

**NATIONAL
INFRASTRUCTURE
COMMISSION**

Challenges for Urban Planning and Decision Making

17th September 2018

Who we are

An executive agency of HMT established to provide impartial, expert advice and to make independent recommendations on economic infrastructure

A panel of eight experts, drawn from across industry and academia, and Chaired by Sir John Armitt

A secretariat of c.35 analysts, policy advisors and specialist secondees from government departments and key infrastructure sectors



What we do

Advise on all infrastructure sectors: energy, transport, water and wastewater, waste, flood risk management and digital communications

- Support sustainable economic growth across all UK regions
- Improve competitiveness
- Improve quality of life

Operate independently and at arm's length from government, making recommendations within a clear fiscal remit

Our work

A National Infrastructure Assessment once a Parliament, assessing the UK's long-term infrastructure needs with recommendations to government

In-depth studies into the UK's most pressing infrastructure challenges, making recommendations to the government

Monitoring the government's progress in delivering infrastructure projects and programmes recommended by the NIC

Completed Studies

Smart Power



March 2016

A Smart Power revolution, principally built around 3 innovations:

- **Interconnection**
- **Storage**
- **Demand flexibility**

Could save consumers up to £8 billion a year by 2030; help the UK meet its 2050 carbon targets; and secure the UK's energy supply for generations.

High Speed North



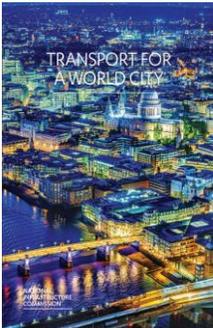
March 2016

A long term plan to reduce journey times, increase capacity and improve reliability.

On rail, HS3 should be at the centre of a High Speed North, integrating with HS2 and redevelopment of gateway stations.

On roads, investment should be brought forwards on the M62, alongside funding to identify and assess further proposals.

Transport for a World City



March 2016

Subject to strict conditions on funding, cost and housing **Crossrail 2 should be taken forward as a priority.**

Funding should be made available now to develop the scheme fully with the aim of submitting a hybrid bill by autumn 2019. This would enable Crossrail 2 to open in 2033.

Connected Future



December 2016

Major roads: Our motorways must have roadside networks in place by 2025.

Key rail routes: The railway network must rapidly improve connectivity and have a plan in place by 2017.

Towns and cities: Local Authorities and LEPs should work with network providers to establish a reliable network of in our urban centres.

Completed Studies

Cambridge-Milton Keynes-Oxford Growth Arc



November 2017

The Commission's central finding was that rates of house building will need to double if the arc is to achieve its economic potential.

This requires a new deal between central and local government – one which aligns public and private interests behind the delivery of significant east-west infrastructure (East-West Rail and the Oxford-Cambridge Expressway) and major new settlements, and which seeks commitment to faster growth through a joined-up plan for jobs, homes and infrastructure.

Any deal must give local areas the certainty, freedoms and resources they need to create well-designed, well-connected new communities.

Data for the Public Good



December 2017

Highlights the opportunities that new innovations like artificial intelligence and machine learning create to make the best use of our infrastructure. These could include:

- cutting the numbers of delays and disruptions to train journeys by better planning maintenance and making repairs more quickly through the use of sensor network;
- reducing the numbers of traffic jams on the roads by using smart traffic lights;
- responding to extreme weather events like snowstorms and floods in a more coordinated way;
- faster identification of leaks in the water network through data from smart water meters; and
- increasing competition between mobile and broadband operators by sharing data on signal and connection speeds – helping to end intermittent services.

The National Infrastructure Assessment



The Commission's plan of action for the UK's infrastructure over the next 10-30 years

The recommendations include:

- Nationwide full fibre broadband by 2033
- Half of the UK's power provided by renewables by 2030
- Three quarters of plastic packaging recycled by 2030
- £43 billion of stable long term transport funding for regional cities
- Preparing for 100 per cent electric vehicle sales by 2030
- Ensuring resilience to extreme drought
- A national standard of flood resilience for all communities by 2050.

Alongside these, better design and more efficient funding and financing can save money, reduce risk and create a legacy that looks good and works well.

The government has committed to respond to the Commission's recommendations and to adopt agreed recommendations as government policy.

Revolutionising road transport

Vehicles of the future will be cheaper, cleaner, quieter and safer

Electric vehicles mean:

- Cleaner air: vehicles contribute to 80% of air pollution breaches
- Lower costs: electric motors are 3 times as efficient as petrol
- Flexibility for the energy system: smart charging provides flexible demand

Charge point infrastructure is required to enable close to 100% electric new car and van sales in 2030

Connected, autonomous vehicles could bring even bigger changes, including for the roads themselves

Key recommendations:

- Making it easier to convert parking spaces and provide charge points on the street
- Investing in the electricity network to achieve the benefits of electric vehicles
- Government support for rural charge points
- Future road and rail investment plans need to reflect the impact of connected and autonomous vehicles

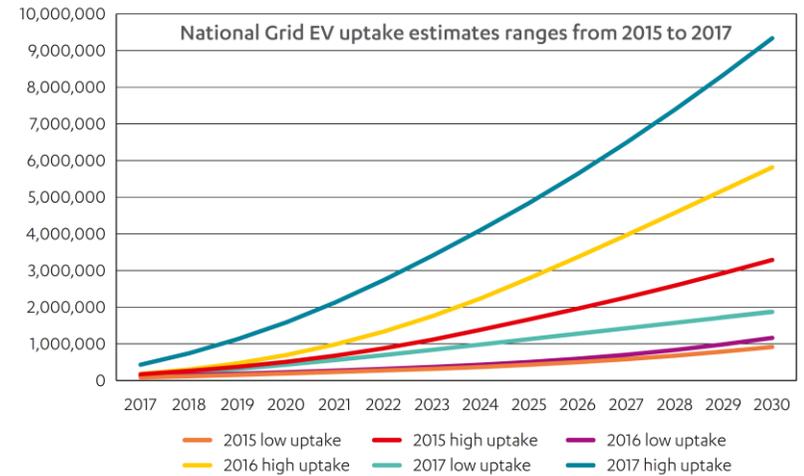


Figure 3.1: Range of battery electric and plug-in hybrid vehicle uptake estimates from National Grid's Future Energy Scenarios⁹

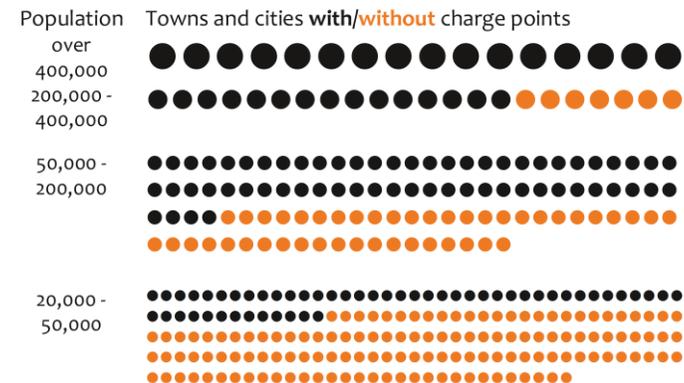


Figure 3.4: Proportion of built-up areas with at least one rapid charge point in June 2018 (by population)³⁵

Transport and housing for thriving city-regions

Cities are the next transport investment priority

Transport investment should target growing and congested urban areas, key interurban corridors, and key international gateways.

- After years of delay, the first two are getting the priority they deserve
- But cities outside London continue to lag behind

Cities are hubs for wider city-regions, delivering employment and specialist services

But transport capacity is limited in many UK cities: mass rapid transport is needed to increase accessibility

Key recommendations:

- City-led plans for transport, housing and jobs
- Devolved, long-term funding to give certainty to all cities
- Major projects in the fastest growing, most congested cities
- £43 billion of additional stable, long term funding by 2040

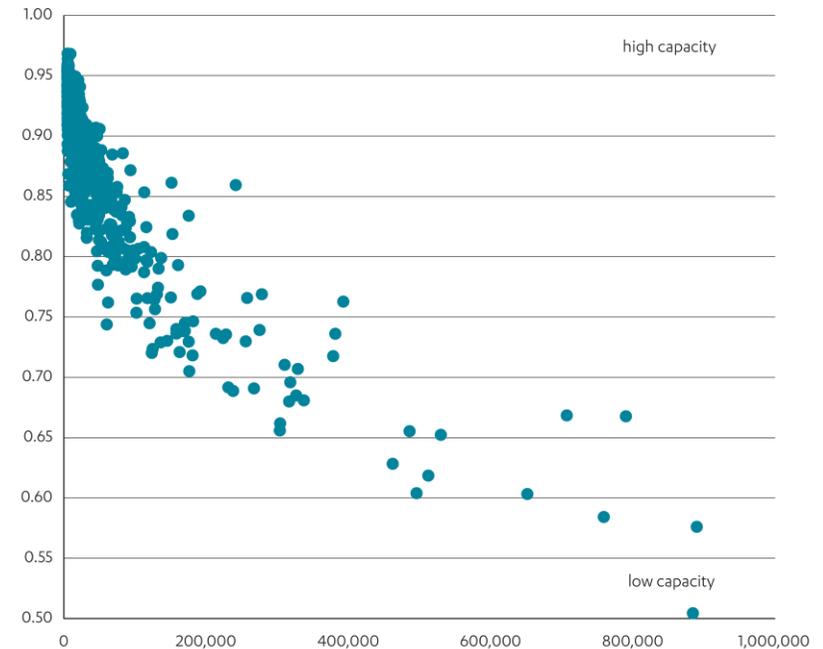
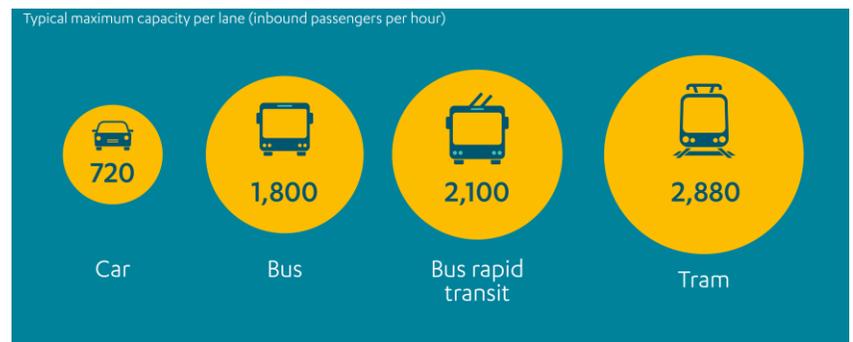


Figure 4.1: Built up area population and ratio of peak to off-peak connectivity for built up areas with population under 1 million²⁵



Reducing the risks of drought and flooding

Climate change increases the risk of both flooding and drought

- Over 1 million homes have more than 1% chance of flooding in any given year
- There is a 1 in 4 chance of severe drought by 2050

Resilience saves money and avoids adverse impacts

- Higher flood resilience saves on insurance and the trauma of flooding; a net benefit of £250-500m pa
- Relying on emergency drought measures would cost £40bn to 2050; resilience £21bn

Key recommendations:

- A national standard of flood resilience with a higher standard in major urban areas
- Nationwide, catchment-based plans combining green and grey infrastructure
- A national water transfer network and new water supply, such as reservoirs
- Halving leakage by 2050 and reducing demand through efficiency and smart metering

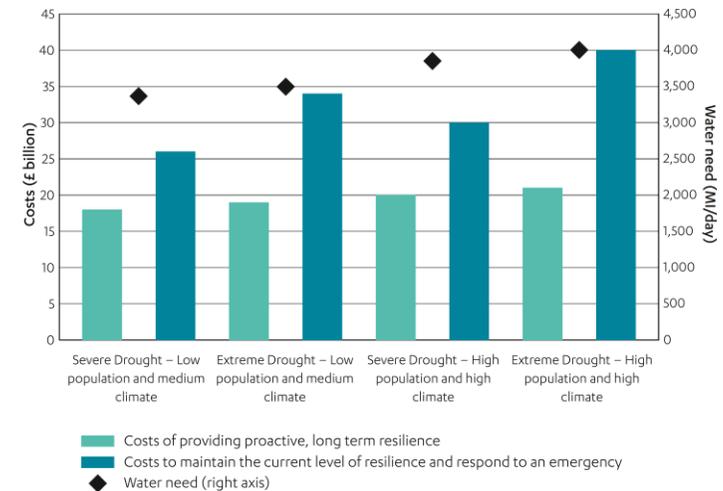


Figure 5.5 Costs of providing proactive, long term resilience and relying on emergency response for droughts beyond current resilience levels²⁰

Note: Costs are expected present values to 2050 (in 2018 prices) and include maintaining 1 per cent resilience, which is considered to be 'business as usual'.

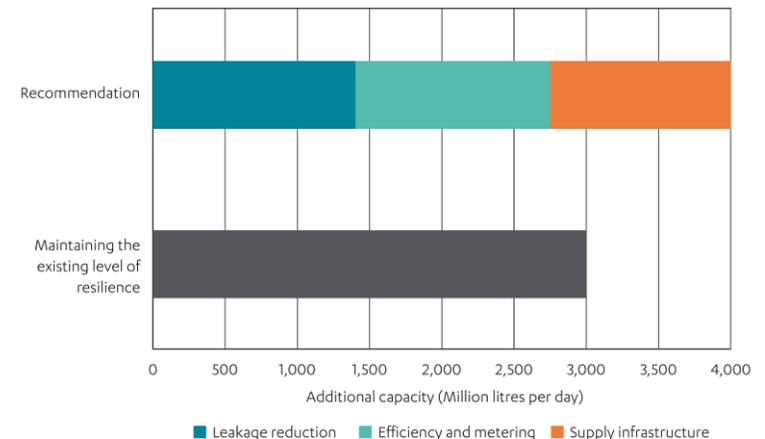


Figure 5.6 Twin-track approach addressing demand and supply²¹

Choosing and designing infrastructure

Better decisions can be taken

The UK needs to have confidence in its decision making and ability to deliver high quality infrastructure.

It must make effective and timely decisions, and get the best value over the lifetime of infrastructure.

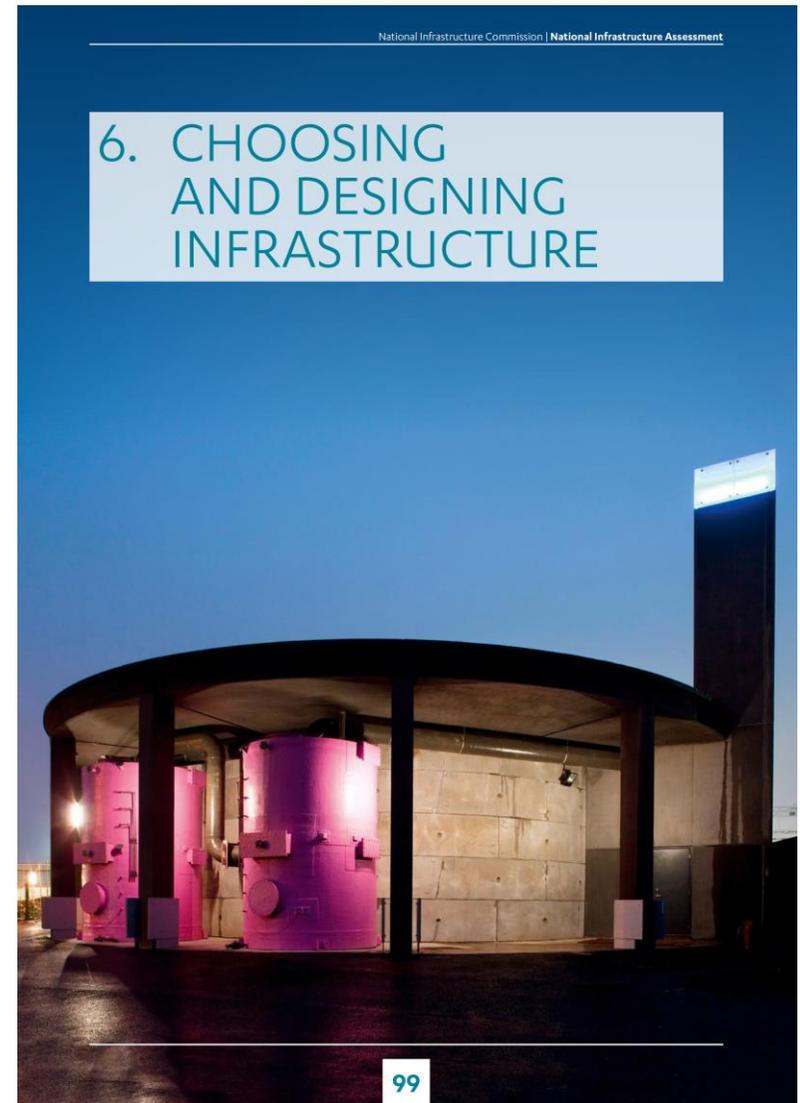
This requires:

- improving project appraisal by collecting better data on outturn costs and benefits
- ensuring quality design in future nationally significant infrastructure projects
- developing a clear framework for measuring infrastructure performance

Key recommendations:

- Publishing forecast costs and benefits of major projects at each appraisal stage and on completion
- Ensuring major projects have a board level design champion and use a design panel

Delivery also depends on skills, project management, the supply base, and the capabilities of government and infrastructure owners. The IPA works on this.



Funding and financing

This is not an unaffordable wish list

The Commission has made judgements on spending within the government’s funding guidelines.

The impact on bills is no more than £20 a year for an average household, with savings in the longer-term.

Getting the best value infrastructure also requires improvements in funding and financing arrangements:

- Improving the analysis of costs and benefits of private financing and traditional procurement
- Engaging the public on paying for road use; the existing approach is unsustainable

Key recommendations:

- Government should deliver long term certainty by adopting the ‘fiscal remit’ funding profile
- A new, operationally independent, UK infrastructure finance institution if EIB access is lost
- local authorities should be given further powers to capture a fair proportion of land value increases.

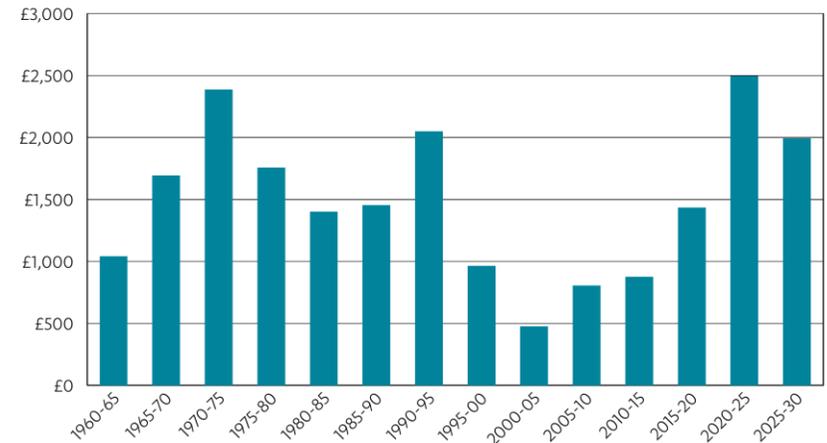


Figure 7.1: Historic and planned enhancement spending on strategic roads⁶

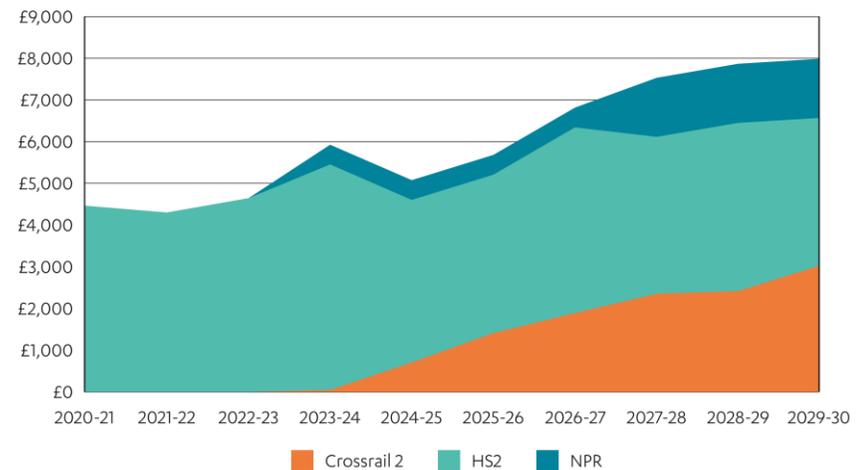


Figure 7.2: Capital Investment in rail ‘mega projects’ (£m, 2018/19 prices)

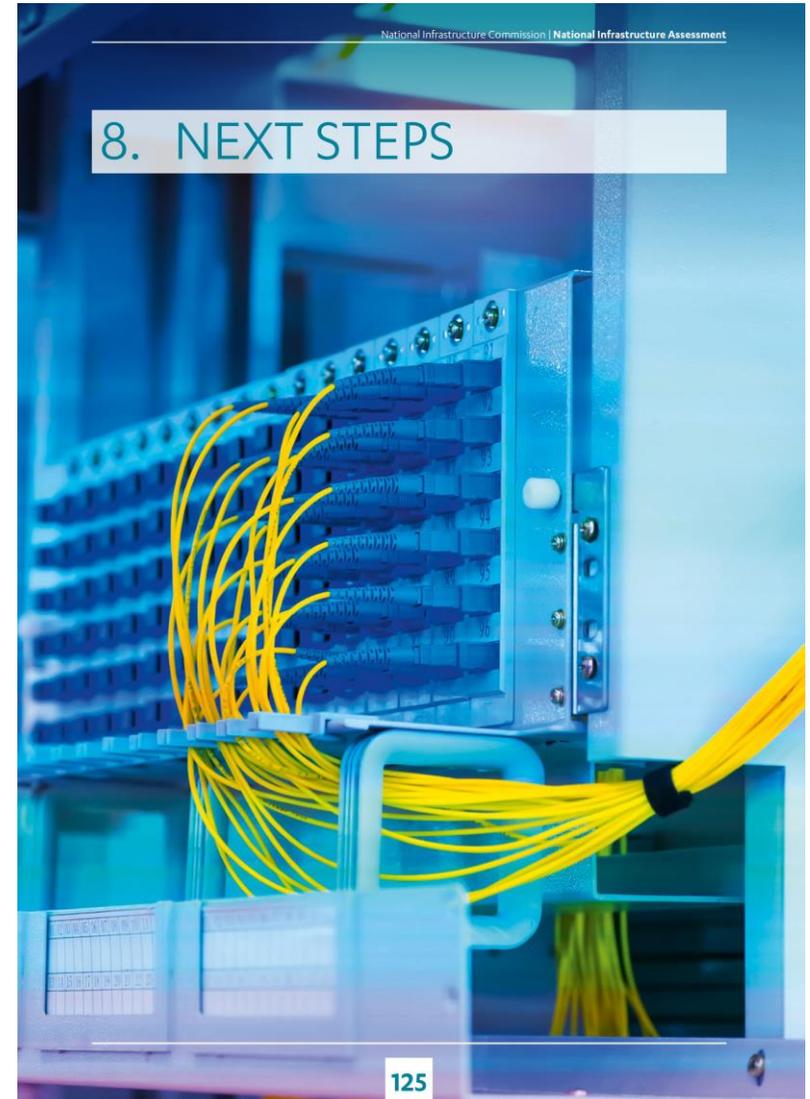
Next steps

The work does not stop here

Government, regulators, industry and others will all need to contribute to making this a reality.

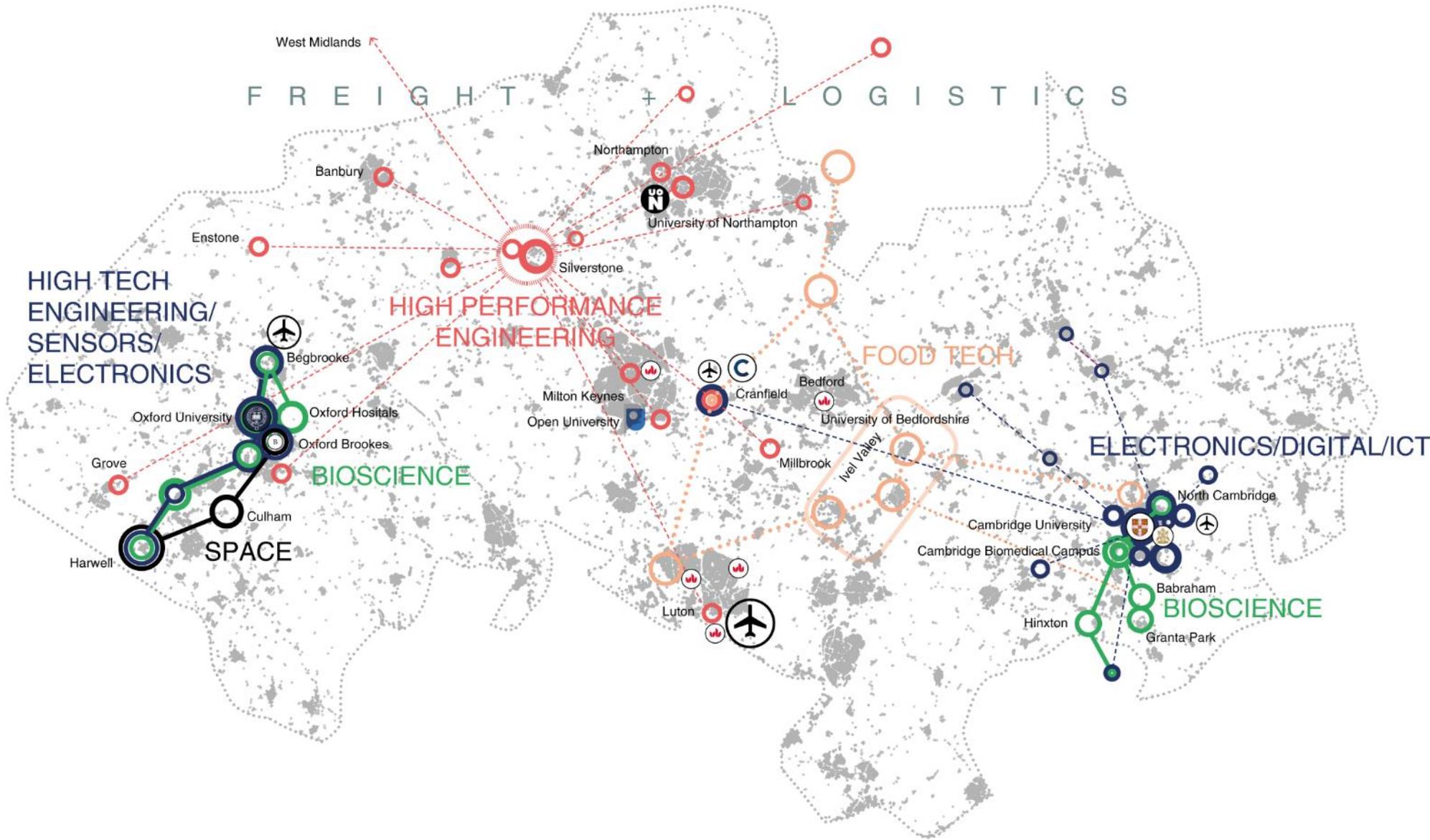
Over the coming months and years, the Commission will:

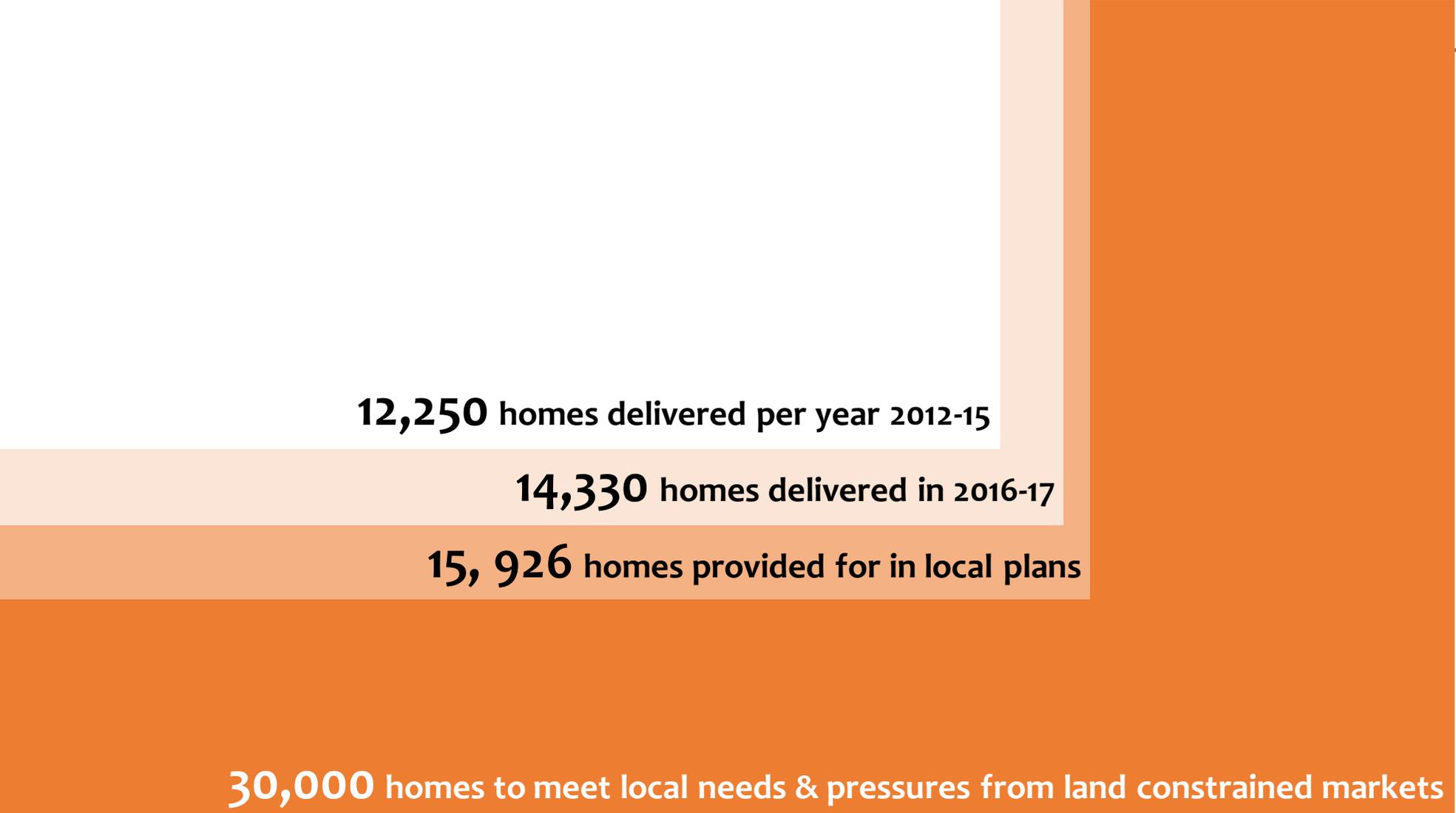
- Seek consensus on its recommendations
- Work with government to establish its recommendations as government policy
- Monitor the implementation of the recommendations and of earlier studies
- Carry out further work, including housing, design and economic regulation
- Begin work on the second National Infrastructure Assessment, expected around 2023.



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**Partnering for Prosperity:
A new deal for the Cambridge - Milton Keynes – Oxford Arc**





12,250 homes delivered per year 2012-15

14,330 homes delivered in 2016-17

15,926 homes provided for in local plans

30,000 homes to meet local needs & pressures from land constrained markets



**1.1 million
new jobs by
2050**

**GVA of £265
billion per
year by 2050**

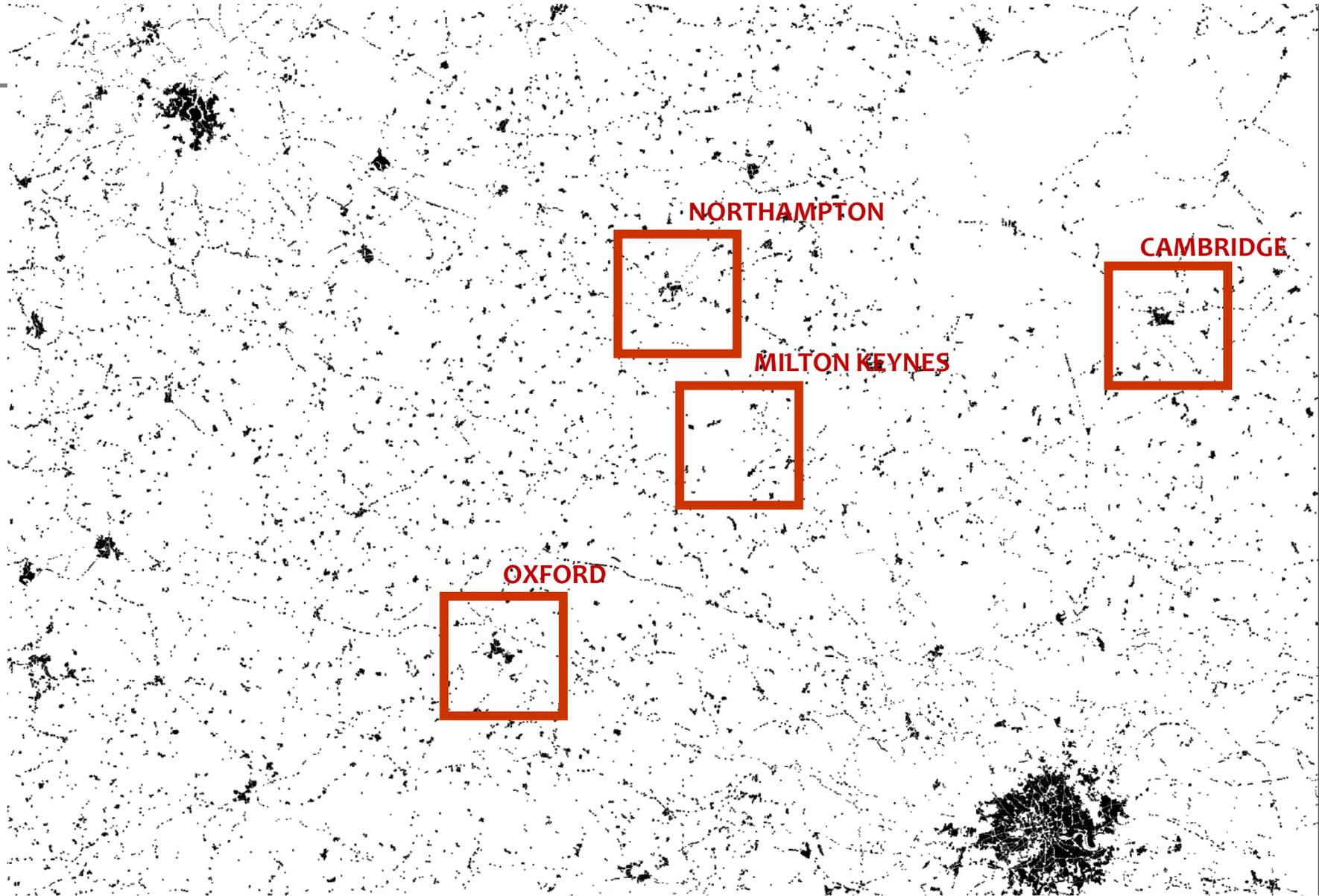


**1 million
new homes
by 2050**

**Up to 1.9
million new
people**



1900



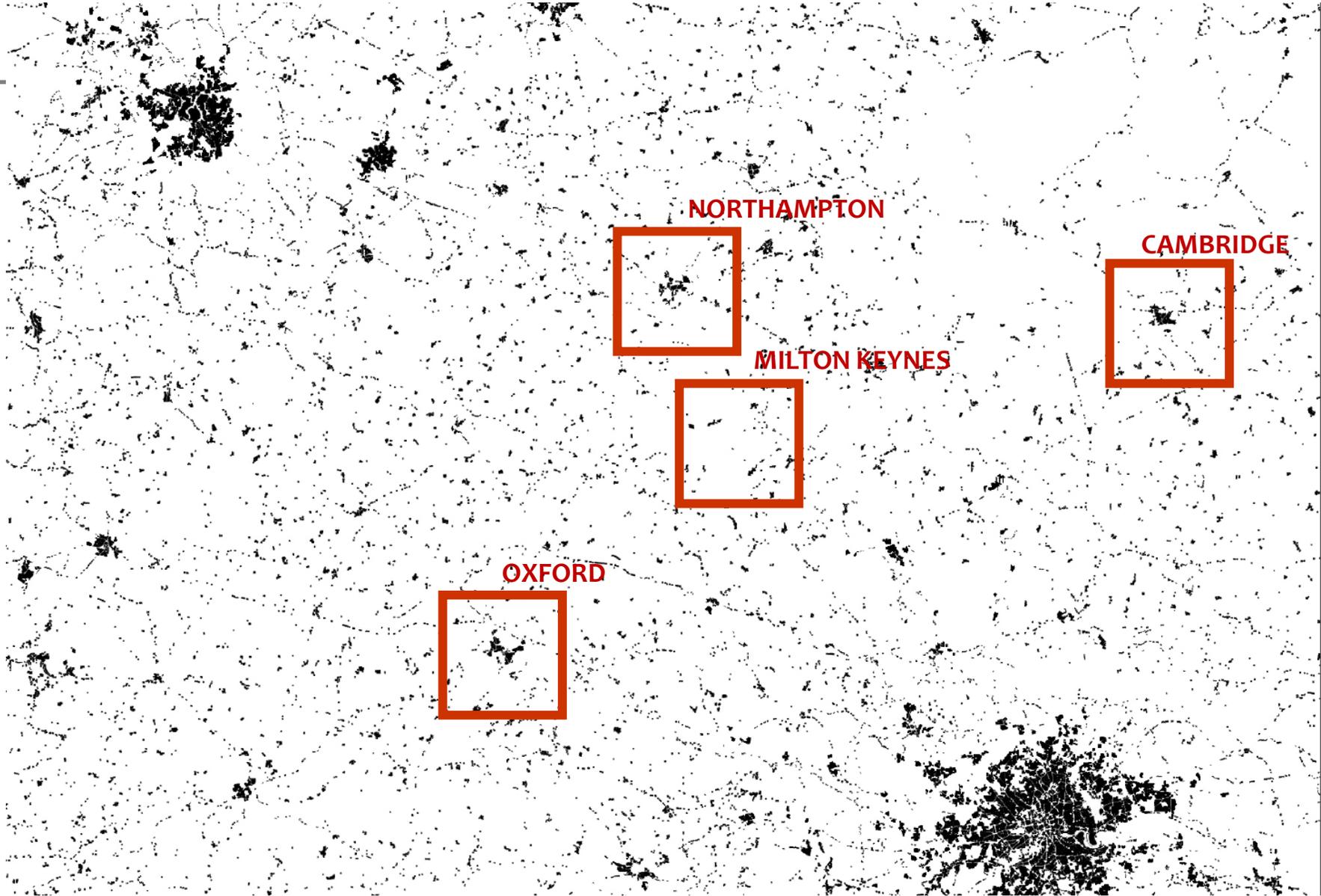
NORTHAMPTON

CAMBRIDGE

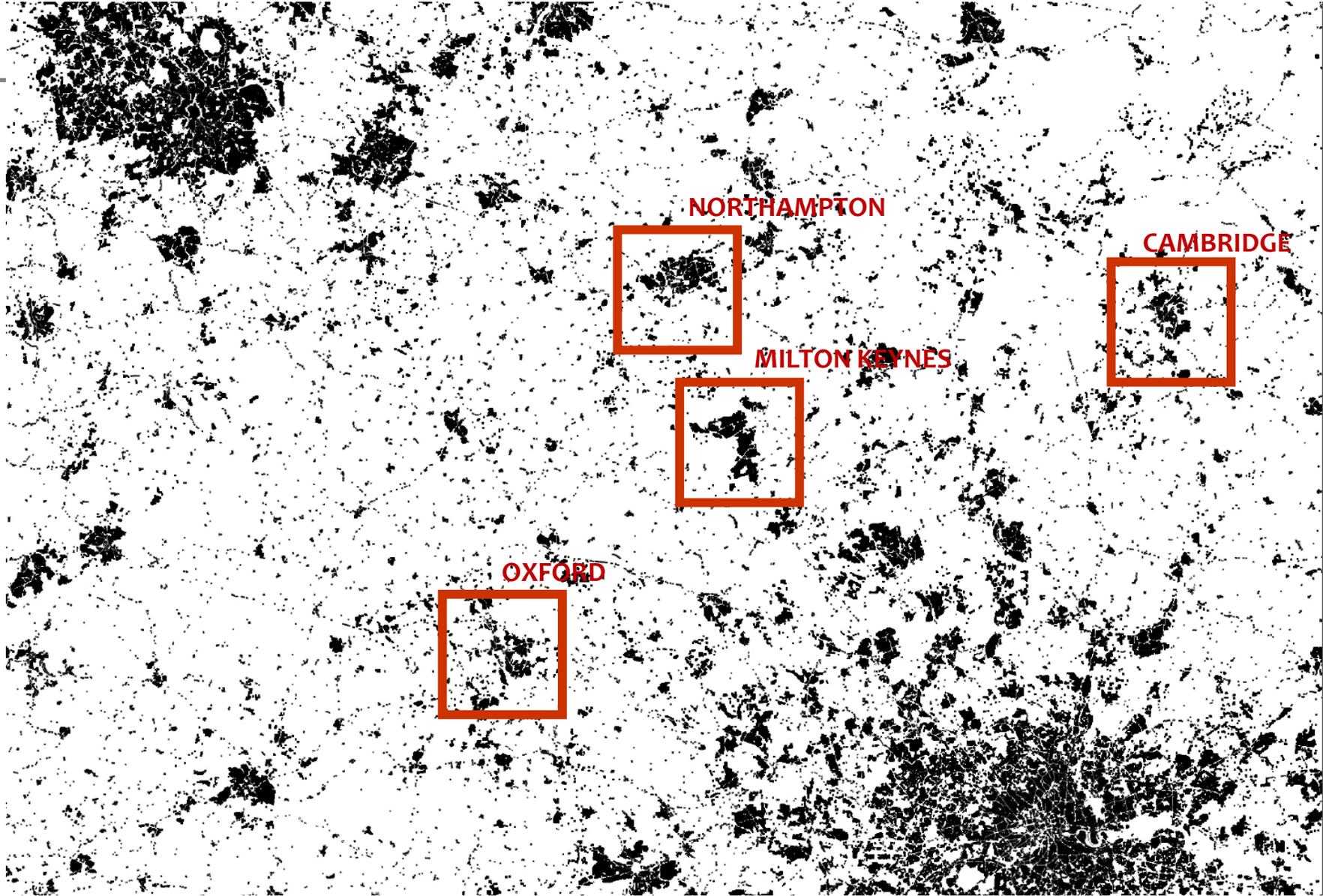
MILTON KEYNES

OXFORD

1939

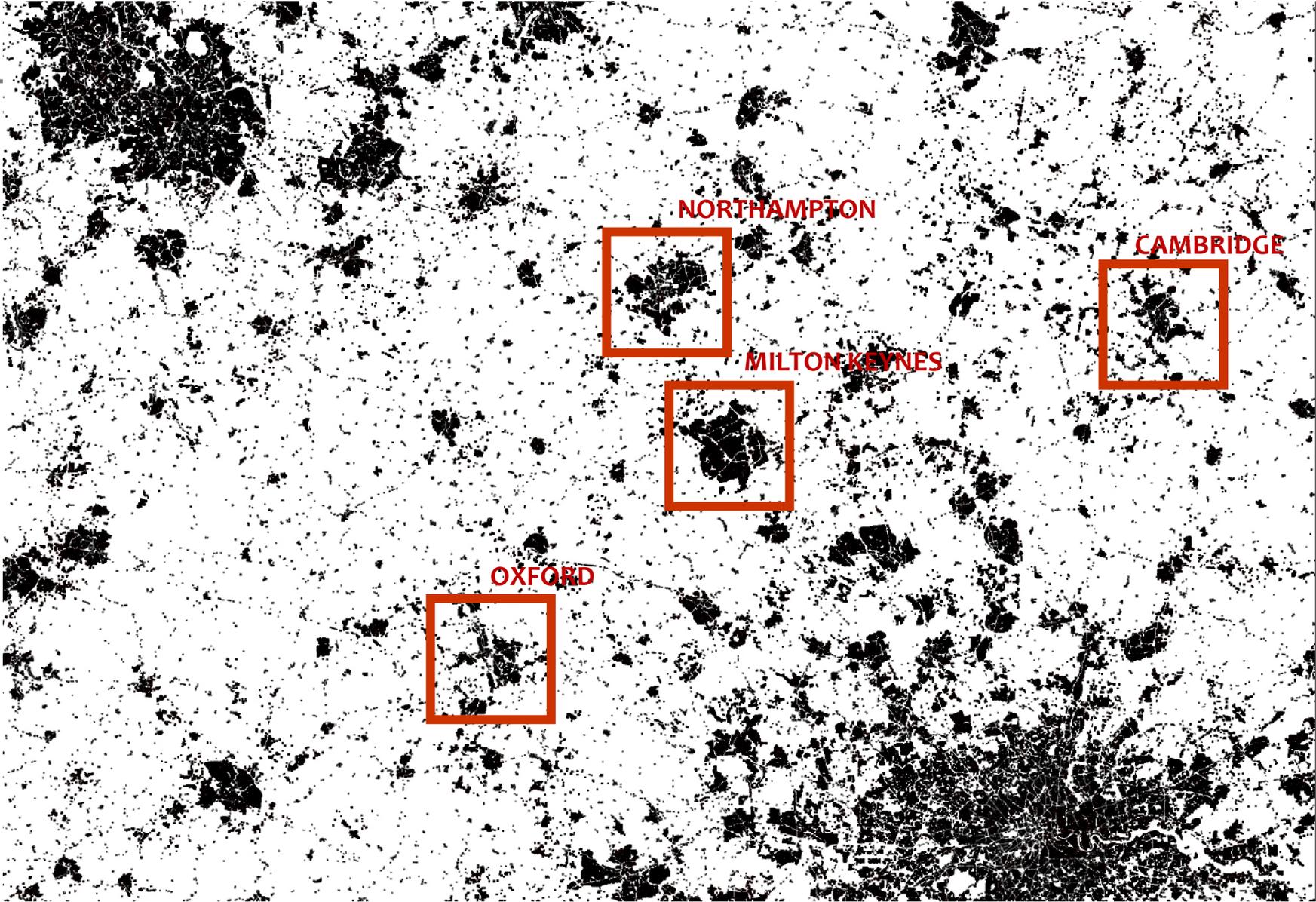


1982



2015

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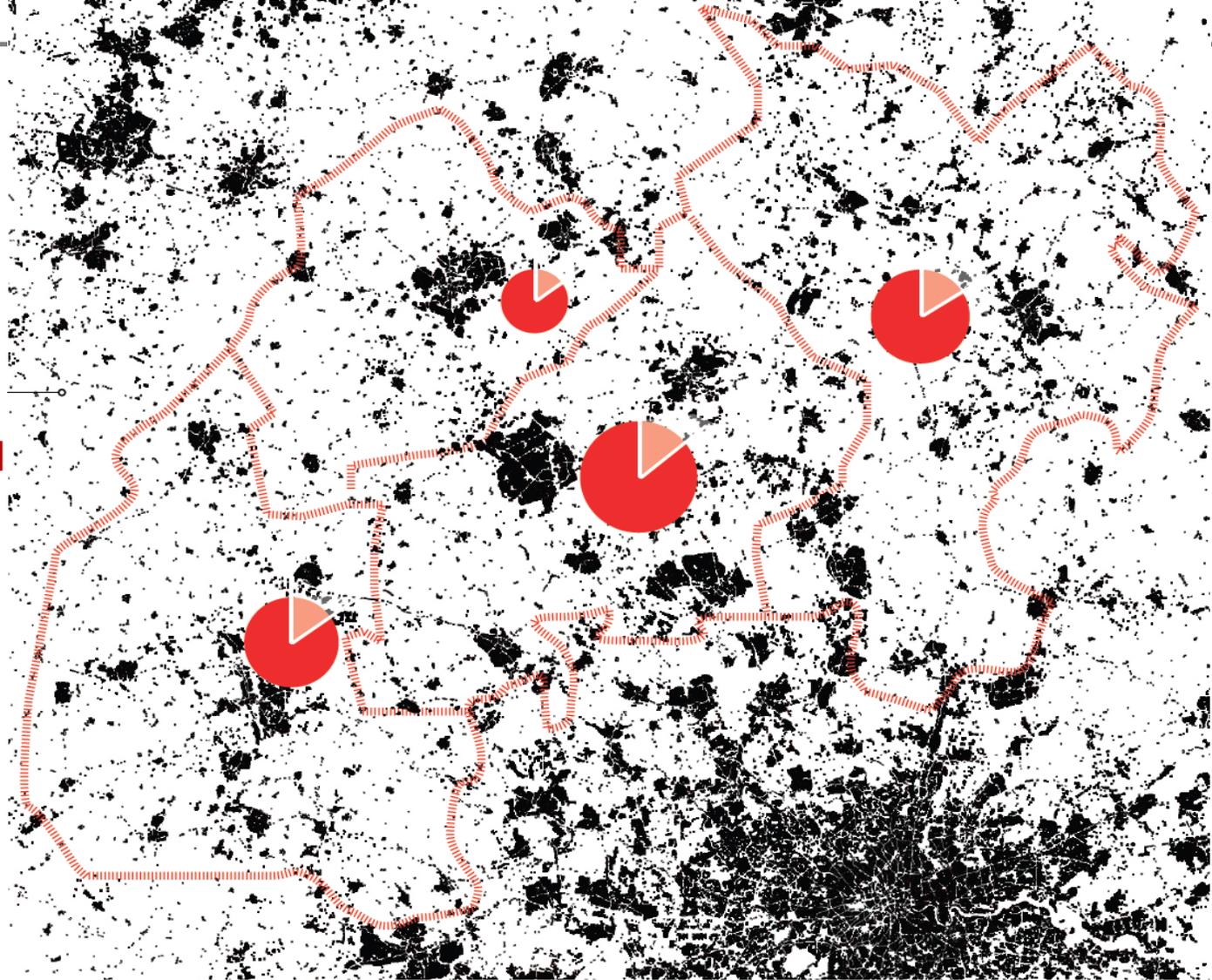
2050

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New homes in
the pipeline



Additional
homes required



Cambridge



Bedford



Milton Keynes



Bicester



Oxford





Cambridge

London

Luton

Bedford

Milton Keynes

Northampton

Oxford

THE SCHOLAR'S WAY

THE SCHOLAR'S WAY

THE SCHOLAR'S WAY

THE SCHOLAR'S WAY

CAMKOX NATIONAL PARK

CAMKOX NATIONAL PARK

CAMKOX NATIONAL PARK

CAMKOX NATIONAL PARK

Yardley White Wood

Mid Vale Ridge

Bedfordshire Greens and Ridge

The Chilterns

The Chilterns

Cam Valley

2022



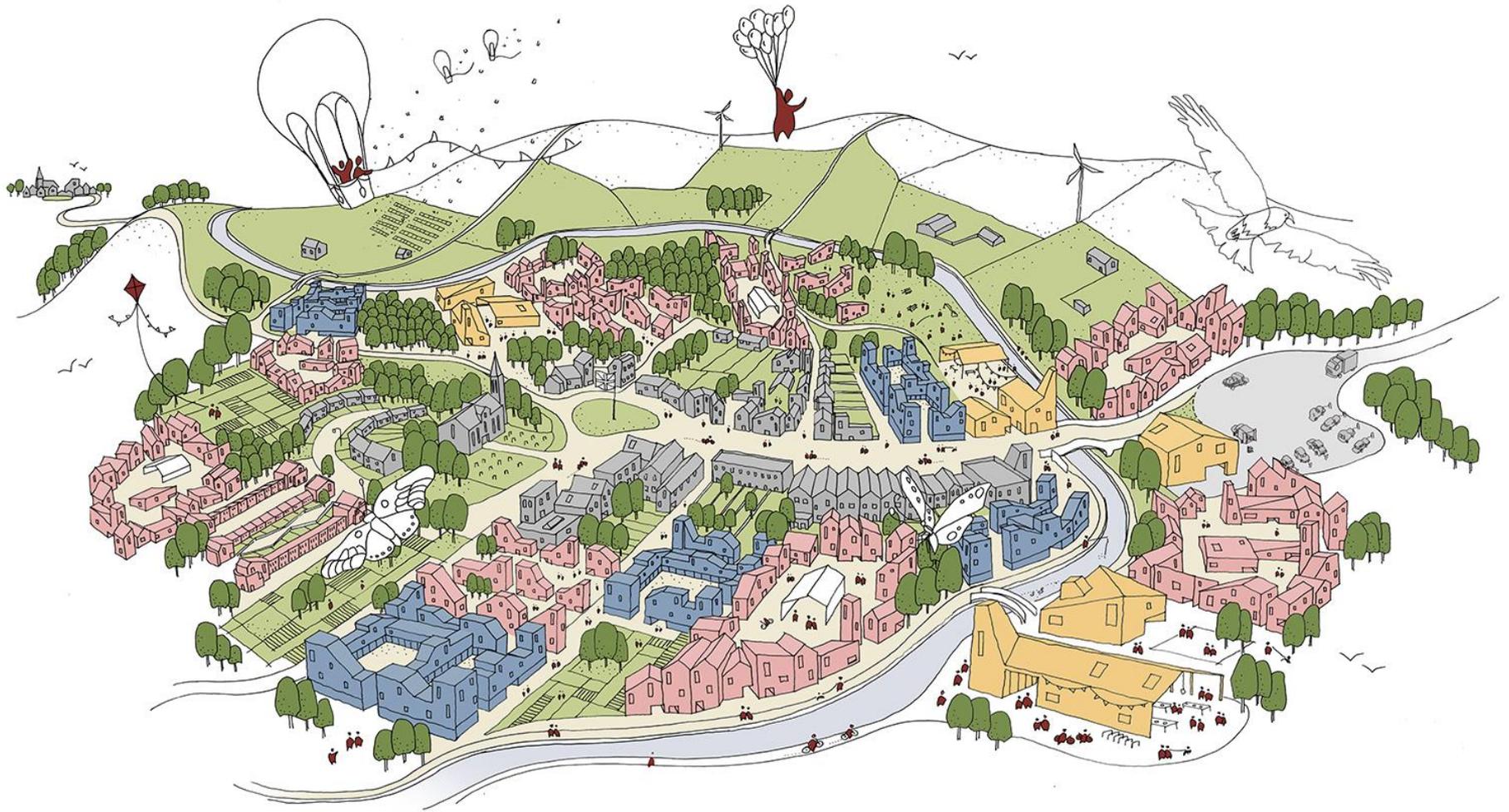
2035



2050







GOVERNMENT



Deliver

NEW TRANSPORT INFRASTRUCTURE

unlocking opportunities for transformational development



PROVIDE THE MECHANISMS AND RESOURCES

to enable new settlements and wider housing growth

LOCAL AREAS



Commit to

DOUBLING THE RATE OF HOUSEBUILDING

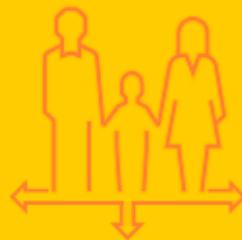
attracting the talent and skills that businesses need to grow



DEFINE A LONG TERM VISION

for the arc with the right governance to support delivery

COMMUNITIES



WELL-CONNECTED, THRIVING LOCAL COMMUNITIES

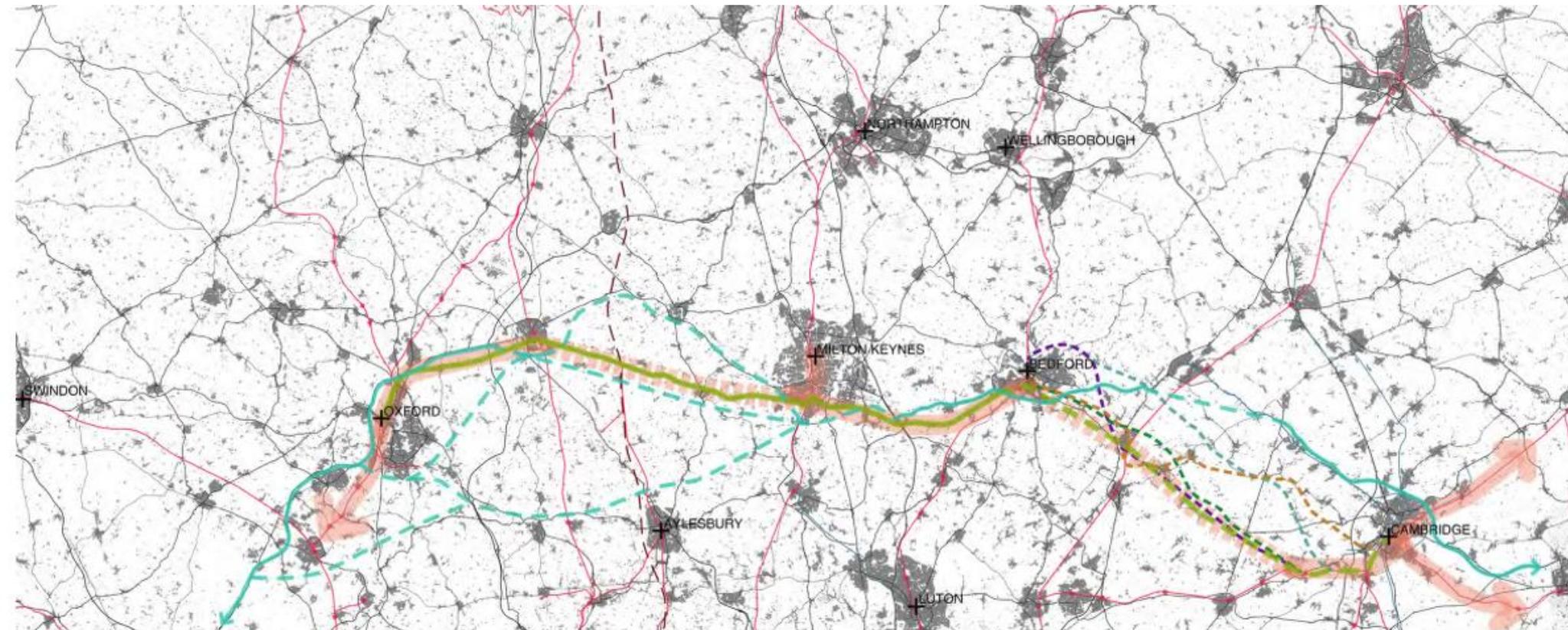
with access to jobs and services, and homes for future generations



Development must support

QUALITY OF LIFE AND WELLBEING,

for new and existing residents, whilst respecting the natural environment



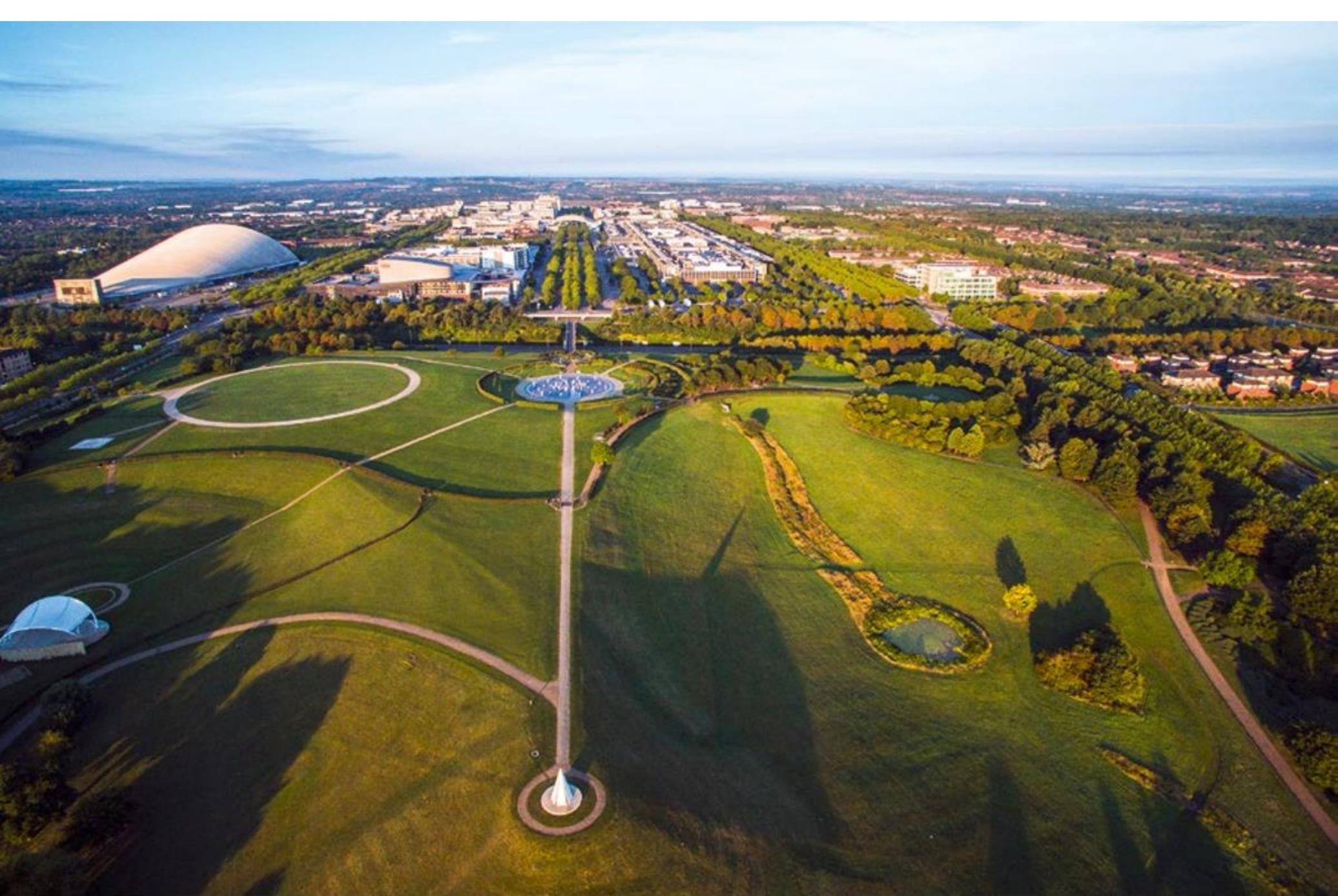
EXISTING AND PROPOSED INFRASTRUCTURE

- Legend**
- Settlements
 - East West Rail Western Section
 - East West Rail Central Section C1-0 (most favourable)
 - East West Rail Central Section Alternative C1-1
 - East West Rail Central Section Alternative C1-6
 - East West Rail Central Section Alternative C1-9
 - Former Bedford to Cambridge Railway Line - (demolished)
 - High Speed 2 (HS2)
 - Guided Bus Routes
 - Non-Bus Routes

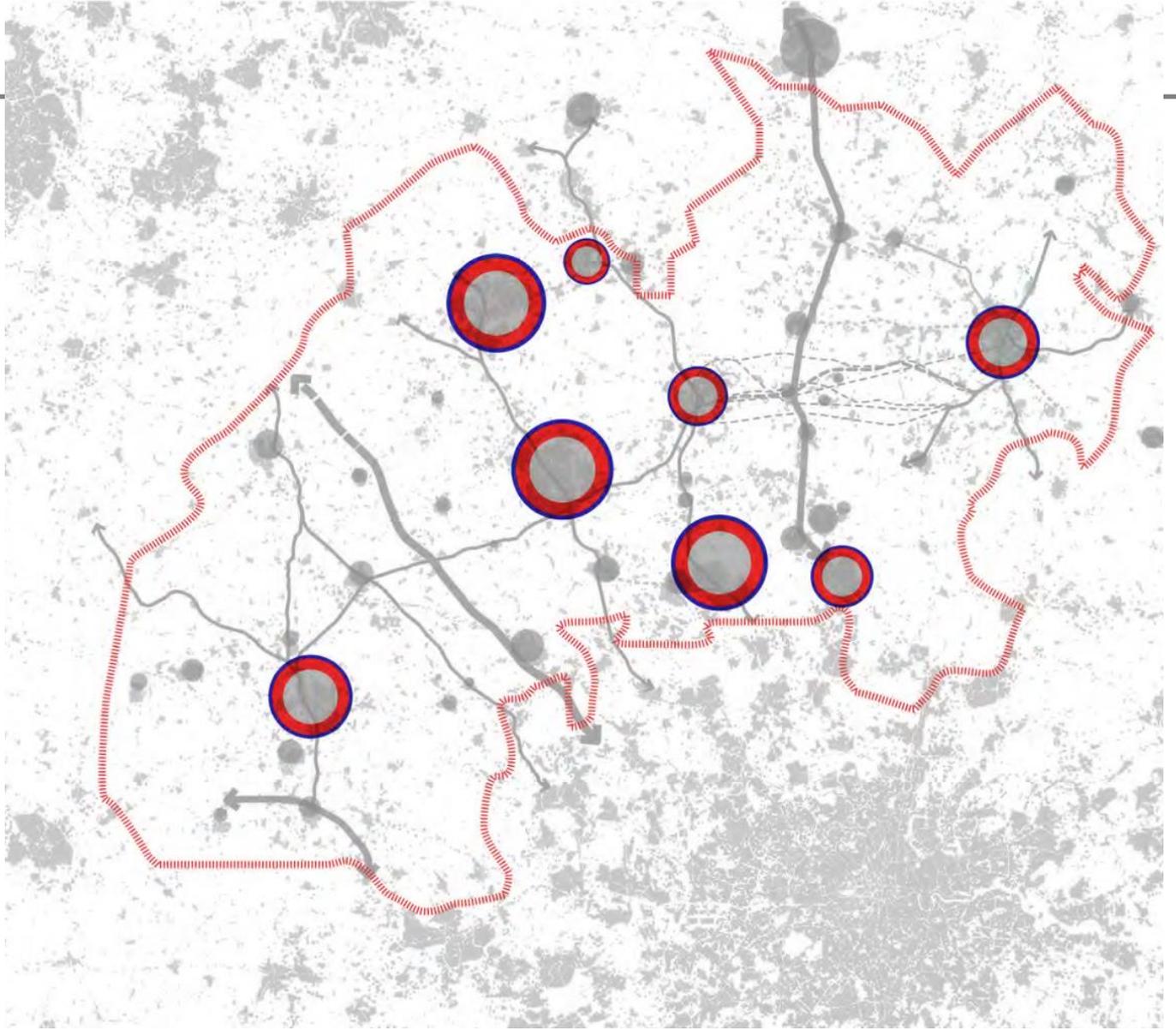


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 Historic England | Environment Agency | Natural England | DCLG |
 Highways England | Department for Transport | National Infrastructure Commission |



DEVELOPMENT IN EXISTING TOWNS



MAKING THE DEAL WORK:

- **SHARED VISION FOR THE ARC
TRANSLATED INTO STATUTORY PLANS**
- **COLLABORATION BETWEEN GOVERNMENT
AND LOCAL AREAS**
- **LOCAL STAKEHOLDERS WORKING IN THE
NATIONAL INTEREST**

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Ongoing Questions

NATIONAL INFRASTRUCTURE COMMISSION
