A NEW ERA FOR THE CAMBRIDGE ECONOMY

Exploring drivers of change in cities post pandemic

CAMBRIDGE AHEAD

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We cannot solve our problems with the same thinking we used when we created them

Attributed to
Albert Einstein

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In this report we set out some of the major implications for policy – including transport, design, climate and data collection. Our considerations all have their goal as improving quality of life for all in Cambridge.

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Change is the law of life. And those who look only to the past or present are certain to miss the future

Attributed to **John F. Kennedy**

1. https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/gdpmonthlyestimateuk/november2021

2. https://www.trusselltrust.org/news-and-blog/latest-stats/mid-year-stats/

3. Centre for Business Research data finds that 46.5% of corporate employment in Greater Cambridge is in knowledge intensive industries. https://www.cambridgeahead.co.uk/cambridge-cluster-insights/

4. De Fraja, Matheson, Mizen, Rockey, Taneja, and Thwaites: *Covid reallocation of spending: The effect of remote working on the retail and hospitality sector*

5. https://www.gstatic.com/covid19/mobility/2022-02-06_GB_Greater_London_Mobility_Report_en-GB.pdf

DR DAVID CLEEVELY, CBE
Chairman

It is my pleasure to publish this paper exploring the New Era for the Cambridge Economy (NECE). This report reflects on the changes which the society and economy of Cambridge are experiencing and identifies what the priorities are now to embed change that has happened for the better. We believe we have provided a unique analysis across a breadth of macro trends – aiming to understand their cumulative impact.

The recession brought about by the Covid-19 pandemic was dramatic in the short-term. In some senses, the recovery was fast. The GDP headline metric suggests a recovery is complete[1]. Employment has bounced back, with the phasing out of furlough schemes not being met with a surge in joblessness.

But beneath the surface, longer-term impacts are making their presence felt. As well as the tragic loss of life during the pandemic, long Covid and mental health complications look set to linger, hampering quality of life and the ability to work for some. The pressure on public services, from justice to health, as they deal with backlogs is immense. Food banks continue to see more need for their services than before the pandemic[2] – compounded by rising prices.

And for most businesses, including those which make up Cambridge Ahead's membership, the pandemic redefined how it was possible to work. A body of evidence, including our own survey of local businesses, confirms that greater homeworking is here to stay. In a city like Cambridge, with a much larger than usual concentration of workers in knowledge industries[3], this will have a major impact.

But this impact won't just be felt by those who work in these occupations. According to one of the best estimates, the effect of greater working from home post-Covid is likely to reallocate £3bn of retail and hospitality spending in the UK every year, generally moving from urban to suburban areas[4]. Footfall remains well down in areas with concentrations of offices: In Greater London, use of retail spaces such as shops, cafés and restaurants is still 25% below pre-Covid levels, two years on from the beginning of the first lockdown[5]. And those who are more likely to work remotely tend to be better paid –whose disposable incomes make many of the city's businesses viable. Though the shift most directly affects those in professional occupations, it has knock on effects for a number of less obvious industries, including cleaners, barbers, and taxi drivers.

Much of our commentary focuses on the experiences of those changing working patterns – because this is where the change begins. The final impact is by no means inevitably positive for all. The NECE Steering Committee will need to continue to work to understand these impacts.

In this report we set out some of the major implications of these changes for policy – including transport, design, climate and data collection. Our considerations all have their goal as improving quality of life for all in Cambridge. I am convinced that the economic reset we have experienced gives us the chance to do things in a better way – including those with little direct connection to the pandemic.

I want to express my sincere thanks to the Steering Committee, which has come together to be a catalyst for change. The group has a range of experts from academia, utilities, design, property, and finance.

More research needs to be done, but – two years on from the onset of the pandemic in the UK – I very much hope and trust this will be a valuable guide to those looking to shape our city's future, as well as other global cities looking to chart a course forward.

Executive Summary

On March 23rd 2020, citizens in Cambridge – and across the UK – were given the very clear instruction by the Government: "You must stay at home". Building sites ground to a halt, offices lay empty, businesses closed, roads were deserted.

Such shocks to the system bring with them fresh opportunities and risks, and the scale of change may mark the beginning of a New Era for the Cambridge Economy. How should a city like Cambridge respond? What will work in this new context? In response, we have developed six areas of focus we believe need to be prioritised:

01

STRENGTHENING NETWORKS FOR A RESILIENT AND RESPONSIVE CITY

Resilient and responsive cities evolve, adapt, and learn from shocks. Cambridge needs to preserve the good elements of more flexible working – especially the possibility of better work-life balance – while still creating the "moments of value" which draw employees, entrepreneurs, and others together for creative interactions.

02

MEASURING WHAT MATTERS MOST

The impact of the pandemic has been multifaceted, with economic, social, environmental, health and other indicators moving in many different directions simultaneously. The city should adopt a "Six Capitals" model – capturing the full range of types of value, beyond just the financial – to understand the many sources of wealth within the city.

03

DESIGNING IN AN INCLUSIVE MIX OF SPACES

The division of space between traditional categories – residential, office, leisure – is likely to be increasingly blurred. For the city to develop high-quality local "quarters", where all main services and amenities are within a 15 minute walk or cycle, requires a more proactive approach to actively support mixed uses that are open to the public.

Making sense of the shock

As we developed these recommendations, we wanted to understand not just what had happened over the last two years, but to look deeper. What has changed at a fundamental level? What are the trends? Where might the city be headed?

This meant looking at, but also beyond, the pandemic. The beginning of this new era has coincided with the advent of post-EU Britain, increasing impetus towards tackling climate change, global demographic shifts, and other major disruptions. None of these can be looked at in isolation.

To do so, we convened workshops with leading thinkers – from business (including hospitality, arts, IT & technology, law, property, finance, and transport sectors), academia, policy, health, and design communities. There remains much to be known and researched. Not every sector of the economy, or section of society has been represented but we wanted to catalyse a process of exploration and engagement, with a breadth of views and lively debate.

It may be argued that it is still too early to publish such a report. The pandemic is not over, and it is possible that future waves of the virus may cause further changes in behaviour. There is, of course, a need for further research, and throughout this report we give indications of where this needs to happen. But it is at times when so much is being questioned that actions can make the most impact.

Behaviours, typically resistant to change, have adjusted sharply. There is a chance to redefine how people relate to their workplaces, their homes, and their neighbourhoods – and where habits have changed for the better – to embed them. To not act now would be to miss the chance to grasp these shifts and use them to improve people's quality of life.

Remaining questions

At the same time, this report seeks to open a discussion with people across the city. At the end of every section we pose a series of questions. How has the pandemic changed the shape of the city's social networks? How can we best define the mix of spaces we need to see in developments?

How can we most effectively incentivise those who are able to improve the energy efficiency of their homes, and support those who are not, to do so?

These questions are central to a fuller understanding of how we can best understand and respond to the impacts of the shock.

The NECE group will continue to work together with communities, stakeholders, and subject matter experts to find answers to these questions.

04

INVESTING IN ALTERNATIVES TO THE PRIVATE CAR

Cambridge should build infrastructure for public and active travel, investing in emergent alternative modes like e-bikes, and introducing progressive road charging policies. Cambridge should also build the data platforms needed to enable more flexible transport, designing in inclusivity and accessibility.

05

BUILDING FOR THE CLIMATE ALTERED FUTURE

As a region that faces both high drought and flood risk, there is an urgent need to try to consolidate some of the behaviours that led to lower emissions nationwide in 2020, and make the city "spongier" and shadier, as well as a concentrated focus on emissions from buildings.

06

EMBRACING EXPERIMENTATION AT THE CITY LEVEL

Cambridge has a proud tradition of experimentation, and the city should offer itself up as a national and international testbed of new approaches. This requires continuing to convene the group established through the NECE process so that organisational and institutional leaders can continue to learn from each other's experimentation and select projects – from those suggested in this report, or others – to proactively monitor and publish data so that other cities can benefit and share their experiences. These need an emphasis on generating societal benefit.

A moment to reflect: The purpose of this report

The Covid-19 pandemic has had a dramatic impact on the city of Cambridge. As of 22 February 2022:

- 161 people in Cambridge have died with Covid-19 on their death certificate. The total number of deaths in the city was highest during the first wave of the virus

- 34,551 people have tested positive in Cambridge – though the true number of people in the city to have had Covid-19 at some stage is certainly considerably higher

- Over 3,000 jobs were lost, as well as many more going on the Government's furlough scheme – though employment numbers have now recovered to pre-Covid levels. The data is unpacked in more detail in the Appendix.

4.7

Before Covid-19, the average number of days in the office

6. https://covid19.who.int/

7. https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker Comoros is the only country in the index to never introduce any restrictions

8. Google community mobility data

Of course, this is just a small part of the global picture. The World Health Organisation (WHO) has had 5.5m deaths reported to it[6] - almost certainly a large underestimate of the true number. Restrictions have been introduced everywhere[7]. The Blavatnik School of Government has developed a Stringency Index ranking restriction severity at different times in different countries.

All but one country has introduced restrictions and the vast majority have at some point imposed restrictions ranking higher than 50 out of 100 in the index. Relatedly, huge reductions in international travel brought about by border restrictions have led some to claim that Covid-19 has reversed globalisation, though whether this is in reality a shift or merely a temporary effect is questionable.

The impact of restrictions forced major societal behavioural changes. In Cambridge, the amount of time spent in workplaces dropped by almost 80% in the first lockdown. Since then, it has at no point been above 80% of pre-Covid levels[8].

This appears to be a permanent change for many businesses: a survey conducted for this report in November 2021 found that anticipated future working practices involve many fewer days in the workplace than before the pandemic, though there is likely to be an increase on more recent practices. 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. →

Fig 1: Amount of time/anticipated amount of time for workforce to be in the workplace per week

Legend: ● 5 days or more ● 4 days ● 3 days ● 2 days ● 1 day ● None
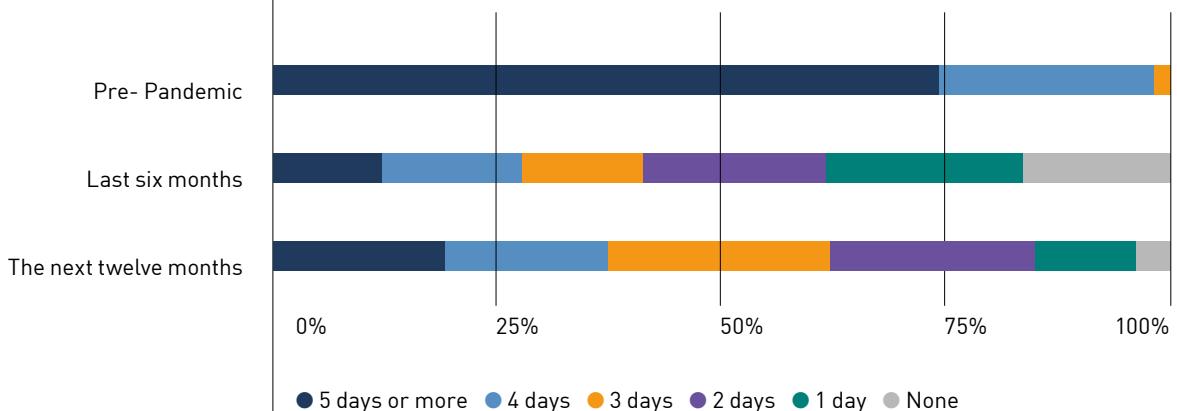
Source: Cambridge Ahead Business Survey

→   This in turn has shifted a lot of other variables across space and time – with more disposable income spent in residential suburbs, energy usage spread across the day, increased consumption of data, and greater water usage [9].

When such a major disruption occurs, there is a chance to reflect on where we are heading. The ambition of this report is to understand and respond to this change, as well as the many other trends – some of which have been accelerated by the pandemic.

Sustainable and inclusive economic growth is good for everyone in Cambridge, but achieving it before the pandemic was challenging. The city already had high levels of inequality, unaffordable housing, and inadequate infrastructure[10]. Now, we need to think again, in a new context, about how to drive growth that delivers for everyone.

This requires a readiness to re-examine assumptions and trial new approaches. In the first workshop, David Halpern, Chief Executive of the Behavioural Insights Team commented: "Habits are cued by certain kinds of trigger, when you reintroduce the original trigger then people slide back shockingly fast to what they did before… the stuff that tends to stick is where you've made some kind of structural adjustment".

The questions we are exploring are – as many of the original triggers return with the easing of restrictions, how much of a structural adjustment has been made? How much will we revert to previous behavioural patterns? How much has the length of the pandemic – close to two years – ingrained new thoughts and habits? What structural adjustments do we want to see happen? The answers to these questions will determine how much this is the beginning of a new era.

9. Anglian Water reported to NECE that in their region total water demand had gone up by 12% due to people who were previously outcommuting from the region during the day

10. See, for example, the Cambridgeshire and Peterborough Independent Economic Review (CPIER)

This report has four objectives:

01

To reflect upon the changes the society and economy of Cambridge has experienced since March 2020, to understand what future challenges and opportunities have developed, and to ask questions to provoke thoughts.

02

To understand, as best we can, what the new economy will look like and what the key strategic decisions are that we need to take now to avoid future regret.

03

To create the foundation for further collaboration in Cambridge to understand and respond to these changes. There is a strong competitive advantage for any city which can gather its leaders – from business, the public sector, academia, and wider society – to debate, share information, plan and implement together.

04

To be a pioneer in the international debate about city economies post-pandemic. This report should be a useful case study for places, particularly those with similar characteristics, such as tech hubs.

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To achieve these objectives, we have followed a rigorous process, drawing on and generating high-quality data. This has included:

- Four expert workshops, carried out between August and November 2021. Each focused on a major question we are asking:

1 How will we work?

2 What types of space do we need, where?

3 How will we connect?

4 How can we leave a positive legacy?

- A survey of businesses across Cambridge, carried out in October and November 2021. There were 97 responses from companies in sectors such as property, IT, education and arts, construction, manufacturing, and life sciences, and this data is used throughout the report.

- A detailed desk-based research exercise to understand the changes happening here and around the world.

- Targeted interviews with lead organisations in different spheres such as finance, arts and culture, and life sciences. A full list is included in the Appendix to this report.

COLL/

NEW NODES NEEDED NOW

Ideas stem from interactions, but where and how we spend our working day is changing and our paths cross much less than before. How can we create new nodes to make sure we regularly intersect and connect to continue to spark ideas, solve problems and make breakthroughs?

DE

Strengthening networks for a resilient and responsive city

Cambridge's networks are at the heart of its innovation economy. How does working from home affect them, and is the city at risk?

Our understanding, based on evidence

The success of Cambridge has been correctly described as a phenomenon. How has a relatively small city managed to become the heart of the UK's tech ecosystem, where Apple, Microsoft, and Samsung all want to have a base? How has the city managed to remain cutting edge despite many waves of new technology and major competition from other international tech hubs?

A growing body of work in Cambridge has highlighted the central importance of **networks** both formal[11] and informal. The Cambridgeshire and Peterborough Independent Economic Review (CPIER) noted that market and non-market relationships (which include the markets for labour, capital, and property, as well as informal networks and relationships) are one of the three main components of successful business and innovation systems[12]. The testimonials of many of Cambridge's successful entrepreneurs indicates that the ability to quickly connect to the right people to get the right information, or access the right finance, is a major part of what has made the city successful. And networks are useful for more than business. Having good personal relationships is vital to quality of life, and other systems, such as health systems, also require good networks to work effectively.

Understanding antifragility

For Cambridge to respond well to the economic shock of Covid-19, and indeed future shocks, it will need to be both resilient to change, and responsive to it. This means not just getting back to a previous equilibrium as if the shock had never happened, but learning from the shock, and evolving to be better prepared in future. A concept known as "antifragility" has been developed to attempt to capture this idea.

The concept is described by Nassim Nicholas Taleb: "Antifragility is beyond resilience or robustness. The resilient resists shocks and stays the same; the antifragile gets better"[13].

An antifragile city does not remain static when it experiences a shock, nor does it try to get back to where it was before. Instead, it evolves and adapts, learning from the shock, and maturing through the process. An antifragile city does not see a shock as a pure negative to be minimised, but also recognises opportunity to do things in a better way than they were done before.

During the pandemic, health systems have been especially heavily affected, and many fragilities have been revealed.

For Cambridge to be a truly antifragile city will require increasing the amount of resource available for this type of activity.

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The ability to quickly connect to the right people to get the right information, or access the right finance, is a major part of what has made the city successful

44%

Respondents to the Cambridge Ahead Business Survey who reported collaboration between teams had worsened

Recent research has begun to explore how network theory can be used to understand the ability of systems to respond to changes. This suggests that the existence of open paths via connections across a network (percolation) is a key feature of adaptable networks – and many more paths are created when there are a high number of interlinked nodes[14].

These networks, with high numbers of connections allow the responsiveness and resilience Cambridge needs.

A high number of paths linking individuals allows the system to respond quickly to a change, with learning shared at speed between members of the network. If certain connections are severed – for example, a major business with links across the city has to close – an antifragile network can find ways around the problem, such as creating employment opportunities for skilled workers in other businesses or sharing information about local small businesses which provide the same services. Therefore, as well as being an economic shock, Covid-19 may affect the ability of Cambridge to respond to shocks. This is because **it has already and will likely continue to reshape networks.**   →

Fig 2: How would you describe collaboration at your organisation, compared to before the pandemic?

Percentage points difference between 'better' and 'worse'

Source: Cambridge Ahead Business Survey
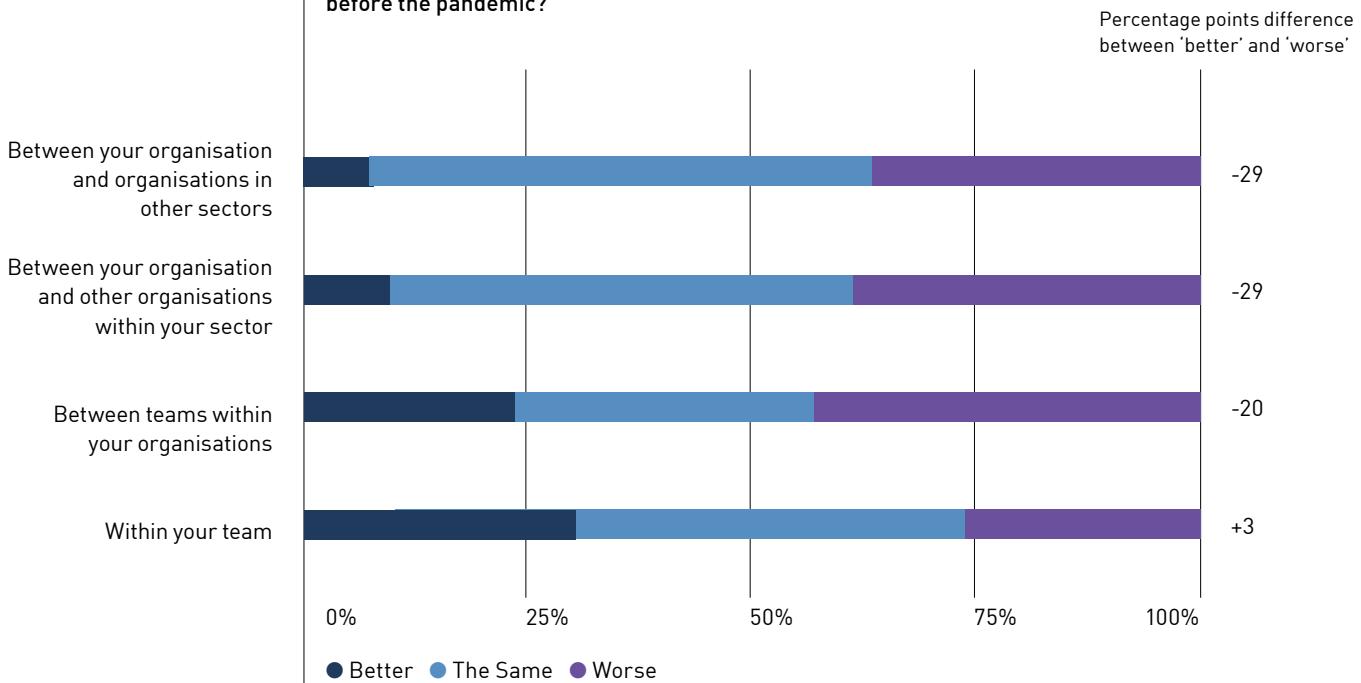
11. For a list of some of Cambridge's formal networks, see https://www.cambridgeand.com/a-unique-ecosystem
12. https://www.cpier.org.uk/media/1671/cpier-report-151118-download.pdf, p50
13. Nassim Nicholas Taleb (2012). Antifragile: Things That Gain from Disorder
14. https://phys.org/news/2018-06-affects-resilience-network.html and https://www.pnas.org/content/115/27/6911

→ The Cambridge Ahead Business Survey asked firms how collaboration had changed at different levels over the pandemic. The findings indicate that while, on balance, collaboration within the closest group – teams – has slightly improved, collaboration at a broader level – between teams – has worsened, and collaboration with other companies has worsened even more. This corroborates findings from Microsoft, who conducted analysis of e-mails and MS teams messages, to show that communication with those who are "close" in a person's network has increased during the pandemic, communications with those "distant" has reduced[15]. A researcher who produced that data commented: "When you lose connections, you stop innovating. It's harder for new ideas to get in." A more fragile (left) and more antifragile (right) network, both with twelve nodes. The fragile network is vulnerable to the removal of a node or connection, with only one path between any two nodes. The antifragile network has many more connections, reducing vulnerability, and central nodes with many connections allow quick paths across the whole network.

Fig 3: Example network structures
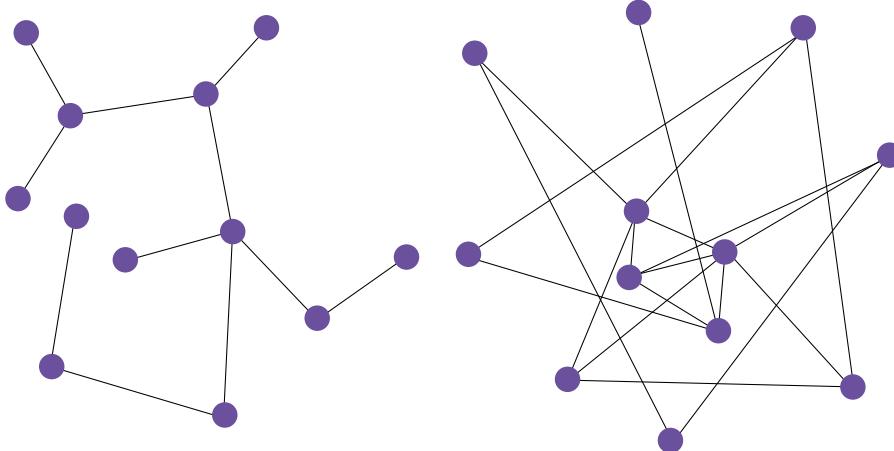
It is also generally harder to forge new relationships in the absence of physical meeting. The importance of "serendipitous encounters" which bring together two or more people with the right combination of ideas, has been stressed repeatedly through the workshops. These can be facilitated online, and it is important to make the most of the tools available, but human interaction, creativity, and spontaneity all tend to work best in the physical world, and there is a depth of connection possible which is as yet rarely found in the virtual world, certainly as far as business networks are concerned. As argued in the CPIER: "Given the importance of networks to the area… maintaining physical proximity and the buzz of business districts is in fact more important than ever."[16]

In a social network, interaction forges and strengthens connections. There is the very real danger that with reduced interaction, Cambridge's networks, central to its innovation and creativity, will weaken. For Cambridge to thrive, its businesses need to rise to the challenge of greater remote working by innovating to protect collaboration. This collaboration does not have to look exactly the same as it did before the pandemic – and indeed new ways of working have created new methods of collaboration – but in some form we must return to levels seen before the pandemic. Greater individualism and a more atomised business culture are unlikely to support innovation.

These questions become particularly acute when we look at younger workers. A recent survey by Cambridge Ahead's Young Advisory Committee found that young professionals (aged 21-35) in the city preferred working from home for "focus" tasks such as report writing, but felt the office was better suited for "collaboration" and "socialising". These two activities – at the heart of network formation – were generally felt to be best accomplished in an in-person workspace. They are also most important for young workers – who are learning new skills and forming new networks, unable to rely upon previous connections as older workers can. This suggests younger workers will have been more disadvantaged in the pandemic. It is important that we don't see a disconnect growing between the management of companies and their younger workers, which would risk lower innovation from new ways of thinking and fewer progression and development opportunities. →

15. https://www.microsoft.com/en-us/worklab/work-trend-index/hybrid-work

16. https://www.cpier.org.uk/media/1671/cpier-report-151118-download.pdf

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The central goal is to create 'moments of value' which bring people together for meaningful creative engagement

At the same time, younger workers are generally more adept at using technology to recreate some of these benefits by accessing online learning and using social media to develop connections. Digital skills seem likely to only become more important – which may in turn disbenefit older workers. Much of the labour force is likely to require formal and informal training to adapt to this shift.

None of this is to suggest the best approach is for everyone to return to the workplace as they were before. Just because some physical interaction is vital doesn't mean all physical interaction is useful. The central goal is to create "moments of value" which bring people together for meaningful creative engagement. As Matt Brittin, President of Google EMEA, argued: "We've always been a company that's thrived on colliding people for innovation... creativity, coaching, and culture are really enhanced by physical proximity." The goal, then, should be to create the right kinds of physical interactions, at the right times. How can this be done?

- Cambridge's networks need to be curated, or – if interaction remains low – they will wither. Firstly, leaders within these networks need to embed a culture of open sharing and learning within their networks. As companies adjust to the New Era, it is vital that learning can be shared and collaborative experiments conducted across organisations. Secondly, there is a need to create the spaces where interactions can happen. Cambridge should create the next wave of innovation spaces, which might be along the lines of a "third space" – neither home nor work, bringing in aspects of leisure and culture. Cambridge could experiment with urban design and seek to learn from elsewhere about which design approaches can best support innovation.

- Employers, networking organisations, and others should adopt an approach of creating "moments of value" where people gather in person. These must, by design, allow the benefits that can happen when people come together – fresh thinking, inspiration, and meaningful relationship development – so that those who participate do so willingly, not resentfully. Some approaches can support this to happen:

– Bringing together a wide range of people from across the company or network. Much of the value lies in the opportunities for engagement with people you could not easily contact over a digital platform.

– Smaller groups are more likely to allow this creative engagement to occur, so while some stimulus for discussion may be provided "from the front", generally people should be encouraged to have as many conversations as possible.

– A relaxed environment in which to interact, with the possibility of interesting and engaging experiences, beyond what might typically be found in a workplace. This might include elements of cultural and artistic experience, or "competitive socialising" such as games or sports.

- There is a major open question about how likely it is that technological development in the future will more successfully replicate the benefits of human interaction. It became clear through the pandemic that currently widespread technology (video calls, e-mails) allowed businesses to continue to operate in many areas, in ways they wouldn't have been able to without this technology.

However, it has also become clear that this technology is not yet being used to give the full benefits such as body language, the same degree of creative engagement, and unplanned encounters. This is both a question of technological development and behaviour. Younger workers who are "digital natives" are more likely to find ways of making connections virtually, others may find this less effective.

At the same time, technology companies will continue to develop new approaches to improve virtual engagement, but there is no guarantee we will get to the stage where this replicates the benefits of face-to-face interaction – it may depend just as much on behavioural responses to new technology as it does on the technology itself. The city should keep under review how well these approaches are compensating for current drawbacks, and how widespread their usage is becoming among Cambridge organisations.

Outstanding Questions

Q1
Will young people lose out on the opportunity to gain new skills in the new economy? Or will digital learning successfully substitute?

Q2
How much will new technology – and behaviours associated with that technology – replace the benefits of face-to-face interaction?

Q3
How has the pandemic changed the shape of the city's networks?

At Arm's global headquarters in Cambridge, staff are used to breaking the mould to invent the future. What next for the working practices of the technology giant's thousands of employees worldwide, as countries juggle restrictions and grapple with uncertainty?

Arm taking tailored approach to reshaping work

CHRIS TOLLEY
Senior Director of People Services, Arm

We've grasped this as an opportunity to rethink how work gets done. The pandemic exposed structures, processes and practices that were not as efficient as they could be and encouraged us to rethink our approach to everything from travel to how we use our office spaces. Now our offices have reopened, it's a chance to come back differently and to consider how to work more sustainably, flexibly and efficiently.

Arm has 30 years of growth based on face-to-face interaction for innovation. It's vital we retain the collaboration that's at the heart of our success, but we need to define how to do it effectively in a new world where people meet up less frequently.

During lockdown we took the physical world of work and tried to recreate it virtually. We learnt that some things just work better in person. Take whiteboarding for example – a practice that's at the heart of engineering. We've tried a lot of different whiteboarding tools during the last 18 months, and we've got solutions out of the sessions. But none of those tools can yet replicate the energy and intensity of an in-person session. We know our engineers really miss the buzz of being in the room and in the moment.

30

Years of growth based on face-to-face interaction and innovation. Arm is investigating how to ensure employees continue to collaborate effectively now they meet up less frequently

© **Arm technology** is powering the next decade of computing in phones

Even tasks you might think lend themselves to working apart, like coding, have hidden collaboration needs. A challenge can often be solved in minutes by tapping a colleague on the shoulder and asking them to take a quick look. It takes more time and effort when you have to put a slot in someone's diary to discuss it. There's a temptation to stick with the problem longer than you should, trying to resolve it alone. Last year we had a record year in terms of product releases, and that's down to the incredible productivity of our teams throughout restrictions – but this hasn't been without its challenges. In addition to the impact of remote work on how we perform tasks and productivity, we have realised that people really value feeling part of a community, and the social aspect of working in the office, such as building friendships and having a different physical location in their daily routines, is critical to many.

We believe some time together in person is crucial, probably as part of a hybrid working model, and have been trialling country-specific arrangements since our offices around the world began reopening. In Israel, a weekly check in where staff need to present a negative PCR test or show

vaccination records has helped create sufficient confidence for a 'critical mass day' with attendance running at around 70%. Staff know most of their colleagues will be in, so it will be worth battling the Tel Aviv traffic to be there too. In France, unions have agreed that staff will be office-based 50% of their time, over a 6-month trial period, with flexibility for teams to decide how they organise themselves to achieve that 50%. Here in the UK, where employees can choose how often to come into the office, efforts focus on assessing how to use the working space most effectively, so people find it comfortable and rewarding to be there.

In Cambridge we know the majority of people want to be in the office two or three days a week. The question is how to make the best use of those days.

We're trying to use our space differently to encourage collaboration in all its forms, so meeting rooms are reserved for solving a problem with others, while the canteen is for chats, and international meetings and larger remote meetings are done from desks or on days from home to foster the sense that everyone's equal – we don't want people not in the room to feel left out. Nor do we want people coming into the office to spend all day on Zoom

calls – that's not the value of being in the office. While some employers are moving to hotdesking, We are not yet taking that decision for engineers. While our enterprise functions hot-desked before the pandemic and are used to working that way, we know engineers returning to the office want some stability in terms of where they'll be working and with whom on the days that they come in. We're trying to strike the right balance of certainty and flexibility.

Arm sees the coming months as a period of transition, especially in countries where lockdown was longest, and is prioritising listening, learning, and moving slowly. For example, we have seen an uptick in the number of people asking to establish different working patterns, including being fully remote or working from different countries.

While it will take time to create a solution, this is an important dynamic in a sector where demand for talent is high, and how work fits into a broader lifestyle is a key element in choosing where to work. We are running focus groups and engagement forums, and leaders are holding virtual coffee breaks and other meetings to take the pulse of the organisation and learn what works from each other to decide how to evolve working practices further. We're all finding our way to a new future for which there's no map. We're creating it together.
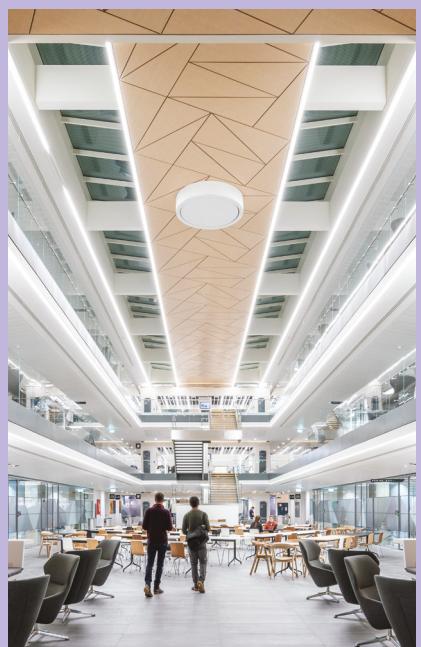
Arm's Cambridge HQ
©Hundven-Clements photography

focu

MEASURING WHAT
MATTERS MOST

DECISION-MAKING DASHBOARD

The limitations of current measures of economic success have been thrown into sharp relief by the pandemic and our response to it. Add the stark challenges raised by COP26, and it's clear we are at a pivotal moment in time. By changing how we define economic success, could we create a fairer, more sustainable future?

MIND THE GAP

Why are economic statistics vastly more detailed than other measures of success?

RULE OF SIX

The Wealth Economy approach to measuring progress against multiple types of capital.

Measuring what matters most

The pandemic has prompted us to rethink what the most important goals of policy might be. How can we measure how we're doing against them? How can we be focussing on quality of life as the guiding principle for a sustainable and inclusive economy?

Our understanding, based on evidence

Cambridge, on one reading, is an economically successful city. Research from the Centre for Business Research finds that corporate employment in the city region has grown by 5.3% per year on average over the last six years, with rates of 10.5% per year in life sciences[17]. You don't need statistics to know this – the rapid growth of Cambridge's science parks over recent years testifies to a vibrant business culture.

Economic growth has been central to the ambitions of the Combined Authority for Cambridgeshire and Peterborough, which at the time of its establishment via a devolution deal set a goal to double economic output[18] in 25 years. However, it is increasingly recognised that this is too narrow an approach by which to measure society's progress.

> You don't need statistics to know this – the rapid growth of Cambridge's science parks over recent years testifies to a vibrant business culture.

The pandemic has driven home to us how important health and wellbeing are. Dramatic economic losses, with a huge increase in national debt, have been accepted by society in the name of protecting people from harm. Meanwhile, the COP26 conference has brought home to us the pressing need to act for the climate, protecting nature and ensuring our children and grandchildren do not inherit an extremely damaged planet.

In this context, it is interesting to note the views of business (Figure 4) on how the last two years have impacted different aspects of their operations. We find, firstly, that half of respondents felt that productivity had either seen a small or large positive improvement while many more people have been working from home. By itself, this is clearly a positive. However, more concerningly most companies feel that employee wellbeing has suffered over the pandemic, with 15% seeing a large negative impact. But equally, the large majority perceived sustainability improvements, presumably largely due to lower travel.

How do we navigate these tensions between economic, social and environmental goals? As Dr Matthew Agarwala, economist at the Bennett Institute for Public Policy, set out in the final workshop: "We need a broader set of metrics to understand whether or not there has been progress."

73%

Nearly three quarters of respondents to the Cambridge Ahead Business Survey thought new working practices had been positive for the environment

The availability of different types of statistics varies widely. Economic statistics in the UK are increasingly detailed. It is now possible to know the economic output of narrow sectors at a local authority geography on an annual basis[19]. It is also possible to know the employment levels of even more specified sectors, at even lower-level geographies[20]. Real-time data on wages and employee levels are now being provided monthly[21]. →

Fig 4: How did change in the workplace impact the following?

Source: Cambridge Ahead Business Survey

● Large negative ● Small negative ● No impact ● Small positive ● Large postive

17. https://www.cambridgeahead.co.uk/cambridge-cluster-insights/cambridge-cluster-insights-for-researchers/
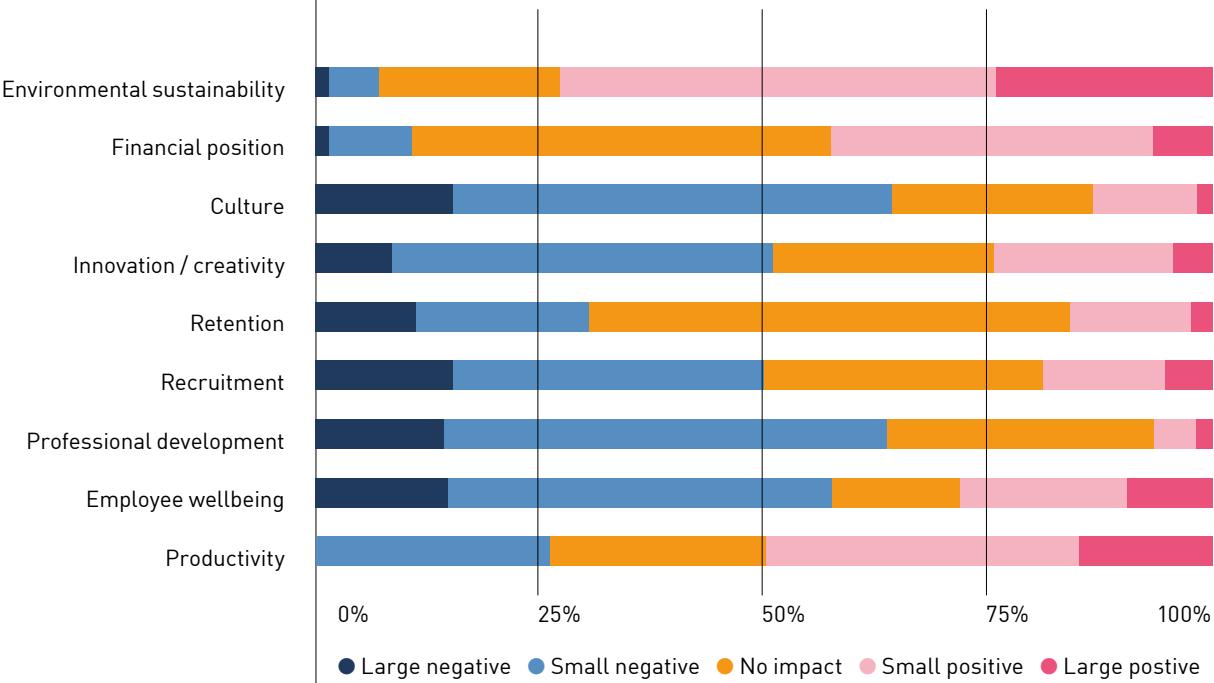
18 As measured by Gross Value Added. (GVA)

19. https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/uksmallareagvaestimates

20. https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/

21. https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/datasets/
realtimeinformationstatisticsreferencetableseasonallyadjusted businessregisterand employmentsurvey

→ This is all to be welcomed. What is less welcome is that other areas are further behind. One example is data on personal wellbeing. Over the last ten years the ONS has begun surveying people about their assessment of their own wellbeing. The results in Cambridge appear surprising:

Fig 5 : Self assessment of wellbeing

| Overall, how satisfied are you with your life nowadays? | Overall, to what extent do you feel that the things you do in your life are worthwhile? | Overall, how happy did you feel yesterday | Overall, how anxious did you feel yesterday? |
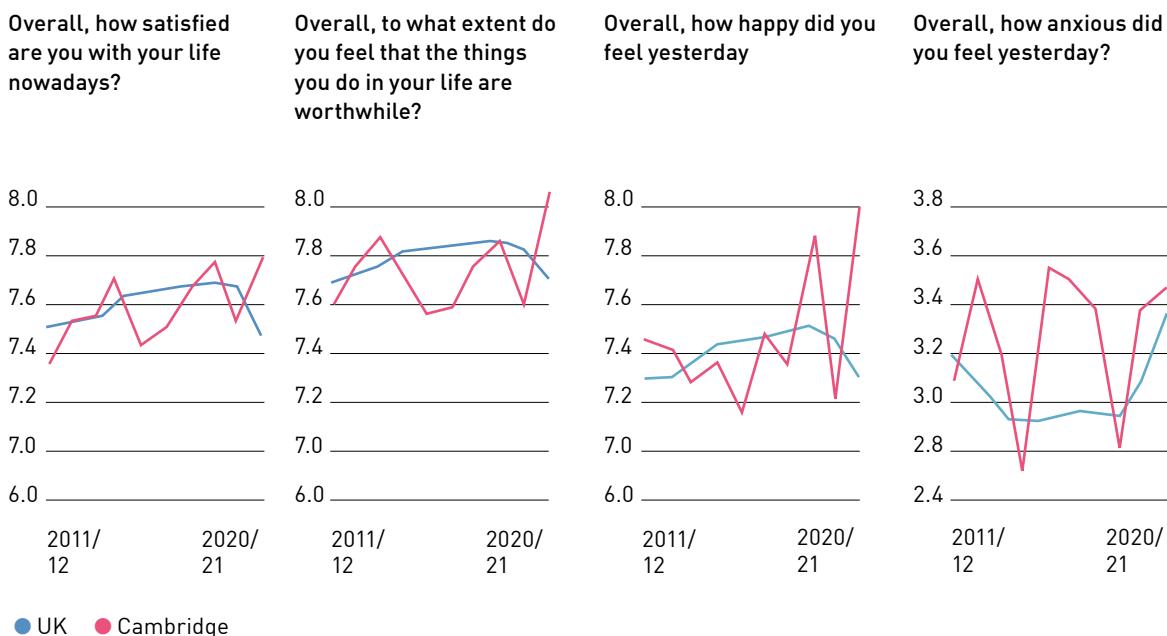
● UK ● Cambridge

Source: ONS

On all measures – except anxiety – Government data suggests that Cambridge has seen an improvement since the onset of the pandemic.

However, there are some issues here. Firstly, due to small sample sizes, the data is spiky, and confidence intervals around the Cambridge data are wide; therefore it is hard to conclude with confidence what has really happened. Second, this data only captures an average, when what may well matter most to us as society is how people at the bottom end of the spectrum are faring. Thirdly, we know from real world experiences of the pandemic and worrying metrics like the increase in usage of foodbanks that many people have not experienced improvements to their wellbeing[22].

Environmental data is also generally less detailed than economic data. Emissions estimates are provided for local authorities, though these rely on proxies such as total travel, and do not capture actual emissions. There have been successful attempts to measure the value of nature (natural capital) in places, though this hasn't been standardised at a national level.

Or, to take another example, our data on skills in the local economy is limited. The Annual Population Survey tells us what level of skills people have achieved but not what these skills are in, and therefore how able they are to use their skills within the economy.

Finally, even where we do have better data – on businesses, for example – we are still often unable to see the distribution of businesses, or how some businesses in particular are struggling.

22. Between April 2020 and March 2021, 10% more people accessed Cambridge City Foodbank's emergency support services compared to the same period the previous year." https://cambridgecity.foodbank.org.uk/2021/05/04/foodbank-use-in-cambridge-up-127-since-2015/

"

Economists, and so politicians and officials, talk all the time about which policies will be best for GDP. But it has become increasingly clear in recent times that what's good for GDP might not be what's best for people

Professor Diane Coyle,
Bennett Professor of Public Policy,
University of Cambridge

- Decision makers in Cambridge should work together to adopt a new approach to measuring value in the New Economy. This requires a framework. As part of our enquiry, the Bennett Institute spoke about the Six Capitals model for capturing economic outcomes. The inclusive wealth of any economy (national, regional, or local) and indeed any organisation (charity, business, or public service provider) comprises many interconnected capitals. The Six Capitals approach leverages the mutually reinforcing nature of these assets. The result is a strategy that increases the returns to all investments (public and private) by recognising the importance of complementary assets (such as air quality and health or local infrastructure and community cohesion).

- Cambridge, and the wider region, can be a pilot for using these capitals to measure the different types of value in the economy, and therefore to understand whether society is making progress. One basic assumption should be that unless Cambridge has improved on all these metrics, it should not be said to have overall improved its position. For example, if economic output has grown, but the quality of the environment has worsened, the city cannot be said to have improved.

- Cambridge should continue to use more real-time data, by using dashboard type tools, to understand how the stock of these various capitals is changing over time. A housing dashboard has already been produced, and over time a suite of dashboards to ensure a breadth of monitoring activity should be developed.

The Six Capitals are:

Physical Capital
(Also known as 'produced capital')
Refers to infrastructure, homes, machines and equipment, and information and communications technology.

Natural Capital
Refers to environmental stocks and systems that generate benefits for people, including ecosystem services, raw materials, and a stable climate

Human Capital
Refers to the health and skills of the population. It is a core determinant of labour productivity.

Knowledge Capital
Refers to the accumulated 'best practices' and 'ways of doing things' that arise from learning-by-doing and which enable innovation in management and business processes. Unlike human capital, it can live forever.

Social Capital
Refers to interpersonal trust, shared social norms, neighbourhood belonging and community cohesiveness. It is the glue that holds societies together and it enables us to overcome collective action problems - that is, decisions that need many people to coordinate and agree even if their personal benefit will be small.

Institutional Capital
Refers to the quality and reliability of governance and relationships between institutions and organisations.

Outstanding Questions

Q1

How have the stocks of different capitals in Cambridge changed over the pandemic?

Q2

Which indicators can best help us quantify the value of each stock?

When Anglian Water took the bold step to adopt a purpose beyond profit, the company needed to find ways to measure success.

Prosperity flows from purpose

ALEX PLANT
Director of Strategy & Regulation,
Anglian Water

For a long time, Anglian Water has been focused on reducing its carbon footprint, and we've driven out about 60% of our capital carbon from our baseline in 2007.

As part of our journey to net carbon zero by 2030, we'd already signed up to the UN's Sustainable Development Goals. Then, in 2019, our Board took the decision to change its articles of association from a standard limited company, where the stated purpose of the company is to maximise return for shareholders, to a new form of company, where the stated purpose is to deliver environmental and social prosperity to the region we serve, whilst earning a fair return for shareholders.

It wasn't an easy choice or taken lightly. The decision effectively means that the range of organisations that shareholders may be able to sell their stake to in future is reduced. It is also very difficult to reverse out from such a change, so the change embeds this commitment for the long term and for future owners and managers of the company.

But after lots of discussion, the Board unanimously agreed that this was the right thing to do. The structure of the standard limited company model did not fit the ethos of the organisations, so why not change that structure?

While it locked in behaviours that were already inherent in the company, it was nevertheless a big shift with significant implications. Once that purpose was part of our constitution, and a legal duty against which we are held accountable, we needed to find a robust way to operationalise it. That's when we began exploring and applying the Six Capitals framework, initially as a way to inform our investment decisions. Take the example of treating recycled water before it's discharged back into the environment. We have to abide by Environment Agency rules to ensure it's treated to a certain standard before it's discharged to the river.

Traditionally, we might have built a concrete tank and dosed the final effluent with ferric phosphate, which guarantees that we meet those requirements in terms of phosphorous, ammonia and other chemicals before we discharge the treated water back to the environment.

This approach works, but it doesn't score well against the Six Capitals framework. What we're now doing is finding solutions

Ingoldisthorpe wetland treatment site
© Anglian Water

that deliver a similarly safe outcome for discharge, but do so through approaches that also create increased natural and social capital. By constructing wetlands and reed beds to do the job, we can create a natural process that takes out the phosphorus and ammonia. The resulting wetland is a place people can walk around and enjoy, so there's social amenity value too.

That thinking is informing our wider investment programme for the future, which means we'll be delivering a lot more natural and social capital water recycling treatment solutions in the future and fewer concrete-constructed and chemical solutions.

100

The number of capital investment schemes the Six Capitals have been applied to

Applying the Six Capitals framework is not without its challenges, and we're still at an early stage. Currently, it's much more embedded in our capital investment choices than it is in our day-to-day operating decision making. But that's a good start as we invest many billions in programmes each year.

The main difficulty is in the metrics – how we measure likely impacts of decisions. The metrics are more mature for some aspects of the Six Capitals than others. We did some work with the UEA which gave us a baseline position on natural capital, and you can measure that readily. For example, if you create reed beds you get biodiversity net gain. There's some social uplift too, however that's harder to quantify currently.

But we're determined not to let best be the enemy of the good. We take the view that even if we're not at the point where we can clearly measure impact on all the elements of social capital, we can at least use the framework to assess whether the choices available may augment or be neutral or negative in terms of impact on social capital. It's not yet as scientific as we would like it to be, but it can still inform our decisions.

Employees are really positive about it our approach to purpose. One of the things that was a consideration for us in

deciding whether to make the change to the articles was a recognition that our ability to recruit, particularly younger people, was going to be helped by a purpose that went beyond profit. Despite the added complexity for our colleagues, we've managed to test the Six Capitals in just over 100 capital investment schemes. Now it's being incorporated into our value framework and benefits realisation process so when we're demonstrating the benefits that are realised from a particular investment, we're capturing it on multiple dimensions.

One interesting developing area is around new markets for credits for carbon and biodiversity. In the future, whenever we build anything we're going to have to demonstrate biodiversity net gain. Sometimes that's hard to do on a particular site, but if you (or another organisation) has a neighbouring wetland that you can expand, you can potentially find a way to meet your biodiversity net gain requirements through credits. That provides flexibility.

We're still in the foothills of applying the Six Capitals framework, but it's going to become ever more important in terms of the way we frame our forward plans. Every five years we put a business plan proposition to Ofwat as to what we need to invest in and what we should be allowed to charge customers for. We've nodded towards the Six Capitals in our previous plans but the next one will be much more framed by it from the outset. Once the plans are constructed using the framework, operationalising the investment choices will follow suit more seamlessly.

Exploring Rutland Water
© Anglian Water

WELCOMING SPACE IN EVERY PLACE

Space is precious in land-poor cities like Cambridge, driving up prices and squeezing out people and businesses. Despite changes in working patterns, demand for commercial property remains high, and left to its own devices, the market often designs buildings with great facilities for the few. How can we create diverse places that more people can use, for more of the time?

Designing in an inclusive mix of spaces

Cities which allow all residents to live flourishing lives provide a mix of spaces within easy reach. How can this be provided in a city like Cambridge with very high land values?

Our understanding, based on evidence

Despite changes in working patterns that look set to last, there has been no clear reduction in the demand for commercial property in the city. Indeed, the evidence from agents suggests that demand is as high as it has ever been. What might explain this?

Firstly, requirements for social distancing in the workplace dictated that for every worker present in an office, more space was needed. The expectation of more space may continue even as the worst effects of the pandemic abate. Secondly, it may be that even though the average number of people in a workspace will be lower, employers value the opportunity to bring together the whole company or whole teams in a specific place at a specific time, meaning the overall capacity needs to be maintained. Thirdly, some of Cambridge's workers – particularly lab-based staff – need to be present to carry out the core tasks of their job. Fourthly, some of the other factors which appeal to businesses about a Cambridge location – such as the prestige associated with the city – remain. And finally, there may be a degree of uncertainty hanging over businesses as they await an understanding of what the new normal is.

The Cambridge Ahead Business Survey asked questions about how likely businesses were to change their physical footprint in some way. The results, presented in Figure 6 suggest that almost half of those questioned are definitely or maybe going to reduce space (which may support the "uncertainty" theory of sustained property prices) but the majority have for now ruled out any other changes – though the idea of creating satellite offices enjoys some support.

Businesses may also need to consider not just how much space they need, but how they use the space they have. Research from Alison Hirst at Anglia Ruskin University (ARU), a contributor to the process, suggests three trends which successful workplace design will need to respond to:

1

A recognition that privacy is not hiding.
The introduction of collaborative spaces can backfire, with people resisting what can explicitly or implicitly amount to workplace surveillance. Just as important may be the need to design in private spaces, where individuals can focus without distraction.

2

Access to local workspaces.
Use of co-working spaces recovered quickly after the pandemic and can offer a place to work that is closer to a worker's home. Adopting this model may allow employees to enjoy some of the benefits of a workspace such as freedom from home distractions, without having to engage in a wearying commute as frequently.

3

Places that enable people to integrate work and life.
Allowing the workspace to fit into someone's daily rhythm, such as leisure, shopping, and family commitments should enable employees to feel more valued and in turn contribute more to the workplace.

Fig 6: How likely is your organisation to do the following with buildings?

Give up some workspace
Create satellite offices
Move into a rural location
Move to the outskirts of city
Move to city centre location

0%   25%   50%   75%   100%

● Definitely   ● Maybe   ● Definitely not

Source: Cambridge Ahead Business Survey

43%

The proportion of young professionals interested in an alternative work space, from a survey run by Cambridge Ahead's Young Advisory Committee
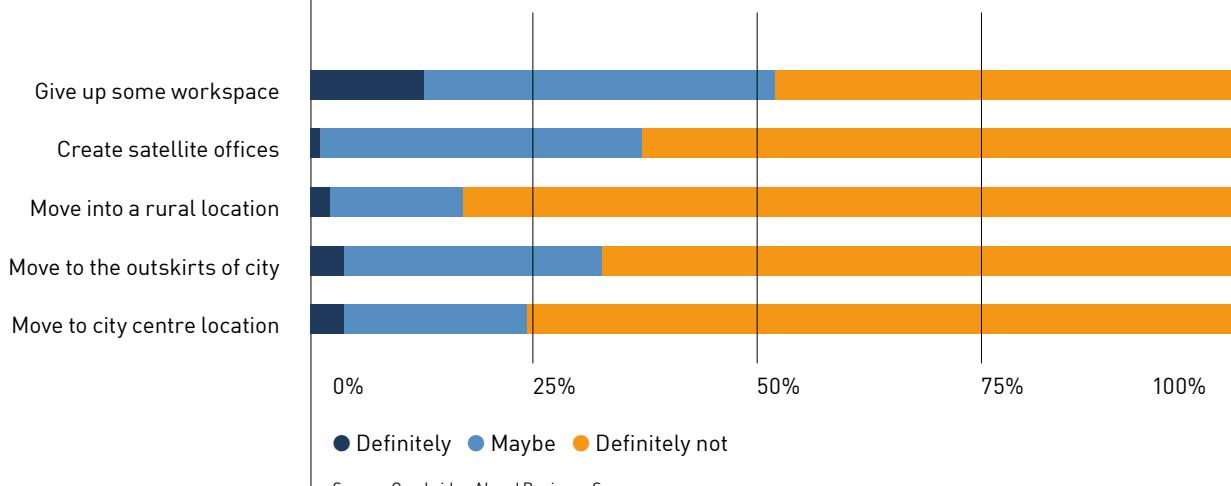
Reinforcing Hirst's research around the value of local workspaces, 43% of respondents in a survey of 205 young professionals in Cambridge indicated that they would be "interested in an alternative space to the home and workplace" and that this being "close to home" was a key ingredient that they would be looking for from this kind of environment [23].

How might the need for other spaces in the new economy vary? Research carried out by the Universities of Sheffield, Nottingham, and Birmingham into the impact of working from home has found that demand for locally consumed services – those which are generally consumed on or near site, such as cafés, barbers, gyms, etc. – looks set to fall in city centres, with corresponding increases in suburbs [24].

The increases will be largest in more affluent suburbs, because workers will in general be more able to work remotely and undertake jobs with higher salaries which can be spent on these services. This would suggest a concentrated city centre model for retail space may be replaced by a more dispersed model, which over time would naturally evolve into a "quarters" type approach to city development. These would each have a vibrant offering of retail and other types of space such as working and living space.

23. Cambridge Ahead Young Advisory Committee survey, conducted October-November 2021, 205 respondents aged <35

24. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3752977

"

We have a good modern hub office in the middle of Cambridge and we are unlikely to change that, but also now unlikely to expand the floor space, and more likely to have have people working flexibly to make the space work for all

Cambridge Ahead Business Survey Respondent

33

Marmalade Lane, Cambridge – where residents benefit from extensive shared facilities © Mole Architects, David Butler Photography www.dnbutler.com and TOWN

25. https://www.15minutecity.com/about

26. https://www.cambridge.gov.uk/media/9751/greater-cambridge-creative-workspace-supply-and-demand-report.pdf p5

15– Min

The maximum time it would take to reach services in a 15-minute city

→ This provides an opportunity to rethink the relationship between Cambridge and its surrounding market towns. The traditional one-way commute model can be shifted towards a more balanced approach, where workers in market towns have access to local workspaces. Firms in the city who find they employ a concentration of workers in a particular town could explore setting up a satellite office or hiring desks in a local co-working space. This can improve employee wellbeing and support the economic development of market towns, deepening economic relationships across the area. However, for this shift to happen an improvement in rural broadband is likely to be needed.

There is also a large body of research exploring the need for a good mix of spaces across cities. Professor Carlos Moreno, a speaker at one of the NECE workshops and leading urbanist, has developed the concept of the 15-minute city. The vision of the project is that "Everyone living in a city should have access to essential urban services within a 15-minute walk or bike" [25]. This focus on access and a mix of services ensures that city dwellers can live enriched and varied lives without having to resort to the private car for day-to-day needs.

One of the underpinning values of the framework is solidarity – by making spaces more accessible it is possible to reduce inequality of access, and create genuine community spaces where a mix of people interact. The approach also entails making better use of existing buildings – for example, a building that service as a workspace in the day could serve as an adult education venue in the evenings, a school playground could be open to the wider community on weekends.

We believe this ambition is achievable in a city like Cambridge and should be treated as a useful for framework for improving the lives of city residents.

However, our conversations suggests that **Cambridge has seen a decay in mix**. We don't have the data to prove this, but anecdotal evidence from those who have lived in the city over a longer time frame suggests that uses such as mechanics, workshops, and similar spaces have been squeezed out of the city.

We have also heard about a lack of space for artistic production, including rehearsal space, workshops, recording and studio space. One recent report concluded "artist and creative studio spaces to be fragile in terms of security of tenure (particularly in central Cambridge), with several spaces at risk of closure in the near future" [26].

This would make sense, given the huge pressure for housing supply and high-grade office in the city, pushing rental values far beyond the ability of many businesses to pay. Estate agents report that more recently logistics uses are increasingly taking up space, a use that supports people's desired modes of consumption, but does little to contribute to a sense of place and amenity.

What we also seem to be seeing across the world is the growth of mixed space environments which are privatised. The rapid growth of co-working spaces (and increasingly "co-living spaces") is an example. These often feature a mix of spaces – such as a shops, gyms, beauticians, etc. – but membership is required to access these benefits.

This raises an existential question for successful cities around the world: Is it possible to have a highly functioning economy, and maintain a vibrant mix of uses which are available to all, while leaving the allocation of space to market mechanisms?

As well as a mix of spaces, there is a requirement for "porous" spaces – those which are open and accessible, being easily passed across and through. As Sadie Morgan, a leading designer who founded the Quality of Life Foundation, argues: "We are experiencing a paradigm shift in the way we design places.

The boundaries between work and leisure, public and private are increasingly being blurred, with place-makers looking for solutions that will drive holistic inclusivity. This is happening for three main reasons: we need better functionality and efficiency in our local neighbourhoods to design out unsustainable habits of the past.

We need cultural and social diversity to uphold the kind of togetherness we feel represents us today. And, most importantly, we need to live in places that prioritise our humanity, health and wellbeing."

Finally, 15-minute city thinking suggests that areas on the outskirts of the city of Cambridge should see themselves less as "suburbs" – which suggests a position defined purely in relation to the city centre – and more as "quarters" – which suggests a place in its own right, with a unique contribution to the fabric of the city. By building this mentality into planning processes, Cambridge can create multiple vibrant centres with a mix of uses, more accessible than the city centre for those who live in the area.

- A proactive approach to the design and delivery of mixed space is needed, recognising that collective effort is necessary to make this a reality. Leaders across sectors in Cambridge should work together to understand what frameworks and design principles should exist to give preference to progressive, high-quality, proposals that come forward. The range of significant developments coming forward in the city region over the next decade provide real opportunity in this regard.

- A 15-minute city approach will require the continued development of "quarters" across the city. Cambridge should see itself as a polycentric city, by fostering the development of local high streets, and encouraging a greater mix of uses. These quarters will each need the provision of high quality, genuinely public, green space, while avoiding an approach of urban sprawl which would be damaging for the city and its wildlife. This will avoid characterless development and help create strong communities across the city.

- Employers need to work actively with employees on workplace design to understand the mix of spaces within a building which is needed – e.g., the balance between collaboration and focus space, and how the needs of workers relate to this. More broadly, businesses should explore collaboration with other users of space – such as cultural and artistic organisations – to create more diverse, interesting spaces with a broader set of possible uses.

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We need better functionality and efficiency in our local neighbourhoods to design out unsustainable habits of the past. We need cultural and social diversity to uphold the kind of togetherness we feel represents us today. And, most importantly, we need to live in places that prioritise our humanity, health and wellbeing

Sadie Morgan, Founder of the Quality of Life Foundation

Outstanding Questions

Q1

Which areas of Cambridge are closer to the 15-minute city paradigm, and which less so?

Q2

How can we best define the mix of internal and external spaces? What do we need to see in developments?

In November 2021, HRH The Prince of Wales officially unveiled AstraZeneca's Discovery Centre located on the Cambridge Biomedical Campus. This state-of-the-art £1bn R&D facility has been designed to bring people together around world-class science.

AstraZeneca's open doors for open minds

DR ANDY WILLIAMS
Vice President Cambridge
Strategy and Operations, AstraZeneca

We chose to build our new centre at the heart of Europe's leading biomedical cluster. Around us, we have the MRC's Laboratory of Molecular Biology and the Institute of Metabolic Science, Cancer Research UK's Cambridge Institute, the National Heart and Lung Research Institute, world-class hospitals, the University of Cambridge and hundreds of other academic institutions and biotechnology companies.

With all these world-class partners on each other's doorstep, we have a golden opportunity to accelerate our collective ability to turn science into medicines that improve patients' lives. AstraZeneca has already established more than 200 partnerships across Cambridge with academia, business, and leading scientific institutions.

To address the biggest healthcare challenges facing the world today, we believe we need to keep our doors and minds open. Our vision was for a building that would help us do just that. We designed our centre to make our innovative science visible, encouraging those crucial interactions between our scientists and the surrounding scientific and medical community. That's why the laboratories have floor-to-ceiling windows to put our cutting-edge research on display.

The Discovery Centre at the
heart of the Biomedical Campus
© Hufton+Crow

We also wanted the centre to be an inviting space for the wider community. Neighbours, students, school children and the public are all welcome to come and see for themselves the work that we do. When designing The Discovery Centre, architects described the building as 'porous' – that means visitors and passers-by are welcome not just in the surrounding gardens and lawns, but in the heart of the building where there is a green courtyard. They can grab a coffee from the café and have world-leading scientific discovery taking place all around them.

Welcoming green space
at The Discovery Centre
© Hufton+Crow

When it comes to working here, in addition to the labs we have everything from private study spaces and quiet booths to informal collaboration areas. The building was designed well before the arrival of the COVID-19 pandemic, but we'd already recognised trends in working practices; in many ways the pandemic simply re-enforced ways of working we were already establishing.

We know that people often like to sit alongside those with whom they work most closely on a day-to-day basis and that different groups have different space and working requirements. While many areas within the building are open plan, we've tried to move away from a one-space-fits-all idea and be more fluid. We have 'neighbourhoods' to enable groups to be together. We designed-in flexibility of office space; there are as many seats in collaborative working areas as there are 'traditional' desk-based seating. A desk booking tool enables employees and teams to request the space which best meets their needs on any particular day or week.

Successful pilots have also been carried out to enable greater flexibility in the labs, through booking work spaces and scientific kit – providing flexibility of working for scientists and

AstraZeneca has already established more than 200 partnerships across Cambridge witha academia, business, and leading scientific institutions.

200

maximizing efficiency and productivity of the increasing specialist equipment scientists are using.

In some respects it's a workplace 'on demand' or a building as a service. Employees are equipped to book everything from cycle storage to parking, electronic vehicle charging, discounted public transport, their lunch, coffee and more. Using a building in this way requires well-functioning and forward-thinking IT tools and we have built applications that help make bookings quick and simple.

I think in the long-term, we'll settle into a pattern where people will have a more dynamic relationship with the workspace, maximising opportunities for in-person collaborative working and leading-edge scientific research in the laboratories. We believe the experience of working in our building will continue to be one of the factors that attracts talent to AstraZeneca but we also recognise that over the last couple of years everyone has had to evolve their ways of working (including working remotely) which, for many, has also proved highly effective. The way the private sector, the NHS and academia came together online to deal with the pandemic broke down a lot of barriers. We want to ensure we capture and retain the best of those new ways to collaborate, both in person and apart.

PLUG IN AND CONNECT

As the daily 9 to 5 evolves into much more flexible work patterns for some and we become more able to use data to pinpoint demand, can we move to a more responsive and integrated public transport system that people will choose to use? Or will electric vehicles still keep us in our cars?

BATTLING THE BOTTLENECKS

The rise in electric vehicles may improve air quality, but could it make congestion worse?

ALL CHANGE PLEASE

Public transport use hasn't yet bounced back from the pandemic. What developments would make it desirable and viable now?

ON YOUR E–BIKE

Cycling boomed on near-empty roads during lockdown one. Can we clear the way for active travel?

Investing in alternatives to the private car

Private road transport has rebounded much more strongly than public transport. How can we make sure the New Era doesn't see the triumph of the private car?

Our understanding, based on evidence

The pandemic has had a profound effect on how we move around. During the first lockdown, mobility using cars and public transport fell sharply. Even goods and trade vehicles – HGVs and LCVs – saw sharp drops in usage.

Fig 7: Transport usage during 2020 and 2021 as compared to first week of February 2020

Legend: ● Cars ● LCVs ● HGVs ● National Rail ● Bus (ecx London)
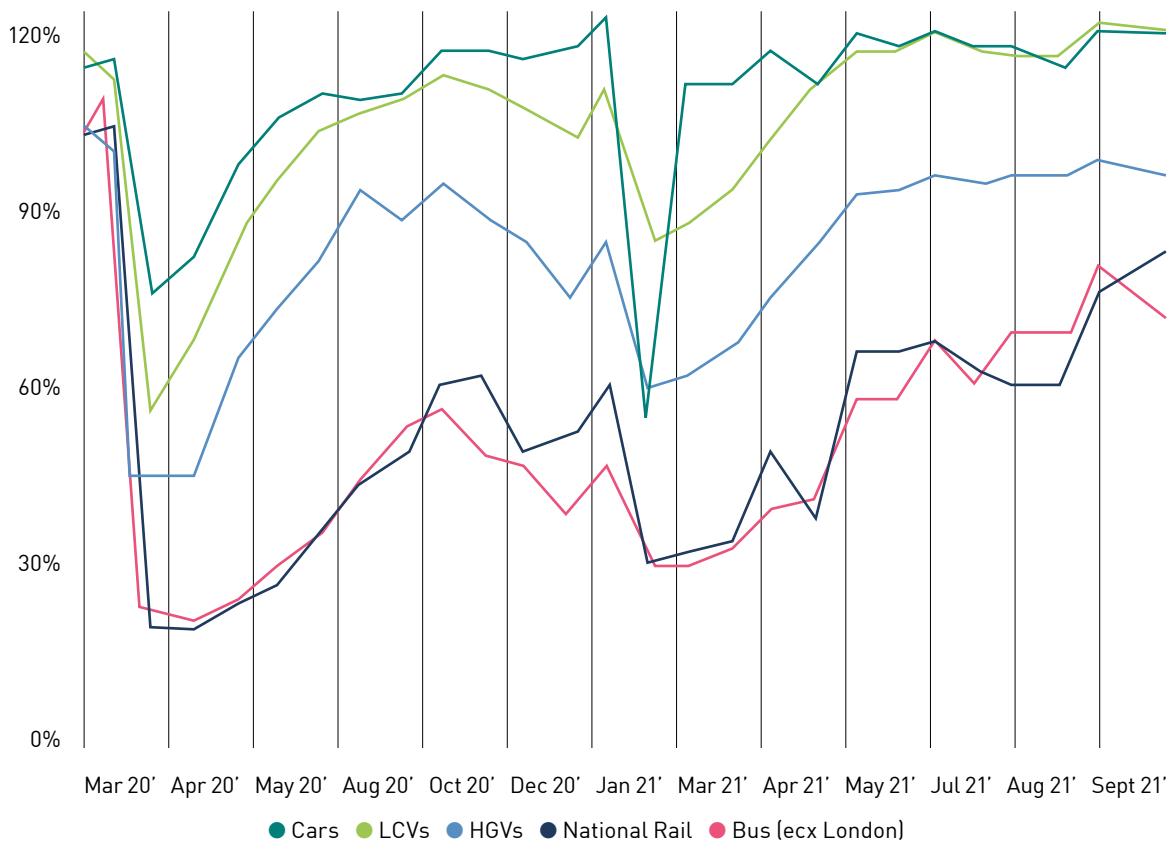
Source: Department for Transport

4.8x

Car usage recovered to 80% of pre-Covid normal 4.8x as quickly as bus usage

Since then, use of cars has almost recovered to previous levels and goods vehicles are in fact now above the previous baseline. But public transport is still well down on where it was before, and the market appears to be "pricing in" lower public transport usage in future. The expectation of lower revenues can be seen in the share prices of major transport groups, which are all well below their pre-Covid peak. The recent merger between National Express and Stagecoach is indicative of market consolidation in what is already a very concentrated sector.

Figure 8. Transport group share prices

Stage Coach Group

National Express

First Group

GoAhead Group

Source: Nasdaq and Refinitiv. Abellio is owned by the Dutch Government, and therefore does not have a share value on the market

● Share price as of start of 2020

Fig 9: Cycling relative to February 2020 baseline

225%

150%

75%

0%

Mar 20′ Apr 20′ May 20′ Aug 20′ Oct 20′ Dec 20′ Jan 21′ Mar 21′ Apr 21′ May 21′ Jul 21′ Aug 21′ Sept 21′
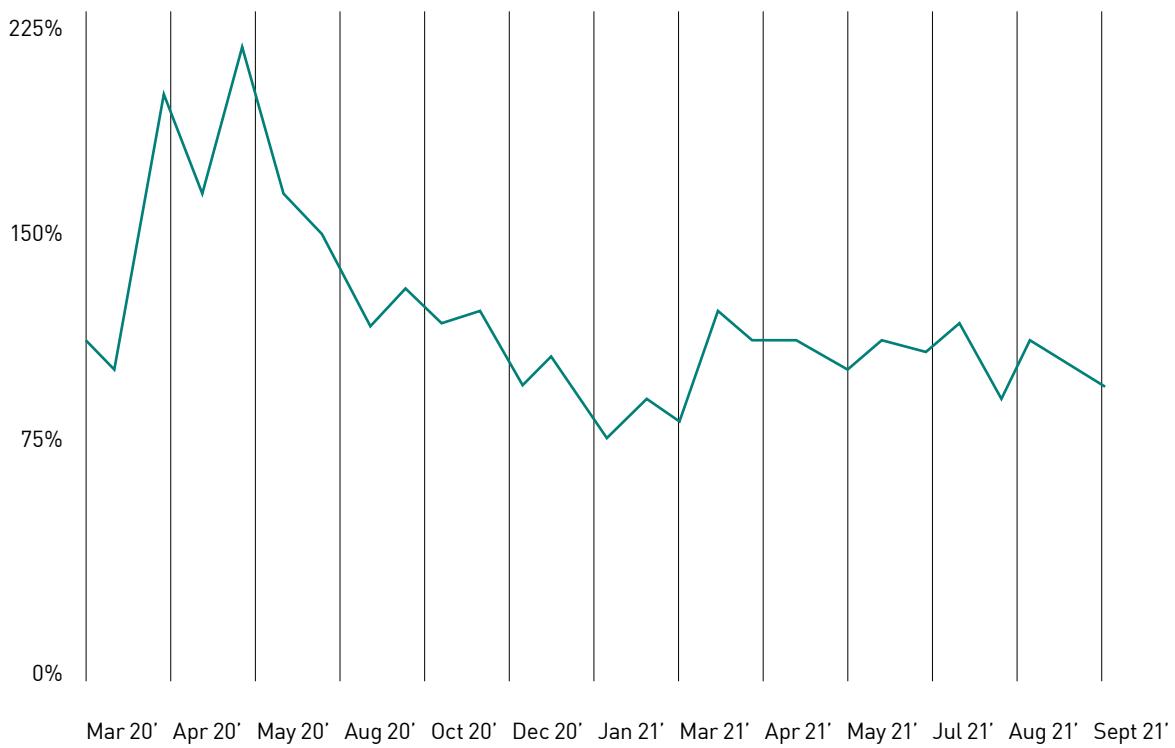
Source: Department for Transport

27. Of course, in the first lockdown there was also more cycling for leisure – which itself brings many health and quality of life benefits

28. As measured by CO_2 equivalent

27. https://carbonmonitor.org/9

→ **However, a decline was not seen in all modes of transport. Most notably, cycling saw a huge boom in usage during the first lockdown, with levels peaking at 2.5 times their pre-Covid level.**

The key point to note is that this spring/summer boom was not repeated in 2021. The most natural explanation is that when road traffic levels were lower in 2020 people were enthusiastic to cycle, but in 2021, once levels had returned to normal, they were less so. There was a major opportunity to switch people away from cars towards cycling, but it was missed. However, the evidence suggests that if you can reduce the use of the private car, levels of "active travel" will go up [27].

The private car is also problematic for emissions, contributing to climate change and damaging air quality. In Cambridge 19.3% of total emissions[28] come from road transport. 2020 demonstrated that on both of these counts, using private cars and other polluting transport less can have a major impact. Across the UK, emissions CO_2 fell by 28.7% between the second quarter of 2019 and the second quarter of 2020 – with over half of this coming from less transport use [29].

Air quality in Cambridge was also notably better in 2020. Figure 10 opposite shows the levels of different pollutants at Gonville Place in the city centre. 2020 was the best year on record for all three pollutants.

Electric vehicles (EVs) will also improve local air quality but this does not mean that EVs should be looked at as the primary transport solution. Firstly, EVs still cause congestion and pose a danger to life via traffic accidents, thereby discouraging cycling and walking. Secondly, the electrical grid in Cambridge is already very stretched, with real difficulties supporting existing EV charging.

Cambridge will struggle to scale up as a city and improve quality of life while its roads are congested with cars. Cambridge Ahead's quality of life research has found that the two things which Cambridge residents are most dissatisfied with in their daily lives are the state of public transport in their area, and the state of traffic in their area. These two are closely connected. Cars will most likely remain part of the transport mix – but what ideas can best reduce some of their harms, such as congestion and pollution?

Fig10: Average pollutant levels at Gonville Place

Y-axis: Annual Mean Concentration, Microgrames per Cubic Metre (0, 15, 30, 45, 60)

X-axis: 2007, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

Nitrogen Dioxide
PM10
PM2.5

Source: Cambridge City Council. Note PM2.5 levels were only collected from 2011 onwards.
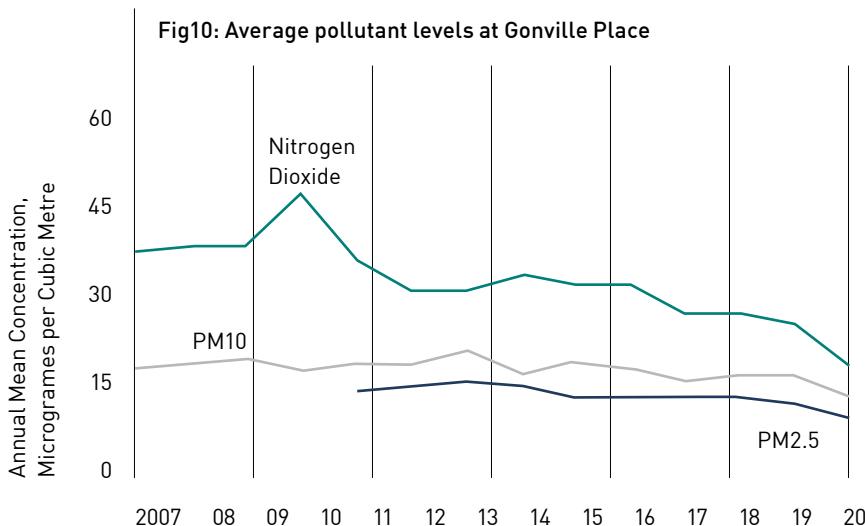
The aim is not to get rid of all cars, but to move to a better balance where public or active transport is first choice for most journeys, and the costs of congestion are dramatically reduced. Meanwhile, where vehicles are needed, including freight and buses, we should move towards electric vehicles to reduce emissions.

In terms of long-term shifts, our survey of businesses suggested that patterns of movement are likely to be much more varied, with a less clearly defined peak. Over 90% of businesses surveyed were offering flexibility around the start and end times of workers' days, which days they work from home and how many days they were in different locations, to at least some employees. Over 40% of businesses were offering this to all employees. As a result more flexibility is likely to be the new normal that transport companies and transport planners will have to respond to.

Fig 11: On which elements of working practices is your organisation providing a choice?

Categories: Work abroad, Work elsewhere in UK, Which days per location, How many days per location, Start/end working day

X-axis: 0, 20%, 40%, 60%, 80%, 100%

Legend: ● All employees ● Some employees

Source: Cambridge Ahead Business Survey

- **The city should see road space as a precious commodity.** In a city with very limited space, it is essential this space is well used. Congestion, accidents, and air pollution are all signs that the way space is being used is having a negative impact. As part of this, bikes and electric bikes (e-bikes) should be promoted much more heavily than electric cars, as they take up less space and place a much lower burden on electrical infrastructure than EVs. For a small, relatively flat city like Cambridge, they are adequate for most journeys. Electric bikes and other emergent modes like electric scooters present new opportunities, if well managed, to provide for short and mid-distance journeys. This could be particularly transformational when combined into longer journeys – the most popular location for e-scooter and e-bike usage in the Cambridge trial has been outside Cambridge Train Station. More space should also be given to pedestrians where street widths are too narrow, as became clear in some parts of Cambridge during the pandemic.

- In order to incentivise this change and prevent the pandemic from sealing the triumph of the private car we should introduce a form of road charging in the city. This would make Cambridge one of only a few places in the UK to adopt this. Any approach should be responsive to inequality in the city, so that implementation does not further disadvantage any groups who have less choice and rely most on the system.

- Public transport needs to be supported in the city, as the best way of reducing use of private cars. Providers should work with the city to create a big data platform of all public transport, to allow public transport to become more useful and usable. The development of apps using this platform would allow operators to source real-time data on the types of journeys people want to take, allowing them to respond to the greater flexibility people are looking for.
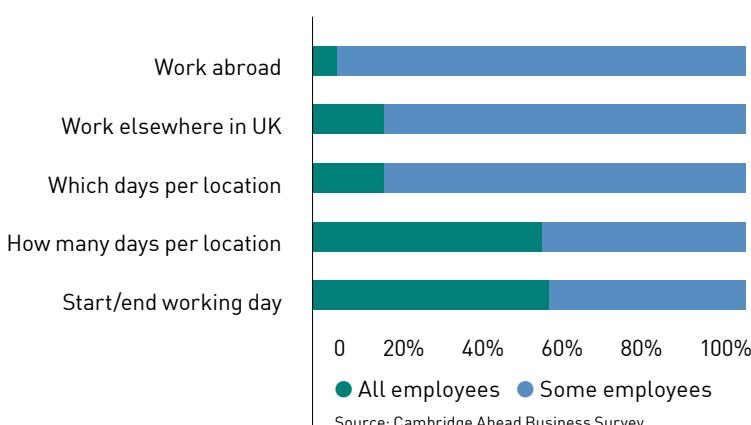
Outstanding Questions

Q1

How much can the city influence public transport provision to achieve the city's goals in a privatised sector with decreasing competition?

Q2

How could a road charging scheme work most effectively, linking with other UK charging systems?

The pandemic has had a huge impact on public transport in particular, while car usage has rebounded. The Government is on track to ban sales of new petrol and diesel vehicles by 2030, but will electric vehicles improve our quality of life?

Transport heading for the electric era

CHARLENE ROHR
Technical Director, Mott MacDonald, and Former Co-Director Centre for Futures and Foresight Studies, RAND Europe

A move from petrol and diesel to electric vehicles (EVs) is something we should make as soon as possible. It would reduce car tail pipe emissions and improve air quality. Last mile deliveries should be net zero, using a combination of cargo bikes and EV light goods vehicles, for example.

But EVs are not a panacea, and we need to be clear that people may not use them in the same way as they use their current cars. The cost of driving an EV charged at home may be lower than that of driving a a petrol or diesel vehicle. This may be great in terms of cost savings, but we know from our research that lower prices for travel encourages us to make more journeys.

Further, EV users may feel less guilty about driving - it's a bit like moving to low-fat yoghurt to lose weight and then feeling free to eat lots of it. If people think EV journeys are green, they may choose to drive instead of cycling or walking, further increasing congestion. Busy roads discourage people from walking and cycling, when we should be encouraging that kind of 'active transport'.

While electric vehicles can reduce greenhouse gasses, they still release dangerous particulates from the wearing down of brakes, tyres and road surfaces. They tend to be heavier too, with implications for traffic accidents. So, although they're undoubtedly a key part of the decarbonization solution, replacing petrol and diesel vehicles with EVs is unlikely to solve our congestion problem in Cambridge.

What's needed is a radical shift not only in how we move around, but when and why. It's time to rethink how we design cities, asking ourselves what we want our cities to feel like in the future, and what is the role of transport to support this system.

Within a city, a broader mix of local services would reduce the need to travel – the 15-minute city concept is

> "

Public transport plays a vital role, and one principle we should adopt is to make it cheaper than car travel

very interesting in this regard. And while it's not practical to dig up existing roads, we can restructure how we use existing resources. We can create more mixed land use, rethinking where we sleep, eat, shop, work and socialise. Barcelona, Amsterdam and now Paris have been leading the way in becoming polycentric cites with thriving local neighbourhoods. The planners in Nordhavn in Copenhagen are pushing these ideas even further aiming for neighbourhoods where key services are reachable to all in just five minutes. This doesn't just apply to the city centre – if we had better services in villages people wouldn't be forced to travel into the city or market towns as frequently either.

We also need to be willing to experiment. When Bristol's leaders decided to trial pedestrianised streets, businesses were worried it would reduce footfall. But against expectations, these streets increased social interaction and people and businesses began to prefer them. I think what this shows is the importance of piloting ideas to test assumptions in the real world.

Public transport plays a vital role, and one principle we should adopt is to make it cheaper than car travel. Now volumes are lower and patterns less predictable,

the financial model is under further stress. Perhaps we need to start to see it as service, subsidised for community benefit rather than profit?

We should also think about the role data and technology can play in making public transport more attractive. There's an opportunity to think of mobility as a service and make it more demand led and user centric. For example, a single payment could allow a passenger to hop on and off buses, e-scooters and bikes seamlessly to get around. Helsinki and Vienna have progress in this respect. Public transport needs to be more pleasant and convenient to entice people away from the car and for those who don't have access to a car.

It's highly controversial, but we have to acknowledge though that the most effective way of getting people out of their cars is some form of road-user charging, something the Greater Cambridge Partnership has been consulting on. This isn't always a popular option, but the evidence – from London and Stockholm for example – shows it works.

In Stockholm the city piloted charging, noted the traffic decline, then stopped the pilot, and saw the traffic return. A little like turning a tap on and off. Public

support for the scheme fell as the introduction approached, but once the charges were introduced support increased again. People are often negative about proposed changes, but experience can transform views.

Careful consideration needs to be given to avoid road-user charging disproportionately affecting the least well off and therefore increasing inequality. It would need to be matched with a good public transport system. In Cambridge, people priced out of the city could be doubly penalised and I know that our local leaders are alert to this potential issue.

Experiments would be worthwhile and they can be simple things. Park and rides could be places to get coffee, collect high street shopping and Amazon parcels, get your dry cleaning done – somewhere to do your everyday jobs. When I was a mother of young children, I really valued being able to exchange my bike for a push chair for a few hours in the city centre, making cycling viable. Someone had recognised the precise practical challenge and provided a simple solution, and we need more of that thinking.

FL...
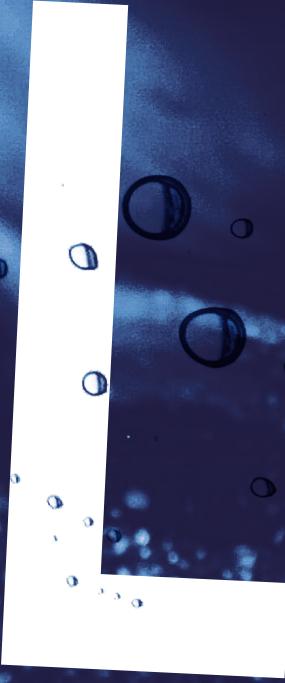
LIVING IN A DAPPLED FUTURE

Temperatures are rising, our greenhouse gas emissions are 25% higher than the UK average, and we face the twin threats of flooding and drought. With the least well off in our city likely to be most affected, what are the solutions, and how could we urgently adopt them?

OW

FEELING THE HEAT

Warmer temperatures cause health problems and sap productivity. With more of us working from home, how can good design and retrofitting help us keep our cool as the mercury rises?

NURTURING NATURE

The city has nature corridors in the form of Commons, meadows and greens along the Cam. What can we learn from this tradition when planning new public green space?

A TALL ORDER

Could higher density development improve biodiversity?

Building for the climate altered future

The Covid-19 crisis has coincided with greater recognition of another – the climate crisis. Just as the pandemic exposed fragility in many of our national systems, the climate crisis will need a robust response. Cambridge's climate is already changing and will continue to do so. How can the city prepare itself and protect its people?

Our understanding, based on evidence

The climate in Cambridge is already changing rapidly. Figure 12, below, shows the trend increase in hottest daytime temperatures per decade since 1960. In Cambridge this has been close to a degree a decade. The City Council has declared a climate emergency, with an aspiration for the city to be carbon neutral by 2050.

Fig 12: Increase in hottest daytime temperatures, 1960-2019

-0.8 -0.6 -0.4 -0.2 **0** 0.2 0.4 0.6 0.8
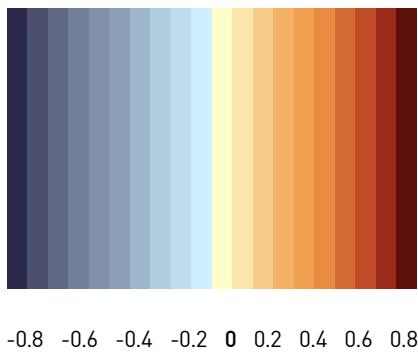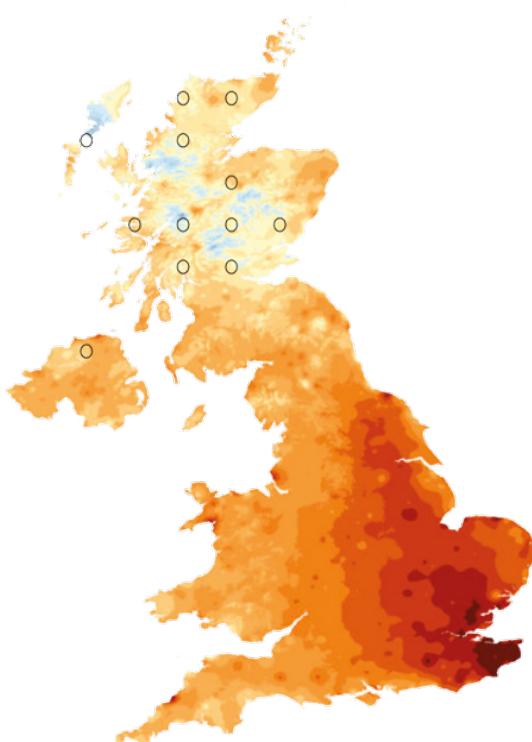
The need for immediate action is clear. Research conducted as part of the Cambridgeshire and Peterborough Independent Commission on Climate has found that if the area continues on a business-as-usual emissions trajectory, its carbon allowance will be exhausted in six years [30].The pandemic has demonstrated the ability of changing behaviour patterns to make a real impact – particularly with regards to transport, where (as noted above) emissions saw a notable decline and air quality improved when less road and air transport was used.

Source: Christidis et al, Nature Communications (2020)

Fig 13: Sources of emissions in Cambridge

Source: https://naei.beis.gov.uk/laco2app/
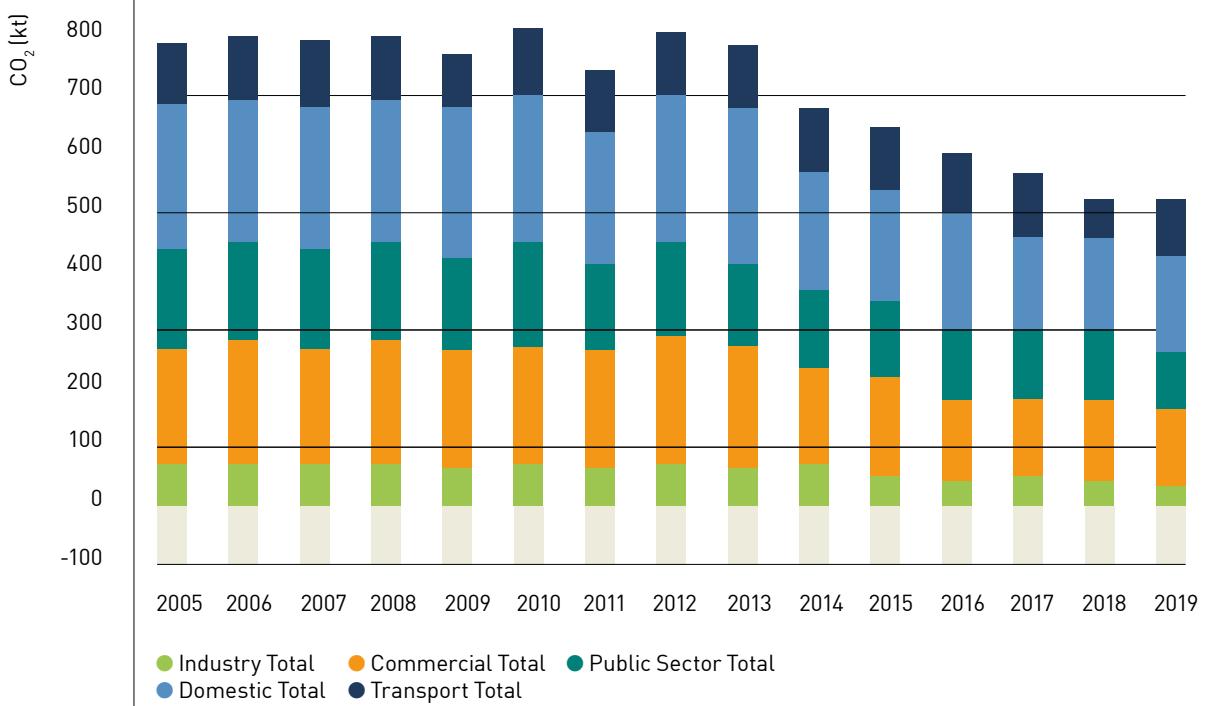
SIX

The number of years in which the area could exhaust its carbon allowance

30. Cambridgeshire and Peterborough Independent Commission on Climate

31. https://assets.publishing. service.gov.uk/government/ uploads/system/uploads/ attachment_data/file/1032260/ UK_Energy_in_Brief_2021.pdf

32. https://assets.publishing. service.gov.uk/government/ uploads/system/uploads/ attachment_data/file/953492/ Social-deprivation-_and-flooding-report-v2.pdf

33. Fairness, nature and communities, addressing climate change in Cambridgeshire and Peterborough, page 74

Emissions in Cambridge have been on a downward trend for at least eight years, driven primarily by decreases in the commercial and domestic sectors, as the electricity grid's energy mix has moved towards lower-carbon sources[31]. However, domestic emissions remain the largest category of emissions. Much of this is generated by heating, where poor insulation of properties and oil or gas-based heating systems need to be tackled for further emissions reductions.

While moving towards zero carbon rapidly is essential, a degree of future climate change has become inevitable, and threatens the city in several ways:

- Higher summer temperatures are associated with drought risk. Cambridge is already in a highly water stressed area, and further development will increase water demand.

- Higher temperatures will be associated with poor health outcomes, including heatstroke, exhaustion, etc.

- Climate change is likely to bring an increased number of heavy rainfall days, liable to cause surface water flooding, with disruption to residents and businesses. This may also cause rivers to flood more frequently.

- Rising sea levels also threaten Cambridge and the wider county of Cambridgeshire, where a lot of land is very low lying and already dependent on pumping infrastructure to control water levels.

We also know that the impacts of climate change will not be evenly felt in society. For example, Environment Agency research finds that "individuals who are more socially deprived disproportionately bear more flood risk than less deprived people[32]." As well as being more at risk, those with fewer economic resources will find it much harder to respond to a flooding event and research demonstrates that those on lowest incomes are eight times more likely to have serious mental health issues following a home flooding event.

Therefore, Cambridge needs to build for the climate altered future, for reasons of health and social justice [33].

"

Quality public green space, at the heart of different urban quarters

This is an opportunity to increase the amount of green space in Cambridge. Ordinance Survey data of "open" green spaces suggests Cambridge currently has less than comparator settlements[34]. Table 1, below, shows five places of similar size and characteristics – in that the built-up area largely fills the local authority.

Responding to the climate emergency can also create economic growth. New technologies and approaches will need to be adopted – both to reduce emissions and adapt for future changes. The city has a small emerging Clean Tech sector, which must be nurtured. Entrepreneurs across the city will increasingly need to think differently about the materials, methods, and outputs of their processes, an area where networks can again allow the sharing of knowledge and adoption of new approaches.

Table 1: Green space in Cambridge in comparator towns and cities

	Cambridge	Gloucester	Ipswich	Luton	Oxford
Open Greenspace (km^2)	4.4	4.5	4.9	5.6	7.4
Total size of city/town (km^2)	40.7	40.5	39.5	43.4	45.6
Open Greenspace %	10.8%	11.1%	12.5%	13.0%	16.3%

10.8%

The proportion of Cambridge that is open greenspace
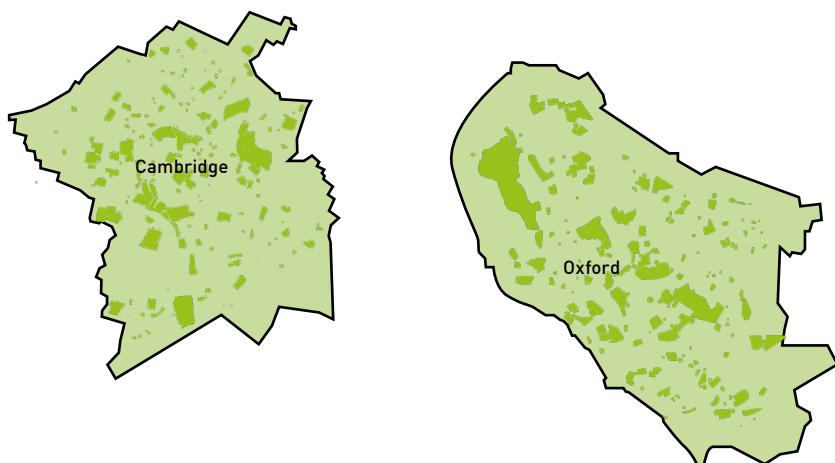
34. These include parks, allotments, cemeteries and areas for sport. Comparator areas were chosen due to having similar spatial profiles – an urban settlement that largely fills the local authority boundary and doesn't go far beyond it

Cambridge

Oxford

New approaches for the New Economy

- Cambridge has a distinctive pattern of dense streets opening out to key green spaces, such as the commons and meadows along the river. The city should look to build upon this tradition, by strategically developing key natural locations in some areas, while allowing denser dwellings in others. This new green space should not be primarily in the form of private green spaces – such as small suburban gardens – but instead in quality public green space, linked to different urban quarters. It should build upon the work of the Cambridge Nature Network to explore the possible extensions of important local habitats, as shown in Figure 14.

This can provide several benefits:

– Making the city "spongier" and more able to absorb water from flooding. These approaches have been trialled in Chinese cities, where traditional approaches to managing floodwater in farming areas have been adapted to urban environments

– Providing increased shade, which will be needed for more frequent heatwaves. This requires more tree cover in outdoor spaces

– Improvements in wellbeing and mental health, which green space has been demonstrated to improve

– Increase biodiversity, by creating new habitats in an interlinked network "based around remaining... high quality wildlife habitats" [34]

- This needs to be reflected in the spatial planning for the city, which will likely entail the need for more building height in some areas (greater densification) in order to protect green spaces. This process can also aid increasing nature in the city, through the use of green walls and vertical spaces for nature, as well as the passive benefit of generating shade.

- In addition to transport interventions described above, which will move the city towards a cleaner transport system, Cambridge could pilot "green building passports" which would accredit the environmental standards of buildings. These would capture the efficiency and future climate readiness of properties, including water consumption, ability to provide passive heating and cooling, and generation of green energy through solar panels. This approach would be linked to a major retrofit programme which would provide financial support for improving the environmental credentials of buildings.

- As noted in the case study, employers may have a role to play – especially as for many, home space is now doubling up as workspace, and improvements to improve heat retention in winter and cooling in summer will have productivity benefits. However, for any such approach to be successful will require an increase in the number of individuals with the skills needed to undertake these renovations.

- Finally, water management will become increasingly critical with hotter temperatures and more frequent heavy rainfall days. To prevent further damage to local rivers and respond to anticipated population growth, more water storage will be needed (reservoirs, etc.) which will also protect agricultural land from droughts.

Fig 14: Cambridge Nature Network Area Map

Source: http://cambridgenaturenetwork.org/
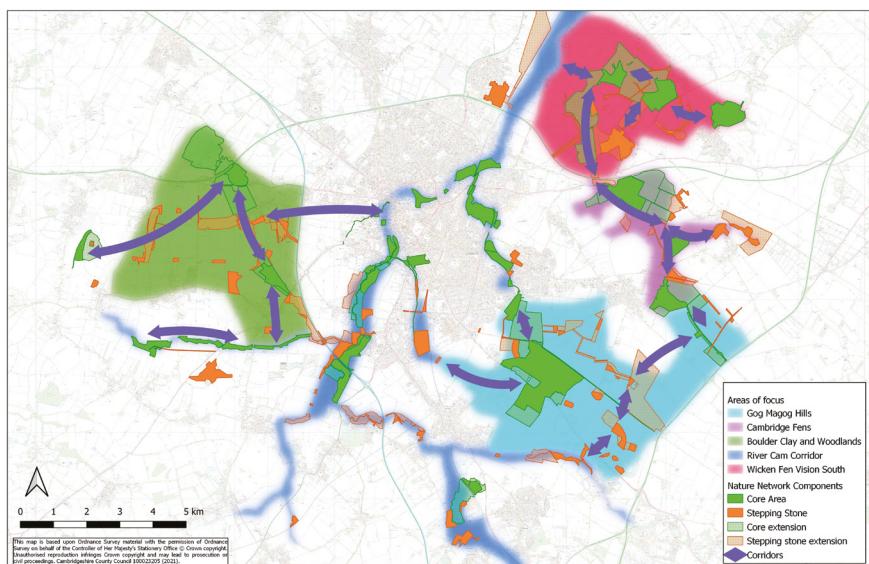
Outstanding Questions

Q1
How can we best design in green areas and shade into both new development and existing buildings and streets?

Q2
How can we most effectively incentivise those who are able to improve the energy efficiency of their homes, and support those who are not, to do so?

Q3
How can we support biodiversity in the city and extend habitats?

In October 2021 the Cambridge & Peterborough Independent Commission on Climate called for urgent action to tackle the impact of climate change locally. The Combined Authority and local councils have broadly accepted the recommendations contained in its report, Fairness, nature and communities – addressing climate change.

Fairness, nature and communities – addressing climate change

DAME JULIA KING
Baroness Brown of Cambridge, Chair of the Cambridgeshire & Peterborough Independent Commision on Climate

We have very high emissions in the Cambridge area compared to elsewhere in the UK and that is challenging, in part because this region grows a lot of vegetables and salad on degrading peat, a major source of emissions. But even excluding emissions from peat, we only have about six years remaining before we will have exhausted all our 'allowed' share of emissions to 2050, if we are to play an equal part in delivering the UK's Net Zero target.

One factor is transport and the traffic corridor through our region that serves the East Coast ports. It's noteworthy that in this area, we drive significantly more miles to work than most of the UK, and we need to cut that commute. A substantial number of people began working from home over the last couple of years, successfully so, and how many more people could do it, given the opportunity, if we installed great broadband right across our region? Moreover, we need to consider how to create better paid jobs in locations further away from our cities, to reduce the need to travel at all. And of course, we need to improve public transport.

When people do need to get from A to B, we should plan for the changes we want to see. For example, with the Oxford-Cambridge Arc developments we must get away from the 'predict and provide' model for transport provision which always leads to creating more roads, increasing congestion and emissions. While some choose to live outside our centres, many on lower incomes are forced out by high house prices, then face long and costly commutes.

> ## The solutions already exist to start tackling many of these challenges - we just need to begin

This kind of inequality isn't limited to travel. When it comes to dealing with hotter summers, more affluent families can afford things like window shutters and a garden large enough for a shady tree. Compare that to someone on a low income living in a small flat that becomes unbearably hot and forces them out to a public park to get fresh air.

Employers might play a role here. Heat affects productivity, so with greater numbers spending more time working at home, companies could consider offering low interest loans to their employees to make changes to their homes to cope. These could also finance energy

Water efficiency labels could promote wiser choices

efficiency improvements – while vehicle emissions reduce when people aren't commuting to work, their water and energy usage rises.

Perhaps our combined authority could use their borrowing powers to do something similar to extend this offer to wider population? It may be too much to ask an individual council to fund this sort of thing but a specialist investment team might be able to create funding solutions, for example attracting pension funds, which are prepared to take a long-term view.

While it probably isn't practical, healthy, or desirable to live life permanently in shadow, being able to be in the shade, out of direct sunlight, will become increasingly necessary over the next decade. And we can plan for this today - architects can design features on buildings that cast shade at critical times of day and developers can plant trees alongside pavements, reducing the temperature for people on foot and encouraging them to walk more.

We need to think about water too, starting with how to manage heavy rainfall. Cambridge should become spongier, to give water somewhere to go when it rains hard. The development at Eddington is a good example of what can be done – it

features more green space and water channels, giving water somewhere to go and directing it to where it can be stored. There are many other actions we can take, such as installing more sustainable urban drainage systems, increasing the use of green roofs and porous paving, and helping farmers create on-farm water storage.

At the same time, we must be smarter about how we conserve water. Putting water efficiency labels on appliances, taps and bathroom fittings could have a big effect on behaviour, as energy efficiency labels have. And why can't people see their water usage in real time, on a smart meter, just as they can with their energy usage? That could make a difference.

This may all sound daunting but the solutions already exist to start tackling many of these challenges – we just need to begin. Addressing climate change is a prime candidate for experimentation and local approaches could be interesting. How about developing the area's first zero emission village, developing a programme that helps people in historic homes answer the zero carbon challenge, or finding solutions to store some of the energy collected by solar panels on a street-by-street basis? That would add up to a great start.

LEA

TEST AND TRACE

We're not trying to predict the future, nor ignore it. Instead, we recognise we've been through a game-changing experience and we're going to need to invent new ways of seizing opportunities and tackling threats. To ensure we continue to thrive, how can we become more alert to change, committed to experimentation and willing to act on imperfect information?

AP

EVOLUTION OF DEVOLUTION

What kind of powers and funding will we need to lead our experiments?

IT'S IN OUR DNA

Cambridge is celebrated as a centre of knowledge creation and innovation. Can we apply our long history of experimentation with robust evaluation in new ways today?

Embracing experimentation at city and region level

New approaches are needed, but in some cases, concrete evidence on what works is lacking. How can the city learn from experimentation?

Our understanding, based on evidence

This final recommendation brings all of the others together. Throughout this process, areas have been highlighted where more data can been gathered. Clearly there is much more important research to be done, to understand just how profoundly the economy has been changed by recent events.

Many contributors have also been keen to stress the amount of uncertainty facing Cambridge as it looks to the future. Just some of the major contributing factors to this uncertainty are:

- Further Covid mutations, and possibly new pandemics in future

- Increasingly unpredictable weather systems due to climate change

- Geopolitical instability and supply chain disruptions likely to continue

A natural response to this uncertainty is to bide our time and wait for things to become clearer. This has major drawbacks though. Change will continue, and the quest for more understanding is a perpetual one. We need to be alert to change, committed to experimentation and willing to act fast on imperfect information if we are to continue to thrive.

The idea of "experimentation" has naturally arisen at several points in the NECE workshops. David Halpern, in the first NECE workshop, set out the priority: "We want cities and places to try out new things and find out: does it work?" The new working patterns of

the future haven't yet been established – so companies should experiment with different approaches, getting feedback from employees and customers to understand what works and what doesn't[36]. The impacts of a road charging scheme can't be known with perfect foresight – but there is an opportunity to run a trial scheme, gather data, and analyse it. The best way to design successful mixed spaces where collaboration, innovation, and leisure can all co-exist will also require a degree of experimentation.

The central differences between reckless and progressive experimentation is whether the mechanisms are in place to learn from the experiments which take place, and whether experiments have a clear upside opportunity to benefit the public. These mechanisms need to be established from the outset, and as far as possible should publish open data for others to use. The aim should be for Cambridge to be a city that experiments and learns at the city scale, as befits its scientific and entrepreneurial culture.

Cambridge will also need to be given the powers necessary to make significant changes at a city level. The devolution journey has begun but must go further. These might include revenue raising powers to generate funds for initiatives, increased power over transport (such as bus franchising), flood risk management powers, or others. This will allow for some of the major investment – such as in driving up the quality of the public realm – that the city needs.

36. Of course, many firms are undertaking this at the moment, for example with the trialling of four-day working weeks in some companies

> **Cambridge will need to be given the powers necessary to make significant changes at a city level. The devolution journey has begun but must go further**

These experiments must also consider Cambridge's different quarters and surrounding networks of towns and villages. One of the big shifts in the last two years – toward more working from home – has given the city an opportunity to rethink the relationship it has with these places, and deepen other links which don't just depend upon commuting to Cambridge – such as more proactively supporting the development of supply chain links with businesses in surrounding towns.

New approaches for the New Economy

- There is an opportunity to establish a UK collaborative multidisciplinary test bed based in Cambridge. Cambridge presents a unique opportunity for the UK to gain insights into the world post Covid. It is arguably the most innovative city in the UK. The economy is growing strongly. There are opportunities to observe, measure, experiment and learn. We want to share best practice so that we can capture the benefits and avoid the potential downsides for both disadvantaged communities as well as the tech elite. To begin the discussion and prepare for economic change, Government would be called upon to fund:

- A framework for implementing experiments and studies covering health, education, climate, new ways of working, transport, housing, business models, and the evolution of office and industrial space.

- A board which would consider proposals and allocate money for projects, work with existing organisations such as the Connected Cities Catapult, and have an explicit remit to link to other cities and regions in the UK and involve them in the work.

- Funding to be determined as the framework is established in a further phase of activity. Existing mechanisms for funding would be identified first. More than half would be spent outside Cambridge involving other regions and cities in the UK.

- Cambridge must be an international testbed for tackling the many challenges noted in this report and innovating new approaches, in partnership with local and national government. This would require a framework, and some experiments. The framework would consist of the following:
- A commission/organisation to oversee the experiments, with a work programme and structure of meetings. The NECE group could evolve into such an organisation

- A commitment to engaging with citizens' ideas for experiments and to being transparent with the rationale for, and findings of, other experiments

- Involvement of the city's universities, departments, and possibly targeted research institutes, such as the Bennett Institute, and the Department of Land Economy at the University of Cambridge

- An administrative function to apply for research grants and host a website

- A programme for producing publications, and an open data approach to all schemes, allowing others to benefit and share learning

- A series of experimental trials. These could include:

- Mixed workspaces which bring together work facilities, cultural spaces, leisure and retail, in a way which creates accessible mix

- Providing free Wi-Fi across the city

- Hybrid delivery experiments in areas such as working, education, and health

- Integrated (digital) transport

- Public transport design approaches to reduce transmission of disease and give users confidence

- Redesign of legal and regulatory frameworks

- New approaches to building design, including increased green space and improved ventilation

- Cambridge could also build an international network of cities with a focus on antifragility as a common purpose. There is much to learn from other cities, operating in different contexts – for example, cities in warmer climates have already had to develop many of the mitigating approaches that Cambridge will have to develop in future. International cities often have more developed governance mechanisms than have currently been

Outstanding Questions

Q1

Which experiments hold out the most promise to benefit the people of Cambridge?

Humans are at the heart of every city and its progress. But people are notoriously poor at predicting or imagining the future, and often stick to the status quo. How can a city collectively change behaviours and harness experimentation to improve quality of life today and tomorrow?

Disruption – a catalyst for discovery

PROFESSOR DAVID HALPERN
Chief Executive, The Behavioural Insights Team (BIT), and the What Works National Advisor

Habits are hard to break, even when they're sub-optimal or downright bad for us (smoking being a case in point). Thousands of decisions drive our acts each day and often, we simply don't have the time or the mental energy to re-consider our established ways of behaving.

Thinking patterns are the same. Our default is to look for confirming evidence and run within the lines. Small perturbations will generally self-correct back and we need quite a violent jolt to get us to move onto another track. Behavioural scientists are disproportionately interested in these jolts - moments of disruption - because they present the biggest opportunity to change habits. It took a London Underground strike to show some commuters that the tube wasn't the best way to get around.

Travel habits are often deeply engrained, so when the BIT was asked to support adoption of a new cycling scheme, we started by asking, is there a potential disruptive moment? Sure enough, people are four times more likely to sign up to use cycling docks if they're contacted within three months of moving house.

Instead of going into broadcast mode about those locked into habits, local leaders can use this evidence to get smarter about targeting. Consider new towns and settlements – all residents have moved and they haven't yet established new travel habits. With the right infrastructure in place, it's a golden opportunity for sustainable transport. Beyond travel, we can seize this moment to build strong and cohesive communities as social networks have also been disrupted. Too often we think about a new development purely in terms of physical capital when we should also be systematically building social capital too.

Of course, the pandemic has been a major moment of disruption. When it comes to working practices, many of us have had our habits shaken up. At the BIT we're often asked, will remote or hybrid working stick, or will people gradually return to the office?

> ❝
>
> **When people receive those energy bills, they start turning off the lights, but they also do things like install insulation.**

Autonomous vehicle trials,
© The Greater Cambridgeshire Partnership

There are two relevant change factors here: 'software habits' and structural changes. There's a famous energy-efficiency intervention where people reduce energy use when their bill contains feedback about how much energy they use relative to their neighbours. It's a nice microcosm of a more general phenomenon that's relevant for thinking about working practices. When people receive those energy bills, they start turning off the lights, but they also do things like install insulation. When the feedback bills stop, people use more energy again – half the effect wipes out and half sticks. The half that decays is that which requires active effort to maintain – the software habit of remembering to turn off the lights, which takes effort. But the insulation is a structural change that persists.

When you apply that logic to home working, you can see that people have got into the habit of going to a home desk, but the office is still there and now open, so they could drift back. However, some people have moved house, moved cities even. That's a structural change they've made that persists and influences their behaviour and, particularly if they're senior in their organisation, it's an anchor point for others too. The BIT house view is that things have changed permanently – at least to a point.

Behaviour change and experimentation go hand in hand. A commitment to deliberately and systematically test variations can provide a competitive edge – Amazon has built its business model and platform on that basis. We've been working with mayors in the USA to test lots of variations to, for example, increase the payment rate of local tax. Closing up small gaps can bring a large financial gain. It can also embed a capability – and mentality – to experiment more widely, and to be more attuned to the evidence behind policy options or operational choices.

I believe the UK needs more formal and radical experimentation. For example, our housing market offers a very limited range of options – why aren't cities here testing ideas like 'co housing' as parts of Northern Europe are?

To do largescale experimentation well, cities need to nurture something known as 'innovability' – systems which are easy to experiment within. Cities can be thought of as big capital investments which are relatively inflexible. Take the example of whether to build a structure one way or another. You can't run two versions of that, but you can ensure you build with certain characteristics, like modularity, which allows you to combine and recombine elements. The guided busway in Cambridge was innovative at the time, but it didn't have innovability in comparison with a road dedicated to buses that could have been flipped between different modes of transport for experimentation purposes.

Experimenting cities also require certain characteristics in terms of data architecture, capability and ways of working. There's the opportunity for partnership, as can be seen at the Chicago Public Services Lab – a bridge between the university and the city. Why wouldn't more cities with universities have such innovation labs to prototype ideas?

While people find it hard to predict whether they will actually prefer something before they try it, they can engage with prototypes. The BIT does a lot of online testing where we show thousands of people different versions of something and see what difference that makes to their comprehension, or liking or intention in some way. Prototyping often aims to assess the impact of an initiative on problems like crime levels or traffic congestion, but it can also reveal how people will feel and that's another relevant variable. Indeed, we've even done a form of this – with 3-D simulation – to help shape the design of a new city in Asia.

Citizens could even provide the mechanism to authorise experiments themselves. In an academic setting that's a role usually carried out by be an ethics board, but in a city it could take the form of deliberative democracy.

The Levelling Up agenda presents a huge opportunity to help the country experiment. DLUHC should be helping and empowering cities try out all sorts of things, but the quid pro quo should be that they must evaluate it in a way that ensures every other city will understand what worked and what didn't. And not because Whitehall needs to know whether something Cambridge did worked or not, but because every other city needs to know and should want to know. That looks a lot like a public good.

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CONCLUSION

This report has set out some of the big changes emerging in the New Era, and the approaches that a city like Cambridge – and other cities around the world – can begin to take in response.

It is the beginning of the journey, not the end. As has been noted throughout, there is still much that is unknown. The work of the NECE group will continue to inform and support the direction the city is taking. More research needs to be carried out: to develop new ways of measuring value in the economy, to understand the best approach for bringing transport data together, and to analyse where more green space can be brought into the city, among other things.

However, these broad priorities are the ones which we believe should shape a new strategy for Cambridge's economy. The city has the opportunity to become an exemplar of how to respond well to changes being seen in cities across the world. While it has brought much grief, the pandemic has provided an opportunity to rethink, change direction, stop things that aren't working, and start new things which might work – in a healthy spirit of experimentation and learning.

The next stage of work for the NECE group is to engage with the wider community in Cambridge to explore the questions set out in the report, and others brought to our attention. Further workshops and research will develop more detailed recommendations and shape experiments.

WITH THANKS
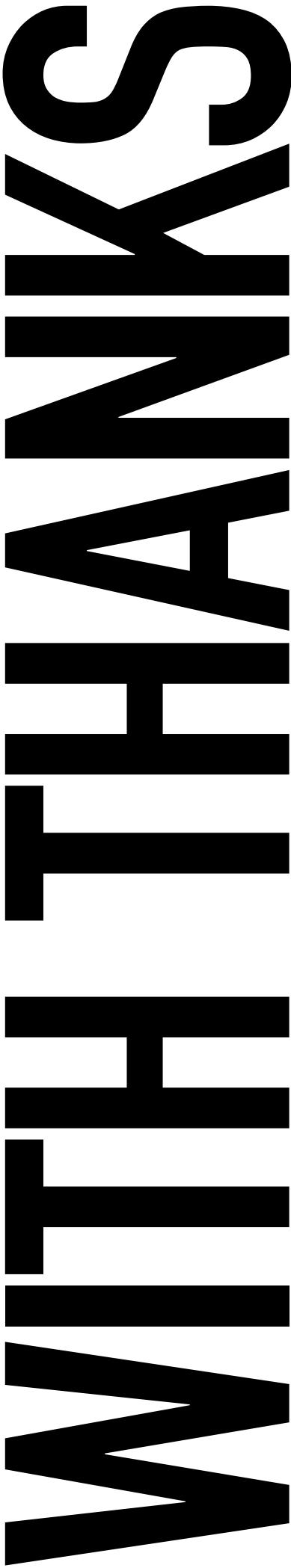
Steering Committee

Dr David Cleevely
CBE FRENG FIET – Chair
David Cleevely is an entrepreneur who has founded a series of companies including Abcam, Analysys and the award winning restaurant Bocca di Lupo. He was Chairman of the Raspberry Pi Foundation, founding Chairman of the Cambridge Science Centre, and founding Director of the Centre for Science and Policy, University of Cambridge. He also co-founded Cambridge Network, Cambridge Wireless, Cambridge Angels and Cambridge Ahead, and helped set up the Cambridgeshire and Peterborough Independent Economic Review (CPIER)

Professor Phil Allmendinger
Phil Allmendinger is Professor of Land Economy at the University of Cambridge, and a Fellow of Clare College. He is senior advisor to the Vice Chancellor on City and Regional Affairs. Previous roles include Professor of Planning at the University of Reading and Head of the Department of Land Economy at the University of Aberdeen. He has published extensively in the areas of spatial planning, planning theory, policy and practice, land and property regulation, housing and local government, and is a member of the Communities and Local Government Housing Markets and Planning Expert Panel.

Dame Kate Barker
Dame Kate Barker is presently a non-executive director of Man Group plc, chairman of the Trustee board of the Universities Superannuation Scheme and chairman of trustees for the British Coal Staff Superannuation Scheme. She is also chair of the Governing Council for the Productivity Institute. Kate was Chief Economic Adviser at the CBI in the 1990s, and then became a member of the Bank of England's Monetary Policy Committee (MPC) from 2001 until May 2010. During this period, she led two major policy reviews for Government, on housing supply and on land use planning. In 2018 she led the Cambridgeshire and Peterborough Independent Economic Review (CPIER).

Kelly Beaver
Kelly Beaver is Chief Executive of Ipsos in the UK & Ireland. She has been with Ipsos for over a decade and was previously Managing Director of Ipsos's UK Public Affairs division which supports government clients to monitor and understand public opinion, behaviours and societal trends, design public services and policies, and to determine what works in achieving social and economic policy objectives. Kelly has led a wide range of notable research programmes including the REACT study tracking Covid-19 prevalence across England, public attitudes work ranging from the use of evidence, Brexit and vaccines, through to a key piece of work with the Royal Foundation on the importance of the Early Years. Prior to joining Ipsos, Kelly held roles across various consultancies including PwC and KPMG and specialised in public policy evaluation.

Matthew Bullock
Matthew Bullock is a founder and Honorary Vice-Chair of Cambridge Ahead. He was Master of St Edmund's College, Cambridge, from 2014-19, as well as Chairman of the Transforming Pathology Partnership. For the last 12 years, Matthew has also been the chairman of International House Trust Ltd. Matthew was most recently the non-executive director of Cambridge University Hospitals Foundation Trust (Addenbrooke's), and Chairman of its Audit Committee from April 2011–July 2013. In this position, Matthew played an active role in improving the financial and commercial performance of this large hospital group. He was also a founding member of the Advisory board at the University of Cambridge Judge Business School and a member of the University's Audit Committee for 12 years.

Professor Diane Coyle CBE
Diane co-directs the Bennett Institute for Public Policy at the University of Cambridge where she heads research under the themes of progress and productivity, and has been a government adviser on economic policy, including throughout the covid-19 pandemic. Diane is also a Director of the Productivity Institute, a Fellow of the Office for National Statistics, an expert adviser to the National Infrastructure Commission, and Senior Independent Member of the ESRC Council. She has served in public service roles including as Vice Chair of the BBC Trust, member of the Competition Commission, of the Migration Advisory Committee and of the Natural Capital Committee. Diane was Professor of Economics at the University of Manchester until March 2018 and was awarded a CBE for her contribution to the public understanding of economics in the 2018 New Year Honours.

Harriet Fear MBE
Harriet was a Diplomat for over 20 years with the British Foreign Office. She served in 17 countries, in various roles including Deputy Ambassador, Head of Press and Public Affairs and Head of Commercial Services. She regularly served in hostile environments, trouble-shooting specific crises including in the Congo, Cambodia and Ethiopia. Harriet was Chief Executive of One Nucleus from 2009 to 2017, which became the largest life science and healthcare membership body in Europe, and was the Prime Minister's Business Ambassador for Life Sciences for 5 years to 2018. Harriet is currently a Director of Cambridge&, a new inward investment service for Greater Cambridge.

Sam Gomarsall
Sam is the Community Trust Manager at Cambridge United Community Trust, the official charity of Cambridge United Football Club. Sam leads the team at the Trust in delivering projects in the local community across the themes of Inclusion, Community Engagement, Wellbeing, and Education & Skills utilising the social power of football to make a positive impact. They have just released their new strategy 'At the Heart of our Community' setting out to be at the heart of a stronger, healthier & more equal community. Sam also sits on the English Football League Trust advisory board.

Professor Tom Holbrook
Tom Holbrook is founding partner of spatial design practice 5th Studio and Professor of Architecture & Urbanism at RMIT University. Tom's design practice explores complex urban regeneration, sustainability, and the resilience of cities. His work with 5th Studio has been published internationally and has been recognised by a wide range of awards across the fields of architecture, urban design, infrastructure, planning and landscape. He is a Design Advocate for the Mayor of London and a member of the Design Panel for HS2, the UK's high-speed rail project. Current work includes a number of masterplans around London's Olympic Park and the Royal Docks as well as designing buildings and spaces for innovation, creative exchange and making in the Lea Valley and Oxford-Cambridge Arc.

Professor Dame Julia King, Baroness
Brown of Cambridge, DBE, FRS, FREng
Julia is an engineer, with a career spanning senior engineering and leadership roles in industry and academia. Her interests include climate change adaptation and mitigation and the low carbon economy. She was Vice Chair of the Committee on Climate Change for 12 years and is Chair of the Adaptation Committee; she is a non-executive director of Ørsted and of Ceres Power. She was non-executive director of the Green Investment Bank, she led the King Review on decarbonising transport (2008) and was the UK's Low Carbon Business Ambassador from 2008-2018. She is a crossbench Peer and a member of the House of Lords European Science and Technology Select Committee.

Professor Sadie Morgan OBE
Sadie Morgan is a founding director of Stirling Prize winning architecture practice dRMM, alongside Alex de Rijke and Philip Marsh. As a design champion Sadie undertakes advisory roles including chairing the Independent Design Panel for High Speed Two and as a commissioner for the National Infrastructure Commission (NIC). She has been instrumental in setting up the NIC's Design Group which places design at the heart of major infrastructure projects. She recently founded the Quality of Life Foundation – an independent body aimed at raising wellbeing through improvement of the built environment. In 2017, Sadie became a Mayor's design advocate for the Greater London Authority and was named New Londoner of the Year by the NLA for her work championing design at the highest political level. In the New Year's Honours 2020 she was awarded an OBE for services to design advocacy in the built environment.

Ben Page

Ben Page is Chief Executive of Ipsos MORI. He joined MORI in 1987 after graduating from Oxford University in 1986, and was one of the leaders of its first management buyout in 2000. He was CEO for UK and Ireland between 2009 and 2021. A frequent writer and speaker on trends, leadership, and performance management, he has directed thousands of surveys examining consumer trends and citizen behaviour. Since 1992 he has worked closely with both Conservative and Labour ministers and senior policy makers across government, leading on work for Downing Street, the Cabinet Office, the Home Office, and the Department of Health. He is a visiting Professor at Kings College London, Fellow of the Academy of Social Sciences and serves on the ESRC Council and the CBI Council for London.

Jane Paterson-Todd MBA

Jane is CEO of Cambridge Ahead, a membership organisation for large scale businesses and institutions in the Cambridge region, supporting and influencing local and central Government decision making on the growth needs of the region by providing credible research and analysis. Prior to her appointment at Cambridge Ahead, Jane's career spanned both the commercial and not-for-profit sectors, including roles as CEO of a London-based theatre, the Group Commercial Director of Emap Conferences, Head of Fundraising and Development at the Barbican Art Centre, as well as over 11 years in national media advertising including The Telegraph, The Times and prominent women's consumer magazines such as Elle and Elle Decoration.

Alex Plant

Alex became Strategy and Regulation Director at Anglian Water in 2017. He is now taking forward the plans for new reservoir systems in the region to address the water scarcity challenges in the East. Previously he has worked as Director of Regulation at Royal Mail, Executive Director for Economy, Transport & Environment at Cambridgeshire County Council, and Chief Executive of Cambridgeshire Horizons (the body overseeing the plans for sustainable new communities in Cambridgeshire). In addition to his role with Anglian Water, Alex is a Board Member of the Centre for Cities, an Operational Board Member for Cambridge Ahead, a Board Member for Water Resources East, and chairs the Regional Productivity Forum for East Anglia (as part of the wider £32m ESRC-funded Productivity Institute).

Charlene Rohr

Charlene was appointed as Technical Principal at Mott MacDonald in June 2021, having previously led RAND Europe's transport policy research as well as being co-director of RAND Europe's Centre for Future and Foresight (CFFS). During her time there she was seconded as a senior research fellow at the Institute for Policy Research at King's College London, where she undertook research on the impact of autonomous vehicles and the impact of road traffic on air quality. Charlene has over 30 years' experience undertaking research to better understand: drivers of mobility, the impact of transport on society, and the role of policy to maximise societal benefits of transport. Charlene is a member of the DfT's Joint Analysis Development Panel advising on forecasting, appraisal and modelling and was a previous Chair of the Applied Methods Committee for the European Transport Conference.

Henry Stark

Henry has recently started a role within External Relations for Marshall of Cambridge (Holdings) Ltd. As part of this new role, he will be working closely with each of the Marshall businesses comprising of its Aerospace and Defence, Property, Fleet Solutions and Apprenticeships and Training Centre. Prior to this, Henry worked in the Marketing and Communications department for Marshall Aerospace and Defence Group. In addition to his role at Marshall, Henry is also playing an active role within the Cambridge Ahead Young Advisory Committee where his main focus has been on 'The Future of Flexible Working' for the under 35 demographic.

Chris Tolley

Chris is currently Senior Director, People Services at Arm, where, amongst other responsibilities, he oversees the Arm People Team's response to the COVID-19 pandemic. Chris is on the steering committee for Arm's return to workplace programme and is the lead on several of the key related HR workstreams. He has previously held roles in the public, private and third sector across the full range of HR functions in organisations including the Foreign & Commonwealth Office, HMRC (where he was the policy lead for flexible working in pre-COVID times), the Government Digital Service and Cabinet Office. Chris is an Associate Member of the Chartered Institute of Personnel and Development.

Professor Roderick Watkins

Professor Roderick Watkins was appointed Vice Chancellor of Anglia Ruskin University in February 2019. He first joined ARU in 2014, as Pro Vice Chancellor and Dean of Arts, Law and Social Sciences, before being appointed Deputy Vice Chancellor (Research and Innovation) in 2015. Prior to joining ARU, he was Dean of the Faculty of Arts and Humanities at Canterbury Christ Church University, where he was appointed Professor of Composition and Contemporary Music in 2005. He is a composer with a particular interest in digital sound synthesis and the combination of acoustic and synthetic timbres, and his compositions have been performed and broadcast across Europe and the UK. He was a member of the Advisory Group for Lord Stern's Review of the REF (2015-16), and the Research England/Universities UK Working Group developing the Knowledge Exchange Concordat (2018).

Workshop attendees and interviewees

In addition to the attendance of various Steering Group members:

David Abecassis
Analysys Mason

Matthew Agarwala
Bennett Institute for Public Policy

Vic Annells
Cambridgeshire Chambers of Commerce

Greg Archer
Cambridgeshire and Peterborough
Independent Commission on Climate

Amanda Askham
Cambridgeshire County Council

Richard Astle
Natural Cambridgeshire

Craig Bennett
The Wildlife Trust

Tarquin Bennett-Coles
George James Ltd

Howard Bernstein
Deloitte

Dame Carol Black
British Library / Centre for Ageing Better

Mike Bodkin
TOWN

Jessica Bowles
Bruntwood

David Braben
Frontier

Matt Brittin
Google Europe

Fiona Bryant
Cambridge City Council

Harry Bullivant
LEX Diagnostics and Cambridge Ahead
Young Advisory Committee

Matt Burman
Cambridge Junction

Adam Challis
JLL

Kay Chaplin
Mantle Business Centres

Melanie Collett
Aviva Investors

Sam Davies
Cambridge City Council

Katrina Dodd
East West Rail

Jaime Doig-Bowles
Red Gate Software

Annesley Donald
Addenbrookes

Nicholas Falk
URBED

Tom Fraser
Savills Cambridge

Adrian Gault
London School of Economics

Noelle Godfrey
Connecting Cambridgeshire

Sam Gomarsall
Cambridge United
Community Trust

Jenny Granshaw
Cambridge BID

Richard Hall
Cambridge Consultants

David Halpern
Behavioural Insights Team

Charlie Hamilton
Deloitte

Pam Herries
Today The Arena

Bev Hindle
Oxford to Cambridge Arc
Leadership Group

Alison Hirst
Anglia Ruskin University

Dr Ying Jin
University of Cambridge Cities
and Transport Group

Gareth John
First Intuition

Tony Jones
One Nucleus

Stephen Joseph
University of Hertfordshire

Chris Land
ARU

Peter Landshoff
University of Cambridge

Jemma Little
Cambridge City Council

Jesse Matheson
University of Sheffield

Duncan McCunn
Barclays

Professor Carlos Moreno
The 15-Minute City Project

Matthew Morgan
The Quality of Life Foundation

Olaide Oboh
Socius Development

Laurel Powers-Freeling
Uber UK

Hans Pung
RAND Europe

Andrew Rawlings
Mott MacDonald

Darren Roe
Stagecoach

Nykki Rogers
Huntingdonshire District Council

Liam Ronan-Chlond
Socius Development and Cambridge
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Emma Russell
Jagex

Ian Sandison
Cambridge BID

Kim Sawyer
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Peterborough Combined Authority

Chris Sexton
Cambridgeshire
Autonomous Metro

Alison Shakespeare
The Perse School

Matt Smith
BioMed Realty

Sara Spear
ARU

Paloma Strelitz
Patch Local

Ben Szreter
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St John's College and Cambridge Ahead
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Committee

Chris Tolley
ARM

Olivia Toulson
Birketts

Chris Van Stolk
RAND Europe

Isobel Wade
Greater Cambridge
Partnership

Jeanette Walker
Cambridge Biomedical
Campus

Dick Wise
Bidwells

APPENDIX

The impact of Covid-19 on Cambridge

Health

The pandemic has significantly impacted the health of Cambridge's population. Since the onset of the Covid pandemic, 151 people in Cambridge have died with Covid on their death certificate[37]. We can see a clear peak in all cause deaths in April 2020. However, since then deaths in the city have generally remained around typical levels. Across the whole pandemic, the city of Cambridge has seen relative few deaths, possibly reflecting a large, younger student population – 88.8 people per 100,000 have died within 28 days of a positive test for Covid-19, compared to 141.1 in Cambridgeshire, and 224 in the UK [38].

Fig 15: Deaths in Cambridge, March 2020 to April 2021

● Average deaths for that month 2015-19
● Total deaths
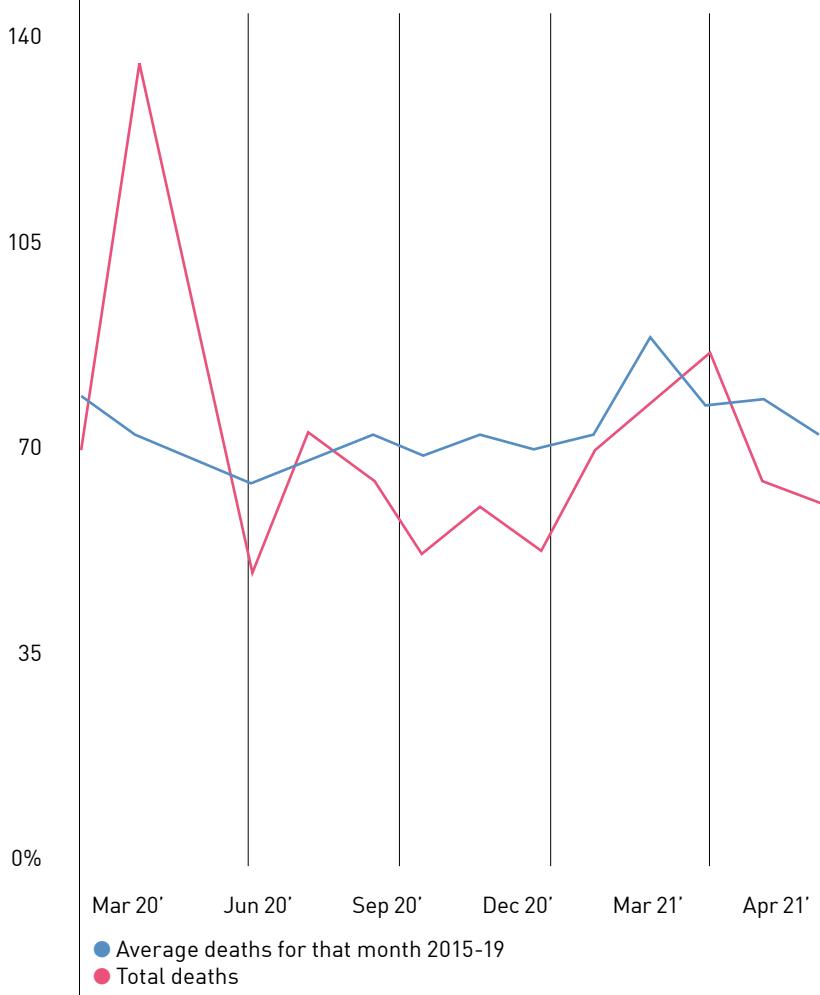
Source: ONS article: Excess deaths in your neighbourhood during the coronavirus (COVID-19) pandemic

18,622 people have tested positive in Cambridge – though the true number of people in the city to have had Covid-19 at some stage is certainly considerably higher. For some, this has a long-term health impact – ONS research finds that 6.7% of those who are symptomatic during the acute phase of the infection experience ongoing symptoms [39].

There is also the significant impact of the pandemic on mental health. This is much harder to gauge at a local level. The ONS publishes research on self-assessment of wellbeing for local authorities – in most places, these metrics (life satisfaction, sense life is worthwhile, happiness, and anxiety) worsened, but surprisingly, in Cambridge there was a measured improvement across three of the four categories. However, these are average metrics which don't capture the extremes and feedback from local organisations suggests that an increasing number of people have been pushed into poor mental health due to the pandemic.

Employment

According to real-time PAYE data from HMRC, the number of employees in Cambridge returned to its pre-Covid highest level (February 2020) in November 2021, after hitting a lowest point in February 2021. While this is positive, and suggests a lower degree of labour market "scarring" than might have been anticipated, the city was behind the East of England and the UK, which both hit bottom in November 2020 and had recovered by September 2021.

6.7

ONS research finds that 6.7% of those who are symptomatic during the acute phase of the infection experience ongoing symptoms.

Fig 16: Payrolled employees in Cambridge

Pre-pandemic peak
– Feb 2020

Recovery time:
21 months

65,000

62,500

60,000

57,500

55,000

Jul 14' Jul 15' Jul 16' Jul 17' Jul 18' Jul 19' Jul 20' Jul 21'

Source: HMRC
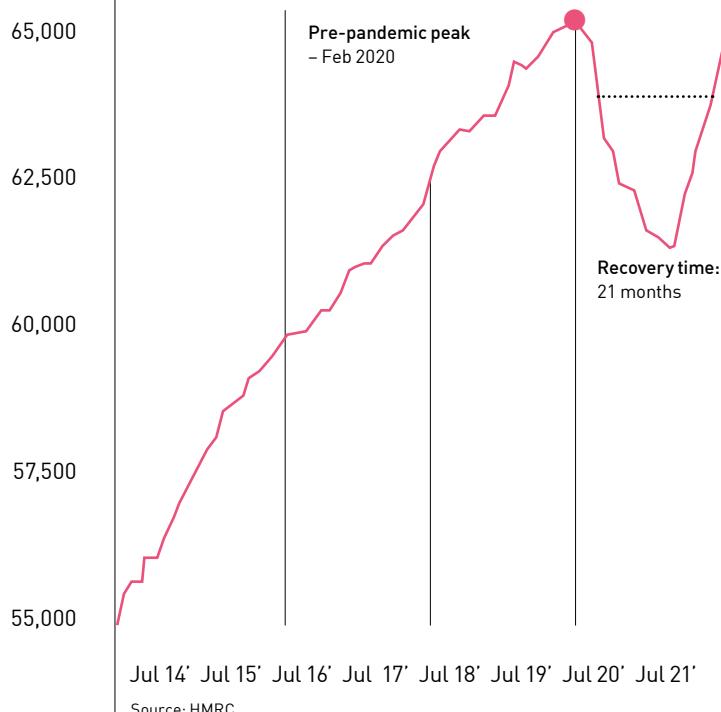
However, evidence gathered locally shows that within the city, employment growth remained strong for Knowledge Intensive (KI) companies, with the annual growth rate of employment standing at 8%, while there was a contraction of 0.8% in non-KI sectors [40].

37. Or 110, within 28 days of a positive test

38. https://coronavirus.data.gov.uk/details/deaths

39. https://www.ons.gov.uk/ peoplepopulationandc ommunity/healthandsocialcare/conditionsand diseases/articles/

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APPENDIX

Workplace usage

While the number of employees has returned to previous levels, the use of workplaces has not. Our survey of businesses indicates a large change in working patterns that has persisted beyond the end of restrictions. The majority (62%) spent five days at the workplace before the pandemic, whereas now only 10% do. Most strikingly, no respondents reported less than three days per week in the workplace before the pandemic – now a majority do. The overall result has been that in our survey numbers of days in the workplace has fallen from an average of 4.7 to an average of 2.5. Over the next twelve months, businesses anticipate returning to higher workplace usage – with the average rising to 3.1 days per week, as the number of businesses keen to maintain fully remote working or only one day a week falls. Three days a week emerges as the most preferred option.

A series of surveys young professionals in Cambridge, conducted at regular intervals throughout the pandemic period, have further shown a strong preference toward individuals wanting to spend either two or three days at their place of work each week [41].

These findings are echoed by Google data which reveal that workspace usage in Cambridge has been at least 30% below pre-pandemic levels since March 2020. The city has generally seen lower levels than Cambridgeshire or the UK, probably due to many of Cambridge's workers have professional occupations which can be more easily done from home.

62%

The majority spent five days at the workplace before the pandemic,

Fig 17: Use of workspaces relative to baseline (7-day rolling values)

1st Lockdown

2nd Lockdown

3rd Lockdown

Mar 20' May 20' Jul 20' Sep 20' Nov 20' Jan 21' Mar 21' Apr 21' Jun 21' Aug 21'

● UK ● Cambridgeshire ● Cambridge

Source: Google Community Mobility data
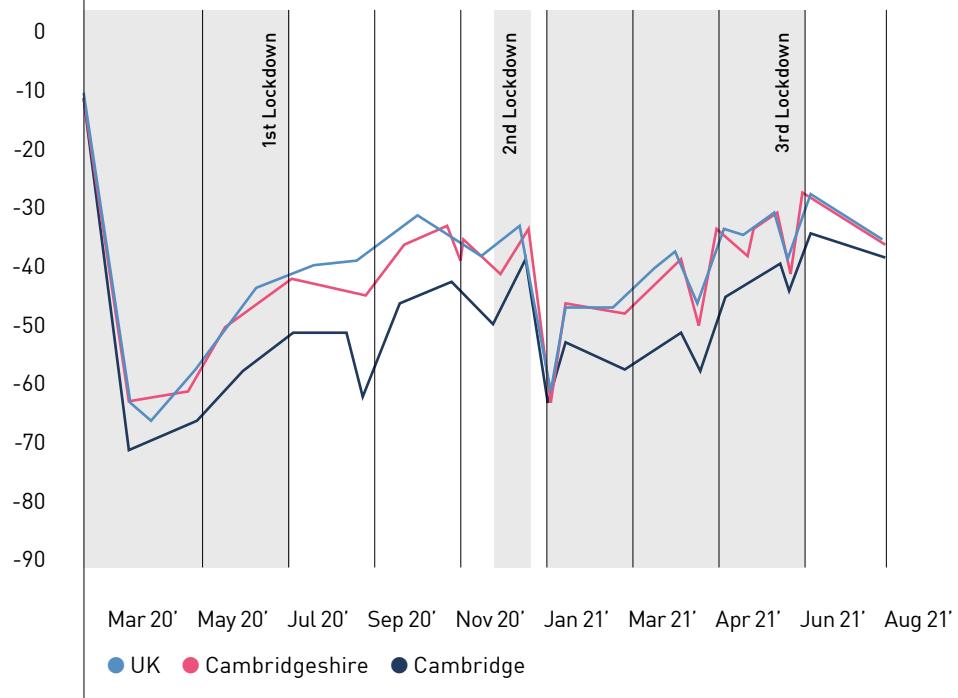
None of this should disguise the fact that, for many and possibly most of Cambridge's workers, especially in sectors like retail, hospitality, and transport, working from home has not been an option throughout the pandemic. This has meant higher exposure to Covid-19 infection risk, and in some cases lower demand for services due to customers no longer working nearby. And for those who have been able to work from home, the experience has varied – for example, an American study found that 79% of men said they experienced "positive work effectiveness" at home, compared with only 37% of women[42].

A UK study found that those who live with multiple housemates – and are therefore less likely to have their own space outside of their bedroom – were much more likely to agree to the statement "Work from home is worse for my health and wellbeing" than those who live alone or with a partner[43].

Despite this contraction, conversations with property agents indicate that demand for workspaces in Cambridge remains strong – a point discussed in recommendation 3 – "Designing in an inclusive mix of spaces". This has been associated, however, with a reduction in use of public transport, though use of cars has rebounded strongly.

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    postacutesymptomsamongpeoplewithcoronaviruscovid19intheuk/26april2020to1august2021

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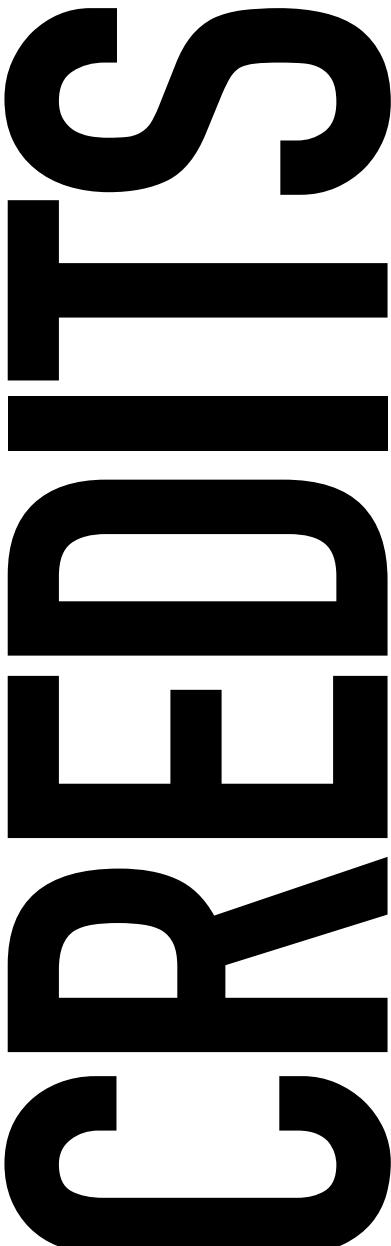
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Contributions from Cambridge Ahead, the NECE Steering Committee, and The Scale Partnership

PHOTOGRAPHY

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