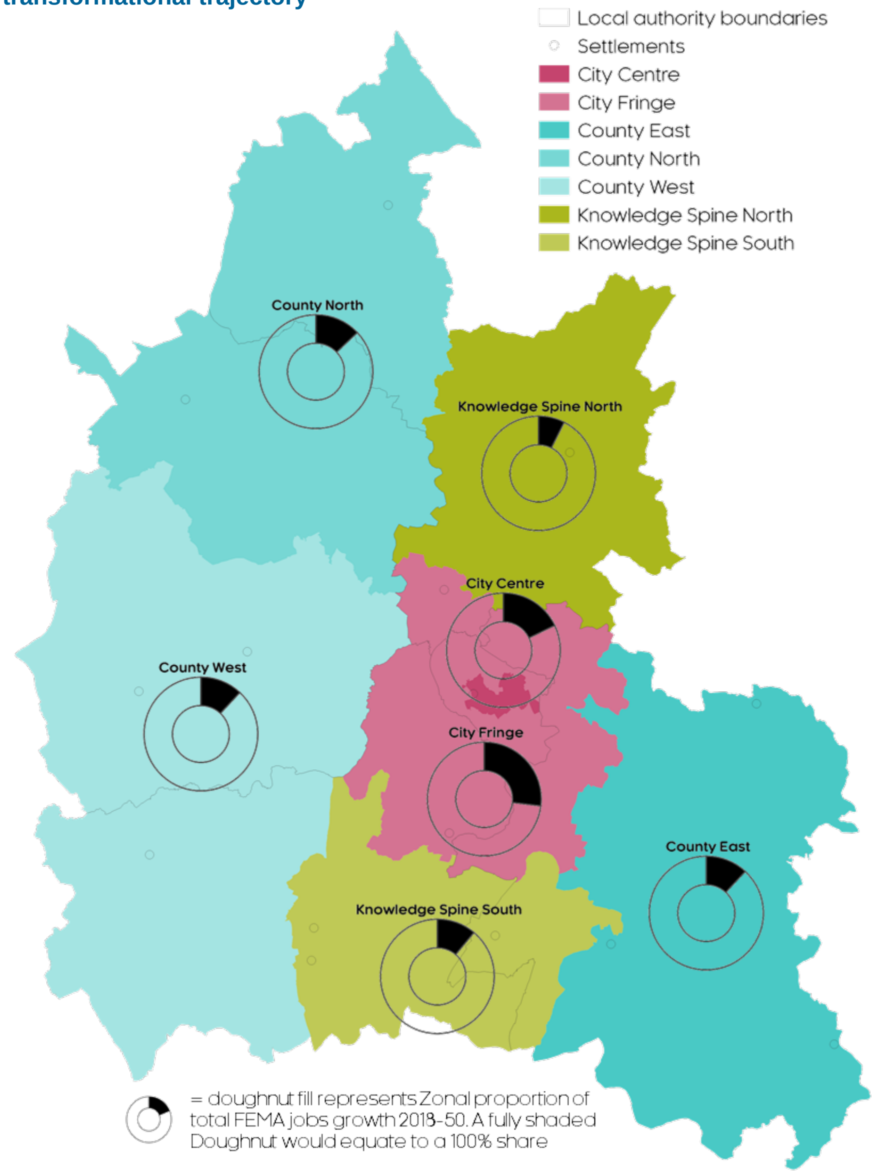
Under this central trajectory, the spatial pattern of growth remains broadly similar to Standard Method (adjusted) trajectory, though the Wider County and Knowledge Spine (particularly Knowledge Spine South) close the gap with the City and Fringe in terms of the expected share of employment growth.

This is largely due to comparatively slower employment growth in the City Centre, which – dominated by industries such as education, public admin and retail – has a lower incidence of LIS high-growth sectors, which are more prevalent in the City Fringe, Knowledge Spine and parts of the Wider County.

Table 3.4.2: Overview of employment growth under the business as usual trajectory

	Change in employment, 2018-50	Change in employment per annum, 2018-50	% share of FEMA change in employment, 2018-50
City Centre	21,300	700	17.4%
City Fringe	32,800	1,000	26.8%
Oxford City and Fringe	**54,100**	**1,700**	**44.2%**
County East	14,700	500	12.0%
County North	15,800	500	12.9%
County West	14,700	500	12.0%
Wider County	**45,200**	**1,400**	**36.9%**
Knowledge Spine North	9,300	300	7.6%
Knowledge Spine South	13,800	400	11.3%
Knowledge Spine	**23,200**	**700**	**18.9%**
FEMA Total	**122,500**	**3,800**	**-**

Figure 3.4.4: Stylized overview of employment (jobs) growth under the transformational trajectory



Transformational trajectory

The adjacent Figure 3.4.4 and Table 3.4.3 provide a spatial overview of Oxfordshire's employment growth under the transformational trajectory, where some 162,300 net additional jobs are expected to be created between 2018-50.

The emphasis on faster growth in LIS-oriented (typically tradeable) sectors sees the Wider County retain a high share of total employment growth, given the concentration of such activities in these Zones. Under this trajectory, County North sees the largest employment share outside of Oxford City and Fringe.

The Knowledge Spine (including Oxford City and Fringe) – ranging from Didcot to Bicester – is expected to remain the significant employment generator though, accounting for over two-thirds of all net additional employment growth under this aspirational scenario, reflecting its favourable overall sectoral mix and high baseline employment shares.

Table 3.4.3: Overview of employment growth under the transformational trajectory

	Change in employment, 2018-50	Change in employment per annum, 2018-50	% share of FEMA change in employment, 2018-50
City Centre	30,500	1,000	17.8%
City Fringe	46,000	1,400	26.9%
Oxford City and Fringe	**76,500**	**2,400**	**44.7%**
County East	20,400	600	11.9%
County North	22,100	700	12.9%
County West	20,500	600	12.0%
Wider County	**63,000**	**2,000**	**36.8%**
Knowledge Spine North	12,700	400	7.4%
Knowledge Spine South	19,000	600	11.1%
Knowledge Spine	**31,600**	**1,000**	**18.5%**
FEMA Total	**171,200**	**5,300**	**-**

Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding.

3.5 Conclusions

This chapter has sought to consider the spatial scale and pattern of projected employment growth within the Oxfordshire FEMA, across its seven constituent Zones. Over the longer timeframe of the *Phase 1* employment trajectories (to 2050), there is the potential for a more spatially balanced growth picture to emerge compared to recent (2011-18) trends.

Central Oxfordshire, encompassing the Knowledge Spine (including Oxford City and Fringe), is expected to remain a significant driver of economic activity though, accounting for a potential two-thirds of net additional employment growth in the FEMA to 2050.

Understanding the potential spatial scale and pattern of employment growth is important for informing, testing and illustrating housing distributions and their implications, which are considered further in the next chapter.

4 The Oxfordshire FEMA and Phase 1 Housing Need

4.1 Introduction

Having explored the spatial scale and pattern of potential employment growth within the Oxfordshire FEMA, this chapter considers a range of potential spatial distribution scenarios for the three FEMA-wide projections of housing need to 2050, as prepared and presented in the *Phase 1 Report.*

As with the previous chapter, it scales projected housing need from the *Phase 1 Report* across the Oxfordshire FEMA, utilising the seven Zones defined and analysed in *Chapter 2*. By taking the opportunity to quantify and test a range of contrasting housing distributions, the potential implications and trade-offs of different development choices can be identified and contrasted at a high-level.

The following analysis begins with a recap of the FEMA-wide housing need from the *Phase 1 Report*, followed by an overview of the methodology and assumptions used to distribute this to Zones, before presenting and analysing the results.

4.2 Recap of the Phase 1 Report housing need

Figure 4.2.1 and Table 4.2.1 provide a recap of the housing need prepared and presented in the *Phase 1 Report* (relative to the three accompanying economic trajectories). As with employment growth, the trajectories have been informed by a broad set of individual assumptions and methodologies, resulting in their contrasting levels of need.

Figure 4.2.1: Phase 1 Report housing need for Oxfordshire, 2020-50

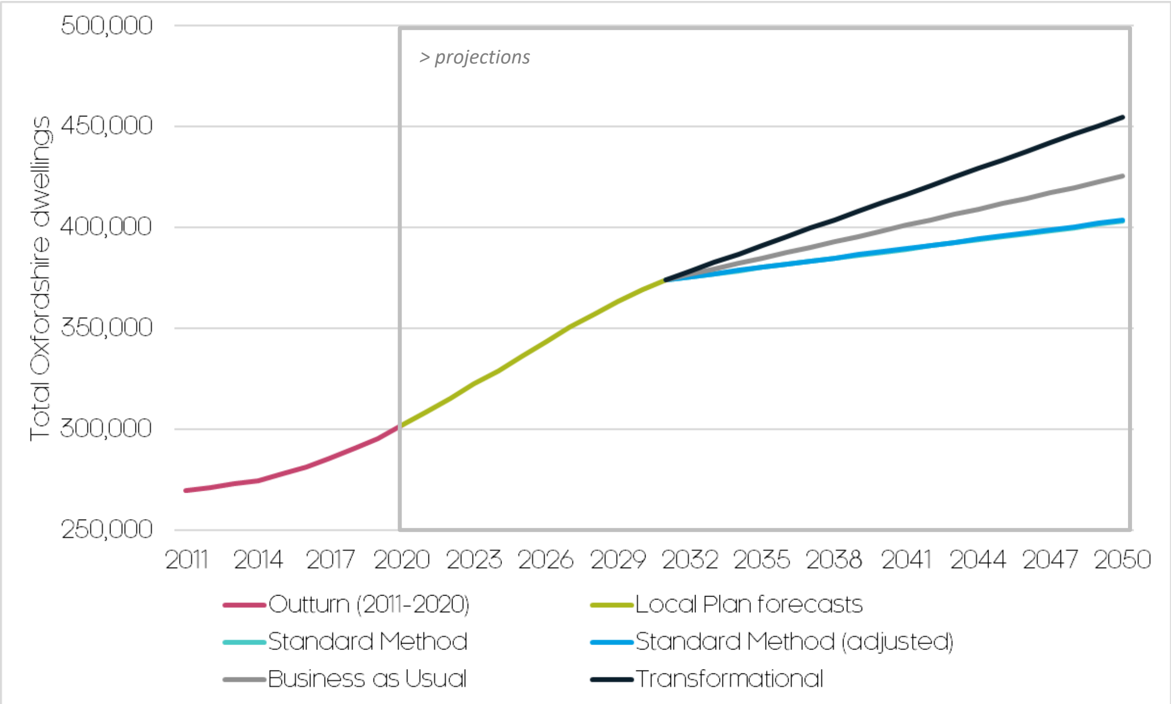


Table 4.2.1: Phase 1 housing need for Oxfordshire, 2020-50

	Oxfordshire homes (dwellings) at 2020	Oxfordshire homes (dwellings) needed at 2050	Oxfordshire homes (dwellings) needed, 2020-50	Oxfordshire homes (dwellings) needed p.a., 2020-50
Standard Method	302,100	403,100	101,500	3,400
Standard Method (adjusted)	302,100	403,600	101,600	3,400
Business as usual	302,100	425,400	123,400	4,100
Transformational	302,100	454,800	152,800	5,100

Source: MHCLG, Cambridge Econometrics, Iceni Projects, Justin Gardner Consulting.

The Standard Method is based on National Planning Policy Framework (NPPF) methodology and is intended to provide a minimum level of housing need *"a minimum baseline"* for the county. The adjusted Standard Method maintains this minimum need but applies a small adjustment to account for a revised demographic baseline.

The business as usual and transformational projections have been informed by demographic and economic forecasts, considering recent growth trends and the ambitions of the Oxfordshire LIS with a series of assumptions around commuting, employment rates and job/worker ratios. A full, stage-by-stage methodology for each trajectory is available in the *Phase 1 Report.*

The analysis shows that to meet the Standard Method (adjusted) level of need over 2020-50, Oxfordshire would require around 3,400 dwellings each year; with the business as usual level of growth this increases to 4,100 dwellings per annum, with a transformational figure approaching 5,100 dwellings per annum, dependent on the realisation of LIS-related ambitions.

These figures can be compared with the Standard Method housing need (unadjusted, across the whole of Oxfordshire) of 3,400 dwellings per annum over the period 2020-50.

Note that until 2031, all of the projections are assumed to follow the same path, that of Local Plan forecast net completions, which have been sourced directly from the respective Oxfordshire local authorities. These forecasts are available across the FEMA in a consistent format (and derived using the same methodology and sources) over the 2020-31 period. After 2031 the projections follow an annualised rate of remaining forecast need.

4.3 Methodology and scenario overview

To estimate the Zonal distributions of housing need, and thus need, to 2050 for the three aforementioned economic trajectories, the following steps were taken:

1. Firstly, dwellings data at LSOA level for 2020 were scaled up to their respective Zones, to provide corresponding baseline (2020) totals of the current number of dwellings in each Zone.
2. By attributing Local Plan forecast net completions to the individual Zones (see Table 4.3.1 for an overview of this process), Zonal-level projections of need have been estimated, per annum, to 2031. These

have been applied to the baseline (2020) totals to provide annualized 2020-2031 need by Zone. As mentioned previously, these Local Plan forecasts are fixed across the three projections up to 2031. This means that the need rates and the Zonal distribution assumptions 2020-2031 are based on planned development, whereas the rate of growth for the rest of the plan period 2031 to 2050 is simply an annualised rate of the remaining forecast need. The forecast net completions were sourced directly from the respective Oxfordshire local authorities, who input to a proforma coordinated by Iceni Projects.

3. For the 2031-2050 period, Zonal level trajectories are then estimated for each trajectory (Standard Method adjusted, business as usual and transformational) by **five intentionally-contrasting housing scenarios** which explore how need and need might be distributed between Zones. These scenarios and accompanying assumptions, which test different distributions over the 2031-2050 period *only*, are as follows:

    i. **Evenly dispersed scenario** – the same % per annum growth rate is applied to all Zones from 2031 to 2050. This means housing need is allocated at an even *percentage* rate (not quantity) across the FEMA.

    ii. **Continued trends scenario** – relative Zonal growth rates from 2031-2050 are matched to 2020-2031 relative growth rates (i.e. the scenario mirrors current concentrations of forecast net completions in Local Plans, extrapolating them from 2031 to 2050).

    iii. **Employment-led scenario** – relative Zonal growth rates from 2031-2050 are matched to the distribution of projected Zonal employment growth, including growth in LIS-outlined key employment locations.

    iv. **County-focussed scenario** – need across the Knowledge Spine is the same as the employment-led scenario. Need across Oxford City and Fringe is the same as the continued trends scenario. The remainder is allocated to the Wider County. This results in the highest proportion of need allocated to the Wider County.

    v. **Centralised scenario** – need across the Knowledge Spine is the same as the continued trends scenario, Oxford City and Fringe is the same as employment-led scenario. The remainder is allocated to the Wider County. This results in the lowest proportion of need allocated to the Wider County.

4. Applying these steps provides complete, aligned and annualized estimates of housing need by Zone, from 2020 to 2050. These are available for the three higher level projections (Standard Method adjusted, business as usual, transformational) and a further five Zonal-specific scenarios, resulting in fifteen Zonal level projections in total.

Table 4.3.1 below provides an overview of the Local Plan-Zonal attribution process. With forecast net completions available across built up areas (BUA's) in Oxfordshire over 2020-31 (which are provided in *Appendix B: Local Plan Forecast Completions)*, the table outlines how these have been attributed to their relative Zone. In some cases, BUA's overlap Zones, so additional adjustments have been made to the attributions (outlined in red, see table footnote for additional details).

Table 4.3.1: Attributing forecast net completions from Local Plans to the FEMA Zones

Local Plan	**Built up Area (BUA)/locality**	**Reference Zone(s) – if BUA/locality is in more than one Zone, values are attributed according to current share of dwellings***			
Oxford City	Oxford City	*City Fringe*	*City Centre*		
		75%	*25%*		
Cherwell	Banbury BUA	*County North*			
	Bicester BUA	*Knowledge Spine North*			
	Former RAF Upper Heyford	*Knowledge Spine North*			
	CDC Partial Review Sites (Kidlington, Begbroke, Gosford and Water Eaton and Yarnton)	*City Fringe*			
	Other Cherwell (e.g. Rural)	*County North*	*Knowledge Spine North*	*City Fringe*	
		50%	*35%*	*15%*	
West Oxfordshire	Carterton BUA	*County West*			
	Witney BUA	*County West*			
	Eynsham SDA/ Cotswold Garden Village	*County West*			
	Other West (e.g. Rural)	*County West*	*County North*		
		75%	*25%*		
Vale of White Horse	Abingdon BUA	*City Fringe*			
	Faringdon BUA	*County West*			
	Wantage & Grove BUA	*Knowledge Spine South*			
	Botley (adjoins Oxford)	*City Fringe*			
South Oxfordshire	Didcot BUA	*Knowledge Spine South*			
	Henley-on-Thames BUA	*County East*			
	Thame BUA	*County East*			
	Wallingford BUA	*County East*			

Other South and Vale Rural	*County East*	*Knowledge Spine South*	*County West*	*City Fringe*
	35%	*30%*	*25%*	*10%*

Source: Cambridge Econometrics, Iceni Projects, Oxford City Council, Cherwell District Council, West Oxfordshire District Council, Vale of White Horse District Council, South Oxfordshire District Council.

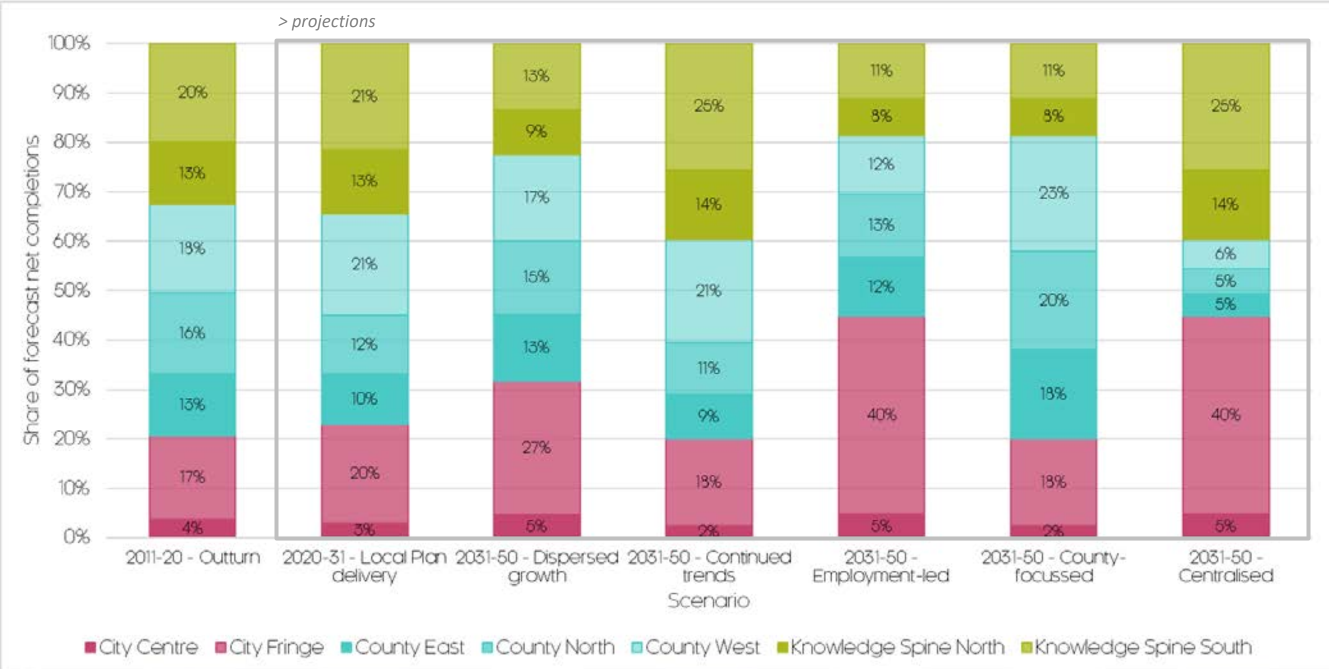
*For BUA's that cover more than one Zone (e.g. Oxford City BUA), forecast completions to 2031 are attributed according to the approximate share of current dwelling stock (i.e. if 75% of dwellings in the Oxford City BUA area are currently located in the City Fringe, it is expected that 75% of Local Plan completions for the Oxford City BUA will also be in the City Fringe).

4.4 Spatial distribution of housing need

Figure 4.4.1 presents distributions of the *Phase 1* housing need, and thus dwellings, across the Oxfordshire FEMA, based on the five spatial scenarios defined in *4.3 Methodology and scenario overview.* These are shown as the Zones share of total housing need to 2050 (not to be confused with the percentage growth rates of the Zones themselves).

Note that these do not reflect actual options or priorities for need, but are rather hypothetical distributions to better understand the implications and trade-offs of different development choices at a high level.

Figure 4.4.1: Spatial scenarios for Zonal distribution of housing need, 2011-20 and 2020-50



Source: MHCLG, Cambridge Econometrics. Note: percentage shares for 2031-50 are an average of distributions across the three employment trajectories.

The 2011-2020 outturn (as explored in *2.5 Characteristics and trends within the Oxfordshire FEMA*), showed relatively high rates of delivery within the Knowledge Spine (31% of additional dwellings) and Wider County (49%). The City Centre and Fringe saw comparatively lower growth, accounting for 21% of additional dwellings over 2011-20.

Local Plan forecasts for completions over 2020-31 show a broadly similar pattern to the 2011-20 outturn, but with a slightly higher emphasis on the

Knowledge Spine (including the City Centre and Fringe), which together account for almost two-thirds of forecast completions over the 2020-31 period.

Looking further ahead to 2050, the main differentiating factor between the housing scenarios is the way 2031-2050 housing need (i.e. post Local Plan forecasts) is allocated across the three main groups of Zones. Up until 2031, the scenarios share the same Local Plan forecasts.

As it allocates housing growth rates equally across Zones, the **evenly dispersed** scenario sees housing distributed the most evenly between the Zones post-2031. The Wider County still has the highest absolute level of growth, as it starts with the highest number of initial dwellings at 2031.

The **continued trends** scenario, extrapolating 2020-31 Local Plan forecasts to 2050, sees significantly greater distribution to the Knowledge Spine, and marginally less allocated to the Wider County and City Centre and Fringe.

The **employment-led** scenario sees much greater distribution to Oxford City (specifically the City Fringe), and comparatively lower levels allocated to the Wider County and Knowledge Spine.

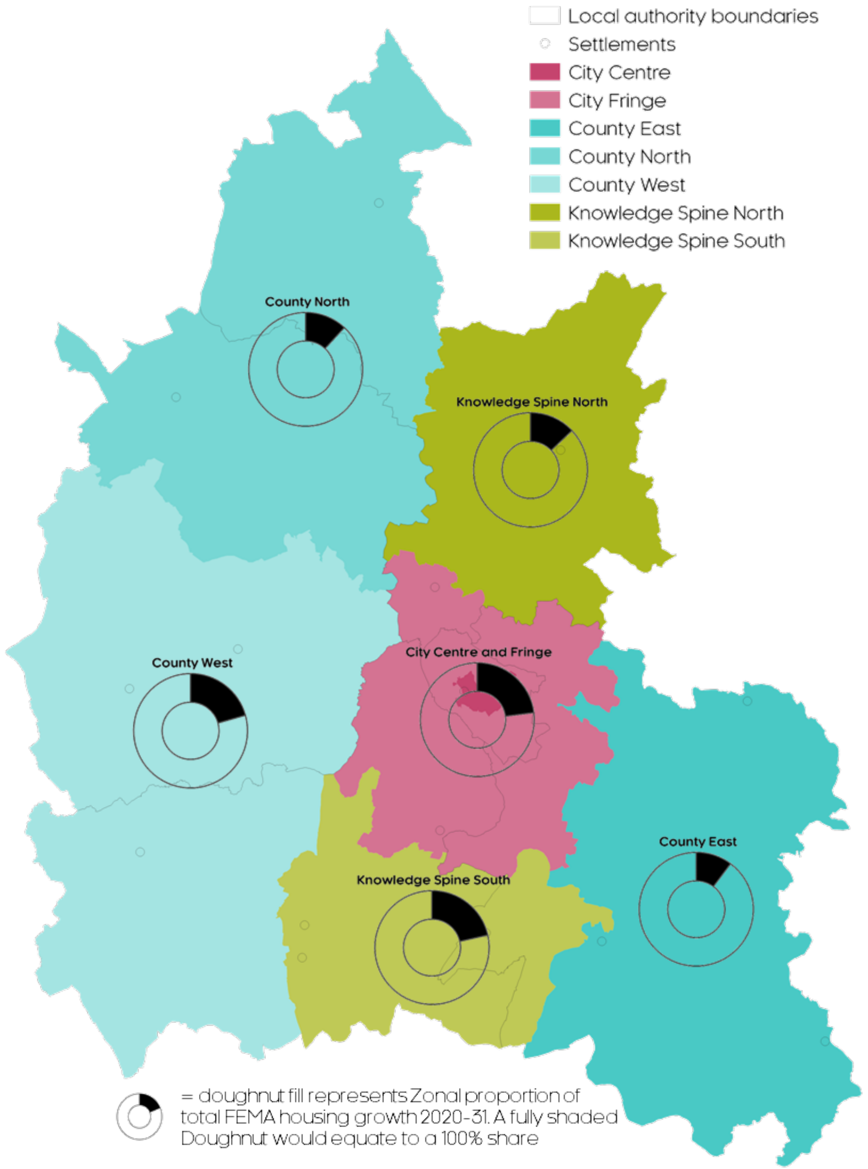
The **County-focussed** scenario combines the low City Centre and Fringe distribution from the *continued trends* scenario with the low distribution to Knowledge Spine from the *employment led* scenario. This scenario results in a very high relative allocation to the Wider County.

The **centralised** scenario reverses this process, with the high City Centre and Fringe distribution from the *employment-led* scenario paired with the high Knowledge Spine allocation from the *continued trends* scenario. This scenario results in a very low relative distribution to the Wider County.

As emphasised previously, these scenarios do not reflect actual options or priorities for need, but are purely hypothetical distributions. It should also be noted that these scenarios are intended to be high level only, and do not take into account specific site constraints, phased need, or development sites outside of the Local Plan period (2020-31).

The following analysis proceeds to put absolute numbers against each of these five scenarios under the three economic trajectories, resulting in fifteen Zonal housing distributions in total. To aid with the analysis and interpretation, stylized maps have been produced to indicate proportional Zonal distributions for the three 2050 employment trajectories.

Figure 4.4.2: Stylized overview of housing need under Local Plan forecasts



Local Plan forecasts

The adjacent Figure 4.4.2 and Table 4.4.1 provide a spatial overview of the forecast net completions outlined in local authority Local Plans, with 72,100 net completions forecast across Oxfordshire between 2020-31.

During this time, there is expected to be an emphasis on central Oxfordshire, particularly within the City Fringe (including Abingdon) and Knowledge Spine South (notably Didcot). In fact, the Knowledge Spine, including Oxford City Centre and Fringe, is expected to account for over two-thirds of the FEMAs completions over this Local Plan period.

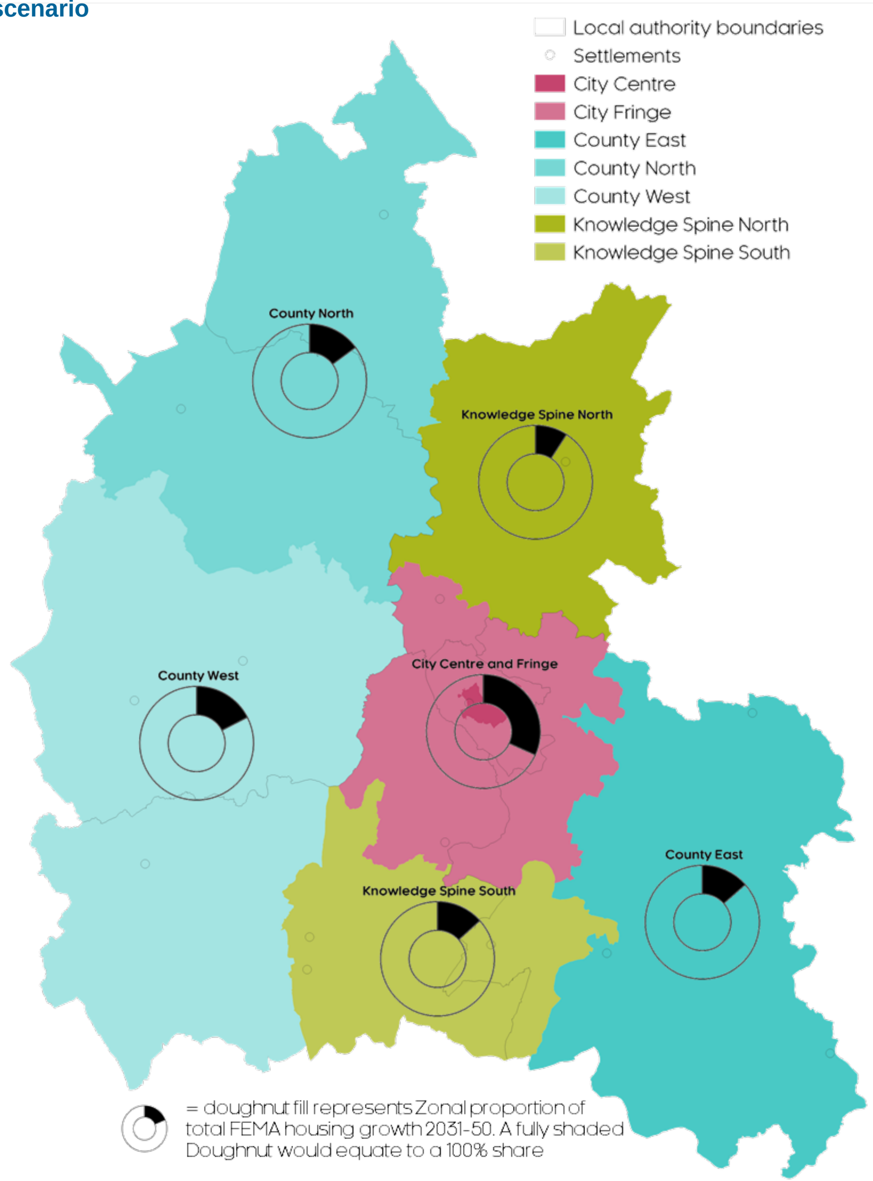
Completions are comparatively lower in the Wider County compared with recent (2011-20) trends, though County West accounts for roughly a fifth – a higher share than 2011-20 - with a notable emphasis on Witney and Carterton.

Table 4.4.1: Overview of 2020-31 Local Plan forecast net completions

	Current homes (dwellings), 2020	As a % of FEMA total, 2020	Local Plan forecast completions, 2020-31	As a % of FEMA total forecast completions, 2020-31
City Centre	15,400	5.1%	2,100	2.9%
City Fringe	86,800	28.7%	14,500	20.1%
Oxford City and Fringe	**102,200**	**33.8%**	**16,600**	**23.0%**
County East	43,100	14.3%	7,400	10.3%
County North	47,200	15.6%	8,500	11.8%
County West	50,400	16.7%	14,900	20.7%
Wider County	**140,700**	**46.6%**	**30,800**	**42.7%**
Knowledge Spine North	24,800	8.2%	9,300	12.9%
Knowledge Spine South	34,400	11.4%	15,500	21.5%
Knowledge Spine	**59,200**	**19.6%**	**24,800**	**34.4%**
FEMA Total	**302,100**	**-**	**72,100**	**-**

Source: Cambridge Econometrics, Oxfordshire local authorities. Note: FEMA totals may not sum due to rounding. City Centre merged with City Fringe in Figure due to comparatively low number of expected completions in the former.

Figure 4.4.3: Stylized overview of housing need under the evenly dispersed scenario



Evenly dispersed scenario

The adjacent Figure 4.4.3 and Table 4.4.2 provide a spatial overview of Oxfordshire's housing need under the evenly dispersed scenario 2031-50, for each of the three economic trajectories.

Under the evenly dispersed scenario, housing need grows at a proportionately even rate across the FEMA from 2031-onwards. Therefore the Wider County, which is expected to account for the majority share of total dwellings in the FEMA by 2031, will also account for the majority share of housing need 2031-50.

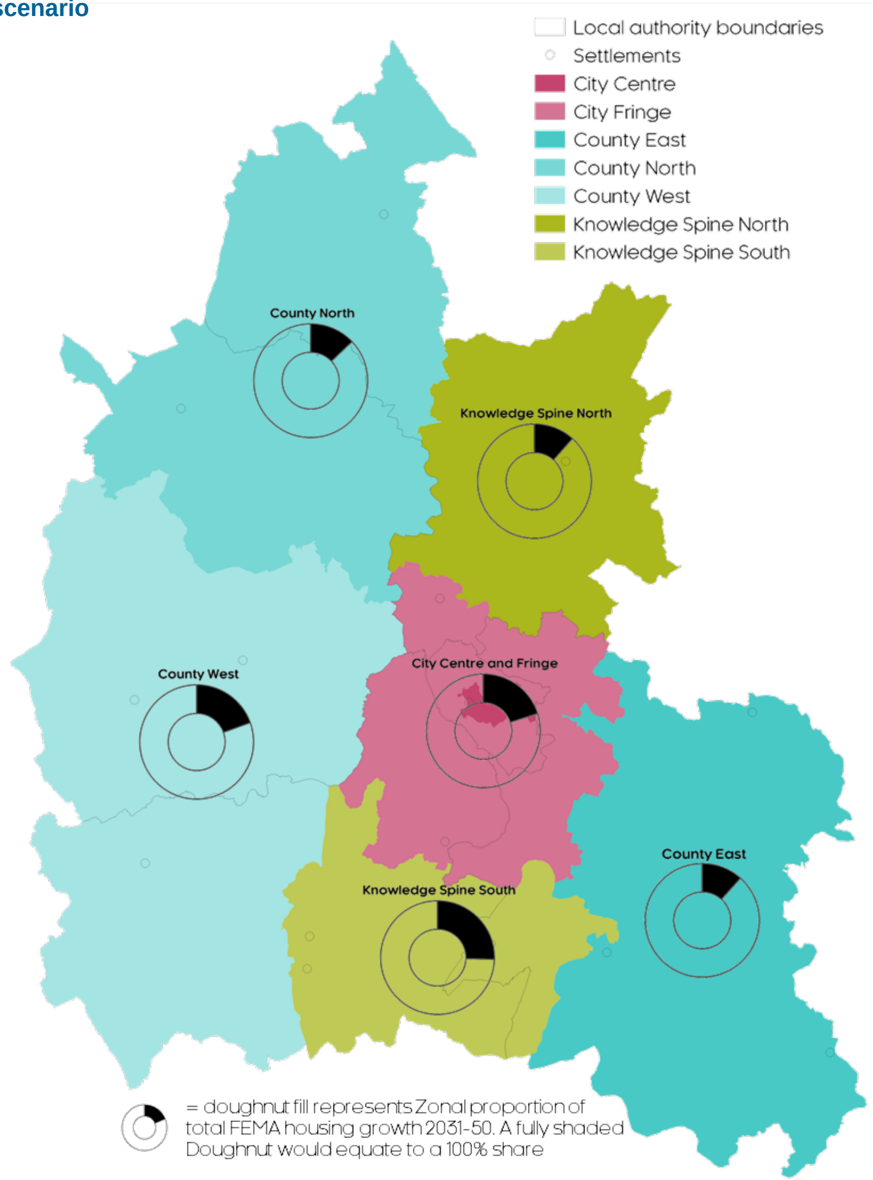
Oxford City, particularly the City Fringe, sees an increase in need - particularly relative to 2011-20 - due to the same reason. The Knowledge Spine, despite having the lowest share of dwellings in the FEMA, maintains a robust share of total housing need 2031-50.

Table 4.4.2: Overview of 2031-50 housing need under the evenly dispersed scenario

	Standard Method (adjusted), 2031-50 (and as % of FEMA total)		Business as usual, 2031-50 (and as % of FEMA total)		Transformational, 2031-50 (and as % of FEMA total)	
City Centre	1,400	4.7%	2,400	4.7%	3,800	4.7%
City Fringe	8,000	27.1%	13,900	27.1%	21,800	27.0%
Oxford City and Fringe	**9,400**	**31.9%**	**16,300**	**31.8%**	**25,600**	**31.7%**
County East	4,000	13.6%	6,900	13.5%	10,900	13.5%
County North	4,400	14.9%	7,600	14.8%	12,000	14.9%
County West	5,100	17.3%	8,900	17.3%	14,100	17.5%
Wider County	**13,500**	**45.8%**	**23,400**	**45.6%**	**37,000**	**45.8%**
Knowledge Spine North	2,700	9.2%	4,700	9.2%	7,400	9.2%
Knowledge Spine South	3,900	13.2%	6,800	13.3%	10,700	13.3%
Knowledge Spine	**6,600**	**22.4%**	**11,500**	**22.4%**	**18,100**	**22.4%**
FEMA Total	**29,500**	**-**	**51,300**	**-**	**80,700**	**-**

Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding. City Centre merged with City Fringe in Figure due to comparatively low need in the former. Figure proportions are an average across the three employment trajectories.

Figure 4.4.4: Stylized overview of housing need under the continued trends scenario



Continued trends scenario

The adjacent Figure 4.4.4 and Table 4.4.3 provide a spatial overview of Oxfordshire's housing need under the continued trends scenario 2031-50, for each of the three economic trajectories.

The continued trends scenario sees housing need distributed in line with 2020-2031 Local Plan forecasts, maintaining this rate of need to 2050. This sees a notable increase in housing need attributed to the Knowledge Spine, particularly the South, reflecting the emphasis on the Science Vale area in Local Plans.

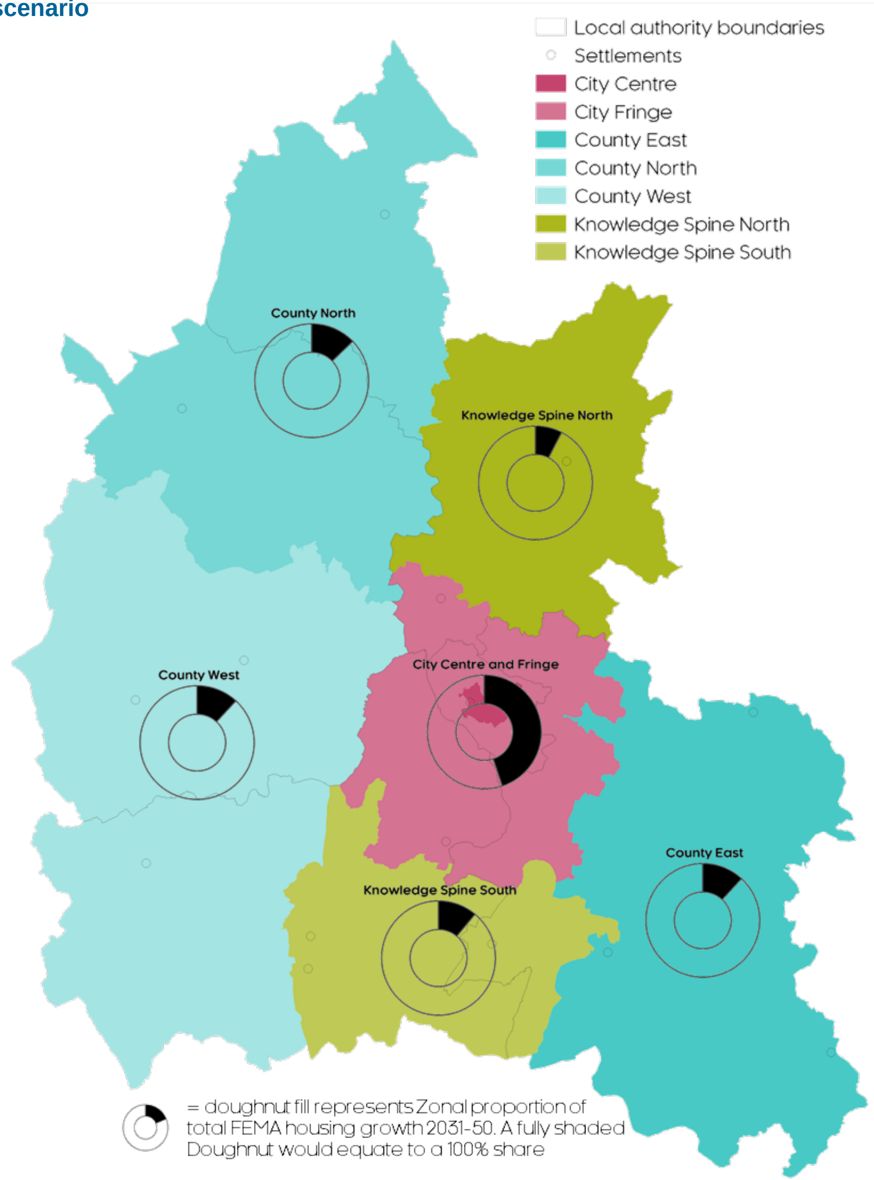
Housing need in the Wider County is resultantly lower but also less uniform, with the County West still expected to maintain high levels of need. Oxford City, specifically the City Fringe, sees an increase compared with recent (2011-20) trends, though still lower than some other scenarios.

Table 4.4.3: Overview of 2031-50 housing need under the continued trends scenario

	Standard Method (adjusted), 2031-50 (and as % of FEMA total)		Business as usual, 2031-50 (and as % of FEMA total)		Transformational, 2031-50 (and as % of FEMA total)	
City Centre	700	2.4%	1,300	2.5%	2,000	2.5%
City Fringe	5,200	17.6%	9,000	17.5%	14,100	17.5%
Oxford City and Fringe	**5,900**	**20.0%**	**10,300**	**20.1%**	**16,100**	**20.0%**
County East	2,600	8.8%	4,600	9.0%	7,200	8.9%
County North	3,100	10.5%	5,400	10.5%	8,500	10.5%
County West	6,100	20.7%	10,700	20.9%	16,800	20.8%
Wider County	**11,800**	**40.0%**	**20,700**	**40.4%**	**32,500**	**40.3%**
Knowledge Spine North	4,200	14.2%	7,300	14.2%	11,500	14.3%
Knowledge Spine South	7,500	25.4%	13,100	25.5%	20,500	25.4%
Knowledge Spine	**11,700**	**39.7%**	**20,400**	**39.8%**	**32,000**	**39.7%**
FEMA Total	**29,500**	**-**	**51,300**	**-**	**80,700**	**-**

Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding. City Centre merged with City Fringe in Figure due to comparatively low need in the former. Figure proportions are an average across the three employment trajectories.

Figure 4.4.5: Stylized overview of housing need under the employment-led scenario



Employment-led scenario

The adjacent Figure 4.4.5 and Table 4.4.4 provide a spatial overview of Oxfordshire's housing growth under the employment-led scenario 2031-50, for each of the three economic trajectories.

Under the employment-led scenario, housing need 2031-onwards is assumed to correlate with projected Zonal employment growth, including growth in LIS-outlined key employment locations. Resultantly, this sees a substantial increase in housing need attributed to Oxford City Centre and Fringe.

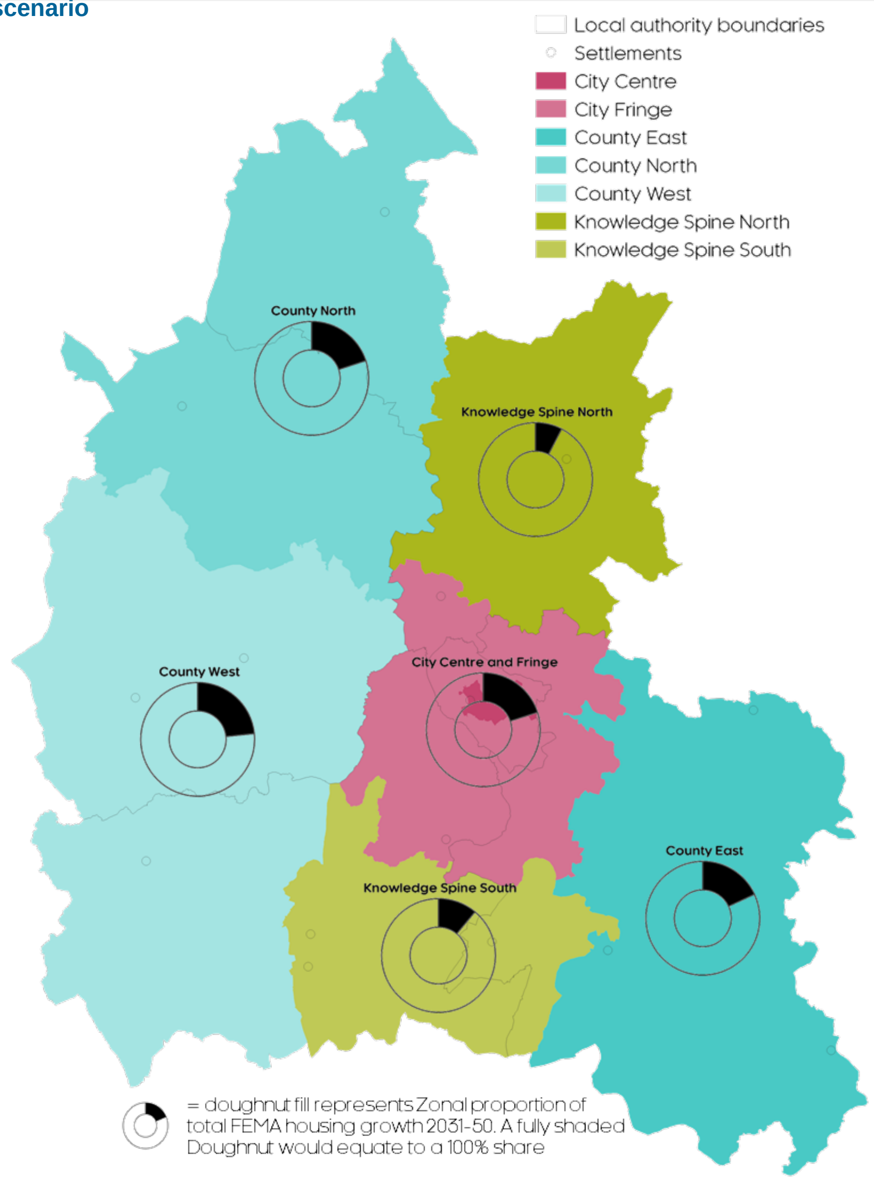
Resultantly, comparatively lower levels of housing need are expected in the Wider County, though it is still expected to account for the majority share. The Knowledge Spine also sees a slight reduction, slightly less so in the South given the potential for LIS-related employment growth in the Science Vale.

Table 4.4.4: Overview of 2031-50 housing need under the employment-led scenario

	Standard Method (adjusted), 2031-50 (and as % of FEMA total)		Business as usual, 2031-50 (and as % of FEMA total)		Transformational, 2031-50 (and as % of FEMA total)	
City Centre	1,400	4.7%	2,500	4.9%	3,900	4.8%
City Fringe	12,100	41.0%	20,100	39.2%	32,200	39.9%
Oxford City and Fringe	**13,500**	**45.8%**	**22,600**	**44.1%**	**36,100**	**44.7%**
County East	3,400	11.5%	6,200	12.1%	9,600	11.9%
County North	3,700	12.5%	6,600	12.9%	10,400	12.9%
County West	3,400	11.5%	6,100	11.9%	9,700	12.0%
Wider County	**10,500**	**35.6%**	**18,900**	**36.8%**	**29,700**	**36.8%**
Knowledge Spine North	2,300	7.8%	3,900	7.6%	6,000	7.4%
Knowledge Spine South	3,200	10.8%	5,800	11.3%	8,900	11.0%
Knowledge Spine	**5,500**	**18.6%**	**9,700**	**18.9%**	**14,900**	**18.5%**
FEMA Total	**29,500**	**-**	**51,300**	**-**	**80,700**	**-**

Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding. City Centre merged with City Fringe in Figure due to comparatively low need in the former. Figure proportions are an average across the three employment trajectories.

Figure 4.4.6: Stylized overview of housing need under the County-focussed scenario



County-focussed scenario

The adjacent Figure 4.4.6 and Table 4.4.5 provide a spatial overview of Oxfordshire's housing growth under the County-focussed scenario 2031-50, for each of the three economic trajectories.

As the name suggests, this scenario sees a greater focus and emphasis on housing need in the Wider County. Resultantly, of the five scenarios this sees the highest share attributed to the Wider County, which under this scenario could account for over half of all need in the FEMA to 2050.

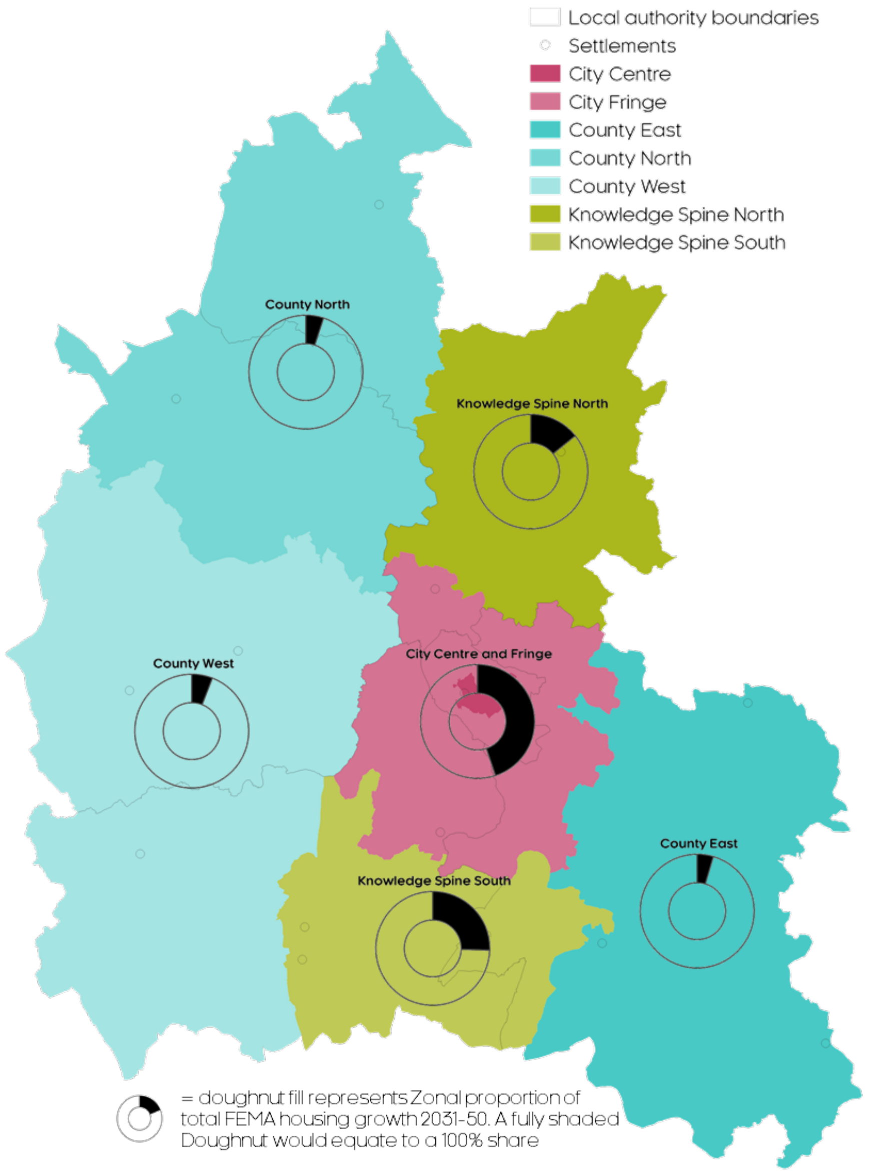
Remaining need is largely balanced between Oxford City Fringe and the Knowledge Spine, though this is the only scenario where the Knowledge Spine (including the City Centre and Fringe) does not account for the majority of need.

Table 4.4.5: Overview of 2031-50 housing need under the County-focussed scenario

	Standard Method (adjusted), 2031-50 (and as % of FEMA total)		Business as usual, 2031-50 (and as % of FEMA total)		Transformational, 2031-50 (and as % of FEMA total)	
City Centre	700	2.4%	1,300	2.5%	2,000	2.5%
City Fringe	5,200	17.6%	9,000	17.5%	14,100	17.5%
Oxford City and Fringe	**5,900**	**20.0%**	**10,300**	**20.1%**	**16,100**	**20.0%**
County East	5,300	18.0%	9,200	17.9%	14,600	18.1%
County North	5,900	20.0%	10,200	19.9%	16,100	20.0%
County West	6,900	23.4%	11,900	23.2%	18,900	23.4%
Wider County	**18,100**	**61.4%**	**31,300**	**61.0%**	**49,600**	**61.5%**
Knowledge Spine North	2,300	7.8%	3,900	7.6%	6,000	7.4%
Knowledge Spine South	3,200	10.8%	5,800	11.3%	8,900	11.0%
Knowledge Spine	**5,500**	**18.6%**	**9,700**	**18.9%**	**14,900**	**18.5%**
FEMA Total	**29,500**	**-**	**51,300**	**-**	**80,700**	**-**

Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding. City Centre merged with City Fringe in Figure due to comparatively low need in the former. Figure proportions are an average across the three employment trajectories.

Figure 4.4.7: Stylized overview of housing need under the centralised scenario



Centralised scenario

The adjacent Figure 4.4.7 and Table 4.4.6 provide a spatial overview of Oxfordshire's housing growth under the centralised scenario 2031-50, for each of the three economic trajectories.

The centralised scenario sees a significant focus and emphasis on housing need throughout central Oxfordshire, covering the Knowledge Spine, City Centre and Fringe. This results in a very low relative allocation to the Wider County, with need almost half that of the County-focussed scenario.

Oxford City (specifically the City Fringe) and the Knowledge Spine (particularly the South) meanwhile see a substantial increase in housing need, well above recent trends and other scenarios. Over three-quarters of housing need in the FEMA could be located along this central 'spine' under this scenario.

Table 4.4.6: Overview of 2031-50 housing need under the centralised scenario

	Standard Method (adjusted), 2031-50 (and as % of FEMA total)		Business as usual, 2031-50 (and as % of FEMA total)		Transformational, 2031-50 (and as % of FEMA total)	
City Centre	1,400	4.7%	2,500	4.9%	3,900	4.8%
City Fringe	12,100	41.0%	20,100	39.2%	32,200	39.9%
Oxford City and Fringe	**13,500**	**45.8%**	**22,600**	**44.1%**	**36,100**	**44.7%**
County East	1,300	4.4%	2,400	4.7%	3,700	4.6%
County North	1,400	4.7%	2,700	5.3%	4,100	5.1%
County West	1,600	5.4%	3,200	6.2%	4,800	5.9%
Wider County	**4,300**	**14.6%**	**8,300**	**16.2%**	**12,600**	**15.6%**
Knowledge Spine North	4,200	14.2%	7,300	14.2%	11,500	14.3%
Knowledge Spine South	7,500	25.4%	13,100	25.5%	20,500	25.4%
Knowledge Spine	**11,700**	**39.7%**	**20,400**	**39.8%**	**32,000**	**39.7%**
FEMA Total	**29,500**	**-**	**51,300**	**-**	**80,700**	**-**

Source: Cambridge Econometrics. Note: FEMA totals may not sum due to rounding. City Centre merged with City Fringe in Figure due to comparatively low need in the former. Figure proportions are an average across the three employment trajectories.

4.5 Conclusions

Informed by a set of robust and varied scenarios, this chapter has sought to quantify, test and illustrate a range of different housing distributions for the Oxfordshire FEMA, allocating the three county-wide trajectories for housing need to 2050 from the *Phase 1 Report*.

The distribution scenarios cover a variety of contrasting development choices, ranging from an economic-led focus on distribution in central Oxfordshire (Oxford and the Knowledge Spine), to a more evenly dispersed approach across the county, to an emphasis on market towns in Wider County areas.

By taking the opportunity to quantify and test a range of different housing distributions, potential implications and trade-offs can be identified and contrasted. This is considered in the next chapter, which proceeds to look at the commuting and transport implications of the respective housing distributions.

5 Commuting Trends Within the Oxfordshire FEMA

5.1 Introduction

Having explored the potential scale and pattern of both economic growth and housing distribution within the Oxfordshire FEMA, this chapter brings the two together to consider the possible implications for commuting and transport use.

This has been undertaken at the Zonal level, aided by the development of an inter-Zonal commuting matrix for the FEMA, which is able to estimate the incremental commuting impacts of different housing and employment distributions. As before, the work considers the three alternative levels of FEMA-wide housing and employment growth laid out in the *Phase 1 Report*.

Given the increasing pressure on Oxfordshire's transport network and the associated externalities (notably, environmental effects), it is important to understand the potential implications for commuting and transport from particular distribution scenarios and growth trajectories.

The following analysis begins with an overview of the relationship between employment, housing and commuting in Oxfordshire, followed by a methodology overview before presenting and analysing the results.

5.2 The relationship between employment, housing and commuting in Oxfordshire

Employment (i.e. jobs) and housing growth can act as relative push and pull factors for commuting by facilitating potential change in the number of employed persons working (workplace employed) and living (employed residents) in an area. Within commuting analysis, it is important to distinguish the difference between these employment identities:

- *Workplace employed:* refers to employed persons by the location of their workplace, regardless of the location of their residence (e.g. someone working in Oxford but living in Reading). This measure is closely related to the number of jobs in an area, but is typically lower because a person can have more than one job (*"double-jobbing"*).
- *Employed residents:* refers to employed persons by the location of their residence, regardless of the location of their work (e.g. someone living in Bicester but working in London). When reflected as the proportion of the population, this is known as the employment rate.

Generally, the number of workplace employed in an area is informed by the amount and concentration of economic activity in that area (which will correspond to the number of businesses and jobs in an area). The number of employed residents meanwhile will be shaped by the availability of housing and other labour market and demographic factors (e.g. labour market activity/inactivity rates).

At the intersection of these two variables is the concept of net commuting, which is simply:

$$net\ commuting = workplace\ employed - employed\ residents$$

Therefore, areas with a higher number of workplace employed relative to employed residents will experience net in-commuting (i.e. a positive net commuting value); consider for instance areas with town/city centres, business parks and other large employment sites.

Meanwhile, areas with a higher number of employed residents relative to workplace employed will experience net out-commuting (i.e. a negative net commuting value); consider for instance suburban estates, villages/dormitory settlements and other housing-led settlements.

Table 5.2.1: Current and potential net commuting flows in Oxfordshire

		Employed residents (linked to housing growth)					
			2011	2018	2050 - SMa	2050 - BAU	2050 - Trans
Workplace employed (linked to employment growth)		-	*336,900*	*361,700*	*449,600*	*483,700*	*527,900*
	2011	*345,900*	**9,000**	-	-	-	-
	2018	*382,200*	-	**20,500**	-	-	-
	2050 – SMa	*461,600*	-	-	**12,000**	-22,100	*-66,300**
	2050 – BAU	*496,600*	-	-	47,000	**12,900**	-31,300
	2050 – Trans	*541,900*	-	-	*92,300**	58,300	**14,100**

Source: ONS, Cambridge Econometrics. Note: * denotes unlikely combinations.

As Table 5.2.1 shows[13], the Oxfordshire FEMA currently (2018) has a net commuting inflow of 20,500 people (that is, 20,500 additional people commute into the FEMA for work relative to residents that commute out of the FEMA for work). This reflects the strength and attractiveness of Oxfordshire's labour market and its high employment density (particularly in Oxford).

As noted in the *Phase 1 Report*, this number has rapidly increased over recent years (from only 9,000 in 2011) to a record high, as people reporting to work in the county continues to exceed the number of employed residents (due to jobs growing faster than the number of new homes delivered, as discussed in *Phase 1 Report*).

Over 2011-18 for instance, the number of people working in the FEMA is estimated to have increased by 36,100, whilst the number of employed residents increased by only 25,200. With some 82.8% of working age residents in active employment (the highest employment rate in the country), Oxfordshire's already tight labour market has been reliant on workers residing outside the FEMA to sustain its economic growth.

Resultantly, net in-commuting has more than doubled over this timeframe. Within the FEMA, the future of commuting in the FEMA will be shaped by how the Oxfordshire economy grows in future, and how housing supply responds to this growth. Even an alignment between housing and jobs growth at the

[13] 'Standard Method adjusted' = 'SMa', 'business as usual' = 'BAU', and 'transformational' = 'Trans'

county level can result in drastic changes to commuting patterns at a detailed spatial level, given the spatial distribution of such growth.

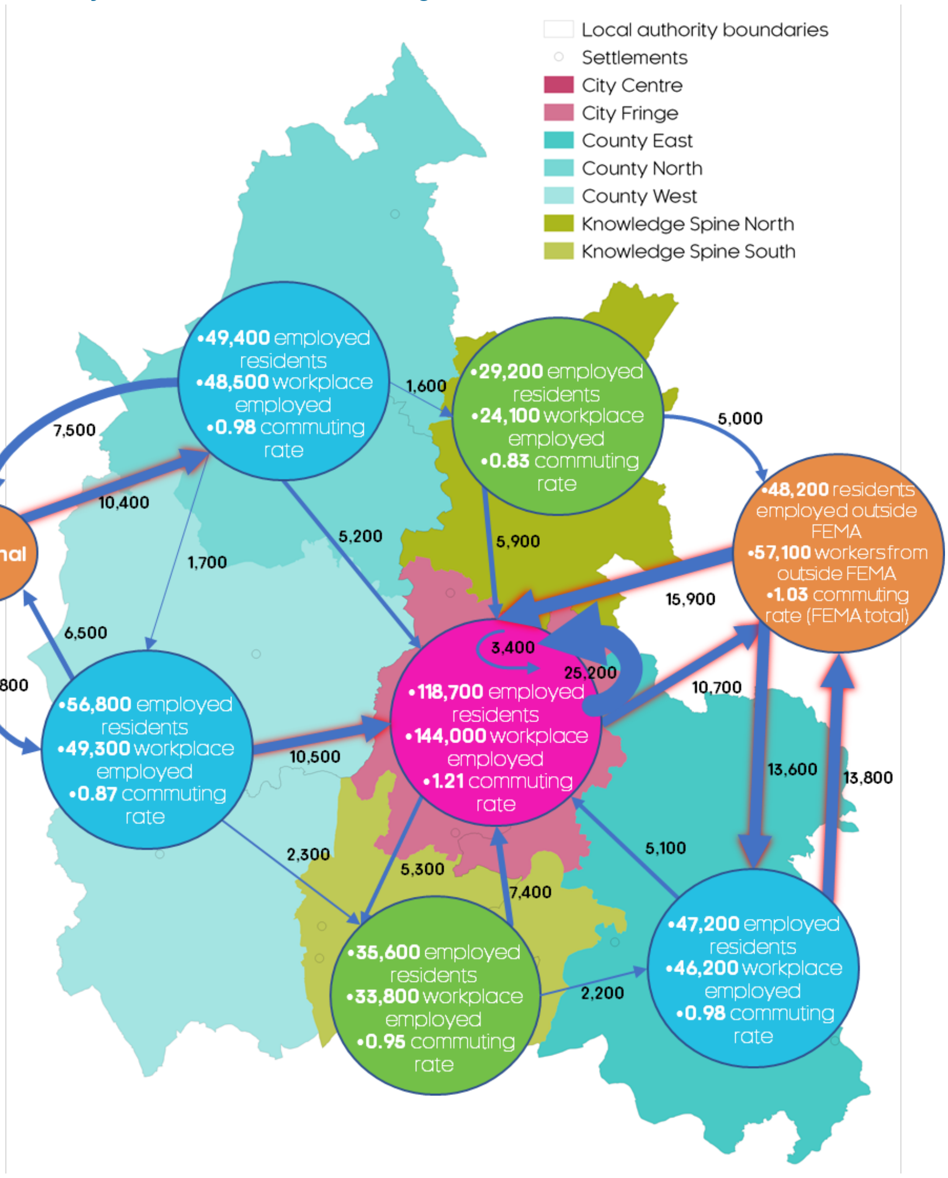
The following analysis looks in more detail at the relationship at this spatial level, considering firstly recent commuting trends within the Oxfordshire FEMA, before estimating how these might change over the respective trajectories and scenarios, and what impact this might have on modal shares and private vehicle trips. This supports extensive analysis in the *Phase 1 Report* which looks at the future relationship between housing, employment and commuting in Oxfordshire.

5.3 Recent FEMA commuting trends

2011 Census baseline

Figure 5.3.1 summarises commuting patterns within the Oxfordshire FEMA according to data from the 2011 Census, the baseline for the inter-Zonal commuting analysis (as it is the most recently available source of reliable commuting data with detailed origin-destination flows i.e. where a commuting trip starts and ends).

Figure 5.3.1: Stylized overview of commuting flows in the Oxfordshire FEMA, 2011



Source: ONS (Census 2011), Cambridge Econometrics.

The map summarises key Zone characteristics (employed residents, workplace employed, and commuting rates[14]) and highlights significant inter-Zonal flows (flows exceeding 1,000 people, with flows over 10,000 shaded red) in the FEMA, which are highlighted using interconnected arrows[15].

Flows are presented between the seven Zones alongside an External area – this captures all permanent residences and workplaces outside of the seven FEMA Zones (i.e. outside Oxfordshire).The accompanying origin-destination matrices, which provide Zone-by-Zone origin-destination flows, can be found in *Appendix A: Inter-Zonal Commuting Matrices*.

Census data showed the Oxfordshire FEMA displayed relatively high levels of self-containment, with 86% of residents working within the FEMA, and 83% of workers resident within the FEMA, giving an overall self-containment rate of 85%, well above the ONS self-containment threshold of 75% (and further highlighting the robustness of the FEMA-definition outlined in *Chapter 2*).

The proportion of residents working within the FEMA varies by Zone though, ranging from a high of 91% in the City Fringe to 71% in County East (the latter reflecting the greater commuting potential to and from the Thames Valley and Greater London labour markets). On average, almost two-thirds of FEMA residents worked within the Zone they resided in, though this ranged from a low of 53% (Knowledge Spine South) to a high of 67% (County North).

Unsurprisingly, inter-Zonal flows were largely focussed on Oxford (City Centre and Fringe), with the most significant flow being the 25,200 who made the short journey from the City Fringe to the City Centre. In terms of External commuting flows, these are greatest in County East, where a third of residents worked outside the FEMA and a third of workers resided outside the FEMA. Long distance commuting into Oxford (City Centre and Fringe) is relatively low, with only 11% of workers travelling from outside the FEMA.

Table 5.3.1 looks at the origin and destination of External flows to and from the FEMA in 2011, which were largely focussed on County East and North, and the City Fringe (together, these three Zones accounted for over two-thirds of External inflows and outflows respectively). Neighbouring Aylesbury Vale, South Northamptonshire and Swindon were the most popular origins, followed by Reading, West Berkshire and Wycombe to the east. The same areas also featured highly in terms of outflows, though central London was the most popular destination for those commuting out of the FEMA for work.

[1414] The commuting rate is simply the ratio of workplace employed relative to employed residents; for instance, an area with 30,000 workplace employed and 28,000 employed residents would have a commuting rate of 1.07 (30,000 / 28,000 = 1.07).

[15] With the arrow tip highlighting the destination and the arrow base the origin. Arrow width/boldness relates to the *proportionate* size of the flow within the FEMA.

Table 5.3.1: Origin and destination of External commuter flows in the Oxfordshire FEMA, 2011

Origin of external workers in Oxfordshire FEMA		Destination of Oxfordshire FEMA residents working externally	
Local Authority area	Inflow	Local Authority area	Outflow
Aylesbury Vale	6,700	Westminster and City of London	3,900
South Northamptonshire	5,400	Aylesbury Vale	3,900
Swindon	4,300	Reading	3,600
Reading	3,700	Wycombe	3,400
West Berkshire	3,100	West Berkshire	2,900
Wycombe	2,600	South Northamptonshire	2,600
Stratford-on-Avon	2,000	Swindon	2,200
Cotswold	1,900	Wokingham	1,600
Wokingham	1,900	Stratford-on-Avon	1,300
Wiltshire	1,300	Hillingdon	1,100

Source: ONS (Census 2011), Cambridge Econometrics.

In total, the FEMA had a net commuting inflow of 9,000 people (that is, 9,000 additional people were commuting into the FEMA for work relative to employed residents commuting out). This equated to an overall commuting rate of 1.03 (that is, there were 1.03 workplace employed relative to employed residents).

This was high compared to neighbouring areas of a similar size, such as Swindon and Wiltshire (0.94), Northamptonshire (0.94) and Buckinghamshire (0.88), reflecting both the high self-containment within the Oxfordshire FEMA, and the relative success and attractiveness of its labour market.

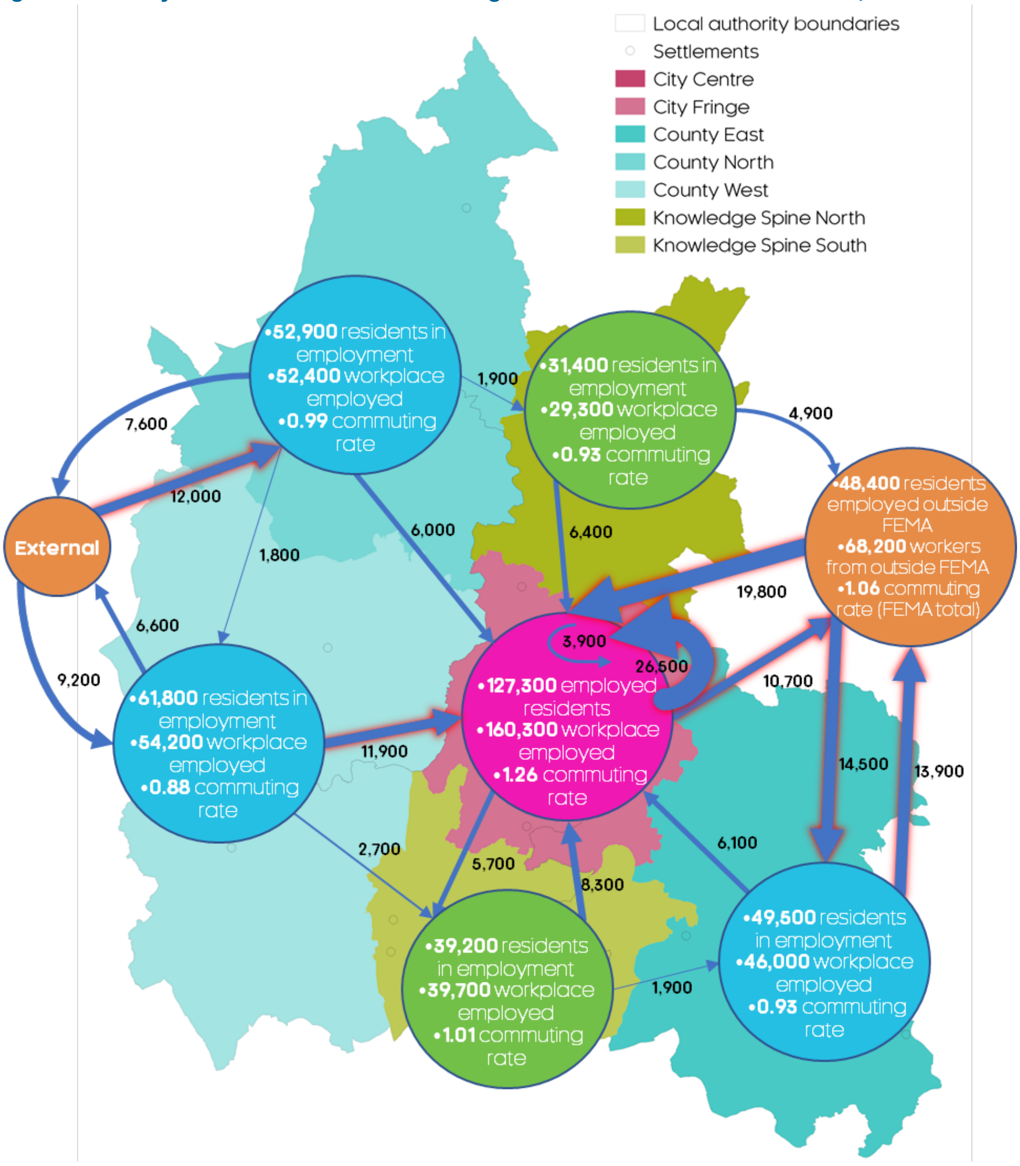
Naturally, this rate varied by Zone. Oxford City (Centre and Fringe) was the highest, with a commuting rate of 1.21. This was due to a higher number of workplace employed (i.e. jobs, given the agglomeration of the Oxford economy) relative to employed residents, resulting in high in-commuting.

Every other Zone had a commuting rate below 1.00, as a result of lower numbers of workplace employed (i.e. jobs) relative to employed residents. The lowest was County West, which resultantly was reliant on high levels of out-commuting (particularly to Oxford City Centre and Fringe).

Recent trends (to 2018)

Figure 5.3.2 presents estimates of Oxfordshire's inter-Zonal commuting patterns for 2018, derived by applying and scaling Zonal employment and housing growth to the original Census estimates. The accompanying origin-destination matrices, which provide Zone-by-Zone origin-destination flows, can be found in *Appendix A: Inter-Zonal Commuting Matrices*.

Figure 5.3.2: Stylized overview of commuting flows in the Oxfordshire FEMA, 2018

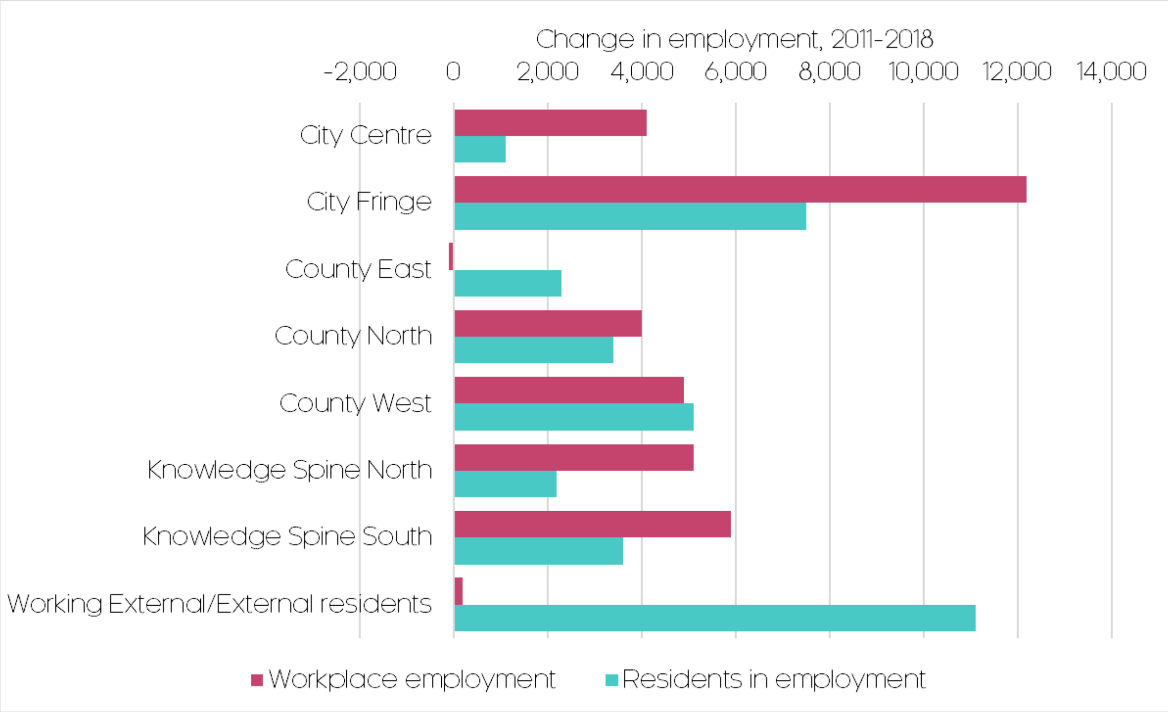


Source: ONS, Cambridge Econometrics.

Most notable from these updated estimates is the significant increase in External inflows across all Zones over 2011-18. Previously, Census data showed Oxfordshire had a net commuting inflow of 9,000 people; between 2011-18, this is estimated to have more than doubled to a net inflow of 20,500 people (that is, 20,500 additional people were commuting into the Oxfordshire FEMA relative to those commuting out for work). This is the highest commuting rate (1.06) for the FEMA since comparable records began (the 1981 Census).

This was due to a particularly large increase in people residing outside the FEMA ('External' residents) commuting into the county for work (+11,100 since 2011). This trend has been corroborated by alternative labour market data, as noted in the *Phase 1 Report*, and the pattern plays out relatively consistently at the Zonal level, with the majority of Zones experiencing faster growth in workplace employment (i.e. jobs) than growth in employed residents (i.e. people to fill those jobs), as Figure 5.3.3 shows.

Figure 5.3.3: Change in workplace employment and residents in employment by Zone, 2011-18



Source: ONS, Cambridge Econometrics.

Oxford City Centre experienced the largest discrepancy between the two, with workplace employment increasing 3.7 times that of the of the increase in employed residents, highlighting the increased agglomeration of jobs in the centre of Oxford relative to residents. Resultantly, all other Zones saw in increase in outflows to the City Centre.

Oxford's City Fringe experienced the largest increase in Externally-based workers, with +2,800 additional people commuting into the Zone from outside the FEMA. County East continues to have the highest dependency on External labour (approximately 14,500 External residents work in the Zone), though it actually saw a decline across all inflows from elsewhere in the FEMA, as total workplace employment in the Zone marginally contracted (the only in the FEMA to do so).

Other notable trends at the Zonal level include an increase in people both living and working within County North and West respectively, indicating reasonable alignment between housing and economic needs in these areas. The Knowledge Spine (particularly South) also saw a significant increase in workplace employed, some from outside the FEMA. The flow between the City Fringe and Centre saw the largest increase out of all inter-Zonal flows, with an additional 1,300 residents undertaking the journey since 2011.

Taking these results and findings, the following analysis details the process and results of inter-Zonal commuting estimates updated for 2050, to estimate the commuting impacts of the three employment and fifteen housing (three economic trajectories, each with five contrasting spatial scenarios) trajectories within the Oxfordshire FEMA.

5.4 Methodology overview

Inter-Zonal commuting matrices, detailing the origin and destination of commuting flows in the FEMA, have been estimated for the three Zonal employment trajectories and five housing scenarios in 2050. These matrices have been achieved by:

1. Firstly, applying Zonal growth rates from official employment data (such as BRES, accounting for double-jobbing etc.) to the Census 2011 totals of Zonal workplace employment (the destination) and Zonal residential employment (the origin) to estimate 2018 totals.
2. Extrapolating Zonal workplace employment (the destination) to 2050, by applying Zonal growth rates from the three economic trajectories (accounting for double-jobbing etc.) to the 2018 baseline of Zonal workplace employment.
3. Extrapolating zonal residential employment (the origin) to 2050 and beyond, by converting zonal estimates of housing need (for the 15 trajectory/scenario combinations) to Zonal residents in employment using population-dwelling ratios, economic activity and employment rates. These residential economic trajectories are aligned with the required commuting rate outlined in the *Phase 1 Report* (which is assumed to return to the ‘normal’ levels of 2011).
4. These estimates of residence employment and workplace employment by zone for 2018 and 2050 (aligned to *Phase 1 Report* Oxfordshire totals) are then entered into the Census 2011 inter-Zonal commuting matrix. A double-adjustment calculation is performed in which 2011 commuting shares are adjusted to reflect the effects of Zonal growth in residence in the origin, and workplace employment in the destination.
5. Once this double-adjustment is applied, the result is internally-consistent inter-zonal commuting predictions for 2018 and each trajectory/scenario combination for 2050. These estimates align with the headline projections of employment and dwellings growth presented in the *Phase 1 Report*.
6. Modal estimates have been estimated by entering 2011 shares into an origin-destination commuting matrix, where a double-adjustment calculation is performed in which 2011 modal shares are adjusted to reflect the effects of Zonal growth in residence in the origin, and workplace employment in the destination. Resultantly, modal shares will only change given the composition of residential and workplace employment (and the existing modal share of flows between these areas), and not because of exogenous factors such as behavioural change and infrastructure improvements.
7. Private vehicle commuting trips have then be calculated from these values, using Department for Transport trip rates data and matching commuting flows to Google Maps distance data. As with modal share, private vehicle commuting trips will only change given the composition of residential and workplace employment (and these existing trips rates

between these areas), and not because of exogenous factors such as behavioural change and infrastructure improvements.

5.5 Implications of the trajectories and scenarios for commuting

The following pages summarise the inter-Zonal commuting implications for the three Zonal employment and fifteen housing (three trajectories, each with five contrasting spatial scenarios) projections to 2050. These are presented for each housing scenario, to highlight the expected changes from the 2018 baseline and the differences between scenarios.

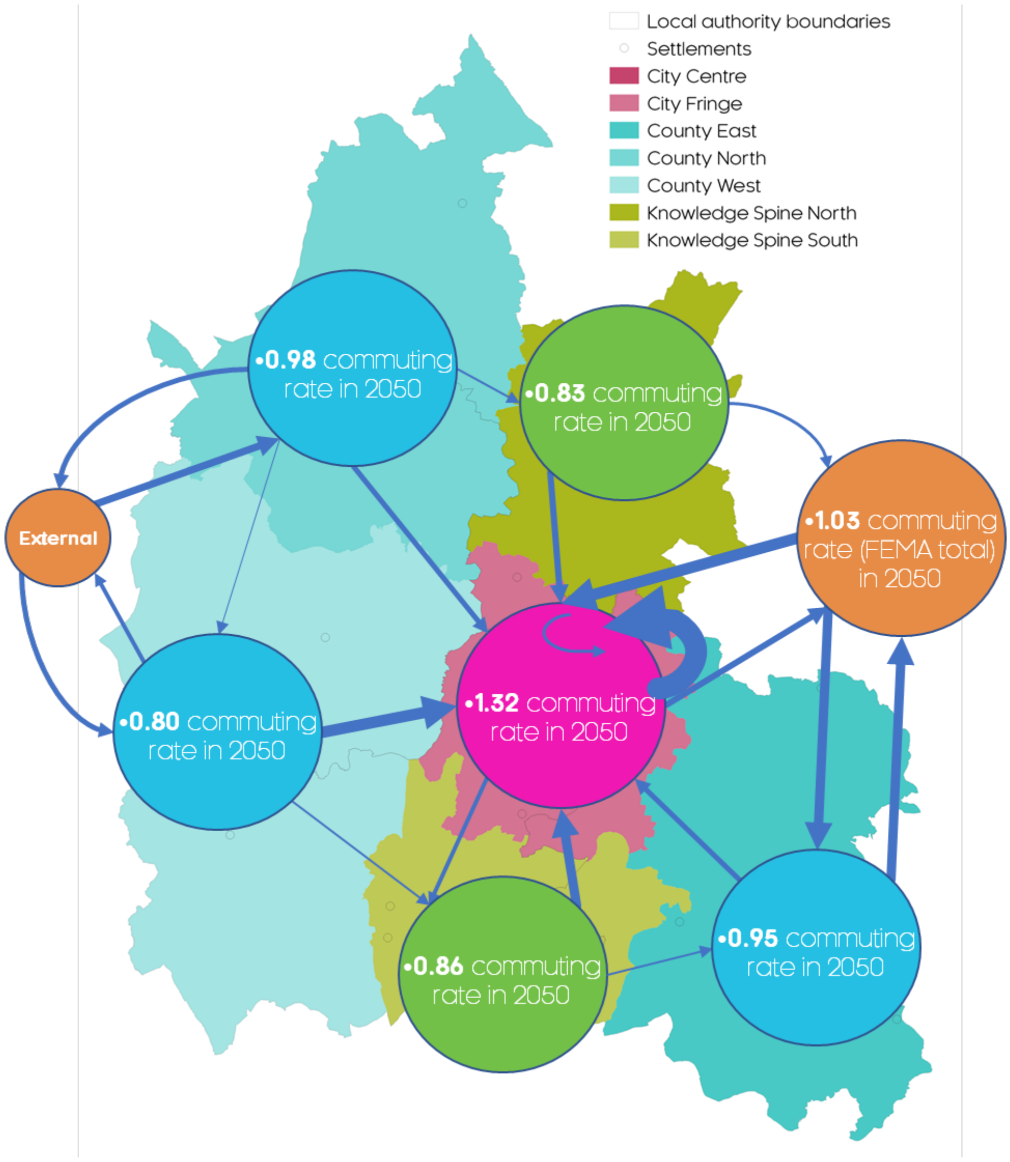
To aid with the analysis and interpretation, stylized maps have been produced. They include Zonal commuting rates (averaged across the three respective trajectories) and highlight proportionate commuting flows. The accompanying origin-destination matrices, which provide Zone-by-Zone origin-destination flows, can be found in *Appendix A: Inter-Zonal Commuting Matrices*.

It should be emphasised that these **scenarios were informed by and developed using trends and data predating the Covid-19 pandemic**. The substantial rise in homeworking during the pandemic, and its likely durability over the timeframe of the OGNA (to 2050), will likely impact some upon some of the following observations.

Though increased homeworking potential is accounted for in CE's econometric forecasting (based on changing occupational structure, and its amenability to homeworking), this may not reflect the extent of the Covid-19 induced change. The potential impacts of the pandemic on commuting, transport use and the OOGNA's wider observations are explored in greater detail in the *Covid-19 Impacts Addendum* accompanying this report.

Evenly dispersed scenario

Figure 5.5.1: Stylized commuting flows, 2050, under the evenly dispersed scenario



Source: Cambridge Econometrics.

Figure 5.5.1 presents stylized estimates of Oxfordshire's inter-Zonal commuting patterns for 2050 under the evenly dispersed housing scenario. Given that this scenario sees housing delivered at a proportionately even rate across the FEMA (regardless of the location of employment growth), there is an increase in most inter-Zonal flows.

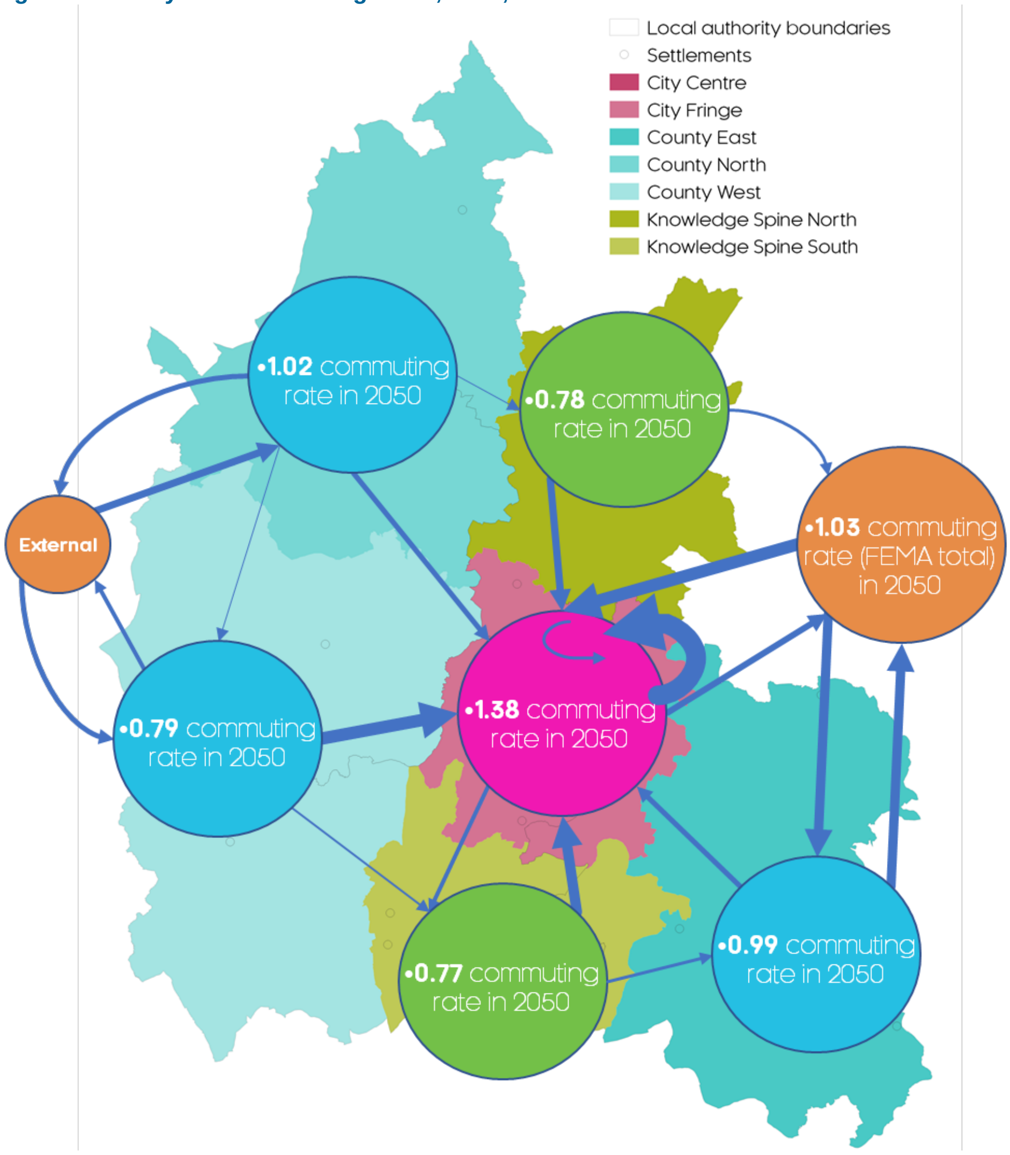
These additional flows largely focus on the Oxford (City Centre and Fringe), where the highest proportion of the FEMAs employment growth to 2050 (on average, 45%) is expected, increasing its commuting rate to 1.32. Flows originating from County West and Knowledge Spine South see particularly notable increases, decreasing the commuting rate in these areas.

Despite this, the scenario remains relatively self-contained with most additional residents working in the Zone they reside in, though this rate varies; for instance, in Knowledge Spine South, only half of new residents are expected to also work in the Zone, whilst in County North this increases to three-quarters.

Both the City Centre and Fringe see a large increase in residents both living and working in the Zone. External flows continue to focus on Oxford and County East. As the FEMAs net commuting rate returns to normal levels, there is a noticeable decline in external flows, particularly inflows.

Continued trends scenario

Figure 5.5.2: Stylized commuting flows, 2050, under the continued trends scenario



Source: Cambridge Econometrics.

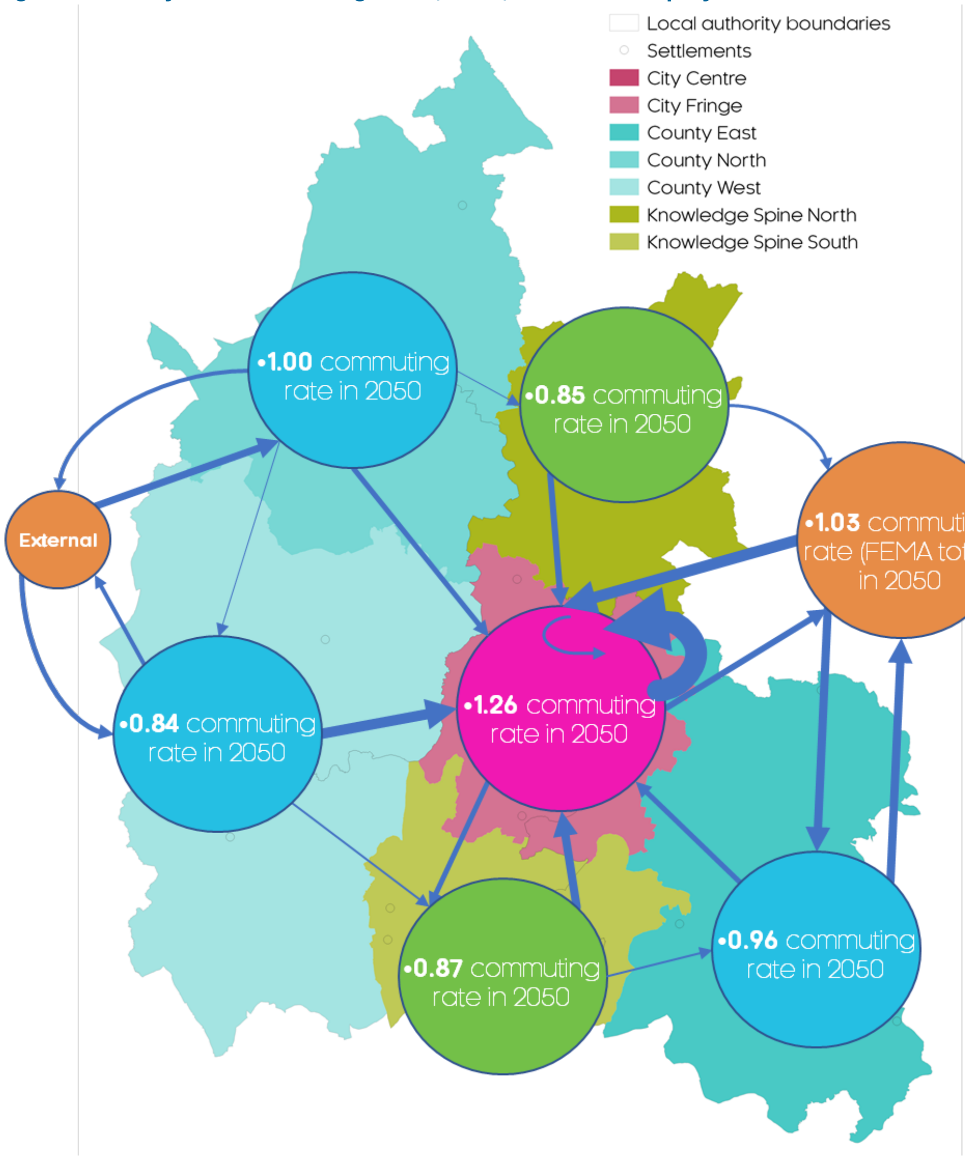
Figure 5.5.2 presents stylized estimates of Oxfordshire's inter-Zonal commuting patterns for 2050 under the continued trends housing scenario. This scenario sees housing delivered at a rate in line with 2020-2031 Local Plan forecasts up to 2050. This sees an increase in commuting flows from the County West and Knowledge Spine, where greater housing growth (and thus growth in employed residents) is expected, particularly relative to their workplace employment growth.

This drives down commuting rates in these areas, and increases the rate further in Oxford (to 1.38). Resultantly, continued trends is one of the less self-contained scenarios; on average, it is expected less than half of additional residents in the County West and Knowledge Spine will work within their Zone, with the remainder largely commuting into Oxford area for work.

As with the other scenarios, as the FEMAs net commuting rate returns to normal levels, there is a noticeable decline in external flows, particularly inflows.

Employment-led scenario

Figure 5.5.3: Stylized commuting flows, 2050, under the employment-led scenario



Source: Cambridge Econometrics.

Figure 5.5.3 presents stylized estimates of Oxfordshire's inter-Zonal commuting patterns for 2050 under the employment-led housing scenario. Under this scenario housing need is assumed to correlate with the distribution of projected Zonal employment growth, including growth in LIS-outlined key employment locations.

Given the stronger alignment between employment and housing growth, inter-Zonal commuting – particularly into Oxford - increases at a much lower rate than alternative scenarios, with the majority of residents working in the Zone that they reside.

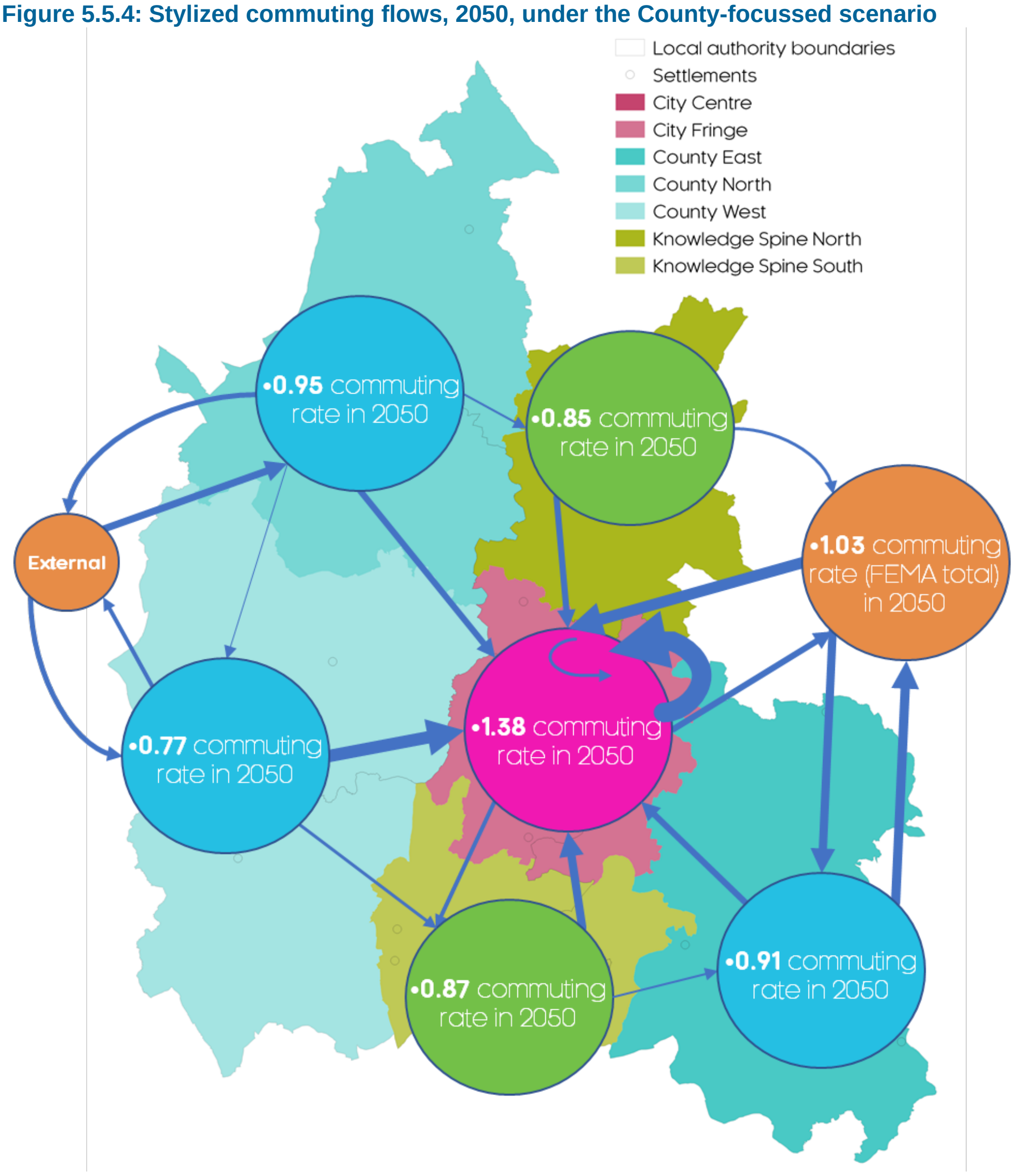
Lower relative flows into Oxford can be attributed to greater resident employment growth in this area, satisfying the higher levels of employment demand (thus a lower commuting rate – 1.26 – compared to other scenarios).

In fact, the greater emphasis on dwellings growth in Oxford even leads to an increase in flows out of the city, particularly into the Knowledge Spine, as the additional residents pursue employment opportunities outside Oxford. This increases the commuting rate in Wider County and Knowledge Spine Zones.

As with the other scenarios, as the FEMAs net commuting rate returns to normal levels, there is a noticeable decline in external flows, particularly inflows.

County-focussed scenario

Figure 5.5.4: Stylized commuting flows, 2050, under the County-focussed scenario



Source: Cambridge Econometrics.

Figure 5.5.4 presents stylized estimates of Oxfordshire's inter-Zonal commuting patterns for 2050 under the County-focussed housing scenario. With this scenario there is a greater focus and emphasis on dwellings growth in the Wider County. Resultantly, this sees a significant increase in commuting flows out of the Wider County, mostly into Oxford, but also with reasonable flows into the Knowledge Spine and External (out of FEMA). This sees lower commuting rates for Wider County areas.

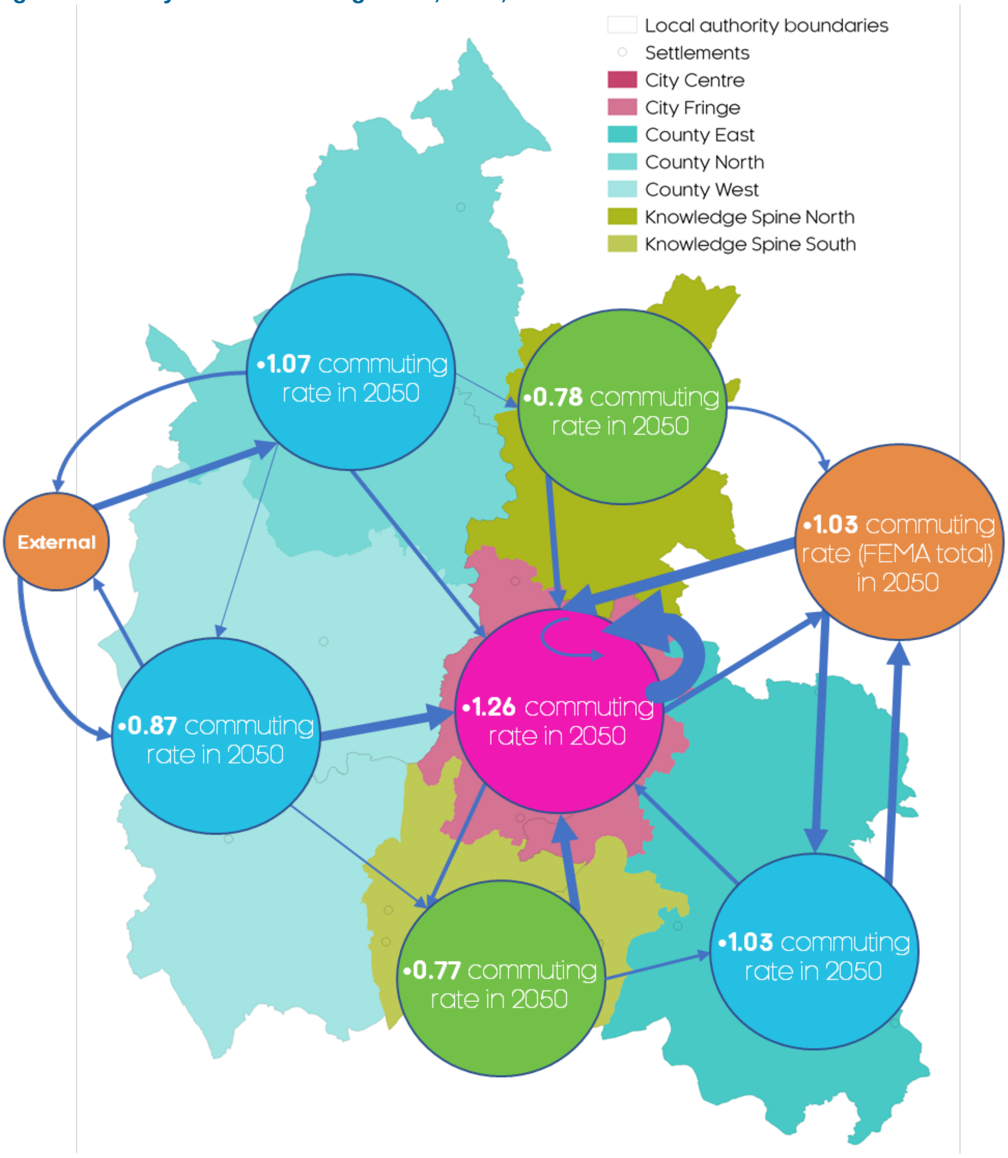
North-South commuting from the Knowledge Spine into Oxford is also noticeably lower, reflecting lower growth in employed residents. Under this scenario, it is estimated only two-thirds of additional Wider County residents will work in the Zone that they reside in, lower than the three-quarters in the employment-led scenario.

Compared with other scenarios, there are also noticeably lower levels of employed residents within Oxford, requiring higher in-commuting to satisfy employer demand (hence a very high net commuting rate of 1.38). There is also less commuting into the Wider County given the saturation of employed residents in these Zones.

As with the other scenarios, as the FEMAs net commuting rate returns to normal levels, there is a noticeable decline in external flows, particularly inflows.

Centralised scenario

Figure 5.5.5: Stylized commuting flows, 2050, under the centralised scenario



Source: Cambridge Econometrics.

Figure 5.5.5 presents stylized estimates of Oxfordshire's inter-Zonal commuting patterns for 2050 under the centralised housing scenario. With this scenario a greater focus and emphasis is placed on dwellings growth throughout central Oxfordshire, covering the Knowledge Spine, City Centre and Fringe.

In terms of the commuting, this results in a sharp increase in North-South flows (from the Knowledge Spine) into Oxford and only a negligible change in East-West flows (from the Wider County) into the Knowledge Spine and Oxford.

Given lower relative employed residents in the Wider County, these areas become more self-contained compared with other scenarios, thus increasing their commuting rates.

The Knowledge Spine is expected to see a large increase in employed residents, less than half of whom will work in the Zone they reside, with many commuting into Oxford. The City Centre and Fringe also see a large increase in residents, though many will continue to work where they reside. Some seek employment opportunities further afield, particularly in the Wider County.

As with the other scenarios, as the FEMAs net commuting rate returns to normal levels, there is a noticeable decline in external flows, particularly inflows.

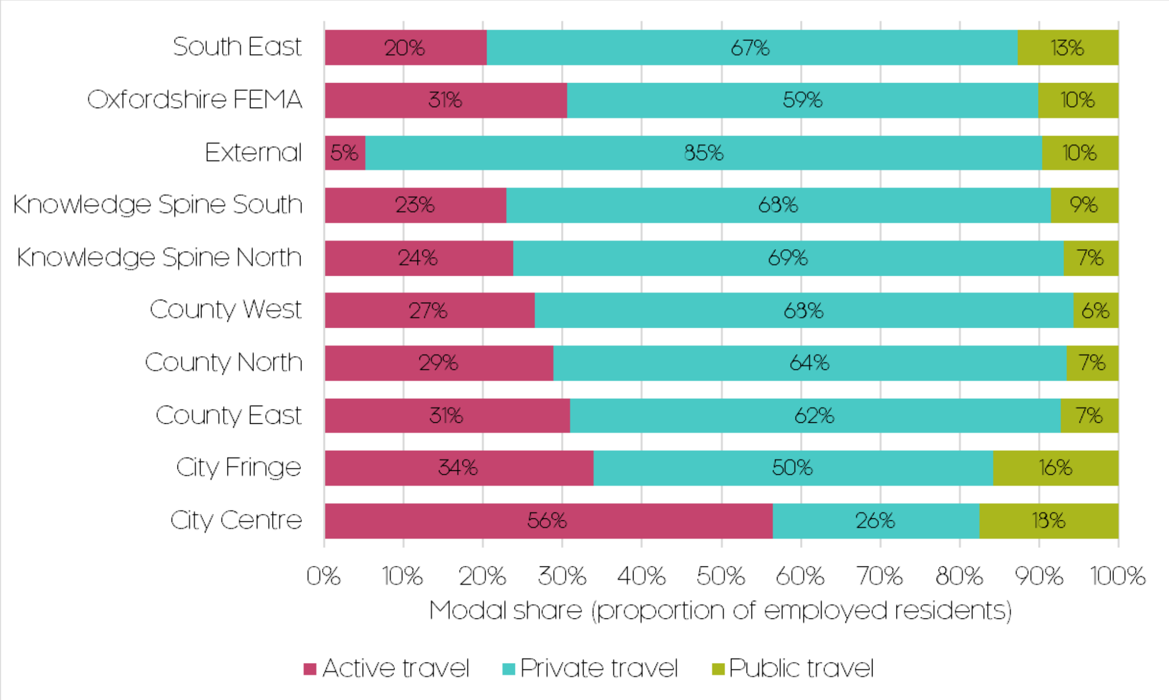
5.6 Implications for modal share

Alongside estimates of overall commuting flows to 2050, accompanying modal shares (that is, the mode of transport used by commuters) have also been calculated. To aid with the analysis and ensure maximal data quality at the required spatial level, modal shares have been aggregated by the following, based on Census mode of travel definitions:

- **Active travel**: this includes employed persons who work mainly at or from home, or travel to work by bicycle or on foot.
- **Private travel**: this includes employed persons who travel to work by car or van (driver or passenger), motorcycle, scooter or moped, or by taxi.
- **Public travel**: this includes employed persons who travel to work by Bus, minibus or coach, train, underground, metro, light rail or tram, or by another method of travel to work.

Figure 5.6.1 shows the modal share for employed residents across Oxfordshire and its constituent Zones, according to the Census (2011) baseline.

Figure 5.6.1: Modal share of employed residents in Oxfordshire, 2011



Source: ONS, Cambridge Econometrics.

Compared with regional and national averages, the FEMA had a greater share of employed residents commuting by active travel, with 3 in 10 residents opting for this mode of travel (compared to 2 in 10 elsewhere in the South East). Resultantly, reliance on private and public transport (the former in particular) is comparatively lower.

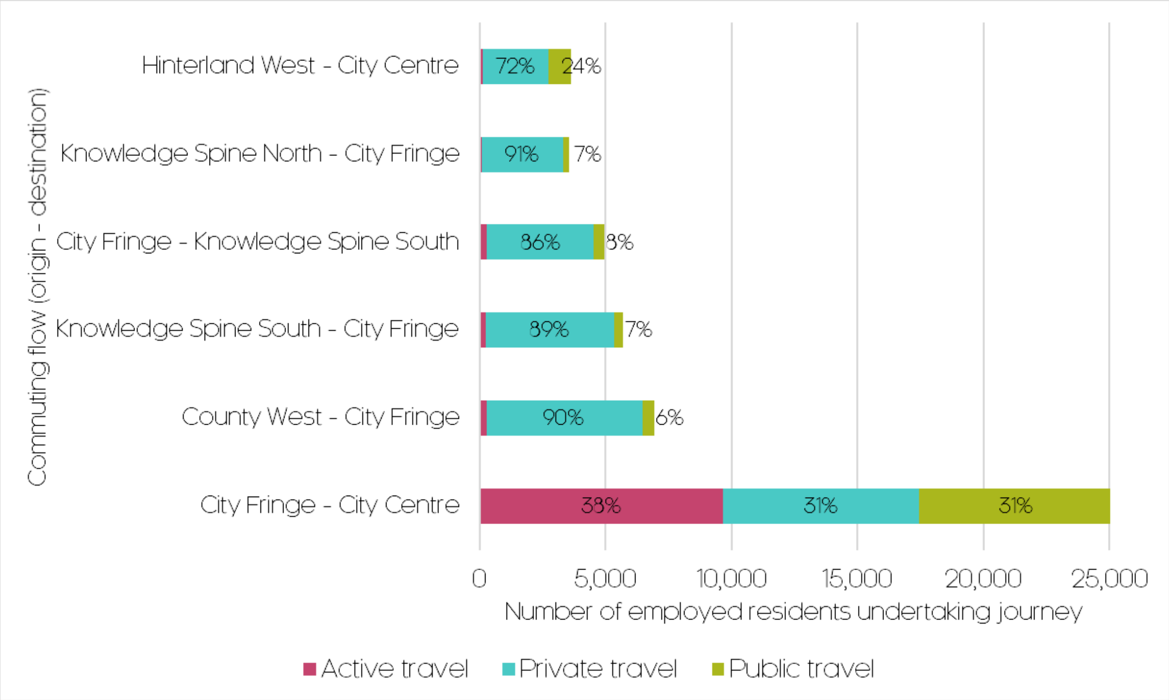
Naturally, this rate varied across the FEMA. Unsurprisingly given its urban density, active and public travel was most widespread in the Oxford (City Centre and Fringe) area, whilst employed residents in the Knowledge Spine had some of the highest reliance on private travel within the FEMA, at rates in line or exceeding the regional average.

Across all Zones in the FEMA though, active travel remained above the regional average. In contrast, public transport use was only above average within Oxford (City Centre and Fringe, and even then, this was somewhat marginal). Public travel was particularly low in Wider County.

Employed residents from outside the FEMA (External) commuting into Oxfordshire for work were the most likely to utilise private travel though, with 9 out of 10 External residents doing so.

Figure 5.6.2 shows the modal composition of the FEMAs most significant inter-Zonal commuting flows from the Census. There was a relatively even split in the preferred mode of transport for the 25,200 employed residents undertaking the short journey from the City Fringe to City Centre, with a small majority prioritising active travel.

Figure 5.6.2: Modal composition of significant inter-Zonal commuting flows, 2011



Source: ONS, Cambridge Econometrics.

The remaining flows, largely from the adjacent Wider County and Knowledge Spine, saw a much higher reliance on private travel, with fewer than 1 in 10 employed residents making these journeys opting to use public transport. Interestingly, the flow from the County West to the City Centre was an exception, with almost a quarter of the 3,600 commuters utilising public transport.

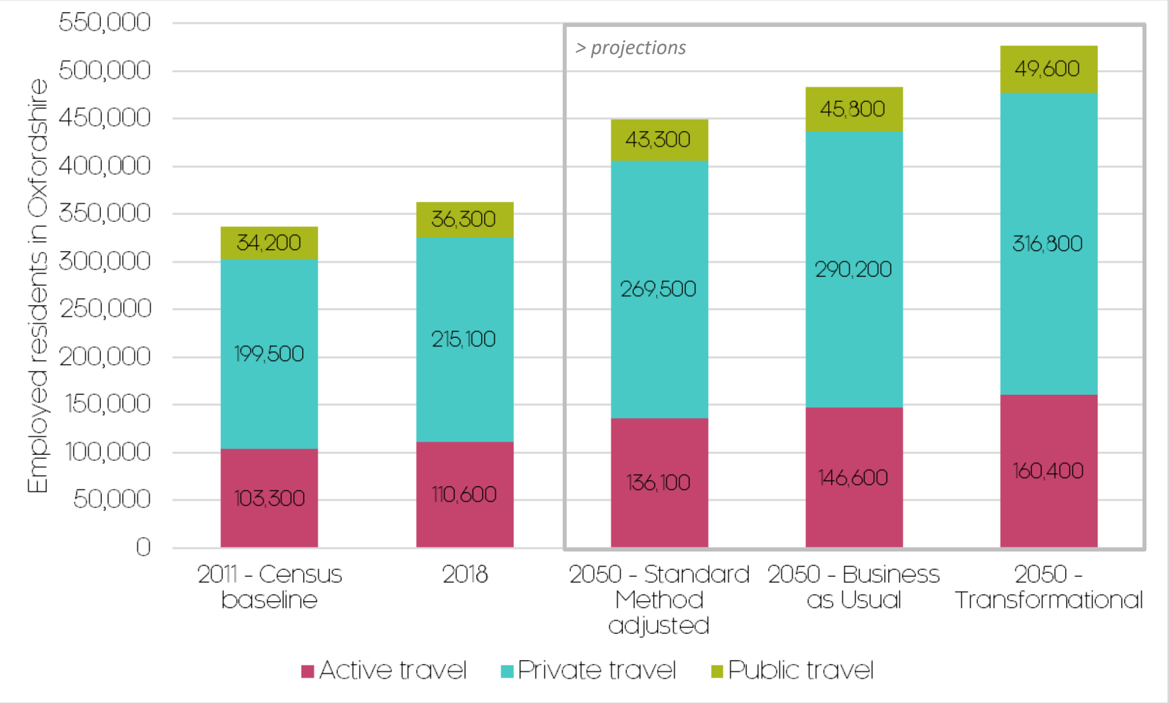
Looking ahead to 2050, Figure 5.6.3 highlights the potential change in absolute modal choice under the three economic trajectories for Oxfordshire. It should be emphasised that this has been taken using an **unconstrained / 'policy neutral' approach**, assuming that behavioural or infrastructure change is fixed.

Broadly speaking, this means current trends and patterns are extrapolated forward against future employment and housing growth without any major policy or infrastructure interventions. So greater housing growth in an area with currently high private travel reliance will resultantly be assumed to see an increase in private travel flows.

Taking such an approach, Figure 5.6.3 shows there could be an additional 49,000 employed residents utilising active travel means by 2050, under the transformational scenario, though twice this amount – 102,000 additional employed residents – could still be reliant on private travel means.

In fact, though all modes of transport are expected to see an increase in use in absolute terms, when looking at the proportion of this use (i.e. the actual modal share) there is much greater variability.

Figure 5.6.3: Potential modal choice in Oxfordshire under the three employment trajectories, 2011-50

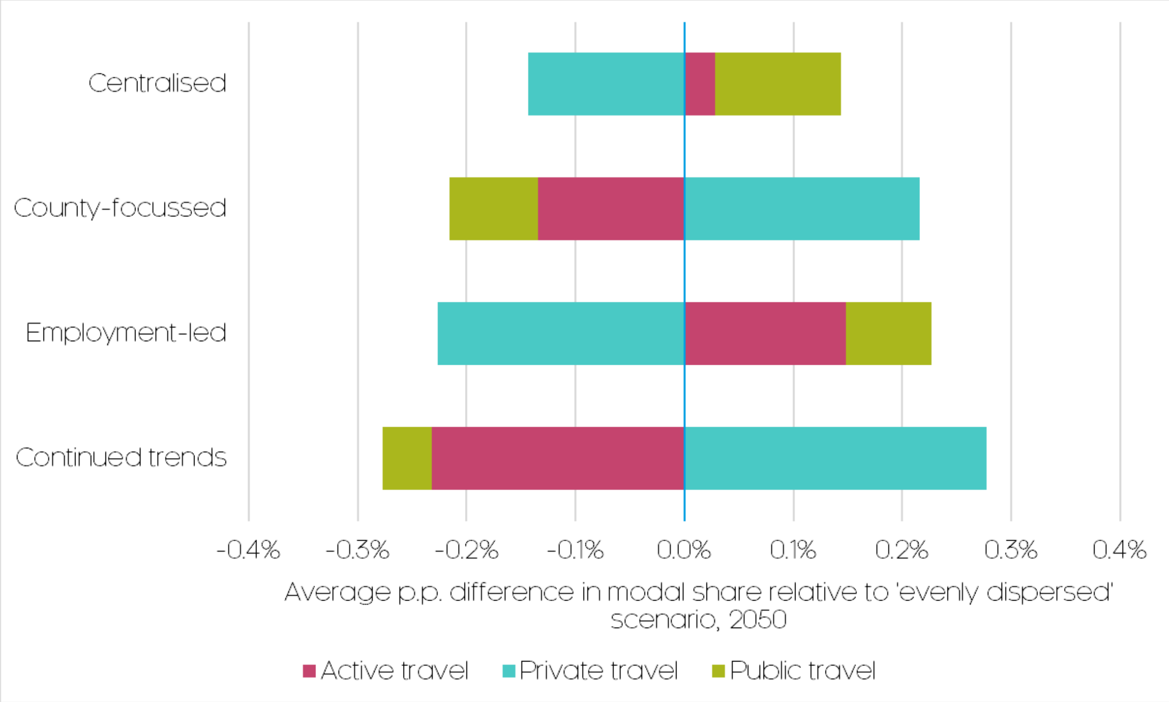


Source: ONS, Cambridge Econometrics.

For instance, Figure 5.6.4 considers the impact of the previously considered spatial scenarios on modal choice. This is presented in terms of the proportional difference for each scenario relative to their modal share under the evenly dispersed scenario.

This is because the evenly dispersed scenario, which sees housing delivered at a proportionately even rate across Zones, maintains existing modal shares

Figure 5.6.4: Potential impact on modal shares in Oxfordshire of the 2050 housing scenarios (averaged across the three employment trajectories)



Source: Cambridge Econometrics.

(i.e. they are held constant to 2050). The evenly dispersed scenario can therefore be seen as a neutral baseline for modal share in 2050.

The **continued trends** scenario, aligning with 2020-31 Local Plan need, sees the biggest shift in modal shares relative to the neutral evenly dispersed baseline, with a large increase in the proportion of employed residents using private travel, reflecting the greater housing growth and thus flows from private travel reliant areas such as the Knowledge Spine.

The **employment-led** scenario, which aligns housing growth with employment growth, sees the largest decline in private travel out of all scenarios, and a modest increase in active and public travel, largely reflecting the increase in intra-Oxford flows. Resultantly, active and public travel are expected to increase.

The **County-focussed** scenario, which emphasises housing growth in the private travel reliant Wider County, unsurprisingly sees a shift to employed residents using private travel, whilst public travel – which fewer than 1 in 10 Wider County residents use - declines.

The **centralised** scenario, allocating high housing growth to the Knowledge Spine and City Centre and Fringe, sees a small decline in the proportion of employed residents using private travel, despite the Knowledge Spines high private travel use, with a marginal shift to active and public travel.

As emphasised previously, these scenarios are 'policy-neutral', and as such only reflect the continuation of past trends. It is likely modal shift away from private travel, for instance, could be even higher, particularly within areas with a high potential for public and active travel - such as the City Fringe and Knowledge Spine - which may not be captured in the previous analysis.

5.7 Implications for private vehicle trips

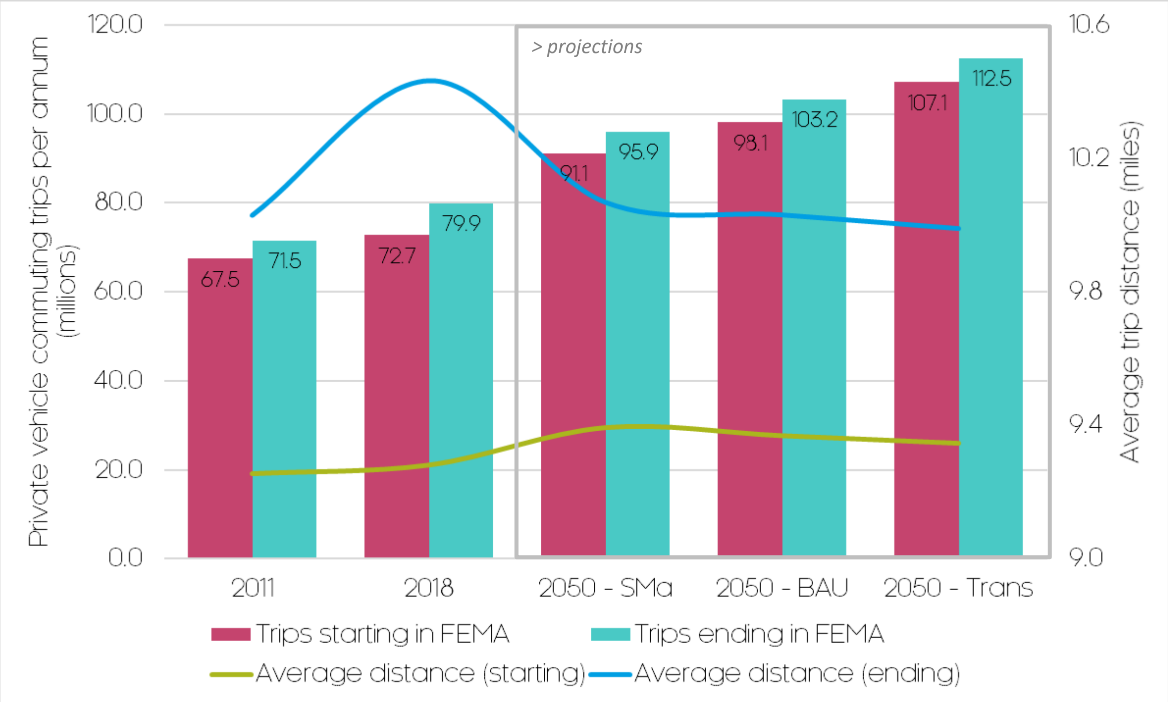
Given that the proportion of employed residents in the FEMA utilising private travel is expected to increase across almost all projections and scenarios, it is important to consider the potential impact on private vehicle trips – in terms of both their frequency and distance travelled - given this is what actually contributes to final infrastructure demand, and associated pressures and strains such as congestion and emissions.

As with modal share projections, it should be emphasised that future trip projections have been estimated using an **unconstrained / 'policy neutral' approach**, and therefore assume that behavioural or infrastructure change is fixed

Broadly speaking, current trends and patterns are extrapolated forward against future employment and housing growth. So greater housing growth in an area with currently high private vehicle reliance will resultantly see an increase in private vehicle trips originating in this location.

Figure 5.7.1 highlights the potential impact on private vehicle commuting trips starting and ending in the Oxfordshire FEMA, as well as the average distance of these trips. During 2018, there was estimated to be approximately 72.7 million private vehicle commuting trips starting in the Oxfordshire FEMA and 79.9 million ending in the FEMA.

Figure 5.7.1: Total private vehicle trips (left hand side axis) and average trip distance (right hand side axis) in the Oxfordshire FEMA under the three employment trajectories, 2011-50



Source: DfT, Google Maps, Cambridge Econometrics.

The number of trips ending was higher due to the positive rates of net commuting into the FEMA (that is, more people commute into the FEMA for work than those that commute out). Since 2011, the number of private vehicle commuting tips starting and ending in the FEMA has increased, though the former only by 8% whilst the latter has increased by 12%.

This larger increase for trips ending in the FEMA reflects the greater number of External residents commuting into Oxfordshire for work, which has increased substantially since 2011 (as observed in Figure 5.6.1). For 9 out of 10 External residents, private travel is the preferred mode of transport into the FEMA, driving this increase in private vehicle trips.

Over the timeframe to 2050, there is expected to be a continued steady increase in trips starting and ending in the FEMA, which could total an estimated 107.1 - 112.5 million respectively (per annum) under the transformational trajectory in 2050.

Notably, the proportional difference between trips starting or ending in Oxfordshire decreases and returns to 2011 levels, given the assumed decline in net commuting relative to 2018, as outlined previously and in the *Phase 1 Report*.

In terms of average distance, trips ending in the FEMA are usually longer; as of 2018, the average trip ending in Oxfordshire covered approximately 10.4 miles relative to the 9.3 miles for those starting in the FEMA.

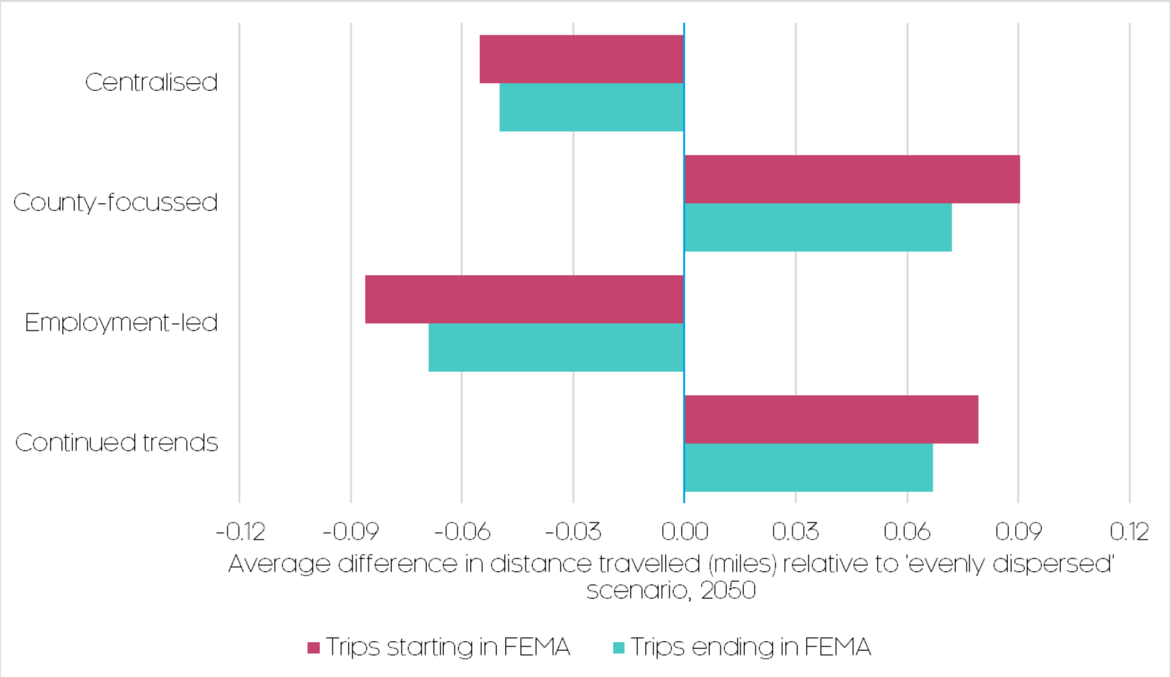
Again, this reflects the positive rates of net commuting into the FEMA and the high and increasing number of External residents commuting into the county for work, particularly relative to FEMA residents commuting out.

And as with total trips, since 2011 the average distance of trips ending in Oxfordshire has increased substantially, indicating not only are more trips being made from outside the FEMA, they are also being made over an increasingly longer distance. For trips starting in the FEMA, the average distance travelled has remained largely unchanged.

Looking ahead to 2050, the average distance of private vehicle trips ending in Oxfordshire is expected to decline, potentially below 2011 levels, largely reflecting the assumed decline in net commuting (and thus long-distance commuting by External residents) relative to 2018. For trips starting in Oxfordshire though, there is expected to be a gentle increase, as residents increase their reliance private travel over longer distances.

Of course, this pattern varies greatly when considering the impact of the aforementioned spatial scenarios, as shown in Figure 5.7.2. As with modal share, this is presented relative to the neutral evenly dispersed scenario, which assume a proportionately even increase in trips and distance across the FEMA.

Figure 5.7.2: Potential impact on average trip distance in Oxfordshire of the 2050 housing scenarios (averaged across the three employment trajectories)



Source: Google Maps, Cambridge Econometrics.

It should be emphasised that despite the differences in Figure 5.6. appearing marginal (as they reflect the average for each individual trip), at an aggregated, FEMA-wide level the impact can be substantial; for instance, a 0.1 decrease in the average trip length ending in the FEMA could reduce total vehicle miles travelled that year by 11.3 million.

Relative to the evenly dispersed baseline, the **continued trends** scenario, which sees the biggest modal shift towards private travel, results in a large increase in average trip distance, though this is slightly less than the County-focussed scenario, reflecting the proximity of the Knowledge Spine to Oxford.

The **employment-led** scenario, which aligns housing and employment growth and resultantly has the largest drop in private travel out of all scenarios, could actually result in a decline in average trip distance, below both 2011 and 2018 benchmarks.

The **County-focussed** scenario meanwhile, which emphasises housing growth in the private travel reliant Wider County, unsurprisingly sees the largest increase in average distance travelled out of all scenarios, regardless of whether the trips starts or ends in Oxfordshire.

Finally, the **centralised** scenario, allocating high housing growth to the Knowledge Spine and Oxford (City Centre and Fringe), also sees a decline in average trip distance, though not to the extent of the employment-led scenario.

5.8 Conclusions

This chapter has undertaken an extensive appraisal of commuting trends in the Oxfordshire FEMA, with a particular focus on understanding the implications for commuting trips, modal share and private vehicle miles within the FEMA as a result of the contrasting employment and housing distributions explored in previous chapters.

Analysis of recent trends has shown that, as a result of employment growth accelerating relative to the supply of housing, commuting into the Oxfordshire FEMA has more than doubled over the past decade. This means more people are commuting – and commuting further, typically using private transport - to work in the FEMA, exacerbating congestion and environmental impacts.

Though the scale of potential employment and housing growth in Oxfordshire will increase the absolute number of commuting trips within the FEMA, given certain development choices there is the potential for the length of these trips to decrease, for modal share to shift towards greener, more sustainable forms of transport, and for millions of private vehicles miles to be taken off Oxfordshire's roads by 2050.

Such outcomes are increasingly desirable given the growing pressure on Oxfordshire's transport network, associated externalities (notably, environmental and emissions effects), and the desire to attain net zero, and should therefore be considered in the appraisal of any future spatial development options for the FEMA.

6 Conclusions

This conclusion chapter seeks to highlight and draw out the key findings and observations presented in the Phase 2 Report, particularly those regarding the definition and characteristics of the Oxfordshire FEMA, the scenarios for the distribution of housing and employment growth, and their resultant implications for commuting and transport use.

The Oxfordshire Functional Economic Market Area (FEMA)

Functional Economic Market Areas (FEMAs) are designed to capture the extent and spatial distribution of a local economic market more accurately than administrative boundaries, which rarely reflect the true scale and reach of local economic markets and accompanying economic flows.

Figure 5.8.1: Spatial levels of the Oxfordshire FEMA

Source: Cambridge Econometrics.

This report has sought to identify the extent and characteristics of the Oxfordshire FEMA, to enable a more precise and in-depth exploration of potential spatial distributions of economic growth and housing need in Oxfordshire.

The analysis of several economic, demographic, and social markets and indicators showed that the county of Oxfordshire is a reasonable approximation for the Oxfordshire FEMA, with Oxford at its centre. Further spatial levels ('Zones') have also been identified within the FEMA, each with their own distinct characteristics and economic attributes. Presented in Figure 5.8.1 above, these include:

- **Oxford City Centre**: the area with the highest concentration of economic activity, as well as central urban amenities, with a strong and growing services-led economy.
- **Oxford City Fringe**: the area surrounding the City Centre, characterised by a high degree of integration with and connectivity to the City Centre, and the presence of important urban fringe sites, such as science parks and large suburb, as well as the undeveloped Green Belt. An area of diverse and fast-growing economic activity.
- **The Knowledge Spine**: an area of globally-recognised knowledge activity that runs through the centre of the FEMA, largely along the A34 corridor. Straddling the City and Centre and Fringe, it comprises a **Northern** and a **Southern** part. Both areas have seen robust economic and housing growth of late.
- **The Wider County**: areas that remain outside both the Knowledge Spine and City Centre and Fringe. They comprise three roughly equal parts of comparable economic activity and functionality: **County East**, **County West** and **County North**. Pockets of high economic and housing growth can be found within these predominantly rural areas.

As emphasised in the report, these Zones are purely hypothetical, to allow for a better spatial understanding of housing need in relation to economic trends, and they should not be regarded as specific options or priorities for the distribution of development.

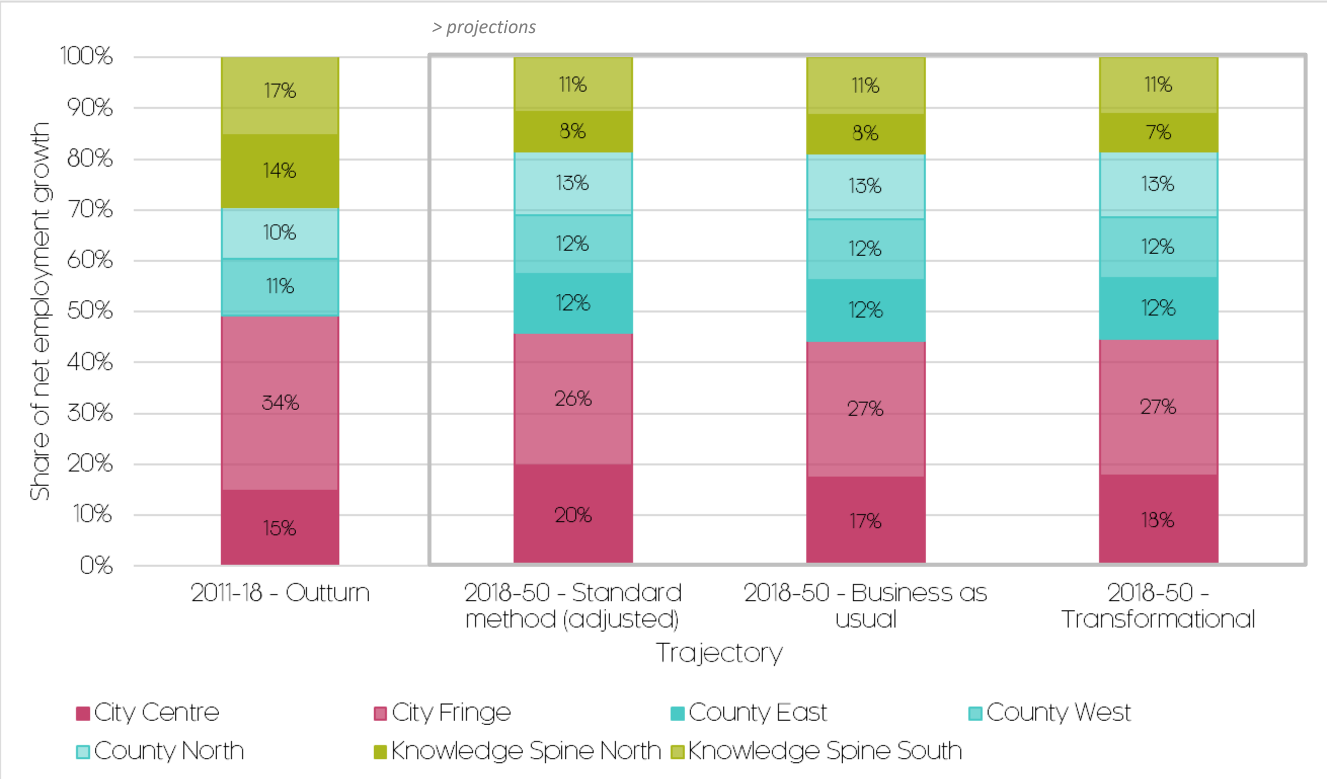
Employment and housing need distributions to 2050

Understanding the potential spatial scale and pattern of employment growth is important for informing, testing and illustrating contrasting distributions for housing need. Drawing on the definition of the Oxfordshire FEMA and its constituent spatial levels ('Zones'), this report has explored the potential spatial distribution of the three Oxfordshire-wide employment trajectories to 2050 (as prepared and presented in the *Phase 1 Report*).

The distributions for employment growth are summarised in Figure 5.8.2 below. Over the longer timeframe of the *Phase 1* employment trajectories (to 2050), there is the potential for a more spatially balanced growth picture to emerge compared to recent (2011-18) trends.

Central Oxfordshire, encompassing the Knowledge Spine (including Oxford City and Fringe), is expected to remain a significant driver of economic activity, accounting for a potential two-thirds of net additional jobs in the FEMA to 2050.

Figure 5.8.2: Spatial scenarios for Zonal distribution of employment (jobs) growth, 2011-18 and 2018-50



Source: ONS, Cambridge Econometrics. County East excluded from 2011-18 outturn due to negative employment growth. . Percentage shares relate to Zones proportion of FEMA-wide jobs growth to 2050.

Having considered the scale and pattern of potential economic growth within the Oxfordshire FEMA, this report then proceeds to illustrate a range of spatial distribution scenarios for the FEMA-wide housing need to 2050 (as prepared and presented in the *Phase 1 Report*.)

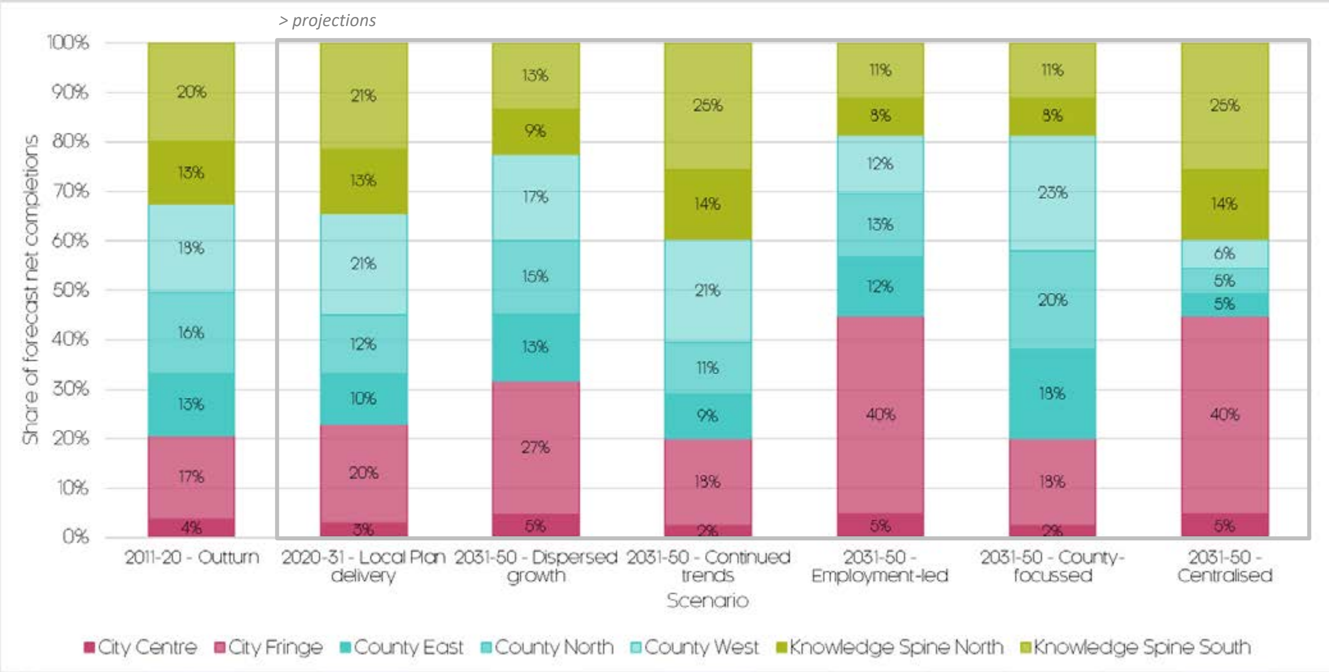
By taking the opportunity to quantify and test a range of different scenarios for housing distribution, the potential implications and trade-offs of different development choices can be identified and contrasted at a high-level.

The distributions of housing need have been informed by a set of robust and contrasting housing scenarios, with the results presented in Figure 5.8.3 below. The scenarios cover a variety of contrasting development choices for need after the 2020-31 period of Local Plan forecast completions. The scenarios include:

1. **An evenly dispersed scenario** – which sees housing need, and thus need, allocated at an even *percentage rate* (not quantity) across the FEMA.
2. **A continued trends scenario** – mirrors current concentrations of forecast net completions in Local Plans (which cover 202-31), extrapolating them over the additional 2031-50 period.
3. **An employment-led scenario** – sees need matched to the distribution of projected Zonal employment growth, including growth in LIS-outlined key employment locations.

4. **A County-focussed scenario** – focuses need on the Wider County, resulting in the lowest proportion of need allocated to Oxford City Centre and Fringe and the Knowledge Spine.
5. **A centralised scenario** – focuses need on central Oxfordshire, incorporating Oxford City Centre and Fringe and the Knowledge Spine. This results in the lowest proportion of need allocated to the Wider County.

Figure 5.8.3: Spatial scenarios for Zonal distribution of housing need, 2011-20 and 2020-50



Source: MHCLG, Cambridge Econometrics. Note: percentage shares are an average of distributions across the three employment trajectories. Percentage shares relate to Zones proportion of FEMA-wide housing need to 2050.

As Figure 5.8.3 shows, the distribution scenarios cover a variety of contrasting development choices, ranging from an economic-led focus on distribution in central Oxfordshire (Oxford and the Knowledge Spine), to a more evenly dispersed approach across the county, to an emphasis on market towns in Wider County areas.

As it allocates housing growth rates equally across Zones, the **evenly dispersed** scenario sees housing distributed the most evenly between the Zones post-2031. The Wider County still has the highest absolute level of growth, as it starts with the highest number of initial dwellings at 2031.

The **continued trends** scenario, extrapolating 2020-31 Local Plan forecasts to 2050, sees significantly greater distribution to the Knowledge Spine, and marginally less allocated to the Wider County and City Centre and Fringe.

The **employment-led** scenario sees much greater distribution to Oxford City (specifically the City Fringe), and comparatively lower levels allocated to the Wider County and Knowledge Spine.

The **County-focussed** scenario combines the low City Centre and Fringe distribution from the *continued trends* scenario with the low distribution to

Knowledge Spine from the *employment led* scenario. This scenario results in a very high relative allocation to the Wider County.

The **centralised** scenario reverses this process, with the high City Centre and Fringe distribution from the *employment-led* scenario paired with the high Knowledge Spine allocation from the *continued trends* scenario. This scenario results in a very low relative distribution to the Wider County.

It should be emphasised that these scenarios do not reflect preferred options or priorities for economic growth or housing delivery, but are rather hypothetical distributions to better understand the implications and trade-offs of different development choices at a high level. It should also be noted that these scenarios do not take into account specific site constraints, phased need, or development sites outside of the Local Plan period (2020-31).

Implications for commuting

By taking the opportunity to quantify and test a range of different economic and housing distributions, potential implications and trade-offs can be identified and contrasted. For the purpose of this report, this report has specifically focussed on understanding the consequences for commuting trips, modal share and private vehicle miles within the FEMA, particularly given their important role in attaining net zero ambitions for the county.

Analysis of recent trends has shown that, as a result of employment growth accelerating relative to the supply of housing, commuting into the Oxfordshire FEMA has more than doubled over the past decade. This means more people are commuting – and commuting further, typically using private transport - to work in the FEMA, exacerbating congestion and environmental effects.

Though the scale of potential employment and housing growth in Oxfordshire will increase the absolute number of commuting trips within the FEMA, the report finds that, given certain development choices, there is the potential for the length of these trips to decrease, for modal share to shift towards greener, more sustainable forms of transport, and for millions of private vehicles miles to be taken off Oxfordshire's roads by 2050.

Such outcomes are increasingly desirable given the growing pressure on Oxfordshire's transport network, associated externalities (notably, environmental and emissions effects), and the desire to attain net zero, and should therefore be considered in the appraisal of any future spatial development options for the FEMA.

Links to other OGNA work

As referenced throughout, this report is directly informed by and relates to the extensive evidence prepared and analysed in the OGNA's *Phase 1 Report*. The *Phase 1 Report* addresses housing need, economic growth and employment land requirements for Oxfordshire – at the county-wide level - and appraises the accompanying high-level commuting and affordability implications

The development of the Phase 2 Report coincided with the Covid-19 pandemic of 2020 and 2021. It is clear that the pandemic and some of its long-lasting effects have the potential to impact upon the findings of this report, not least those relating to commuting. As such additional consideration has been given to this question. This analysis can be found in the **Covid-19 Impacts Addendum** that accompanies this report.

7 References

DCLG (now MHCLG, 2010). Functional Economic Market Areas: An economic note. (Link)

HM Government (2019). Oxfordshire Local Industrial Strategy. (Link)

National Infrastructure Commission (2017). Partnering for Prosperity: a new deal for the Cambridge-Milton Keynes-Oxford Arc. (Link)

Oxfordshire LEP (2018). 2018 Economic Review: Baseline. (Link)

Oxfordshire LEP (2018). 2018 Future State Assessment. (Link)

Appendix A: Inter-Zonal Commuting Matrices

The following tables comprise the detailed origin-destination inter-Zonal commuting matrices referenced during the analysis of *Chapter 5 Commuting Trends Within the Oxfordshire FEMA.*

To read the matrices; columns represent the location of the FEMAs employee's residence, whilst rows the location of the FEMA employee's workplace. Flows are presented between the seven Zones alongside an External region. Cells are shaded according to the size (i.e. significance) of that flow.

For 2018 onwards, the matrices include additional cells (which are accordingly shaded) showing the weighted percentage change in inter-Zonal flows relative to the 2011 or 2018 baseline. Cells are shaded between blue, which indicates a significant increase, or red, for a significant decrease.

2011 Census baseline

Table 5.8.1: Inter-Zonal commuting matrix, 2011

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	11,000	25,200	1,800	2,000	3,600	2,300	1,700	5,000
	City Fringe	3,400	54,400	3,300	3,200	6,900	3,600	5,700	10,900
	County East	300	2,600	26,200	200	500	500	2,200	13,600
	County North	200	1,400	100	33,000	1,700	1,500	100	10,400
	County West	200	2,600	200	1,700	34,700	500	1,600	7,800
	Knowledge Spine North	100	1,300	300	1,600	500	15,500	200	4,700
	Knowledge Spine South	300	5,000	1,500	300	2,300	300	19,400	4,700
	External	1,800	8,900	13,800	7,500	6,500	5,000	4,700	-

Source: ONS (Census 2011), Cambridge Econometrics

2018

Table 5.8.2: Inter-Zonal commuting matrix, 2018

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	11,300	26,500	2,200	2,300	3,900	2,500	1,900	6,100
	City Fringe	3,900	60,100	3,900	3,700	8,000	3,900	6,400	13,700
	County East	100	2,500	26,200	100	400	300	1,900	14,500
	County North	200	1,400	300	34,900	1,900	1,500	200	12,000
	County West	300	2,700	500	1,800	37,500	500	1,700	9,200

	Knowledge Spine North	300	1,600	600	1,900	800	17,300	400	6,400
	Knowledge Spine South	500	5,200	1,900	600	2,700	500	22,000	6,300
	External	1,800	8,900	13,900	7,600	6,600	4,900	4,700	-

		Weighted % change 2011-18							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2011-18	City Centre	0.1%	0.4%	0.1%	0.1%	0.1%	0.1%	0.1%	0.3%
	City Fringe	0.1%	1.7%	0.2%	0.1%	0.3%	0.1%	0.2%	0.8%
	County East	-0.1%	0.0%	0.0%	0.0%	0.0%	-0.1%	-0.1%	0.3%
	County North	0.0%	0.0%	0.1%	0.6%	0.1%	0.0%	0.0%	0.5%
	County West	0.0%	0.0%	0.1%	0.0%	0.8%	0.0%	0.0%	0.4%
	Knowledge Spine North	0.1%	0.1%	0.1%	0.1%	0.1%	0.5%	0.1%	0.5%
	Knowledge Spine South	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.8%	0.5%
	External	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-

Source: ONS, Cambridge Econometrics

2050 – evenly dispersed scenario

Table 5.8.3: Inter-Zonal commuting matrix, 2050 under the Standard Method (adjusted): evenly dispersed scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	13,400	31,600	2,800	2,800	5,800	3,700	3,500	5,300
	City Fringe	4,600	71,000	5,200	4,900	11,000	6,000	10,000	12,600
	County East	300	2,800	31,800	600	1,100	900	3,500	13,800
	County North	300	1,700	700	42,300	3,000	2,300	1,000	10,800
	County West	200	2,700	700	2,000	47,700	800	2,700	8,000
	Knowledge Spine North	200	1,600	900	2,300	1,400	23,200	1,100	5,000
	Knowledge Spine South	400	5,600	2,100	700	3,700	800	30,400	5,000
	External	1,500	8,800	14,000	7,600	6,700	5,100	5,200	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.6%	1.5%	0.2%	0.2%	0.6%	0.4%	0.4%	-0.3%
	City Fringe	0.2%	3.2%	0.4%	0.4%	1.1%	0.6%	1.1%	-0.4%
	County East	0.1%	0.1%	1.6%	0.1%	0.2%	0.2%	0.5%	-0.4%
	County North	0.1%	0.1%	0.1%	2.2%	0.4%	0.2%	0.2%	-0.5%
	County West	-0.1%	-0.1%	0.0%	-0.1%	2.0%	0.0%	0.2%	-0.9%
	Knowledge Spine North	0.0%	0.0%	0.1%	0.1%	0.2%	1.7%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.1%	0.1%	0.0%	0.4%	0.1%	2.4%	-0.5%
	External	-0.2%	-0.2%	-0.1%	-0.1%	0.0%	-0.1%	0.0%	-

Table 5.8.4: Inter-Zonal commuting matrix, 2050 under the business as usual: evenly dispersed scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	14,200	33,600	2,900	2,900	6,100	3,800	3,600	5,300
	City Fringe	5,000	76,800	5,800	5,400	12,000	6,600	10,900	13,000
	County East	400	3,100	34,600	800	1,300	1,100	4,000	14,200
	County North	400	1,800	800	45,700	3,300	2,700	1,100	11,100
	County West	300	2,900	800	2,100	51,500	900	3,000	8,000
	Knowledge Spine North	300	1,800	900	2,500	1,600	25,100	1,200	5,000
	Knowledge Spine South	400	6,400	2,500	800	4,200	800	33,000	5,000
	External	1,500	8,900	14,200	7,600	6,700	5,100	5,000	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.9%	2.0%	0.2%	0.2%	0.7%	0.4%	0.5%	-0.3%
	City Fringe	0.3%	4.8%	0.6%	0.5%	1.4%	0.8%	1.3%	-0.3%
	County East	0.1%	0.2%	2.4%	0.2%	0.3%	0.2%	0.6%	-0.2%
	County North	0.1%	0.1%	0.2%	3.1%	0.5%	0.4%	0.3%	-0.4%
	County West	-0.1%	-0.1%	0.0%	-0.1%	3.1%	0.0%	0.2%	-0.9%
	Knowledge Spine North	0.0%	0.1%	0.1%	0.2%	0.3%	2.2%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.3%	0.2%	0.1%	0.5%	0.1%	3.1%	-0.5%
	External	-0.2%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%	0.0%	-

Table 5.8.5: Inter-Zonal commuting matrix, 2050 under the transformational: evenly dispersed scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	15,500	36,900	3,300	3,300	6,700	4,300	4,000	5,300
	City Fringe	5,600	84,100	6,500	6,100	13,200	7,300	11,900	13,500
	County East	500	3,200	38,000	900	1,600	1,200	4,500	14,800
	County North	400	2,000	900	50,000	3,700	3,000	1,300	11,400
	County West	400	3,100	1,000	2,500	56,300	1,100	3,400	8,100
	Knowledge Spine North	300	1,900	1,100	2,900	1,800	27,300	1,400	5,000
	Knowledge Spine South	400	7,200	2,900	900	4,600	900	36,100	5,000
	External	1,400	9,000	14,600	7,600	6,700	5,100	4,900	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighte	City Centre	1.2%	2.9%	0.3%	0.3%	0.9%	0.5%	0.6%	-0.3%
	City Fringe	0.5%	6.8%	0.7%	0.7%	1.7%	1.0%	1.6%	-0.2%

County East	0.1%	0.2%	3.3%	0.2%	0.4%	0.2%	0.7%	-0.1%
County North	0.1%	0.2%	0.2%	4.3%	0.6%	0.4%	0.3%	-0.3%
County West	-0.1%	0.0%	0.1%	0.1%	4.4%	0.1%	0.4%	-0.9%
Knowledge Spine North	0.0%	0.1%	0.2%	0.3%	0.4%	2.8%	0.3%	-0.5%
Knowledge Spine South	0.0%	0.6%	0.3%	0.1%	0.6%	0.1%	4.0%	-0.5%
External	-0.2%	-0.1%	0.1%	-0.1%	0.0%	-0.1%	-0.1%	-

Source: Cambridge Econometrics

2050 – continued trends scenario

Table 5.8.6: Inter-Zonal commuting matrix, 2050 under the Standard Method (adjusted): continued trends scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	13,200	31,000	2,700	2,700	6,000	4,000	4,000	5,400
	City Fringe	4,500	69,800	5,100	4,800	11,300	6,300	10,700	12,700
	County East	300	2,700	31,300	600	1,200	1,000	4,000	13,800
	County North	300	1,500	600	41,800	3,100	2,600	1,300	10,800
	County West	100	2,600	600	1,900	48,000	800	2,900	7,900
	Knowledge Spine North	200	1,500	700	2,000	1,400	23,700	1,300	5,000
	Knowledge Spine South	300	5,000	2,000	600	3,700	800	31,500	4,900
	External	1,400	8,700	13,900	7,500	6,800	5,100	5,600	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.6%	1.3%	0.2%	0.1%	0.7%	0.4%	0.6%	-0.3%
	City Fringe	0.2%	2.9%	0.4%	0.3%	1.2%	0.7%	1.3%	-0.4%
	County East	0.1%	0.1%	1.5%	0.1%	0.2%	0.2%	0.6%	-0.4%
	County North	0.1%	0.0%	0.1%	2.0%	0.4%	0.3%	0.3%	-0.5%
	County West	-0.1%	-0.1%	-0.1%	-0.1%	2.1%	0.0%	0.2%	-1.0%
	Knowledge Spine North	0.0%	0.0%	0.1%	0.1%	0.2%	1.8%	0.2%	-0.5%
	Knowledge Spine South	-0.1%	-0.1%	0.1%	0.0%	0.4%	0.1%	2.7%	-0.5%
	External	-0.2%	-0.2%	-0.1%	-0.1%	0.0%	-0.1%	0.1%	-

Table 5.8.7: Inter-Zonal commuting matrix, 2050 under the business as usual: continued trends scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of	City Centre	13,800	32,500	2,800	2,800	6,400	4,400	4,400	5,300
	City Fringe	5,000	74,800	5,600	5,300	12,400	7,200	12,000	13,100
	County East	300	2,800	33,800	700	1,500	1,300	4,700	14,300

	County North	300	1,600	700	44,800	3,500	3,100	1,700	11,100
	County West	100	2,600	700	1,900	52,100	900	3,400	7,900
	Knowledge Spine North	100	1,500	800	2,100	1,500	26,000	1,500	4,900
	Knowledge Spine South	300	5,400	2,000	600	4,100	900	35,000	4,900
	External	1,300	8,600	13,800	7,400	6,900	5,100	5,900	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.7%	1.7%	0.2%	0.2%	0.8%	0.6%	0.7%	-0.3%
	City Fringe	0.3%	4.2%	0.5%	0.5%	1.5%	0.9%	1.6%	-0.3%
	County East	0.1%	0.1%	2.1%	0.2%	0.3%	0.3%	0.8%	-0.2%
	County North	0.1%	0.1%	0.1%	2.9%	0.6%	0.5%	0.4%	-0.4%
	County West	-0.1%	-0.1%	0.0%	-0.1%	3.2%	0.0%	0.4%	-1.0%
	Knowledge Spine North	-0.1%	0.0%	0.1%	0.1%	0.3%	2.5%	0.3%	-0.5%
	Knowledge Spine South	-0.1%	0.1%	0.1%	0.0%	0.5%	0.1%	3.7%	-0.5%
	External	-0.2%	-0.2%	-0.2%	-0.1%	0.1%	-0.1%	0.2%	-

Table 5.8.8: Inter-Zonal commuting matrix, 2050 under the transformational: continued trends scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	14,900	35,100	3,100	3,100	7,300	5,200	5,200	5,300
	City Fringe	5,500	80,900	6,300	5,800	13,800	8,300	13,800	13,700
	County East	300	2,900	36,600	700	1,900	1,800	5,600	14,800
	County North	300	1,600	800	48,500	4,100	3,700	2,200	11,500
	County West	100	2,700	800	2,000	57,200	1,100	4,100	7,900
	Knowledge Spine North	100	1,500	800	2,200	1,700	28,800	1,800	4,900
	Knowledge Spine South	200	5,600	2,100	600	4,500	900	39,300	4,800
	External	1,200	8,500	13,800	7,300	7,000	5,300	6,300	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	1.0%	2.4%	0.3%	0.2%	1.0%	0.8%	0.9%	-0.3%
	City Fringe	0.5%	5.9%	0.7%	0.6%	1.8%	1.2%	2.1%	-0.1%
	County East	0.1%	0.1%	2.9%	0.2%	0.4%	0.4%	1.0%	-0.1%
	County North	0.1%	0.1%	0.2%	3.9%	0.7%	0.6%	0.6%	-0.3%
	County West	-0.1%	-0.1%	0.0%	-0.1%	4.6%	0.1%	0.6%	-1.0%
	Knowledge Spine North	-0.1%	0.0%	0.1%	0.1%	0.3%	3.3%	0.4%	-0.5%
	Knowledge Spine South	-0.1%	0.1%	0.1%	0.0%	0.6%	0.1%	4.9%	-0.5%
	External	-0.2%	-0.2%	-0.2%	-0.2%	0.1%	0.0%	0.3%	-

Source: Cambridge Econometrics

2050 – employment-led scenario

Table 5.8.9: Inter-Zonal commuting matrix, 2050 under the Standard Method (adjusted): employment-led scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	13,400	32,600	2,600	2,600	5,500	3,600	3,400	5,300
	City Fringe	4,500	72,600	5,000	4,700	10,600	5,800	9,700	12,500
	County East	300	3,100	31,600	600	1,000	900	3,500	13,800
	County North	300	1,900	700	42,100	2,800	2,300	1,000	10,900
	County West	200	3,000	700	2,000	47,000	900	2,700	8,000
	Knowledge Spine North	300	1,900	900	2,200	1,300	23,100	1,100	5,000
	Knowledge Spine South	400	6,300	2,100	700	3,500	700	30,100	5,000
	External	1,500	9,000	14,000	7,500	6,700	5,100	5,100	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.6%	1.7%	0.1%	0.1%	0.5%	0.3%	0.4%	-0.3%
	City Fringe	0.2%	3.6%	0.3%	0.3%	1.0%	0.6%	1.0%	-0.5%
	County East	0.1%	0.2%	1.5%	0.1%	0.2%	0.2%	0.5%	-0.4%
	County North	0.1%	0.1%	0.1%	2.1%	0.4%	0.2%	0.2%	-0.4%
	County West	-0.1%	0.0%	0.0%	-0.1%	1.8%	0.0%	0.2%	-0.9%
	Knowledge Spine North	0.0%	0.1%	0.1%	0.1%	0.2%	1.7%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.3%	0.1%	0.0%	0.3%	0.1%	2.3%	-0.5%
	External	-0.2%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%	0.0%	-

Table 5.8.10: Inter-Zonal commuting matrix, 2050 under the business as usual: employment-led scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	14,100	35,100	2,700	2,700	5,600	3,600	3,400	5,300
	City Fringe	4,900	79,200	5,500	5,100	11,300	6,200	10,400	12,900
	County East	400	3,500	34,400	700	1,100	1,000	3,900	14,400
	County North	400	2,100	800	45,400	3,100	2,600	1,100	11,200
	County West	400	3,500	900	2,100	50,400	1,000	3,100	8,200
	Knowledge Spine North	300	2,200	1,000	2,500	1,300	24,800	1,200	5,100
	Knowledge Spine South	400	7,300	2,400	700	3,800	800	32,600	5,000
	External	1,500	9,200	14,100	7,600	6,700	5,100	5,000	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Wei	City Centre	0.8%	2.4%	0.2%	0.1%	0.6%	0.3%	0.4%	-0.3%

	City Fringe	0.3%	5.5%	0.5%	0.4%	1.2%	0.7%	1.2%	-0.4%
	County East	0.1%	0.3%	2.3%	0.2%	0.2%	0.2%	0.6%	-0.2%
	County North	0.1%	0.2%	0.2%	3.0%	0.4%	0.3%	0.3%	-0.4%
	County West	-0.1%	0.1%	0.0%	-0.1%	2.8%	0.1%	0.3%	-0.9%
	Knowledge Spine North	0.0%	0.2%	0.1%	0.2%	0.2%	2.1%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.6%	0.2%	0.0%	0.4%	0.1%	3.0%	-0.5%
	External	-0.2%	-0.1%	-0.1%	-0.1%	0.0%	-0.1%	0.0%	-

Table 5.8.11: Inter-Zonal commuting matrix, 2050 under the transformational: employment-led scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	15,500	39,200	3,000	2,900	5,900	3,900	3,600	5,300
	City Fringe	5,300	88,000	6,000	5,500	12,100	6,700	11,300	13,300
	County East	500	4,400	37,600	800	1,200	1,100	4,300	14,900
	County North	500	2,800	900	49,400	3,300	3,000	1,300	11,600
	County West	400	4,400	1,000	2,500	54,500	1,100	3,500	8,200
	Knowledge Spine North	400	2,800	1,000	2,800	1,400	26,800	1,300	5,100
	Knowledge Spine South	400	8,500	2,800	800	4,100	900	35,400	5,100
	External	1,500	9,200	14,500	7,600	6,600	5,100	4,900	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	1.2%	3.6%	0.2%	0.2%	0.6%	0.4%	0.5%	-0.3%
	City Fringe	0.4%	7.9%	0.6%	0.5%	1.4%	0.8%	1.4%	-0.2%
	County East	0.1%	0.6%	3.2%	0.2%	0.2%	0.2%	0.7%	-0.1%
	County North	0.1%	0.4%	0.2%	4.1%	0.5%	0.4%	0.3%	-0.2%
	County West	-0.1%	0.4%	0.1%	0.1%	3.9%	0.1%	0.4%	-0.9%
	Knowledge Spine North	0.0%	0.3%	0.1%	0.3%	0.2%	2.7%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.9%	0.3%	0.1%	0.5%	0.1%	3.8%	-0.4%
	External	-0.2%	-0.1%	0.0%	-0.1%	0.0%	-0.1%	-0.1%	-

Source: Cambridge Econometrics

2050 – County-focussed scenario

Table 5.8.12: Inter-Zonal commuting matrix, 2050 under the Standard Method (adjusted): County-focussed scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of	City Centre	13,200	31,000	3,000	3,100	6,100	3,700	3,500	5,400
	City Fringe	4,500	69,900	5,500	5,200	11,400	6,000	10,000	12,700
	County East	200	2,700	32,300	600	1,100	900	3,400	13,800

	County North	200	1,500	700	42,900	3,000	2,200	800	10,700
	County West	100	2,500	700	2,000	48,300	700	2,500	7,900
	Knowledge Spine North	200	1,500	900	2,400	1,600	23,000	1,100	5,000
	Knowledge Spine South	300	5,300	2,300	800	4,000	800	30,200	5,000
	External	1,400	8,700	14,200	7,600	6,900	5,100	5,000	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.6%	1.3%	0.2%	0.2%	0.7%	0.4%	0.4%	-0.3%
	City Fringe	0.2%	2.9%	0.5%	0.4%	1.2%	0.6%	1.1%	-0.4%
	County East	0.0%	0.1%	1.7%	0.1%	0.2%	0.2%	0.4%	-0.4%
	County North	0.0%	0.0%	0.1%	2.3%	0.4%	0.2%	0.2%	-0.5%
	County West	-0.1%	-0.2%	0.0%	-0.1%	2.2%	0.0%	0.1%	-1.0%
	Knowledge Spine North	0.0%	0.0%	0.1%	0.2%	0.3%	1.7%	0.2%	-0.5%
	Knowledge Spine South	-0.1%	0.0%	0.1%	0.1%	0.5%	0.1%	2.4%	-0.5%
	External	-0.2%	-0.2%	-0.1%	-0.1%	0.1%	-0.1%	0.0%	-

Table 5.8.13: Inter-Zonal commuting matrix, 2050 under the business as usual: County-focussed scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	13,800	32,400	3,300	3,400	6,600	3,900	3,700	5,300
	City Fringe	5,000	74,800	6,300	6,000	12,600	6,600	10,900	13,200
	County East	300	2,800	35,400	800	1,400	1,000	3,800	14,100
	County North	200	1,500	800	46,800	3,400	2,400	900	10,900
	County West	100	2,600	800	2,200	52,600	800	2,700	8,000
	Knowledge Spine North	200	1,500	1,100	2,900	1,800	24,700	1,200	5,000
	Knowledge Spine South	400	5,700	2,800	900	4,600	800	32,700	5,000
	External	1,300	8,600	14,700	7,600	7,000	5,000	4,900	-

		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.7%	1.7%	0.3%	0.3%	0.8%	0.4%	0.5%	-0.3%
	City Fringe	0.3%	4.2%	0.7%	0.7%	1.5%	0.8%	1.3%	-0.3%
	County East	0.1%	0.1%	2.6%	0.2%	0.3%	0.2%	0.6%	-0.3%
	County North	0.0%	0.0%	0.2%	3.4%	0.5%	0.3%	0.2%	-0.4%
	County West	-0.1%	-0.1%	0.0%	0.0%	3.4%	0.0%	0.2%	-0.9%
	Knowledge Spine North	0.0%	0.0%	0.2%	0.3%	0.4%	2.1%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.1%	0.3%	0.1%	0.6%	0.1%	3.1%	-0.5%
	External	-0.2%	-0.2%	0.1%	-0.1%	0.1%	-0.1%	-0.1%	-

Table 5.8.14: Inter-Zonal commuting matrix, 2050 under the transformational: County-focussed scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	14,900	35,000	4,000	4,100	7,500	4,300	4,100	5,300
	City Fringe	5,500	81,000	7,300	7,000	14,200	7,300	12,000	13,800
	County East	300	2,800	39,300	900	1,800	1,000	4,100	14,600
	County North	200	1,500	900	51,700	3,900	2,600	900	11,100
	County West	100	2,600	900	2,600	58,100	900	2,900	8,000
	Knowledge Spine North	200	1,500	1,400	3,400	2,200	26,800	1,300	5,000
	Knowledge Spine South	400	6,100	3,400	1,100	5,300	900	35,600	5,100
	External	1,200	8,400	15,400	7,600	7,200	4,900	4,700	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	1.0%	2.4%	0.5%	0.5%	1.1%	0.5%	0.6%	-0.3%
	City Fringe	0.5%	6.0%	1.0%	0.9%	2.0%	1.0%	1.6%	-0.1%
	County East	0.1%	0.1%	3.7%	0.2%	0.4%	0.2%	0.6%	-0.1%
	County North	0.0%	0.0%	0.2%	4.8%	0.7%	0.3%	0.2%	-0.4%
	County West	-0.1%	-0.1%	0.0%	0.1%	4.9%	0.0%	0.2%	-0.9%
	Knowledge Spine North	0.0%	0.0%	0.2%	0.4%	0.5%	2.7%	0.2%	-0.5%
	Knowledge Spine South	0.0%	0.2%	0.4%	0.1%	0.8%	0.1%	3.9%	-0.4%
	External	-0.2%	-0.3%	0.3%	-0.1%	0.1%	-0.1%	-0.1%	-

Source: Cambridge Econometrics

2050 – centralised scenario

Table 5.8.15: Inter-Zonal commuting matrix, 2050 under the Standard Method (adjusted): centralised scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	13,400	32,700	2,400	2,400	5,300	3,900	3,800	5,300
	City Fringe	4,500	72,600	4,600	4,300	10,300	6,100	10,400	12,500
	County East	400	3,100	30,800	600	1,100	1,100	4,000	13,900
	County North	400	1,900	600	41,100	2,800	2,800	1,400	11,000
	County West	300	3,000	700	1,900	46,300	1,000	3,300	8,100
	Knowledge Spine North	200	1,800	700	1,900	1,000	23,800	1,300	5,000
	Knowledge Spine South	300	6,100	1,900	500	3,100	800	31,500	4,900
	External	1,500	9,000	13,800	7,400	6,600	5,100	5,700	-
		Weighted % change 2018-50							

		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.6%	1.8%	0.1%	0.1%	0.5%	0.4%	0.5%	-0.3%
	City Fringe	0.2%	3.6%	0.2%	0.2%	0.9%	0.6%	1.2%	-0.5%
	County East	0.1%	0.2%	1.3%	0.1%	0.2%	0.2%	0.6%	-0.3%
	County North	0.1%	0.1%	0.1%	1.8%	0.4%	0.4%	0.4%	-0.4%
	County West	-0.1%	0.0%	0.0%	-0.1%	1.6%	0.1%	0.3%	-0.9%
	Knowledge Spine North	0.0%	0.1%	0.1%	0.0%	0.1%	1.9%	0.2%	-0.5%
	Knowledge Spine South	-0.1%	0.2%	0.0%	0.0%	0.2%	0.1%	2.7%	-0.5%
	External	-0.2%	-0.1%	-0.2%	-0.1%	0.0%	-0.1%	0.2%	-

Table 5.8.16: Inter-Zonal commuting matrix, 2050 under the business as usual: centralised scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of work	City Centre	14,100	35,100	2,300	2,300	5,200	4,100	4,100	5,200
	City Fringe	4,900	79,200	4,900	4,500	10,800	6,800	11,600	12,800
	County East	500	3,700	32,900	600	1,100	1,400	4,800	14,400
	County North	500	2,400	700	43,700	2,900	3,300	1,900	11,400
	County West	400	3,700	800	2,000	49,200	1,300	4,000	8,100
	Knowledge Spine North	300	2,000	700	1,900	1,000	26,000	1,500	5,000
	Knowledge Spine South	300	6,900	1,900	500	3,100	800	34,900	4,800
	External	1,500	9,100	13,700	7,300	6,500	5,200	6,000	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	0.8%	2.4%	0.1%	0.0%	0.4%	0.5%	0.6%	-0.4%
	City Fringe	0.3%	5.5%	0.3%	0.2%	1.0%	0.8%	1.5%	-0.4%
	County East	0.1%	0.4%	1.9%	0.1%	0.2%	0.3%	0.8%	-0.2%
	County North	0.1%	0.3%	0.1%	2.6%	0.4%	0.5%	0.5%	-0.3%
	County West	-0.1%	0.2%	0.0%	-0.1%	2.4%	0.1%	0.5%	-0.9%
	Knowledge Spine North	0.0%	0.1%	0.1%	0.0%	0.1%	2.5%	0.3%	-0.5%
	Knowledge Spine South	-0.1%	0.5%	0.0%	0.0%	0.2%	0.1%	3.7%	-0.5%
	External	-0.2%	-0.1%	-0.2%	-0.2%	-0.1%	0.0%	0.2%	-

Table 5.8.17: Inter-Zonal commuting matrix, 2050 under the transformational: centralised scenario

		Location of residence							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Location of	City Centre	15,500	39,200	2,400	2,300	5,300	4,700	4,700	5,200
	City Fringe	5,300	88,000	5,100	4,600	11,200	7,600	13,100	13,100
	County East	500	4,600	35,300	600	1,100	1,900	5,700	15,000

Source: Cambridge Econometrics

	County North	500	3,200	800	46,700	3,100	4,000	2,500	11,800
	County West	500	4,700	800	2,100	52,500	1,800	4,900	8,300
	Knowledge Spine North	300	2,500	700	1,800	1,000	28,800	1,800	4,900
	Knowledge Spine South	300	7,900	1,900	400	3,000	800	39,200	4,800
	External	1,400	9,200	13,700	7,200	6,400	5,300	6,400	-
		Weighted % change 2018-50							
		City Centre	City Fringe	County East	County North	County West	Knowledge Spine North	Knowledge Spine South	External
Weighted % change 2018-50	City Centre	1.2%	3.6%	0.1%	0.0%	0.5%	0.6%	0.8%	-0.4%
	City Fringe	0.4%	7.9%	0.4%	0.3%	1.1%	1.0%	1.9%	-0.3%
	County East	0.1%	0.6%	2.6%	0.1%	0.2%	0.4%	1.1%	0.0%
	County North	0.1%	0.5%	0.2%	3.4%	0.4%	0.7%	0.7%	-0.2%
	County West	0.0%	0.4%	0.0%	-0.1%	3.3%	0.3%	0.8%	-0.9%
	Knowledge Spine North	0.0%	0.2%	0.1%	0.0%	0.1%	3.3%	0.4%	-0.5%
	Knowledge Spine South	-0.1%	0.7%	0.0%	-0.1%	0.2%	0.1%	4.9%	-0.5%
	External	-0.2%	-0.1%	-0.2%	-0.2%	-0.1%	0.0%	0.4%	-

Appendix B: Local Plan Forecast Completions

Table 5.8.1 below shows forecast net completions by built up area (BUA’s) in Oxfordshire over the 2020-31 period, derived from local authorities Local Plans. Note that these estimates were sourced directly from the respective Oxfordshire local authorities, who input to a proforma coordinated by Iceni Projects during the development of this report. These forecasts have been used to inform Zonal distributions of housing need, as explored in *Chapter 4*.

Table 5.8.1: Forecast net completions from Oxfordshire local authority Local Plans, 2020-31

Local Plan	Built up Area (BUA)/locality	Forecast net completions - current pipeline										
		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31
Oxford City	Oxford City	777	544	689	627	851	1191	1252	759	766	490	574
Cherwell	Banbury BUA	498	615	925	749	538	367	337	342	278	142	117
	Bicester BUA	681	529	550	485	577	613	540	481	479	479	379
	Former RAF Upper Heyford	150	130	150	150	150	150	150	150	150	150	150
	CDC Partial Review Sites (Kidlington, Begbroke, Gosford and Water Eaton and Yarnton)	0	105	255	475	505	540	590	575	515	485	355
	Other Cherwell (e.g. Rural)	261	292	452	606	535	570	620	605	545	515	385
West Oxfordshire	Carterton BUA	164	176	276	245	178	178	78	32	13	13	13
	Witney BUA	351	405	383	336	290	315	265	215	215	190	115
	Eynsham SDA/ Cotswold Garden Village	80	80	77	370	370	370	370	370	370	370	295
	Other West (e.g. Rural)	770	582	624	293	348	298	298	273	236	48	0
Vale of White Horse	Abingdon BUA	55	205	168	193	193	178	150	100	0	0	0
	Faringdon BUA	105	145	92	89	89	64	46	46	46	46	4
	Wantage & Grove BUA	521	497	410	325	398	398	311	242	220	220	320
	Botley (adjoins Oxford)	137	0	0	0	0	0	0	0	0	0	0
South Oxfordshire	Didcot BUA	505	582	579	635	882	982	971	632	577	562	279
	Henley-on-Thames BUA	55	32	0	0	134	78	0	0	0	0	0
	Thame BUA	73	70	10	0	60	60	15	0	0	0	0
	Wallingford BUA	180	387	310	127	199	186	172	55	0	0	0
Other South and Vale Rural		1251	1351	1159	988	919	765	853	1451	2031	2016	1966

Source: Oxford City Council, Cherwell District Council, West Oxfordshire District Council, Vale of White Horse District Council, South Oxfordshire District Council.

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Oxfordshire Councils

Oxfordshire Growth Needs Assessment

Covid-19 Impacts Addendum

Final Report

March 2021

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Contents

1 Introduction

The Oxfordshire Councils[1] have commissioned Cambridge Econometrics (CE) to prepare a Covid-19 Impacts Addendum to support the development of the Oxfordshire Growth Needs Assessment (OGNA).

The OGNA and its supporting documents will help to inform the preparation of the Oxfordshire Plan. The Oxfordshire Plan will be a Joint Statutory Spatial Plan which sets out a development strategy for growth across Oxfordshire to 2050.

1.1 Context and links to other work

The Oxfordshire Growth Needs Assessment (OGNA) was initiated in 2019 and carried out throughout 2020. The work fell into two complementary phases; the **Phase 1 Report** provides overall growth need figures for housing and employment in Oxfordshire to 2050. It profiles local housing market, demographic, economic and commercial property market dynamics, all within the strategic policy environment. These factors are then brought together to provide trajectories for future housing and employment land needs, and resultant high-level implications for commuting and affordability.

Following on from this, the **Phase 2 Report** considers a range of high-level scenarios for the distribution of housing and employment across Oxfordshire. The purpose of this is to aid decision-makers in understanding of the implications of alternative spatial choices. It does not seek to identify specific options or priorities for development, but rather explores the potential scale and implications of different approaches.

During the course of this work, it became clear that the Covid-19 pandemic could have significant, long-term impacts that may be relevant to the scope of the study, both in terms of the prospects of different sectors locally, the demand for housing within the county, and the interaction between housing and employment location and transport demand under conditions of remote work.

To reflect the emergence of the Covid-19 pandemic during the development of the OGNA, this short report - the **Covid-19 Impacts Addendum** - has therefore commissioned to sense-check, contextualise, and update the results of the *Phase 1* and *Phase 2 Reports* in light of these developments.

This report draws heavily on and supplements the extensive analysis and research undertaken for Oxfordshire LEP's **Economic Recovery Plan (ERP)[2],** which was produced by Steer ED in conjunction with CE over 2020-21.

Informed by extensive quantitative and qualitative evidence, the Plan provides an authoritative and independent assessment of how, and where, the Covid-

[1] The commissioning authorities comprise Cherwell District Council, Oxford City Council, South Oxfordshire District Council, Vale of White Horse District Council and West Oxfordshire District Council.

[2] The Economic Recovery Plan and its supporting documentation can be accessed from Oxfordshire LEP's website here.

19 pandemic has affected the Oxfordshire economy, and outlines a formal and proactive plan of economic renewal for the Oxfordshire economy post-Covid.

Therefore, it is recommended that the analysis presented in this report is read alongside the other supporting documentation of the OGNA and the Oxfordshire ERP, given their interconnectedness. This report supplements, rather than duplicates, the extensive analysis presented in these supporting documents.

In addition, a stand-alone **Executive Summary**, which highlights and brings together the key observations and messages from the three respective reports, has also been produced.

1.2 This report

This report is structured as follows:

- *Chapter 2* provides an overview of the latest evidence and theory to understand the impact of the pandemic on the UK and Oxfordshire, and the future prospects of a switch towards remote working;
- *Chapter 3* appraises the robustness of the *Phase 1 Report* employment projections for Oxfordshire, assessed in light of the pandemic and its related trends, and finally;
- *Chapter 4* concludes with a discussion as to the long-term options for remote working and a qualitative appraisal of the implications for employment land, housing demand, and commuting patterns.

A summary conclusion and accompanying references and appendices can also be found at the end of the report.

2 Interpreting the OGNA in a post-Covid World: Theory and Evidence

2.1 Introduction

Analysis and forecasts presented in the Oxfordshire Economic Recovery Plan (ERP) show that, despite the extent of the economic shock associated with the Covid-19 pandemic, the Oxfordshire economy has the potential to rapidly recover, stabilise, and return to long-term trends, and at a much faster rate than comparator areas.

Resultantly, over a longer timeframe (i.e. the 2050 horizon of the Oxfordshire Plan), post-Covid *levels of growth* in Oxfordshire are not expected to appear substantially different from those suggested by the OGNA's economic trajectories, despite the latter predating the pandemic. The robustness of the OGNA trajectories are explored in greater detail in *Chapter 3*.

However, beyond just the short- and medium-term economic impact, the longer-term legacy of the pandemic has the potential to trigger and accelerate substantive economic, social and behavioural change in Oxfordshire and beyond; for instance, through the rise in remote working, changing patterns in residential and commercial demand, and shifting transport use.

There is the potential that as a result of these changes, the *composition and distribution of this growth* in 2050 may not be the same as that previously observed in the OGNA, e.g. housing need may shift to suburban and rural locations, demand for retail floorspace could decline in city centres.

However, given the pandemic is at an early and evolving stage, there is still an unprecedented amount of uncertainty when it comes to estimating the longer-term scale and impact of these changes, and whether their impacts are merely transitory or permanent.

This chapter therefore seeks to understand the outlook of the OGNA and its themes within the context of a post-Covid world, drawing on the latest evidence, literature and theory to gauge the longer-term trends and implications, to inform a series of qualitative scenarios to 2050.

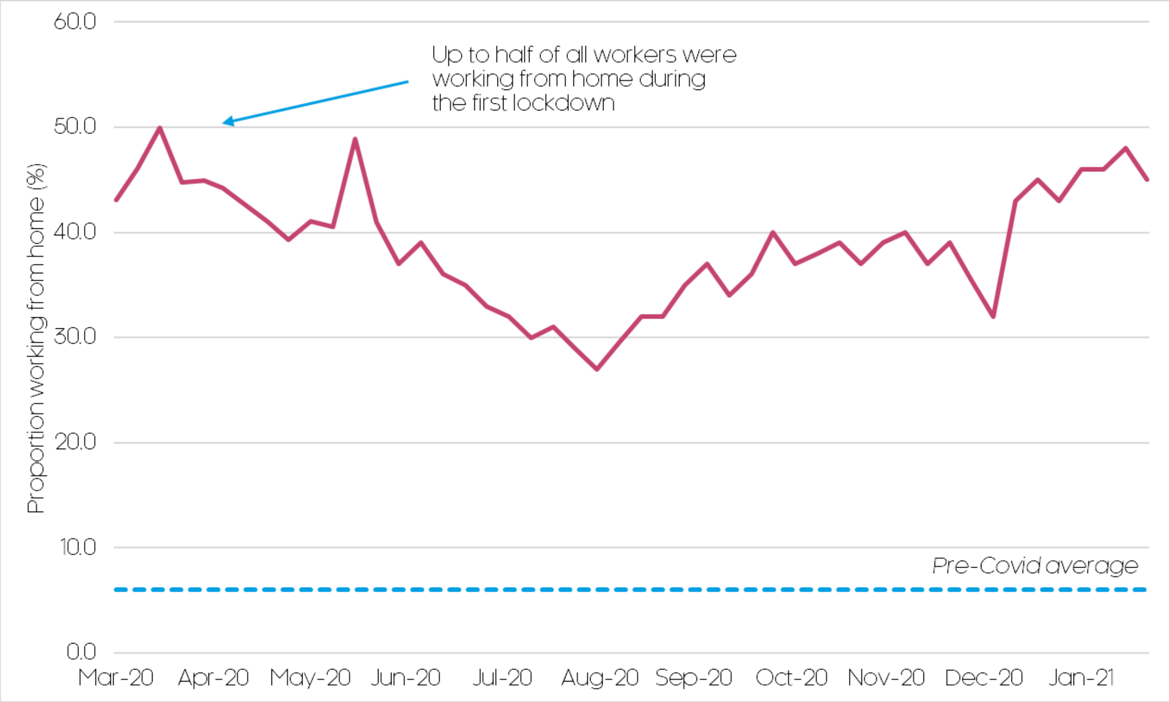
2.2 The pandemics legacy: a changing way of work

The Covid-19 pandemic, and associated 'lockdown' measures, have ushered in an unprecedented change in the way people work, almost overnight. As shown in Figure 2.2.1, at its peak in April 2020, half of the UK labour market was engaged in regular remote working ('working at home') in any given week, either exclusively or partially; pre-lockdown, the average share was only 6%.

This has largely been driven by Government advice for workers to avoid travelling to work and working from home where possible, to reduce virus transmission risks. This has in effect forced an enormous "natural experiment"[3] upon the UK workforce, and for many, the transition has been relatively smooth, and popular.

[3] Deloitte (2020), Home working and the future of cities

Figure 2.2.1: Homeworking trends during the pandemic



Source: ONS, Cambridge Econometrics. Note: data GB-wide.

For instance - as is explored in greater detail later in this chapter - workers have cited benefits including improved health, childcare benefits and a better work-life balance. Firms who were previously reluctant to allow or encourage remote working have been surprised by how productive and engaged their staff remained, and how well their systems have coped.

Yet with softening mobility restrictions over the Summer, there was a steady return to trend; by August 2020 for instance, more than two-thirds of workers were back to exclusively commuting to their workplace. Indeed, it is worth emphasizing that even during strict lockdown measures, the ONS found the majority of the workers were still reporting to have never worked from home.

The homeworking rate settled at around a third during Summer and early Autumn 2020, but continued to fluctuate throughout changing lockdown measures, approaching 50% share once more during the January 2021 lockdown, despite lighter mobility restrictions than the Spring 2020 lockdown.

The magnitude of these trends varies across areas, largely reflecting sectoral and occupational mix (which informs remote working potential). As shown in Figure 2.2.2[4], it is estimated that – given its favourable sectoral and occupational structure – over 4 in 10 (43%) Oxfordshire jobs can be easily done from home, a higher proportion than regional and national averages (39% and 38% respectively).

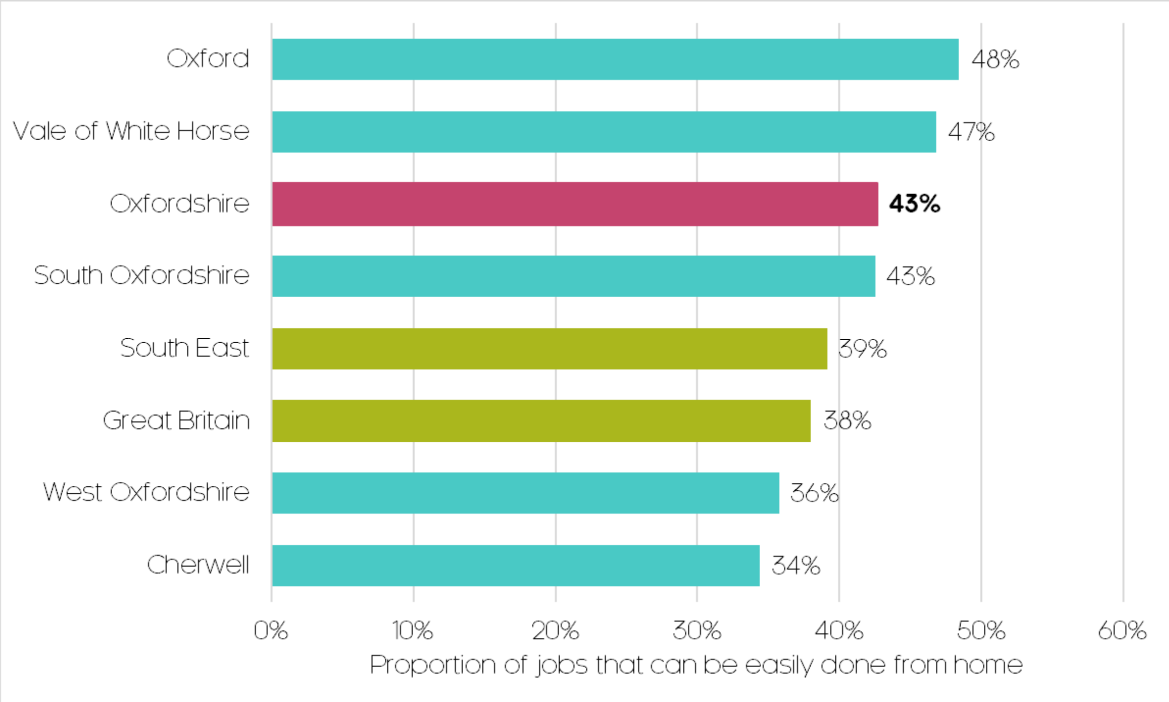
According to the Centre for Cities, Oxford has some of the highest home working potential in the country; almost half of its jobs, it concluded, “could be more easily done from home”.[5] Vale of White Horse and South Oxfordshire also saw rates well in excess of the national average. Cherwell and West Oxfordshire however saw notably lower rates of homeworking potential,

[4] Results adapted from research by; Dingel & Neiman (2020), How Many Jobs Can be Done at Home?

[5] Centre for Cities (2020), How will Coronavirus affect jobs in different parts of the country?

reflecting their sectoral and occupational structure (e.g. only 4% of jobs in accommodation and food and 14% in retail can be easily done from home).

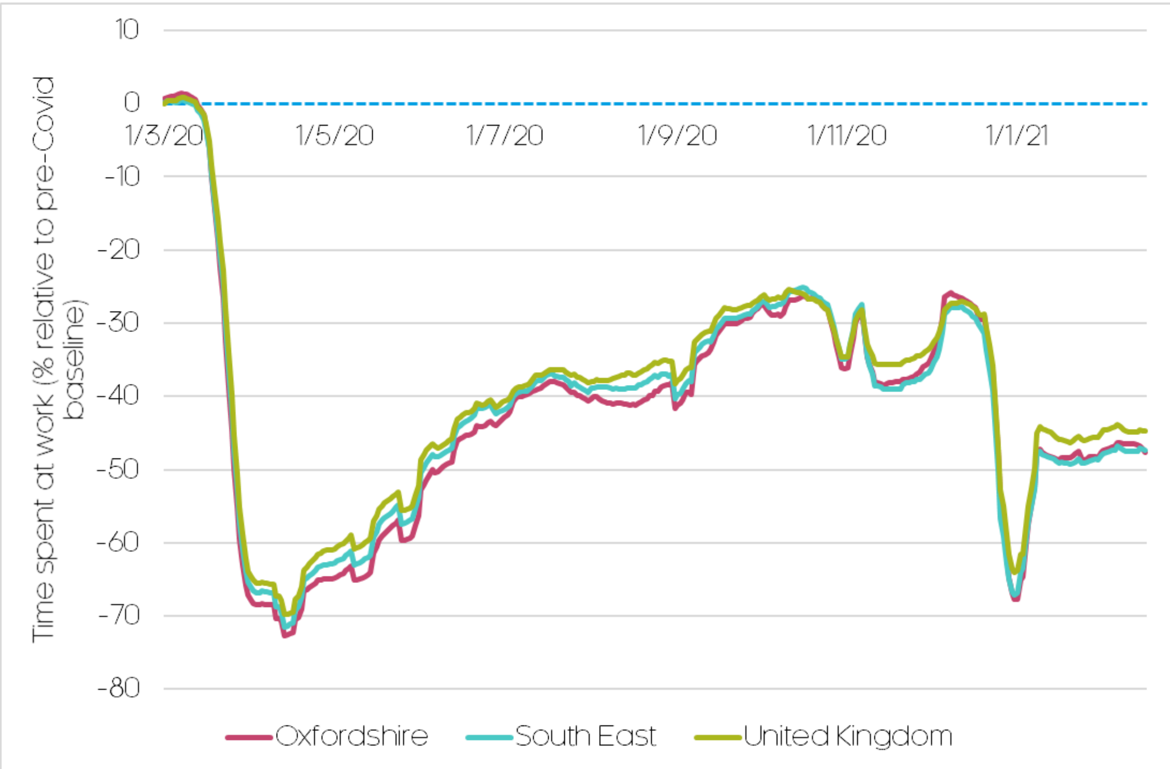
Figure 2.2.3: Homeworking potential across Oxfordshire



Source: Dingel & Neiman (2020), ONS, Cambridge Econometrics.

As a result of this high homeworking potential, as Figure 2.2.3 adapted from the ERP shows, relative to the national and regional average, Oxfordshire's workers have been spending much less time at their workplace and more time at home, indicating that remote working has indeed flourished in the local

Figure 2.2.2: Time spent at workplaces during the pandemic



Source: Google, Cambridge Econometrics. Note: 7-day rolling average labour market. In fact, at its peak during the first lockdown, workers in Oxfordshire were spending in excess of 70% less time at work.

Even when the pandemic abates and people are able to return to their place of work – which appears increasingly likely to be in the short-term given positive vaccine progress, of which the Oxfordshire life sciences cluster has played a critical role - it is likely some element of remote working will remain, and at multiples of its pre-Covid levels.

Of course, it should be noted that remote working and associated flexible ways of working (such as half days, split roles, reduced hours etc.) were present and growing pre-Covid. The pandemic has not prompted anything new in this regard, and CE's previous econometric forecasts have factored in technological change and changing homeworking potential (as a result of occupational change).

However, it has ensured that a profound change that may have taken decades to come to fruition has been accelerated in a matter of weeks. This has been facilitated by an unprecedented amount of innovative adaption and adoption by firms by both firms and employees.

And most importantly, compared with the other well-publicised effects of the pandemic – such as worklessness and job losses, reduced incomes and investment, and subdued demand – there is the potential for this trend to persist over a longer timeframe, and have a greater legacy on local economies.

Given the OGNA looks to a 2050 horizon, it is important that any longer-term trends are therefore given due consideration.

2.3 A changing way of work: outlook to 2050

Though the short-term trends and implications of this shift in working are clear to see, there is still a large amount of uncertainty regarding how this will be sustained and what the longer-term impacts might look like.

Undoubtedly, this will largely be dependent on how durable and widespread the shift to remote working turns out to be. Surveys of workers and businesses suggest increased remote working is likely to persist, albeit not on the same scale, whilst the pattern may be inconsistent across sectors and firms.

For instance, around a fifth of businesses say they intend to use remote working as a permanent business model, whilst employee surveys suggest more than a quarter expect to spend more time working from home, with 3 days in the office, two at home (a hybrid '3-2 model') emerging as the most preferred approach.[6] A BBC survey of 50 of the biggest UK employers also showed that almost half did not have any plans to return workers to the office – in the short term at least.[7]

Yet this outlook varies across and within firms. Google and Amazon, leading proponents of remote working, also acknowledge the majority of employees would prefer to return to the office, whilst the latter has still confirmed take up of 900,000 sq. ft of office space, citing the lack of spontaneity in virtual

[6] Bank of England (2020), Andy Haldane's Autumn Lecture

[7] BBC (2020), No plan for a return to the office for millions of staff

teamwork.[8] [9] Away from the UK, a return to trend was also more evident; in France 83% of office staff were back over the Summer of 2020, and three quarters in Spain, Italy and Germany.[10]

There are also wider considerations which may affect longer-term trends and durability, including the social aspects of work, and issues associated with the ability to train and develop staff which may influence dynamics in the medium- and longer-term. Concern has also been expressed over employee welfare surveys which have noted increased remote working 'fatigue' and 'burnout' in recent months.[11]

Academics have also queried the longer-term impacts of remote working, in particular that relating to wellbeing and welfare, inequality, productivity and innovation, with some notable and well-evidenced concerns over negative effects.[12] Such factors could cause firms and workers to readdress remote working overtime, and may already be evident in the weakening appeal of a full-time shift; a recent Deloitte survey found fewer than 5% of respondents wanted to work entirely from home post-pandemic.[13]

Beyond surveys, technical analysis has also acknowledged the potential longevity of remote working. McKinsey, through a cross-referencing exercise of occupations expected to grow by 2050 with occupations that are able to be performed remotely, suggest that the proportion of workers able to work remotely will grow steadily between now and 2050.[14]

2.4 Demography and housing post-Covid

Depending on the scale and longevity of the Covid-accelerated shift in working patterns, the implications for demography and housing in local areas could be profound.

The sudden and successful transition to remote working for a large number of occupations over the pandemic infers such roles could – in theory – be performed anywhere, regardless of the employer's location (once accounting for the necessary inputs – e.g. digital infrastructure - of course).

Likewise, even with the softening of lockdown restrictions over Summer 2020, many workers have continued to work remotely, even if only part-time, as – even if involuntarily – employers have become more receptive to flexible working arrangements, sweeping away the pre-Covid notion of 'presenteeism'.

Resultantly, a worker's proximity to their workplace may no longer be the overriding factor in determining where a person lives. The longstanding principle of "Marchetti's constant", which theorizes the average worker will reside within ~30 minutes commuting distance of their workplace, could weaken (or even break completely for those working remotely full time).

[8] Google (2020), Googlegeist Annual Workplace Survey

[9] WSJ (2020), Amazon bets on office based work with expansion in major cities

[10] The Guardian (2020), UK office workers slower to return to their desk after Covid

[11] Monster (2020), Overworked

[12] Economics Observatory (2020), Who can work home and how does it affect their productivity

[13] Deloitte (2020), Home working and the future of cities

[14] McKinsey (2020), What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries

Naturally, this could have implications for how workers consider their utility of and need for housing. With proximity to work de-prioritised, if factored in at all, workers will likely consider and re-prioritise other, non-employment factors, including:

- Affordability: for some workers, particularly those in large, economically successful cities (such as London), housing costs can be substantial relative to wages. With a decreased emphasis on proximity to work, workers may seek better value and more affordable housing elsewhere (even when accounting for increased commuting costs, in terms of both time and money).
- Space: even at this early stage, post-Covid housing markets have been driven by a 'race for space'.[15] Ongoing restrictions and increased remote working have resulted in a preference for larger, flexible living spaces or properties with a spare room. For some, gardens and home offices have shifted from being not just desirable but essential. Unsurprisingly, this has seen demand spike in rural and suburban areas, where such properties are more prevalent, and also where pandemic risks generally are lower. In contrast, the market for flats in city centre locations has weakened.
- Wider amenities: schools, parkland and greenspace, leisure, recreation and culture all contribute to the wider amenity value of an area and have long been an important factor in where people chose to live (and how much they are willing to pay). With workplace proximity no longer a priority, people will have greater freedom to locate in areas that offer the greatest amenity value. Importantly, how people value amenity could adapt and shift post-Covid (e.g. greater emphasis on green and open spaces, less on crowded bars and restaurants).
- Inertia: if firms become increasingly open to the idea of hiring workers from across the UK or beyond with no obligation of relocation, then workers may increasingly simply stay where they are. There are significant benefits to remaining where they are settled, close to family, friends and social networks, and if they have them, the workplaces and schools of their partners and children. For new graduate workers, this may mean they increasingly remaining in university towns or cities.

Even at this early stage, such factors have already been observed impacting local housing markets. For instance, in the UK, Rightmove has seen a doubling in searches for homes in small towns and villages (with populations less than 10,000 people),[16] as prospective buyers seek additional space and lower costs in such areas.

They have also reported a significant rise in the number of people searching for homes further from town and city centres, with larger gardens and space for a home office.[17] In the US, consumers have also acted quickly and have been observed prioritising "more space, quieter neighbourhoods, home

[15] BBC (2020), House prices rise as Covid sparks rural relocation

[16] BBC (2020), Lockdown city living 'wasn't the best idea'

[17] BBC (2020), House prices rise as Covid sparks rural relocation

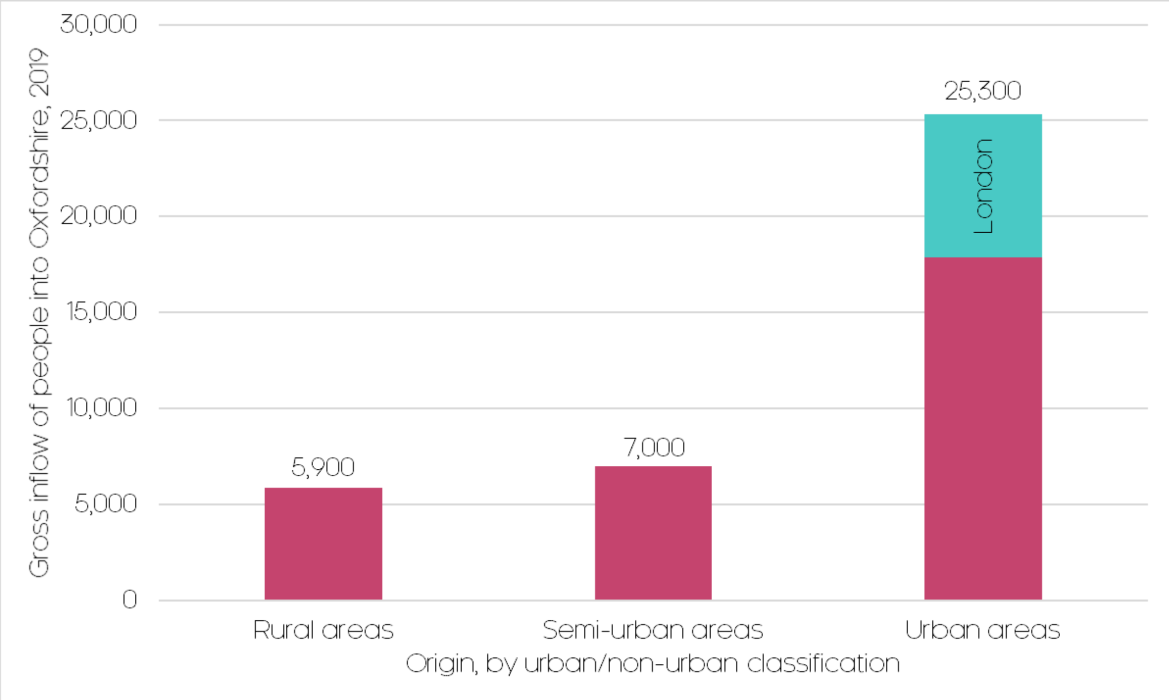
offices, newer kitchens and access to the outdoors, traits which have revived a strong interest in the suburbs and smaller metro areas."[18]

Whilst declining rents and vacant stock have been evident in notoriously competitive and high-cost cities such as London, New York and San Francisco, "bidding wars are breaking out in suburbs and smaller cities as remote workers seek less harried, less expensive lifestyles and homes with a room that can serve as an office or gym."[19] Nationwide reported over 40% of Londoners are moving or have considered doing so because of the pandemic.

However, there is the potential for Oxfordshire's housing market to be, if not already, an attractive proposition for those readdressing their living situation post-Covid, including from households moving out of London to seek greater space and willing to undertake longer commutes (e.g. from 60 to up to 90 minutes) in return for more space and an attractive environment.

For instance, Oxfordshire is already an established destination for residents moving away from large urban centres. As Figure 2.4.1 shows, in the 12 months to June 2019, some 25,300 people arrived in Oxfordshire from urban areas within England, with a particularly established inflow from London, which accounted for almost a third (7,500) of these moves.

Figure 2.4.1: Origin of Oxfordshire migrants in 2019, by urban/non-urban classification



Source: ONS, Cambridge Econometrics.

Oxfordshire's housing market is also particularly well suited to a potential post-Covid shift in demand. For example, detached and semi-detached properties – which given space and amenity benefits have proven increasingly desirable post-Covid – accounted for 65% of pre-Covid residential sales in Oxfordshire, well above the national average of 55%.

In addition, EPC data shows homes in Oxfordshire typically have more space than elsewhere in the country, with an average floor area of 108 m2, 8% larger

[18] Hechinger Report (2020), Pandemic speeds up influx of remote workers to small cities

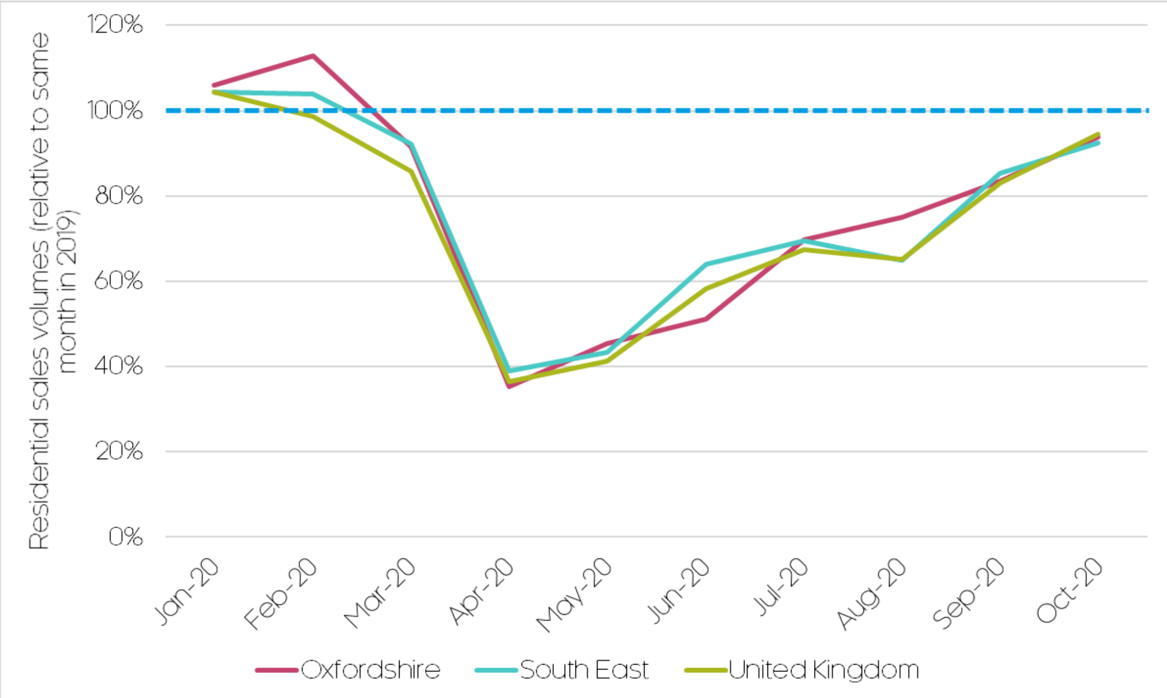
[19] Forbes (2020), Covid-19 has changed the housing market forever

than the national average of 100 m2. Accompanying garden space is also more generous, with Oxfordshire properties having on average 300 m2 of private garden, 14% bigger than the national average of 262 m2.

And combined with this is Oxfordshire's already high amenity values; high house prices in the county relative to wages suggest that theoretically "local amenity benefits are substantial".[20] This includes, for instance, the number of quality schools in Oxfordshire, the prevalence of greenspace, good connectivity, and existing cultural and recreational assets.

However, early sales data provides limited evidence of above-average interest in Oxfordshire's housing market post-Covid. Figure 2.4.2 shows monthly sales volumes in 2020 indexed to same month in 2019; after an effective 'shutdown' during lockdown (with volumes down 60% on pre-Covid levels), sales recovered strongly in Oxfordshire during the Summer, though this increase was in line with the regional and national averages.

Figure 2.4.2: Residential sales volumes in 2020 relative to the same month in 2019



Source: ONS, Cambridge Econometrics. Note: a value of 100% would mean the same sales volume as the accompanying month in 2019.

Sales were somewhat more stable in Oxfordshire moving into the Autumn, yet were still running 6% lower than the previous year. Within Oxfordshire, only in Oxford and South Oxfordshire did sales volumes recover faster than the national average.

There has however been a sharp appreciation in house prices in Oxfordshire, largely a result of the Stamp Duty 'holiday'; the 7% rise between January and October 2020 exceeded both the 6% increase nationally, and the 1% rise over the same period in 2019, with the average sale price peaking at a record £375,600 in October 2020.

[20] SERC Discussion Paper (2011), Real Earnings Disparities in Britain

Of course, at the subnational level, it is difficult to disaggregate short- and longer-term trends in prices and sale volumes. The housing market has clearly been supported by a surge in households seeking to move in part (if not exclusively) to benefit from the temporary Stamp Duty 'holiday' introduced by Government to support the market.

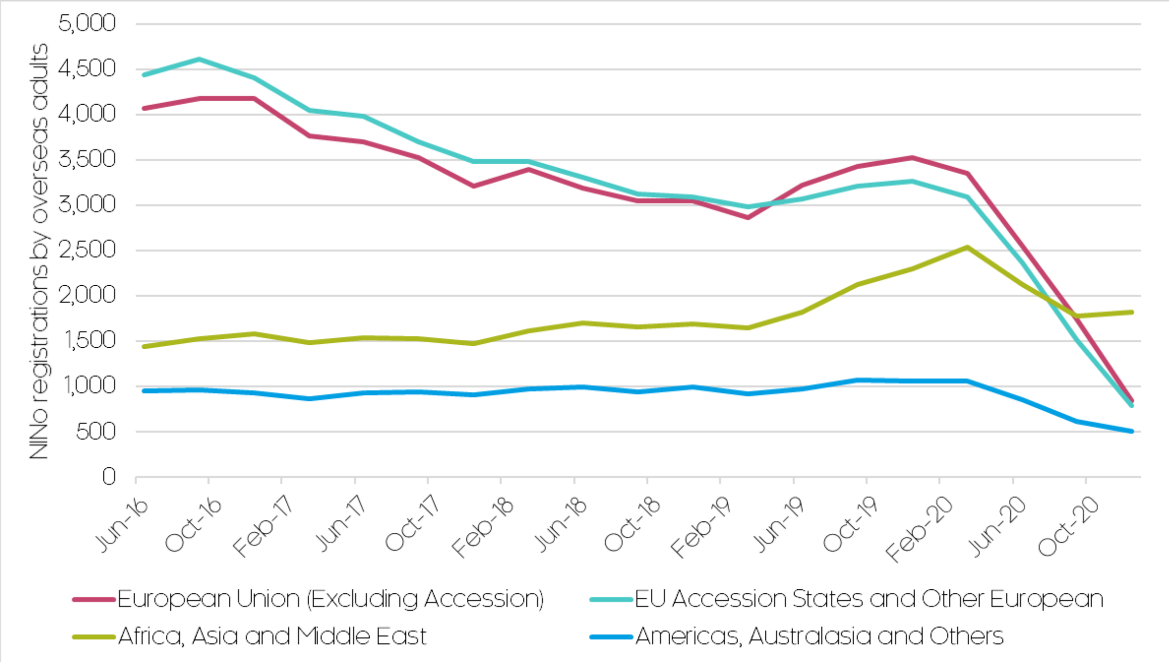
Housing market dynamics could however evolve through 2021, as buying conditions return closer to normal. Indeed, it should be emphasised that the market and its drivers over recent months represents only a very small part of the longer-term trajectory to 2050, especially when accounting for a period with restricted volumes and a bias to the higher-price end of the market.[21]

Such trends will likely ease or could even dissipate over the longer-term, though it is expected they will persist in some form as long as the model of remote working remains durable, if only for certain sectors.

It is also important to note that, though property prices and tastes move and adapt quickly, the response in respect of housing supply (i.e. new housing delivery) is more slowly influenced by the time associated with the planning process and construction. Therefore, any substantial, large-scale changes to population and accompanying housing supply are probably unlikely as a result of the Covid-induced change in property tastes, particularly in the short to medium-term.

In addition to the housing market, a more direct demographic change has been observed as a result of the pandemic. The reduction and relocation of working opportunities throughout 2020, attributable to both the pandemic and Brexit, has seen a significant decline in overseas labour staying and arriving in Oxfordshire. As Figure 2.4.3 shows, National Insurance Number (NINo)

Figure 2.4.3: NINo registrations in Oxfordshire



Source: DWP, Cambridge Econometrics. Note: quarterly values are for the preceding 12-months, not each indiviudal quarter. NINo = National Insurance number

[21] HMRC data shows "higher priced properties have seen a stronger recovery in transaction numbers than those under £500,000." See: Built Place (2021), Weekly Summary: 5th February 2021

registrations to overseas adults have dropped substantially; after a peaking at 10,000 registrations in March 2020, by December, registrations were running at less than half this rate.

A sharp decline in registrations from European nationals (both EU and non-EU) accounted for more than three-quarters of this drop. Though the assumptions for the OGNA modelling accounted for a decline in net-migration, particularly as a result of Brexit, this was not to the sharp and sudden scale observed since the pandemic. As labour market conditions improve from 2021-onwards, it is likely such labour will return to the UK, and registrations will pick up again. The short-term impact could be notable though, particularly in the rental market and sectors reliant on non-UK employment.[22]

2.5 Sectors and employment land needs post-Covid

The ERP showed that few sectors will be immune to the shock associated with the Covid-19 pandemic, though it is anticipated the brunt of the impact will be concentrated in a handful of sectors. In particular, those unable to shift operations to remote working, those susceptible to demand-absorbing social distancing restrictions, and those at risk of changing behavioural attitudes post-Covid, will shoulder the greatest burden short-term.

Analysis by the Centre for Cities (adapted in Figure 2.5.1) shows the Oxfordshire economy has a notably lower incidence of jobs in 'vulnerable' and 'very vulnerable' sectors - these are activities that are expected to experience a discernible and lasting impact from the pandemic, such as tourism (i.e. accommodation and food service), transport (notably automotive and aviation), leisure, and some retail.

Figure 2.5.1: Proportion of pre-Covid (2019) jobs in very vulnerable or vulnerable sectors

Source: Centre for Cities, ONS, Cambridge Econometrics.

[22] Financial Times (2021), Coronavirus sparks exodus of foreign-born people from UK

In fact, Oxford was ranked as having the lowest share of such jobs in the country, and resultantly is “expected to bounce back more quickly” than cities elsewhere in the country.[23]

Such proportions still equate to a significant number of jobs though, some 85,800 in Oxfordshire.

And the incidence varies within the county; Cherwell and West Oxfordshire are notably overrepresented with such activities, reflecting their local sectoral mix – for instance, almost half (43%) of the 53,700 tourism, retail and leisure jobs in Oxfordshire are located in these two districts.

Short-term, such vulnerable sectors have been highly reliant on furlough and financial support. Longer-term though there is the potential for deeper sectoral scarring and hysteresis related to the Covid crisis, particularly as support unwinds and sectors are unable to adapt and return to trend as others.

Importantly, beyond the wider economic and social implications noted in the ERP – such as the fact job and pay losses will disproportionately impact the young, low-paid and those on flexible contracts - from the perspective of the OGNA, this could also have implications for both the longer-term scale and distribution of employment land needs.

As of March 2020, 1.2 million m2 of retail floorspace was present in Oxfordshire, 18% of total non-residential floorspace. Pre-Covid, despite well-publicised challenges (including falling footfall, the shift to online shopping, and high premises costs), the retail market was comparatively buoyant in Oxfordshire, with the Centre for Cities reporting Oxford’s high street vacancy rate (8%) as amongst the lowest in the country, and above-average footfall.

Some of these pre-Covid trends, such as the shift to online retail and associated distribution, was incorporated into the original OGNA floorspace modelling. Yet there is the potential for the pandemic to accelerate and shift additional headwinds against the sector, both directly and indirectly.

For instance, online shopping has surged during the pandemic - almost a quarter of retail spend in Oxford now takes place online[24]- whilst footfall, largely a result of enforced restrictions, has plummeted, with Oxford the fifth hardest hit city in the UK for footfall loss[25] - in part impacted by its dependency on tourism spend.

One of the legacies of the pandemic will likely be an acceleration of the proportion of retail spend online, particularly if people spend more time at home through remote working. Many firms have already adapted their business models and systems to cope with such demand. This will impact on the scale of physical retail floorspace needed, whilst jobs in these terms may shift away from stores towards distribution networks and warehousing.

In fact, freight and logistics demand has proven buoyant, and commercial road transport volumes were already eclipsing pre-Covid levels by Autumn 2020. Resultantly, Rightmove has reported a record number of enquiries for

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[23] Centre for Cities (2020), What does the Covid-19 crisis mean for the economies of British cities and large towns?

[24] Centre for Cities (2020), How have coronavirus and lockdown impacted online shopping in cities?

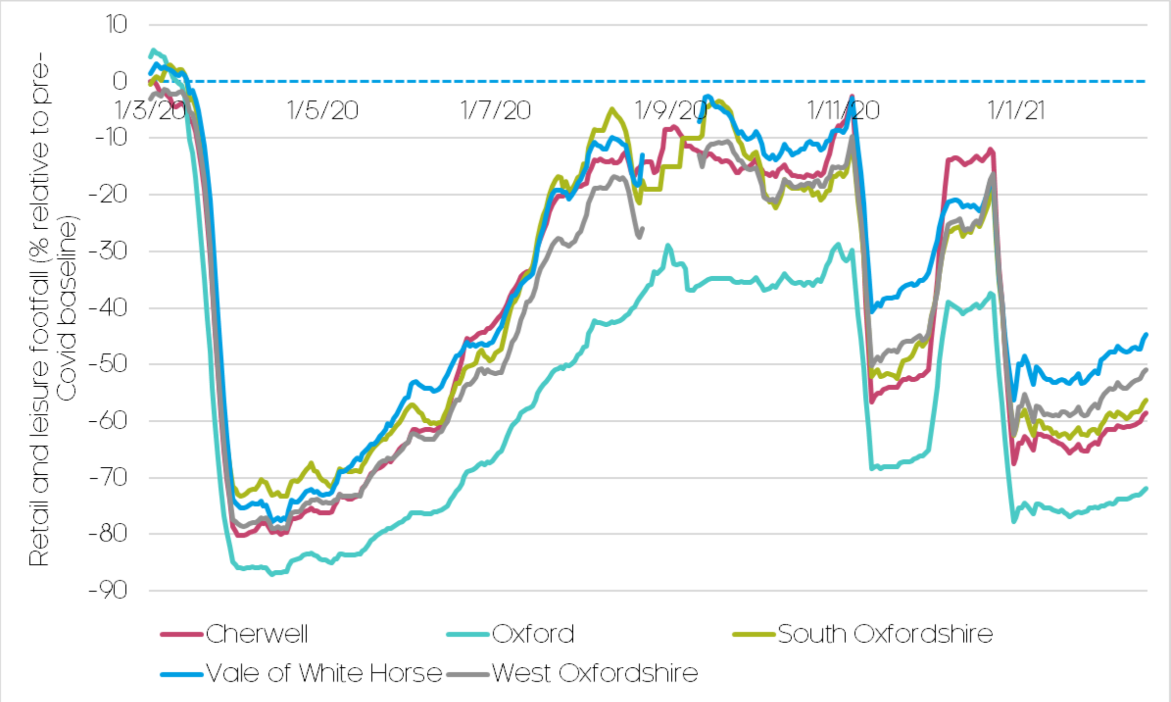
[25] Centre for Cities (2020), High streets recovery tracker

industrial and warehousing property, with the South East region leading this surge in interest.[26] Yet the same report also found enquiries for retail outlets are still higher than their pre-Covid average.

It is therefore likely that, rather than a wholesale decline, different retail centres will be affected in different ways. For instance, footfall and spending that hasn't moved online has also been observed shifting spatially, moving away from large city centres to suburbs and smaller towns, closer to where people live (particularly for convenience and food and drink-related vendors, encompassing the commute/office worker reliant 'Pret economy'[27]).

This is demonstrated in Figure 2.5.2, where footfall has been hardest hit and slowest to recover in Oxford (which saw a close to 90% decline in footfall during the first lockdown), whilst there has been an improved performance in suburban and rural districts, where some smaller and market towns have flourished. Over Summer 2020, many of these areas experienced footfall similar to pre-Covid levels.

Figure 2.5.2: Footfall across Oxfordshire during the pandemic



Source: Google, Cambridge Econometrics. Note: 7-day rolling average.

Alongside this, and indeed contributing to challenging high street conditions, is the risk exposed to the demand for office space as a result of the shift to remote working. As of March 2020, there was just over 1.1 million m2 of office floorspace present in Oxfordshire, and as with retail the local market had been relatively buoyant pre-Covid, with 136,000 additional m2 of floorspace delivered over the past five years.

With the pandemic and associated lockdown measures though, offices across the county have been left at reduced capacity (or closed) as production and staff moved online. The reaction of the market has been swift; commercial

[26] Yahoo Finance (2021), Demand for warehouses skyrockets as retailers adapt to online sales amid COVID-19

[27] Financial Times (2020), Goodbye to the 'Pret economy' and good luck to whatever replaces it

leases were down 60% in the first nine months of the year, according to Jones Lang LaSalle,[28] whilst Central London office values have already been observed falling by 10%.[29]

There is uncertainty however as to the extent the effects of the pandemic will persist over the timeframe to 2050. Already, some of the initial outlooks, including the 'death of the office' narrative,[30] appear overly pessimistic. For instance, in the same report, rather than a wholesale decline, Jones Lang LaSalle has observed an initial diversion in the market, with demand and rents rising for new offices, yet declining for older and second-hand space.

Likewise, a group of large US firms surveyed over 2020 predicted zero change in their future demand for space,[31] whilst Amazon has confirmed it will continue with one of the largest corporate office expansion programmes on record. KPMG reported by Spring 2021 many major employers were already scrapping plans to cut back on office space, given positive vaccine progress.[32] Theoretical analysis has also shown that under a hybrid model of remote working "total demand [for office space] might be the same or higher."[33]

Regardless of the trajectory, previous analysis has shown commercial property markets can be highly adaptable to shocks and sudden changes in local values and needs,[34] in particular, through the change of use of land and premises. Such factors have contributed to stable real rents, even in highly competitive cities such as London.

Post-Covid, the sector may demonstrate this adaptability by focussing development around local service centres (e.g., retail and food, exploiting the footfall shift seen in Figure 2.5.2), distributed shared office space or city centre collaboration hubs (to enhance social and interaction benefits in a remote working future), and also the opportunities around the repurposing of city centre space (be it to residential, leisure, R&D, cultural etc.).

Alongside this, there are a myriad of other factors which may interact to shape office demand moving forward, including potential changes to office densities associated with social distancing, and changes to national policies in this area, including the introduction of Class E which includes office and retail space under a single use class facilitating change of use, and the potential impacts of new permitted development rights on the reduction of office space (particularly for second hand and lower-grade offices).

2.6 Commuting and transport post-Covid

As with demography and housing, depending on the scale and durability of the Covid-accelerated shift in working patterns, the implications for commuting could be similarly profound.

[28] Bloomberg (2020), Only the best London offices thrive in an emerging Covid divide

[29] Bloomberg (2020), Central London office values seen falling by 10 on Covid impact

[30] Financial Times (2020), 'Death of the office' exaggerated despite homeworking boom

[31] NBER (2020), Surveying Business Uncertainty

[32] Reuters (2021), Major employers scrap plans to cut back on offices - KPMG

[33] Economics Observatory (2020), Will coronavirus cause a big city exodus?

[34] BBC (2020), Coronavirus may have huge impact on property markets

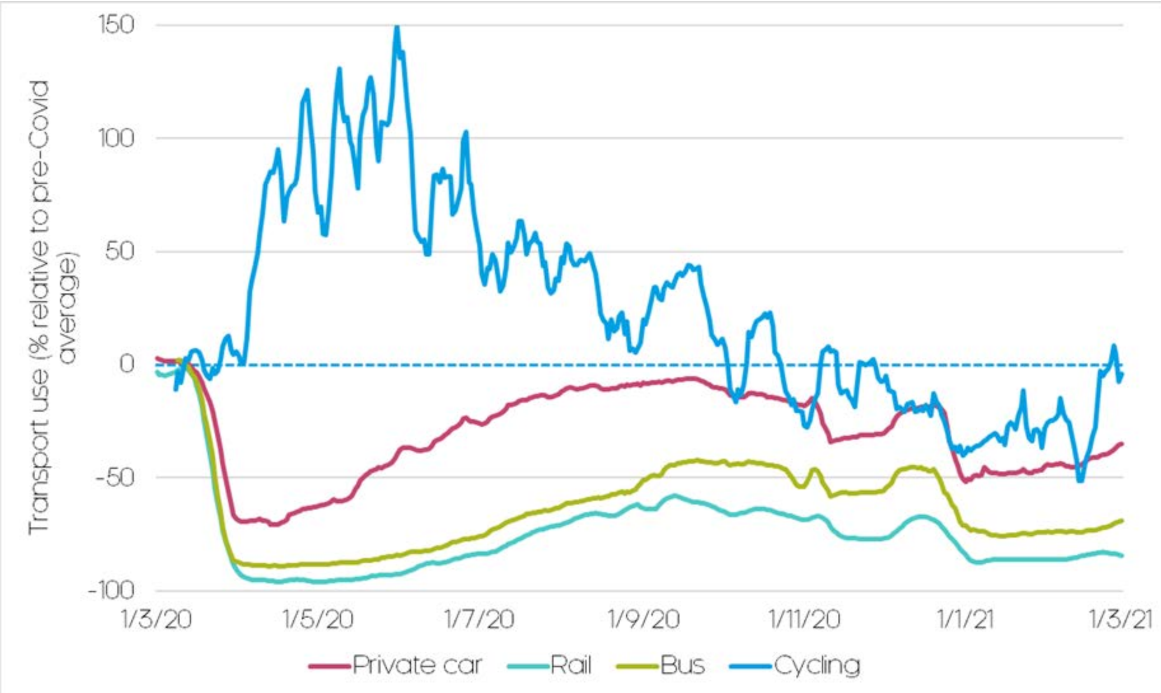
In 2018, an estimated 381,000 people regularly commuted within Oxfordshire for work, many by private means of transport (primarily car), but a large share also by public transport (bus and rail in particular) and active travel (walking or cycling). Notably, over the past decade, people have been prepared to travel longer and further to work in Oxfordshire, increasing reliance on private travel.

Since the Covid-19 pandemic, a substantial, unprecedented change has been observed. In fact, one of the most visual impacts of the pandemic has been the sudden and relatively sustained decline in commuting, largely a result of the shift to remote working, but also to some extent the behavioural response to pandemic risks associated with commuting (especially public transport).

As Figure 2.6.1 shows, across Great Britain transport use ground to an effective halt during the first lockdown, reflecting the 'stay-at-home' advice for all but essential workers during this time. Moving into the Summer, and with the loosening of restrictions, there was some return to trend, though less so for public transport (notably rail and bus) which barely eclipsed 50% capacity at its peak in September and has since tailed off again.

Those that have had to travel for work during the pandemic have increasingly prioritized private transport, which had almost recovered to pre-Covid levels by Autumn 2020, though it has since eased off given the reimposition of 'stay-at-home' advice in early 2021. Active travel, specifically cycling, has been one of the beneficiaries of reduced road volumes and short-term route improvements, though this started to decline moving into Winter 2020, actually falling below pre-Covid levels.

Figure 2.6.1: Modal transport use since the pandemic

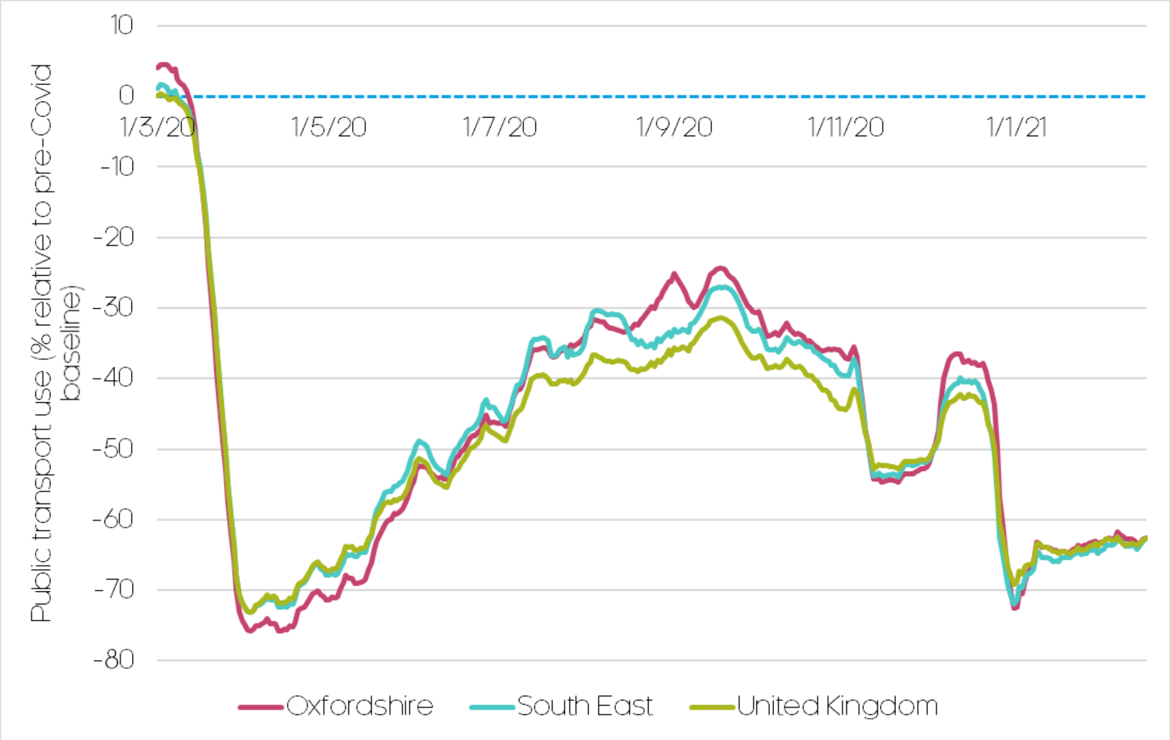


Source: DfT, Cambridge Econometrics. Note: 7-day rolling average.

Within Oxfordshire, residents have been much more successful in avoiding the daily commute than elsewhere in the country; at its peak, workplace visits in the county were 73% lower than its pre-Covid baseline. Though this rate settled at around 30-40% in Autumn 2020, prior to the second national lockdown, it has consistently remained below the national benchmark. In contrast, time spent at home has soared by 20-30%, reflecting the shift to remote working.

Resultantly, as Figure 2.6.2 shows, this had a substantial effect on public transport use in Oxfordshire; the initial 76% drop in use during the first lockdown was larger than the regional and national averages (both 73%). Interestingly, use recovered faster in Oxfordshire than elsewhere and started to exceed the national average but has declined again since re-entering lockdown over Winter 2020-21.

Figure 2.6.2: Public transport use during the pandemic



Source: Google, Cambridge Econometrics. Note: 7-day rolling average.

The longer-term implications of the pandemic for public transport could be significant. Beyond the direct economic impact in terms of commuting revenues – e.g. for bus and rail companies, and automotive-related sales and servicing, which account for some 16,900 jobs in Oxfordshire - there are also broader economic implications associated with this shift in commuting, given the wider commercial ecosystem that is dependent on and has been built around places of work and commuting.

Some of this has been observed already. For instance, across cities in the UK there has been a reduction in city centre footfall and spending, impacting ‘Pret economy’ vendors, and a displacement towards suburbs and smaller towns, as home-working residents shop closer to home. As explored previously, this has also been evident in Oxfordshire, with a much stronger footfall recovery away from Oxford city centre.

The longer-term outlook for commuting, as with other Covid-related behavioural changes, is dependent on the robustness and popularity of remote working as a future model for work. There is the potential for both commuting patterns to change, as well as how many days a week commuters travel.

Indeed, given that commuting is both costly and demanding for many workers – in well-being studies, commuting ranks just after death and divorce for unhappiness, whilst longer commutes correlate with higher blood pressure and obesity[35] – the opportunity to reduce this burden has made it widely popular, and could contribute to remote working's longevity.

And the implications of a durable, sustained shift away from the daily commute could be significant; even just a hybrid model of remote working could lead to a substantial decline in total commuting levels, lifting thousands of private vehicle trips (as well their associated costs, such as emissions, congestion and accidents) off of Oxfordshire's roads.

For instance, assuming the 27% reduction in private vehicle use throughout 2020 equates to a similar drop in private vehicle trips, there could be some 22 million less private vehicle trips ending in Oxfordshire during 2020 relative to its peak in 2018 (when 80 million private trips ended in the county). This would have the potential to lift some 225 million vehicle miles off of Oxfordshire's roads, and their associated externalities (pollution, noise, congestion etc.)

2.7 Summary

Drawing on the latest theory and evidence, this chapter has sought to gauge the potential legacy of the pandemic, particularly in terms of matters associated with the thematic areas identified in the OGNA.

Many of the trends observed were to some extent already in place and were likely to be significant by 2050 anyway; rather than changing the direction of travel, the pandemic has accelerated these trends, whilst, crucially, bringing them to the attention of a wider social, business, and political audience.

Some of the short-term impacts of the pandemic have undoubtedly been significant in terms of the OGNA, and may be felt for several years to come. However, it is difficult to gauge whether they will still have a discernible legacy or impact in 2050.

The following chapter proceeds to consider the longer-term robustness of the OGNA's original economic trajectories, drawing on updated forecasts and evidence incorporating the impact of the pandemic and the trends analysed in this chapter.

[35] BBC (2016), What your commute looks like

3 Evaluating the post-Covid Robustness of the OGNA Economic Trajectories

3.1 Introduction

This chapter considers the longer-term robustness of the OGNA's economic trajectories in light of the Covid-19 pandemic and its potential economic impact and legacy, which was explored in the previous chapter.

The economic trajectories form an important foundation for many of the observations and conclusions in the OGNA, particularly those relating to the scale and distribution of housing and employment needs to 2050. Therefore, evaluating their validity post-Covid is an important part of understanding and setting the OGNA within the context of a post-Covid world.

3.2 Background to the OGNA Economic Trajectories

The OGNA, which started development in 2019, is intended to provide an integrated evidence base to help the Oxfordshire Councils identify the appropriate levels and distributions of housing and employment over the period to 2050.

The OGNA reviewed the Government's National Planning Policy Framework and the associated Planning Practice Guidance, which sets out a "Standard Method" for calculating the minimum local housing need, taking projected household growth and then applying an upward adjustment to improve affordability based on the median house price-to-income ratio.

However, a review of the existing evidence - including recent economic performance, the strategic policy context, and alternative econometric assumptions - suggested that the particular economic characteristics and wider strategic context of Oxfordshire are such that additional consideration is required through the process of developing the Oxfordshire Plan of the compatibility of the Standard Method of housing need assessment with wider strategic growth potential for the sub-region over the long run, or whether significant differences exist.

Resultantly, the OGNA modelled three alternative economic trajectories to 2050 to consider potential housing and employment land need:

- **Standard Method (adjusted) trajectory:** backwards calculated from the Standard Method calculation of housing need, with an adjustment for a revised demographic baseline.
- **Business as usual trajectory:** representing a continuation of Oxfordshire's recent economic performance, taking particular account of the robust growth delivered during the recovery from the 2008-09 recession.
- **Transformational trajectory:** broadly the equivalent of the Oxfordshire Local Industrial Strategy's (LIS) aspirational *"go for growth"* scenario, but updated and adjusted to 2020.

The trajectories recognise that the national planning policies outline that the Standard Method is a minimum, is based on current data, and that national planning practice guidance identifies circumstances where housing need may be above that shown by the Standard Method.

To produce these local economic trajectories, CE utilised forecasts from the bespoke Local Economy Forecasting Model (LEFM) component of its macroeconomic Multi-Sectoral Dynamic Model (MDM-E3) of the UK economy. As a consequence, the local area forecasts for Oxfordshire were consistent with CE's macroeconomic forecasts for the whole of the UK economy at that time (late 2019, thus predating the Covid-19 pandemic).

3.3 Summary of the OGNA Economic Trajectories

The results of the three economic trajectories, shown in terms of total employment (i.e. job numbers), are presented in Figure 3.3.1 and Table 3.3.1 below. They present alternative visions of how the Oxfordshire's economy might have performed under a pre-Covid context.

Figure 3.3.1: OGNA economic (jobs) trajectories to 2050

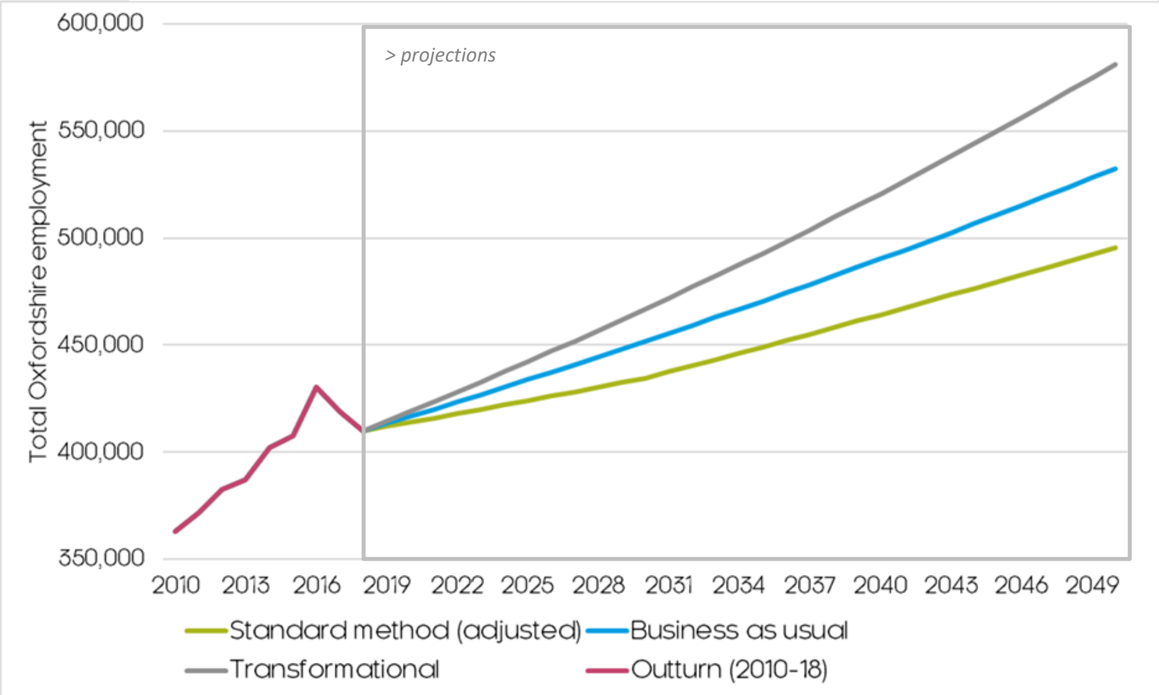


Table 3.3.1: OGNA economic (jobs) trajectories to 2050

	Jobs at 2018 (baseline)	Jobs at 2050	Jobs growth, 2018-2050	Jobs growth per annum, 2018-2050
Standard Method (adjusted) economic trajectory	410,000	495,600	85,500	2,700
Business as usual economic trajectory	410,000	532,500	122,500	3,800
Transformational economic trajectory	410,000	581,300	171,200	5,400

Source: ONS, Cambridge Econometrics.

The Standard Method (adjusted) trajectory showed net additional employment growth of 85,000 between 2018-50, modelling the level of economic activity that could be expected to be supported by delivery of housing in line with the Standard Method calculations (using the adjusted baseline demographic assumptions).

The business as usual trajectory models a continuation of Oxfordshire's robust pre-Covid growth pattern. This showed employment growth of 122,000 over the period to 2050. At this pace of growth, Oxfordshire was expected to have continued along its past high-growth trajectory, as outlined in its 2014 SMHA and SEP, and achieved some its LIS-related ambitions.

The highest scenario, the transformational trajectory, modelled the equivalent of delivering many of the aspirations set out in the Oxfordshire LIS Strategy, and would see employment growth of 171,000 jobs over the period to 2050. The Oxfordshire LIS set out a vision for Oxfordshire as one of the top three global innovation systems by 2040.

From these trajectories, the OGNA also modelled the corresponding level of housing provision that might be needed to support these levels of growth, taking account in particular of changes in the age structure of the population and the proportion of people of different ages in work. The implications for employment land and floorspace was also considered. The results for both of these are summarised in Table 3.3.2.

Table 3.3.2: OGNA housing (dwellings) and employment land needs to 2050

	Total housing need, 2020-50	Total employment land (ha) need, 2020-50
Standard Method (adjusted) economic trajectory	101,600	445
Business as usual economic trajectory	123,400	555
Transformational economic trajectory	152,800	807

Source: Cambridge Econometrics, Justin Gardener Consulting, Iceni.

3.4 Evaluating their post-Covid robustness

Given that the OGNA's economic trajectories were informed by pre-Covid modelling assumptions and data (specifically, Summer 2019), they did not capture and account for the impact of the Covid-19 pandemic on economic activity.

A key element of appraising the robustness of the modelling results will be understanding the ability and speed at which the Oxfordshire economy is able to recover and return to trend, as this will determine the probability of whether it can adapt and continue along its pre-Covid trajectory to 2050, or indeed exceed it, as per the transformational scenario outlined above.

As observed in the ERP, relative to previous recessions, the shock associated with the Covid-19 pandemic is novel; an unprecedented short-term shock to output, but a lighter and sectorally uneven employment effect. There is the potential for a rapid recovery, particularly on the labour market side, which could result in a much faster return to trend compared to previous shocks.

Combined with this is Oxfordshire's intrinsic resilience and adaptability to economic shocks. As Table 3.4.1 shows, Oxfordshire's resistance to economic shocks has generally been stronger than the wider UK economy, and it is expected to show greater resilience to Covid-19 pandemic relative to the wider UK economy.

Table 3.4.1: Oxfordshire's previous recession and recovery performance (GVA growth ratio, relative to the UK average)

	Actual data							Covid-19 forecast	
	1975-79	1979-81	1981-90	1990-91	1991-07	2007-09	2009-19	2019-20	2020-30
	Recovery	Recession	Recovery	Recession	Recovery	Recession	Recovery	Recession	Recovery
Oxfordshire relative to UK	0.1	0.3	0.3	-1.5	0.2	1.0	0.2	*0.3*	*0.4*

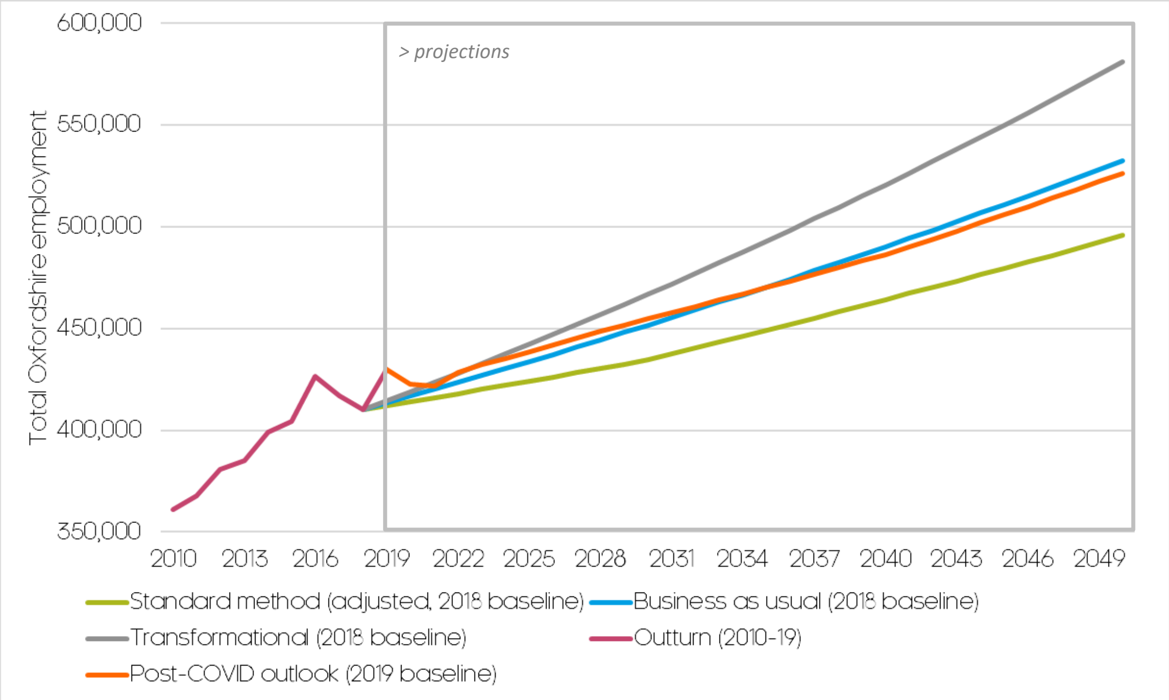
Source: ONS, Cambridge Econometrics. Note: Ratio calculated as Oxfordshire's recovery/recession performance (GVA growth, in percentage terms) relative to the UK average.

Of particular interest, though, is the ability of the Oxfordshire economy to rapidly recover, stabilise, and return to long-term trends. In fact, following every recession over the past 50 years, the Oxfordshire economy has recovered much more quickly than the UK average, and in some cases, has even exceeded pre-recession trend growth.

For instance, during the recovery from the 2007-09 recession – the deepest economic contraction in the county since the 1970s - Oxfordshire emerged as the third fastest growing economy in the country (ranked out of 38 Local Enterprise Partnership areas). This has enabled Oxfordshire to establish and maintain a strong performance advantage relative to the rest of the country.

With these observations in mind, Figure 3.4.1 and Table 3.4.2 consider Oxfordshire's revised central economic trajectory – incorporating the impact of the Covid-19 pandemic ('post-Covid'), as well as the UK's departure from the EU - and how this compares with the original OGNA results. Note that the results have been rebased to their respective forecast baselines, to allow for comparability across different forecast baselines, data and assumptions.[36]

Figure 3.4.1: Oxfordshire's post-Covid outlook to 2050, relative to the OGNA trajectories



Source: Oxfordshire ERP, ONS, Cambridge Econometrics.

[36] The baseline is 2018 for the OGNA and 2019 for the ERP. It should also be emphasised that both forecasts were developed within the same modelling framework. More information on modelling approach and assumptions can be found in *Appendix A: Post-Covid Forecast Methodology.*

Table 3.4.2: Oxfordshire's post-Covid outlook to 2050, relative to the OGNA trajectories

	Jobs, baseline	Jobs, 2050	Jobs growth, baseline-2050	Jobs growth per annum, baseline-2050
Post-Covid outlook (2019 baseline)	**430,100**	**526,500**	**96,400**	**3,100**
Standard Method (adjusted, 2018 baseline) trajectory	410,100	495,600	85,500	2,700
Business as usual (2018 baseline) trajectory	410,100	532,500	122,500	3,800
Transformational (2018 baseline) trajectory	410,100	581,300	171,200	5,300

Source: Oxfordshire ERP, ONS, Cambridge Econometrics.

The first thing to note under the post-Covid forecast is that the additional year of historic data now available (to 2019, represented by the pink 'outturn' line) shows the Oxfordshire economy grew particularly strongly in the lead-up to the pandemic, creating approximately 20,000 net additional jobs over 2018-19, reversing the easing of employment growth seen since 2016 (which was possibly attributable to post-Brexit uncertainty and employment shifting).

In fact, shortly before the pandemic in 2019, there was estimated to have been a record 430,300 jobs in Oxfordshire. Unsurprisingly, the expected contraction in employment over 2020-21 – which could result in a potential 8,000 permanent job losses (represented by the orange line) – brings a sudden halt and reversal to this robust growth, pulling trend employment growth down.

However, this contraction is smaller than both national and regional averages, and the Oxfordshire labour market is expected to recover quickly, eclipsing pre-Covid employment levels by 2023 (a year earlier than the rest of the country).

By the latter half of the 2020's, employment growth will have settled at its pre-crisis trend, broadly in line with the business as usual trajectory (its approximate growth path over the past decade – the light blue line), and once more outpacing the national average.

Business as usual trajectory

Most notably, by the 2030's the post-Covid trend starts to closely track that of the business as usual trajectory – the central trajectory from the OGNA modelling - and by 2050, the two expect similar employment totals for Oxfordshire; approximately 533,000 under the post-Covid forecast, and 527,000 under the business as usual trajectory, with the small shortfall of 6,000 jobs largely attributable to the longer-term scarring of the pandemic.

This shows that, despite the contrasting context, under a consistent modelling approach there is still a broad alignment on Oxfordshire's fundamental characteristics and medium to longer-term growth prospects. Of course, given the nature of the shock, the shape of the trajectories remains different, but this should not detract from the longer-term consistency in the results.

This is reasonable given the timeframe being considered, and on the understanding that historical trends take into account previous recessionary and recovery periods. Of course, the uncertainty of the forecasts heighten the further they look further into the future, but even in the short-medium term (where the data is more robust), the pandemic has not substantially altered Oxfordshire growth outlook.

Standard Method (adjusted) trajectory

Post-Covid trend employment growth is still expected to exceed that of the Standard Method (adjusted) trajectory (the green line). Converted from the Standard Method of housing need, the OGNA considers this trajectory as the 'minimum' level of growth Oxfordshire should aim for.

Though this trajectory could appear conservative in a post-Covid context, it offers a realistic lower bound and the potential for a more pessimistic outlook (such as ongoing/additional restrictions 2021 onwards, or a subdued recovery). And being informed by a government framework (the Standard Method), the underlying methodology remains robust.

Transformational trajectory

The transformational trajectory (the grey line), which assumes the realisation of LIS-related interventions and delivery, remains ambitious, requiring an uplift of over 50,000 additional jobs on the post-Covid trajectory.

The shock of the Covid crisis could make this more challenging to deliver, especially given any diversion of policy and resources (which many LIS interventions are reliant on). For instance, Government has already suggested LIS' may no longer be the basis for future local funding and interventions post-Covid.[37]

However, it should be emphasised that much of this additional growth was targeted in high-innovation LIS "breakthrough sectors." Many of these have remained largely unaffected or have even accelerated growth plans under the pandemic, most notably life sciences and health – with the Oxfordshire cluster at the forefront of the global pursuit of a vaccine – digital and IT services.

In fact, research adapted from the Centre for Cities shows some 130,000 jobs (34% of total jobs) in Oxfordshire are in sectors unaffected or experiencing higher demand from the pandemic. If Oxfordshire is able to exploit its global comparative advantage in such sectors in a post-Covid world, this transformational level of growth could remain within reach.

3.5 Summary

Overall, it does not appear the longer-term robustness of the OGNA's economic trajectories has been significantly weakened or invalidated in light of the Covid-19 pandemic based on current projections, with broad agreement critically on Oxfordshire's destination in 2050 (not least when accounting for the margins of error that accompany such forecasting exercises).

Given Oxfordshire's intrinsic resilience and recoverability to economic shocks, it is expected the short-run impact from the pandemic will be less pronounced in Oxfordshire, whilst Oxfordshire's recovery will also outperform the national average, resulting in a smaller shortfall relative to pre-Covid trends.

The business as usual trajectory remains the central outlook for the Oxfordshire economy, whilst the Standard Method (adjusted) and transformational trajectories represent realistic upper and lower bounds. A consistent modelling approach has been taken across the three trajectories, whilst underlying methodologies remain sound and have not been invalidated by the further assessment in this report.

[37] Local Government Chronicle (2021), Concern over apparent shelving of local industrial strategies

This should not however understate the significant impact of the pandemic on economic activity, and its potential longer-term legacy. Though pre- and post-Covid levels of growth may converge, the economic, the economic, social and behavioural legacy of the pandemic could well change what this growth looks like and means for Oxfordshire, as observed in the previous chapter.

However, significant uncertainty still exists as to the durability and impact of these trends over a longer timeframe. To address this, credible contrasting scenarios have been developed to appraise the potential implications of post-Covid trends for the observations and conclusions of the OGNA. These are considered in the following chapter.

4 Interpreting the OGNA in a post-Covid World: Behavioural Scenarios to 2050

4.1 Introduction

Given the uncertainty and lack of consensus over the longer-term embeddedness and trajectory of remote working, the following analysis considers three contrasting, qualitative scenarios looking at the longer-term implications of the Covid-induced behavioural change in working patterns, and what this means for some of the observations and conclusions in the OGNA.

As explored previously, the trend of remote working is likely to have a discernible and lasting impact on the thematic areas considered in the OGNA, particularly those relating to:

- demography and housing (e.g. by changing the attractiveness of urban living, or people revising their need to reside close to work);
- sectors and employment land needs (e.g. by shifting/reducing demand for retail, leisure and office space, or accelerating the shift to online shopping), and;
- commuting and transport (e.g. by shifting/reducing the volume, mode and distance of commuting trips).

Most importantly, compared with the other well-publicised effects of the pandemic, there is the potential the remote working trend and accompanying behavioural changes to persist over a longer timeframe, and have a greater legacy on local economies.

The behavioural scenarios have been informed by and build on the theory and evidence presented in the previous chapters. They are intended to be high level and indicative only.

Accompanying probabilities or projections have not been calculated, however, the scenarios do broadly relate to and will be informed by the success of the response to the pandemic over the coming months (in particular, the speed and efficiency with which a vaccine can be deployed).

It should be emphasised that efforts to determine the long-term effects of the Covid-19 pandemic (both quantitively and qualitatively) on national and local economies are uncertain and indicative at this moment in time. The following analysis should therefore be regarded as such.

4.2 The scenarios

Scenario 1: a ‘relative’ return to normal

Even under the most optimistic outlooks, a swift and seamless return to pre-Covid working norms appears unlikely, especially given many businesses and workers will experience at least a year of remote working arrangements, even if under ‘forced’ experimentation.

Therefore, the first scenario assumes a ‘relative’ return to normal by 2050; the standard ‘5-0’[38] working week model will still be the norm for many firms and

[38] That is, five days in the workplace, zero days working at home. So a ‘3-2’ model assumes three days in the workplace, two days working at home etc.

workers, but for a small minority a more flexible working model may be preferred (though the 0-5 remote working model will be rare).

The relative restraint could be driven by an increased awareness of remote workings costs – in terms of productivity, wellbeing and innovation – over the long term which leads workers and firms to desire and pursue a 'return to normal'.

Under this scenario, remote working also fails to permeate into more interaction-driven service occupations – despite lockdown experimentation – such as teaching, banking and finance, and sales. Retail, construction, manufacturing and other customer-facing/manual trades largely if not exclusively return to pre-Covid norms.

The legacy of the pandemic on working patterns will still be evident though; rather than the 5% labour market share seen pre-Covid, regular remote working will be around 10-20%, largely encompassing professional and skilled occupations.

Scenario 2: a new normal

This central scenario assumes a more realistic outlook to 2050; remote working – in some form - will persist for many. It stops short of assuming the current, 0-5 model will continue. Instead, firms and workers, having both appraised the benefits and costs of remote working, will reach agreement on a suitable 'hybrid model' of remote working e.g. a 3-2 arrangement.

Manual and customer-facing occupations (e.g. in retail, construction, manufacturing) will still rely on a traditional 5-0 model, but there may be some longer-term remote working uptake in associated back-office/desk-based operations.

The vast majority of professional occupations will be working flexibly, though a strict 0-5 week will still be in the minority, as most firms continue to value face-to-face interactions. Yet even firms with more interaction-driven service occupations (e.g. teaching) will experiment with longer term remote working arrangements.

As a share of the labour market, regular remote working will have settled at 30-40%, slightly below the rates experienced over the Summer of 2020. Despite this, the majority of workers will still exclusively travel to their place of work.

Scenario 3: a step change

Under this scenario, a more drastic 'step change' is assumed to take place. Firms and workers overwhelmingly welcome and prioritise the benefits of regular, long-term remote working e.g. reduced overheads and transaction costs, improved work-life balance, geographic mobility.

They are also able to negotiate and manage some of the shortcomings associated with remote working, aided by ongoing technological improvements and innovations in related product and service areas. Resultantly, this leads to an unprecedented change in how labour markets function.

The majority of workers in the service sector are now engaged in regular remote working. The traditional 5-0 week,, commonplace for over 90% of the workforce pre-Covid, is now in the minority, represented by a few occupations, largely manual and/or customer-facing.

For some service-based occupations, the majority of roles are now exclusively remotely-based, particularly in professional, IT and administrative services. Even previously difficult to permeate occupations, such as interaction-driven teaching, banking and finance, and health, start to engage with a longer-term model of remote working.

4.3 Results and implications for the OGNA

The following analysis draws on the three aforementioned scenarios to appraise the potential implications for Oxfordshire's demography and housing, sectors and employment land needs, and commuting and transport within the wider context of the OGNA.

Scenario 1: a 'relative' return to normal

Despite the magnitude of the short-term shock, under this conservative scenario for remote working it is likely there would be an insignificant impact to the distribution and type of growth expected to take place in Oxfordshire:

Demography and housing:

- There could be a marginal increase in Oxfordshire's total population, as workers (aged 30-40+) in typically urban-based professional and skilled occupations consider relocating to the area, prioritising high amenity values and relative (e.g. to London) affordability.
- This will likely be focussed in Oxfordshire's Wider County areas, where amenity values are typically higher and there is a greater availability of suitable properties, despite higher costs (though this will not be significant deterrence as higher-paid jobs are more amenable to remote working).
- Proximity to connectivity points, not least Oxford's central transport hubs, will remain important though, as most will probably be working a hybrid model. More isolated, less-connected areas will see muted demand.
- Resultantly, there could be a marginal increase in the demand for housing in areas such as the Wider County. This will largely be concentrated at the higher end of the market, with a particular emphasis on detached properties with accompanying rooms and green space.
- This could serve to push up prices at the higher end of the market, and thus deteriorate absolute affordability ratios, though the median and lower-quartile affordability will remain largely unaffected.

Sectors and employment land needs:

- Though a theme factored into the original OGNA, ongoing remote working has the potential to accelerate the shift to online shopping. If this persists, there could be reduced floorspace demand from some retail and leisure trades, who are either unable to compete with online competitors or are themselves able to undergo a wholesale shift to online operations, together with some growth in demand for warehousing floorspace such as close to the M40 and elsewhere to service 'last mile' delivery.

- Beyond this though, the implications for Oxfordshire’s employment land needs would be relatively limited under this scenario. Spatially, there could be a small legacy of the shifting of retail and leisure floorspace away from Oxford city centre to suburban locations and smaller towns. This would be largely concentrated in convenience and food and drink-based trades (the ‘Pret economy’).
- For office space, it is unlikely there would be any substantial shift relative to the trends outlined in the OGNA. There may be an increased emphasis on more flexible, interaction-led office space for some tenants though, particularly for sectors likely to embrace greater remote working, such as IT, professional and business services.

Commuting and transport:

- The limited persistence of remote working under this scenario means, by 2050, many workers will have returned to the standard, five-day model of commuting, with total trips (and distance) and a modal share broadly similar to that explored in the OGNA.
- The increased remote working uptake by some, mostly professional-based occupations, means total commuting trips may be marginally lower, particularly for private and public means of travel. The behavioural legacy of the pandemic, including aversion to public transport, may see a small increase in private modal share (but not absolute trips).
- Existing flows within Oxfordshire will largely be the same as that observed in the OGNA, depending on the respective housing distribution scenario. A marginal increase may be observed from the Wider County, into both Oxford and further afield (e.g. External), the latter particularly if there is an increase in London-based remote workers.

Scenario 2: a new normal

Given the more likely scenario of a widespread adoption of a ‘hybrid’ model of remote working, the impact on the distribution and type of growth (but not the scale) expected in Oxfordshire could be more notable, if still limited:

Demography and housing:

- A larger, although still only moderate increase in Oxfordshire’s population could be observed, as a result of the widespread adoption of hybrid remote working attracting a larger pool of mobile residents, typically urban, whose workplace proximity is now less of a priority.
- This will be most predominant in middle and older-aged groups (30’s+), whose above-average incomes and high current housing costs ensures Oxfordshire is an affordable and attractive location. Some could comprise larger family units, attracted by Oxfordshire’s strong educational and lifestyle offer.
- Spatially, there will be a focus on the larger stock and higher-amenity offer of the Wider County areas, though some (particularly those with families) may be drawn to the affordability and good connectivity of the Knowledge Spine and Outer Fringe.

- The more widespread adoption of remote working may also pull some existing residents away from Oxford city, likely to the Outer Fringe and Knowledge Spine, though it is likely many in the city, especially the young, will continue to value the amenities it offers.
- Resultantly, demand for housing could increase in such areas. Again, this will likely be at the middle-higher end of the market, with an emphasis on detached/semi-detached properties. Depending on the speed and scale of the supply response, prices could accelerate at this end of the market.
- This could deteriorate the mean and median affordability in these areas. Lower-quartile affordability should remain largely unaffected, but there may be some pressures in well-connected areas with limited supply.
- Demand and prices for flats and other small urban properties could fall, though such stock is relatively underrepresented in Oxford, particularly compared to other cities. Any moves to introduce more widespread remote teaching could reduce student numbers in the city, and therefore demand for student accommodation.

Sectors and employment land needs:

- As with the previous scenario, the potential for a sustained shift to online shopping could lead to a small reduction in overall retail and leisure floorspace demand but with increased warehousing space needed. This could even be accelerated further under this scenario, with an observable correlation between increased remote working and online shopping.
- Similarly, there would likely be a more notable shift in the spatial pattern of retail and leisure floorspace demand; the ‘Pret economy’ of convenience and food and drink stores will adapt to reduced workday footfall, either moving online or to suburban and out of town premises. Existing city centre premises could be repurposed for either other commercial use or housing.
- Though a hybrid model of remote working becomes widespread, the demand for office floorspace could remain largely the same, as the benefits of an office presence prevails despite more flexible working arrangements. As before, there may be an increased emphasis on flexible, interaction-led office space. There will likely be a reduction in demand for older, lower-quality office space less amenable to remote working.
- Coincidentally, reduced transaction costs for firms (through improved digital communications and lower running costs) may incentivise some firms to relocate to Oxfordshire as relative costs are lower whilst many of the benefits remain, potentially increasing demand for office space. Conversely, some firms may use this as an opportunity to move away from Oxfordshire.

Commuting and transport:

- With the increased adoption of a hybrid model of remote working, there will be a larger drop in total commuting trips, as people spend an increased number of days working from home rather than travelling to the office, though the latter still remains in the majority.

- The modal share may balance slightly more towards private modes of transport though, as people are likely to reside further from their workplace (and thus reduced probability of public and active travel) and will be happy to incur the cost of a longer private commute on a reduced basis.
- Depending on the housing scenario, flows from the Knowledge Spine and Outer Fringe have a higher potential of shifting to public and active travel modes, though the former may still be avoided given legacy of the behavioural aversion during the pandemic.
- Reliance on active travel may well increase, in both absolute and relative terms, given improved road conditions and potential route improvements during the pandemic. These would largely originate from the Outer Fringe.
- Interestingly, there may be an increase in the proportion of flows and distance travelled from inside Oxford to its outer suburbs (Outer Fringe) and surrounding towns (Wider County and Knowledge Spine), as previously city-centre based retail and leisure ('Pret economy') workers adapt to the potential shift in demand and footfall.
- The proportion of flows originating from the Wider County and Knowledge Spine could also increase, some into Oxford, the remainder to further afield External locations, including London. The latter in particular will be public travel reliant.

Scenario 3: a step change

This ambitious scenario assuming a step change in the adoption of remote working could result in some substantial changes to the distribution and type of growth expected to take place in Oxfordshire:

Demography and housing:

- With remote working adopted by the majority of workers, a substantial pool of potential residents could be attracted to living in Oxfordshire. However, it is unlikely additional population growth will be substantially higher than previous scenarios, as demand, particularly from younger and non-professional occupations, may shift to more affordable locations.
- As with previous scenarios, the age profile of this shift will be broadly the same, as younger cohorts will either continue to prioritise existing urban locations, or pursue more affordable opportunities elsewhere. Greater remote working may incentivise additional family moves, as education and lifestyle becomes a greater priority instead of workplace proximity.
- Importantly for Oxfordshire, with the potential for teaching and education to move online – even if only part-time - under this scenario, there could a significant reduction in the Oxford-based student population.

- Resultantly, a more varied spatial pattern could emerge. The Wider County and Knowledge Spine will remain attractive locations, with the potential for additional interest in more rural and isolated communities (given the necessary digital infrastructure) as full-time remote working increases.
- Oxford's student-led market could see notably reduced demand (particularly international), as remote-teaching persists, whilst lower income service-based workers may also leave the city. Resultantly, city-centre stock could have to adapt to commercial/alternative use, whilst shared-premises may be returned to single use.
- It is unlikely this will impact prices substantially in the city, whilst there is the potential for an appreciation in the Wider County and Knowledge Spine if supply is unable to respond effectively. Affordability will likely deteriorate, but could marginally improve in parts of the city, particularly at the lower-quartile end.

Sectors and employment land needs:

- As with the previous scenario, the potential for a sustained shift to online shopping could lead to a reduction in overall retail and leisure floorspace demand, which could be accelerated under this scenario if greater remote working corresponds with a greater shift to online shopping. Demand for warehouse space would again grow.
- With workers spending more time at home than in the office, related retail and leisure trades - such as the 'Pret economy' of convenience and food and drink stores - will either cease trading, move online or shift to suburban or out of town premises closer to where people live. Such stores may help support the concept of a '15-minute neighbourhood'.
- With a greater emphasis on permanent and hybrid remote working, office floorspace demand for office space will likely be lower. Many tenants will downsize, with a greater emphasis on flexible working space for those that do still go into the office, and interaction areas for clients and employee engagement.
- With this scenario also inviting the concept of an increase in remote-teaching, there is also the potential for reduced demand and redundant education space under this scenario, particularly in Oxford city.
- Redundant working spaces under this scenario could attract a variety of potential use changes, including leisure, cultural, or residential.

Commuting and transport:

- Under this scenario, for the first time the majority of workers will work more days at home than they do in the office. Resultantly, commuting trips could see a substantial drop, by a potential magnitude of two-thirds to a half, with significant economic, social and environmental ramifications.
- Modal share remains unpredictable under this scenario; with the potential for workers to live even further from their workplace, private travel reliance might increase – the longer and costlier private

commute can be balanced with its convenience if only for one or two days a week.

- Given significantly reduced volume on public transport, certain routes and options may become unviable. This could see a reduction in the public travel share, whilst increasing the reliance on private travel.
- Active travel will likely increase its modal share, particularly in and around Oxford, but for those few still commuting to their workplace five days a week (such as manufacturing and construction workers) such travel modes may not always be optimal.
- The potential for more people residing in the Wider County and Knowledge Spine could see an increase in the proportion of flows into Oxford and Externally, but in absolute terms these will drop substantially.
- As with the previous scenario, there could be an increase in flows and distance travelled for retail and leisure workers from Oxford to its suburbs and surrounding towns, as they adapt to the shift in footfall and spending, whilst finding it unaffordable to live nearby.

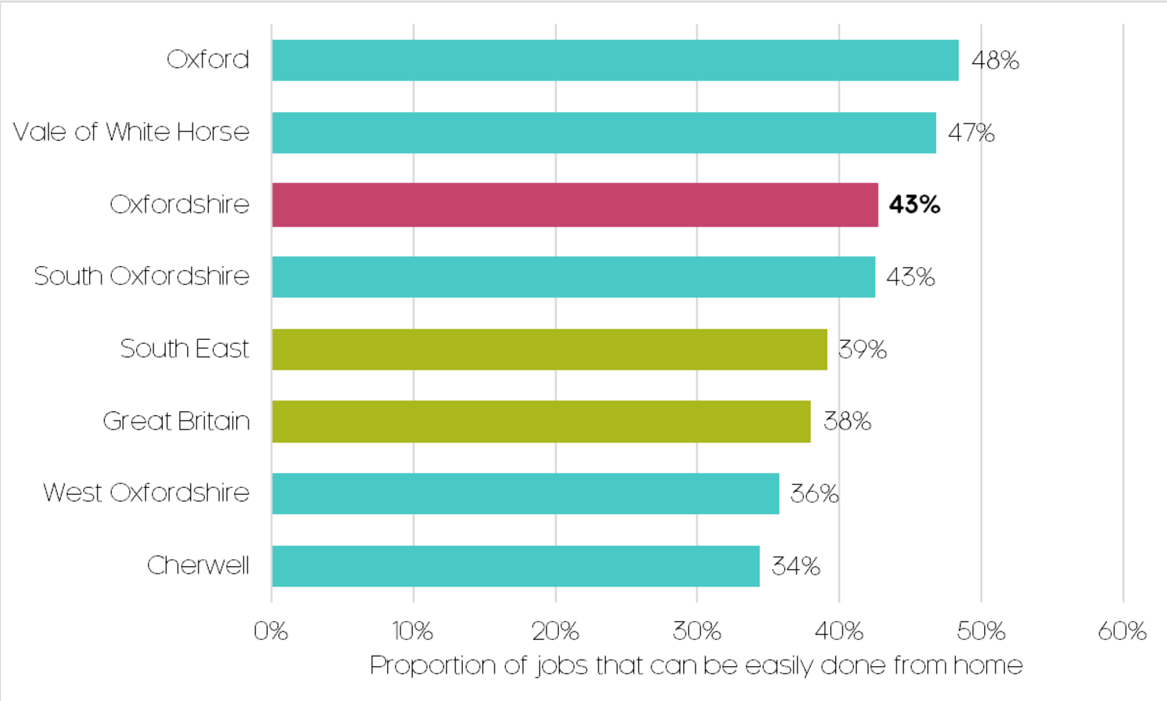
5 Conclusions

This conclusion chapter highlights and draws out the key findings and observations from the Covid-19 Impacts Addendum.

The legacy of the Covid-19 pandemic

Drawing on the latest theory and evidence, the addendum has sought to gauge the potential legacy of the Covid-19 pandemic over the longer timeframe of the Oxfordshire Plan (to 2050). Particular attention has been given to the durability and legacy of the Covid-induced shift to remote working ('homeworking'), which as Figure 4.3.1 shows has the potential to be a much more prevalent within parts of Oxfordshire's labour market.

Figure 4.3.1: Homeworking potential across Oxfordshire



Source: ONS, Cambridge Econometrics. Note: data GB-wide.

Beyond the short- and medium-term economic impact, the addendum appraises the longer-term potential for the pandemic to trigger and accelerate substantive economic, social and behavioural change in Oxfordshire and beyond, particularly in terms of matters associated with the thematic areas identified in the OGNA, such as:

- demography and housing (e.g. by changing the attractiveness of urban living, or people revising their need to reside close to work);
- sectors and employment land needs (e.g. by shifting/reducing demand for retail, leisure and office space, or accelerating the shift to online shopping), and;
- commuting and transport (e.g. by shifting/reducing the volume, mode and distance of commuting trips).

Yet in many instances, the pandemic has simply brought to the fore trends that were already in place and likely to be significant by 2050 anyway (and were typically considered, if not accounted for, within the original OGNA evidence base). Rather than changing the direction of travel, the pandemic has accelerated these trends, whilst, crucially, bringing them the attention of a wider audience.

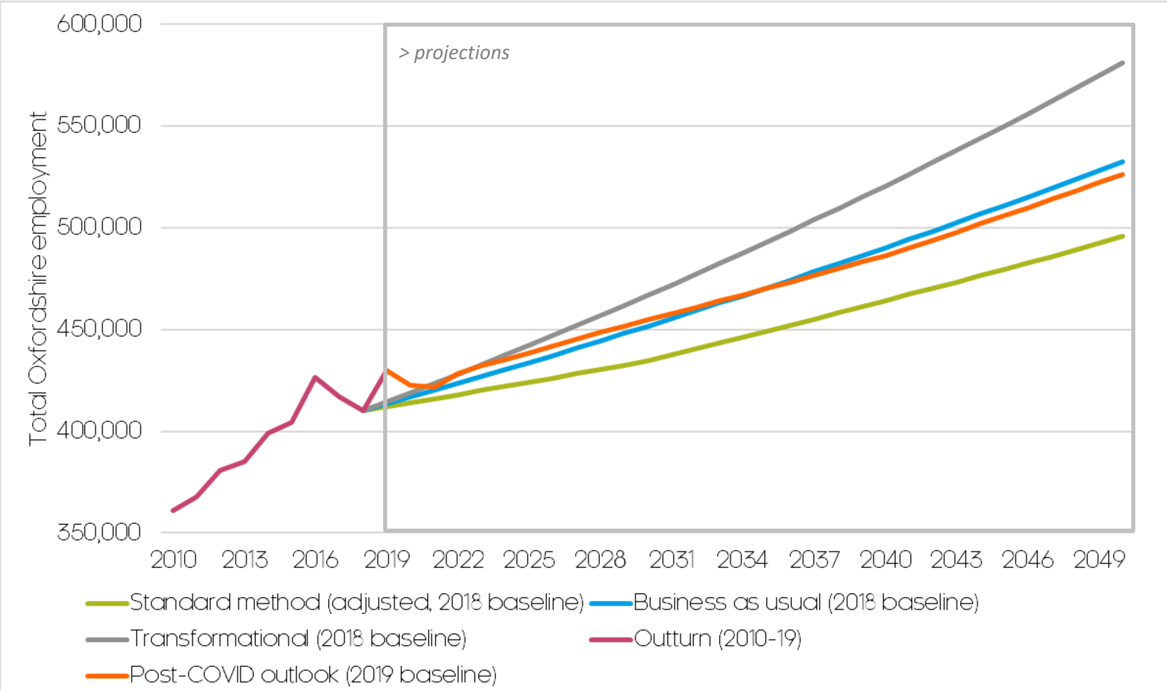
Likewise, for many workers and residents and Oxfordshire, it is important to note that the pandemic may have little to no impact relative to their pre-Covid routine; for instance, even during strict lockdown measures, the majority of workers were still reporting that they had never worked from home.

Although the negative short-term impacts of the pandemic have undoubtedly been severe within Oxfordshire, and will continue to be felt for several years to come, some of the Covid-induced trends, such as homeworking and localism, should be seen not as a threat but a significant opportunity to reshape Oxfordshire's economic geography and transport systems, particularly in the context of the urgent need to reduce emissions.

Robustness of the Phase 1 trajectories

Informed by updated forecasts and evidence incorporating the impact of the pandemic and its accompanying trends (presented in Figure 4.3.2, with post-Covid forecasts shown as the orange line), the addendum appraises the longer-term robustness of the OGNA's original economic trajectories.

Figure 4.3.2: Oxfordshire's post-Covid outlook to 2050, relative to the OGNA trajectories



Source: Oxfordshire ERP, ONS, Cambridge Econometrics.

Given Oxfordshire's intrinsic resilience and recoverability to economic shocks, it is expected the short-run impact from the pandemic will be less pronounced in Oxfordshire, whilst Oxfordshire's recovery will also outperform the national average, resulting in a smaller shortfall relative to pre-Covid trends.

Resultantly, as far as Oxfordshire is concerned, the addendum considers that the analysis underpinning the *Phase 1* and *Phase 2 Report* remains current and valid, though there is undoubtedly a need for the planning system to build in an increased level of flexibility.

As Figure 4.3.2 and Table 4.3.1 show, the range of feasible trajectories for employment growth and subsequent housing need are still well represented by the three trajectories depicted in the *Phase 1 Report*. Similarly, the five housing distribution scenarios outlined in the *Phase 2 Report* are still a suitable means of exploring the implications – in terms of commuting and affordability - between different approaches.

Table 4.3.1: Oxfordshire's post-Covid outlook to 2050, relative to the OGNA trajectories

	Jobs, baseline	Jobs, 2050	Jobs growth, baseline-2050	Jobs growth per annum, baseline-2050
Post-Covid outlook (2019 baseline)	**430,100**	**526,500**	**96,400**	**3,100**
Standard Method (adjusted, 2018 baseline) trajectory	410,100	495,600	85,500	2,700
Business as usual (2018 baseline) trajectory	410,100	532,500	122,500	3,800
Transformational (2018 baseline) trajectory	410,100	581,300	171,200	5,300

Source: Oxfordshire ERP, ONS, Cambridge Econometrics.

What may change is how policy makers calculate these implications, depending upon which version of the future they think is most likely to occur, as captured by the three post-Covid scenarios presented in this addendum. The scenarios, which look ahead to 2050, cover a range of feasible and contrasting behavioural changes as a result of the pandemic:

- *Scenario 1: a 'relative' return to normal* – a conservative scenario for the adoption and durability of remote working.
- *Scenario 2: a new normal* – a more likely scenario of a popular and widespread adoption of a 'hybrid' model of remote working.
- *Scenario 3: a step change* – an ambitious scenario assuming a positive step change in the adoption and durability of remote working.

Drawing on these scenarios, and flexibly incorporating any other relevant trends and indicators that emerge, policy makers are better placed to understand and appraise the scale and distribution of housing and employment space needed, and accompanying implications for commuting and affordability.

For instance, the original OGNA identifies a need for 560 hectares of employment land to 2050 under the central outlook of the business as usual trajectory. However, under the more extreme behavioural scenarios (i.e. scenarios 2 and 3) rather than maximising land allocations, local policy makers may wish to make more flexible allocations for employment land.

Post-Covid monitoring and review

When planning for the Oxfordshire of 2050, there is an increased emphasis on planning for a vision that is both feasible and desirable; the "forced experiment" of the pandemic has provided us with incredibly valuable information as to what that might look like.

For instance, the geography of Oxfordshire's residents has both expanded and contracted during the pandemic: expanded, by the reduced need for daily commuting, which has increased the range of feasible employment or residential options; contracted, by the increased opportunity and willingness to engage with and increase dependence on local communities and amenities.

Moving forward, there is a need for the planning system to continue to monitor such trends and build in additional flexibility and responsiveness, particularly given there is still an unprecedented amount of uncertainty when it comes to estimating the scale and durability of the pandemic's longer-term impacts.

Building on the opportunities provided by the pandemic – such as increased active travel, and reduced commuting - there is also a need for additional analysis on how best to join up spatial planning with infrastructure delivery sequencing, to reach net zero carbon targets whilst maintaining an innovative and prosperous economy.

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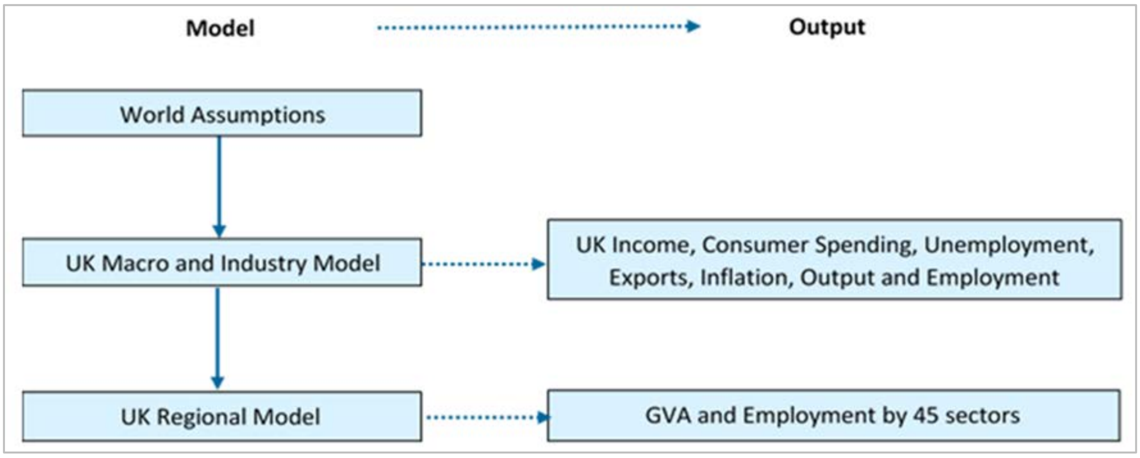
7 Appendix A: Post-Covid Forecast Methodology

As part of its work on the Oxfordshire Economic Recovery Plan (ERP), to better understand the likely longer-term impact of the Covid-19 pandemic on the Oxfordshire economy, Cambridge Econometrics (CE) worked with Steer-ED to develop a series of credible econometric forecasts for the county and its constituent local authority areas.

To produce these local area forecasts, CE utilised the bespoke Local Economy Forecasting Model (LEFM) component of its macroeconomic Multi-Sectoral Dynamic Model (MDM-E3) of the UK economy. Resultantly, the local area forecasts for Oxfordshire are consistent with CE's macroeconomic forecasts for the UK economy as a whole.

Importantly, this approach and modelling framework is consistent with that used to produce the original OGNA trajectories. The forecasts used in this report and the ERP were produced over summer 2020.

Figure 4.3.1: Links between Cambridge Econometrics' suite of models



Source: Cambridge Econometrics.

As Figure 4.3.1 demonstrates, an important feature of this modelling approach is the link to CE's wider modelling suite and framework, ensuring any local area forecasts are consistent with CE's world, UK national and UK regional forecasts and assumptions.

CE's headline UK forecasts have been developed within the context of its position within global trade networks, the worldwide impact of Covid-19, and the changing nature of the UK's trading relationship with the EU. These national level impacts are then systematically distributed to regions and local areas, based on historic sectoral relationships.

The regional and local impact depends, therefore, on the historic precedent of how local sectors have historically performed relative to their national or regional equivalents, thereby capturing the differing intrinsic resilience of local sectors to national economic shocks.

For example, if the Professional Services sector in Oxfordshire has historically been impacted less hard, and/or recovered more rapidly from past shocks, than the UK Professional Services sector as a whole, then this will be reflected in the local forecasts.

To improve the quality and reliability of the Oxfordshire results, particularly in relation to the sectoral and local authority detail, additional quantitative and qualitive data have been incorporated into the forecasts, specifically for the year 2020, for which early data is now partly available.

For instance, by utilising the ‘live’ indicators collected by Steer-ED, for instance Job Retention Scheme (“furlough”) data, or business focus group feedback, it has been possible to enhance the quality of the local forecasts in the very short term whilst ensuring alignment between the CE’s and Steer’s workstreams.

It should be emphasised that at this early stage, any efforts to determine the quantitative implications of Covid-19 on national and local economies are highly uncertain and indicative. Even when accounting for this, as with all kinds of forecasting, there are margins of error associated with the results which tend to widen over time. Furthermore, it should also be noted that the quality and reliability of data decreases at more detailed levels of geography.

Whilst CE’s/Steer-ED’s approach incorporates a wide number of factors, including global, national and local interrelationships and detailed sectoral impacts, there are factors it cannot account for, including any long-term behavioural changes due to the pandemic, or large and unanticipated policy changes at the local or national level.