Greater Cambridge Employment and Housing Evidence Update

Employment Land, Economic Development and Relationship with Housing

Iceni Projects Limited on behalf of the Greater Cambridge Shared Planning Service

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0.2 This commission builds upon the above reports. It would beneficially be read in conjunction with chapter 3 of the ELEDS which discusses Greater Cambridge's economic clusters. It updates and supersedes other aspects of the ELEDS report including the employment forecasts, employment floorspace requirements and balance of floorspace needs. It also updates the outcomes of the HERR.

0.3 The key conclusions of this report are:

Recent employment changes

0.4 The picture from combining a number of datasets is that the pandemic appears to have negatively affected a number of endogenous (local / population related) sectors such as construction, retail, food & accommodation and the arts & recreation. Exogenous (investment led) higher value sectors have generally remained resilient (professional services) or seen growth (ICT and life sciences) through the pandemic.

Property Market

0.5 For labs, demand has reached an all time high with significant capital available for life sciences research but there is a severe shortage of available lab move in space. Immediately available space has fallen to almost zero against this background of high demand.

0.6 For offices, the pandemic has slowed demand due to home working. Secondary or lower quality stock in particular is seeing higher levels of availability, however there is still good demand from businesses wishing to locate in central and north Cambridge in high quality premises, and this trend is expected to continue.

0.7 Industrial demand has risen considerably in recent years and supply has failed to keep pace. Demand has risen for manufacturing, light industrial, warehousing and mid-tech space. E-commerce and e-retailing account for a greater proportion of demand than in the past. Mid tech is a phenomenon arising in recent years and typically combines a former 'mixed B' type unit including advanced manufacture with dry / tech labs and storage space. These units often support part of life sciences supply chain.

Employment forecasting

0.8 Overall this report takes a similar approach to the ELEDS 2020 in terms of employment forecasting. However it uses updated input data which is adjusted for a revised population forecast (derived from the 2021 Census). There is also a greater emphasis on absolute rates of change rather than compound growth rates. The results are set out below.

Summary of employment modelling outputs (Greater Cambridge)

Model	Employment Change 2020 41	Employment 2041 position	CAGR
LEFM ONS SNPP baseline	30,400	244,000	0.6%
LEFM adjusted population baseline	51,200	264,700	1.0%
Standard method based growth	43,300	256,900	0.9%
Central Growth Scenario	**66,600**	**280,200**	**1.3%**
Higher Growth Scenario	**76,700**	**290,300**	**1.5%**
2020 Central Growth Scenario	58,400	277,000	1.2%
2020 Higher Growth Scenario	78,700	299,100	1.5%

Source: Iceni Projects based on CE (LEFM) / Iceni modelling

0.9 Iceni considers that the central scenario is the most likely overall outcome allowing for future economic cycles and shocks. In Iceni's view the higher scenario is a

less likely outcome as it overly relies on the continuation of recent high rates of overall growth.

0.10 The forecast total jobs in 2041 is comparable to the forecast at the same date in the 2020 report (for the central scenarios). However, the 2020 report (based on 2017 data) estimated the 2020 jobs total and could not take account of the pandemic, which resulted in a slower rate of growth in the intervening period. With this 2020 data now available, the change in total jobs is greater to reach a similar 2041 outcome.

Employment floorspace needs

0.11 Recommendations on future employment floorspace requirements are developed using the labour demand (and supply) models, completions trends and market signals.

0.12 For offices, all models result in higher needs than identified in the 2020 ELEDS, largely due to changes in the employment outlook, as well as potential for lower density spaces post pandemic. A future need of 289,700 sqm is recommended for offices, derived from the central jobs scenario.

0.13 For R&D premises, the completions trends sit above the central and high labour models however the completions are heavily influenced by a single development. A balanced position of planning for around 600,000 sqm of R&D is recommended, sitting between the labour demand models and completions trends.

0.14 For industrial and warehouse needs the labour demand scenarios report a c.40,000 – 60,000 sqm requirement. It is considered appropriate to factor in some replacement of future losses to avoid market pressure which is already high. Taking this into account along with other factors results in a need of 200,000 sqm.

0.15 Taking into account the projected supply of employment floorspace in the plan period, a very limited shortfall in office / R&D is identified but a more substantial shortfall in industrial and warehouse floorspace needs.

Range of Projected Employment Floorspace (2020-41) (sqm) Greater Cambridge

Sector	Recommended needs 2020 41	2020/21 deliveries	Needs 2020/21	Supply Dec 2022	Remaining balance
B1 mix	-	18,905*	-	-	-
Office	**289,700**	6,493	269,028	188,795	**-80,233**
R&D	**600,000**	21,235	574,039	651,585	**+77,547**
Industrial / w'house	**200,000**	-6,099	206,099	56,935	**-149,164**
Total	**1,089,700**	40,534	1,049,166	634,621	**-151,851**

Source: Iceni Projects based on CE / Iceni modelling

0.16 Emerging Local Plan (First Proposals) allocations are able to readily fulfil the shortfall in office and R&D type needs given significant allocations at North East Cambridge, Cambridge East, Cambridge Biomedical Campus and Babraham Research Campus.

0.17 Whilst there are dedicated proposed allocations for industrial space, in order for the forecast needs to be met it is necessary for some of the larger general allocations, notably Cambridge East, to emphasise the inclusion of appropriate industrial floorspace in order to avoid under provision.

Housing and employment relationships

0.18 The relationship between jobs and homes is examined. The population growth associated with the Standard Method and number of jobs likely to be supported is set out, as well as the expected level of housing required to support the employment forecast scenarios.

0.19 Using the Government's Standard Method it was calculated there is a need to provide 1,769 dwellings per annum across the study area (685 in Cambridge and 1,084 for South Cambs). This is based on using the 2014-based subnational household projections (SNHP) and an up-to-date house price to income affordability ratio. It is estimated that the Standard Method could support job growth of 43,300 over the 2020-41 period across the Greater Cambridge area,

which is considerably below the jobs needed for the central and higher jobs scenarios.

0.20 Working through demographic modelling to consider changes to the resident labour supply and implied population and household growth it was concluded that to meet the economic forecasts, housing delivery of 2,463 dwellings per annum is required for the preferred central jobs scenario, (assuming 1:1 commuting above the Standard Method). The higher jobs scenario generates a need for 2,763 dwellings per annum (with 1:1 commuting above the Standard Method). It is recommended that the authorities consider planning for 2,463 dwellings per annum to support the central scenario jobs growth.

1. Introduction

1.1 Cambridge City Council and South Cambridgeshire District Council have commissioned Iceni Projects with Cambridge Econometrics and Justin Gardner Consulting to provide an update to the Greater Cambridge Employment Land and Economic Development Evidence (ELEDS) 2020, and the related Greater Cambridge Housing & Employment Relationships Report (HERR) 2020.

1.2 This commission builds upon the above reports. It would beneficially be read in conjunction with chapter 3 of the ELEDS which discusses Greater Cambridge's economic clusters. It updates and supersedes other aspects of the ELEDS report including the employment forecasts, employment floorspace requirements and balance of floorspace needs. It also updates the outcomes of the HERR.

1.3 The key elements of this work as set out in the study brief are:

- An appropriate and proportionate check of the published ELEDS drawing on up to date data, accounting for substantive representations on completed Local Plan consultations.
- A property market review (chapter 2) and review of contextual economic evidence (chapter 3) particularly reflecting latest information and impacts resulting from the COVID-19 pandemic.
- Review of employment forecasting, drawing upon latest available data and completed in a way that is consistent with the approach taken in the published ELEDS (chapter 4), and assessing the employment floorspace implications for the Local Plan (chapter 5).
- Review of Housing & Employment Relationships Report, considering the employment implications of Government's Standard Method minimum Local Housing Need, and the housing implications of the employment forecasting (chapter 6).

2. Property Market Update

2.1 This chapter provides an assessment of the commercial property market across Greater Cambridge. This follows a similar approach to and provides an update to the analysis in chapter 2 of the 2020 ELEDS. Herein a series of study areas are used to benchmark sub-markets and understand trends and patterns for key commercial sectors including office, research and development (R&D) and industrial (where industrial includes general industrial, light industrial and warehousing).

2.2 The assessment combines quantitative analysis with qualitative elements from stakeholder engagement to build up a picture of the market. The quantitative analysis uses CoStar data – CoStar is one of the UK's largest providers of commercial property data. It should be noted however that this database does not cover all properties or transactions (owner-occupier properties, smaller transactions and properties/transactions in rural areas in particular are often not covered by CoStar).

2.3 There is also an issue with CoStar whereby the identification of R&D premises is not clearly separated from office and industrial property, which are the primary CoStar categorisations. R&D premises therefore fall under one of these two categories and cannot be robustly isolated. This is of particular relevance given the strength of the R&D sector in Greater Cambridge. Analysis of third-party data has been undertaken to seek to improve reporting on this sector.

2.4 To aid with understanding of this chapter, a number of key definitions are set out below:

2.5 Net Deliveries – The balance between deliveries and losses of floorspace (i.e. Net deliveries = Deliveries - Demolitions - Other losses).

2.6 Net Absorption - The balance between the amount of space moved into and moved out of (i.e. Net absorption = Move ins – Move outs). Equal to the change in the total amount of occupied floorspace over a given period (a year) measured in

sqm (can be positive or negative). Provides an indicator of the strength of demand unless constrained by supply (i.e. a low vacancy rate meaning that whilst demand may exist there is limited space to take up). A positive net absorption figure indicates strong demand and leads to a falling vacancy rate (unless it is outweighed by net deliveries). On the other hand, a negative net absorption figure indicates weaker demand and leads to a rising vacancy rate.

2.7 Take-up – The leasing of space (generally expressed over a year long period in sqm). The amount of take-up is a key measure of demand.

2.8 Vacancy Rate – The amount of space which is vacant as a proportion of total existing space. A vacancy rate of around 7.5% suggests an appropriate balance between supply and demand but this varies between markets.

2.9 Availability Rate – The amount of space which is being marketed for lease or sale (even if not vacant still under construction/renovation) as a percentage of total rentable space. Availability rates are generally higher than vacancy rates. The market based availability definition differs from local planning authority land supply (permissions and allocations) in that it refers to availability of floorspace and not land, and takes into account existing floorspace.

Study areas

2.10 For offices, the Greater Cambridge study area has been broken down into the following distinct sub-markets (see figure 3.1):

- Prime Central (lying in central Cambridge around Cambridge Rail Station);
- Urban Periphery (covering most of the rest of Cambridge but missing parts of the north such as Cambridge Business Park);
- Northern cluster (covering parts of both Cambridge and South Cambridgeshire including Cambridge Science Park, St Johns Innovation Centre and Cambridge Business Park); and
- South Cambridgeshire (the rest of the district of South Cambridgeshire).

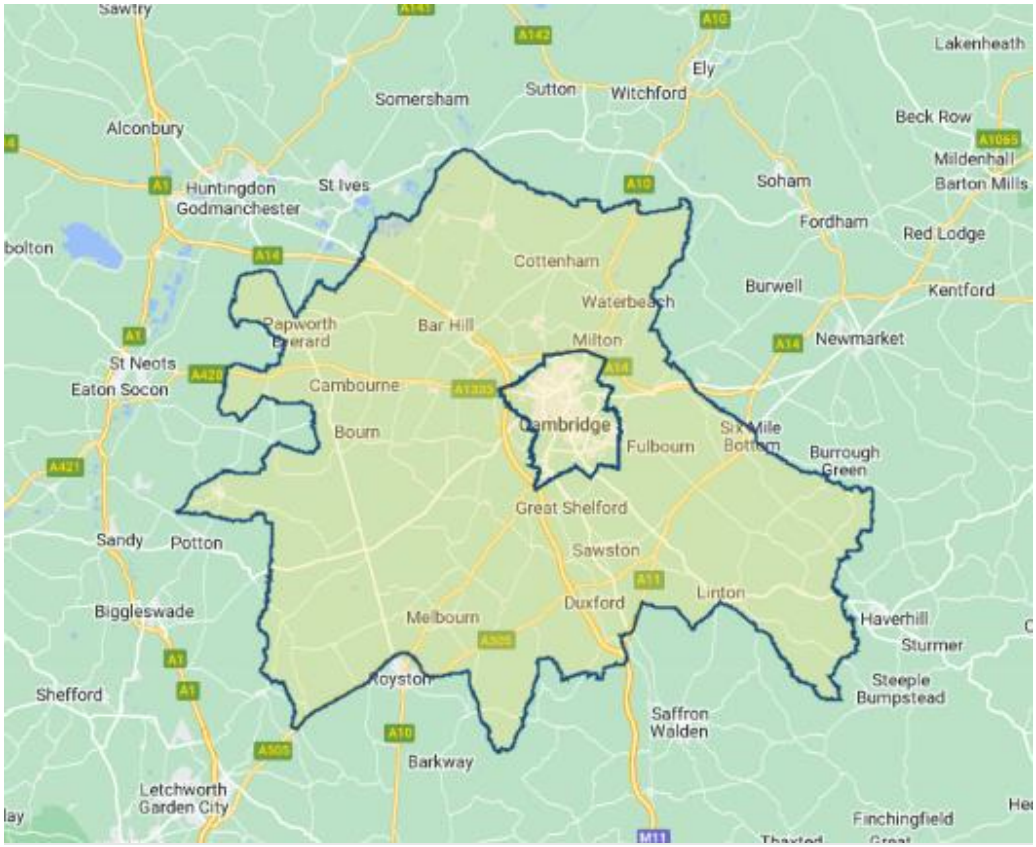
2.11 These boundaries are consistent with the 2020 ELEDS, aside from the Northern cluster which was included as a sub-market but its boundary was different – it was previously adjusted slightly to align more precisely with the North East Cambridge AAP. This adjustment has not been made here and the difference is not considered material.

Figure 2.1 Office market sub market study areas

Source: CoStar

2.12 For industrial property, the Greater Cambridge study area has been broken down into the following sub-markets: Cambridge and South Cambridgeshire. The Cambridge sub-market covers the whole of the district of Cambridge but extends slightly into South Cambridgeshire covering the area south of the A14 and east of Cambridge Road. This includes Cambridge Science Park and St Johns Innovation Centre. These sub-markets are consistent with those used in the 2020 ELEDS.

Figure 2.2 Industrial sub-market study areas



Source: CoStar

Office Market

2.13 This section provides an assessment of the office market. This will be used to inform the scale and type of future need which is identified later in this report. It includes a particular focus on research and development (R&D) in order to capture the importance of the life science and associated employment sectors across Greater Cambridge. Wherever possible, the analysis is split into submarkets as presented earlier.

National

2.14 The COVID-19 pandemic and enforced home working has completely overhauled the UK office market. National vacancy has climbed from 4.5% to over 7% and is expected to continue to rise. Net absorption has been negative with ongoing move-outs as occupiers review their property portfolio requirements - close to 10 million sqft (approx. 930,000 sqm) of negative net absorption occurred in 2020–21. By 2022 there has been some return to leasing however the overall national

demand picture remains subdued. National net absorption has remained negative during 2022 as firms continue to release space onto the market. While reductions in demand have been lighter than in 2021, weak demand and rising net deliveries continue to push the national office vacancy rate upwards.

2.15 Whilst overall demand is still weak, there is an increase in demand for high-quality space and although office asking rents fell during the pandemic, rent declines have recently levelled off. Prime buildings should continue to outperform secondary ones in the coming years as firms continue to move to better-quality, well-ventilated space — to attract staff, welcome clients and meet growing Environmental, Social and Governance (ESG) commitments — even if many take less space overall amid a permanent rise in home working.

2.16 Floorspace supply-constrained markets with a strong technology, media, and telecom (TMT), life science or professional services demand base and a highly educated workforce have outperformed during the pandemic and should continue to do well in the medium term. The likes of Greater Cambridge, Bristol and Edinburgh fall into this category, with markets such as Milton Keynes, Newcastle upon Tyne, Brighton and Leeds also likely to fare relatively well[1].

Cambridge Market Area

2.17 CoStar suggest that Cambridge's reach and hence defined market area covers the district of Cambridge itself as a well as South Cambridgeshire and East Cambridgeshire. This market area hosts a dynamic office market, owing to the success of 'Silicon Fen' or the Cambridge Cluster, which has evolved into a renowned science and technology hub with close ties to the University of Cambridge. The market's robust talent pool serves as a magnet for high-tech companies in industries like biopharma, electronics and software development. Apple, Microsoft , Gilead Sciences and Amgen are among the numerous high profile global firms to have expanded in Cambridge in recent times.

[1] Developed from CoStar national office market report October 2022

2.18 CoStar’s Cambridge Market Area has been one of the UK's most active office markets over the past couple of years. Notable expansions by flagship tech firms including Roku and Mathworks, and flexible workspace provider Fora, amongst other firms.

2.19 Demand has rebounded after turning only mildly negative in 2020 amid the forced shift to working from home. The Cambridge Market Area’s occupier base is more likely to be more resilient against the long-term negative effects of the pandemic on office demand based on the market's five-year forecast for net absorption which as a percentage of existing stock, is the strongest in the nation.

2.20 The **Prime Central** sub-market in Cambridge is a midsized sub-market that contains around 170,000 sqm of office space. The vacancy rate currently sits at a very low 2.4%, slightly below the 10 year average of 2.5%. Net absorption over the past year was positive at around 8,300 sqm, above the ten-year average of 4,700 sqm . Rents grew by 5.9% over the past year, which is slightly above the decade-long annual average of 5%.

2.21 The **Urban Periphery** sub-market in Cambridge contains about 330,000 sqm of office space. The vacancy rate is a very low 2.89%, below the ten-year average of 3.89%. Annual net absorption came in at negative 1,000 sqm over the past year compared to a ten-year average of positive 1,000 sqm. Over the past five years, the sub-market has posted net absorption of about 5,000 sqm per year on average, suggesting negative net absorption over the last year could be due to constrained supply. Rents increased by 4% over the past year, positive but below the 4.5% average change over the past decade.

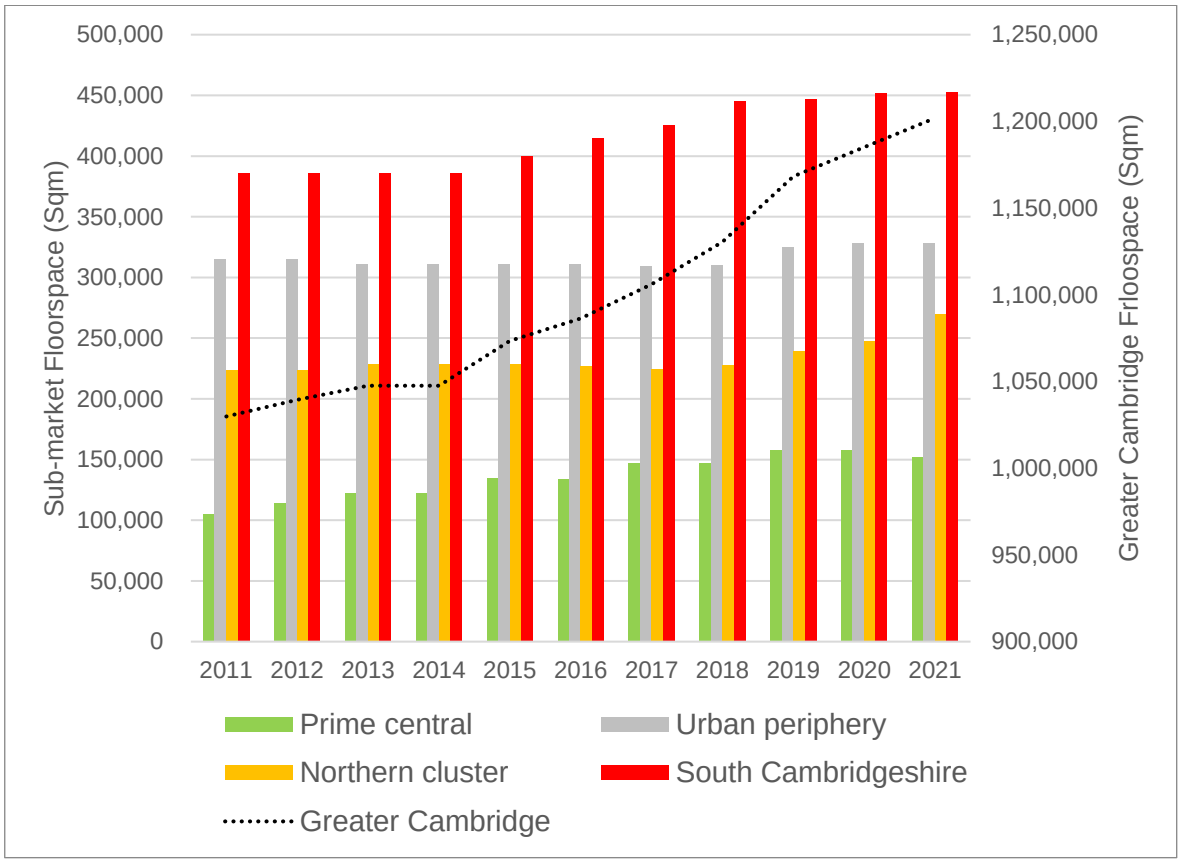
2.22 The **Northern Cluster** sub-market in Cambridge contains about 280,000 sqm of office space. The vacancy rate has fallen somewhat over the past year, but at 3.14%, the rate is slightly higher than the long-term average of 3.01%. Net absorption over the past year was about 14,000 sqm, above the ten-year average of 4,000 sqm. Rents posted a gain of 4.8% over the past 12 months, similar to the 4.9% average annual increase over the past decade.

2.23 The **South Cambridgeshire** sub-market contains about 480,000 sqm of office space, which represents more than a third of the overall market inventory. The vacancy rate has fallen slightly over the past year (compared with previous year), and at 5.24%, was below the 10-year average of 6.82%. Net absorption over the past year was about 22,000 sqm, more than twice the five-year average of 10,000 sqm. Rents grew by 4.5% over the past year, which is slightly above the decade-long annual average of 4%.

Market analysis

2.24 Across the Greater Cambridge market as a whole, there are an estimated 1.2m sqm of office space as of 2021 – based on CoStar data. Each sub-market has seen fast growing stock levels since 2011, as seen in the chart below (CoStar data). The Valuation Office Agency (VOA) report 940,000 sqm in office space across Greater Cambridge. There are always inconsistencies between the VOA and CoStar data, including because VOA don't include vacated stock, but the scale of discrepancy does point potentially to some R&D space being included in the CoStar records. VOA data suggests an increase of stock of c.12% since 2011 and CoStar c.16%.

Figure 2.3 Office market total stock 2011 to 2021, sqm (Greater Cambridge total right side)



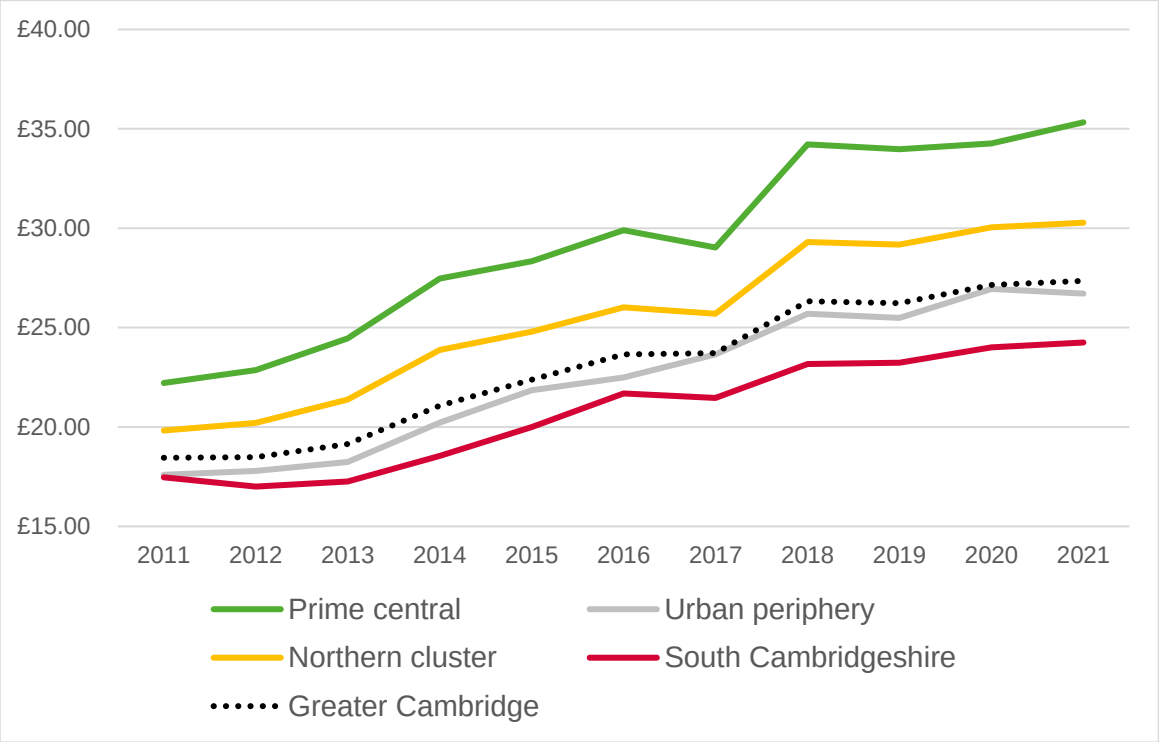
Source: CoStar & Iceni analysis

2.25 The figure below shows how rental prices have evolved over the past decade. Rental prices have increased significantly between 2011 and 2018, but are now close to plateauing since 2018, with slightly stronger growth in the 'prime central' sub-market.

2.26 Savills report that office rents plateaued in the city centre during 2021, but they are expected to rise by over 8% in 2022. According to Savills, laboratory rents will continue to rise[2].

[2] https://pdf.euro.savills.co.uk/uk/office-reports/cambridge-offices-and-laboratories---spotlight---march-2022.pdf

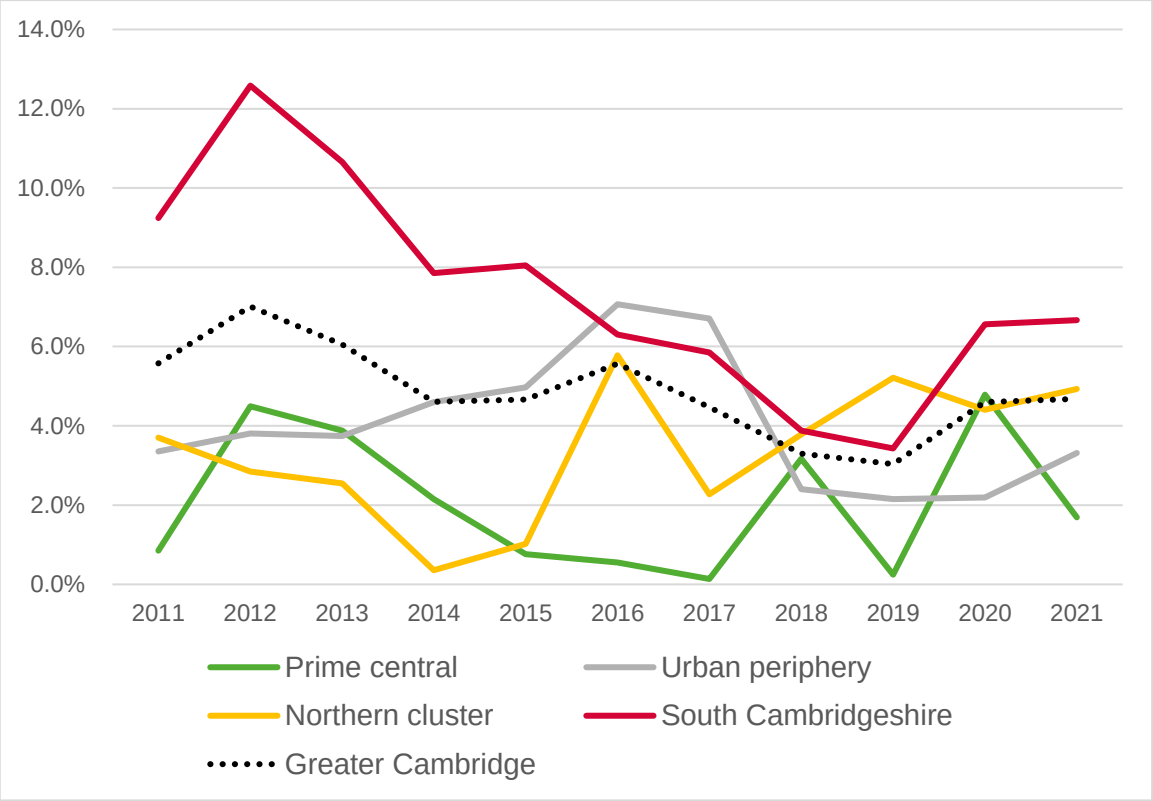
Figure 2.4 Office Rental Prices, 2011 to 2021 (£/sqft)



Source: CoStar & Iceni analysis

2.27 The following chart shows vacancy rates trends over the past 10 years. Vacancy rates have fallen sharply across all sub-markets. As of 2021, there were low vacancy rates in the Cambridge office sub-markets:, 1.7% in Prime Central, 3.3% in Urban Periphery and 4.9% in Northern Cluster. South Cambridgeshire's office vacancy rate was a moderate-low 6.7% pushing up the Greater Cambridge average to 4.7%.

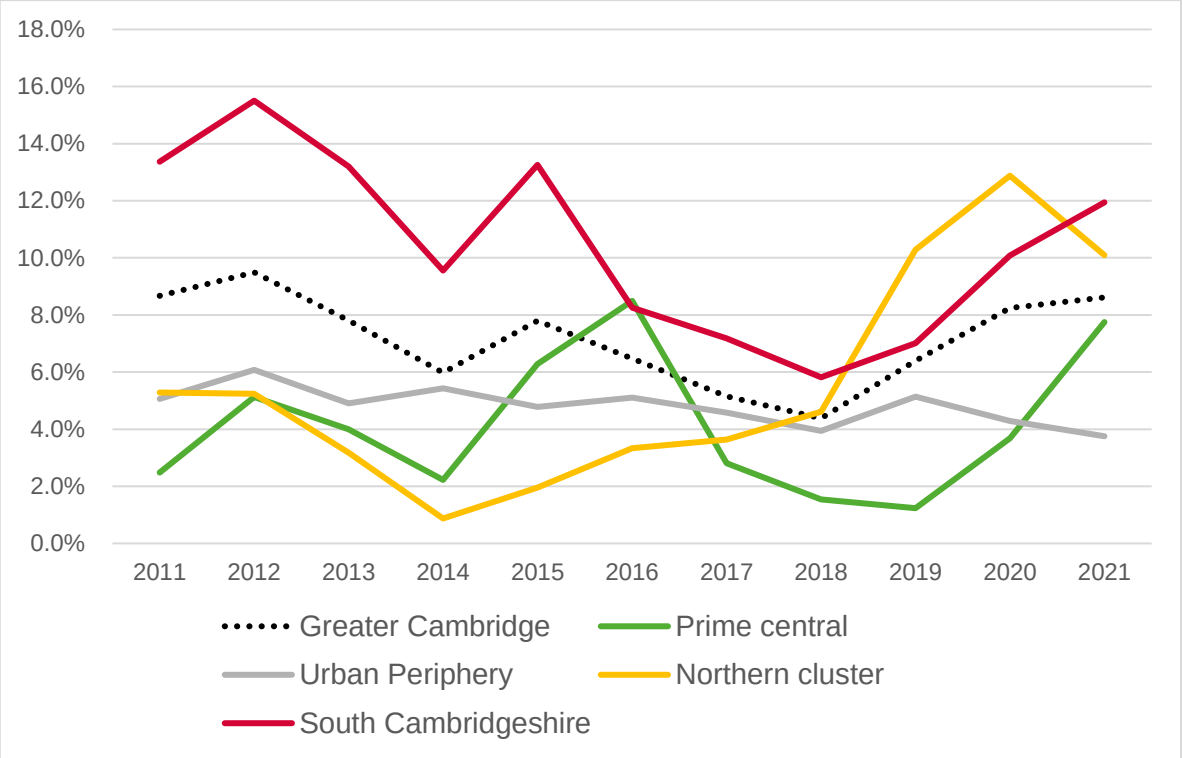
Figure 2.5 Office Vacancy rates, 2011 to 2021



Source: CoStar & Iceni analysis

2.28 Another key market indicator is the availability rate. As of 2021, availability rates have climbed compared to 2018 to 8.6% across Greater Cambridge as a whole The Prime Central and Urban Periphery sub-markets were lower at 7.8% and 3.8% respectively. On the other hand, the Northern Cluster and South Cambridgeshire had higher vacancy rates at 10.1% and 11.9% respectively.

Figure 2.6 Office Availability rates, 2011 to 2021



Source: CoStar & Iceni analysis

2.29 Analysis of the locations of available offices as below highlights that the majority are in South Cambridgeshire. Excluding forthcoming developments (i.e. looking at existing stock only which is shown in brackets) there is an even balance of available floorspace between the Cambridge sub-markets suggesting that there is not an area with particularly low/high levels of availability, but again South Cambridgeshire has the highest level of availability by far (both in absolute terms and relative to the proportion of total stock in the sub-market).

Available office distribution August 2022

Sub market	% of available floorspace (Existing only)	Available floorspace as a % of total floorspace
South Cambridgeshire	43% (47%)	36%
Urban Periphery	13% (18%)	26%
Northern Cluster	24% (17%)	22%
Prime Central	19% (17%)	12%

Source: CoStar

2.30 As can be seen in the table below, in terms of age, most available stock in Greater Cambridge was built pre-2000. Most pre-2000s stock being advertised as available is in South Cambridgeshire (47%). South Cambridgeshire only has 36% of total stock suggesting a high proportion of the available stock in South Cambridgeshire was built pre-2000. As discussed below, demand for Grade A space is holding up well, but has weakened for older stock in peripheral locations.

Available Office Floorspace by Age, Greater Cambridge (August 2022)

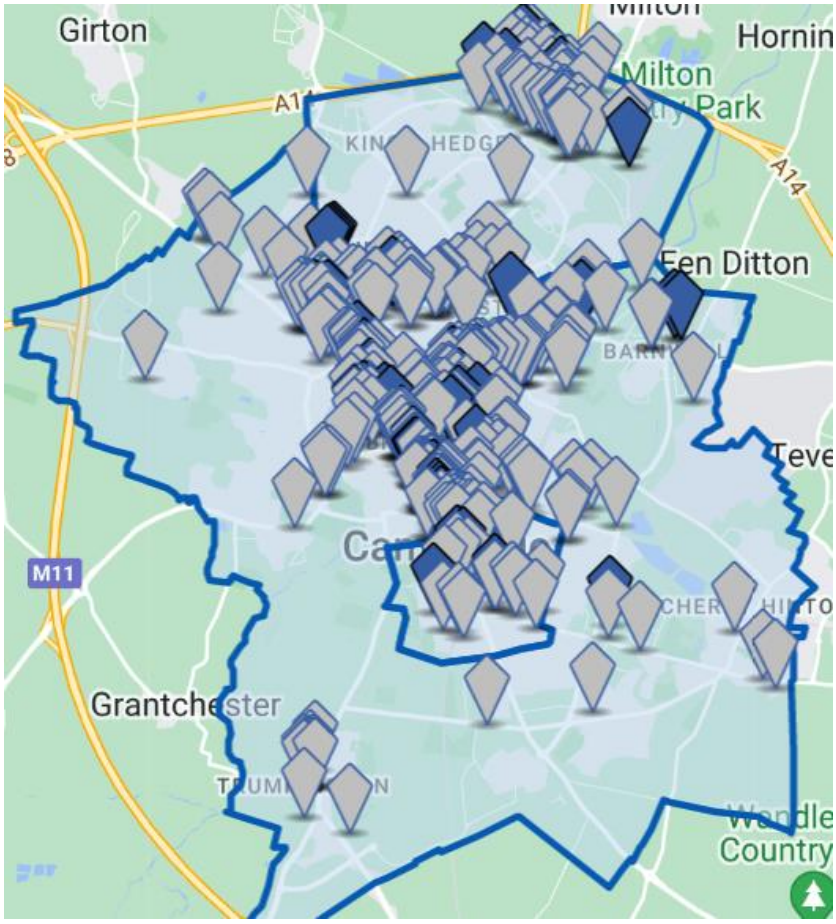
Status / Age	% of floorspace	Floorspace (sqm)
Proposed / under construction	21%	25,570
2010+	20%	24,307
2000-10	17%	19,901
Pre 2000*	47%	61,550

Source: CoStar

*Including properties within an unknown build date which are usually older stock

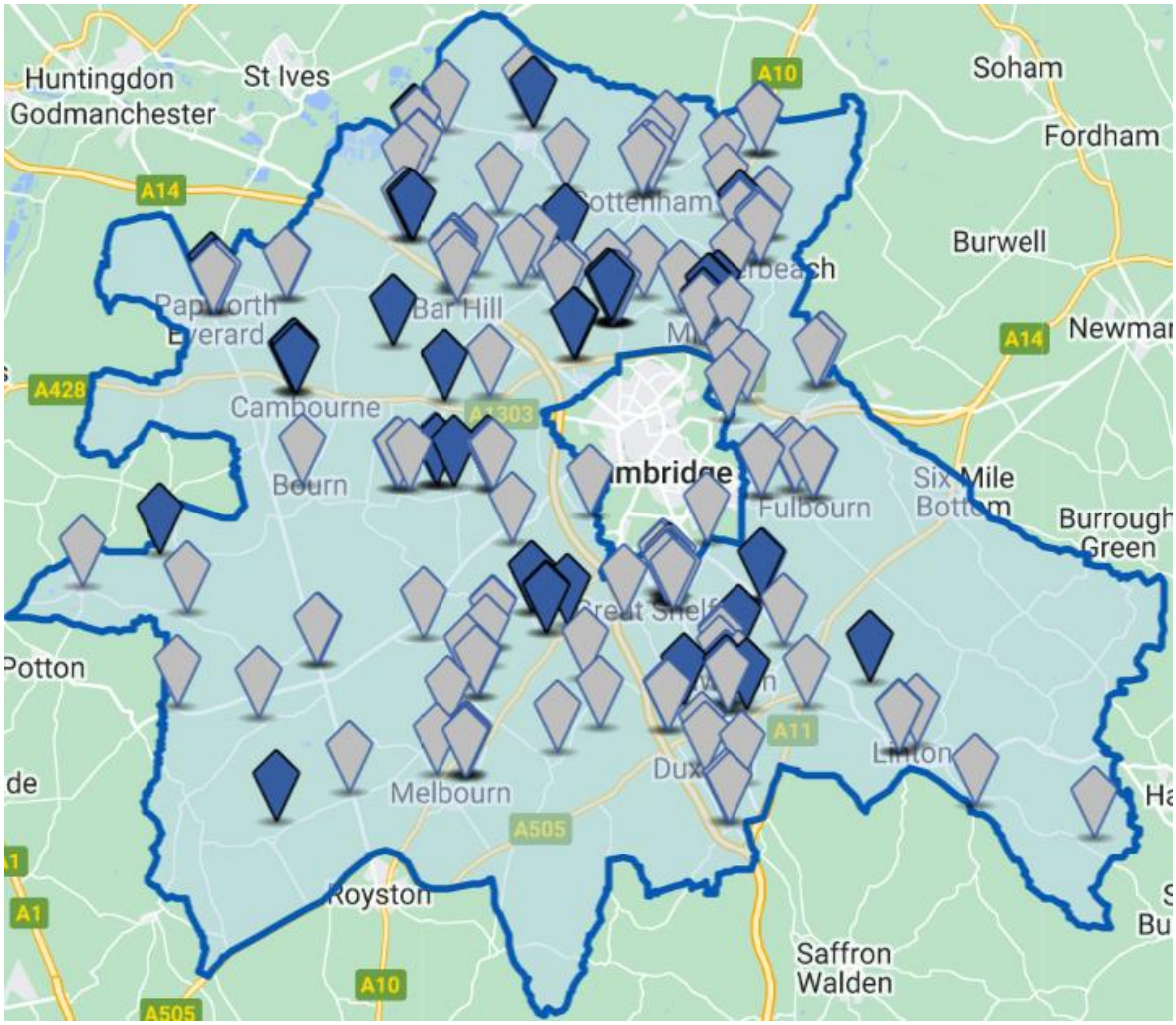
2.31 The maps below highlight the distribution of pre-2000 built stock within the sub-market areas with properties with available space marked blue. This provides an indication of the broad areas in which the renewal of stock may be needed.

Figure 2.7 Map of Office Stock Built Pre-2000, Cambridge Sub-markets



Source: CoStar (**blue** markers = advertised as available)

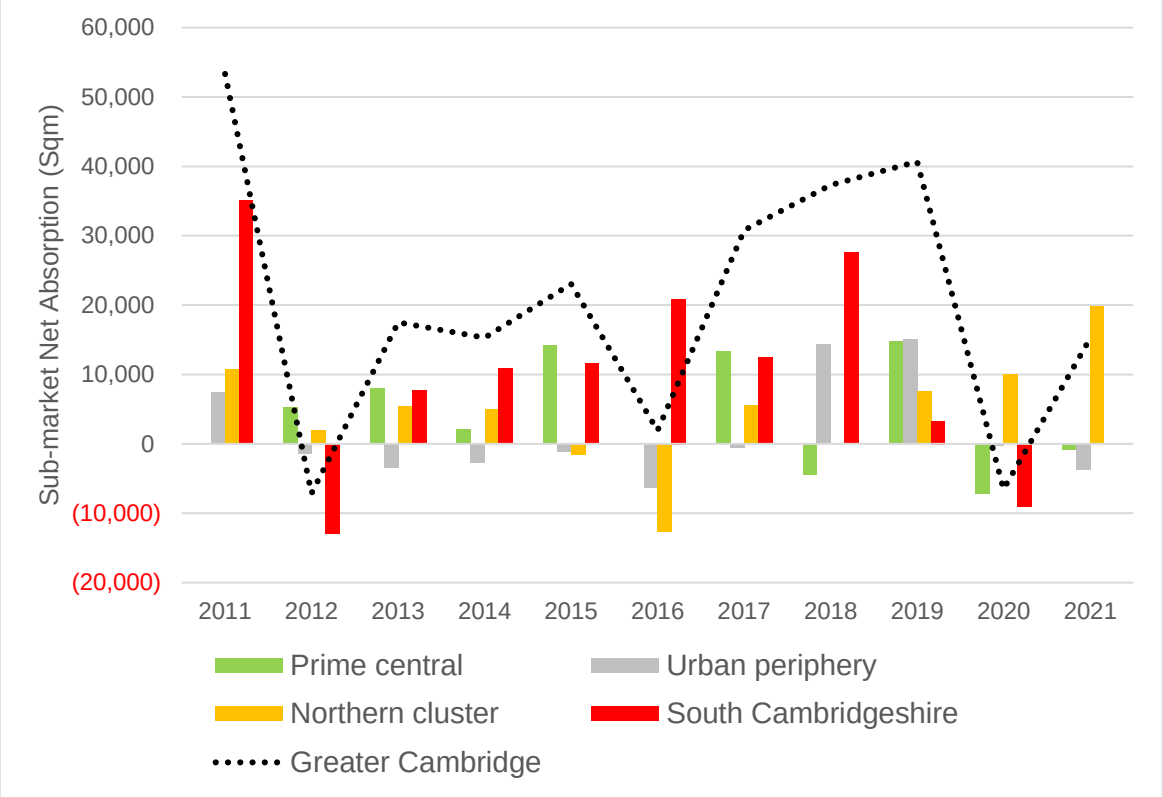
Figure 2.8 Map of Office Stock Built Pre-2000, South Cambridgeshire



Source: CoStar (**blue** markers = advertised as available)

2.32 As can be seen below, net absorption has been strongest in South Cambridgeshire with consistently positive figures for the past 10 years (aside for two years in 2012 and 2020). The Prime Central and the Northern Cluster sub-markets also exhibited strong net absorption figures in the past decade – an indicator of a busy market. 2020 overall was a negative year but with a bounce back in demand evident in 2021. 2021 was however well below the pre pandemic average of around 27,800 sqm at around 15,800 sqm.

Figure 2.9 Net absorption of Office Floorspace, Greater Cambridge, 2011 to 2021

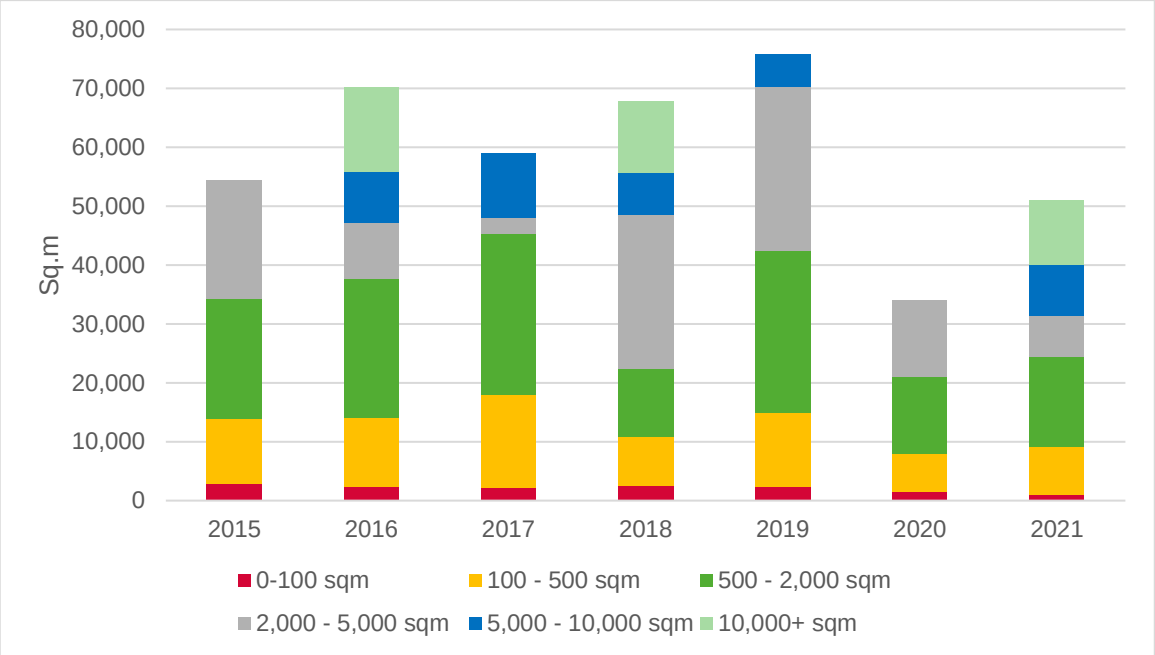


Source: CoStar & Iceni analysis

Deals

2.33 The following chart shows a summary of all deals recorded by CoStar in all office sub-markets from 2015 to 2022 (as of September 2022) and classifies the total sqm. of deals taken each year within each of the size ranges. The market did not completely recover to the pre-Covid highs of around 70,000 sqm of deals per year by 2021 but the volume of floorspace leased in 2021 was quite strong and included very large deals in the 10,000+ sqm category.

Figure 2.10 Deals by Size Range (sqm), Greater Cambridge (2015 to 2021)



Source: CoStar & Iceni analysis

Future Floorspace Availability

2.34 The table below provides a summary of future floorspace availability (proposed by a developer, in planning and under construction) across Greater Cambridge based on CoStar data. This can be summarised as:

- Proposed (a building that has been announced for future development. Proposed floorspace does not necessarily have any planning status and is not due to start construction for over 12 months): 21 properties, c. 167,000 sqm (1,800,000 sqft)
- Final planning (Project will begin construction within the next 12 months. This differs from the local authority records unimplemented permissions): none recorded
- Under construction: 7 properties, c. 35,000 sqm (376,000 sqft)

2.35 There is potential for some of these sites come forward as lab or part lab space, such as those at Granta Park, which highlights issues with the CoStar office data.

2.36 It is also important to note that this represents a snapshot in time and that some of the CoStar data may have inaccuracies or not be fully up to date.

Future availability, as of July 2022

Sub market	Address	Post code	Net Internal Area (sqft)	Status
South Cambridgeshire	Cambridge Rd, Melbourn	SG8 6ED	118,500 (11,000 sqm)	Under Construction
South Cambridgeshire	London Rd, Pampisford	CB22 4EE	17,900 (1,700 sqm)	Under Construction
City Centre Periphery	12 Kingston St	CB1 2NU	719 (66 sqm)	Under Construction
City Centre Periphery	Coldhams Ln	CB1 3LH	21,258 (1,900 sqm)	Under Construction
Northern Cluster	One Cambridge Square	CB4 1UN	93,711 (8,700 sqm)	Under Construction
Prime Central	2022 Clarendon Rd	CB2 8FH	59,352 (5,500 sqm)	Under Construction
Prime Central	20 Station Rd	CB1 2JD	65,000 (6,000 sqm)	Under Construction
South Cambridgeshire	Granta Park	CB21 6GQ	38,000 (3,500 sqm)	Proposed
South Cambridgeshire	Lower Rd	SG8 0HF	8,193 (760 sqm)	Proposed
South Cambridgeshire	Beach Dr	CB25 9PD	18,000 (1,700 sqm)	Proposed
South Cambridgeshire	Beach Dr	CB25 9PD	15,000 (1,400 sqm)	Proposed
Prime Central	2022 Clarendon Rd	CB2 8FH	8,192 (760 sqm)	Proposed
Prime Central	104-112 Hills Rd	CB2 1LQ	50,600 (4,700 sqm)	Proposed

Sub market	Address	Post code	Net Internal Area (sqft)	Status
Northern Cluster	Cowley Rd, Johns IP,	CB4 0DS	330,818 (30,000 sqm)	Proposed
Northern Cluster	Cowley Rd, St Johns IP, B2	CB4 0WS	85,000 (7,900 sqm)	Proposed
Northern Cluster	Cowley Rd Johns IP, Dirac	CB4 0WS	88,436 (8,200 sqm)	Proposed
Northern Cluster	250-260 Milton Rd (Phase 2)	CB4 0WE	52,065 (4,800 sqm)	Proposed
Northern Cluster	289 Milton Rd (Phase 3)	CB4 0WE	61,376 (5,700 sqm)	Proposed
City Centre Periphery	Devonshire Rd	CB1 2BH	120,000 (11,000 sqm)	Proposed
South Cambridgeshire	Fulbourn Rd, (lab / office)	CB1 9NJ	496,416 (46,000 sqm)	Proposed
South Cambridgeshire	London Rd	CB22 3FT	94,999 (8,800 sqm)	Proposed
South Cambridgeshire	Granta Park, Unit H	CB21 6GQ	56,000 (5,200 sqm)	Proposed
South Cambridgeshire	Granta Park, Unit F	CB21 6GQ	85,000 (7,900 sqm)	Proposed
South Cambridgeshire	Granta Park, Unit A	CB21 6GQ	72,000 (6,700 sqm)	Proposed
South Cambridgeshire	Granta Park, Unit B	CB21 6GQ	72,000 (6,700 sqm)	Proposed
South Cambridgeshire	High St	CB22 3AZ	41,333 (3,800 sqm)	Proposed

Source: CoStar

Focus on life science & laboratories

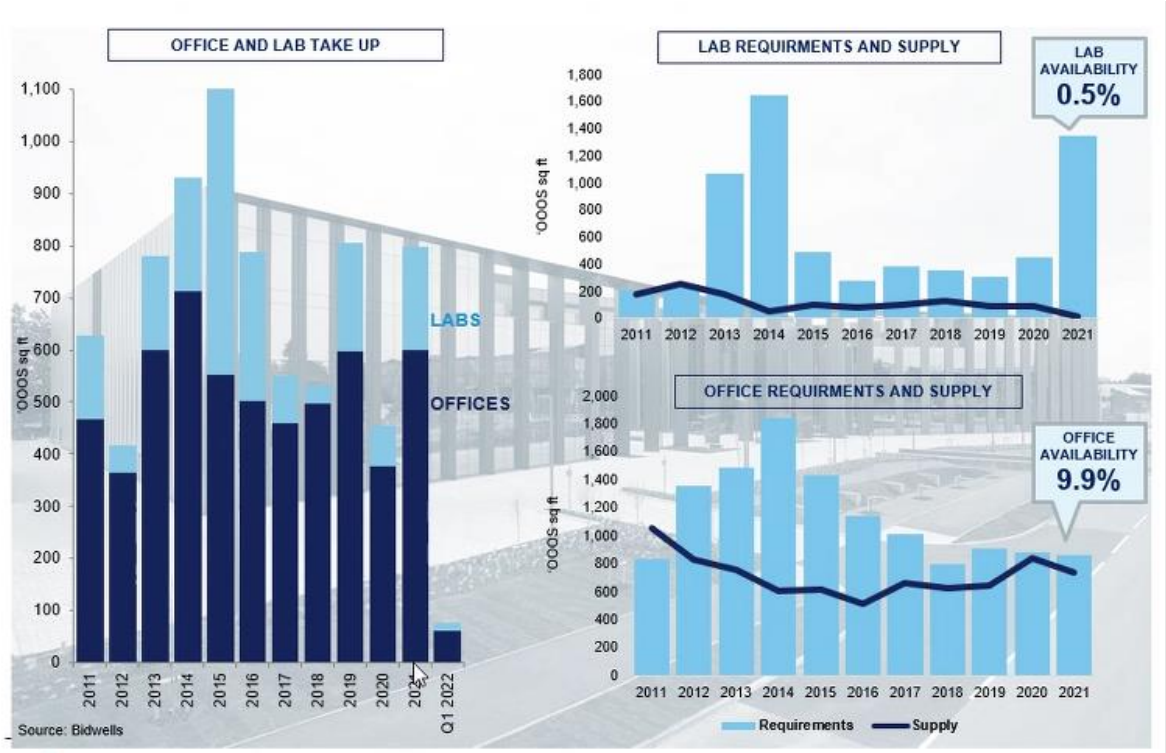
2.37 Extensive consultation has been undertaken with key market stakeholders including Bidwells, Savills, and science park operators. The outcomes are reported later in this chapter. Immediately below, third party market reports are considered.

2.38 Bidwells produce property market reports for different parts of the OxCam Arc as part of their Arc Databook. The databook for Cambridge covers Cambridgeshire as a whole. Even though this considers the whole county, this is the most useful data available for understanding levels of lab demand in Greater Cambridge.

2.39 According to the Bidwells report, Cambridgeshire lab take-up was around 200,000 sqft (18,600 sqm) in 2021, however the demand hugely exceeded the supply meaning take-up was suppressed. The scale of demand in 2022 remains reportedly extremely high and availability very low, indicating that the immediate pipeline has not kept up with changes in demand profile. This is happening in the context of continuing strong investor interest and a potential untapped demand for labs of close to one million sqft as reported by stakeholders.

2.40 Figures below, extracted from Bidwells' market intelligence report, show how low lab availability compares to the general office class. In any market, availability below the 5% mark is considered unhealthy as it leaves no space for choice and churn for occupiers including inward investors, reducing competition and rising rents, and limited growth potential in the short and medium term. It may also lead to some occupiers choosing to locate in other cities, domestic and international.

Figure 2.11 Laboratories vs. office - take up, requirements and floorspace supply, Cambridgeshire

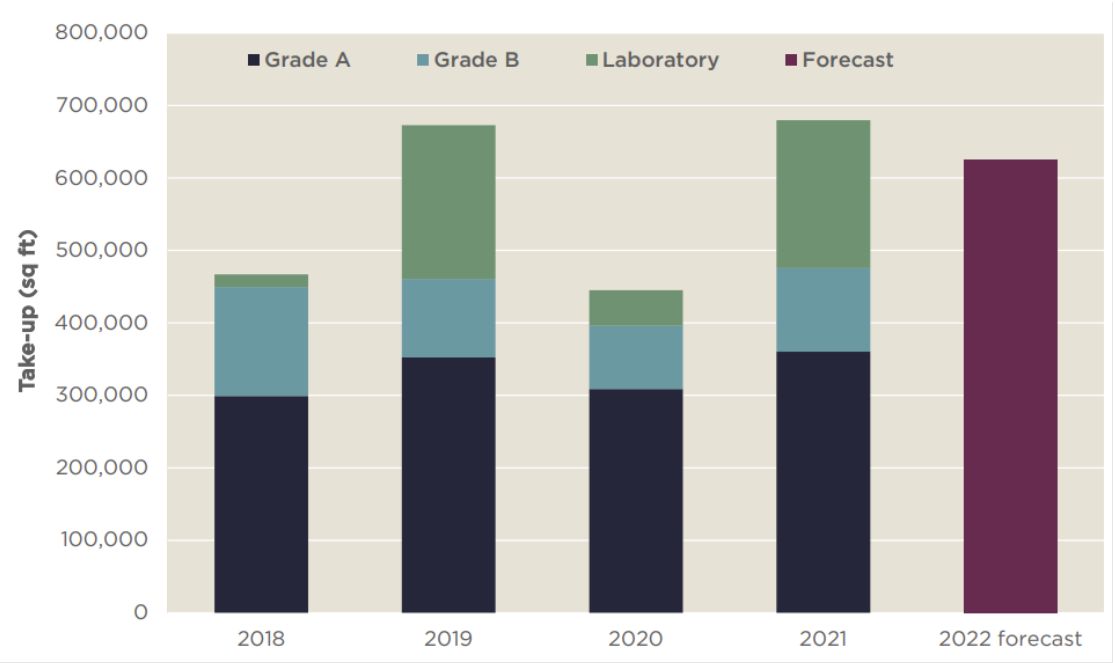


Source: Bidwells, Arc Market Databook Summer 2022 (available at https://www.bidwells.co.uk/what-we-think/arc-market-databook-offices-and-labs-cambridgeshire-summer-2022)

2.41 Savills data[3] is drawn from their Cambridge research which is understood to cover both Cambridge and South Cambridgeshire (based on their indicative map). This suggests that Lab take up is strong but that there is no further availability to accommodate new occupier requirements.

[3] https://pdf.euro.savills.co.uk/uk/office-reports/cambridge-offices-and-laboratories----spotlight---march-2022.pdf

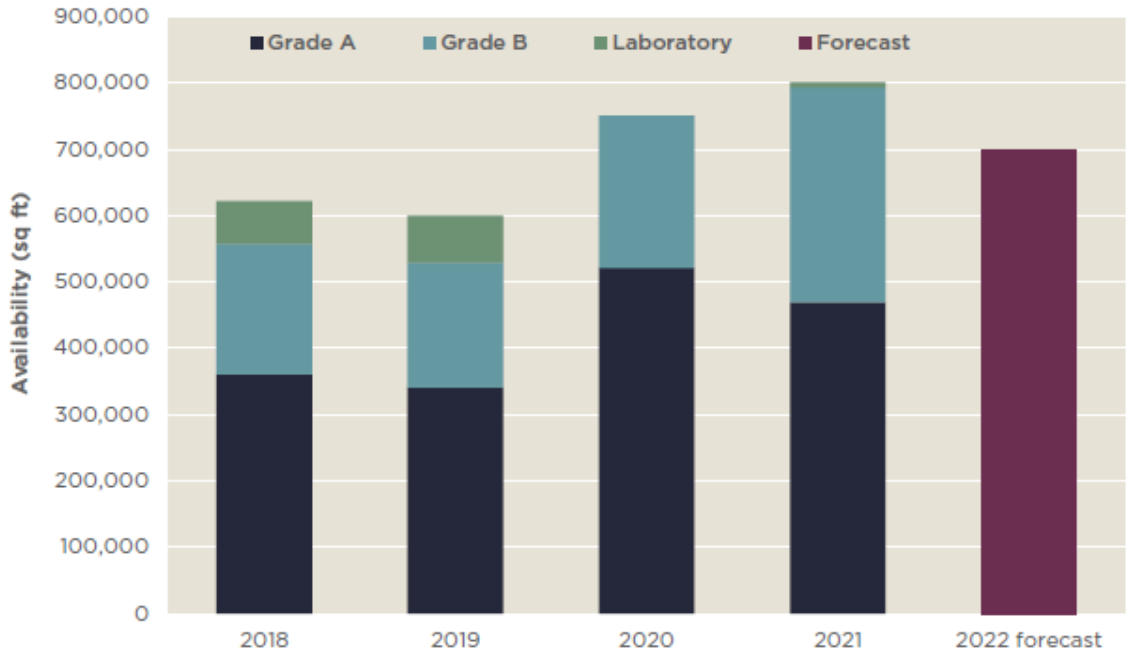
Figure 2.12 Take up by office sub-class, Cambridge (2018 to 2022)



Source: Savills Research. https://pdf.euro.savills.co.uk/uk/office-reports/cambridge-offices-and-laboratories----spotlight---march-2022.pdf

2.42 Savills data for office availability indicates that it has risen during the pandemic and remains above the pre pandemic average. However, lab availability is essentially zero. Differential dynamics are thus evident for the labs market as against general office stock.

Figure 2.13 Availability by office sub-class, Cambridge (2018 to 2022)



Source: Savills Research

2.43 Savills report an uptick in take-up in emerging locations for office buildings being converted to labs. For instance, Vision Park in Histon is an existing employment location which has seen circa 45,000 sq ft of lab deals complete where the unit will need to be converted into lab-space. These deals are to three companies including Talga Technologies and Source Bioscience UK, all of which have relocated from Cambridge Science Park. The emerging trend of conversion of office stock to deliver lab space is also evident in the comparable Oxford market.

Industrial and warehouse market

2.44 This section provides an assessment of the industrial market drawing on a range of data sources including CoStar and VOA. For CoStar data, industrial properties have been filtered to exclude the sub type 'R&D' premises to avoid R&D / lab crossover, which improves data reporting but is not perfect (as not all premises have a sub type label). For the purposes of this section, warehouse (Use Class B8) and industrial (Use Class B2 and E(g)(iii), former B1(c)) are interchangeable.

National

2.45 The pandemic has driven all time highs in rent and occupier demand for warehousing space as a result of increases in online retail. Therefore, Industrial vacancy in 2021 was below 3.0% and availability below 5.0% whilst the national rental average has broached £8 per sq ft for the first time.

2.46 At the end of the first half of 2022 Industrial market conditions remain strong, however demand does face downward pressure due to rising operating costs and a pullback in consumer spending, which could dampen occupiers' appetite for expansion. This is particularly seen in the logistics sub-sector with Amazon's recent announcement concerning the scaling back of its leasing activity (as they acquired 25 million sqft (230,000 sqm) in 2020–21) means less demand to take-up the record 62.3 million sqft (580,000 sqm) of floorspace under construction.

2.47 Vacancies are expected to edge upwards as leasing moderates, affording tenants a little more negotiating power. Larger developers like Prologis and Panattoni are better insulated from these downward pressures than their smaller counterparts as a result of their larger size and continue to press ahead with major schemes. Rental growth is expected to slow in the coming quarters, having picked up strongly after the onset of the pandemic and the associated online shopping boom.

2.48 Although the pace of rental growth has begun to slow, rents continue to see positive growth at 9.1% year-over-year, which although positive for landlords, adds to affordability concerns for some warehouse occupiers in the face of rising operational costs and increased business rates from next April.

2.49 Despite expectations of slowing growth, Industrial rent gains remain on track to outpace the other main property sectors over the coming years, with the newest and greenest warehouses well-placed to outperform.

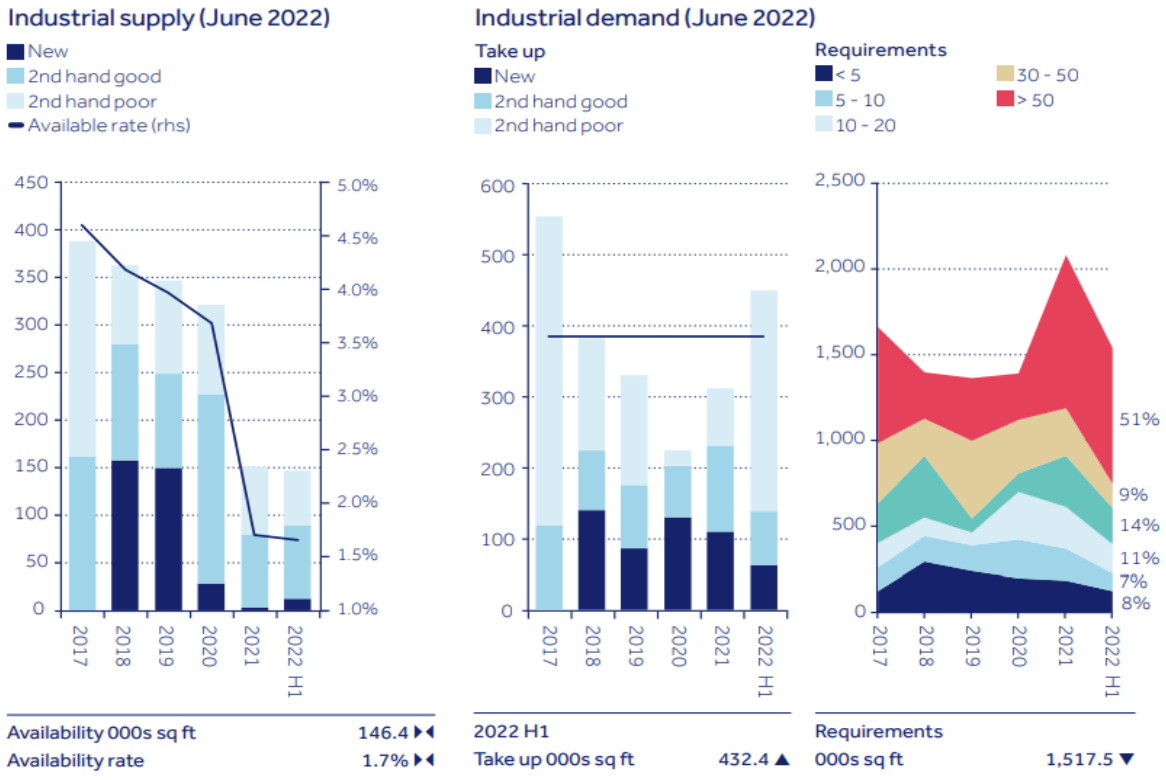
2.50 It should be noted that while much Industrial demand has been driven by warehousing there is also strong demand for specialised (manufacturing) and light industrial space with very low vacancy rates of 2.6% and 2.1% respectively and strong positive net absorption across these two uses combined.

Cambridgeshire

2.51 Bidwells provide reliable data and information on the Cambridgeshire (not necessarily just Greater Cambridge) industrial market. This highlights:

- A severely weakening supply side position with availability below 2.0%.
- Average 5 year take up at 400,000 sqft, (37,000 sqm) with 2022 expected to exceed that position.
- Over half of floorspace requirements being for 20,000+ sqft (1,800+ sqm) premises.

Figure 2.14 Bidwells Industrial data, Cambridgeshire



Source: Bidwells Arc Market Databook – Cambridgeshire, Summer 2022 available at https://www.bidwells.co.uk/what-we-think/arc-market-databook-industrial-cambridgeshire-summer-2022/

2.52 Bidwells[4] report that at summer 2022 “a notable lack of available space is posing a significant challenge for occupiers in Cambridgeshire. Demand for storage warehouse space continues to be dominated by retailers, and in particular on-line retailers, who represent almost 40% of requirements. However, the lack of Big Box units (typically over 100,000 sqft/9,200 sqm) in the Cambridgeshire area makes satisfying these requirements almost impossible. The life science and technology sectors account for 17% of overall demand, with requirements ranging from 5,000-30,000 sq ft. A number of new schemes are under construction and attracting strong interest, but the volume will fall well short of requirements across all size bands. The supply demand imbalance is sustaining robust levels of investor and developer activity.”

2.53 Iceni has also analysed Greater Cambridge (rather than Cambridgeshire) Industrial market deals data from 2011 onwards (floorspace total) from CoStar which identifies occupier type (although only around half of all transactions include this data capture so results are indicative) and sets out the below findings. These are broadly in line with Bidwells but the below represents a longer-term historic picture rather than current market need – of note there is less emphasis on warehouse / e-commerce historically:

- 30% are professional services and health and care, which when reviewing occupier types[5] suggests an approximation of the mid tech sector (see later discussion).
- 25% of deals are retail (including trade counter), service (including automobiles), construction and wholesale.

[4] Industrial Cambridgeshire Summer 2022 Arc Market Databook

[5] Including Fluidic Analytics, Concept Life Sciences, Clover Biopharmceuticals, Element Materials Technology, CMR Surgical, Sense Biodetection Ltd, Astrazeneca UK, Cambridge Pharma Ltd, PetMedix, Peritus Healthcare Ltd

- 25% manufacturing deals.
- 10% warehousing and distribution deals.
- 10% other.

2.54 Size band analysis suggests a reasonable split across the micro (sub 5,000 sq ft/460 sqm), small (5,000 – 10,000 sqft, 460 – 930 sqm) and medium (10,000 - 25,000 sqft, 930 – 2,300 sqm) ranges – although as above there are very limited large units that would accommodate big box deals even if sought.

Cambridge Market Area

2.55 CoStar suggest that Cambridge's reach and hence defined market area covers the district of Cambridge itself as well as South Cambridgeshire and East Cambridgeshire (although the market analysis that follows excludes East Cambridgeshire).

2.56 The Market Area's can be described as relatively small, serving local occupiers and the city's science, technology and advanced manufacturing sectors, which require mid-tech and R&D-type space to accommodate a mixture of office, lab and manufacturing uses. Mid-tech space is usually represented by flexible 'smart sheds' which reflect previous 'mixed B Class' type units where everything from office, development research / manufacturing and storage can all take place under one large roof. These look akin to industrial / warehouse units but tend to be located in higher quality business park type environments. Examples include at Alconbury6, Royston7 and Cambridge Research Park (Enterprise Development).

[6] https://www.urbanandcivic.com/application/files/5015/7606/2656/Mid-TechSeptember_17WEB.pdf

[7] https://roystongateway.co.uk/wp-content/uploads/2022/01/Royston-Gateway-Industrial-brochure-2022v1.pdf

These more land hungry units can be challenging to deliver with Cambridge's constrained supply and high land values.

2.57 Pharmaceuticals giant AstraZeneca, composite materials manufacturer Hexcel Corporation, Marshalls and food company Hain Daniels are among Cambridge market area's larger industrial occupiers.

2.58 In keeping with the picture across the UK, the Cambridge Market Area's industrial market has fared well over the past couple of years. However, demand here is more focussed towards specialised industrial (i.e. manufacturing) and light industrial space compared to the national market. Demand outpaced supply in 2020–21 and vacancies have fallen to 3.4% as of the third quarter of 2022, with the specialised industrial sector particularly undersupplied. Recent activity has revolved around the smaller size bands with key deals including HVAC specialist Smith Brothers Stores taking 2,100 sqm at Buckingway Business Park in Q4 2021 and the University of Cambridge and printing technology firm Xaar each leasing around 650 sqm at Cambridge Research Park earlier in the year.

2.59 **Greater Cambridge** has around 940,000 sqm of industrial space recorded on CoStar. This compares with the VOA figure of 1.1m sqm (2021 data). The VOA suggests total industrial space has steadily fallen in Cambridge but remained stable in South Cambridgeshire and is now increasing (since 2018).

2.60 **Cambridge** contains about 310,000 sqm of industrial space according to CoStar. Vacancies have dipped slightly over 2021/22, and at 2.0%, there's not much room left for further reductions meaning take-up may be constrained by a lack of supply. Net absorption over the past year was 1,700 sqm, positive but below the five-year annual average of 12,000 sqm.

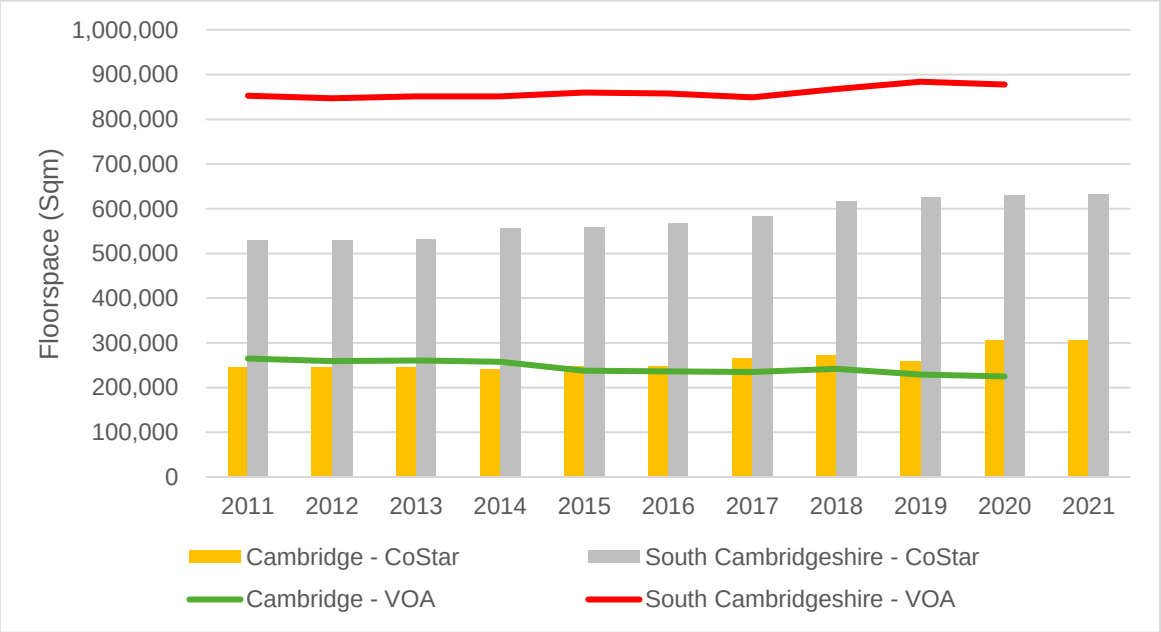
2.61 The 630,000 sqm of industrial space in **South Cambridgeshire** represents more than two thirds of the Cambridge Market Area's total industrial inventory. The vacancy rate (5.4%) has hardly budged from this time last year. Net absorption was essentially flat over the past year. Over the five-year timeframe, the submarket has posted 14,000 sqm of positive net absorption per year, on average.

Market analysis

2.62 The graph below shows the amount of industrial floorspace in Cambridge and South Cambridgeshire according to both CoStar and VOA data. We suggest that there is likely to be around 880,000 sqm of industrial space in South Cambridgeshire in line with VOA data as CoStar tend to under report industrial space. VOA data actually suggests that there is less industrial space in Cambridge than CoStar suggest. In any case, there is around 280,000 sqm of industrial space in Cambridge.

2.63 Both data sets suggest that there has been some growth in the amount of industrial space in South Cambridgeshire over the last ten years. However, there is disagreement between the datasets for Cambridge.

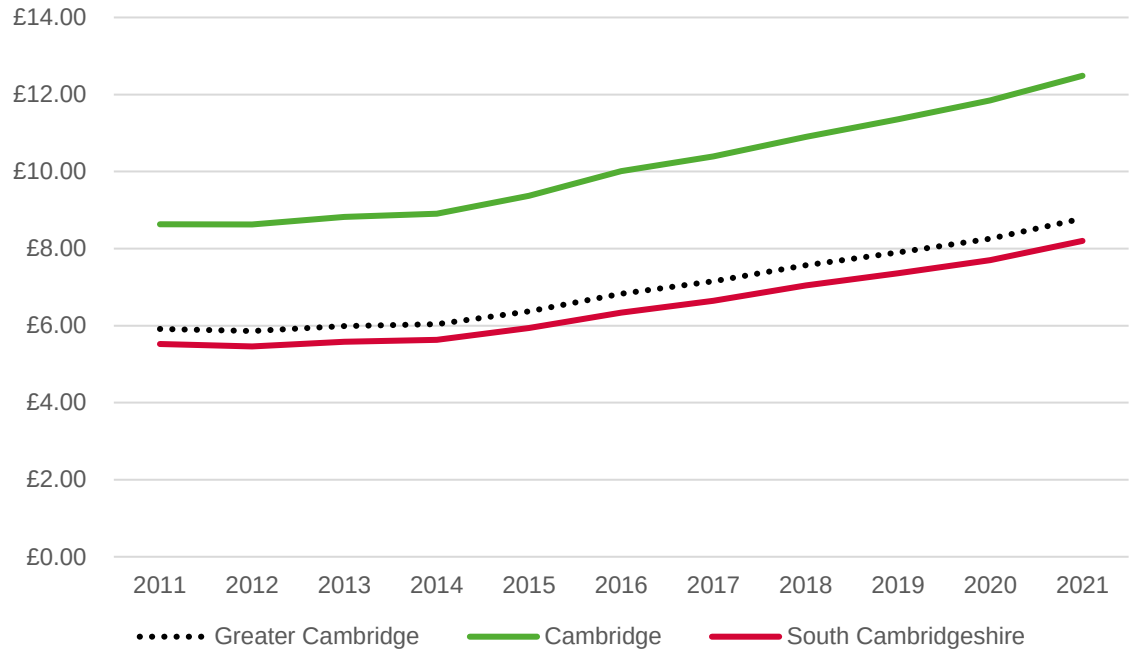
Figure 2.15 Industrial stock change, 2011 to 2021, sqm



Source: CoStar / VOA & Iceni analysis

2.64 The figure below shows how rental prices have evolved over the past decade. Rental prices have increased consistently between 2011 and today, with slightly stronger growth in the Cambridge sub-market.

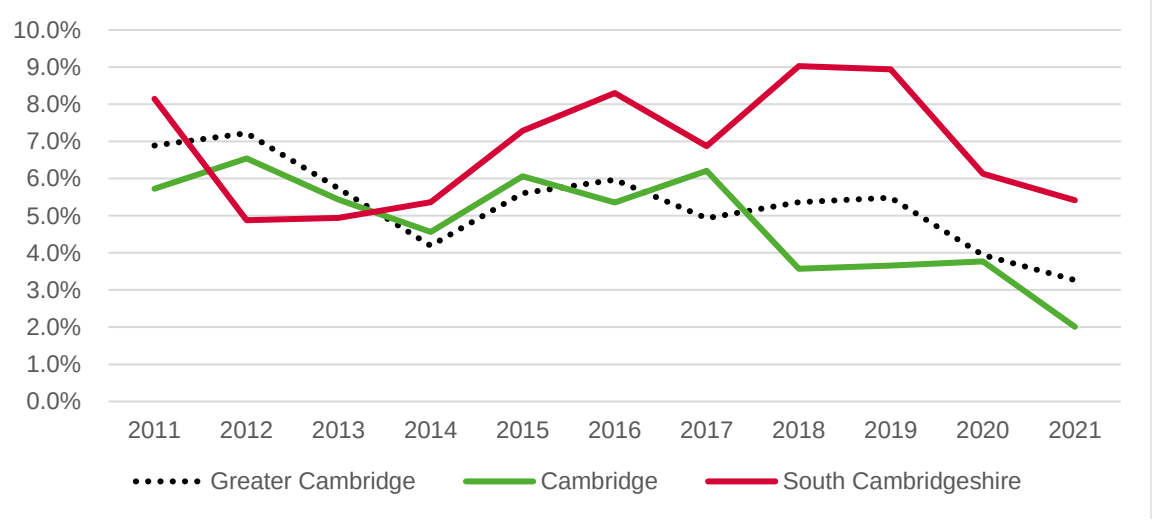
Figure 2.16 Industrial Rental price, Greater Cambridge, 2011 to 2021(£/sqft)



Source: CoStar & Iceni analysis

2.65 The following chart shows vacancy rates trends over the past 10 years. While vacancy was low but not critical until around 2019, it has now fallen sharply across all study areas. As of 2021, there were very low vacancy rates for Greater Cambridge as a whole (3.3%) and Cambridge (2%), and a low vacancy rate for South Cambridgeshire (5.4%). All markets are therefore undersupplied given a healthy vacancy rate is around 7.5%.

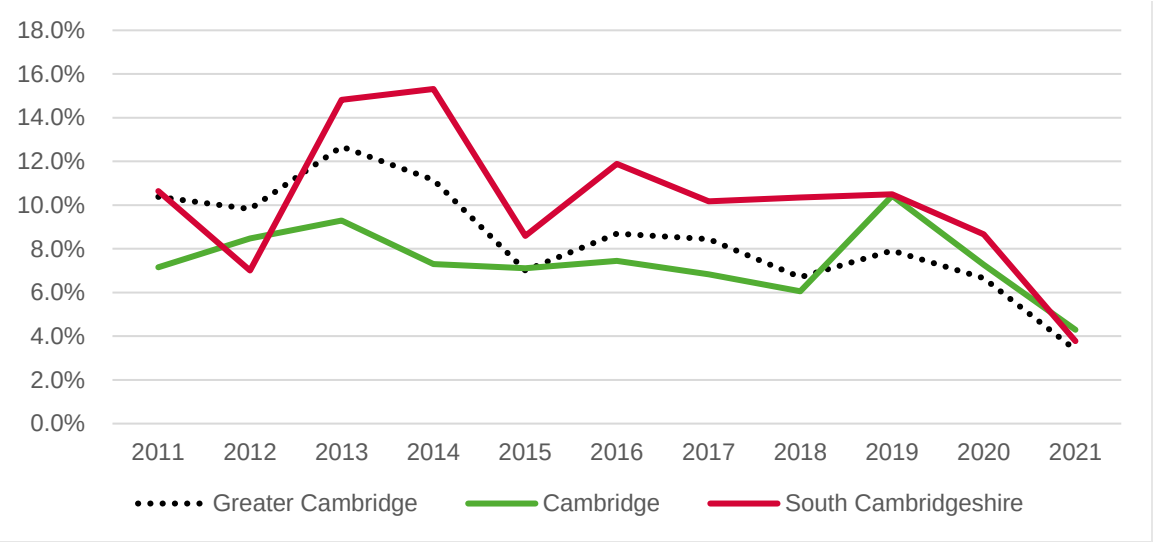
Figure 2.17 Industrial vacancy rates, Greater Cambridge (2011 to 2021)



Source: CoStar & Iceni analysis

2.66 Another key market indicator is the availability rate. As of 2021, availability rates were also critically low across sub-markets: 3.4% for the Greater Cambridge average, 4.3% in Cambridge, and 3.8% in South Cambridgeshire. Availability has collapsed in 2020 and 2021.

Figure 2.18 Availability rates, 2011 to 2021

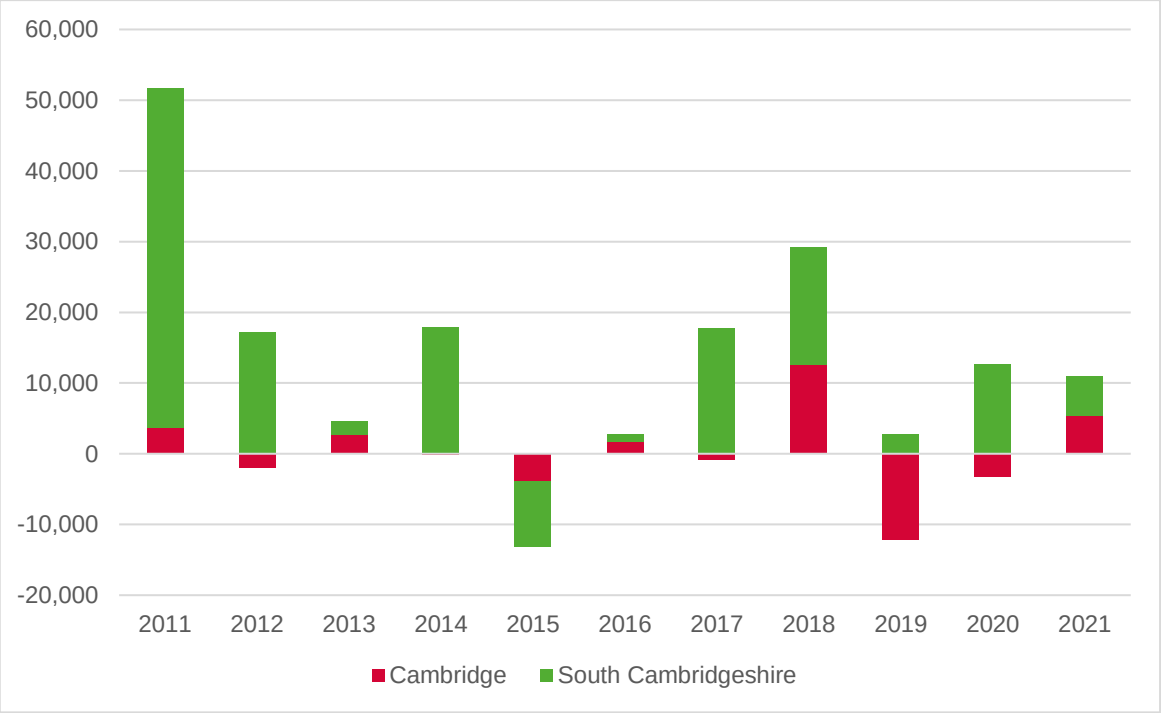


Source: CoStar & Iceni analysis

2.67 According to CoStar two thirds of available space is in Cambridge however much of this is proposed and not constructed (notably at Coldhams Lane), and for existing space there is only around 7,400 sqm in each sub area.

2.68 In terms of net absorption (change in the amount of occupied floorspace), there is no clear pattern of change. Average net absorption for 2012-2021, was around 12,000 sqm for the study area as a whole. Net absorption has been by far strongest in South Cambridgeshire with a 2011-2021 average of 12,000 sqm which reflects the fact it has higher amounts of industrial stock than in Cambridge, which had a lower average ten-year net absorption.

Figure 2.19 Industrial Net absorption, 2011 to 2021 (sqm)



Source: CoStar & Iceni analysis

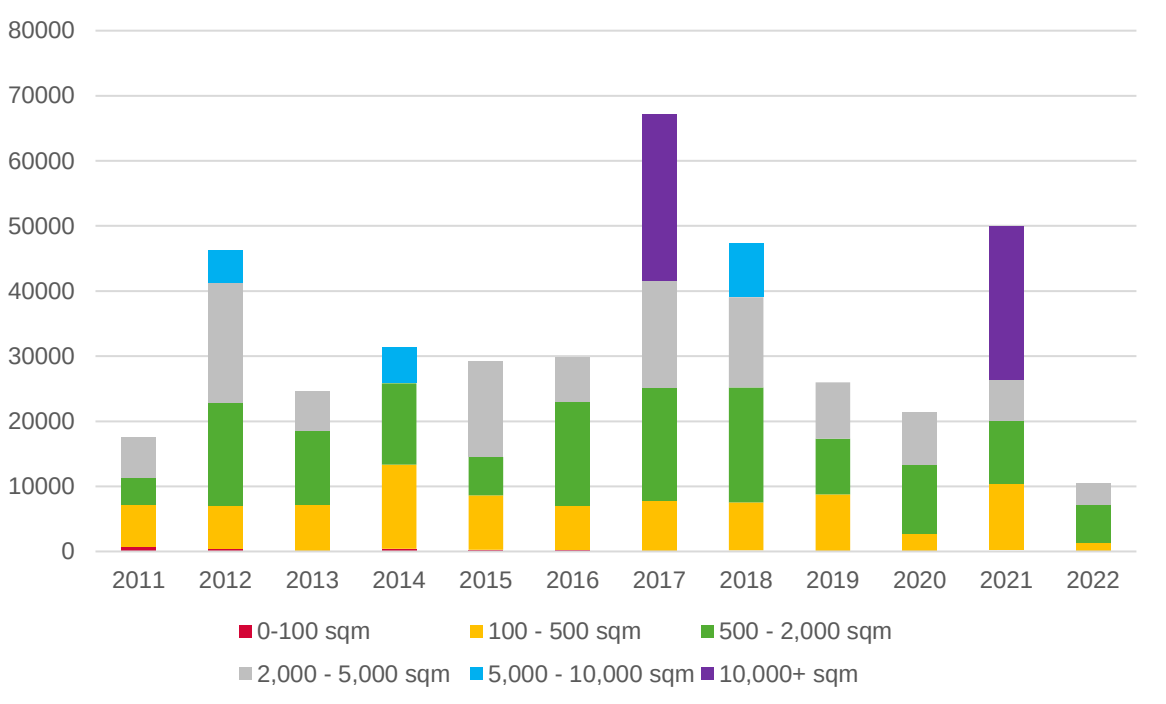
Deals

2.69 The following chart shows a summary of all deals (i.e. leases signed) recorded by CoStar in both sub market areas from 2011 to 2022 (as of the end of the first half of 2022) and classifies deals by size range. The market has been relatively slow in 2019 and 2020 but has bounced back significantly in 2021 with a record year (along with 2012 and 2017) for industrial deals.

2.70 Largest deals in recent years include:

- 23,000 sqm at the Spicers Site, Sawston Business Park (White Stores outlet Ltd)
- Several deals at Buckingway Business Park including 5 ranging between 2,000 sqm and 5,000 sqm for Beam Group, Aixtron, Sense Biodetection and Smith Brothers Stores.

Figure 2.20 Greater Cambridge Industrial deals (Take-up) by size range, sqm, 2011 to 2022



Source: CoStar & Iceni analysis

Future availability

2.71 The table below provides a summary of future industrial floorspace availability across Greater Cambridge. Based on different status, this sums up as:

- Proposed (A building that has been announced for future development. The project is not expected to start construction in the next 12 months. Proposed floorspace does not necessarily have any planning status and is not due to start construction for over 12 months): 8 properties, c. 55,000 sqm.

- Under construction: 2 properties, c. 5,000 sqm

Future availability, as of July 2022

Sub market	Street	Town/City	Post code	Floorspace (Net Internal Area, sqft)	Type	Status
South Cambridgeshire	2A Building B Bar Hl	Cambridge	CB23 8SQ	45,758 (4,200 sqm)	Warehouse	Under Construction
South Cambridgeshire	Bar Hl	Cambridge	CB23 8SQ	13,552 (1,200 sqm)	Warehouse	Proposed
South Cambridgeshire	Butts Ln	Royston	SG8 7SL	9,343 (800 sqm)	Light ind. / R&D	Under Construction
Cambridge	Coldhams Ln, Unit C	Cambridge	CB1 3LH	37,459 (3,500 sqm)		Proposed
Cambridge	Coldhams Ln, Unit B	Cambridge	CB1 3JH	33,605 (3,100 sqm)		Proposed
South Cambridgeshire	Grove Rd	Cambridge	CB22 3TJ	40,374 (3,700 sqm)	Warehouse	Proposed
South Cambridgeshire	Whittlesford Rd, Sawston Bus. Pk Phase 2	Cambridge	CB22 3XD	217,000 (20,000 sqm)	Warehouse	Proposed
Cambridge	Coldhams Ln, Unit E&F	Cambridge	CB1 3JQ	65,337 (6,000 sqm)		Proposed
Cambridge	Coldhams Ln, Unit D	Cambridge	CB1 3RG	78,577 (7,300 sqm)		Proposed

Source: CoStar

Class E

2.72 From 1st September 2020 Class E was introduced to the Use Class Order covering shops, offices, restaurants, labs and light industrial (former B1 and parts of Class A and D). This increases the flexibility of conversion without requiring planning

permission. Class E(g) parts i, ii, iii represent offices, labs and light industrial respectively.

2.73 As of August 2021 changes of use covered by ‘permitted development’ are also included from Class E to C3 (residential) up to 1,500 sqm subject to meeting all limitations and conditions, including Prior Approval. Significant losses of stock to residential are not reported in Greater Cambridge.

2.74 In Greater Cambridge with demand for offices and notably labs being high, permissions for this can be sought under Class E(g). In plan making terms, allocations would be expected to merge under Class E(g), similarly to B1.

2.75 One matter that has been identified is the potential conversion of retail premises to lab (or office space). Both the Grafton Centre and Beehive Centre retail areas are being promoted for part conversion into urban lab spaces. This would have the benefit of increasing supply for labs but may put pressure on the needs of local communities who use those spaces for retail.

Economic and market outlook: stakeholder engagement

2.76 The following market stakeholders have been engaged with:

- Cambridge Ahead
- Bidwells
- Savills
- Babraham Institute
- Granta Park
- U+I
- Cambridge Biomedical Campus
- Melbourn Science Park

- GLP

2.77 The comments of stakeholders have been merged to provide the following feedback:

Offices

2.78 The wider office market is shifting post COVID-19 and now depends much more on quality – the best spaces always have demand and the market trend is of a 'flight to quality'. Occupiers generally want to cluster and to be near others – for example at Granta Park and Babraham Research Campus which are in a cluster of themselves across incubation, academia and pharma. Cambridge Science Park is more tech focused.

2.79 One agent reported that there is still about 100,000 sqm of office space unsatisfied. Whilst there is about 65,000 sqm of office available, much of this is identified as poor quality or in the wrong place. Requirements tend to be for Cambridge specifically, not usually Cambourne, due to the clustering effect of the existing knowledge industries and concentration around Cambridge Science Park and central Cambridge (CB1).

2.80 The trend post 2015 has been around 75,000 sqm pa take-up which is split 75:25 office:lab. Requirements used to be smaller at around 2,000 sqm but now they are c20,000 sqm. Many existing units simply are not big enough – for example ARM taking all of Peterhouse, Microsoft and Apple taking out large proportions of CB1, Lumina at Granta Park. In most markets 70% of take up is churn and 30% is inward investment, but in Greater Cambridge it is closer to 50:50. At present sites are being brought forward for lab space and not a lot of office space – there may be weaker office demand in the future with work from home trends.

2.81 It is considered difficult to solve the office challenge of high demand in the central locations. North East Cambridge and the proposed redevelopment at Cambridge Airport have potential to provide significant office development.

2.82 It is estimated by agents that there is a need for 50,000 sqm per annum in net floorspace spilt between R&D / office over the next 10 years and there is potential

for more dry lab space in the future crossing over to offices. This is outside of institutional specific requirements such as the Genome Campus. The North East Cambridge area and Cambridge Science Park densification are estimated by agents to be able to support additional floorspace in the range of 200,000-300,000 sqm, as well as development at Cambridge Airport.

Labs / R&D

2.83 A number of stakeholders recognise the potential of the UK life science market, comparing with the USA where the markets have pulled back and biotech is trading below cash value, whereas the UK is more nascent in this sector and less likely to be affected by the stock market despite the Brexit headwind. Broadly it is estimated that the American life science market is 10-15 years further along than UK. This provides the potential for another 10 years of fast growth (albeit that a weakening macro economic outlook could have some impact); bricks and mortar constraints are considered the key issue. One stakeholder pointed out that the UK has 4 of the top 10 universities globally and the South East / East of England has 8 out of 20 of the biggest pharmaceutical companies thus demonstrating the agglomeration of the sector in the region. There is some fear that growth in life sciences investments will move towards Boston in USA because of greater availability of space – a threat of lack of UK supply. This would have a direct knock on for Greater Cambridge which has such a successful high tech sector. However the strength of the dollar relative to sterling currently makes UK investments relatively affordable.

2.84 Overall stakeholder views are that there is severe lack of lab space in the market at present and not enough being built. COVID-19 has shone a light on the resilience and importance of the life science sector which has received considerable venture capital investment leading to growth in headcount and space requirement demands. All years since 2019-2022 have been year on year record breaking for venture capital. Availability for space is hovering around 0%. Looking ahead - there is a lot of investor interest in the sector remaining – there are lots of R&D and health issues ranging from cancer to Alzheimer's. There is reported to be in excess of 1m sqft lab space deficit, with capital investors and operational occupiers in the sector keenly seeking new lab space of a range of sizes. The

trend could be 100,000 sqm per annum going forwards labs / R&D. Babraham Research Campus has not had a void for over a decade.

2.85 Granta Park reports providing smaller suites which have all seen pre let prior to completion. Chesterford Research Park also pre-leased their smaller units. Granta Park's Portway building has seen 9,000 sqm leased in 2021 - two users took 5,000 sqm each fully fitted. Average size level of demand has now doubled to 2,000-3,000 sqm supported by venture capital. 2022 enquiries are currently ahead of 2020 which was a record breaking year; but behind 2021 which was even higher. Density for lab employees is generally reported as roughly 1:20 sqm (lower than national average closer to 1:30) however this view differs amongst stakeholders with some noting it rises to 1:40 (issues around floorspace densities and implications are discussed in section 4 of this report). There is a good supply chain effect from lab space that helps to support businesses in the wider area ranging from cleaners to dry cleaners, dog kennels, nursery and café / restaurant as well as lab equipment.

2.86 There are elements of lab function that can work from home such as back office, accounting, regulation and write up. However, scientists and researchers in many instances do need access to physical lab space for experiments and research activities. Through COVID-19 some internal offices were converted to labs but have now been part returned. However, with ongoing high demand for lab space, some offices buildings – and retail parks (see above) - are now being considered for conversion to labs due to the greater returns and demand on lab space.

Industrial

2.87 Vacancy is well below acceptable levels. There is only 10,000 sqm of existing supply - mostly poor quality. Demand is reported at 150,000 sqm (detailed enquiries) with much higher levels of demand with those who have a wider area brief (i.e. Cambridgeshire and Peterborough) and additional demand from those being displaced from the City due to a combination of being squeezed out by rising rents and competition for units as well as a reduction in space due to losses to other uses.

2.88 Historically Cambridge has had limited demand for larger units but Brexit and COVID-19 alongside A14 corridor improvements have seen strong demand arise. Comparably Bury St Edmunds has seen 167,000 sqm of deals through speculatively built space. The ‘big box’ unit occupiers tend to have a sub-regional level of search which includes Greater Cambridge but extends beyond on the A14, A1(M) and M11 corridors. There is reported big box demand for the wider Greater Cambridge area which is necessarily met in the wider sub region due to lack of supply.

2.89 Increasingly stock is being taken up by the high demand mid-tech (flexible research and production space) sector, however this is crowding out space for warehousing and light industrial, both which have strong requirements, including for last mile delivery centres / customer fulfilment centres (a warehouse run by a third-party logistics (3PL) provider where customers orders are processed and delivered) for Cambridge residents. Cambridge is reported to be rated as one of the UK’s towns with the least amount of warehouse space available as a ratio of registered businesses, suggesting local under provision.

2.90 Demand is also driven by supply chain and onshoring – post Brexit there is greater uncertainty regarding the former supply chains. Companies are being priced out of existing estates with agents reporting that they have nowhere to go.

2.91 A range of focused companies are looking at mid tech and advanced manufacturing space such as healthcare-related firms as well as advanced research materials. These units can contain typically 20% but up to 40% offices but require industrial / manufacture / storage space for firms such as CMR Surgical (medical devices) or Nyobolt (energy and battery storage) as well as traditional IT tech research and gaming space (such as Microsoft). Mid tech in itself is being pushed to the margins in the areas it has previously located such as Cambridge Science Park by strong HQ and lab premises demand with mid-tech rents at £16 psf compared with £50 psf for offices and labs. The Bourn Quarter new units have seen rapid letting to the sector and there is also take up at Bar Hill – displacing some traditional / retail type occupiers that are less able to absorb climbing rents.

2.92 Mid tech is a reported emerging industrial sector. Whilst manufacturing is nationally declining, in Greater Cambridge the mid tech market is growing and the production / clustering of the sector is happening in the area. This is considered important to the UK industrial strategy – covering robotic arms, chips and drugs. These 'smart shed' premises are a mix of Use Class B/E types. Savills report the completion of 15,000 sqm of mid-tech (flexible research and production space) accommodation at Bourn Quarter has seen a number of new R & D occupiers look to secure space, with c.80 per cent of the scheme now either let or under offer[8].

2.93 In terms of locational needs, agent discussions consider there to be benefits of locating these research type units near the existing science and tech clusters around the city such as Cambridge Science Park and elsewhere, capturing knowledge spillovers and improving worker accessibility. However given the level of constrained supply, it is recognised that delivering these units anywhere in the Greater Cambridge area would assist in meeting growth demands.

Summary

- For labs, demand has reached an all time high with significant capital available for life sciences research but there is a severe shortage of available lab move in space. Immediately available space has fallen to almost zero against this background of high demand.
- For offices, the pandemic has slowed demand due to home working. Secondary or lower quality stock in particular is seeing higher levels of availability, however there is still good demand from businesses wishing to locate in central and north Cambridge in high quality premises, and this trend is expected to continue.

[8] https://www.savills.co.uk/insight-and-opinion/savills-news/331026-0/occupiers-focus-on-secondary-locations-as-availability-of-lab-space-in-cambridge-remains-at-zero

- Industrial demand has risen considerably in recent years and supply has failed to keep pace. Demand has risen for specialised and light industrial, warehousing and mid-tech space. Mid tech is a phenomenon arising in recent years and typically combines a former ‘mixed B’ type unit including advanced manufacture with dry / tech labs and storage space, and can be crucial to life sciences supply chain.

3. Economic Review

3.1 A focused review has been undertaken of recent sectoral changes in employment in Greater Cambridge. This is to inform an understanding of how the COVID-19 pandemic has affected particular sectors and any implications for the long term sector and overall employment outlook for the study area.

3.2 Data reporting in this section comes from:

- the Business Register and Employment Survey (BRES), which is the Office for National Statistics formal employee and employment estimates based on survey returns derived from the directory of UK businesses registered for VAT and/or PAYE or with Companies House;
- Cambridge Econometrics' (CE) Local Economic Forecasting Model (LEFM dated Q1 2022) which is CE's model for historic and future employment by sector and local geography derived from BRES and adjusted for self-employed persons not readily captured by BRES; and
- the Centre for Business Research (CBR) at University of Cambridge, drawing on findings from Companies House[9], provided to Cambridge Ahead.

3.3 At the time of undertaking the review, (summer 2022) BRES data was available up to 2020 (September data). This incorporates the first part of the COVID-19 pandemic impact. 2021 BRES data was later released and some additions are made to reflect this.

3.4 One initial matter to highlight is that BRES has a data issue around the education sector, reporting a jump from 2019-2020 in employment in Cambridge from 25,000

[9] Explanation of CBR data gathering available at https://www.cambridgeahead.co.uk/media/2032/about-companies-on-the-cambridge-cluster-map-2022.pdf

jobs to 36,000 jobs. After contacting ONS, it has been acknowledged that there is an underlying data issue and that a continuation of the 2019 position is more realistic.

3.5 Employment change has been analysed from 2019-20 in order to understand any immediate impacts arising from COVID-19, with BRES data representing September 2020 although recognising this is early in the pandemic, thus potentially masking sectoral downturns occurring later. Key changes 2019 to 2020 reported by BRES are as below:

- Largest absolute falls in professional services, education, manufacturing and construction as well as food and accommodation.
- Largest percentage falls in property, construction and manufacturing.
- Gains in health, ICT, business administration and wholesale that outweigh losses.
- Limited overall change in employment.

Cambridge and South Cambridgeshire employment change 2019-20 (BRES)

Sector	Cambridge City	Cambridge City%	South Cambridgeshire	South Cambridgeshire %	Greater Cambridge	Greater Cambridge %	Greater Cambridge, 2020 Employment Count
1 : Agriculture (A)	0	0%	250	14%	250	14%	2,100
2 : Mining (B,D and E)	100	29%	0	0%	100	10%	1,150
3 : Manufacturing (C)	250	17%	-1,000	-9%	-750	-6%	11,750
4 : Construction (F)	250	17%	-1,000	-17%	-750	-10%	6,750
5 : Motor trades (Part G)	-100	-11%	0	0%	-100	-3%	2,800
6 : Wholesale (Part G)	250	20%	500	17%	750	18%	5,000
7 : Retail (Part G)	0	0%	500	13%	500	4%	12,500
8 : Transport & storage (H)	0	0%	250	14%	250	8%	3,500
9 : Accommodation & food (I)	0	0%	-500	-11%	-500	-3%	14,000
10 : Information & communication (J)	1,000	13%	0	0%	1,000	6%	17,000

Sector	Cambridge City	Cambridge City%	South Cambridgeshire	South Cambridgeshire %	Greater Cambridge	Greater Cambridge %	Greater Cambridge, 2020 Employment Count
11 : Financial & insurance (K)	0	0%	0	0%	0%	0%	2,250
12 : Property (L)	-250	-13%	-350	-28%	-600	-18%	2,650
13 : Professional(M)	1,000	6%	-2,000	-9%	-1,000	-2%	40,000
14 : Business administration (N)	0	0%	1,000	17%	1,000	9%	12,000
15 : Public administration (O)	0	0%	0	0%	0	0%	3,750
16 : Education (P)	0*	0%	-1,000	-14%	-1,000	-3%	31,000
17 : Health (Q)	1,000	5%	1,000	14%	2,000	8%	28,000
18 : Arts (R,S,T and U)	0	0%	0	0%	0	0%	8,000
Total	**2,350**	**2%**	**-2,000**	**-2%**	**350**	**0%**	**203,350**

Source: BRES, ONS

* 2019 position

NB Figures may not sum due to rounding

3.6 Considering the LEFM dataset from CE, there are similar findings to the BRES position above regarding 2019-20 data. LEFM makes adjustments for self-employment that mean results differ slightly from BRES data. Findings are:

- Largest absolute falls in professional services, agriculture, manufacturing and motor trades.
- Largest percentage falls in agriculture, motor trades, transport & storage, professional services and manufacturing.

Cambridge and South Cambridgeshire employment change 2019-20 (LEFM)

Sector	Cambridge	Cambridge %	South Cambs	South Cambs %	Greater Cambridge	Greater Cambridge %	Greater Cambridge, 2020 Employment Count
1 : Agriculture (A)	-200	-74%	-580	-38%	-780	-43%	1,020
2 : Mining (B,D and E)	10	0	30	107%	40	164%	70
3 : Manufacturing (C)	140	6%	-850	-7%	-710	-5%	13,580
4 : Construction (F)	460	18%	-790	-10%	-330	-3%	9,840
5 : Motor trades (Part G)	-240	-23%	-290	-13%	-530	-16%	2,700
6 : Wholesale (Part G)	40	3%	-2430	-7%	-200	-4%	4,600
7 : Retail (Part G)	400	5%	430	10%	830	7%	13,200
8 : Transport & storage (H)	-90	-5%	-290	-12%	-390	-8%	4,150
9 : Accommodation & food (I)	0	0%	-340	-7%	-330	-2%	14,200
10 : Information & communication (J)	710	9%	0	0%	710	4%	16,850
11 : Financial & insurance (K)	-50	-4%	-50	-4%	-100	-4%	2,470

Sector	Cambridge	Cambridge %	South Cambs	South Cambs %	Greater Cambridge	Greater Cambridge %	Greater Cambridge, 2020 Employment Count
12 : Property (L)	80	5%	-60	-6%	10	0%	2,660
13 : Professional(M)	210	1%	-2,770	-11%	-2,560	-6%	41,070
14 : Business administration (N)	-130	-2%	140	2%	0	0%	12,480
15 : Public administration (O)	-10	0%	50	3%	40	1%	3,880
16 : Education (P)	0*	0%	-250	-3%	-250	-1%	31,610
17 : Health (Q)	700	4%	920	12%	1,620	6%	28,000
18 : Arts (R,S,T and U)	200	3%	480	11%	680	6%	11,210
Total	2,210	2%	-4,460	-4%	-2,240	-1%	213,590

Source: CE, LEFM

* 2019 position

NB Figures may not sum due to rounding

3.7 When looking back across a 5 year period from 2015 to 2020, the key trends coming from both datasets are as follows (figures from LEFM but comparable to BRES):

- Gains in professional services (7,100 driven notably by gains in architectural & engineering services and head offices & management consultancies), ICT (2,300), accommodation & food (2,400), education (2,600), health (2,200). Losses are seen in retail and public admin.

3.8 LEFM also provides a 2021 position for Greater Cambridge based on regional data and better reflecting the ongoing pandemic at the time. Key findings from this are:

- Gains in agriculture, a bounce back from 2019-20 losses.
- Some further decline in manufacturing and construction continuing the 2019-20 trend. Regarding construction this is perhaps surprising given that the Authority Monitoring Report for Cambridge City Council and South Cambridgeshire District Council for 2020/2021 reports the combined annual completions in 2020-2021 for Greater Cambridge (1,752 dwellings) being slightly higher than the average annual delivery rate required of 1,675 dwellings a year and above the 2019/20 position of 1,567. However the sector does include non housebuilding trades such as maintenance and improvement.
- Losses in retail (-300) and motor vehicles trade (-200) the latter continuing the 2019-20 trend.
- Losses in food and accommodation (-300) continuing the 2019-20 trend.
- Stability in professional services, with gains in R&D propping up losses in finance and architecture & engineering.
- Gains in health (+1,900), which is unsurprising given the pandemic.

- Losses in the arts and recreation (-1,400) that may have been previously staved off by furlough schemes.

3.9 Since the primary analysis of BRES was undertaken above, a release was made for 2021 data before the publication of this report. Analysis indicates for 2020 to 2021:

- Strong gains in education (+1,000), ICT (+2,000) and professional services (+2,000)
- Losses in health (-3,000) which is perhaps surprising but reverts the total position to nearer the pre pandemic count.
- Losses in food and accommodation (-1,000) continuing the 2019-20 trend.
- Lower level losses in a number of other sectors including manufacturing, construction, motor trades, mining and agriculture.

3.10 CBR provide data in their Greater Cambridge Employment Update June 2022[10] for activity 2020-21 based on their own data research. Sectoral classifications differ from those in BRES / LEFM. Key messages extracted and summarised from this update include:

- Corporate employment growth in the Greater Cambridge area has increased from 3.6% in 2019-20 to 5.4% in 2020-21, pointing to an overall improvement in company performance as businesses learn how to live with COVID-19. However, there is variation in these growth rates across both industry sectors and firm sizes. The faster employment growth in the last year is due to a strong performance of knowledge intensive (KI) sectors, which have seen growth accelerating from 6.8% in 2019-20 to 9.7% in 2020-21.

[10] https://www.cbr.cam.ac.uk/research/research-projects/the-cambridge-corporate-database-regional-growth/#item2

- ‘Life science and healthcare’ (+16.6%) and ‘Information technology and telecoms’ (+11.1%) have been the fastest growing sectors during 2020-21. Sectors like Life Sciences are involved in supporting the fight against the virus and future outbreaks. Information technology and telecoms have benefited as a consequence of the increase in remote communications, gaming and internet security.

- Non-KI sectors have shown [more] modest employment growth of 0.7% in the last year, up slightly from 0.4% in the previous year The picture for non-KI sectors is somewhat less optimistic if we exclude the Education sector, where amalgamations and incorporations of schools have inflated employment growth. Without Education, non-KI employment growth would be -2.7% in Greater Cambridge, -3.1% in Cambridge and -2.4% in South Cambridgeshire. Hospitality, travel and tourism, and some retail businesses have been severely affected by lockdowns and other restrictions.

- The results suggest that Greater Cambridge corporate employment has started to recover from the worst impacts of COVID-19. Whilst non-KI sectors continued to show modest growth during 2020-21 – and would have suffered larger falls in employment without the furlough scheme – KI sectors achieved faster growth compared with 2019-20 as the local economy came out of lockdowns.

Summary

- Data from BRES and LEFM suggests employment was relatively static 2019-2020 and then fell in 2021 slightly. Sectors fell in a number of sectors during the 2019-20 pandemic years including professional services, agriculture, manufacturing and motor trades.

- For 2021, post furlough, emerging data indicates further decline in manufacturing and construction as well as losses in retail, food & accommodation and the arts & recreation.

- Looking back across a 5 year period from 2015 to 2020, the key trends are gains in professional services, ICT, accommodation & food, education and health. Losses are seen in retail and public admin.

- CBR data for activity 2020-21 is based on their own research. They report faster employment growth in the last year [compared to 2019-20, is] due to a strong performance of knowledge intensive sectors. ‘Life science and healthcare’ (+16.6%) and ‘Information technology and telecoms’ (+11.1%) have been the fastest growing sectors during 2020-21. Non-KI (knowledge intensive) sectors have shown [more] modest employment growth of 0.7% in the last year, up slightly from 0.4% in the previous year. The picture for non-KI sectors is somewhat less optimistic if we exclude the Education sector.

- Overall combining the picture from all datasets, the pandemic appears to have negatively affected a number of endogenous (local / population related) sectors such as construction, retail, food & accommodation and the arts & recreation. The potential of return to pre pandemic (i.e. 2019) levels of employment is not yet known but is considered in the forecasts section that follows. Exogenous (investment led) higher value sectors such as life science and ICT have generally remained resilient or seen growth through the pandemic.

4. Employment Forecasts

4.1 This section considers the long term employment outlook for Greater Cambridge.

4.2 The ELEDS 2020 followed an approach to employment forecasting which can be summarised as:

- Using the East of England Forecasting Model (EEFM) 2017 as a base outlook, with some BRES updates for the 2015-17 period.
- Identifying key sectors that in Cambridge are unlikely to perform as per the regional outlook; and developing alternative scenarios based on differing compound annual growth rates for these key sectors, broadly based on historic compound rates for the sectors.

4.3 Overall this update report takes a similar approach but there are some key differences which are summarised as follows, and discussed in further detail in this chapter:

- Use of Cambridge Econometrics' Local Economic Forecasting Model (LEFM) dated Q1 2022 as a base forecast, capturing Brexit / pandemic implications (as EEFM has not been updated since 2017). LEFM has a sector split of 45 sectors rather than EEFM's 31 sectors which has implications for the modelling approach. LEFM's population input data is based on the latest ONS sub national population projections.
- A revised population input to LEFM has been developed using custom population forecasts derived from 2021 Census data (released spring 2022), which shows considerably higher population growth than the sub national population projections. This input led to a revised (higher) baseline employment output for population driven sectors. The population modelling is discussed elsewhere in this report.
- Minor revisions to the list of key sectors for adjustment, partly due to the revised LEFM sector split and partly to reflect latest data analysis.

- A greater emphasis on absolute rates of change rather than compound growth rates, with average absolute rates preferred due to the instability of using compound rates (particularly for small sectors) which is an issue discussed in the ELEDS and further below. Use of average absolute change is considered appropriate due to there being a near decade of historic data during the 'fast growth' period since 2011, rather than 2011-2017 for the 2020 ELEDS.

Summary of results

4.4 The main results are set out in the table below.

- Two baselines are reported, one with the ONS sub national population projections and one with the revised population inputs derived from the Census 2021 results.

- The population adjustments, based on the revised Census data, make a considerable difference to the baseline position, even without adjusting for the faster growth key sectors.

- A standard method based jobs figure is included, which reports the jobs supported by the standard method housing and population position (discussed later in this report).

- The revised central scenario has increased in its scale of growth from the 2020 ELEDS position by 8,000 jobs to 2041, however the actual jobs position by 2041 is comparable to the previous ELEDS outcome. This is due to a different jobs start point, with the 2020 start point being lower than anticipated, partly due to the effects of the pandemic (as jobs at 2020 was a modelled start point in the 2020 ELEDS which had a 2017 base. 2020 points was estimated as 218,600 but CE report as 213,600).

- The revised higher scenario sees a similar scale of jobs growth to the 2020 ELEDS higher scenario, however the actual jobs position by 2041 is much lower due to a lower 2020 start point.

- The central scenario is recommended as the most likely outcome to plan for to 2041, similarly to the 2020 ELEDS position, based on analysis set out in this chapter.

Summary of employment modelling outputs (Greater Cambridge) including 2020 ELEDS outputs

Model	Change 2020 41	2041 position	CAGR
LEFM ONS SNPP baseline	30,400	244,000	0.6%
LEFM adjusted population baseline	51,200	264,700	1.0%
Standard method based growth	43,300	256,900	0.9%
Central Growth Scenario	**66,600**	**280,200**	**1.3%**
Higher Growth Scenario	**76,700**	**290,300**	**1.5%**
2020 Central Growth Scenario (ELEDS)	58,400	277,000	1.2%
2020 Higher Growth Scenario (ELEDS)	78,700	299,100	1.5%

Source: CE LEFM / Iceni Projects / ELEDS 2020

Methodology

LEFM:

4.5 A detailed description of the LEFM model is appended to this report. In summary, LEFM is a demand-led model that models the relationships between firms, households, government and the rest of the world in a highly disaggregated framework (45 sectors), which enables the impact on the economy (employment and value added) of demand-side factors (such as an increase in demand due to stronger world growth) to be analysed.

Adjusted Population Inputs:

4.6 For the LEFM baseline, CE use the latest ONS sub national population projections. However due to the most recent Census results (released after the LEFM baseline) being significantly different to the ONS projections, an updated population forecast has been developed. See Appendix A4 for an explanation of this issue and the methodology used to develop the update population forecast.

4.7 To take account of the different population input, employment is adjusted in population-dependent sectors (e.g. retail, health, education etc) based on the employment: population historical relationship in that sector in the local area relative to the employment: population historical relationship in that sector in the region/UK. These coefficients are estimated econometrically and then applied to the regional/UK forecast of employment: population ratios (i.e. the historical relationship is expected to continue). The coefficients seek to capture how a change in population impacts demand (and so employment) in a particular sector which can then be adjusted accordingly. The considerable differences between the ONS sub national population projections and the Census results have implications for the future expectations around population growth.

Standard method:

4.8 The conversion of standard method based homes to working population and jobs is set out in chapter 6 and follows the same approach as established in the HERR 2020.

Key sectors and scenarios:

4.9 For the central and higher scenarios, the LEFM forecast with adjusted Census based population is used as a baseline and thereafter adjustments made to key sectors. The following sectors are identified as ‘key sectors’ where the future outlook is expected to perform above the LEFM outcome. The starting point is the 2020 ELEDS key sectors and the detailed narrative regarding these in chapter 3 of that report. The selection of key sectors is based on their historical performance compared with the projected baseline outlook, as well as discussions with stakeholders. They represent sectors which are expected in particular to drive economic performance in the Greater Cambridge economy.

4.10 The table below sets out LEFM adjusted population forecast baseline, alongside a projection of the continuation of 2001-20 and 2011-20 absolute rates of change for selected sectors (the 2020 ELEDS establishes the year 2011 to be the beginning of the ‘fast growth’ phase for Cambridge, reference ELEDS paragraph 5.21, with 2001 being the preferred date for the full cycle peak to peak assessment, reference ELEDS paragraph 9.35).

4.11 In all instances the LEFM outlook is far below that of the recent past performance (from 2011) and typically below the 2001-20 performance. This suggests that an adjustment is warranted above the long term baseline. Appendix A1 provides a breakdown of the results for all 45 sectors. This is not to say that a 'straight line' continuation of absolute change for a single period is considered an appropriate way to model future growth and a continuation of the last decade alone is not realistic. Future growth in many sectors tends to differ from the past due to factors including different population growth rates, population age concentrations, productivity improvements in sectors through capital investments, sector maturity and wider macro economic outlook and events. However, past performance does provide an indication of growth potential, including through cycles of change and response to shocks.

Key sector 'absolute historic trends' and 'LEFM adjusted population' employment change to 2041 (Greater Cambridge) ('000s)

Sector	2020 employment count	Continuation of 2011 20 growth (change)	Continuation of 2001 20 growth (change)	LEFM adjusted baseline outlook (change)
Health and care	20.4	+14.5	+10.2	+10.8
IT services	13.4	+11.6	+2.1	+4.4
Head offices & manag'ment con.	6.4	+8.9	+4.4	+1.2
Architectural & engineering	10.2	+11.2	+6.2	+2.8
Other prof. services (inc. R&D)	20.5	+23.3	+10.0	+9.9
Other manufacturing & repair	1.6	+1.6	+0.5	-0.4

Source: CE LEFM / Iceni Projects analysis

4.12 A brief discussion on each sector is set out below in terms of the past performance and adjusted LEFM baseline outlook:

- **Health and care:** the case for this key sector was established in the 2020 ELEDS (including para 9.38 and elsewhere) and the economic conditions for growth remain robust particularly in terms of the relationship to the growth of life sciences and medical research. The outlook for jobs growth in the LEFM adjusted baseline is above the long term historic trend although falls below the shorter term trend. There is considered to be potential for growth above the baseline.

- **IT services:** not featured as a key sector in 2020, the recent performance of the sector has been very strong with a number of international companies locating in Cambridge, benefiting from the skills and knowledge cluster. The employment count has increased by nearly 40% since 2011. Cambridge is increasingly a hub for artificial intelligence companies and a number of international tech giants have established a presence in Cambridge, including Amazon, Apple and Microsoft in the CB1 area. Stakeholders consider this a fast growth sector with potential for continued strong growth and thus an adjustment above the baseline outlook is explored.

- **Head offices & management consultancies / Architectural & engineering services:** components of professional services (which was an overarching ELEDS key sector), the historic performance of these sectors suggests they are likely to exceed the baseline outlook, although stakeholders indicate growth capabilities are likely to be below life sciences-related sectors. All historic datasets indicate these should perform above the baseline outlook, with the 2011 to 2020 jobs count showing a doubling of both of these sub sectors of professional services, therefore justifying scenario based uplifts.

- **Other professional services (inc. R&D):** the case for this key sector was established in the 2020 ELEDS (see para 9.42 and elsewhere). BRES (2020) reports that 90% of this sector is made up of 'Scientific research and development' representing life sciences activities. This a primary growth sector for Greater Cambridge. The LEFM population adjusted baseline shows considerable expected growth but there is considered to be potential to exceed this considering the recent past performance. The pandemic has been a catalyst for investment in the life science's sector and therefore, contrary to

some other sectors, it is seeing strong growth as a result which is expected to continue for the short to medium term.

- **Other manufacturing & repair:** this was not a 2020 ELEDS key sector and is one of the few manufacturing sub sectors to show continued growth (only in South Cambridgeshire), with BRES identifying that this relates to the 'Manufacture of medical and dental instruments and supplies' supporting the life sciences (although it is noted the Hexcel is also listed under 'Other manufacturing' according to Companies House). A modest positive outlook is expected rather than the baseline contraction. 'Other transport equipment' also performs well but this is believed to be associated with Marshall who are expected to leave Greater Cambridge.

4.13 For completeness, the relationship of key sectors in the 2020 ELEDS and this updated work, with justification, is set out below.

Key sectors

Key sectors	2020 ELEDS	2022
Health and care	Key sector	Potential growth above baseline.
IT services	Not a key sector	Ongoing fast growth indicates performance above baseline outlook expected.
Professional services: Head offices & management consultancies	Professional services as a key sector	LEFM provides more granular sector split than EEFM. Strong recent performance suggests potential for growth above baseline. Legal and accounting is excluded from the broader professional services umbrella.

Key sectors	2020 ELEDS	2022
Professional services: Architectural & engineering services	Professional services as a key sector	LEFM provides more granular sector split than EEFM. Strong recent performance suggests potential for growth above baseline. Legal and accounting is excluded from the broader professional services umbrella.
Other professional services (inc. R&D)	Key sector	Ongoing fast growth indicates performance above baseline outlook expected.
Other manufacturing & repair	Not key sector	Ongoing fast growth (South Cambs registered jobs) indicates performance above baseline outlook expected.

Source: 2020 ELEDS / Iceni Projects 2022 analysis of LEFM

4.14 In the 2011-20 period the above sectors have shown notable strong growth, well above the economy average, as reported below, including compound average growth rates (see ELEDS paragraph 5.14 for explanation of compound average growth rates).

4.15 It is worth considering this performance in the context of the 2018 adopted Local Plans for Cambridge City and South Cambridgeshire, which drew upon the EEFM data available at the time. This assumed 44,100 jobs to be created 2011-31. However, by latest CE data, 42,800 jobs or 107% of this total were created between 2011-20 (i.e. 45% of the Plan period), indicating that EEFM forecasts used for the Local Plan underestimated economic growth potential in Greater Cambridge.

Key sector 2011-20 (Greater Cambridge) ('000s)

Sector	2020 Employment count	2011 20 Total change	2011 20 Average Change pa	2011 20 CAGR
Health and care	20.4	6.2	0.7	4.1%
IT services	13.4	5.0	0.6	5.3%
Head offices & manag'ment con.	6.4	3.8	0.4	10.6%
Architectural & engineering	10.2	4.8	0.5	7.4%
Other prof. services (inc. R&D)	20.5	10.0	1.1	7.7%
Other manufacturing & repair	1.6	0.7	0.1	6.6%
All sectors	213.6	42.8	4.8	2.5%

Source: CE LEFM / Iceni Projects analysis

4.16 Supplementing the LEFM data analysis, the planning authority and Iceni Projects have also kindly been provided with historic data by CBR from their own database for the 2010/11 to 2020/21 period. A detailed analysis and comparison of this data with LEFM has not been undertaken due to differences in sector definitions and methodological approaches to data gathering, which can lead to incompatible outcomes. However Iceni does highlight the following headline findings from the CBR data:

- Compound growth rates for the 2015-21 period[11] of:
    - High-tech manufacturing 1.2% (BRES 0.0%)
    - Life sciences manufacturing 5.9% (BRES 3.8%)
    - ICT 8.8% (BRES 4.5%)

[11] CBR data definition: summary data from Cambridge Ahead and non-corporates for both districts. NB BRES data reporting of results here is based on CBR sector definitions and analysis of BRES which may not align with Iceni analysis

- R&D 7.5% (BRES 5.5%)
- Knowledge intensive services 5.8% (BRES 5.8%)
- Total all sectors 5.2% (BRES 2.2%)

4.17 Regardless of specific sector definitions, the above does reinforce that for this most recent period, the above ‘knowledge intensive’ sectors as selected by CBR, which see a broad correlation with the selected LEFM key sectors, report strong performance based on both BRES and CBR data (other than high-tech manufacturing via BRES data).

4.18 In looking forward to modelling future outcomes for sectors, as an alternative to the use of compound average growth rates (CAGRs) in the 2020 ELEDS, an assessment of the future potential of sectors draws on adjusted historic absolute rates of change (see table 4.3). The use of absolute change is considered appropriate for two main reasons. Firstly, as the data from 2011-20 now covers nearly a decade thus providing a longer run and more reliable period (with 2011 being the start of the recent ‘fast growth’ phase) than the 2011-17 period used for the 2020 ELEDS. Secondly, as this absolute change approach provides a more stable outlook, particularly for small sectors, where high CAGR’s can lead to rapid exponential growth. This point was set out in the 2020 ELEDS (paragraph 5.17) and is repeated here for clarity. Smaller sectors expanding quickly see very high percentage increases year on year, which rapidly fall as absolute change steadies. For example, a sector growing by 400 jobs per year from 100 jobs to 500 jobs to 900 jobs has an average growth rate of 200%. If the sector continues to expand by 400 jobs per year for the next two years the average growth rate falls to 37% and so on – hence leading to the use of discounted compound rates in the ELEDS modelling. For compound rates to be maintained, the absolute change needs to increase continuously. This is possible particularly in the growth phase of a cluster / sector, but inevitably there is a levelling off of rates as sectors reach maturity or the scale of growth continually increases.

4.19 Stakeholders (see previous chapter) are broadly of the view that Greater Cambridge, notably life sciences, is in a fast growth cycle at present that will

continue for a period but that a slow down in the medium term can be expected. A key question is therefore the rate of return to a slower average. The rate of faster growth and then stabilisation is based on the maturity of the sector. Maturity of this (or any) sector would potentially be demonstrated by a notable slow down in year on year absolute and percentage change in jobs growth, a reduced demand for new physical space and a greater emphasis on productivity than job growth. Stakeholder views consulted for this work are that the life sciences sector has furthest to travel in its growth phase, compared to other key sectors (such as professional services) in Greater Cambridge, although life sciences does influence the other sectors.

4.20 Quantitative approaches to growth modelling are considered here below, with the rate of slow down being the factor differentiating the central and higher growth scenarios. For the modelling:

- The 2001-20 and 2011-20 absolute rates of change[12] projected forwards are used as upper and lower bounds, representing typical (full cycle) and (more recent) faster growth cycles. This differs from the 2020 ELEDS which placed greater emphasis on the 1991 and 2001 start points for historic cycles (for CAGRs), but is considered appropriate considering the emphasis on absolute change and the longer run dataset post 2011.

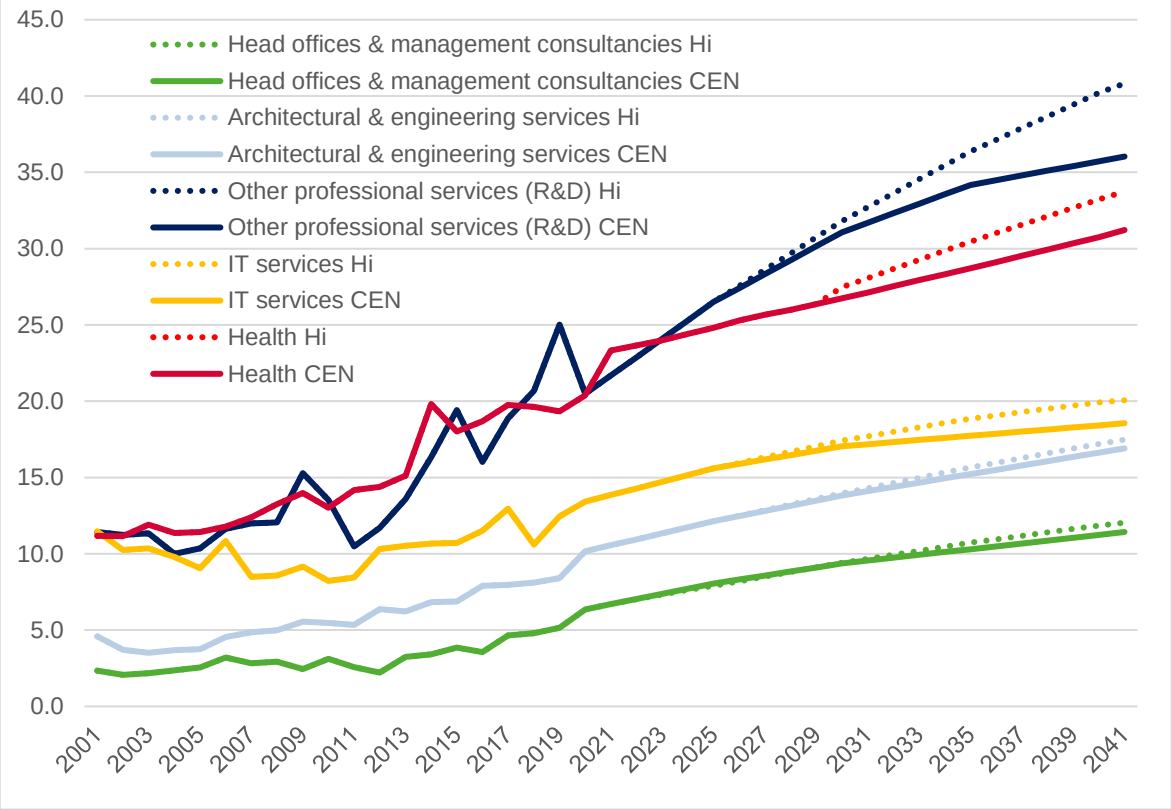
- For the central scenario, it is assumed growth continues at the 2011-20 rate for the first 5 years, the midpoint of the longer (2001-20) and shorter (2011-20) run averages for the next 5 years, and for the 2001-20 average for the 2031+ period (thus incorporating the balanced and faster growth periods). Where outcomes using this model fall below the adjusted population LEFM baseline outlook, the higher position is assumed.

[12] To avoid single year sector performance issues, the average is derived from the 2000-2002 and 2010-2012 positions and the 2019-20 position

- For the higher scenario, it is assumed growth continues at the 2011-20 rate for the first 5 years, the upper quartile for the next 5 years, midpoint of the longer and shorter run averages for the following 5 years, and for the 2001-20 average for the 2031+ period. This therefore gives greater weight to the most recent fast growth.

4.21 The chart illustrates the sector outcomes. The greatest difference in the future occurs in the R&D sector because of the greater influence of the particularly fast recent growth

Figure 4.1 Key sector outlook 2001-40 by scenario (employment, '000s)



Source: CE LEFM data / Iceni Projects analysis and scenarios

4.22 The table below sets out the overall results and the total change position.

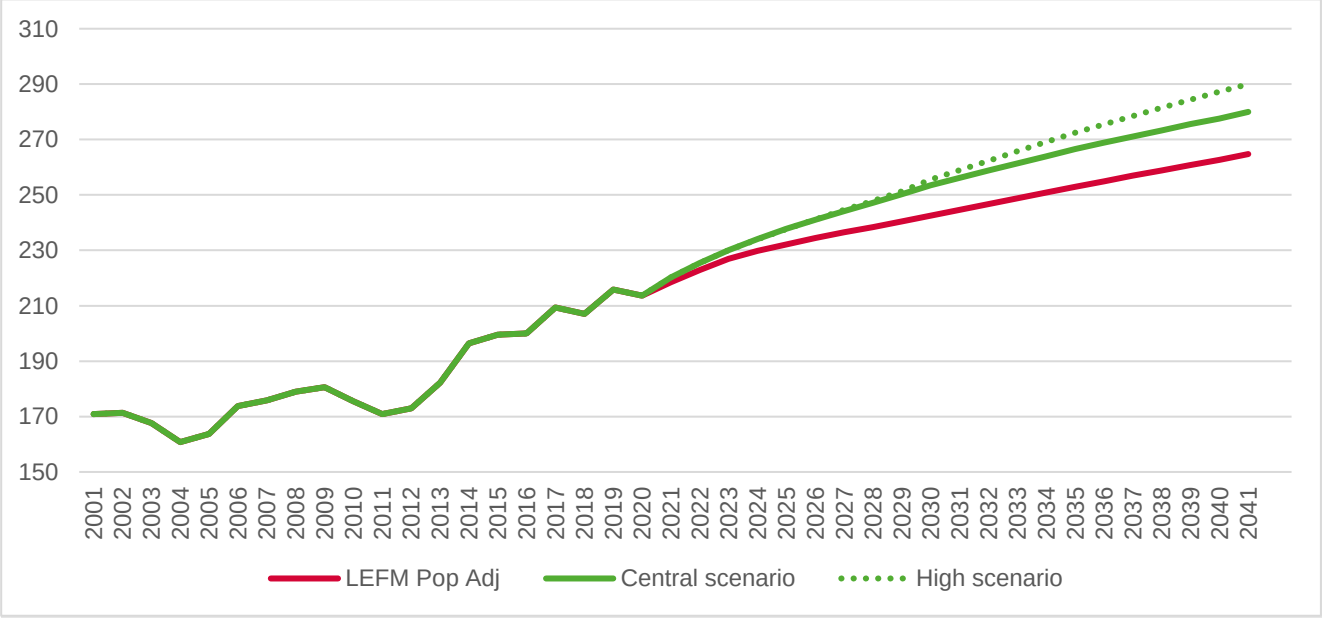
Sector employment growth scenarios to 2041 (Greater Cambridge) ('000s)

Sector	2020 employment count	Central scenario (change)	Central scenario CAGR	High scenario (change)	High scenario CAGR
Health and care	20.4	+10.8	2.0%	+13.4	2.4%
IT services	13.4	+5.1	1.5%	+6.6	1.9%
Head offices & manag'ment con.	6.4	+5.1	2.8%	+5.7	3.1%
Architectural & engineering	10.2	+6.7	2.4%	+7.3	2.6%
Other prof. services (inc. R&D)	20.5	+15.6	2.7%	+20.3	3.3%
Other manufacturing & repair	1.6	+0.8	1.9%	+0.9	2.1%
All sectors	213.6	+66.6	1.3%	+76.7	1.5%

Source: CE LEFM / Iceni Projects analysis (totals may not sum due to rounding)

4.23 The chart below reports on the overall jobs outlook.

Figure 4.2 Total Employment scenarios 2020-41 (Greater Cambridge) ('000s jobs)



Source: CE LEFM / Iceni Projects

4.24 It is necessary to consider which of the central and higher scenarios are the most likely outcome in order to assist the Local Plan development.

4.25 In order to make a recommendation on the most appropriate level of growth we consider differing historic absolute rates of change. Looking at the chart above we can see that the 2009-2011 period is one of contraction for Greater Cambridge, and therefore the 2011-14 (very) fast growth period includes some recovery and that this overall growth is not maintained in the years that follow for 2014-19 (although it does reflect the potential of growth at this rate). As a result, for the whole economy rather than individual sectors, the 2009-20 period is therefore more balanced than the 2011-20 period (as is the 2001-2020 period).

4.26 Projecting forward the 2009-20 annual average results in a jobs outcome of +62,900, being below the central scenario. Only when including the 2011-14 recovery phase (i.e. the 2011-20 projection) do we get the highest results. Looking across the historic performance of the economy for various periods (table below) we can see that both the central and higher scenarios are relatively optimistic insofar as they outperform historic projections. Whilst they are both potentially achievable, there are a wider range of macro economic downside factors which are inevitably likely to occur over the coming decades through future economic cycles.

4.27 In Iceni's view the higher scenario is a less likely outcome as it overly relies on the continuation of exceptional rates of overall growth since 2011. Iceni considers that the **central scenario remains the most likely overall outcome** as:

- It reflects a relative continuation of the strong recent performance of the economy since 2009, and some growth above the continuation of this average (and considerably above the 2001-2020 average) which is considered plausible given the growing economic and population base, strong potential of key sectors and infrastructure investment

- It reflects previous economic cycles and therefore allows for shocks within future economic cycles so builds in some downside risk – and thus better representing a balanced outcome (for Greater Cambridge) - rather than

aligning to the continuation of fast growth from 2011 which the higher scenario is considered to do.

- At the sector level, the higher scenario has a considerable reliance on a very strong performance of the life sciences post 2030/35, which is not considered robust based on data currently available.

Sector employment growth scenarios to 2041 (Greater Cambridge) ('000s)

Sector	1991 2020	2001 2020	2009 2020	2011 2020	Central	Higher
Absolute average change	2.6	2.2	3.0	4.8	3.2	3.7
Historic CAGR	1.4%	1.2%	1.5%	2.5%	-	-
Absolute average change projected to 2041	54.3	47.2	62.9	99.8	66.6	76.7
Projection CAGR	1.1%	1.0%	1.2%	1.8%	1.3%	1.5%

Source: CE LEFM / Iceni

Summary

- Overall this report takes a similar approach to the ELEDS but there are some key differences summarised as follows: the use of Cambridge Econometrics' Local Economic Forecasting Model dated Q1 2022 as a base forecast (as EEFM data has not been updated post COVID-19); a revised population input to LEFM developed using custom forecasts derived from 2021 Census data (released spring 2022); and a greater emphasis on absolute rates of change rather than compound growth rates.

- The results are set out below.

Summary of employment modelling outputs (Greater Cambridge)

Model	Change 2020 41	2041 position	CAGR
LEFM ONS SNPP baseline	30,400	244,000	0.6%
LEFM adjusted population baseline	51,200	264,700	1.0%
Standard method based growth	43,300	256,900	0.9%
Central Growth Scenario	**66,600**	**280,200**	**1.3%**
Higher Growth Scenario	**76,700**	**290,300**	**1.5%**
2020 Central Growth Scenario	58,400	277,000	1.2%
2020 Higher Growth Scenario	78,700	299,100	1.5%

Source: CE LEFM / Iceni Projects

- In Iceni's view the higher scenario is a less likely outcome as it overly relies on the continuation of recent high rates of overall growth. Iceni considers that the **central scenario provides the most likely overall outcome** allowing for future cycles and shocks.

- The forecast total jobs in 2041 is comparable to the forecast at the same date in the 2020 ELEDS report (for the central scenarios). However, the 2020 ELEDS report (based on 2017 data) estimated the 2020 jobs total and could not take account of the pandemic, which has led to a slow down in anticipated growth in the intervening period. With this 2020 data now available, the change in total jobs is greater to reach a similar 2041 outcome.

5. Employment Land Requirements and Balance

5.1 This section considers the employment floorspace requirements arising from a number of planning practice compliant methods namely relating to labour demand, labour supply, trends and market signals. It then considers the balance of demand and supply based on current authority monitoring data.

5.2 In the 2020 ELEDS the key approaches to forecasting future land use needs were to consider the labour demand model, standard method based labour supply and local authority monitoring completions trends. These approaches are repeated and updated below with some adjustments and market based modelling, using net absorption, also included.

5.3 A number of methodological matters are considered here that have implications for the results:

5.4 **Working from home practices:** in the 2020 ELEDS no specific assumptions were included regarding working from home in relation to the 'needs' model although it recognised that 12-13% of office based sectors work from home. A downwards adjustment has been made to office based needs forecasts to reflect the national average on typical home work by sector for pre pandemic i.e. 2019 (see Appendix A2). However the pandemic has had a considerable influence on this issue. According to latest information from Savills, reporting on Remit Consulting data,[13], national office occupancy at June 2022 is around 30% compared to around 70% pre pandemic, a substantial fall (although this data source is not considered fully representative). The British Council for Office (BCO)[14] suggest that rates could settle at 60% in the longer term. Post COVID-19 there has certainly been a period

[13] https://www.costar.com/article/334546903/uk-office-occupancy-hits-highest-level-since-pandemic-started

[14] BCO Guide to Specification Key Design Criteria Update 2022: A Position Paper

– which continues based on market engagement undertaken – of a restructuring of corporate property portfolios and there are many examples of downsizing (with businesses reducing their office footprint on lease events). In terms of national / international businesses, HSBC cut its global office space by 40%; Lloyds cut desk numbers by 20%; Alphabet developed a model where staff work three days in the office and two days from home; and Facebook now allow 'complete flexibility'. National vacancy has moved from 5% to 8% and appears to be steadying. There is suggestion that individual sectors are responding very differently, with CoStar reporting at the national level that "the TMT (technology, media, and telecom) and co-working sectors are helping to fill the void left by financial and professional services, which have traditionally led demand in the big regional cities."

5.5 In Greater Cambridge, stakeholder engagement indicates that demand remains robust for the highest quality space whereas secondary space is less desirable than previously. Local research by Cambridge Ahead[15] reports that "Before COVID-19, the average number of days in the office among those surveyed was 4.7, in the second half of 2021 it was 2.5, and it is anticipated to increase to 3.1 over the next twelve months – still a day and a half less per week than before the pandemic".

5.6 In Iceni's view it is appropriate to test a scenario where employment growth translates at a reduced rate to office need than in the past, with -30% considered an appropriate level of discount based on the evidence in the round. An adjustment has also been made to R&D based activity but only at -5%, reflecting the much more limited ability to work remotely.

5.7 **Densities:** whilst office utilisation is likely to fall, there is potential for densities to change to reflect the need for more meeting and break out space that people use when visiting the office, as well as additional amenities and circulation space. The

[15] A New Era for the Cambridge Economy, April 2022, p11

BCO[16] suggest this could lead to a rise between 40% and 25%. Iceni agree that for some businesses this is likely to be the case, particularly those at the higher end of the market, but that across the market as a whole this will be ambitious including when taking into account co-working space which tends to have lower densities. On balance Iceni does think that some change will occur and as a result has altered the average future office density from 9 sqm per FTE (2020 ELEDS pg 101) to 11 sqm per FTE which reflects discussions with stakeholders and agents. This increase in densities will not exceed the reduction made by the reduced occupancy, as otherwise this would lead to overall higher requirements for offices which seems counter intuitive. No evidence or suggestion has been presented regarding changes in R&D density.

5.8 **Sector - use class split**: Iceni has largely sought to maintain the 2020 ELEDS assumptions in terms of sector to use class split (see ELEDS Appendix C), however the change from the EEFM to LEFM base model means some adjustments have been required for the new sector split. The results are set out in Appendix A3. One adjustment of note is that the 'Other professional services (including R&D)' assumes 85% R&D space and 10% office space (5% 'other'), previously at a 70:25 split in the ELEDS (5% 'other'). This reflects latest data from BRES that 89% in that sector are employed in 'Scientific research and development'.

5.9 **Jobs to FTE assumptions**: the employment forecasts for jobs have been converted into full time equivalents based on a Greater Cambridge average derived from BRES 2020 data at 2 digit SIC. Detailed assumptions are appended.

[16] BCO Guide to Specification Key Design Criteria Update 2022: A Position Paper p4, rise from 10-12.5 to 16.7 square metres NIA per person.

Labour demand and supply models

5.10 In line with the 2020 ELEDS densities (para 6.20) other than for offices, the FTE forecasts are converted to commercial premises requirements in sqm as reported below[17].

- Office (E(g)(i)): an average of 11 sqm NIA and 14 sqm GEA per employee based on adjusted densities as above
- R&D (E(g)(ii)): an average of 28 sqm GEA per employee based on local data;
- Industrial (E(g)(iii)/B2): a blended average 44 sqm GEA per employee, reflecting a blend of 36 sqm GIA for B2 and 47 sqm GIA for E(g)(iii) (former B1(c))
- Warehouse/ Distribution (B8): an average of 70 sqm GEA per employee. This is the lower of the range of employment densities for B8 activities, reflecting the type of warehousing in the area more typified to final mile than regional / national distribution.

5.11 The increased work from home (WFH) occupancy adjustments assume -30% for offices and -5% for R&D.

5.12 Applying these employment densities to the forecasts of net growth in FTEs for the use classes provides the following results, with a typical and adjusted occupancy. The LEFM with adjusted Census 2021 based population baseline input is included, along with the standard method based jobs (derived from homes and population as set out later in this report) with the central and higher labour demand models from the previous chapter.

[17] These also align with accepted standard densities derived from the HCA Employment Density Guide 3rd edition 2015

Floorspace requirements 2020-41, Greater Cambridge (scenarios) sqm

Sector	LEFM Census Pop. Standard occ.	LEFM Census Pop. Inc. WFH occ.	Standard method Standard occ.	Standard method Inc. WFH occ.	Central scenario Standard occ.	Central scenario Inc. WFH occ.	Higher scenario Standard occ.	Higher scenario Inc. WFH occ.
Office	129,100	92,100	136,500	96,200	222,900	157,800	253,000	178,900
R&D	223,700	212,200	229,600	217,800	354,400	336,600	462,800	439,700
Industrial	-64,100	-64,100	-41,000	-41,000	-30,300	-30,300	-26,300	-26,300
Warehousing	80,800	80,800	80,700	80,700	82,700	82,700	86,800	86,800
Total	369,500	321,000	326,700	274,600	629,700	546,800	776,300	679,100

Source: Iceni Projects based on CE / Iceni modelling

5.13 For comparison the 2020 labour demand model outputs are reported below.

Floorspace requirements 2020-41, Greater Cambridge (2020 ELEDS) sqm

Sector	Central scenario	Higher scenario
Office	80,400	103,200
R&D	375,500	477,900
Industrial	-71,400	-71,400
Warehousing	32,000	32,000
Total	416,400	541,700

Source: 2020 ELEDS table 38 pg111 (rounded)

5.14 The key differences between the labour demand models are:

- A considerable increase in the demand for offices. This relates to improved outlook for a number of the sectors based on recent employment data notably in ICT, head offices & management consultancies and architectural & engineering, as well as adjustments to densities, notwithstanding a sensitivity on increased working from home.

- A comparable level of demand for R&D premises. The total employment growth is comparable to the ELEDS but the adjustment for typical home working in the sector has affected the outcome.

- An improved outlook for industrial (albeit still negative) and warehousing premises. For industrial, specific labour demand adjustments have been made (see previous chapter regarding key sectors), whereas for warehousing the baseline position has improved.

Flexible Margin and future vacancy capacity

5.15 Whilst not included in the 2020 ELEDS - as the flexibility was provided by the suggestion of planning for floorspace based on the higher scenario and jobs on the central - Iceni considers it good practice to include a flexible margin to account for:

- The potential error margin with the forecasts;

- Providing a choice of sites to facilitate competition; and

- Providing flexibility to allow for any delays in sites coming forward.

5.16 Such a margin is typically based on 2 or 5 years of average gross completions or 20% of total needs (see following section). Iceni considers a 2 year margin appropriate and proportionate to the scale of needs (being around 20% of the central scenario). This provides a level of consistency with the 2020 ELEDS with the higher scenario floorspace provision recommendation as a margin being around 20% above the central scenario needs. Application of these figures results in the below requirements.

5.17 In addition, a further 7.5% of the need is added to reflect the expectation that a level of vacancy is necessary in stock to allow for choice and churn – this is consistent with the 2020 ELEDS.

Need including 2yr Flexible Margin and 7.5% vacancy, 2021-2040 sqm

Sector	LEFM Census Pop. Standard occ.	LEFM Census Pop. Inc. WFH occ.	Standard method Standard occ.	Standard method Inc. WFH occ.	Central scenario Standard occ.	Central scenario Inc. WFH occ.	Higher scenario Standard occ.	Higher scenario Inc. WFH occ.
Office	188,800	149,100	196,800	153,400	289,700	219,700	322,000	242,300
R&D	303,500	291,000	309,800	297,100	443,900	424,800	560,500	535,600
Industrial	-50,000	-50,000	-25,200	-25,200	-13,700	-13,700	-9,400	-9,400
Warehousing	104,100	104,100	104,000	104,000	106,200	106,200	110,500	110,500
Total	546,400	494,300	585,400	529,300	826,000	737,000	983,600	879,100

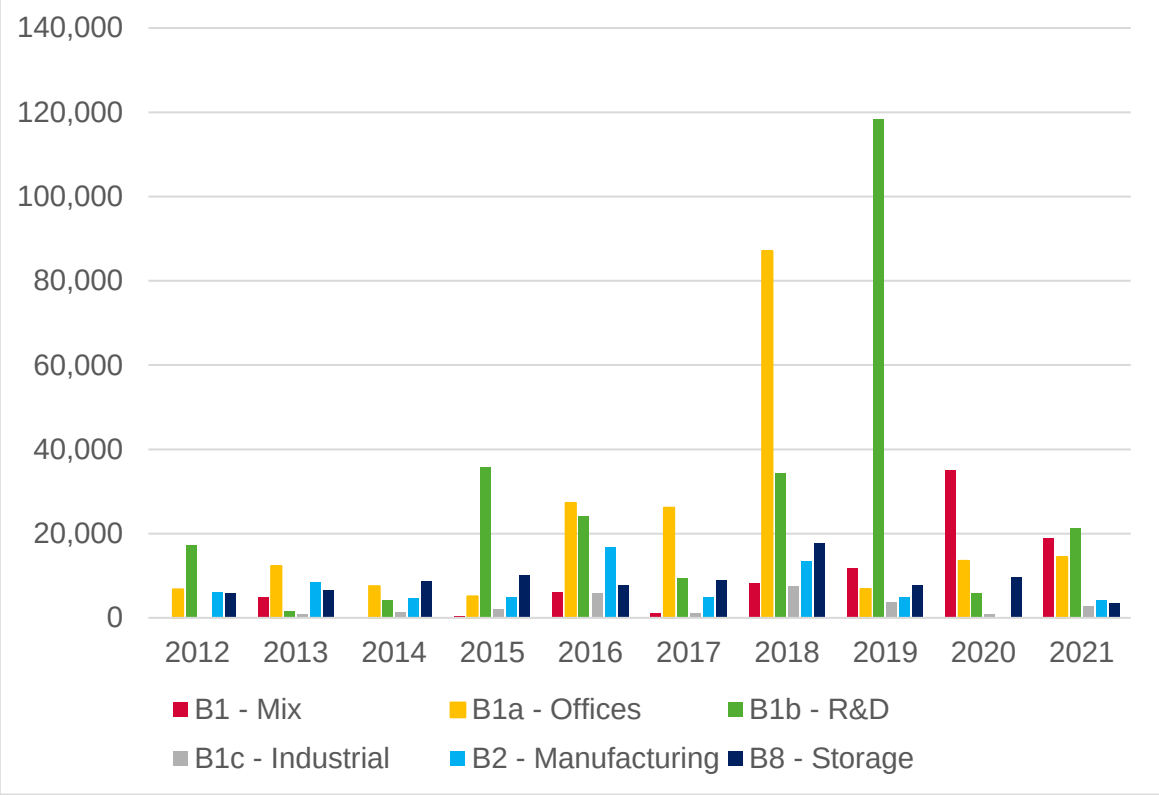
Source: Iceni Projects based on CE / Iceni modelling

NB: B1mix completions divided 50:50 office / R&D for purposes of margin

Completions forecast

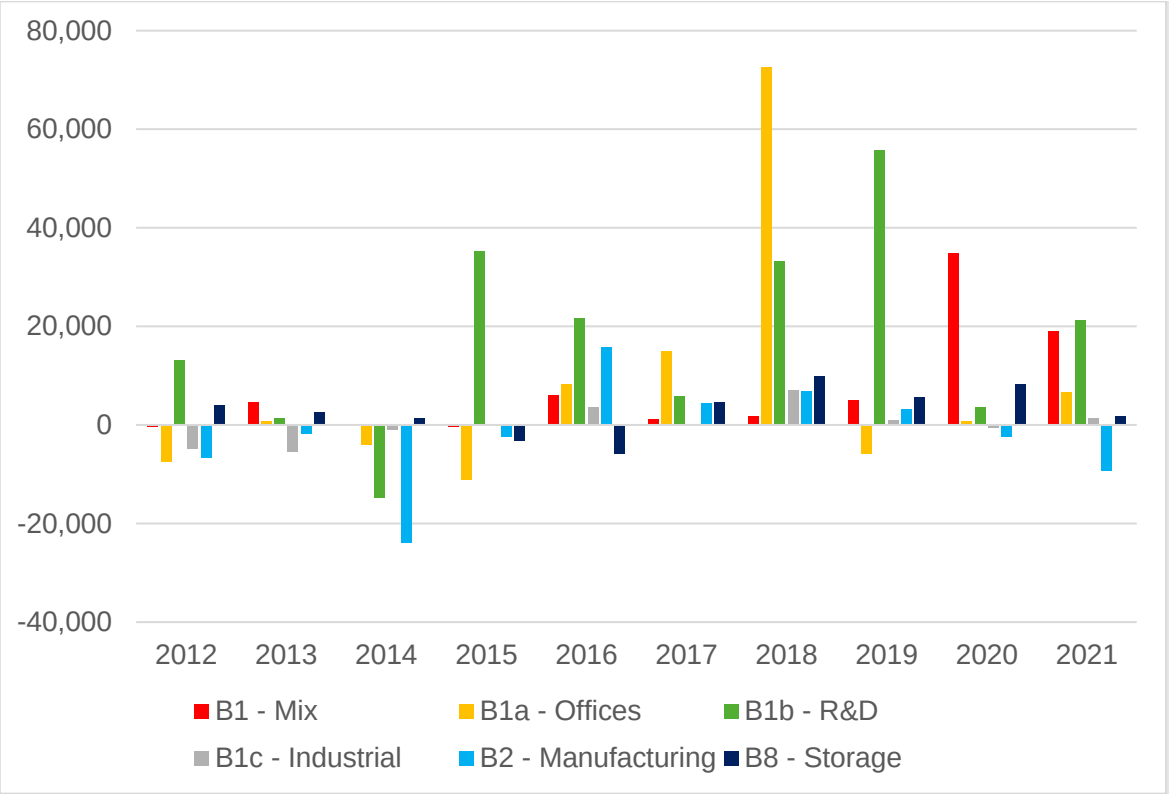
5.18 Iceni has considered completions trends. These provide an indication of market demand, other than where there have been land supply restrictions. Completions (and market absorption models, see later) can be particularly useful for industrial and logistics market forecasting where labour demand models are considered increasingly ineffective in reporting future floorspace needs due to changes in productivity requiring upgrades and replacement commercial premises. A roll forward of completions would assume future needs being of a similar pattern to the past. This approach is in line with the PPG and the 2020 ELEDS method. This draws on latest data from the councils (net and gross) which has been provided for the 2011/12-2020/21 period. A longer term historic dataset has not been considered as this was discarded as a suitable model in the 2020 ELEDS. The gross and net completions are reported below.

Figure 5.1 Gross Completions, Greater Cambridge (sqm) (financial years beginning 2011/12)



Source: Iceni analysis of LA data

Figure 5.2 Net Completions, Greater Cambridge (sqm) (financial years beginning 2011/12)



Source: Iceni analysis of LA data

5.19 The datasets for this 2011/12 to 2020/21 period have been annualised and projected forward to the 2020-41 period as below.

Floorspace requirements 2020-41, completions trend (sqm)

Sector	South Cambs Net	South Cambs Gross	Cambridge Net	Cambridge Gross	Greater Cambridge Net	Greater Cambridge Gross
B1 mix	91,500	108,500	58,300	72,800	149,800	181,300
Office	60,000	128,000	99,000	306,600	159,000	434,600
R&D	250,300	298,800	244,500	271,700	494,800	570,500
Light industrial	16,700	44,800	-13,700	9,500	3,000	54,300
Industrial	-27,100	121,300	-7,600	22,600	-34,700	143,900
Warehousing	96,900	154,300	-36,500	26,800	60,400	181,100
Total	488,200	855,700	344,000	710,000	832,200	1,565,700

Source: Iceni Projects based on GCSP data / Iceni analysis

5.20 The figures indicate:

- A notable volume of mix B1 which includes a number of sites at Cambridge Science Park likely to be offices with R&D.
- Significant delivery of office space, with net figures less than half the gross position, suggesting recycling or displacement of sites. In Cambridge there were major deliveries in 2018.
- Significant delivery of R&D space, with more limited difference between the net and gross position. Large gains are seen in 2019 at Addenbrookes and Granta Park.
- Healthy demand for industrial space (excluding warehouse) through gross completions, although a negative net trend when combining light and general industrial. The gross trend is particularly strong in South Cambridgeshire including at Bar Hill and Buckingway Business Park and in Cambridge, Coldhams Business Park. Some industrial losses are likely to be associated with displaced sites for residential, others replaced by warehousing and generally reflecting changes in economic structure as manufacturing declines.
- Completions for warehousing are also positive for net and gross, particularly in South Cambridgeshire at Papworth Everard (Stirling Way).
- Combining industrial and warehouse overall identifies a positive net position.

Market signals: Absorption Trends

5.21 A model that rolls forwards the trends in lease deals is also set out here. Iceni consider this to be increasingly useful in considering property needs analysis noting this approach is also being promoted by the British Property Federation[18] and reflects the Planning Practice Guidance on market signals.

[18] Levelling Up - The Logic of Logistics 2022 https://bpf.org.uk/our-work/research-and-briefings/

5.22 This approach ideally relies on good quality local data on net absorption, being lease deals minus lease exits (breaks). However as acknowledged in the commercial review, CoStar data which Iceni has access to doesn't pick up all transactions particularly for smaller deals, and doesn't clearly differentiate R&D deals from industrial and offices (although secondary type listings filters have been applied). To try and overcome this issue we have considered data from Bidwells, some of which has been provided directly. This again does not entirely suit the exercise as this is for all deals (gross absorption) excluding exits, and the study areas do not match completely as Bidwells' study area is reportedly for the County, so the figures will be too high. A further potential issue is that with low availability, absorption will be suppressed, so figures are under reporting the R&D need and potentially with the industrial market, based on vacancy and availability data.

5.23 The limitations of this exercise are accepted but notwithstanding it is considered useful to provide a general market direction and assist in triangulating against other methods. The table below summarises the modelled outputs.

Lease deal property requirement projections 2020-41 (sqm)

Type	Co Star net annual average 10 yr	CoStar 10yr roll forward to 2041	Co Star net annual average 5 yr	CoStar 5yr roll forward to 2041	Bidwells gross annual average 5 yr	Bidwells roll forward to 2041
Office	17,400	**364,300**	24,200	**509,200**	45,900	**963,900**
Industrial	8,200	**171,800**	11,100	**233,000**	32,200	**676,600**
R&D	-	-	-	-	11,700	**245,700**

Source: CoStar / Iceni Analysis

5.24 The figures indicate:

- Recent increase in office deals trends, based on CoStar data, suggesting a 400,000 – 500,000 sqm requirement in the future across the models.
- Increase in industrial demand (including warehousing) in the recent past pushing up the short term trend, although this will have been partly

suppressed. Bidwells data is gross and for a larger area. Demand potential could exceed 200,000 sqm in the future.

- The R&D data is weaker and Bidwells deals are likely to under-represent the market demand potential which should readily exceed 400,000 sqm in the future.

Replacement demand

5.25 Iceni considers it appropriate to consider the need to make provision for industrial spaces that may be lost in the future and not readily compensated for, thus suppressing the amount of space available. Many existing industrial premises are older stock and may not be fit for modern business purposes, particularly when considering the plan period ahead. The need for this adjustment is one of the reasons why labour demand models alone may fail to forecast future industrial needs, as they do not factor in the loss of older premises that need to be replaced in the future. For example CoStar reports that by unit count 75% of industrial stock is aged 1999 or before and 43% pre 1990s (by floorspace, 52% is pre 1990). By 2041 much older stock will need to be replaced, although some of it may no longer be needed because of changes in industrial structure. Some units will be replaced on site but in other instances new sites will need to be found due to viability issues or historic sites being in poor demand locations. In simplistic terms, if 52% of stock is too old and half of this is needed to be replaced (but the rest lost to structural change); and 50% was replaced on existing sites this would amount to around 100,000 sqm of additional need (based on CoStar's 940,000 sqm of all stock). The level of broad estimation in this exercise is recognised.

5.26 Analysis of historic losses indicates -16,700 per annum for industrial and warehousing from 2012-21, slowing to 10,000 sqm per annum in the last 5 years. Some of these are redeveloped on site and some don't need replacing. Replacing 25% to 50% of these losses (10 year) over the future 21 year plan period on new sites would be 88,000 sqm to 175,000 sqm (53,000 sqm to 105,000 sqm for the 5 year historic losses). This helps to corroborate the way in which we can think about replacement demand. The lower end would better represent the preferred policy position (i.e. protection and intensification of existing sites, which has seen some effect given the reduction in losses) however with an increasingly ageing

stock as well as pressures on EPC ratings[19] may make this more challenging. The midpoint of the 25% and 50% of the replacement demand historic rates is c75,000 and 130,000 sqm.

5.27 Replacement demand is one factor in explaining the differences in the labour demand modelled future need (40,000 – 60,000 sqm in rows D & E combined in table 6.6) compared with market trends of around 200,000 sqm (table 6.5 CoStar projections). We also know that the net completions trend is around 30,000 sqm for Greater Cambridge (table 6.4 combining light industrial, general industrial and warehousing) but that this is not generating enough stock to support market needs, based on market indicators and stakeholder feedback. Gross trends are very high at nearly 400,000 sqm combined, which tells us that there are very significant losses occurring, even though they are being replaced primarily through a transfer from Cambridge to South Cambridgeshire (based on table 6.4). It is also understood that some uses are locating beyond the Greater Cambridge area, as land values are too high for industrial development to compete with other land uses.

5.28 For the labour demand requirements to get closer to the market absorption trends, replacement demand of 100,000 sqm is considered a starting point. This is discussed further below.

Summary and recommendations on future need

5.29 The range of outputs from the previous sections are reported below (first table excluding margin and vacancy adjustments, second table including these). The net absorption model is excluded due to data uncertainties but is included in the sector narrative and recommendations that follow.

[19] Government target valid EPC minimum rating would increase to 'B'.by 1 April 2030

Range of Projected Employment Floorspace (2020-41) (sqm) Greater Cambridge

Sector	Completions Net	Completions Gross	Standard method Standard occ.	Standard method Inc. WFH occ.	Central scenario Standard occ.	Central scenario Inc. WFH occ.	Higher scenario Standard occ.	Higher scenario Inc. WFH occ.
A: B1 mix	149,800	181,300	-	-	-	-	-	-
B:Office	159,000	434,600	136,500	96,200	222,900	157,800	253,000	178,900
B+A@50%: Office inc 50% B1	233,900	525,300	-	-	-	-	-	-
C: R&D	494,800	570,500	229,600	217,800	354,400	336,600	462,800	439,700
C+A@50%: R&D inc 50% B1	569,700	661,200	-	-	-	-	-	-
D: Industrial	-31,700	198,200	-41,000	-41,000	-30,300	-30,300	-26,300	-26,300
E: Warehousing	60,400	181,100	80,700	80,700	82,700	82,700	86,800	86,800
F: Total	832,200	1,565,700	405,800	353,700	629,700	546,800	776,300	679,100

Source: Iceni Projects based on CE / Iceni modelling / LPA data

5.30 This is updated to include a 2yr margin and 7.5% future vacancy below for all aspects.

Range of Projected Employment Floorspace (2020-41) (sqm) Greater Cambridge including flexible margin and vacancy adjustment

Sector	Completions Net	Completions Gross	Standard method Standard occ.	Standard method Inc. WFH occ.	Central scenario Standard occ.	Central scenario Inc. WFH occ.	Higher scenario Standard occ.	Higher scenario Inc. WFH occ.
A: B1 mix	178,300	212,200	-	-	-	-	-	-
B: Office	212,300	508,600	196,800	153,400	289,700	219,700	322,000	242,300
B+A@50%: Office inc 50% B1	301,450	614,700	-	-	-	-	-	-
C: R&D	586,200	667,600	309,800	297,100	443,900	424,800	560,500	535,600
C+A@50%: R&D inc 50% B1	675,350	773,700	-	-	-	-	-	-
D: Industrial	-12,600	231,900	-22,100	-22,100	-11,400	-11,400	-7,400	-7,400
E: Warehousing	82,200	211,900	104,000	104,000	106,200	106,200	110,600	110,600
F: Total	1,043,800	1,832,200	720,500	672,000	960,400	871,300	1,117,700	1,013,100

Source: Iceni Projects based on CE / Iceni modelling / LPA data

B1 mix

5.31 B1 mix does make a substantial contribution and influence on the completions trends. Iceni estimate that a 50:50 office / R&D split may best represent the trend best on discussion with officers, and a row based on this assumption is included to enable a comparison to the labour demand / supply models. B1mix includes the following completed sites.

- 32-38 Station Road (assumed offices)
- Plots 1 to 21, 22, 25, 26, 27 Cambridge Science Park
- Land adjacent to Cambridge North Station
- Site 6, Granta Park

Office discussion

5.32 The outcomes (table 5.8) report broad consistency between labour demand scenarios and net completions (with B1mix element) - giving a degree of confidence. Given the changing ways of working in relation to offices, it is considered unlikely that the future need would exceed the historic net completions trend and it may be lower. The net trend has also supported a market which is now relatively stable (as a whole, although not necessarily at a sub area level). A realistic range would be between the standard and discounted (increased work from home) central scenario outcomes being 219,700 to 289,700 sqm. These are lower than the market signals (net absorption) data models however there are data uncertainties with these data sets particularly in a changing market. There are challenges planning for future office needs under the current market circumstances, however taking these market signals into account, and planning positively for growth, the higher end of the central scenario outcomes is considered appropriate being **289,700 sqm** including margin adjustments.

5.33 This is substantially higher than the 2020 ELEDS outcomes and recommendations for offices, this is due to revisions in the outlook for professional services and improved integration with the market signals. Densities have also been raised slightly to reflect changing workspace practices.

5.34 The authorities will need to consider how to deal with losses of older or less desirable space. In some employment land studies it is recommended that losses are monitored and a replacement rate (i.e. 25%-50%) included additionally to the stated needs. Iceni is minded not to recommend this approach taking into account the balanced outcomes above and positive market and viability in Cambridge.

R&D discussion

5.35 For R&D premises, the completions trends exceed even the highest labour demand models, before taking into account the B1 mix element. Net completions have risen substantially since the 2020 ELEDS (288,099 sqm projected from 2012-18, p111) with the 2019 Addenbrookes Hospital Campus expansion (c60,000 sqm) having a significant influence on the trend. The forecast which would fall to 445,000 sqm net (including B1 mix element) without this delivery,

which is between the unadjusted central and higher scenarios here although closer to the higher position (and this is broadly in line with the 2020 ELEDS outcome). The other factor influencing the outcomes may be the density assumptions around R&D labour demand modelling. At 28 sqm per FTE, these are based on recent permissions information (as per 2020 ELEDS) however longer run historic data may have had different densities, leading to some variation in outcomes (it is noted for example that the HCA Densities Guide suggests reports 40-60 sqm, although this is considered too high). The future modelling is highly sensitive to these changes but it is likely that densities would be closer to the lower end in the future, given land pressures.

5.36 The range of outcomes and sensitivities does present some challenges when providing future recommendations. In Iceni's view, looking across the outcomes, a future need of around **600,000 sqm of R&D** is considered appropriate. This does sit above the labour demand models but is not to say that the labour requirement needs to increase to fulfil this space but rather to reflect uncertainties in densities and provide generously in market choice terms. The position is below the completions trend (with B1 mix) partly to reduce the influence of the Addenbrookes development and partly to reflect future land efficiencies. It is recognised that the current level of demand for labs is very high but rather than making a needs based adjustment, it is considered that this is also a factor of delivery of sites rather than necessarily availability of land supply.

Industrial and warehousing discussion

5.37 Iceni considers it appropriate to collate the industrial and warehouse needs.

5.38 The unadjusted labour demand scenarios, report a 40,000 – 60,000 sqm requirement, which is above the 2020 ELEDS (table 38) and is largely due to the alternative population forecasts as well as some improvements in the outlook due to changes in shopping patterns as well as the adjustment for manufacturing 'key sector' demand. This sits a little above the net completions (around +30,000 sqm for industrial and warehouse).

5.39 As discussed previously, these figures are considered too low in the context of market compression being reported and there is a need to make an additional allowance to compensate for the replacement demand element. The market absorption rates suggest a need of around 200,000 sqm looking forwards (table 6.5, long and short term CoStar deals average). To get to this figure, a replacement demand rate of around 95,000 sqm would be needed after accounting for the scenario industrial and warehousing adjusted needs (table 6.7 rows D+E). Based on the discussions in paragraphs 6.25-6.28 above, this seems reasonable and should ensure a good level of provision in the future. This is considerably above the c40,000 sqm of aggregated industrial and warehouse need in the 2020 ELEDS (table 41). However a higher rate is considered appropriate, given the level of market compression, taking into account the changes in structural industrial demand post pandemic, as reflected at the national level, as well as the relationship between higher value activities and industrial stock, such as mid-tech.

5.40 On balance Iceni therefore recommends that that **200,000 sqm** would be appropriate to help improve pressures on industrial demand.

Balance with supply

5.41 Consideration has been given to the employment supply position in order to establish a balance of needs. The supply position at April 2021 has been provided via authority monitoring data. This has been updated with a series of corrections, more recent resolutions to grant planning permission, significant planning decisions since March 2021 and proposed changes to employment allocations in 2018 Local Plans. The details of these are set out in Appendix A6. These make some increases notably to R&D (West Cambridge) and industrial premises (correction to the inclusion for B2 of Former Waste Water Treatment Facility Cambridge Road Hauxton).

Greater Cambridge employment supply, Dec 2022 (sqm)

Sector	Supply 2020/21 monitoring	Supply with latest data at December 2022
B1 mix	170,575*	164,648
Office	83,537	130,133
R&D	317,229	475,599
Light industrial	25,832	35,923
Industrial	-34,439	19,538
Warehouse	71,887	71,474
Total	634,621	897,315

Source: authority monitoring to April 2021 plus adjustments (see appendix A6)

* 5 permissions / allocations make up 85% of this supply. These are Wellcome Genome Campus (assumed 120,000 sqm of 150,000 sqm as B1mix), Land to the West of Cambourne, Fulbourn Rd East, Oakington Barracks (Northstowe), Bar Farm, Longstanton. Overall the B1 mix is estimated as contributing 75% R&D and 25% offices.

5.42 The table below resolves the residual need balance with the latest supply after accounting for 2020/21 deliveries.

Range of Projected Employment Floorspace (2020-41) (sqm) Greater Cambridge

Sector	Recommended needs 2020 41	2020/21 deliveries	Needs 2020/21	Supply Dec 2022	Remaining balance
B1 mix	-	18,905*	-	-	-
Office	**289,700**	6,493	269,028	188,795	**-80,233**
R&D	**600,000**	21,235	574,039	651,585	**+77,547**
Industrial / w'house	**200,000**	-6,099	206,099	56,935	**-149,164**
Total	**1,089,700**	40,534	1,049,166	897,315	**-151,851**

Source: Iceni Projects based on CE / Iceni modelling

* Majority (90%) 32 – 38 Station Road, overall assumed as contributing 75% office and 25% R&D to balance for 2020/21

5.43 The table above identifies needs in use class types above which the Local Plan should seek to accommodate through future allocations:

- Offices, 80,200 sqm required
- R&D, surplus of 77,500 sqm (notably due to the recent West Cambridge permission)
- Offices and R&D combined, a shortfall of 2,300 sqm. In the 2020 ELEDS the balance was effectively +36,944 (table 41, combining B1 and B1a/b).
- Industrial and warehouse, 149,200 sqm required. In the 2020 ELEDS the balance was effectively -76,941 (table 41, combining B1c/B2/B8).

5.44 For the purposes of plan making the above floorspace requirements are detailed and exact. However it is recognised that a great many assumptions are involved in coming to these figures, both in terms of modelling needs and the make up of supply, and that it will generally be beneficial for the authority to see these as a minimum when providing land for economic growth.

5.45 This assessment does not include the emerging First Proposals potential allocations. The most notable of these are set out as follows:

5.46 **S/NEC: North East Cambridge**: the Proposed Submission North East Cambridge AAP states under 'Policy 12a: Business' up to 188,500 sqm of additional Class E (g) floorspace could be accommodated. Not all to be delivered in Plan period.

5.47 **S/CE: Cambridge East**, the First Proposals consultation notes could include 9,000 jobs on the 'safeguarded land' identified in the 2018 Local Plans at Cambridge Airport (although these may not all be delivered by 2041). This is to include offices, workshops and other uses, providing a variety of opportunities to support not only Cambridge's high technology clusters, but also industry and

creative uses, including local jobs to provide for existing communities and help contribute to community integration.

5.48 **S/CBC: Cambridge Biomedical Campus - S/CBC-A** - Possible future expansion area adjoining Babraham Road. An updated masterplan will be required for the Campus, to improve the overall experience of the site for workers and visitors. Full capacity of the campus has yet to be confirmed but expected to provide additional R&D floorspace.

5.49 **S/CB: Cambourne** – the First Proposals identifies Cambourne as a broad location for future growth in the 2030's to respond to the opportunity that will be provided by the proposed East West Rail that includes a station at Cambourne. The overall aim for an expanded Cambourne is to provide sufficient critical mass to perform the following role which includes growing employment centre to provide local opportunities for its residents and nearby communities.

5.50 **S/C/SCL: Cambridge** - Site area of 9 hectares, suitable for commercial development (such as relocation of 'space intensive' uses such as builders' merchants sales and storage facilities which are currently located on land elsewhere in the city). 21/05476/FUL application pending for development of 31,400sqm (GEA) of commercial floorspace, including B8 (storage and distribution), flexible B8/E(g) (office, research, and development and light industrial) and E(g) floorspace.

5.51 **S/BRC: Babraham Research Campus** - the First Proposals proposed to remove this site from the Green Belt and allocate an additional area for employment development (research and development) of 17.1 hectares within and adjoining the existing built area of the campus. This is proposed to enable employment floor-space within up to five new build and two replacement R & D buildings for a minimum of 30,000sqm of floor-space to provide research and development facilities for early stage start up and scale up life science companies,

5.52 **S/RRA/S Land to the south of the A14 Services**, site area of 18.2 hectares, suitable for the following uses: Class B2 (General Industrial) or Class B8 (Storage or Distribution) providing a range of small and medium sized units.

5.53 **S/RRS/B Land at Buckingway Business Park, Swavesey** - Site area of 2.1 hectares, suitable for following employment uses: Class B2 (General Industrial) or Class B8 (Storage or Distribution). B8 use would be limited to small to medium sized premises (up to 2,500m2).

5.54 Considering the above, it is clear that the need for the offices or office / R&D shortfall combined (a small 7,300 sqm) will be met through the proposals at North East Cambridge, Cambridge East, Cambridge Biomedical Campus and Babraham Research Campus. Whilst the exact floorspace to be delivered within the Plan period is not yet fully known, it is clear that it will exceed the shortfall by some measure. The recent West Cambridge permission of 170,000 sqm has a significant bearing on this. The over supply and flexibility is considered to be beneficial given the range of assumption inputs (and potential fallacies) in the modelling, the strength of Cambridge economy and potential uncertainties of delivery relating to any given site.

5.55 For industrial and warehousing needs, the 18.2 ha at the A14 services could potentially provide 72,800 sqm assuming a 0.4 plot ratio. Application 21/05476/FUL at S/C/SCL: Cambridge would also provide further space of around 30,000 sqm and Buckingway Business Park some 8,400 sqm which would still leave a shortfall of around 40,000 sqm. In order to meet this, some of the proposed allocations would need to ensure a good level of suitable industrial provision, most notable at Cambridge East, as without this there is a risk of a shortfall to meet business needs. If there is uncertainty in meeting this need then the expansion of current allocations or additional sites should be considered.

5.56 In further considering the suitability of the industrial supply the following points are identified:

- That the needs reflect a combination of traditional industrial units with wholesaling / servicing and manufacturing; alongside mid-tech units and more warehouse and distribution focused units. Analysis of past trends (floorspace deals where known) suggests that this is represented by general industrial / wholesale and retail (25%), mid tech (30%), manufacturing (25%), distribution (10%), other (10%). However looking forwards there is expected to be an increased focus on retail / on-line retailers including distribution (40% of need) seeking mid and larger units, as well as the mid-tech sector, potentially at the expense of more traditional manufacturing.

- For mid tech, demand is most sought after on the City fringe where there can be synergies with research such as that at Cambridge Science Park and elsewhere. Whilst acknowledging this, and the delivery of some units at Cambridge Research Park, it is not considered critical to the success of development to have this proximity, and historically units have been occupied across the area. It is however reasonable to recognise that there is more dedicated provision for this sector than in the past.

- Generally, industrial units should have good access to the strategic road network and accessibility to the labour pool.

- It would be reasonable to deliver units in a number of locations potentially focussing some mid tech at the City fringe, such as Cambridge East, and some final mile opportunities such as A14 Services, whilst there should be sites in other accessible locations around Greater Cambridge to support general industrial needs.

- The result of failing to address a shortfall would most likely to be the displacement of traditional occupiers (by mid tech) as well as longer distances travelled into the area (from e-commerce / final mile).

Summary

- Recommendations on future employment floorspace requirements are developed using the labour demand (and supply) models, completions trends and market signals.

- For offices all models result in higher needs than identified in the 2020 ELEDS largely due to changes in the employment outlook. On balance the central scenario jobs model results **of 289,700 sqm** is recommended

- For R&D premises, the completions trends sit above the central and high labour models however the completions are heavily influenced by a single development. A centred position of planning for around **600,000 sqm of R&D** is appropriate, sitting between the labour demand models and completions trends.

- For industrial and warehouse needs the labour demand scenarios report a c.90,000 – 100,000 sqm requirement. It is considered appropriate to factor in some replacement of losses in the future to reduce market pressure. Between 25% and 50% of past losses are recommended for replacement, after considering market signals, which results in a preferred need of around **200,000 sqm**.

- Taking into account the projected supply of employment floorspace in the plan period, a very limited shortfall in office / R&D is identified but a more substantial shortfall in industrial and warehouse, 149,000 sqm required.

- Emerging Local Plan allocations are likely to be able to readily fulfil the shortfall in office and R&D type needs given significant allocations at North East Cambridge, Cambridge East, Cambridge Biomedical Campus and Babraham Research Campus.

- Whilst there are dedicated proposed allocations for industrial space, in order for the forecast needs to be met it is necessary for some of the larger general allocations, notably Cambridge East, to emphasise the inclusion of appropriate floorspace industrial floorspace in order to avoid under provision.

6. Housing and Employment Relationships

Introduction

6.1 This section of the report moves on to consider the inter-relationship between economic growth and housing need. It has been prepared against a backdrop in which a minimum local housing need is defined using the standard method – a formula set out in the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG) to provide a figure for the minimum number of homes a local authority is expected to plan for – but recognise that there may be circumstances where actual housing need is higher than the standard method indicates.

6.2 As the PPG sets out[20], the standard method does not attempt to predict the impact of future Government policies, changing economic circumstances or other factors that might influence demographic behaviour. However the economic dynamism of the Greater Cambridge area means that this is an important influence on its housing market, including the movement of people to the area, and thus on overall housing need.

6.3 This section of the report therefore works through a staged process to consider the implications of planning on the basis of the standard method, and the scale of housing need which might be necessary to support the economic scenarios prepared as part of this report.

6.4 The section is therefore structured as follows:

- Part 1: sets out the standard method starting point and considers what population growth it can be expected to support, taking into account the latest

[20] ID 2a-010-20201216

demographic trends and appropriate assumptions for strategic planning purposes;

- Part 2: considers the number of jobs likely to be supported by the standard method; and
- Part 3: in the context of the economic growth scenarios developed previously, considers the expected level of housing required to support those levels of growth.

Part 1: Standard Method

6.5 The analysis below considers the level of local housing need for Greater Cambridge using the Standard Method. The methodology for calculating housing need is clearly set out by Government in Planning Practice Guidance (PPG). The four-step process set out in the PPG is worked through in the following sub-sections.

Step One: Setting the Baseline

6.6 The first step in considering housing need against the Standard Method is to establish a demographic baseline of household growth. This baseline is drawn from the 2014-based Household Projections, as required by the PPG, and should be the annual average household growth over a ten-year period, with the current year being the first year i.e. 2022 to 2032. This results in household growth of 12,146 households (1,215 per annum) over the ten-year period for the study area (445 per annum in Cambridge and 769 in South Cambridgeshire).

6.7 Although this figure is calculated over a ten-year period from 2022 to 2032, Paragraph 12 of the PPG states that this average annual household growth (and the local housing need arising from it) can then “be applied to the whole plan period” in calculating housing need.

6.8 The PPG requires the use of the 2014-based Household Projections even though more recent data is available, as this provides stability for planning authorities and communities and is consistent with the Government’s objective of significantly

boosting the supply of homes.[21] It means that a consistent set of demographic projections are used in all local authorities across England in calculating the starting point minimum local housing need.

Step Two: Affordability Adjustment

6.9 The second step of the standard method is to consider the application of an uplift on the demographic baseline, to take account of market signals (i.e. relative affordability of housing). The adjustment increases the housing need where house prices are high relative to workplace incomes. It uses the published median affordability ratios from ONS based on workplace-based median house price to median earnings ratio for the most recent year for which data is available.

6.10 The Government's Guidance states that for each 1% the ratio is above 4, the average household growth should be increased by a quarter of a percent – which when worked through the formula (below) means that each 1% increase in the ratio of house prices to earnings, above 4, the average household growth should be increased by 6.25%.

$$Adjustment\ factor = \left(\frac{Local\ affordability\ ratio\ -4}{4}\right) x\ 0.25 + 1$$

6.11 The latest affordability ratio, which is for 2021, is 10.55 in South Cambridgeshire, and 12.61 in Cambridge, which when applied in the above formula generates affordability uplifts of 41% and 54% respectively. These are applied to the average annual household growth from Step 1. This leads to housing need figures of 685 dwellings per annum in Cambridge and 1,084 dpa for South Cambridgeshire.

Step 3: The Cap

6.12 The third step of the standard method is to consider the application of a cap on any increase and ensure that the figure which arises through the first two steps

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does not exceed a level which can be delivered. There are two situations where a cap is applied:

- The first is where an authority has reviewed their plan (including developing an assessment of housing need) or adopted a plan within the last five years. In this instance the need may be capped at 40% above the requirement figure set out in the plan.

- The second situation is where plans and evidence are more than five years old. In such circumstances a cap may be applied at 40% of the higher of the projected household growth (step 1) or the housing requirement in the most recent plan, where this exists.

6.13 Cambridge and South Cambridgeshire Local Plans 2018 have been adopted within the last 5 years. The cap is therefore calculated as 40% above the housing targets in those plans (700 dpa and 975 dpa for Cambridge and South Cambridgeshire respectively). However in both situations identified above, the outcome of Step 2 for Cambridge and South Cambridgeshire is lower than the capped figure (local plan target plus 40%). Therefore, regardless of the date of adoption of the local plans, the capping in this case does not impact the level of housing need in Cambridge or South Cambridgeshire.

Step Four: Urban Uplift

6.14 The fourth and final step in the calculation means that the 20 largest urban areas in England are subject to a further 35% uplift. This uplift ensures that the Government's stated target of 300,000 dwellings per annum is met and that "homes are built in the right places, to make the most of existing infrastructure, and to allow people to live nearby the service they rely on, making travel patterns more sustainable." (Paragraph: 035 Reference ID: 2a-035-20201216).

6.15 Neither of the authorities is listed within the top 20 urban areas in the country and therefore there is no additional uplift.

Standard Method Calculations

6.16 The table below works through the Standard Method calculations and for the whole of the study area shows a need for 1,769 dwellings per annum.

Standard Method Housing Need Calculations

Calculation Stage	Cambridge	South Cambridgeshire	Greater Cambridge
Households 2022	52,276	69,571	121,847
Households 2032	56,728	77,265	133,993
Change in households	4,452	7,694	12,146
Per annum change	445	769	1,215
Affordability ratio (2021)	12.61	10.55	N/A
Uplift to household growth	54%	41%	N/A
Uncapped need (per annum)	685	1,084	1,769

Source: Derived from a range of ONS and MHCLG sources

Developing a Population Projection linking to the Standard Method

6.17 Having established the minimum housing need using the Government's Standard Method the next stage of analysis seeks to project how the population of each area is likely to change if housing delivery is at this level.

6.18 The 2014-based Household Projections are used in the standard method for the purposes of consistency and generating an appropriate minimum level of housing provision. However there is more recent demographic data available, for instance around birth and death rates as well as from the 2021 Census which are relevant to developing an accurate projection for what demographic growth and economic growth might be supported by housing provision in line with the standard method.

6.19 The starting point has been to develop an updated population projection for Cambridge and South Cambridgeshire by making adjustments to the ONS 2018-based Sub-National Population Projection (the latest official trend-based projections from ONS) to take account of 2021 Census data. This is necessary in particular as the Census showed a much larger population in Cambridge than ONS has previously been predicting – the Census population for Greater Cambridge was 21,700 above that shown in the ONS 2020 Mid-Year Population

Estimates of which 20,600 was in Cambridge. The detailed modelling is described in Appendix A4.

6.20 It is then necessary to make assumptions on household formation rates and the level of vacant homes to calculate the population which would be supported by housing delivery in line with the standard method. Adjustments are then made so that population change (when converted into household growth) provides sufficient additional households to fill additional dwellings.

6.21 Within the modelling, migration assumptions have been changed so that across the two areas the increase in households matches the housing need (including a standard 3% vacancy allowance). 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%).

6.22 A further adjustment has been made to deal with any suppression of household formation within the projections. To do this a 'part-return-to-trend' analysis has been developed, where the rate of household formation sits somewhere between figures in the 2014-based projections and those in an older 2008-based version. This approach has been widely used in analysis of this nature and was an approach previously suggested by the Local Plans Expert Group (LPEG), it is also a consistent approach to that used in the previous housing and employment relationships report. This is further discussed in Appendix A5.

6.23 The resultant projection estimates that with housing delivery in line with the standard method, the population of the study area would grow by around 57,200 people over the 2020-41 period. The population aged 65+ is projected to see the highest proportionate increase (increasing by 53%), with the number of people in what might be described as core 'working-age' groups (people aged 16-64) growing by 30,600 (15%). The number of children is projected to see a small increase of 2% in the period studied.

Population Change 2020 to 2041 by broad age bands – Greater Cambridge (linked to Standard Method)

Age	Population 2020	Population 2041	Change in population	% change from 2020
Under 16	52,332	53,367	1,036	2.0%
16-64	203,227	233,844	30,617	15.1%
65 and over	48,044	73,613	25,569	53.2%
Total	303,603	360,824	57,222	18.8%

Source: Demographic Projections

Part 2: Relationship Between Standard Method and Economic Growth

6.24 The analysis below moves on to consider the relationship between housing and economic growth; seeking to understand what level of jobs might be supported by changes to the local labour supply if housing delivery matched that the standard method local housing need. To look at estimates of the job growth to be supported, a series of stages are undertaken. These can be summarised as:

- Estimate changes to the economically active population (this provides an estimate of the change in labour-supply);
- Overlay information about commuting patterns, double jobbing (i.e. the fact that some people have more than one job) and potential changes to unemployment; and
- Bringing together this information will provide an estimate of the potential job growth supported by the standard method.

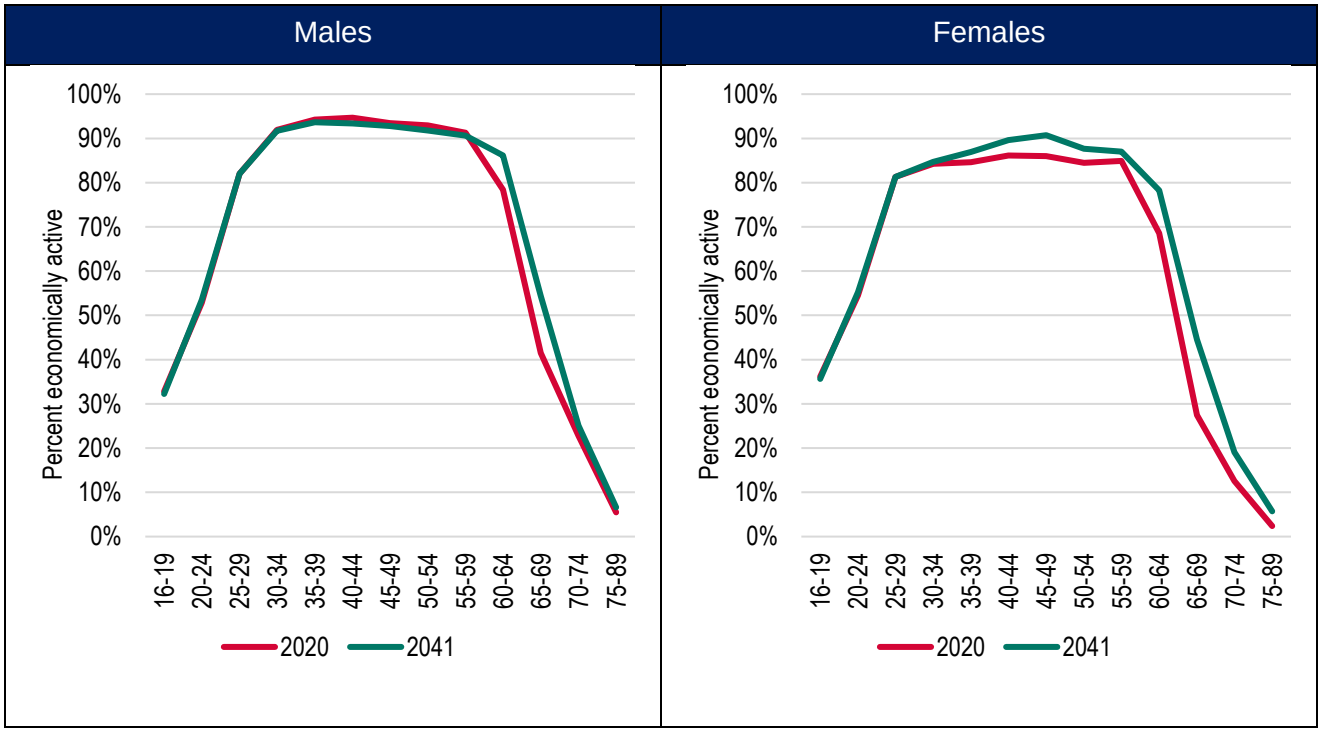
Growth in Resident Labour Supply

6.25 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).

6.26 The figure and table below show the assumptions made (for the whole study area). 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 pensionable 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). Whilst data is presented for the whole of the study area, all analysis has been developed on an individual local authority area basis.

Figure 6.1Projected changes to economic activity rates (2020 and 2041) – Greater Cambridge



Source: Based on OBR and Census (2011) data

Projected changes to economic activity rates (2020 and 2041) – Greater Cambridge

Age Group	Males 2020	Males 2041	Males Change	Females 2020	Females 2041	Females Change
16-19	32.8%	32.2%	-0.6%	36.1%	35.6%	-0.5%
20-24	52.9%	53.5%	0.6%	54.5%	55.2%	0.8%
25-29	82.0%	82.0%	0.0%	81.3%	81.3%	0.0%
30-34	91.9%	91.7%	-0.2%	84.2%	84.7%	0.4%
35-39	94.3%	93.6%	-0.6%	84.6%	86.9%	2.3%
40-44	94.7%	93.4%	-1.3%	86.1%	89.6%	3.4%
45-49	93.4%	92.8%	-0.6%	86.0%	90.7%	4.7%
50-54	92.9%	91.8%	-1.1%	84.5%	87.6%	3.1%
55-59	91.3%	90.6%	-0.7%	84.9%	87.0%	2.1%
60-64	78.4%	86.2%	7.8%	68.6%	78.3%	9.7%
65-69	41.5%	54.4%	12.9%	27.5%	44.5%	17.1%
70-74	22.7%	25.0%	2.3%	12.5%	19.0%	6.5%
75-89	5.5%	6.6%	1.1%	2.4%	5.7%	3.3%

Source: Based on OBR and Census (2011) data

6.27 Applying the age and sex specific economic activity rates to the projected population it is possible to estimate the overall change in the number of economically active people in the study area – this is set out in the table below. The analysis shows that the projection linked to the Standard Method results in growth in the economically-active population of 33,500 people – a 20% increase.

Estimated change to the economically active population (2020-41) – Greater Cambridge (Standard Method projection)

Area	Economically active (2020)	Economically active (2041)	Total change in economically active	% change
Cambridge	76,238	87,285	11,047	14.5%
South Cambridgeshire	89,260	111,744	22,484	25.2%
Greater Cambridge	165,498	199,029	33,530	20.3%

Source: Derived from demographic projections

Linking Changes to Resident Labour Supply and Job Growth

6.28 The analysis above has set out the change in the number of people who are economically active. However, for the purposes of this report it is more useful to convert this information into an estimate of the number of jobs this would support. The number of jobs and resident workers required to support these 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 over the projection period then more jobs could be supported for a given population growth (and vice versa).

Commuting Patterns

6.29 The table below shows summary data about commuting to and from Greater Cambridge from the 2011 Census. Whilst the 2011 Census data is quite dated; it is the most up-to-date and reliable information available at the time of writing. Census 2021 commuting data is some way off being published, and given its timing during COVID-19 may not be representative of longer term patterns.

6.30 Overall, the data shows that the study area sees a level of net in-commuting for work, influenced by its economic dynamism, with the number of people resident in the area who are working being about 18% lower than the total number who work in the area. This number is shown as the commuting ratio 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). Figures for individual authorities show net in-commuting to Cambridge but out-commuting from South Cambs.

Commuting patterns in Greater Cambridge

Commuting patterns	Cambridge	South Cambridgeshire	Greater Cambridge
Live and work in Local Authority (LA)	33,704	23,832	-
Home workers	6,570	10,714	17,284
No fixed workplace	3,203	5,443	8,646
In-commute	51,299	34,983	-
Out-commute	16,388	39,701	-
Total working in LA	94,776	74,972	169,748
Total living in LA (and working)	59,865	79,690	139,555
Commuting ratio	0.632	1.063	0.822

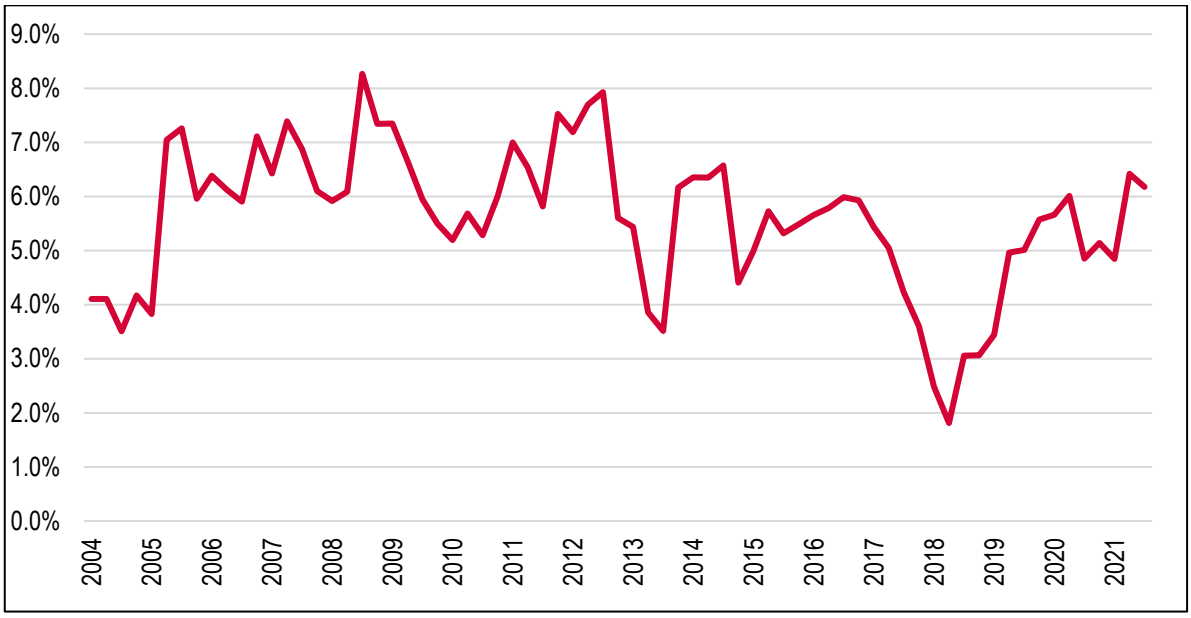
Source: 2011 Census

6.31 In translating the commuting pattern data into growth in the labour-force, a core assumption for the purpose of considering the number of jobs supported by the standard method is that the commuting ratio remains at the same level as shown by the 2011 Census. This recognises that the standard method represents a consistent baseline across different local planning authorities. This assumption is applied to the Standard Method projection described in the previous section.

Double Jobbing

6.32 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 the local authority divided by the number of jobs. Data from the Annual Population Survey (available on the NOMIS website) back to 2004 (2004-21) suggests across the study area that typically about 5.6% of workers have a second job, although the latest period for which data is available puts the figure slightly higher (at 6.2%).

Figure 6.2Percentage of all people in employment who have a second job – Greater Cambridge



Source: Annual Population Survey (from NOMIS)

6.33 For the purposes of this assessment analysis has been carried out separately for each local authority with the relevant double jobbing percentages being 6.2% in Cambridge and 5.1% for South Cambridgeshire. Taking the example of Cambridge the modelling has assumed that around 6.2% of people will have more than one job moving forward. A double jobbing figure of 6.2% gives rise to a ratio of people in work and jobs of 0.938 (i.e. the number of jobs supported by the workforce will be around 6.2% higher than workforce growth). It has been assumed in the analysis that the level of double jobbing will remain constant over time.

Unemployment

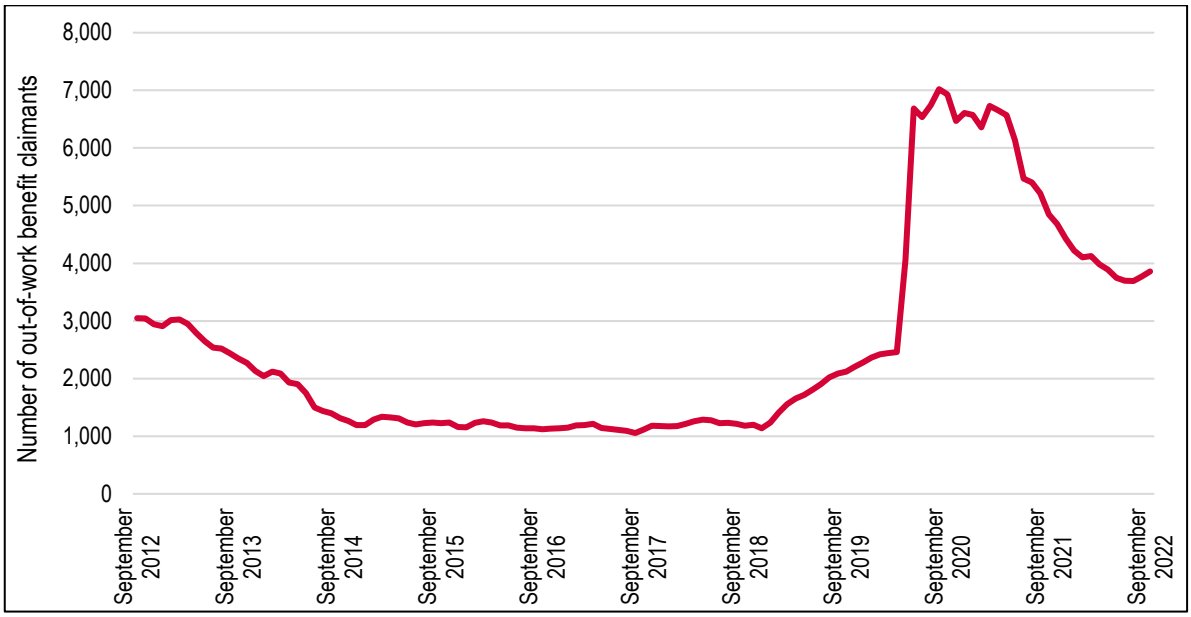
6.34 The last analysis when looking at the link between jobs and resident labour supply is a consideration of unemployment. Essentially, this is considering if there is any latent labour force that could move back into employment to take up new jobs. This is particularly important given there are likely to have been notable increases in unemployment due to COVID-19, although it will be difficult to be precise about numbers, particularly as the impact of the ending of the furlough scheme is unknown.

6.35 The figure below looks at Claimant Count data (described as the number of people claiming Jobseeker's Allowance plus those who claim Universal Credit who are out of work). This will not give a full picture of unemployment as not all those unemployed will be a claimant, but it will certainly help to provide an indication; claimant count data is available up to September 2022 with the data below showing a trend for the previous decade.

6.36 The analysis shows a clear increase in the number of claimants (presumably as a result of the pandemic) – rising from around 2,500 to approaching 7,000 in Autumn 2020, dropping in the latest period for which data is provided to around 4,000 in Autumn 2022).

6.37 Overall, the data would suggest there was some unemployment as a result of the pandemic, but it is also considered that as of the end of 2022 most people who would be expected to move back into the labour force have done so. This is important as the forecasts in this report take a 2020 base, a time when there was almost certainly a latent labour supply. It is not possible to be precise, but for the purposes of modelling it has been assumed that the latent labour supply in 2020 was around 2,400 people (split for modelling purposes equally between the two authorities as the evidence suggested similar changes in each location).

Figure 6.3Number of out-of-work benefit claimants (2012-2022) – Greater Cambridge



Source: NOMIS

6.38 Arguably, the claimant count data shows a higher latent labour supply in 2020 than 2,400 (given that figures in 2020 were generally at least 6,500 and now stand at less than 4,000). However, this data has also been cross-referred with ONS modelled unemployment estimates which show unemployment in 2020 as typically around 6,000, and now being 4,100; this is a lower difference (1,900) although generally unemployment statistics have been less variable through the pandemic than the claimant count data. The 2,400 figure represents the level of latent labour at the starting point of the modelling which are considered could return to work.

Jobs Supported by Growth in the Resident Labour Force

6.39 The table below shows how many additional jobs might be supported by population growth under the Standard Method projection. Given current commuting patterns and estimates about double jobbing, it is estimated that around 43,300 additional jobs could be supported by the changes to the resident labour supply in the demographic projection over the 2020-41 period.

6.40 Taking the example of Cambridge, the analysis shows 11,047 economically active residents. With 6.2% of people having more than one job, the initial number of jobs supported is 11,773 (11,047÷0.938) – i.e. jobs supported taking no account of

commuting. Given commuting dynamics in the 2011 Census, this figure further increases to 18,639 (11,773÷0.632) – which is jobs supported excluding pandemic influences. Finally, with an estimated 1,200 jobs lost through the pandemic (which will be recovered) the final estimate of jobs supported is 19,839 (18,639+1,200). For South Cambridgeshire, it is envisaged that the change in the economically active population would be 22,500 persons with the total number of jobs supported being slightly higher than this at 23,500 over the 2020-41 period.

Jobs supported by demographic projections (2020-41) –Standard Method

Area	Total change in economically active	Jobs supported including allowance for double jobbing	Jobs supported including allowance for net commuting	Plus pandemic losses (= jobs supported)
Cambridge	11,047	11,773	18,639	19,839
South Cambridgeshire	22,484	23,703	22,300	23,500
Greater Cambridge	33,530	35,476	40,939	43,339

Source: Derived from a range of sources

6.41 Across Greater Cambridge, the number of jobs supported by the standard method at 43,300 falls substantially below the number of jobs forecast to be created (66,600 – 76,700) over the 2020-41 period.

Part 3: Economic Growth and Housing Need – Job Forecasts

6.42 To look at estimates of the numbers of homes required to support jobs growth, the method which is followed is identical to that set out for translating homes into jobs but completed in reverse to get to a population growth. In essence within the modelling, migration if increased to support the additional employment. This is realistic recognising that Greater Cambridge's economic dynamism influences the retention and attraction of people to the area.

6.43 The stages of the modelling can be summarised as:

- Start with estimates of job growth – including an allowance for jobs lost (and expected to be recovered) due to the pandemic;

- Estimate changes required to the economically active population to meet the jobs growth – this takes account of information about commuting patterns, double jobbing (i.e. the fact that some people have more than one job) and potential changes to unemployment) Two scenarios for commuting are modelled, as described later in this section;

- Flex levels of migration within the demographic model so that the change in the economically active population equals the change required to meet the number of jobs (migration can be 'flexed' up or down with stronger economic growth resulting in higher net in-migration as more people are required in the labour-supply); and

- Apply household representative rates to the resulting population projection and apply a vacancy allowance (as described in Appendix A5) to calculate the number of households and dwellings needed.

6.44 Two job scenarios have been considered (Central and Higher). The tables show job growth of 66,600 in the Central scenario and 76,700 for the Higher variant – both of these are higher than the estimated job growth supported by the Standard Method and in general the scenarios show relatively stronger job growth in Greater Cambridge (and particularly Cambridge) when compared with the Standard Method figures pointing to a higher scale of housing need.

Forecast future jobs in Greater Cambridge – Central scenario

Area	Additional jobs (2020 41)
Cambridge	36,882
South Cambridgeshire	29,697
Greater Cambridge	66,579

Source: Iceni

Forecast future jobs in Greater Cambridge – Higher scenario

Area	Additional jobs (2020 41)
Cambridge	42,551
South Cambridgeshire	34,161
Greater Cambridge	76,711

Source: Iceni

Economic Growth and Housing Need

6.45 The demographic model developed to look at housing need has been used to consider the link between jobs and housing.

6.46 The methodology uses the demographic projection described earlier in this section as a starting point, and consistent assumptions on economic participation, double jobbing and unemployment to those described in the Part 2 analysis above.

6.47 Within the modelling, migration is adjusted upwards to support the expected level of employment growth.

6.48 The extent of additional migration necessary is however influenced by what growth in employment is supported by additional net in-commuting. Two scenarios are presented here, consistent to those in the 2020 Housing & Employment Relationships Report. The first scenario maintains the 2011 Census commuting ratio – in effect resulting in growth in net in-commuting from beyond Greater Cambridge. The second scenario treats the standard method as a consistent baseline across local authorities, but models a 1-1 relationship between jobs growth and labour supply in Greater Cambridge beyond this; such that the additional jobs growth above the level supported by the standard method is accommodated by additional workforce within Greater Cambridgeshire alone.

6.49 The first part of the analysis is to estimate what level of growth in the labour supply growth would be needed in Greater Cambridge for the job growth forecast to be met. This calculation is shown below; there are four scenarios, two for each of the job growth forecasts, with differing assumptions about commuting patterns for additional jobs over and above the level supported by the Standard Method. The four tables show growth in the resident labour supply of between 49,900 and 65,000 people.

Forecast job growth and change in resident workforce with double jobbing and 1:1 commuting patterns above the Standard Method – Central scenario (2020-41)

Area	Net additional jobs (2020 41)	Total additional jobs (net of adjustments to unemployment)	Total additional jobs including allowance for double jobbing (=change in economically active)	Total additional jobs including allowance for commuting (1:1 above Standard Method)
Cambridge	36,882	35,682	33,480	27,038
South Cambridgeshire	29,697	28,497	27,031	28,362
Greater Cambridge	66,579	64,179	60,511	55,400

Source: Derived from a range of sources

Forecast job growth and change in resident workforce with double jobbing and Census commuting patterns above the Standard Method – Central scenario (2020-41)

Area	Net additional jobs (2020 41)	Total additional jobs (net of adjustments to unemployment)	Total additional jobs including allowance for double jobbing (=change in economically active)	Total additional jobs including a allowance for commuting Census 2011)
Cambridge	36,882	35,682	33,480	21,148
South Cambridgeshire	29,697	28,497	27,031	28,732
Greater Cambridge	66,579	64,179	60,511	49,880

Source: Derived from a range of sources

Forecast job growth and change in resident workforce with double jobbing and 1:1 commuting patterns above the Standard Method – Higher scenario (2020-41)

Area	Net additional jobs (2020 41)	Total additional jobs (net of adjustments to unemployment)	Total additional jobs including allowance for double jobbing (=change in economically active)	Total additional jobs including allowance for commuting (1:1 above Standard Method)
Cambridge	42,551	41,351	38,799	32,357
South Cambridgeshire	34,161	32,961	31,265	32,596
Greater Cambridge	76,711	74,312	70,065	64,954

Source: Derived from a range of sources

Forecast job growth and change in resident workforce with double jobbing and Census commuting patterns above the Standard Method – Higher scenario (2020-41)

Area	Net additional jobs (2020 41)	Total additional jobs (net of adjustments to unemployment)	Total additional jobs including allowance for double jobbing (=change in economically active)	Total additional jobs including allowance for commuting
Cambridge	42,551	41,351	38,799	24,508
South Cambridgeshire	34,161	32,961	31,265	33,233
Greater Cambridge	76,711	74,312	70,065	57,740

Source: Derived from a range of sources

6.50 The migration assumptions within the demographic projections are then adjusted to match this level of jobs growth. 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%).

6.51 Drawing through the modelling assumptions set out above, the tables below show estimates of housing need set against the job growth scenarios. The analysis shows a range of need across the study area of between 2,284 and 2,763 dwellings per annum – these figures are above the Standard Method (1,769 per annum) – illustrating that economic growth can be expected to support higher housing need given Greater Cambridge's economic dynamism.

Economic-led Housing Need – linking to 1:1 commuting patterns above the Standard Method – Central scenario

Area	Households 2020	Households 2041	Change in households	Per annum	Dwellings (per annum)
Cambridge	53,189	77,684	24,495	1,166	1,201
South Cambridgeshire	67,182	92,909	25,726	1,225	1,262
Greater Cambridge	120,371	170,592	50,221	2,391	2,463

Source: Demographic projections

Economic-led Housing Need – linking to Census commuting patterns above the Standard Method – Central scenario

Area	Households 2020	Households 2041	Change in households	Per annum	Dwellings (per annum)
Cambridge	53,189	73,806	20,617	982	1,011
South Cambridgeshire	67,182	93,136	25,954	1,236	1,273
Greater Cambridge	120,371	166,942	46,571	2,218	2,284

Source: Demographic projections

Economic-led Housing Need – linking to 1:1 commuting patterns above the Standard Method – Higher scenario

Area	Households 2020	Households 2041	Change in households	Per annum	Dwellings (per annum)
Cambridge	53,189	81,185	27,996	1,333	1,373
South Cambridgeshire	67,182	95,519	28,337	1,349	1,390
Greater Cambridge	120,371	176,705	56,333	2,683	2,763

Source: Demographic projections

Economic-led Housing Need – linking to Census commuting patterns above the Standard Method – Higher scenario

Area	Households 2020	Households 2041	Change in households	Per annum	Dwellings (per annum)
Cambridge	53,189	76,018	22,829	1,087	1,120
South Cambridgeshire	67,182	95,912	28,730	1,368	1,409
Greater Cambridge	120,371	171,930	51,559	2,455	2,529

Source: Demographic projections

Summary

6.52 Using the Government's Standard Method it was calculated there is a need to provide 1,769 dwellings per annum across the study area (685 dpa in Cambridge and 1,084 dpa for South Cambridgeshire). This is based on using the 2014-based subnational household projections (SNHP) and an up-to-date house price to income affordability ratio. Analysis indicates the Standard Method housing need could support 43,300 additional jobs.

6.53 Two job growth forecasts were used to look at the relationship between jobs and housing. The first (Central scenario) showed forecast job growth (2020-41) of 66,600 with the second (Higher scenario) putting job growth at 76,700. In both cases the number of jobs is in excess of the number potentially supported by the Standard Method.

6.54 Working through demographic modelling to consider changes to the resident labour supply and implied population and household growth it was concluded that economic forecasts would result in the following levels of housing need:

Overview of Scenarios for Housing Need

Scenario	Jobs change 2020 41	Dwellings change 2020 41	Dwellings per annum
Standard Method	43,339	37,149	1,769
Central scenario with Census commuting patterns	66,579	47,964	2,284
Central scenario with 1:1 commuting above the Standard Method	66,579	51,723	2,463
Higher scenario with Census commuting patterns	76,771	53,109	2,529
Higher scenario with 1:1 commuting above the Standard Method	76,771	58,023	2,763

A1. Employment Outcomes to 2041, Baseline and Trend

Table A1.1 Employment outcomes (000s) to 2041, LEFM baseline and past trends

Sector	2020 employment count	Continuation of 2011-20 absolute growth (change)	Continuation of 2001-20 absolute growth (change)	LEFM population adjusted baseline (change)
Agriculture, forestry & fishing	1.0	-0.9	0.2	0.4
Mining & quarrying	0.1	0.0	0.0	0.0
Food, drink & tobacco	1.0	-0.1	-0.4	0.1
Textiles etc	0.1	-0.4	-1.5	0.0
Wood & paper	0.3	-0.4	-1.4	-0.1
Printing & recording	1.2	1.2	-0.8	-0.4
Coke & petroleum	0.0	0.0	0.0	0.0
Chemicals	0.4	0.1	-0.9	-0.1
Pharmaceuticals	0.8	-0.4	-0.9	0.0
Non-metallic mineral products	0.7	-0.6	-1.3	-0.1
Metals & metal products	0.7	-1.5	-0.9	-0.2
Electronics	2.2	-0.5	-0.8	-0.7
Electrical equipment	0.4	-0.2	-0.2	0.0
Machinery	1.0	-1.3	0.0	-0.2
Motor vehicles	0.1	0.2	-0.6	-0.1
Other transport equipment	2.1	3.0	0.8	-0.3
Other manufacturing & repair	1.6	1.6	0.5	-0.4
Electricity & gas	0.1	-0.1	0.1	0.0
Water, sewerage & waste	0.9	-0.6	0.3	0.1
Construction	9.8	2.8	1.2	1.7
Motor vehicles trade	2.7	0.9	-0.2	0.6
Wholesale trade	4.6	-4.0	-0.9	0.7
Retail trade	13.2	-3.0	1.9	1.1

Land transport	2.5	0.9	0.4	0.1
Water transport	0.0	0.0	0.0	0.0
Air transport	0.0	-0.1	-0.7	0.0
Warehousing & postal	1.6	-5.4	-0.7	0.2
Accommodation	2.3	2.4	0.8	0.7
Food & beverage services	11.9	9.3	5.5	6.2
Media	3.4	2.9	-0.8	1.0
IT services	13.4	11.6	2.1	4.4
Financial & insurance	2.5	-1.0	-1.1	-0.8
Real estate	2.7	0.7	0.7	0.9
Legal & accounting	4.1	1.9	0.5	1.1
Head offices & management consultancies	6.4	8.9	4.4	1.2
Architectural & engineering services	10.2	11.2	6.2	2.8
Other professional services (R&D)	20.5	23.3	10.0	9.9
Business support services	12.5	6.7	4.4	4.0
Public Administration & Defence	3.9	-2.8	-2.1	0.8
Education	31.6	10.6	6.4	3.8
Health	20.4	14.5	10.2	10.8
Residential & social	7.6	0.6	1.6	2.7
Arts	3.2	4.2	2.1	-1.1
Recreational services	1.7	0.4	0.6	0.0
Other services	6.3	2.9	2.6	0.2
Total	213.6	99.8	47.2	51.2

A2. Homeworking by Sector (UK, 2019)

Table A2.1 Homeworking by Industry Sector in the UK, January to December 2019 (%) (ONS)

Sector	Own Home	Same grounds or buildings, or home as base	Separate from home	Work at home in the week prior to interview	Ever work at home
A Agriculture, forestry and fishing	8.6	41.8	49.5	13.7	39.0
B Mining and quarrying	5.7	3.3	91.0	8.9	24.8
C Manufacturing	3.9	6.0	90.0	9.3	21.1
D Electricity, gas, air cond supply	4.9	9.6	85.5	13.6	29.6
E Water supply, sewerage, waste	1.9	7.0	91.1	6.5	20.4
F Construction	3.8	24.3	71.5	10.2	25.9
G Wholesale, retail, repair of vehicles	3.2	4.0	92.5	6.2	13.4
H Transport and storage	1.8	9.5	88.6	3.4	11.0
I Accommodation and food services	2.1	3.5	94.1	4.4	10.0
J Information and communication	14.8	12.5	72.5	32.8	53.1
K Financial and insurance activities	5.2	5.4	89.1	22.8	38.9
L Real estate activities	12.3	12.4	75.1	18.4	40.3
M Prof, scientific, technical activ.	12.8	13.5	73.6	26.3	46.3
N Admin and support services	5.6	16.7	77.6	11.2	23.2
O Public admin and defence	2.6	3.6	93.5	13.7	29.4
P Education	2.7	5.9	91.2	12.8	38.3
Q Health and social work	3.9	4.2	91.7	8.0	20.3
R Arts, entertainment and recreation	9.9	14.1	75.7	17.4	33.3
S Other service activities	7.8	16.8	75.1	16.8	30.3
T Households as employers	10.8	26.1	63.1	14.3	19.5
U Extraterritorial organisations	4.6	4.3	90.9	19.8	27.8

A3. Sector – use class split

Table A3.1 Sector to Floorspace ratios

Sector	Non B/E	Industry (E(g)(iii)/B2)	Warehousing (B8)	Office (E(g)(i)	R&D (E(g)(ii)
Agriculture, forestry & fishing	100%				
Mining & quarrying	100%				
Food, drink & tobacco	0%	100%			
Textiles etc	0%	100%			
Wood & paper	0%	100%			
Printing & recording	0%	100%			
Coke & petroleum	0%	100%			
Chemicals	0%	100%			
Pharmaceuticals	0%	100%			
Non-metallic mineral products	0%	100%			
Metals & metal products	0%	100%			
Electronics	0%	75%			25%
Electrical equipment	0%	75%			25%
Machinery	0%	100%			
Motor vehicles	0%	100%			
Other transport equipment	0%	100%			
Other manufacturing & repair	0%	75%			25%
Electricity & gas	100%				
Water, sewerage & waste	80%	20%			
Construction	90%		10%		
Motor vehicles trade	55%	45%			
Wholesale trade	20%	10%	70%		
Retail trade	100%	0%	0%		
Land transport	60%	20%	20%		
Water transport	80%		20%		
Air transport	80%		20%		

Warehousing & postal	55%		45%		
Accommodation	100%				
Food & beverage services	100%				
Media*	0%	10%	5%	85%	
IT services*	0%		5%	75%	20%
Financial & insurance*	20%			80%	
Real estate*	40%			60%	
Legal & accounting*	5%			95%	
Head offices & management consultancies*	5%			95%	
Architectural & engineering services*	5%			95%	
Other professional services (R&D)*	5%			10%	85%
Business support services*	50%	5%	5%	35%	5%
Public Administration & Defence*	40%			60%	
Education	100%				
Health	100%				
Residential & social	100%				
Arts	100%				
Recreational services	100%				
Other services	100%				

Source: Iceni Projects

* run at 70% office 95% R&D for sensitivity

A4. Trend-based Demographic Projection

Introduction

A4.1 This appendix sets out the method used to develop a trend-based demographic projection. This projection is an important input to the LEFM and is used in the demographic modelling within this report. The various sub-sections below provide some discussion of the data available and how this has been used to develop a trend-based position. It also informs the standard method jobs providing a more accurate demographic model for testing potential demographic change associated with the Standard Method, from which further modelling of changes to the economically active population could be modelled.

A4.2 LEFM's local area population data includes historical data to 2020 from the ONS mid-year population estimates, and the projections are based on the 2018-based subnational population projections (SNPP) scaled to CE's UK/regional population projections and with some adjustments for COVID-19 and Brexit related migration.

A4.3 However 2021 Census data was published in 2022 which allows a view of the current population size and age structure in different areas. This indicated a significantly greater population in Greater Cambridge in 2021 than previous ONS Mid-Year Population Estimates, indicating that historical ONS data for Greater Cambridge (and in particular Cambridge) is likely to have substantially under-estimated population growth and therefore does previous ONS projections, such as the 2018-based SNPP, are not likely to accurately reflect population trends in the area.

A4.4 The analysis below looks at key data about demographic trends in Greater Cambridge, particularly focussing on past population growth and the components of population change as these provide the inputs to developing projections for future population growth.

Population

A4.5 The table below shows ONS estimates for the population by authority for mid-2020. The population of Greater Cambridge was estimated to be around 286,000.

Table A4.1 Estimated Population by Local Authority (2020) – Greater Cambridge

Area	Estimated population	% of population
Cambridge	125,063	43.7%
South Cambridgeshire	160,904	56.3%
Greater Cambridge	285,967	100.0%

Source: ONS MYE

A4.6 The data above can be contrasted with more recent information from the 2021 Census (albeit this is for one year later than the MYE). This shows a notably higher population in the study area than previously estimated with the biggest difference being seen in Cambridge.

Table A4.2 Estimated Population by Local Authority (2021) – Greater Cambridge – Census data

Area	Estimated population	% of population
Cambridge	145,700	47.4%
South Cambridgeshire	162,000	52.6%
Greater Cambridge	307,700	100.0%

Source: 2021 Census

A4.7 The table below shows estimated population change between the two Census dates. Across the whole study area population is shown to have increased by around 13%, with higher changes seen in Cambridge (18% population growth).

Table A4.3 Change in Population by Local Authority (2011-21)

Area	2011	2021	Change	% Change
Cambridge	123,900	145,700	21,800	17.6%
South Cambridgeshire	148,800	162,000	13,200	8.9%
Greater Cambridge	272,600	307,700	35,100	12.9%

Source: 2011 and 2021 Census

Iceni estimates of population size and structure in 2021

A4.8 As part of the previous Housing and Employment Relationships Study, Iceni had made estimates of the likely population size and age structure in the study area using secondary data sources (largely the Patient Register). For information, the table below shows a comparison between the 2018-based subnational population projections (SNPP), Iceni's previous estimates and the 2021 Census. Data has been taken from the SNPP as this allows an ONS figure for 2021 to be included – it should be noted that the SNPP figure will be based on ONS estimates of trends up to mid-2018.

A4.9 Generally, the Iceni estimates are quite close to Census figures, and certainly much closer than previous ONS figures – this is particularly the case when looking at population estimates for Cambridge. Importantly, the Census has shown the area's population is substantially higher than the ONS was projecting it to be.

Table A4.4 Comparing Population estimates and projections for 2021 – Greater Cambridge

Area	SNPP (2021)	Iceni (2021)	Census (2021)	Census difference from SNPP	Census difference from Iceni
Cambridge	125,100	140,000	145,700	20,600	5,700
South Cambs	160,700	164,700	162,000	1,300	-2,700
Greater Cambridge	285,800	304,800	307,700	21,900	2,900

Source: ONS and Iceni population modelling

A4.10 The table below shows a comparison between these sources of age structure estimates in 2021 (data for the whole study area) – again the Iceni estimates are generally closer to the Census than SNPP. But importantly the Census shows substantially more people, particularly in their 20s, 30s and to a lesser extent 40s, than the ONS has been projecting.

Table A4.5 Comparing age structure population estimates and projections for 2021 – Greater Cambridge

Age Group	SNPP (2021)	Iceni (2021)	Census (2021)	Census difference from SNPP	Census difference from Iceni
0-4	15,000	16,500	15,100	100	-1,400
5-9	17,600	17,600	17,100	-500	-500
10-14	18,000	17,800	17,200	-800	-600
15-19	19,300	19,500	20,200	900	700
20-24	25,600	27,600	26,700	1,100	-900
25-29	19,200	23,100	24,600	5,400	1,500
30-34	16,800	21,300	23,600	6,800	2,300
35-39	16,900	20,300	21,600	4,700	1,300
40-44	18,600	20,900	20,900	2,300	0
45-49	18,400	19,600	19,900	1,500	300
50-54	18,900	19,300	19,600	700	300
55-59	17,800	17,900	18,100	300	200
60-64	14,800	15,000	14,600	-200	-400
65-69	12,600	12,800	12,700	100	-100
70-74	12,700	12,300	12,600	-100	300
75-79	9,700	9,500	9,500	-200	0
80-84	6,600	6,600	6,700	100	100
85+	7,300	7,300	6,900	-400	-400
TOTAL	285,800	304,800	307,700	21,900	2,900

Source: ONS and Iceni population modelling

A4.11 The implication is that the Census shows that the ONS 2018-based SNPP does not provide a reliable base projection of population growth for the Greater Cambridge area. It is based on under-estimates of population growth over the

period since 2011, and therefore can equally be expected to under-project future population growth.

Developing a trend-based population projection in Greater Cambridge

A4.12 In this section we move on to develop an updated trend-based projection for population growth in Greater Cambridge. As noted, a key driver of this is due to publication of new (2021) Census data which essentially resets estimates of population (size and age structure) compared with previous mid-year population estimates (MYE) from ONS. The trend-based projection is used as an alternative population input to the LEFM.

A4.13 Whilst for many areas, the ONS estimating of population through the MYE looks to be similar to results now published from the Census, there are many locations (notably Cambridge) where there are clear discrepancies between previous estimates and the Census.

A4.14 The analysis seeks to provide projections rebased to 2021 (Census data) and draws on ONS MYE data up to 2020 – including data about births, deaths and migration. It should be noted that the ONS projections are based on published data which in many cases (e.g. discrepancies between MYE and the Census) is likely to be incorrect and therefore all analysis has been carefully developed to be as robust as possible. It should also be noted there may be a potential impact of COVID-19 on the Census results – but at the time of analysis, there is insufficient data for a position different to the Census being reached.

A4.15 That said, assumptions have needed to be made and it is considered that these projections are based on the best information available at the time of writing. Assumptions will need to be reviewed as appropriate following further publications of data from ONS, including a new MYE to 2021, further releases of Census data and 2021-based subnational population projections (SNPP) – likely to be in 2023. In the next round of projections ONS will need to grapple with the same issues as raised in the analysis below, notably how to deal with past population estimates where Census data shows these to be substantially wrong.

A4.16 A projection has been developed looking at estimated migration trends over the past 5-years. A 5-year period has been chosen as it is consistent with the time period typically used by ONS when developing subnational population projections.

A4.17 Below we set out the general method used for each of the components of population change and the outputs from a trend based projection. The example used is for Cambridge (where the Census showed far stronger growth between 2011 and 2021 than had previously been estimated by MYE) but can equally be applied to South Cambridgeshire.

Overview of Methodology

A4.18 The start point of the projection was the population age and sex structure in 2021, based on Census data – this was slightly adjusted to take account of the fact that the Census was carried out in March, while demographic data typically looks at mid-year estimates.

A4.19 For births (fertility) the analysis drew on birth data up to 2020 and used this to estimate a fertility rate in each local authority. This was projected forward on the basis of projected changes within the most recent (2018-based) SNPP. It was considered important to provide an up-to-date estimate of births as (at a national level and locally) it is evident that fertility rates have been dropping and are currently some way below where they were projected to be in the 2014-SNPP.

A4.20 For deaths (mortality) a similar approach was taken (using data on actual deaths up to 2020). As with the birth data it was considered important to look at up-to-date death rates as mortality has generally been higher in the recent past than was projected by the 2014-SNPP (i.e. a greater number of deaths than had been projected). Combining birth and death data provides information on natural change, which was projected to be lower than previously projected.

A4.21 For migration two main analyses were undertaken to initially establish a base trend-level of migration. Firstly, the projections looked at how ONS had recorded migration in the past 5-years for which data is available (2015-20). The use of a 5-year period is consistent with projections typically developed by ONS. A five-year

period is however consistent with the trend period used in the 2014-SNPP. The second part of the analysis sought to use the Census data to look at the extent to which migration over the decade to 2021 might have been higher or lower than previously estimated.

A4.22 The two analyses of migration were used to estimate a base (starting point) for migration (taken to be the 2021/22 year). Moving forward the analysis modelled that migration might change as populations change. For example, as the population of an area increases there will be more people who could be out-migrants.

Fertility

A4.23 For fertility, it is the case that underestimating population will mean that fertility rates in the SNPP are too high (as ONS is essentially assuming a number of births to fewer people). To make an adjustment, the number of births for 2021/22 in the SNPP is used and then an estimate made of how many births the ONS rates would imply if the population age structure for 2021 (informed by the Census) is replaced as the base against which births are calculated. In the case of Cambridge, the higher population in the Census would imply a much higher level of births if the rates in the SNPP are used and so birth rates have been reduced significantly (initially by around 44%).

- 2021/22 births SNPP – 1,140
- 2021/22 births updated population – 2,040
- Rate as % of SNPP – 56% (1,140/2,040)

A4.24 There is however some more recent data about births from the 2020 MYE which can be used to moderate this figure (noting that the SNPP draws on data to 2018). In this case the actual number of births recorded is slightly higher than was projected in the SNPP so a small upward adjustment is made to the fertility rate.

- MYE births (2018-20) – 2,633
- SNPP births (2018-20) – 2,422

- Adjustment – 109% (2,633/2,422)

A4.25 The two adjustments are then multiplied to give a change to base fertility rates, this is around 61% (56% * 109%).

A4.26 The table below shows the adjustments applied for both local authorities. It can be seen that both are in a downward direction, reflecting the general trend (including up to 2020) for birth rates to be falling as well as adjustments made for Census population estimates.

Table A4.6 Adjustments made to modelled fertility rates from 2018-based position

Area	Adjustments to 2018 based SNPP fertility rates
Cambridge	61%
South Cambs	90%

Source: Derived from ONS data

Mortality

A4.27 The same issue arises with mortality, in that deaths recorded by MYE are applied to a different population than is now shown (i.e. deaths are applied to the MYE to calculate death rates in the SNPP but the 2021 Census shows a different population level and profile). Generally for mortality any adjustments are far more minor than for fertility, this is because most deaths occur in older age, and generally the MYE is fairly good at estimating the size of the older person population (in part due to them being less likely to be migrants). In Cambridge, the adjustment is very slightly in an upward direction, although only a 2% change from the SNPP position.

- 2021/22 deaths SNPP – 864
- 2021/22 deaths updated population – 843
- Rate as % of SNPP – 102% (864/843)

A4.28 A similar adjustment to fertility is made to take account of death data to 2020 as shown below, when this data is taken into account the modelled adjustment to death rates is very modest – rates being decreased by about 4% from the SNPP position.

- MYE deaths (2018-20) – 1,649
- SNPP deaths (2018-20) – 1,718
- Adjustment – 96% (1,649/1,718)

A4.29 Again, the two adjustments are multiplied to give a change to base mortality rates, this is around 98% (102% * 96%).

A4.30 The table below shows the adjustments applied for both local authorities in the study area. It can be seen that both are estimated to be around 98% - implying very little adjustment from the rates underpinning the 2018-SNPP.

Table A4.7 Adjustments made to modelled mortality rates from 2018-based position

Area	Adjustments to SNPP mortality rates
Cambridge	98%
South Cambs	98%

Source: Derived from ONS data

Migration

A4.31 When looking at migration our start point is to consider how different migration has been over the 2011-21 period (estimated using Census data) than was previously estimated (and projected) by ONS. Essentially the difference in population growth between the two sources – the MYEs as against the Census - is likely to be attributable to migration, this is on the basis that it is expected that births and deaths have been fairly well recorded by ONS.

A4.32 Analysis is slightly complicated by MYE data only being available to 2020 but the Census having a clear data point of 2021 (but not 2020). To try to provide as

consistent a comparison as possible the MYE to 2020 has been used and the incremental change in the SNPP for 2020-21 added on to get to a 2021 estimate. Whilst this will be an estimate, the inclusion of just 1-year of data from the SNPP is unlikely to have any significant impact on the findings.

A4.33 Again focussing on Cambridge, the figures below shows the MYE and SNPP expected/projected population to have increased by 2,110 people in the 2011-21 period, whereas the Census now shows a change of 21,833 – this is a difference of 19,723. This would imply net migration has on average been about 1,972 people higher per annum over the decade to 2021 (19,723/10).

A4.34 For information, the table below shows the same figures for both authorities in the study area, this clearly shows in both areas that population figures shown by the Census are above previous estimates/projections (to a lesser extent in South Cambs). It will also be noted from the table that the two 2011 figures are slightly different, this is due to one being a mid-year figure and the other dated as of the Census (which was March). The main difference is seen in Cambridge, which looks to be due to ONS removing some people of student-age between the two dates (presumably as students start to return home).

Table A4.8 MYE and Census population estimates – Greater Cambridge authorities

Area	Data Source	2011	2021	Change
Cambridge	MYE/SNPP	122,725	124,835	2,110
Cambridge	Census	123,867	145,700	21,833
South Cambs	MYE/SNPP	149,842	161,862	12,020
South Cambs	Census	148,755	162,000	13,245
Greater Cambridge	MYE/SNPP	272,567	286,697	14,130
Greater Cambridge	Census	272,622	307,700	35,078

Source: Derived from ONS data

A4.35 It is not known if this difference in population growth (attributed to migration) is due to an under-estimate of in-migration or an over-estimate of out-migration and in

reality it is likely to be a combination of the two. For the purposes of modelling it has been assumed that the difference is split equally between these two components, i.e. for Cambridge this means that in-migration was on average around 986 people per annum higher in the 2011-21 period and out-migration 986 people lower (i.e. 1,972÷2).

A4.36 Analysis also seeks to determine a baseline start position for each of in- and out-migration and to do this data from MYE up to 2020 has been used. To be consistent with the methodology used by ONS when developing SNPP data for the previous five years has been studied. Information about migration estimates is shown in the table below with average figures provided for 2015-20 (latest 5-years), 2013-18 (the 5-year period prior to the last published SNPP) and 2009-14 (the 5-year period relevant to 2014-based projections, as used in the Standard Method. The figures shown are all as published by ONS (i.e. excluding any adjustments to take account of differences between the MYE and Census).

A4.37 Looking at the study area as a whole, the analysis shows net migration to be generally decreasing, from an average of around 1,200 people per annum in the 5-years to 2014, down to 700 for the 2013-18 period and then approaching 300 per annum over the last 5-years for which data is available. For both authorities, the analysis generally shows a decreasing level of net migration.

Table A4.9 Past trends in net migration – Greater Cambridge authorities

Year	Cambridge	South Cambs	Greater Cambridge
2009/10	1,251	1,632	2,883
2010/11	252	1,317	1,569
2011/12	-747	456	-291
2012/13	-36	566	530
2013/14	4	1,092	1,096
2014/15	866	1,032	1,898
2015/16	-1,006	815	-191
2016/17	-237	203	-34
2017/18	334	382	716
2018/19	-1,505	1,083	-422
2019/20	-137	1,513	1,376
Average (2009-14)	145	1,013	1,157
Average (2013-18)	-8	705	697
Average (2015-20)	-510	799	289

Source: ONS MYE

A4.38 The table below shows the start point estimate of migration for Cambridge based on MYE data up to 2020 (so covering a 5-year period 2015-20). The table shows the average in- and out-migration over this period in Cambridge and the adjustment made to take account of the difference previously shown between population estimates and the Census. Over the 2015-20 period ONS estimated an average net out migration of 510 people each year, but the Census suggests this was around 1,972 higher and so the base position is net (in) migration of about 1,462. In modelling in- and out-migration figures are treated separately but it is typically easier to compare data when looking at net figures.

Table A4.10 Base estimate of migration – Cambridge

Migration	Average (2015 20)	Adjustment	Base position
In-migration	20,406	986	21,392
Out-migration	20,916	-986	19,930
Net migration	-510	1,972	1,462

Source: Derived from ONS data

A4.39 Across the whole of the study area, the start point net migration is estimated to be around 2,400 people per annum – this is significantly higher than migration recorded by ONS and is due to the Census showing a notably higher population in the study area than had previously been estimated.

Table A4.11 Base estimate of migration – Greater Cambridge

Area	Migration	In migration	Out migration	Net migration
Cambridge	Average (2015-20)	20,406	20,916	-510
Cambridge	Adjustment	986	-986	1,972
Cambridge	Base position	21,392	19,930	1,462
South Cambs	Average (2015-20)	11,393	10,594	799
South Cambs	Adjustment	61	-61	123
South Cambs	Base position	11,454	10,532	922
Greater Cambridge	Average (2015-20)	-	-	289
Greater Cambridge	Adjustment	-	-	2,095
Greater Cambridge	Base position	-	-	2,384

Source: Derived from ONS data

A4.40 It is however not a simple process to just apply these figures for each year of the projection as migration can vary over time. In- and out-migration need to be considered separately.

In-migration

A4.41 Levels of in-migration will to some extent vary depending on the size of the population from which migrants will be drawn. If for example typically 10% of people in Area A move to Area B in any given year then the size of the population in Area A will impact on the actual numbers moving. If in year 1 there are 10,000

people in Area A then 1,000 would be expected to move to Area B, but if in year 2 the population is only 9,000 there would only be 900 movers.

A4.42 The age structure will also have an influence on the number of moves as typically older people are less likely to be migrant and so an ageing population might see in-migration reduce over time, although an increasing population generally might be expected to see migration increase.

A4.43 For the purposes of modelling we have considered the relationship between the national population and the projected number of in-migrants. The latest national projection is a 2020-based ONS publication.

A4.44 Over time, population growth rates nationally are projected to fall (remaining positive but at a reducing rate) and this is in part (in early years) due to reducing levels of in-migration – although reductions in natural change have the greatest impact over the longer term. Overall, it is considered with an increasing population that levels of in-migration will increase over time but at a reducing rate. For the purposes of modelling it has been assumed that future in-migration will broadly track the midpoint between rates remaining in-line with national population change and the rates estimated for the 10-year period to 2020.

A4.45 Whilst this is an assumption, it is considered to be broadly reasonable given the general direction of demographics both locally and nationally.

Out-migration

A4.46 For out-migration, levels will vary depending on the size of the population in the area being studied. For example, if the population of Cambridge grows at a faster rate than other locations then there is a larger pool of people from which out-migrants might be drawn. With a growing population, out-migration would therefore be expected to increase over time.

A4.47 However, it is also noted that at a national level, out-migration in the early years of the projection is projected to fall, whilst a changing age structure (increasing older

person population) will to some extent moderate any changes, as older people are less likely to be migrant.

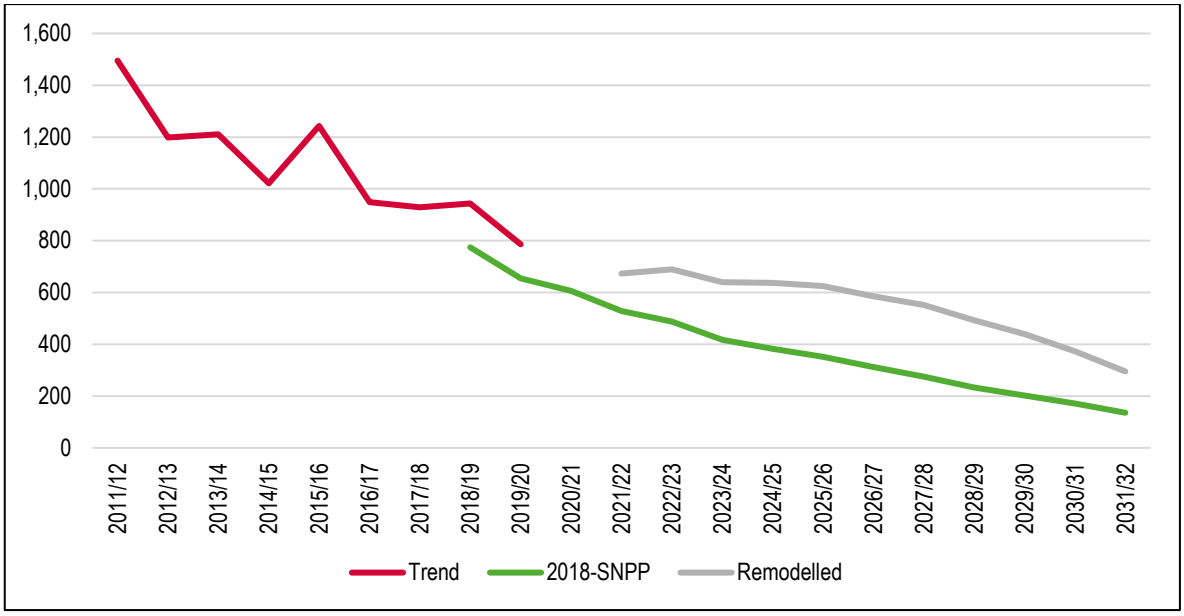
A4.48 Therefore a consistent method to that used for in-migration has been applied for out-migration, that is the estimated level of out-migration is set at the midpoint between estimated past levels of out-migration and the level that would be expected if the ratio between population growth and out-migration were maintained. As before, this is an assumption, but is likely to be reasonable given the range of data available.

Study-area-wide projection outputs

A4.49 The above estimates of fertility, mortality and migration (including changes over time) have been modelled to develop a revised demographic projection. Below are a series of charts showing key components of change and overall population change. For contrast, data is compared with that from the 2018-based SNPP, that being the most recent projection released by ONS.

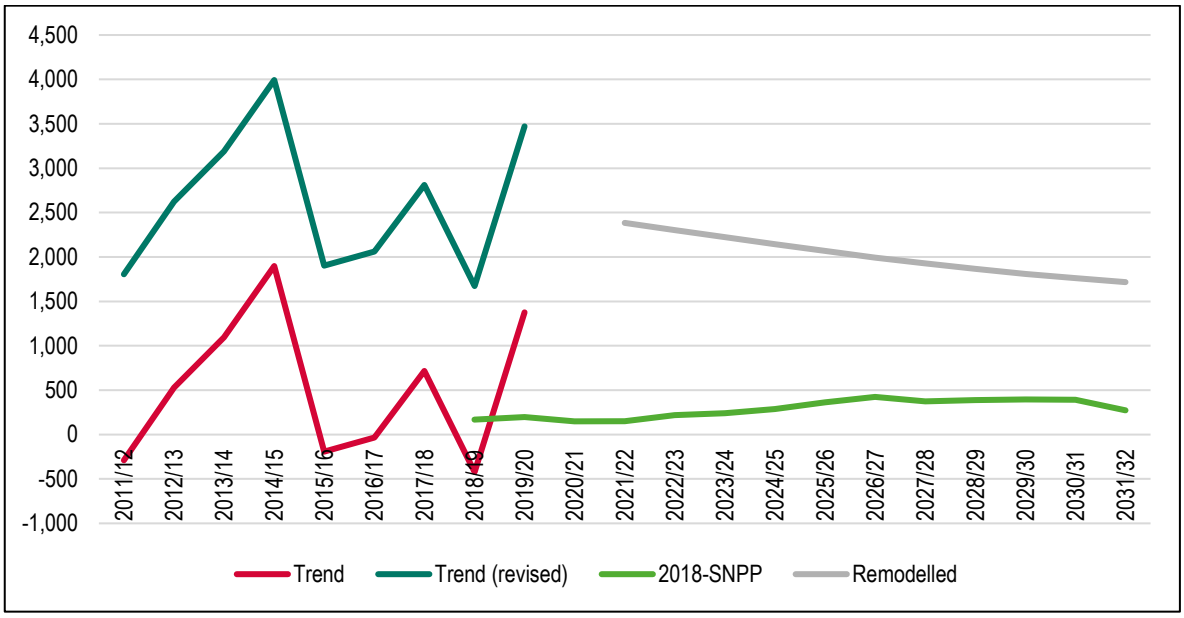
A4.50 It was previously noted that Census and MYE figures for the same date show different population figures – this being due to the Census being carried out in March (i.e. not mid-year). For the purposes of population projections it is typical to look at mid-year data and therefore a small adjustment has been made to Census data for 2021 to get to a mid-year position. This has been based on adjustments seen in 2011 (i.e. looking at the difference between the MYE in 2011 and Census data for the same year) and applying the same difference for 2021.

Table A4.12 Past trends and projected natural change – Greater Cambridge



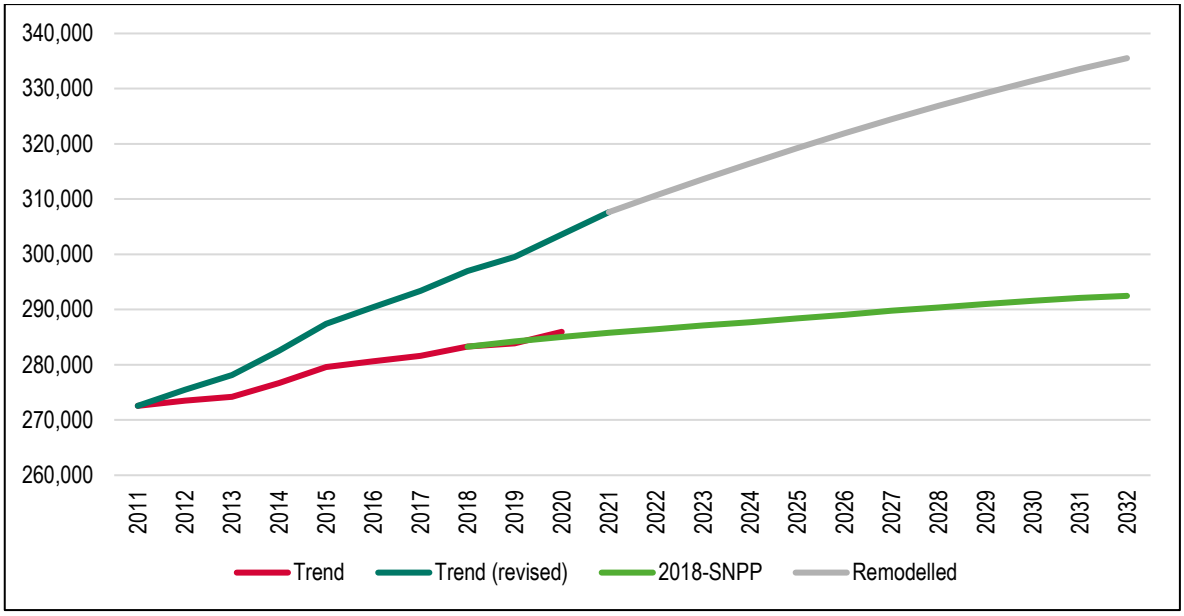
Source: ONS and demographic projections

Table A4.13 Past trends and projected net migration – Greater Cambridge



Source: ONS and demographic projections

Table A4.14 Past trends and projected population – Greater Cambridge



Source: ONS and demographic projections

A5. Household Estimates and Projections

A5.1 This Appendix addresses the assumptions used in modelling household formation (the household representative rates) in the demographic modelling, as referred to in chapter 6 of the main report relating estimates of population to homes and vice versa.

A5.2 Household representative rates are used to convert population estimates into households by discounting the communal population (to give a household population) and then applying household representative rates (HRR). The first analysis is however to estimate the number of households in the study area (and authorities) as of 2021. The table below shows household estimates from the Census and also dwelling counts from DLUHC live tables.

A5.3 It can be seen in both areas that the number of completions exceeds the growth in households. It is unclear why the Census figures are lower and modelling has been undertaken to provide estimated households in 2021 based on looking at the relationship between households and dwellings in 2011 and applying a similar relationship to 2021 dwellings. In doing this, a base number of households in 2021 is as shown below:

- Cambridge – 54,263
- South Cambridge – 68,013

Table A5.1 Change in the number of households and dwellings (2011-21) – Greater Cambridge

Area	Household sor Dwellings	2011	2021	Change
Cambridge	Households	46,714	52,400	5,686
Cambridge	Dwellings	48,288	56,091	7,803
South Cambridge	Households	59,960	67,000	7,040
South Cambridge	Dwellings	61,724	70,014	8,290
Greater Cambridge	Households	106,674	119,400	12,726
Greater Cambridge	Dwellings	110,012	126,105	16,093

Source: ONS (Census) and DLUHC (Table 125)

A5.4 In projecting forward, data about household representative rates (HRRs) has been drawn from the 2014-based subnational household projections (SNHP). 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 2014-based figures are used as these underpin the Standard Method and generally have attracted less criticism in terms of building in a suppression of household formation than more recent projections.

A5.5 It is necessary for the purposes of this report to consider not simply trends in household formation but to consider what are suitable assumptions to assume for the purposes of strategic planning. It would not for instance be appropriate to apply assumptions which assumed a deterioration of affordability or constraint on housing supply resulting in reduced household formation. This would not be consistent with national planning objectives.

A5.6 Recent SNHP (since the 2014-based release) have come under sustained criticism. This is largely as they are based on data in the 2001-11 Census period and project forward trends in household formation in this period – one in which housing affordability deteriorated significantly. In Greater Cambridge, this suppression is particularly evident for the 25-34 age group where there was a

notable drop in formation rates from 2001 to 2011, and ONS are projecting some continuation of this moving forward to 2021, after which the (lower) rate is held broadly stable. The assumptions on household formation in the 2016- and 2018-based household projections thus assume that household formation for younger age groups is constrained. We consider that the appropriate starting point is therefore to use the assumptions within the 2014-based Household Projections. This is consistent with the approach used in the standard method.

A5.7 Data about the communal population has also been drawn from the 2014-SNHP. For all areas, the 2014-HRRs have been adjusted to match the estimated number of households shown above with future (projected) years using the same incremental changes as in the base source.

A5.8 However, government objectives are to improve affordability. The modelling therefore assumes a ‘part return to trend’ in household formation rates for those aged 25-44 over the projection period, moving back half way to the position shown in the 2008-based household projections over the projection period. This approach models improved housing affordability and ability to form households for younger people over time. It responds to national policy requirements including the integration of market signals into assessment of housing needs.

A6. LEFM Model Description

A6.1 LEFM is a demand-led model that models the relationships between firms, households, government and the rest of the world in a highly disaggregated framework (e.g. 45 sectors), which enables the impact on the economy (employment and value added) of demand-side factors (such as an increase in demand due to stronger world growth) to be analysed.

A6.2 LEFM has been developed by Cambridge Econometrics (CE) in collaboration with the Institute for Employment Research at the University of Warwick. It is a software package tailored to model regional and local economies. It has been commercially available since the early 1990s (since when it has been continually developed) and is designed to empower organisations to undertake detailed economic analysis in-house. It is used extensively by local agencies, including local authorities, and by CE for more specialised analysis often commissioned by local authorities.

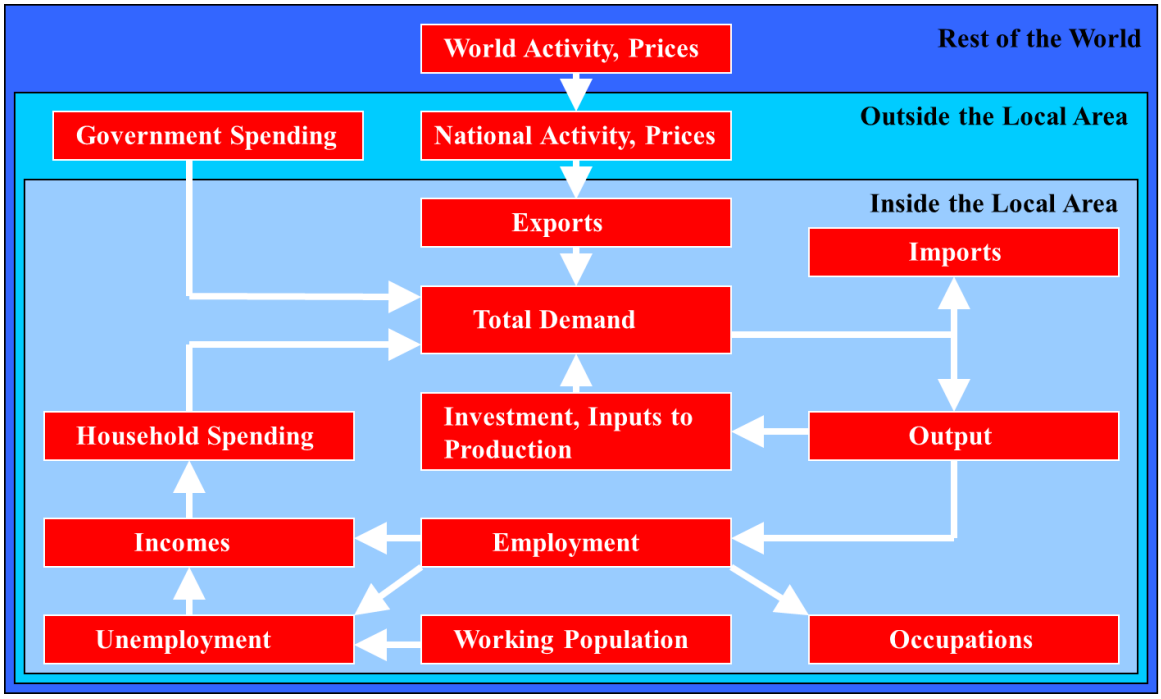
A6.3 LEFM has been designed to project economic indicators for a local area by explaining the output of local sectors through an explicit representation of expenditure flows in the area and their links with the world outside the local area. In this it differs from other methods of local economy modelling which typically link local output or employment (by sector) directly to national or regional output or employment. Such methods include shift-share or econometrically estimated equations. While these methods allow a user to derive projections for local output or employment growth from national or regional projections, they offer little scope for introducing an explanation of local performance relative to these higher levels, and they are typically not suitable for analysing the indirect effects on the local economy arising from the opening of a new enterprise or the closure of an existing one.

A6.4 LEFM is also distinguished from other approaches by its sectoral detail. It identifies 45 sectors1 (defined on SIC07), allowing (for example) electronics to be distinguished from electrical equipment, and IT services from other business

support services. Detailed disaggregation by sector is usually valuable because different sectors have different prospects (e.g. technological change is driving much faster growth in electronics and computing than in the other sectors with which they are commonly combined), because they have different employment characteristics, and also because it allows local knowledge about specific firms to be more easily incorporated in the forecast. There is, however, a cost to working in such detail: most variables in the model have to be disaggregated by sector (or a similar classification: see below for more details).

A6.5 LEFM's structure draws heavily on that of MDM, CE's multi-sectoral model of the UK economy and its regions.

Table A6.1 LEFM diagram (Cambridge Econometrics)



A7. Employment Land Supply Changes Compared with the March 2021 Data

Corrections

A7.1 Former Waste Water Treatment Facility Cambridge Road Hauxton - identified as industrial, but it should be registered as sui generis. (loss of 32,000m2 B2 floorspace in monitoring data at March 2021).

Proposed Changes to employment allocations in 2018 Local Plans

A7.2 Church End Industrial Estate Cambridge - Site is proposed for deallocation, as no capacity for further growth on the site (gain of 2,432m2 B2 in monitoring data at March 2021)

A7.3 1 and 7-11 Hills Road – Cambridge Local Plan allocation E5, – the redevelopment of this site is not considered to be deliverable and therefore the Greater Cambridge Employment Land and Economic Development Evidence Study (November 2020) recommends that it is de-allocated. This was reflected in the Local Plan First Proposals (gain of 953m2 B1a in monitoring data at March 2021)

A7.4 Dales Manor Business Park, Sawston (Policy H/1a) – no longer anticipated to provide housing as a result of implemented industrial planning consent, and proposed for removal as a residential allocation by the First proposals (loss of 11,357 B1, 3,370 B2, 3,370 B8 in monitoring data at March 2021)

A7.5 Housing allocation at, The Paddocks Trading Estate, Cherry Hinton Road, Cambridge - this is an active site of mixed commercial uses and in reviewing whether the allocation should be carried forward, it is considered more appropriate to retain the site for the existing uses, rather than it being redeveloped for residential uses. This was reflected in the Local Plan First Proposals. (loss of 4,002 B1, 4,491 B2, 4,491 B8 in monitoring data at March 2021)

Housing Allocation Land North of Over Road, Longstanton - Site allocated for Offices; Research and Development; and Light Industry in the 2018 South Cambridgeshire Local Plan. The First Proposals suggested the employment use be deleted and replaced with a site for new housing, that will also support the completion of community facilities in the village. (gain of 12,500 B1b in monitoring data at March 2021)

A7.6 SCDC Local Plan 2018 allocation SP/12b West of Eastern Counties Leather, London Road, Pampisford – Residue of Local Development Framework allocation, not longer considered to provide additional capacity. Deletion of this was noted in Greater Cambridge Employment Land and Economic Development Evidence (November 2020). (gain of 6,078m2 B1 in monitoring data at March 2021)

A7.7 Land South of the Business Park, Cambourne – Now anticipated to be a primarily residential development (Previously identified as a gain of 4,400m2 B1)

Updates to reflect resolutions to grant planning permission

A7.8 West Cambridge - Outline planning permission was resolved to be granted in July 2021 (subject to agreeing a Section 106 agreement) providing a long-term vision and strategy for the comprehensive development of the site. This would supersede the remainder of this outline from 1997. It has been resolved to approve subject to S106, and includes commercial/research institute floorspace, up to 170,000m2 will be commercial floorspace (Class B1b). (gain of 17,786 B1b in monitoring data at March 2021)

A7.9 Northstowe Phase 3 - Northstowe Phase 3 applications, which the council resolved to grant in January 2022, propose Phase 3A Local Centre Workspace (B1) 5,882 m2, and Phase 3A “Flexible Workspace’ (B1) 3,325m2. Monitoring data included residue based on the Northstowe AAP allocation. All phases now have planning permission, so monitoring data should reflect these commitments instead (gain of 21,915 B1, 9,552 B2, 13,374 B8 in monitoring data at March 2021)

Bourn Airfield - Pending outline planning application (S/3440/18/OL) includes 1500m2 new employment space. Previous data based on estimates. (gain of 8,800 B1, 500 B1a 500 B2, 500 B8 in monitoring data at March 2021) **Significant Planning Decisions since March 2021**

A7.10 Betjeman House Broadcasting House Botanic House and Public Houses at 106 - 108, Hills Road, Cambridge - 06/0552 superseded in March 2022 by 20/03429/FUL on appeal, including 26,674m2 of office space (loss of 4,190 b1a in monitoring data at March 2021 based on an earlier consent for residential use).

A7.11 An Outline application (S/4615/18/OL) for Cambridge Research Park for 28,000m2 of mixed B1 (a) B1 (b) B1 (c) B2 and B8 space received permission in April 2021. A subsequent reserved matters application (21/05624/REM) for 8,400m2 (GEA) of mixed offices, research and development, light industrial, general industrial, storage and distribution in what are described as Mid tech and Low tech buildings on Plot 5000 was approved in June 2022. To note: the Section 106 agreement for the outline permission caps floorspace at 8,400m2 for the first phase of development 'unless adequate transport network capacity can be demonstrated in subsequent phases', due to capacity issues with the A10. The outline permission included 12,170m2 on Plot 5000.

A7.12 A new R&D building on Site 1, Granta Park (21/03822/FUL) was granted permission in September 2022. This will create an additional 11,316m2 (GIA) of R&D space,

A7.13 The erection of a new 3,480 m2 office/R&D building at Babraham Research Campus (21/03607/FUL) received permission in January 2022.

A7.14 F2 and B2 Devonshire Road was received planning permission (21/00264/FUL) in April 2022. It includes an additional 4,629 m2 (GIA) of B1(a) floorspace.

A7.15 The demolition of Lockton House, Clarendon Road Cambridge and 1&2 Brooklands Avenue and their replacement with two new office buildings (20/04826/FUL) will create net additional Use Class E space of 5,216 m2.