Oxford-Cambridge Supercluster

Scenario Modelling

Oct
2024

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Overview

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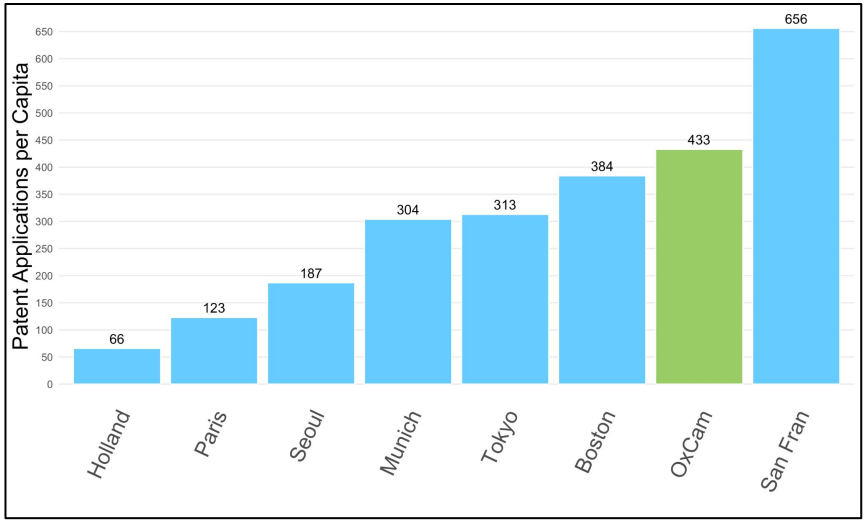
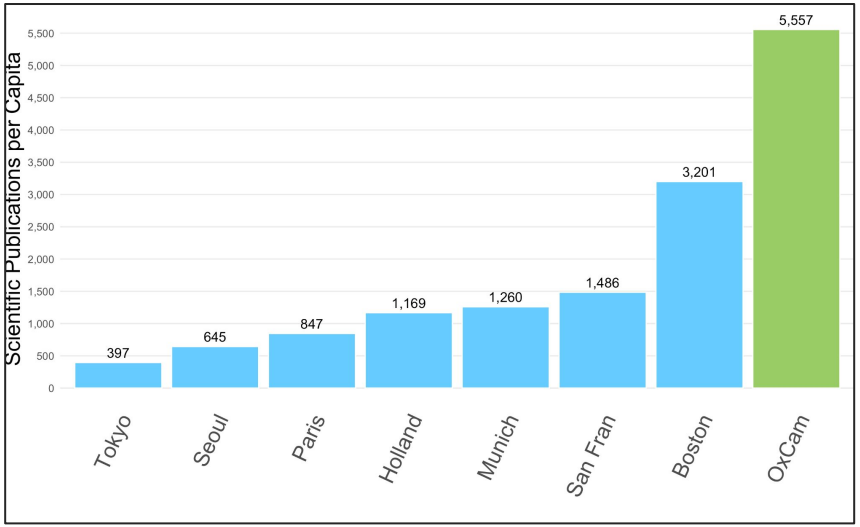
The OxCam region is one of the most innovative globally, with world leading levels of patents and scientific publications per capita





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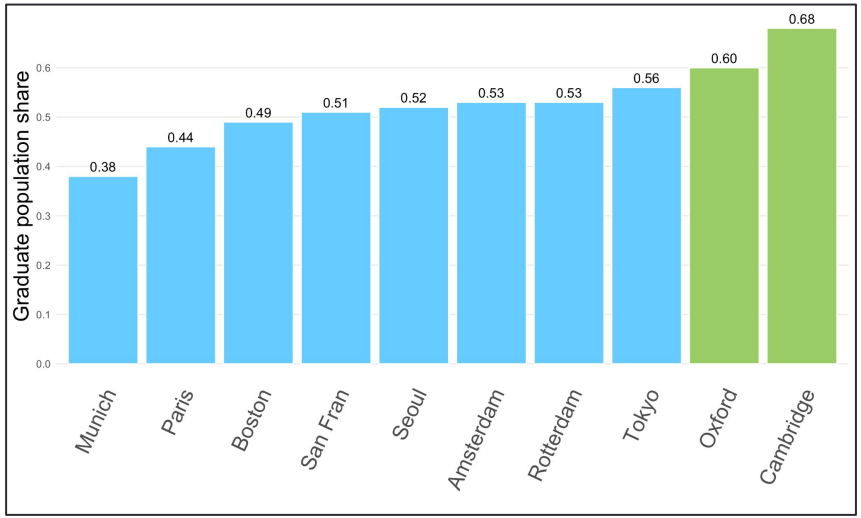
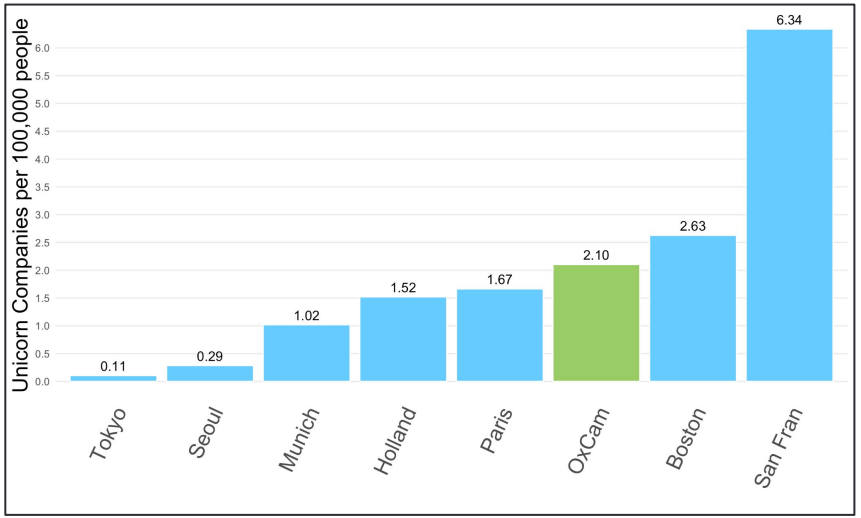
The region also boasts extraordinary levels of graduate educated population, and at a per capita level produces a high amount of Unicorn startup firms (valued over $1bn)





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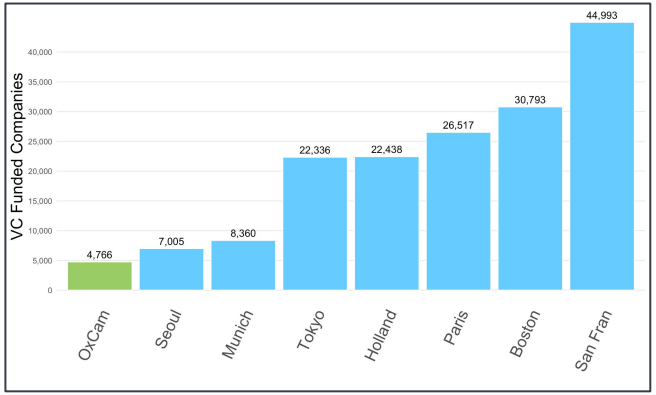
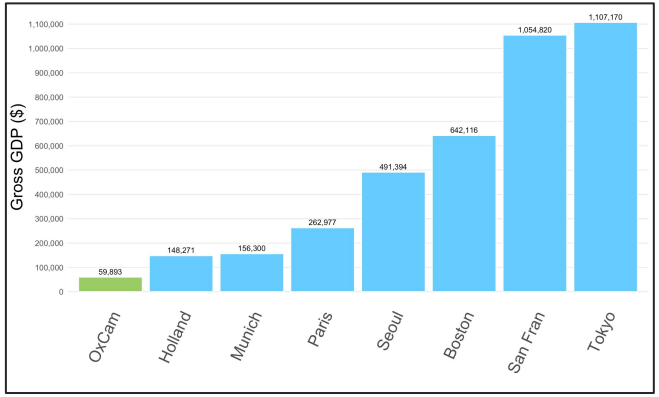
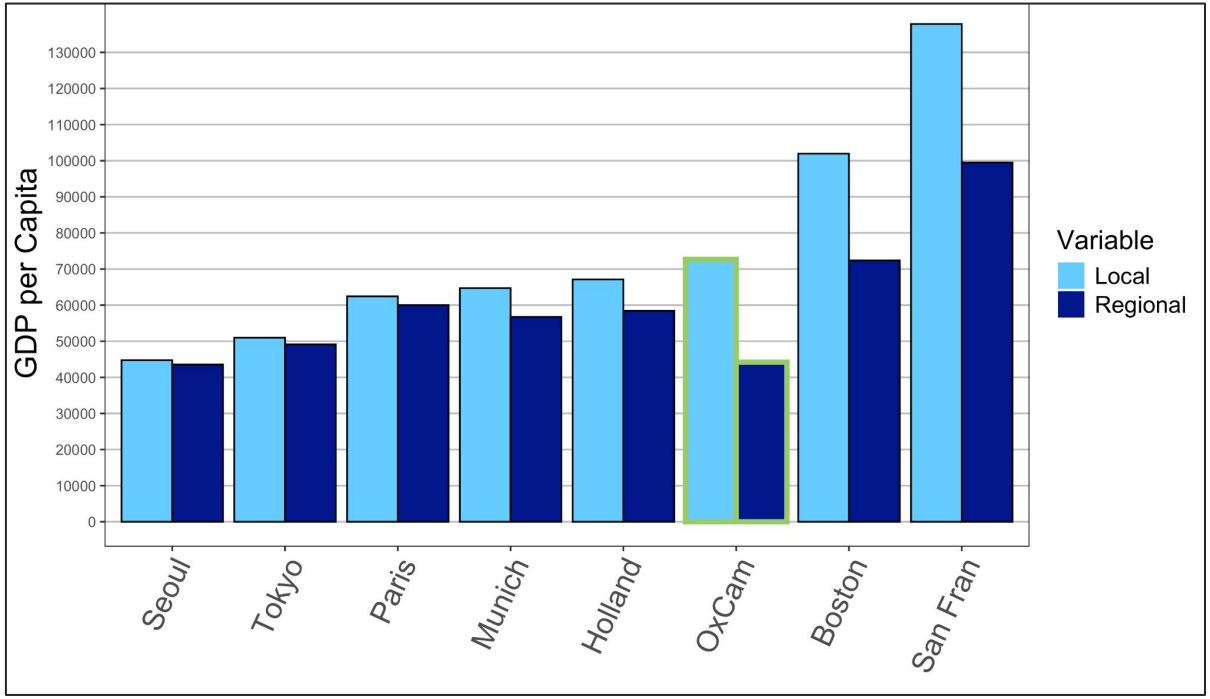
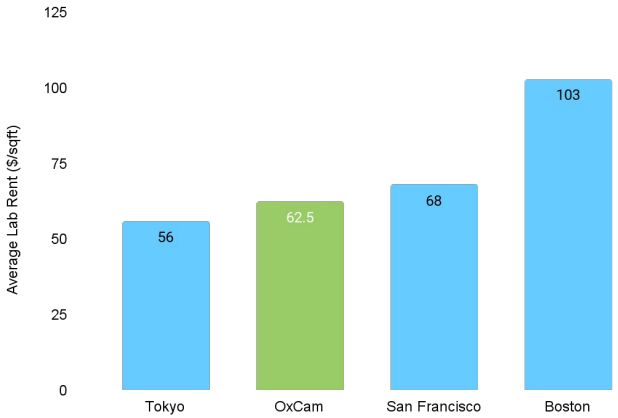
Despite high GDP per capita, the spillover effects are small because the overall scale is small







Whilst the region's high skilled sectors continue to grow above national levels at 3-4%, excess demand for housing and commercial space paint an unsustainable picture



Lab Rents are on a par with San Francisco

850,000 ft²

Shortfall of Lab Space in Cambridge Alone

12

Ratio of average house prices in Oxford and Cambridge to average earnings - Well above England average of 8.2

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Model

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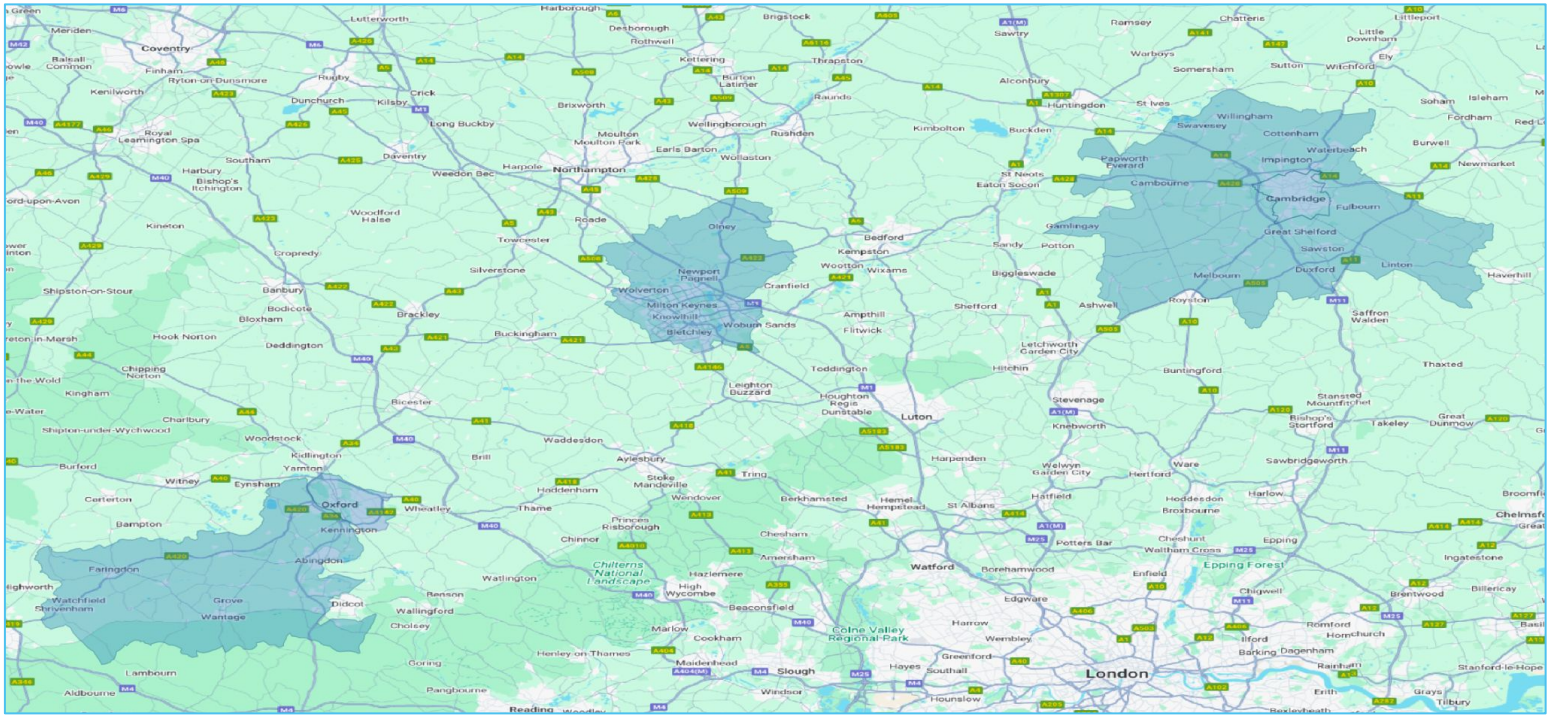
We model growth in the GVA of Oxford, Milton Keynes and Cambridge, but allow for infrastructure to be delivered across the entire region



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We have modelled the effect of three scenarios on GVA produced by the core OxCam region over the next 25 years to 2050

Stagnate

This scenario considers the effect of limited policy ambition to address constraints to growth.

Outcomes

- **Skilled worker growth** slowly falls to levels in line with national trends (1%)
- **Job growth** remains at similar levels, creating 150,000 new jobs
- Growth rates of VC backed **startups** stagnate at current levels of 1%
- National **R&D** remains at 2.8% of GDP over the time period, with OxCam retaining its current share
- 30% Skilled worker **growth** comes from **additional** sources (immigration, international students and upskilling)

Maintain

This scenario considers the effect of moderate policy ambition, relaxing constraints to continued growth

Outcomes

- **Skilled worker growth** is sustained at 4%
- **Job growth** strengthens, adding 300,000 new jobs
- Creation rates of **startups** in the region continue to strengthen to 2% growth
- **R&D** reaches 3% of GDP, with the region contributing the same share to this higher expenditure
- 37% skilled worker **growth** comes from **additional** sources

Growth

This scenario considers the effect of ambitious policy, boosting the region towards full potential

Outcomes

- **Skilled worker growth** is improved to 6%
- Significant barriers to **job growth** are removed, adding 450,000 new jobs
- Creation rates of **startups** in the region are vastly improved to 5% growth
- **R&D** reaches that of international leaders, reaching 3.2% of GDP, with the region contributing the same share
- 40% Skilled worker **growth** comes from **additional** sources

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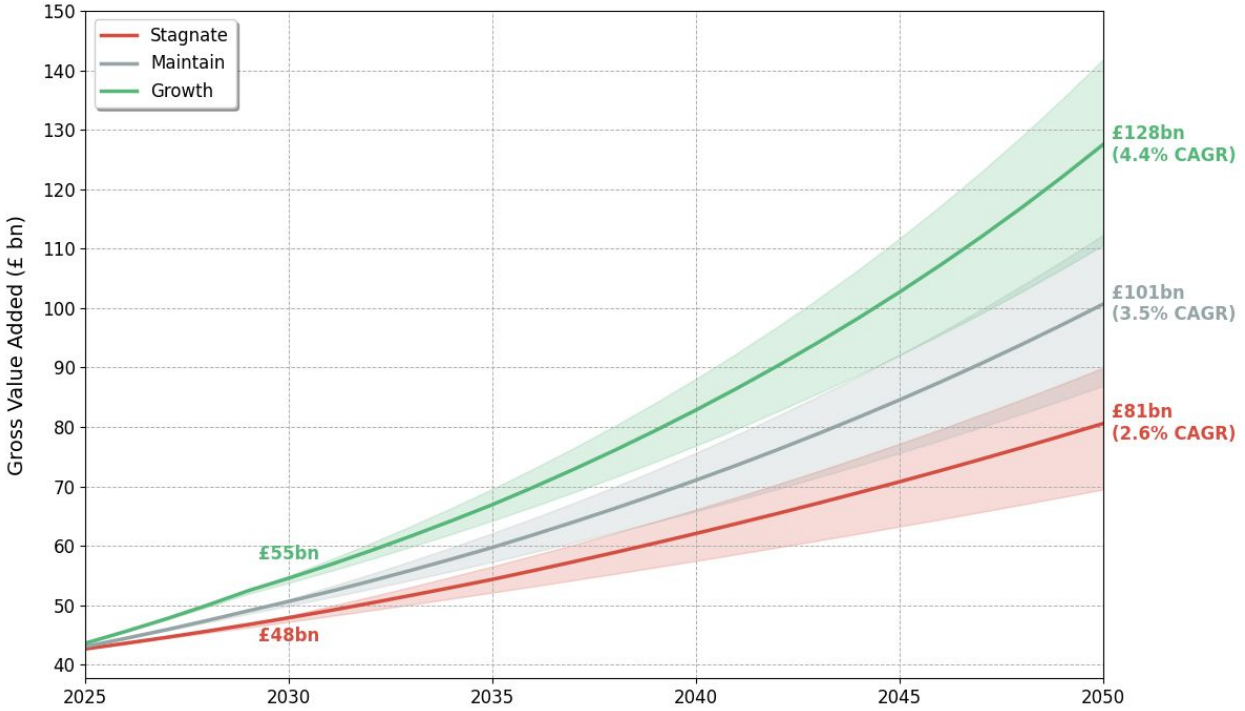
There is potential for the OxCam core to provide significant economic outcomes for the UK in both the short and long run



It is worth noting that while our growth model factors in the effect of increased R&D spending on productivity in the long run, current GVA figures do not include R&D expenditure, and therefore likely underestimate the region's current impact to the economy. Including R&D expenditure could increase the current GVA estimates by £4bn-£5bn

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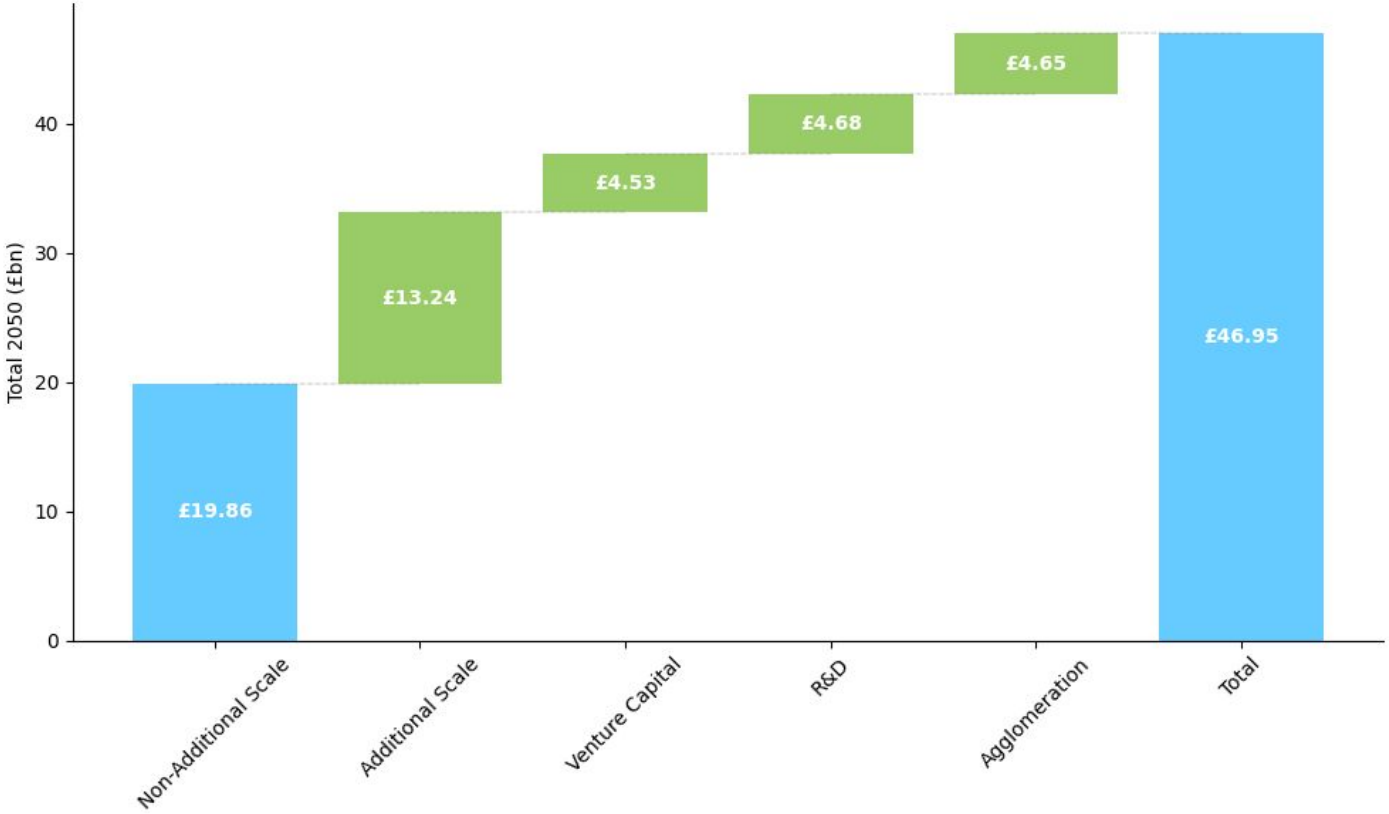
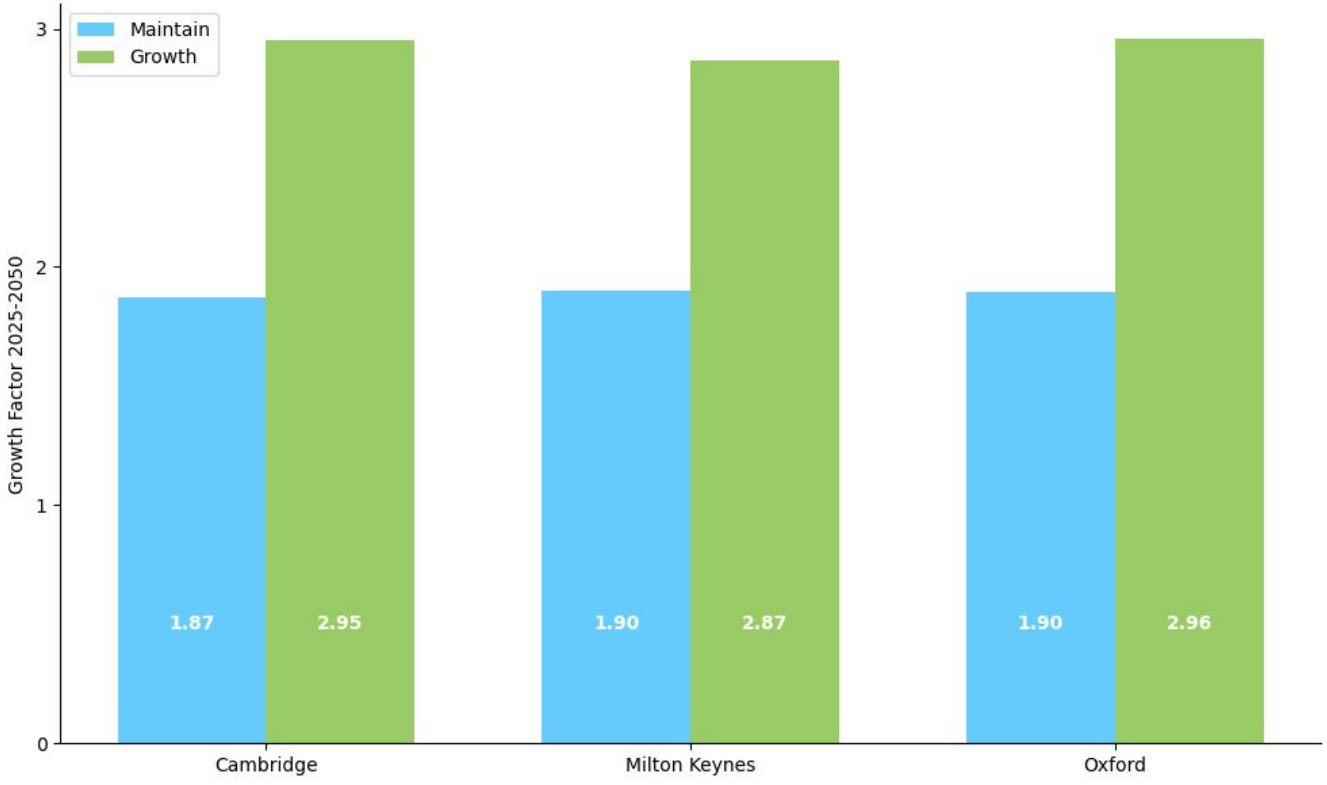
By 2050, the growth scenario achieves a GVA of £47bn above the baseline, equivalent to £51bn in GDP, and much of these gains can be additional to the UK economy



Alongside productivity gains from our economic drivers, if skilled worker growth can be fuelled by upskilling and attracting skilled workers internationally, we estimate £27bn of additional GVA or **£29bn of additional GDP** could be generated for the economy in the growth scenario- **the equivalent of three times the output of Cambridge city alone**

Growth is spread evenly between the regions, with the opportunity for each to nearly triple their economic output in the high growth scenario



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These are example policies that could address the key constraints and move us to the growth scenario

Innovation & Startups

- No increase in VCT, SEIS and EIS funding
- No increase in capacity to approve innovation founder visas
- Increases in VCT, SEIS and EIS funding caps and provision
- Increased capacity to approve innovation founder visas
- Investment in incubators
- UK TIBI scheme
- University spinout dashboard
- Yozma-style co-investment

Agglomeration

- EWR not delivered
- No new towns & limited land release
- Growth and skills levy not directed to R&D intensive sectors
- Land release
- New towns & small scale developments across EWR
- Update to growth and skills levy, directed at R&D intensive activity
- Reduced skilled worker visa salary caps
- Business rate uplift retention
- Tax Increment financing

R&D

- No change to R&D expenditure credit, limited data centre expenditure
- Adaptations to R&D expenditure credit
- Investment in data centre capacity
- Including CAPEX in R&D expenditure credits
- New public-private R&D programmes to support industrial priorities
- Implement bespoke sandbox environments for key technologies
- Bring UK visa costs and salary caps in line with OECD top quartile

- Baseline Stagnate Scenario
- Various ambition Maintain and Growth Scenarios
- Growth scenario only

Main Model Drivers

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Agglomeration: Using the stagnate scenario as a baseline, additional density of skilled workers could provide significant benefits

Increased sharing of knowledge, economies of scale and improved quality of skill matching provide productivity benefits, especially in high knowledge sectors.

We estimate that, in relation to the stagnate scenario the following benefits are realised by increase in scale, and then additional gains through productivity gains from agglomeration.

The current estimates assume half new skilled jobs are in proximity to existing ones (e.g. expanding business parks). The more jobs that can be created near existing activity hubs, the higher the potential gains. For example, if 75% of new skilled jobs are created near existing ones, **a further £2.3bn could be added** to the regions annual GVA.

Maintain

£16.5bn — Increase in 2050 GVA through scale effects

£1.5bn — Increase in 2050 GVA through agglomeration effects

Growth

£33bn — In scale effects - **equivalent to nearly double the current GVA of Sheffield**

£4.6bn — In agglomeration effects - **equivalent to the GVA of Norwich**

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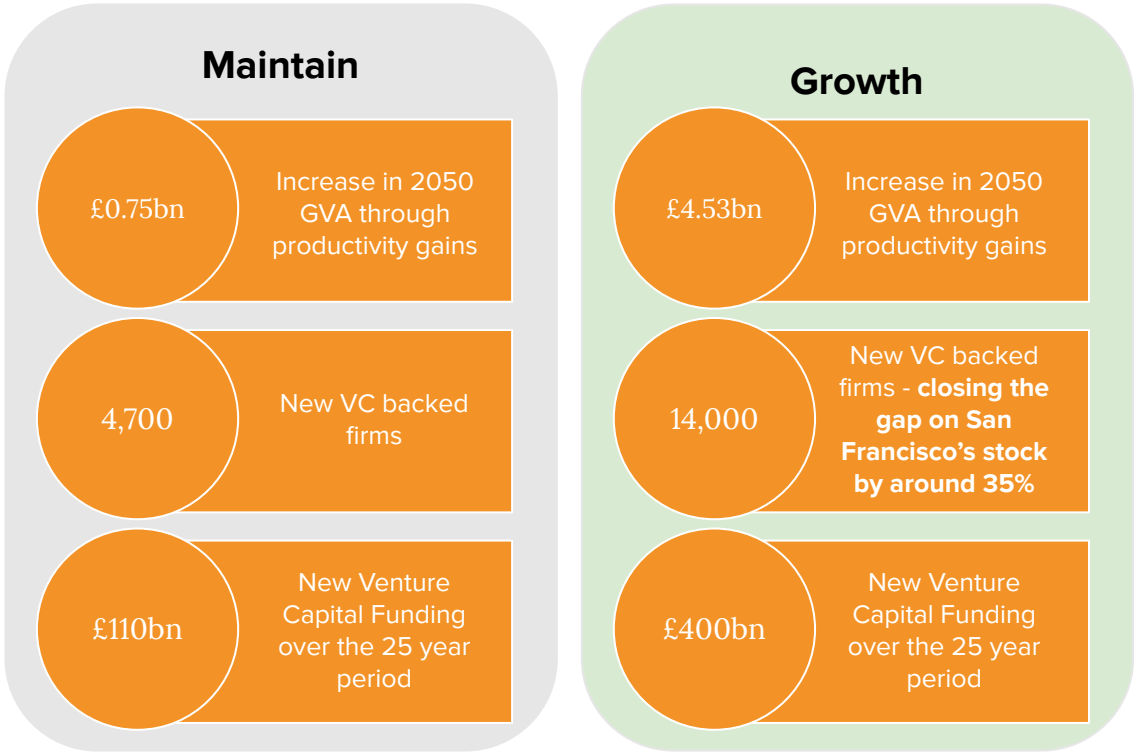
Start-Ups: If the region can attract investment to sustain high levels of venture capital per deal, startup growth offers potential for substantial economic gains

There are approximately 5,000 startup firms that have been founded across Oxford, Cambridge and Milton Keynes

Increased innovation, the creation of new markets and increased risk taking all have **positive impacts on productivity**

These gains occur under the assumption that new companies are of the same quality as the existing stock, requiring policy to focus on significantly **scaling amounts of venture capital** to the region



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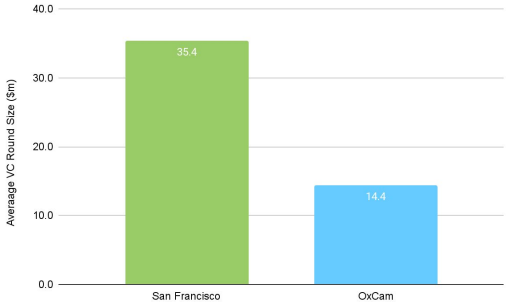
The high growth scenario implies a significant increase in venture capital funding which will require the type of intervention seen in Boston and Paris

Average deal size in Oxford and Cambridge are far below that in San Francisco, with many firms that are created in the OxCam region eventually leaving to markets such as San Francisco and Boston due to the provision of large scale capita



Boston - Lab Central:

Lab Central was founded in 2013, with the goal of sparking entrepreneurship and innovation in the biotech and life science industry. By providing a space and infrastructure for startups to test, demonstrate and connect with investors, the institution has achieved:

- **£14.5 bn in venture funding** over the 10 years since their inception
- Nearly **300 new companies** that have been supported by Lab Central
- **132 clinical trials** and **180 new patents** from companies supported by the institution

Paris - Station F:

Founded in 2017, Station F is a vast startup campus, leveraging partnerships with leading tech firms to offer a number of startup programmes, networking opportunities and even affordable housing for entrepreneurs. Results of the campus include:

- **£1 bn per year in venture capital** raised by startups at Station F
- **Over 1,000 startups** currently on campus
- Station F estimates it has helped create nearly **40,000 jobs** globally through the startups it has supported

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The OxCam region contributes substantially to national R&D, and increases to current expenditure have productivity benefits for OxCam and the wider economy

Maintain

£1.2bn

Increase in 2050 GVA through productivity gains

Growth

£4.7bn

Increase in 2050 GVA through productivity gains

Evidence suggests that increases in R&D can have significant productivity gains, especially when invested in the types of high tech sectors that exist in the region

Looking at the potential £4.7bn annual gains from R&D, the 'Maintain' scenario of keeping current R&D provides around 25% of this. Using the example of Korea, if **ambitious policy outlined above** can get us closer to leading countries in R&D, **a further 75% of potential gains** can be realised.

These potential productivity gains are not just local, but also have long term positive impacts on productivity nationally, and across different sectors

South Korea - Seoul:

South Korean R&D stands at an impressive **4.9% of National GDP** and total expenditure is the **5th highest globally**, with government policy focussed on supercharging research investment:

- **A tax credit for capital expenditure** on 'facilities and fixed assets' ranging from 10% for SMEs to 1% for large organisations.
- **Investment zoning** policies in high growth areas; Seoul offer tax incentives for both foreign and domestic research investment
- **Large direct government investment**, targeted at high growth R&D. For example a a 2020 $135bn fund for investment in sustainable technologies

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Underlying implications & constraints

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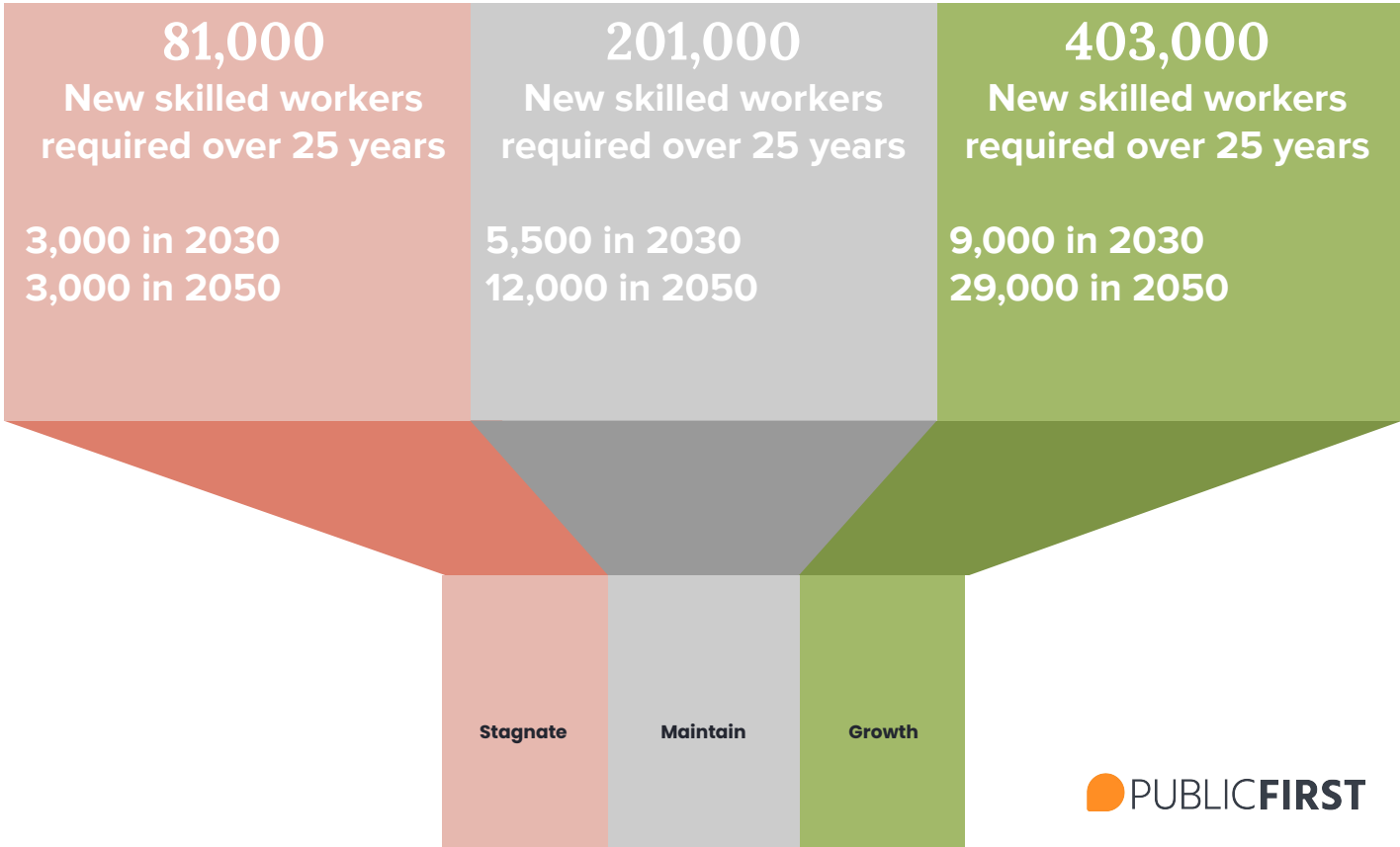
Skilled worker growth in the region cannot be met solely through university retention in the long run

3,000 students are retained on average each year across Oxford, Cambridge and Milton Keynes, losing around 83% of the 19,000 that graduate each year

Around 25% of these are international students

In the short term, this is enough to cover around 30% of new skilled worker requirements



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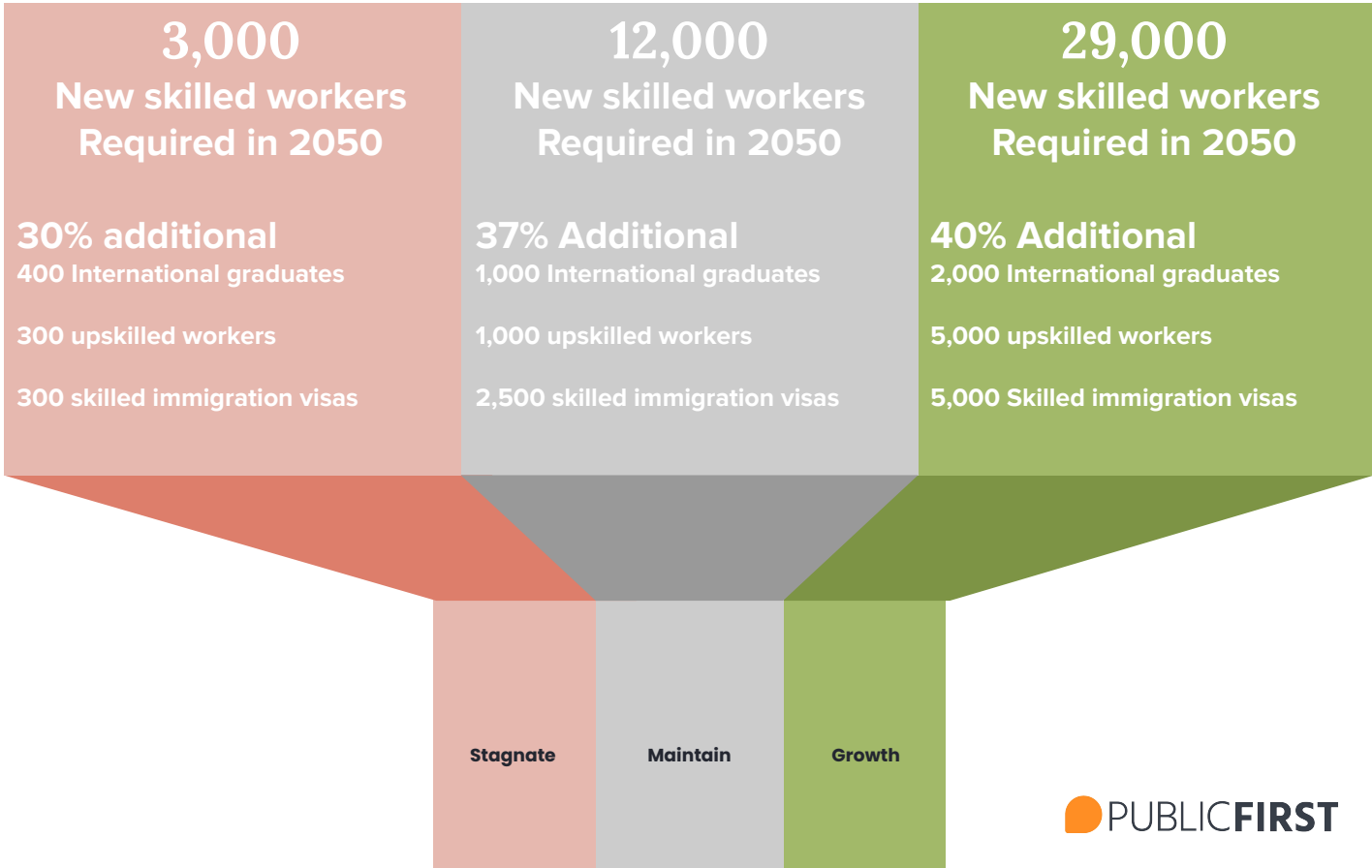
An ambitious approach on skilled workers has the potential to create significant additional gains for the economy

While some skilled worker growth will come from internal migration, there are **significant gains from upskilling existing workers and attracting skilled workers from abroad**

In our high growth scenario, if 5,000 skilled jobs can be filled by upskilling existing workers this implies **£5.6bn of annual scale effects can be additional to the UK economy** rather than just replacing a skilled job elsewhere in the UK economy

Similarly, if visas and increased graduate retention rates induce 7,000 international skilled workers annually, this equates to nearly **£8bn in additional scale effects**



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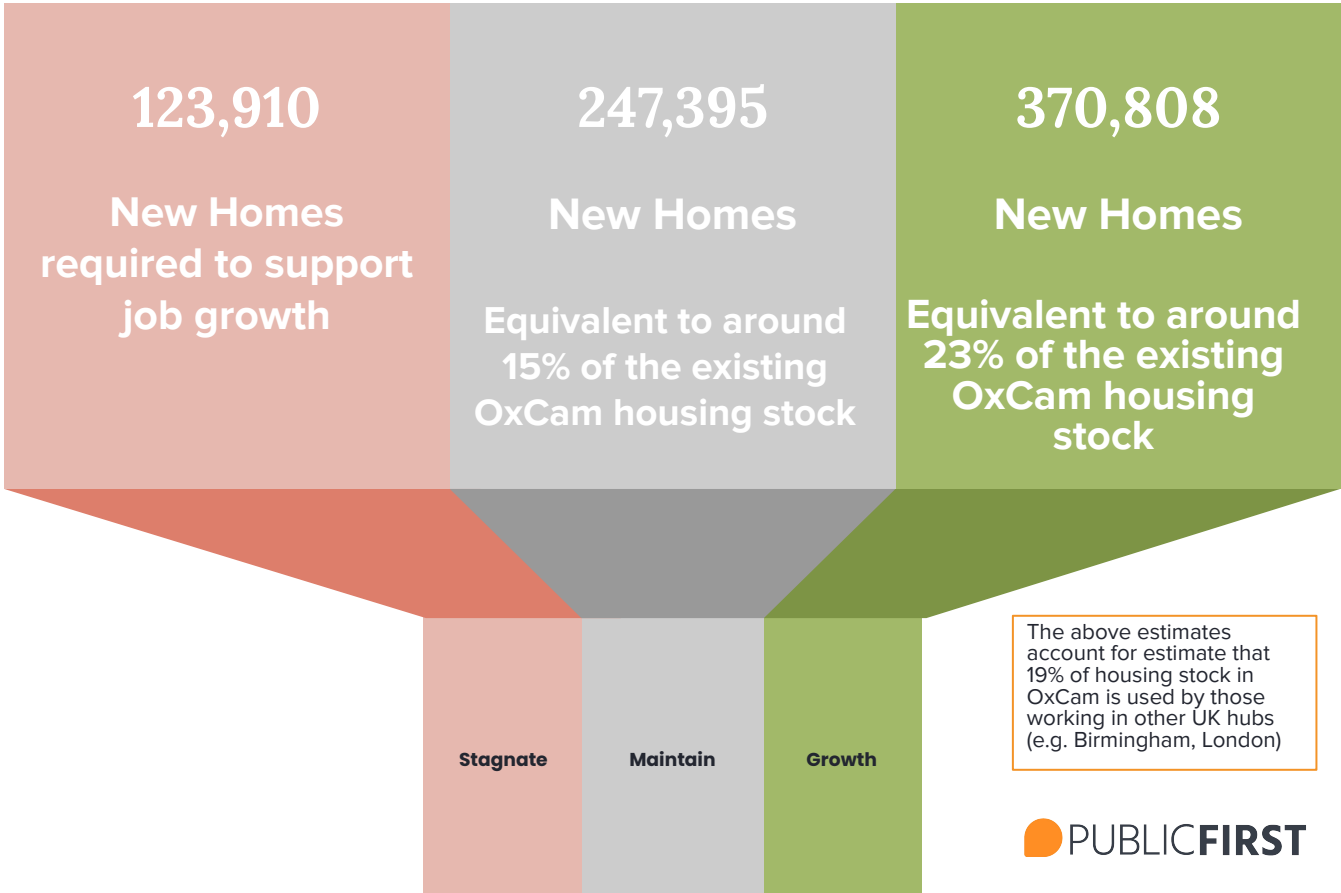
Under the high growth scenario that we model, there is significant homebuilding required over the next 25 years

The need for housing is an immediate concern, especially in Oxford and Cambridge. To reach the high growth scenario, the region should be aiming for nearly **15,000 homes a year** on average. This resembles a 300% increase above 2023 levels in Greater Cambridge, Oxford and Milton Keynes.

There are also **significant infrastructure constraints** to consider, for example an estimated £2.6bn in water infrastructure in the high growth scenario. Recent studies suggest the elasticity of output to infrastructure investment could be as high as 0.193, suggesting that to achieve the additional £47bn in GVA by 2050 could require **around £243bn of total investment over 25 years,** across areas such as education, transport and **healthcare infrastructure** in order to facilitate job and population growth in the region

Source: Ramey, V., The macroeconomic consequences of infrastructure investment, 2021



The above estimates account for estimate that 19% of housing stock in OxCam is used by those working in other UK hubs (e.g. Birmingham, London)

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Growth in life science, high tech manufacturing and other job sectors in OxCam require significant delivery of working space across the region

These requirements highlight a large requirement over the next 25 years, which is unlikely to be met without a holistic regional strategy to commercial space provision

Much like the flexibility EWR would bring to potential homebuilding locations, a connected region also provides the opportunity for the region to collaborate and identify projects that can be jointly beneficial to actors across the entire region

17.6mn ft^2 working space

- **7.8m ft^2 Office**
- **4.6m ft^2 Lab**
- **5.2m ft^2 Industrial**

48.9mn ft^2 working space

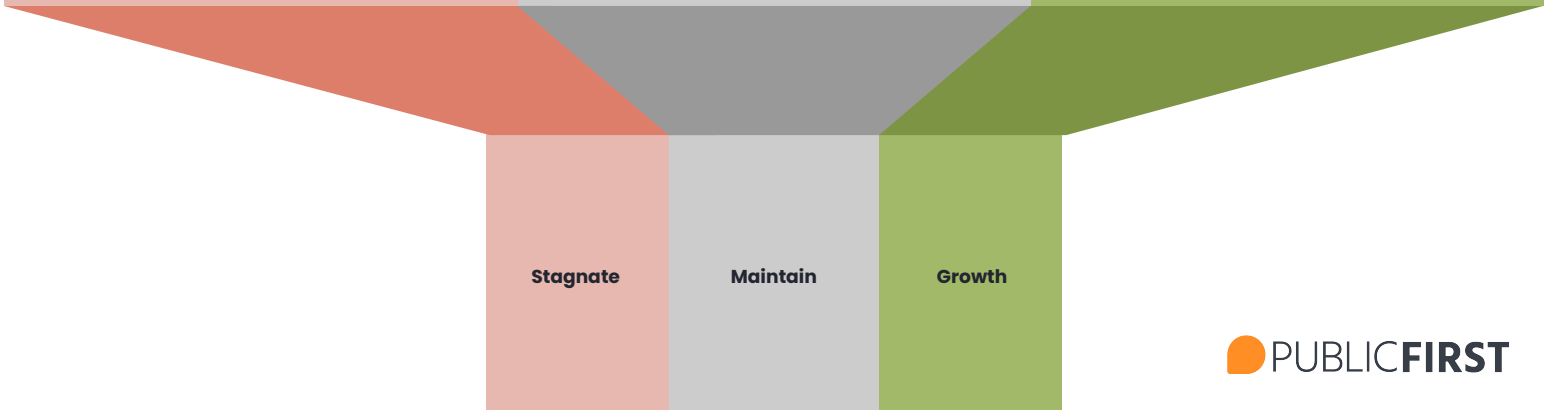
Equivalent to building nearly 16 Milton Science Parks

- **17.8m ft^2 Office**
- **15.6m ft^2 Lab**
- **15.5m ft^2 Industrial**

80.1mn ft^2 working space

Equivalent to building 40 Cambridge Science Parks

- **27.9m ft^2 Office**
- **26.5m ft^2 Lab**
- **25.7m ft^2 Industrial**



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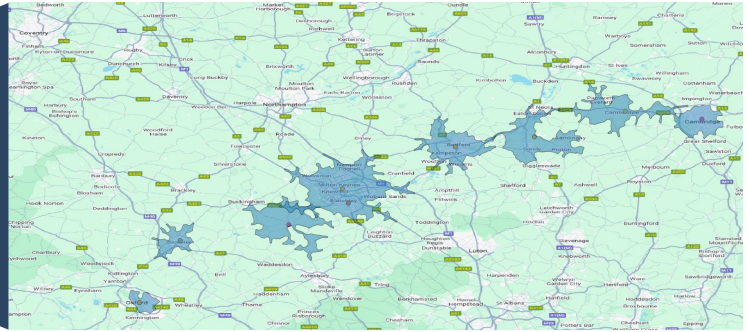
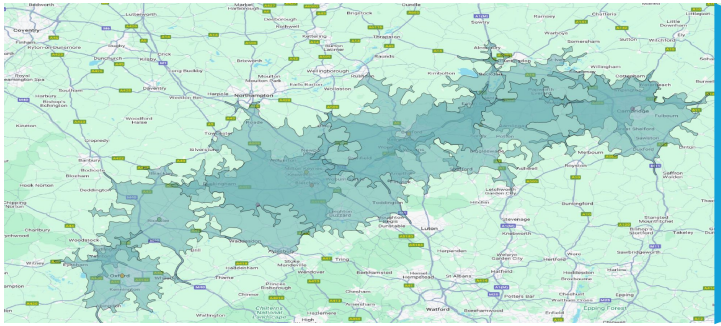
There is a strong case for East West Rail, which is crucial in providing flexibility to where commutable housing and working space can be built across the region

Through delivery of EWR, we estimate **374,000 homes** will be within 10 minutes of an EWR station, connecting homes across the entire region





Highlighting the opportunity of excellent first and last mile connectivity, an additional **305,000 homes** are within 20 minutes of these stations

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