

THE OVERHEATED ARC

Part 3 – The economic mirage



“The process of levelling up is not just aimed at creating opportunity throughout the UK, it is about relieving the pressure in the parts that are overheating.”

Boris Johnson, 15 July 2021

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The Arc

[Stella Stafford]



Smart Growth UK is an informal coalition of organisations and individuals who want to promote the Smart Growth approach to planning, transportation and communities. Smart Growth is an international movement dedicated to more sustainable approaches to these issues. In the UK it is based around a set of principles agreed by the organisations that support the Smart Growth UK coalition in 2013:-

- Urban areas work best when they are compact, with densities appropriate to local circumstances but generally significantly higher than low-density suburbia and avoiding high-rise. In addition to higher density, layouts are needed that prioritize walking, cycling and public transport so that they become the norm.
- We need to reduce our dependence on private motor vehicles by improving public transport, rail-based where possible, and concentrating development in urban areas.
- We should protect the countryside, farmland, natural beauty, open space, soil and biodiversity, avoiding urban sprawl and out-of-town development.
- We should protect and promote local distinctiveness and character and our heritage, respecting and making best use of historic buildings, street forms and settlement patterns.
- We should prioritize regeneration in urban areas and regions where it is needed, emphasising brownfield-first and promoting town centres with a healthy mix of facilities.
- Civic involvement and local economic activity improve the health of communities.

Executive summary

Introduction: The prime minister's "levelling-up" speech said the intention is to relieve pressure in overheated areas and he argued strongly against making richer parts richer. Yet the Government continues to press accelerated development in the badly overheated and relatively wealthy Arc although the case for accelerated development in the Five Counties is weak or non-existent.

What they didn't ask: The Arc has been under development for 10 years, yet no-one behind it has yet asked three very basic questions:-

- Is the "arc" concept a useful one?
- If the arc concept is a sound one, are there other areas which could support the growth, actually need it and could support it more sustainably?
- Could a huge area like the Oxford-Cambridge Arc ever generate the agglomeration benefits of a "growth corridor"?

What they claim: Big claims have been made for the Arc in a series of publications but the Treasury has yet to say why it chose the Five Counties, other than the presence of universities where senior ministers and civil servants obtained their degrees.

The National Infrastructure Commission, its consultants, publications from the property industry and its public relations people, leaders of those Arc local authorities that have accepted Government cash and the Government itself continue to puff its supposed economic potential. Yet their arguments don't stand up to scrutiny and they never ask whether there are better alternatives.

Does "agglomeration" justify the Arc? The basic Arc literature has argued it would be possible to create a functioning high-productivity, knowledge-based, growth corridor around the "agglomeration cycle". But this would need "diversified specialisation" and the various parts of the Arc have little in common in terms of activity or human capital.

The "growth corridors" argument they use doesn't work in employment or GVA terms. Claims "quality growth" could be based on "economic dynamism" give a very uneven picture and Arc cities' share of private, knowledge-based jobs is around the UK average.

Even the NIC's consultants admit the Arc isn't a single growth corridor but five largely independent wedges radiating from London. Analysis of employment in various sectors and R&D shows the Arc is made up of three or four distinct economic areas, so making any sense of it as a "growth corridor" would need extensive road building, both new radial routes to London and the Cambridge-Oxford "Expressway". But despite the latter's cancellation, other bodies are still carrying out "connectivity studies".

Do research and development levels justify the Arc? R&D features in most business cases advanced for the Arc but a recent study casts doubt on the strength of this argument. R&D funding across the world is certainly concentrated in areas, but UK R&D spending is traditionally weak and while Cambridge and Oxford feature fairly

strongly in UK university R&D spend, they are modest spenders internationally. UK clusters have tended to emerge around one or two universities, not a big area.

Regional R&D spending is very variable around the UK and even within regions and its use in supporting regeneration lacks support in Whitehall where it's not considered central to levelling-up.

Reliance on fee income hinders UK R&D spending at universities which now have a huge deficit. While some Cambridge and Oxford colleges can raise funds from urban sprawl on historic land holdings, this does nothing to assist levelling-up. Some UK regions only have one university described as "research-intensive" and there are no proposals to address this two-tier structure (though regional collaboration might help). Only very small areas in the Arc show characteristics of clusters.

But though UK R&D spending is weak and clusters of it in the Arc are small, there are other clusters elsewhere in the UK. The Arc's supposed strength comes from the imbalance of funding enjoyed by two of its universities. Concentrating inadequate national R&D resources in the Arc would effectively undermine levelling-up.

Would jobs growth justify the Arc? The "incremental scenario" and "transformational growth scenario" considered by the NIC consultants relied on massive investments in transport, housing and other infrastructure, but unifying the Arc's widely separated economic areas would still be problematic. While growth in knowledge-intensive businesses was sought, no overall growth in jobs in the key high-tech manufacturing sector was predicted.

Are there better places for an arc? Smart Growth UK has already shown there are other places in the UK that meet both the criteria on which the Arc was proposed and other sustainability criteria: brownfield land availability, no acute housing shortage, high-quality public transport and a need for economic regeneration. Another report has now identified eight regional innovation hubs and says cities should have populations >200,000 to facilitate agglomeration. It also identified five regional alliances, two of which matched part or all of our alternative arcs.

Continuing concentration in London and the south-east would exacerbate the UK inequality, harming not just the economy, but with profound effects in areas like health.

The economy they never mention The Arc contains much of the country's very best and most versatile land and farming occupies almost three-quarters of it. Yet a string of reports on the Arc fail to mention it at all, even in an economic context.

Conclusions The Arc remains "an idea founded on sand" and that includes its economic justification. Its proponents never ask three important questions:-

- 1. If the Arc, as formulated was a good idea.**
- 2. If so, whether it was being developed in the right place.**
- 3. If the Arc proceeds in the Five Counties, would it undermine urgently needed "levelling-up" elsewhere?**

It should be dropped before any more public money is wasted.

1. Introduction

A barrage of Government reports has promoted the so-called “Oxford-Cambridge Arc” as central to the UK’s economic future. Yet analysis shows that the claims for it are misleading or false and its main effect would be to undermine “levelling-up”.

On 15 July 2021, prime minister Boris Johnson made a major speech¹ on levelling-up which presented an excellent case for abandoning the Oxford-Cambridge Arc. Although Mr Johnson argued that levelling-up could not be achieved by constraining companies or making the richer parts poorer, he comprehensively destroyed the case for making the richer parts even richer.

“Governments have created a sort of Matthew effect,” he said. “To him that hath shall be given so you end up investing in areas where house prices are already sky high and where transport is already congested and by turbo charging those areas, especially in London and the south east – you drive prices even higher and you force more and more people to move to the same expensive areas - and two-thirds of graduates from our top 30 universities end up in London – and the result is that their commutes are longer, their trains are more crowded, they have less time with their kids, they worry at the same time that the younger generation won’t be able to get a home and that their leafy suburb or village will be engulfed by new housing development but without the infrastructure to go with it.”

While he stressed he wasn’t intending to weaken London, he made quite clear his intention was not to continue stimulating places that were already over-stimulated.

“The process of levelling up is not just aimed at creating opportunity throughout the UK, it is about relieving the pressure in the parts that are overheating,” he said.

Having comprehensively demolished the case for the Oxford-Cambridge Arc, Mr Johnson did manage a reference to it while commending the success of battery technology throughout the entire country.

“This battery development will drive investment from Cornwall to Thurso, so that without in any way detracting from the golden triangle of Oxford London Cambridge – the greatest scientific constellation anywhere in this hemisphere – we drive high tech high wage jobs across the UK,” he said.

He presumably meant the Northern Hemisphere as the Arc straddles both East and West, but as we shall see, claims about the scientific prowess of the Arc exceeding anywhere else in the Northern Hemisphere are without foundation.

Central to the long-running Government attempt to impose substantial urbanisation on the five rural counties of the “Oxford-Cambridge Arc”, however, has been the claim that the area offers “a unique economic and environmental opportunity”. The February 2021

paper, snappily entitled *Planning for Sustainable Growth in the Oxford-Cambridge Arc: An Introduction to the Oxford-Cambridge Arc Spatial Framework*², claimed the area is “home to a unique business, science and technology ecosystem”.

It is, of course, also home to a huge amount of ecosystem services, but these are obviously less important, despite a lot of greenwash about “doubling nature”.

Such is the Treasury’s desire to progress this brainchild, the Government is prepared to claim that: “The Arc’s success is key to the UK’s national prosperity, international competitiveness, and ability to meet the challenges and opportunities we will face as a country over the next century”, as if that weren’t true of any part of the entire country.

But the claims Government bodies have made about the Arc over the past five years are flimsy or false and there has been a regrettable tendency to cherry-pick statistics. The February 2021 MHCLG publication, for instance, includes a claim that: “it is home to some of the country’s fastest growing and most innovative places. Cambridge’s rate of patent applications – a key indicator of innovation – is the highest in the UK”.

Table 1.1: Patent applications per 100,000 population 2018

Cambridge	148.12	Basildon	10.93	Blackpool	6.49
Coventry	95.53	Southampton	10.35	Leeds	6.46
Oxford	64.51	Nottingham	9.89	Blackburn	6.30
Derby	60.98	Plymouth	9.28	Stoke	6.05
Aldershot	39.03	Portsmouth	9.08	Manchester	6.01
Aberdeen	34.07	Northampton	9.07	Sheffield	5.96
Edinburgh	31.63	Telford	8.83	Burnley	5.66
Gloucester	24.03	Newport	8.82	Huddersfield	5.52
Bristol	20.06	Dundee	8.74	Mansfield	5.48
Birkenhead	19.85	Chatham	8.69	Birmingham	5.46
Crawley	19.48	Belfast	8.58	Warrington	5.40
Slough	18.14	Norwich	7.87	Liverpool	5.37
Peterborough	17.32	Bournemouth	7.63	Sunderland	4.91
Exeter	16.59	Brighton	7.37	Glasgow	4.45
Newcastle	16.46	Worthing	7.02	Southend	4.32
Cardiff	14.39	Middlesbrough	6.95	Luton	4.28
Reading	14.10	Swansea	6.91	Doncaster	4.13
York	13.97	Hull	6.82	Ipswich	4.09
London	13.64	Leicester	6.82	Barnsley	3.64
Milton Keynes	11.99	Bradford	6.59	Wakefield	2.90
Preston	11.55	Swindon	6.51	Wigan	2.65

Oxford-Cambridge Arc towns shown in brown

Source: Centre for Cities³

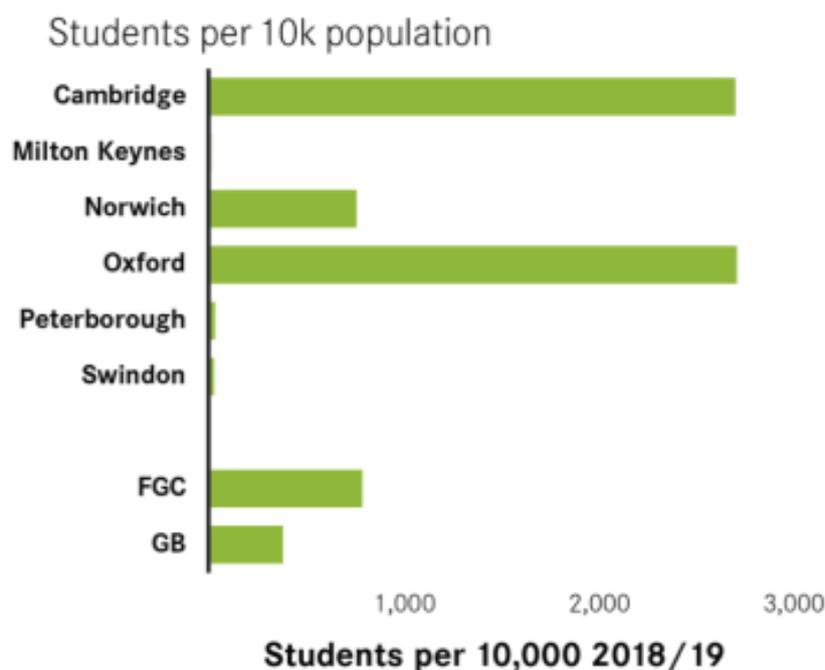
But the choice of “patent applications per 100,000 population” is a strange one to use to justify the Arc. With Cambridge first and Oxford third in the list [Table 1.1], it would appear to make a strong case, but the other large towns in the Arc feature much less

strongly. Peterborough is ranked 13th, Milton Keynes, despite its high productivity, 18th, while Northampton is 25th and Luton 56th.

It is, in any case, hard to see what the relevance of patent applications is. It can't be the excellence of the local university as Aldershot, Birkenhead, Crawley, Slough etc. don't have one. And both Cambridge and Oxford have low populations relative to the size of their universities, so they're likely to do misleadingly well on the measure of applications per 100,000 population. More interesting would be measures of how well cities' patents are turned into products or services, but they're not included.

Indeed, misleading statistics about the quality of local universities using the size of the local population are quite a feature of Arc promotion. The Centre for Cities' *Fast Growth Cities – 2021 and Beyond*⁴ report covered four Arc cities (Cambridge, Milton Keynes, Oxford and Peterborough) and two others nearby (Norwich and Swindon). It included the following table which claimed to show Cambridge, Norwich and Oxford "make strong contributions to the higher education sector in Great Britain".

Figure 1.1: Centre for Cities' Analysis of "Contributions to the Higher Education Sector"



Source: HESA, Higher education student data 2018/19.

Note: Data for Milton Keynes is for 2015 as data for the University of Bedfordshire campus there is unavailable for 2018/19.

Source: Centre for Cities

The three cities do of course make a significant contribution, but then so do many others. Yet "students per 10k population" is a bizarre way to rank settlements. On this basis, the strongest contributions to higher education would come from universities located away from large towns and the lowest from those in big cities. Keele and

Lampeter are fine universities and they would top the league on this basis; London University would presumably be bottom.

The Arc's proponents put forward many arguments about the area's supposedly unique contribution to the nation's economy. These need calling out before irreversible damage is done to sustainable development in this country.

2. What they didn't ask



“Silicon valley”

[Stella Stafford]

Developers have long cast covetous eyes on the comparatively unfragmented countryside of the counties north and north-west of London. The origin of the current Arc concept, however, lies in a ludicrous 2011 conversation between the then prime minister David Cameron and his friend, Next plc chief executive and garden city enthusiast, Lord Wolfson. Asked why Britain doesn't have a “silicon valley”, Lord Wolfson complained about how long it took to get planning consent and how long it took to drive from Cambridge to Oxford. Mr Cameron relayed this to chancellor George Osborne and Mr Osborne ordered the National Infrastructure Commission (NIC) to make favourable recommendations for a “growth corridor” between the two cities where he and many of his cabinet colleagues had attended university.

With the Treasury ordering things, the NIC, most local authorities in the Arc and the local universities (especially those set to make huge profits out of their land holdings) fell into line, eagerly pursued by a throng of property interests, builders and their consultants.

No-one, anywhere in these 10 years, appears to have stopped and asked whether an “arc” was a good idea and, if so, whether the area now identified for the Arc would be the best place to locate it. Instead, a huge thunderhead of hype about the area's supposed economic potential has been developing, threatening to break destructively over the Five Counties.

So in this report, we repeat two questions we have asked before and add a third. If those proposing the Arc are unable to provide convincing answers to them, then the project should be abandoned before any more public money is wasted on it.

- Is the “arc” concept a useful one?
- If the arc concept is a sound one, are there other areas which could support the growth, actually need it and could support it more sustainably?

And now we must ask:-

- Could a huge area like the Oxford-Cambridge Arc ever generate the agglomeration benefits of a “growth corridor”?



No-one has ever stopped to ask whether the Five Counties are the best place for an arc

[Stella Stafford]

3. What they claim



“A single knowledge-intensive cluster”

[Stella Stafford]

Right from the start, big economic claims have been made for the Arc. The case was set out by the National Infrastructure Commission in 2016 in its *Partnering for Prosperity*⁵ document. This was produced in response to the chancellor’s instruction to “make recommendations to maximise the potential of the Cambridge-Milton Keynes-Oxford corridor as a single knowledge-intensive cluster that competes on the world stage”- thus presupposing the answer.

But just in case it wasn’t clear that the Commission was not to question the wisdom of this choice of location, it was instructed to “provide the Government with proposals and options for the long-term infrastructure to unlock growth, jobs and housing within the Cambridge-Milton Keynes-Oxford corridor over the next 30 years”. Quite why the jobs and houses had been imprisoned here and needed “unlocking” was unclear, but there was never any attempt to provide critical economic analysis of the Arc or its location before it was approved in principle. To this day, the Treasury has never revealed the thought process that led to the choice of the Arc, other than the presence of the universities from which senior ministers and civil servants had gained their degrees.

Cambridge Econometrics/SQW: In response to the chancellor’s orders, the NIC commissioned four studies to underpin its favourable recommendations, including one from Cambridge Econometrics and SQW on the economic case for the Arc. From the start it was clear that the report⁶ was mainly intended to provide a puff for the Arc and

thus, effectively, close down consideration of accelerated growth anywhere else in the country.

The report thus has to be understood as advocacy rather than a critical assessment of the wisdom of the project. “This report focuses on *the economic rationale* [our italics] for infrastructure investment in the Cambridge, Milton Keynes, Northampton, and Oxford area,” it admits (the NIC by then having quietly annexed Northampton to the “corridor”).

From the start, Cambridge Econometrics was hobbled by Mr Osborne’s instructions to the NIC which ordered it to:-

- “make recommendations to maximise the potential of the Cambridge – Milton Keynes – Oxford corridor as a single, knowledge-intensive cluster that competes on the global stage”;
- “look at the priority infrastructure improvements needed, and assess the economic case for which investments would generate the most growth”;
- “provide the Government with proposals and options for the long-term infrastructure priorities to unlock growth, jobs, and housing within the Cambridge – Milton Keynes – Oxford corridor over the next 30 years”.

So, right from the start, the consultants were told what to find: i.e. that the Arc is a “knowledge-intensive cluster” that already “competes on the global stage” – not to demonstrate that it is, nor even to find ways of making it so, if that were possible.

Another problem was that the Treasury hadn’t at that point got around to saying where exactly the Arc should be. In the end the report chose an area based roughly on Bedfordshire, north Buckinghamshire, north Hertfordshire, Swindon, Cambridgeshire, most of Northamptonshire and Oxfordshire – thus including some areas that made the eventual list and others that didn’t (north Hertfordshire and Swindon) and excluding others that did like south Buckinghamshire and the rest of Northants. No-one subsequently seemed worried, however. In one of the other NIC-commissioned reports⁷, Savills distributed the million homes proposed across the same area, yet the million homes target didn’t change once the larger Five Counties definition for the Arc was determined.

The report was able to claim: “The area around Greater London (that largely fits the study area defined above) has long been viewed as a high growth area, and in particular one that is based on knowledge-intensive sectors”. This was despite the chosen area excluding anywhere close to London, or recognised knowledge-intensive sector hotspots like the Thames Valley.

As we shall see, Cambridge Econometrics and SQW concluded the area they had chosen to demonstrate optimal agglomeration of knowledge-intensive business around the Oxford-Cambridge corridor does not actually function as a growth corridor, so they were forced to claim only the *potential* [their italics] exists to make it one.

Despite this, they were able to make some big claims about this “potential”. On business-as-usual, they concluded there would be economic and productivity growth across the study area, but slower than the previous 25 years. With acceleration of the existing high rate of house building and acceleration of infrastructure around Cambridge and Oxford, further inward migration could occur and 300,000 new jobs could be created. But if house building could be accelerated to 23,000 new homes a year and new roads like the proposed Cambridge-Newbury Expressway built, then 700,000 new jobs could be created. Savills added 7,000 per annum to this figure, to give 30,000 p.a. as the transformational growth ambition. No-one bothered to question where the inward migration would come from; that would of course have revealed much of it would be the brightest and best from less economically successful regions that could not afford to lose it.

The report looked at patterns of growth across the area and included case studies of the area’s growth potential and some scenarios based on building more houses, roads, etc..

But it also had a warning for the NIC. “It is also clear that without the housing and infrastructure interventions outlined in Chapter 5 of this report, employment and productivity growth in the four key sub-areas is unlikely to be maintained at current rates, and genuinely transformational changes will be required to realise the full potential of the study area and effect the Chancellor’s envisaged ‘knowledge intensive growth corridor’,” said the report.

Had rational and objective rules been applied to policy formation, this might have been the point at which it was worth asking whether such things could have been secured in other parts of the country at lower cost and with less damage. But this was not a study of whether the Arc was a good thing or whether this was the right place to impose it. It was simply a way of justifying a bad idea.

Yet despite the clear instructions to make a favourable economic case for the Arc, rather than to examine the case for and against, reality still intruded. Indeed, as we shall see later in this report, the Cambridge Econometrics/SQW report actually provided a much less than fully supportive economic case for the Arc, even though subsequent work has claimed that it did.

The National Infrastructure Commission: The NIC, however, used its findings to inform its *Partnering for Prosperity* report which added some hype to the analysis.

“The Cambridge-Milton Keynes-Oxford arc must be a national priority,” it exclaimed. “Its world-class research, innovation and technology can help the UK prosper in a changing global economy. But success cannot be taken for granted. Without urgent action, a chronic undersupply of homes could jeopardise growth, limit access to labour and put prosperity at risk.”

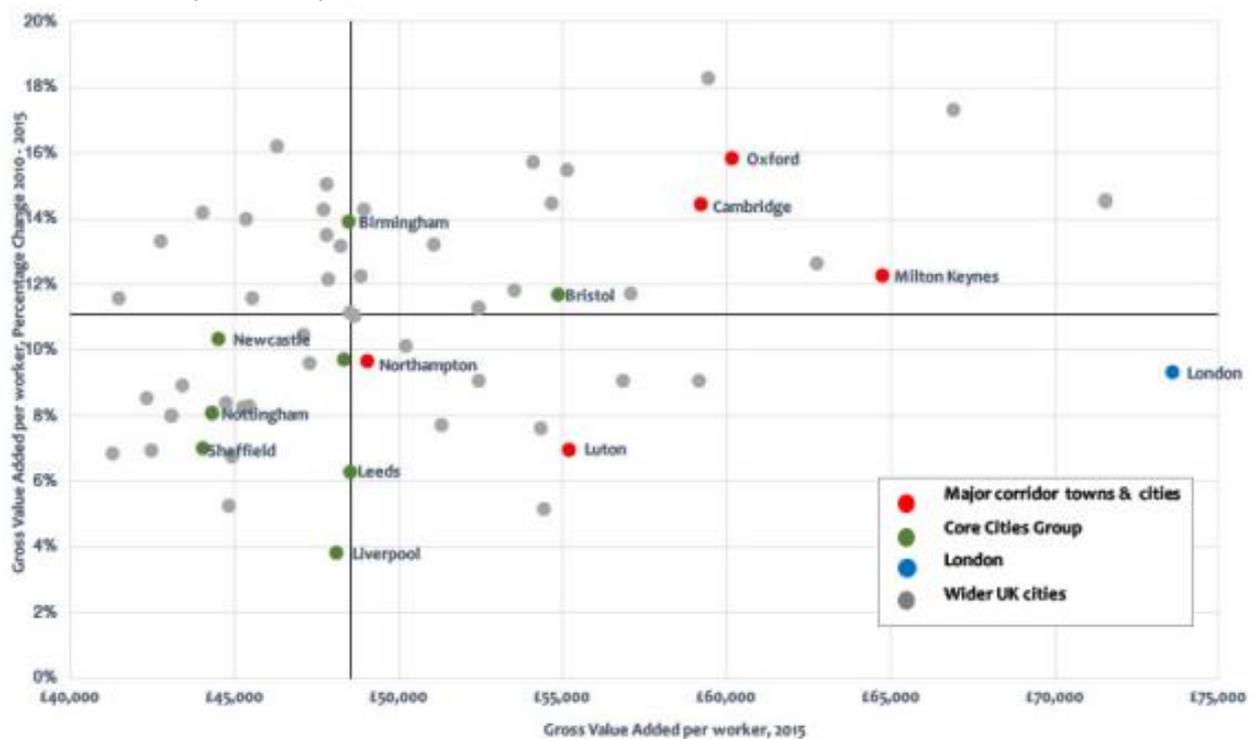
That, it argued, would justify rapid completion of the Expressway and major new settlements.

In the NIC's hands the Arc continued to shape-shift: "from Cambridgeshire, via Bedford and the south east midlands, to Oxfordshire. It forms a broad arc around the north and west of London's green belt, encompassing Northampton, Daventry and Wellingborough to the north, and Luton and Aylesbury to the south. The Arc links with Norfolk and Suffolk in the east and with Swindon to the west."

The Commission spilled a lot of ink on the institutional framework that would be needed to impose the Arc and the need to double house building rates and build new motorways etc. to support its vision. But it was less forthcoming about both the supposedly unique economic qualities of the Arc or the potential to grow what was emerging quite plainly as not a single economic region, but at least four.

The NIC cited the number of patent applications as a measure of the area's research capability and, though we've already seen that this is a poor measure of economic potential and the Arc is far from uniformly excellent, it was willing to use this to claim the Area was superior to the Core Cities Group cities (an advocacy group for 11 of the largest cities outside London).

Figure 3.1: *Partnering for Prosperity* comparison of "fast-growing and highly productive cities (2010-15)



Source: Centre for Cities

Note: City median data reflects the median for UK's largest 62 towns and cities

A diagram in *Partnering for Prosperity* [Figure 3.1] tried to show the superiority of Arc cities' productivity over the rest of the UK cities, including those of the Core Cities Group. It did, however, demonstrate how few cities or large towns there are in the Arc and how great the need for "levelling-up" is.

At the heart of the NIC's economic vision was support for unsustainable patterns of house building and transportation. *Partnering for Prosperity* is strong on assertion about the Five Counties' supposed economic superiority, but weak on analysis, though perhaps, given lukewarm support from its supporting reports, that isn't surprising.

"Cambridge, Milton Keynes and Oxford are amongst the UK's most productive, successful and fast growing cities," it claims. "They host a highly skilled labour force, cutting edge research facilities and technology clusters which compete on the world stage."

They may be among the most productive cities but, as ever, the NIC failed to compare them seriously with other UK cities which may have equivalent, or superior, qualities or to ask whether the Arc as a whole is a suitable place for accelerated development, especially the unsustainable development patterns proposed.

The NIC proposals depended heavily on two of its reports – from Savills (on houses) and from Cambridge Econometrics/SQW (on economy, jobs, population). Savills certainly proposed a transformational number of houses and put forward a number above the strategic housing management assessment (SHMA) predictions. The economics report then fell into line with the housing proposals.

The Savills report had three growth scenarios:-

- Baseline (BAU);
- Incremental (meeting local needs);
- Transformational.

It said: "There are two potential sources of additional housing need in our transformational scenario beyond the levels set out in SHMAs:-

- the first comes from the corridor taking a share of national housing need of 300,000 additional homes per annum, with the distribution of supply skewed towards those local economies in which housing supply is constraining growth; and
- the second is to meet need from economically connected areas in which there is insufficient deliverable land on which to meet housing need, with the most notable constrained area being London."

"The Commission's central finding is that rates of house building will need to double if the Arc is to achieve its economic potential," says *Partnering for Prosperity*. "This requires a new deal between central and local government – one which aligns public

and private interests behind the delivery of significant east-west infrastructure and major new settlements, and which seeks commitment to faster growth through a joined-up plan for jobs, homes and infrastructure.”

Since *Partnering for Prosperity* there have been other attempts to puff the Arc’s supposed superiority to places which have knowledge intensive businesses, high-tech industries, innovative universities – and also good, rail-based public transport, less of a significant housing shortage, a skilled workforce and a genuine need to be economically “levelled-up”. Most are strong on assertion but weak on economic analysis, keen to promote car-dependent sprawl and hopeless at comparing the Arc to more suitable areas to accommodate growth.

Blackstock Consulting, Bidwells and Perkins & Will: In October 2019 a “*Radical Regeneration Manifesto*”⁸ was published which aimed to set out “inspirational policy ideas for a future Oxford-Cambridge Arc powerhouse, stepping up delivery and sparking knowledge industry-led regeneration and truly sustainable economic growth across the UK”.

This came from the property industry, led by Blackstock Consulting (“More than simply a property PR agency, we’re an integrated strategic consulting, public relations and research agency focused on real estate and construction”), property consultancy Bidwells and architects Perkins & Will.

The publication was, arguably, radical, as it aimed to provide: “policy ideas for a future Oxford-Cambridge Arc powerhouse” which would, beyond any doubt, radically alter an area that is presently overwhelmingly rural. Harder to fathom was the reference to “regeneration”. A few small pockets apart, the Five Counties of the Arc are mostly around or just above national levels of prosperity⁹ and some parts of it are very prosperous indeed. Yet the publication managed no less than 32 uses of the word “regeneration” which suggests its use was more intended as a word associated with positive planning than with any serious attempt to address economic disadvantage.

In the document, the word “regeneration” appears to be used to refer to urban expansion proposals when used about the Arc. It does, however, use the word in its traditional usage in relation to examples *outside* the Five Counties such as: “the £1bn town centre regeneration at Purfleet-on-Thames”, the “lessons learned from Kings Cross” and work on “Brindley Place in Birmingham”. A contribution from First Base director Barry Jessup makes the entirely valid point that mixed-use regeneration is preferable to housing-led, without suggesting why it should be necessary in the overwhelmingly rural, but otherwise prosperous, Arc.

Otherwise the meaning of regeneration is simply stretched to cover whatever Arc proponents want it to mean such as: “we currently have the technology and capability to deliver net-zero buildings across all regeneration schemes”. This was not so much repairing what’s in need of repair, but an attempt, as Perkins & Will managing director

Steven Charlton put it: “to create diverse and resilient locations through its length of supply chains and breadth of employment opportunities, as the foundation for future regeneration”.

As for “manifesto”, the dictionary defines this as: “a public written declaration of the intentions, opinions or motives of a leader, party or body, or of a sovereign”. There is no leader, party or sovereign here and most of the bodies involved would appear to have a strong commercial interest in expressing their intentions and opinions, though not perhaps their motives.

To be fair to the “*Manifesto*”, it did at least play with some interesting ideas. It recommended high-density development on selected brownfield sites adjacent to centrally located or urban-fringe railway stations, but then undermined it by calling for permitted development rights for developments despite the very great care needed to get such *laissez faire* right. It demanded proper funding for housing associations to provide social housing, a topic completely ignored in most Arc publications, but failed to extend this to council housing. It called for various “zero emission” or “carbon-free” initiatives but showed its lack of understanding of these challenges by suggesting that: “mandating negative emissions for green belt development schemes could also provide an incentive that brings online, land sorely needed for new housing”, without realising the inevitability of high carbon emissions from such greenfield housing remote from public transport and too distant to allow much in the way of active travel.

The document’s economic arguments were pretty much a repetition of what had gone before, stressing the importance of clustering, but its suggestion that “innovation relies on diversity in clustering which can only be achieved through scale” would appear to go against the basic idea of extra-urban clusters. The sole example it quotes is not encouraging.

“The 700 acre Harwell Campus is a perfect example of this,” it claims. “Businesses rub shoulders with UK government-backed agencies like the Science and Technology Facilities Council plus the European Space Agency, UK Space, Faraday Institute, Medical Research Council and 30 plus international universities at any time, all using the national research facilities like Diamond Light Source and RAL Space.”



The Arc is a giant agricultural area

[Stella Stafford]

But a 280-hectare cluster could be created almost anywhere, and would be best located in an existing urban area where it could tap into existing businesses and facilities. Plonking it in the middle of a giant agricultural area means isolation, not clustering.

As ever with puffs for the Arc, the “*Manifesto*” failed to ask the question: “If an arc is a good idea, would there be better places for it?” One contributor, Bidwells partner Richard Todd, however, did get near to an answer, in a discussion of universities.

“If we want to look to regenerating our towns and cities, we need to look at these powerhouses of knowledge that reside within them,” he wrote. “Liverpool, Nottingham, Lincoln – cities in serious need of economic regeneration – welcome 30,000 new students every year, of which 8,000 are postgrads.”

So we can only agree with him that: “We should not make universities temples of capitalism but we should offer more chances to our best and brightest to create new businesses and commercialise their ideas.” And we should note his accurate statement that land is in short supply in Cambridge and Oxford, but in Manchester there is brownfield land available.

Arc Leadership Group, Arc Universities Group and Arc Local Partnerships Group: In October 2020, the Arc Leadership Group, Arc Universities Group and Arc Local Partnerships Group produced *The Oxford-Cambridge Arc Economic Prospectus*¹⁰. Those hoping for a detailed comparison of the Arc with other areas were to be disappointed, however, though those looking for assertion and hype were fully satisfied.

“The region has an incredible tradition of bringing the best minds together to create solutions to the most complex challenges,” it said. “It is home to some of the world’s greatest innovators who transform lives with their ideas, entrepreneurs who have created world leading products and services and researchers and academics who are at the frontier of human discovery.” Obviously, nowhere else in the UK has these qualities.

But despite asserting Arc promoters’ “ambition for a green Arc” which would have “world-leading innovations” to address climate change and natural capital decline, it was plainly less worried about exacerbating climate change when there was business growth to be had. The *Prospectus* made no secret of its ambitions for the automotive sector.

“Motorsport Valley is a £6bn global cluster of automotive, motorsport and advanced manufacturing companies extending from Northamptonshire to Oxfordshire,” it said. “Silverstone is at the heart of the advanced manufacturing sector, testing facilities for materials and vehicles and the world-famous F1 Circuit... The Arc has the credentials to lead the UK’s push for global prominence in connected autonomous vehicles (CAV), building on its expertise in robotics and autonomous systems (RAS) in which RACE at Culham Science Centre is a key UK centre of excellence, alongside the Millbrook Proving

Ground which is employing 5G technology for innovative real-time autonomous vehicle trials.”

While this would, no doubt, aim to tap into the Department for Transport’s aims to decarbonise UK transport, there are still huge doubts about a shift to electric cars and vans achieving this, given the high embodied carbon in vehicles and their high energy demands. And however vehicles are powered, a million low-density homes, mostly remote from public transport in a rural area, would inevitable bring a big increase in congestion and accidents across a huge area.

The road freight industry has long been eyeing plans for an Expressway as a sort of “Outer M25” to provide a short-cut to the congested north-west section of the M25. The HGV-dependent distribution industry has been building its infrastructure all across the country near motorway interchanges and the Arc has already suffered grievously in thus undermining sustainable transport. Growing this has always been one of the less publicised aspects of the Arc project or, as the *Prospectus* says: “The Arc benefits from its position at the centre of the UK transport and logistics network that connects to the Midlands, Greater London, East Anglia, the South West of England, UK ports and global markets beyond”.

The *Prospectus* even foresees growth in aviation. “As well as having the UK’s fastest growing major airport, the Luton Airport cluster is one of the top three hubs for business aviation services, specialising in aircraft maintenance,” it says.

Aviation is, of course, the hardest sector of the transport industry in which to reduce carbon emissions. But the *Prospectus* claims to want to: “forge a pathway towards zero-carbon aviation, delivering a leadership position for the UK in the evolving global market of ‘green’ aviation. At the heart of this will be three networked and collaborative world-class academic partnerships with industry and innovators: the UK Zero Carbon Airport and Aviation Centre, based at Cranfield’s Global Research Airport, the Oxford Thermofluids and Energy Institute and the National Centre for Propulsion and Power at the New Whittle Laboratory in Cambridge”.

The *Prospectus* claims that, at the Arc’s heart: “will be the UK’s Zero Carbon Airport and aviation centre, supporting the development of a mature supply chain to scale innovation and the UK’s most sustainable airport, London Luton”. Currently, of course, Luton Airport (“the UK’s fastest growing major airport” and the home of an “aviation cluster”) accommodates extremely high-carbon aircraft. Despite claims being made about future low-carbon or zero-carbon aircraft, that technology is still years away and many observers believe it to be unachievable. And even if it were available one day, aircraft would still embody considerable carbon and they are extremely intense users of energy. It takes a great deal of energy to keep 300 tonnes of heavier-than-air craft seven miles above the ground for many hours at a time. Even once the energy sector has been decarbonised, there are far more useful uses for non-fossil energy.

Still, at least the first scintilla of doubt about the Arc project's ability to undermine national efforts to rebalance the economy did creep into the *Prospectus*, with a paragraph on "national rebalancing".

"The Arc is uniquely placed to play a leading role driving change in the UK growth dynamic," it said. "The region can support the growth potential to secure better jobs for local people, by promoting the capabilities of, and connecting the assets in, our area. The region can connect the growth trajectory of London and the South East to the rest of the country."

Quite how such a connection could be achieved and how it would assist the rest of the country was unclear, doubtless because it couldn't, but this was perhaps the first time Arc proponents had conceded its inability to do this. As ever, any attempt to compare the Arc's economic potential and its ability to accommodate it sustainably with anywhere else in the UK was lacking, although it was ready to claim: "the Arc has the ability to lead the UK".

Just recently, however, efforts towards making rebalancing claims for the Arc have tried to claim it would be able to rebalance the uneven economy of the Five Counties alone, a clear indication the Arc's supporters will define words like "sustainable", "levelling-up", "rebalancing" or "doubling nature" in ways of their own choosing to promote their project.

Ministry of Housing, Communities & Local Government: The *Introduction to the Oxford-Cambridge Arc Spatial Framework*¹¹ published by MHCLG in February 2021 was as coy about how the Arc's economy was intended to develop as it was about where a million homes would be dumped. In just one page, it assured readers that: "We will take an integrated approach to planning for growth", as if there was a possibility of them not doing so.

Even less reassuring was the promise to "start by developing an Arc-wide economic strategy". So, after five years of intensive planning for the Arc based on its supposed economic potential, here was the Ministry in charge admitting it had yet to start planning for this growth.

The *Introduction* said the strategy would include:-

- analysis of the Arc's economy and forecasts of future growth, including analysis of local economies and key sectors, drawing on existing analysis that has supported existing Local Industrial Strategies, and understanding of the monetary value of the Arc's natural capital;
- identification of specific employment space and infrastructure requirements to support future growth;
- identification of the policies and investments needed to deliver the Arc's economic potential in a sustainable way, working with local partners to identify priorities, and supporting a green recovery.

To support this, it said, the spatial framework would:-

- provide an assessment of existing employment land, planned growth and anticipated future need;
- set policies to support local planning authorities in allocating these as strategic business zones or strategic industrial locations, as appropriate;
- set policies to support different land uses for different sectors and sizes of business.

As the draft spatial strategy isn't due to be published until autumn 2022, "with implementation of the final framework shortly after", details on these key issues will have to wait.

The new timetable was set out in MHCLG's July 2021 document *Creating a Vision for the Oxford-Cambridge Arc*¹² which could have set out some detail on what is proposed. Those hoping for some were, however, disappointed.

The "Vision" did, however, contain some thoughts about the Arc's economy, together with some familiar claims about it. As well as the usual aspirations to support economic growth that is sustainable economically, socially and environmentally, it expressed a belief that the Arc could help national productivity "as we build back better from the impacts of covid-19", despite the fact Arc projects would be unlikely to be realised for many years.

As ever, the claims for the Arc's potential were big ones. "We think that the Arc can be one of the most productive places in the world by creating new jobs, improving the standard of living and the quality of life for local communities," it said.

As we have seen in earlier reports, the current productivity of the Five Counties is mostly around, or just above, the national average, with one or two areas within it a little below. The *Vision* document helpfully confirms this with a table [Figure 3.2].

But by deliberately excluding London and most other areas in the south of England, some of whose productivity (even on a crude measure like GVA per head) exceeds that of the Five Counties, the diagram pretty much confirmed the Arc's weakness in this area.

On the other hand, it also illustrated clearly that the Arc is not in need of the economic regeneration that the Government's "levelling-up" policy aspires to.

Figure 3.2: The Arc's economy (based on 2018 prices) compared to other areas in England



Source: MHCLG, July 2021

The *Vision* document lists four clusters in the Arc:-

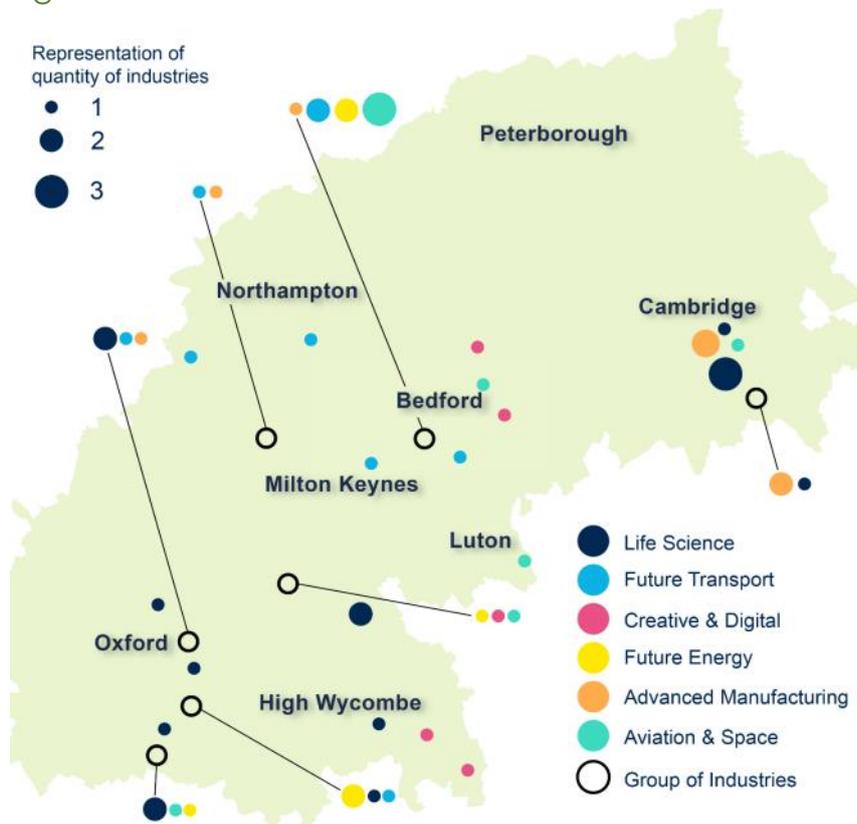
- life sciences around Cambridge
- a “space cluster” in Oxfordshire and Buckinghamshire
- an energy cluster in Oxfordshire
- digital innovations in Milton Keynes.

It repeats the claim (criticised earlier in this report) about Cambridge’s rate of patent applications and notes that the area has 11 higher education establishments.

But its claim that: “It is home to some strong and innovative sectors, world-leading companies, internationally recognised research and development centres and research universities” could equally be applied to other places in the UK, as our earlier reports have shown.

The map it uses to illustrate this, however, shows very clearly how widely separated the supposed clusters are and why the Arc is not a single functional economic area.

Figure 3.3: “Economic clusters in the Arc”



Source: MHCLG, July 2021

What the map does show very clearly is that the Arc is a huge cluster of one very important industry which does not get a single mention in the *Vision* document or, indeed, most of its predecessors – agriculture.

But the *Vision* document does reveal the first national attempt to answer the obvious threat to “levelling-up” that the Arc represents. For some time now, a few local authority supporters of the Arc have been suggesting that levelling-up, when applied to the Arc at any rate, only means levelling-up of the various parts of the Five Counties.

“Places like Oxford, Cambridge and Milton Keynes have seen significant economic and wage growth; however, this has not been spread evenly across these centres or in other towns and rural areas,” it admits. “The cost of homes has grown a lot over the years, particularly in these areas. Local communities are worried that people and businesses do not have access to the right infrastructure that they need such as better transport connections and digital services,” as if these were not common problems in much of England.

The *Vision* then proceeds to further demolish the case for special economic regeneration in the Arc. One diagram shows employment has been consistently a few percent above the national average and another (below) shows how baseless the claims of the Arc’s supposed massive industrial potential are. In reality it has become increasingly dominated by services.

Figure 3.4: Employment by sector in the Arc



Source: MHCLG, July 2021

The *Vision* says the Government is committed to maximizing the Arc’s economic potential by planning for sustainable growth and making it a more attractive place to live. Those hoping for detail on how this might be achieved, however, were in for fresh disappointment.

What plans there are involve:-

- developing an economic strategy, supported by strong economic evidence, to identify the policies, locations and investment needed to deliver the Arc's potential for sustainable and green economic growth;
- setting policies to make sure growth is felt by all communities and the Arc becomes a better place to live and work for all, such as by providing more housing in the right places, making sure people can move around by public transport and other infrastructure, and enhancing the Arc's natural capital;
- setting policies which help local planning authorities to plan for new business and employment space, support small and medium-sized enterprises (SMEs), and places for global companies;
- setting policies to meet the needs of different sectors and businesses – from large firms to start-ups and promoting the green economy, industry, innovation and technology.

“We want to understand different views about the Arc's economy to help us form our vision,” says the document. As the Arc's supposed economic potential is, allegedly, the basis on which so much time and money has been spent over a period of years, it is amazing that these aspirations are still to be formulated.

To help the Government ask the right questions about the Arc's economy, we must yet again remind it of two important questions we first asked two years ago and which the *Vision*, like all the other promotional publications about the Arc, has failed to ask:-

- Is the “arc” concept a useful one?
- If the arc concept is a sound one, are there other areas which could support the growth, actually need it and could support it more sustainably?

And to which we have now added the third:-

- Could a huge area like the Oxford-Cambridge Arc ever generate the agglomeration benefits of a “growth corridor”?

Even if the answer to the first question is “maybe”, there is nothing in the *Vision* document which even asks the second question or which provides a positive answer to the third. Despite more than five years of trying to put together a valid economic argument for pursuing the five county Arc, the *Vision* actually provides some evidence as to why we should not. As ever, our description of it in our first *Overheated Arc* report as “an idea founded on sand” remains as accurate as ever.

4. Does “agglomeration” justify the Arc?



“This area serves as the main driver of sustainable growth”

[Stella Stafford]

The concept of agglomeration is central to the Arc proposal.

“Much of the argument for investing in the study area is to improve connectivity, foster agglomeration, and create a functioning growth corridor that has high-productivity knowledge-based sectors at its heart,” said the Cambridge Econometrics/SQW report¹³. “Therefore, for the purposes of this exercise we are using a framework which is centred around the ‘agglomeration cycle’. This may be understood as a series of self-reinforcing processes in which high levels of human and physical capital combine to produce growth in output, employment and knowledge-based assets, that then feedback to attract human, physical and finance capital to the region for future time periods.”

The report discussed the concept of agglomeration in general terms at some length, both localisation economies (i.e. a specific sectoral level) and urbanisation (acting on an economy-wide level). But even during this extended general discussion, significant unease about the relevancy to the Arc is evident.

Economic specialisation: This is particularly so in the Cambridge Econometrics/SQW discussion of economic specialisation where “traditionally, the Marshallian argument for cities to specialise assumes that knowledge spill-overs among similar firms promotes innovation”.

It argues that “modern” concepts of “diversified specialisation where a city or region specialises in a few (related) sectors but is otherwise diversified” can benefit from both diversified and specialised economies simultaneously and “related variety” allows economies of scale between interacting sectors and creates the “possibility of innovative activity” through cross-sectoral knowledge sharing.

It might be concluded that this dilutes the concept of agglomeration to the point of meaninglessness, but the report claims: “these modern concepts offer a reasonable rationale for why cities continue to specialise in certain industries, as is the case in all major cities on the Corridor”.

“For example, Cambridge and Oxford are highly specialised in high-tech industries such as biosciences, computer services, research and development (R&D), and professional and business services,” it says. “Milton Keynes and Northampton have a large proportion of economic activities in business services and consumer services.”

So, apparently, the cities are involved in “diversified specialisation” and “related variety”. But even if this involves any meaningful specialisation at all, it is specialisation in very different sectors from one another, so it’s plain that diversification is more important to this argument than specialisation. The report actually admits this.

“Milton Keynes mirrors Cambridge and Oxford only slightly in the large professional, business and technical service base and differs substantially in the detailed sector composition,” it says. “The city is surrounded by equally major towns and largely characterised by migration, which makes it a popular destination for headquarters as well as non-financial business sectors. On the other hand, Northampton’s growth may be partly attributable to affordable property prices and good transport and digital connectivity.”

Nor is the report’s consideration of “human capital” very supportive.

“Measured in terms of qualifications and educational attainment, skills may contribute less to growth in Milton Keynes and Northampton as in Cambridge and Oxford,” it says. “However, Milton Keynes and Northampton have the advantage of a business environment friendly to start-ups and small businesses which could be a great potential source of growth. In this case, the impact of human capital on city growth may be more through the arrival of talented entrepreneurs and the investment that comes with them than highly educated residents already in the area.”

Indeed the *Cambridgeshire & Peterborough Independent Economic Review – Final Report*¹⁴ was also to consider agglomeration only within Cambridgeshire and conclude that it’s not possible to have agglomeration on the scale of the county, or even the districts., it can only be it on the scale of the city – Cambridge itself. “We conclude that a dispersal strategy, which seeks to relocate homes and businesses away from city centres is unlikely to be successful, as it is ‘agglomeration’ – the desire to be near other companies – that attracts companies to the area,” it said.

“In the case of knowledge-intensive business where agglomeration effects are important, the spatial area in which they are happy to be located is tightly bounded,” it concluded. “Therefore, while it is tempting to imagine the benefits which could occur if clusters were dispersed and high value companies relocated, realism is needed about

the ability to do this. If a KI [knowledge-intensive] company is forced to move away from the sphere of clustering activity, it is likely to relocate to another cluster, rather than stay in the local area.”

Curiously the one homogenous economic activity which could be said to unite most of the Arc goes unmentioned. But given the damage the Arc developments would do to the area’s sole genuine industrial specialisation - agriculture - this is probably just as well.

Growth corridors: Yet having demonstrated that the Arc, even the smaller version their report was considering, offers little in the way of economic specialisation, the consultants then moved on to the key issue of spatial geography. They discuss growth corridors, the idea the Arc plan grew out of and which it was supposed to be providing an “economic rationale” for, helpfully saying why the concept is important, while also successfully undermining its relevance to the Arc.

“The concept of growth corridors is less of a theoretical concept, and more of a practical description of how a particular geography is seen to be performing strongly, and what are the characteristics that make it work in this way,” it says.

It’s worth quoting a whole paragraph here.

“Bruner (2013)¹⁵ defines the role of economic corridors to ‘...connect economic agents along a defined geography. They provide connection between economic nodes or hubs, usually centred on urban landscapes, in which a large amount of economic resources and actors are concentrated. They link the supply and demand sides of markets’. In relation to the role of transport, Bruner goes on to say that: ‘economic corridors are not mere transport connections along which people and goods move. Economic corridors are integral to the economic fabric and the economic actors surrounding it’. Transport then has a role to play in improving the functioning of an economic or growth corridor by enhancing the connections between the activity hubs and increasing the degree of interaction between the economic actors within it.”

The Cambridge Econometrics/SQW report attempts to draw a distinction between traditional aspects of growth – employment and GVA growth – and “quality growth” (as defined by Grant Thornton¹⁶) based on “economic dynamism”. It’s quickly clear why they make this distinction as it admits that, while London is top and the area around London performs well, Milton Keynes comes in as the third highest growth area outside London and Cambridge the tenth using traditional measures.

But using Grant Thornton’s concept of “quality growth”, which it says is based on “knowledge intensive businesses which employ highly skilled labour and continually seek to innovate and develop new products and solutions”, gives a different result. On this measure, it says, Cambridge comes in at number one, with Oxford fifth, Milton Keynes seventh and Northampton eighteenth.

From this it makes the extraordinary claim that: “Thus, it seems that this area serves as the main driver of sustainable growth in the United Kingdom”.

This is the basis for the rest of the report and offers an almost unique example of an Arc apologist actually comparing the Arc’s suitability with other parts of the United Kingdom.

But the Grant Thornton report on which this claim is based is actually less bullish. This is the “economic growth index” used for cities outside London:-

Figure 4.1: Grant Thornton's “economic growth index”

Cities (excluding London)	Economic growth score
1. Manchester	145
2. Warrington	136
3. Bristol	132
4. Milton Keynes *	131
5. Newcastle upon Tyne	121
6. Cambridge *	121
7. Brighton and Hove	120
8. Nottingham	117
9. Oxford *	115
10. Derby	115
11. Liverpool	111
12. Coventry	110
13. Swindon	107
14. Peterborough *	102
15. York	98
16. Plymouth	96
17. Reading	96
18. Leeds	95
19. Bradford	89
20. Northampton *	89

* Arc towns

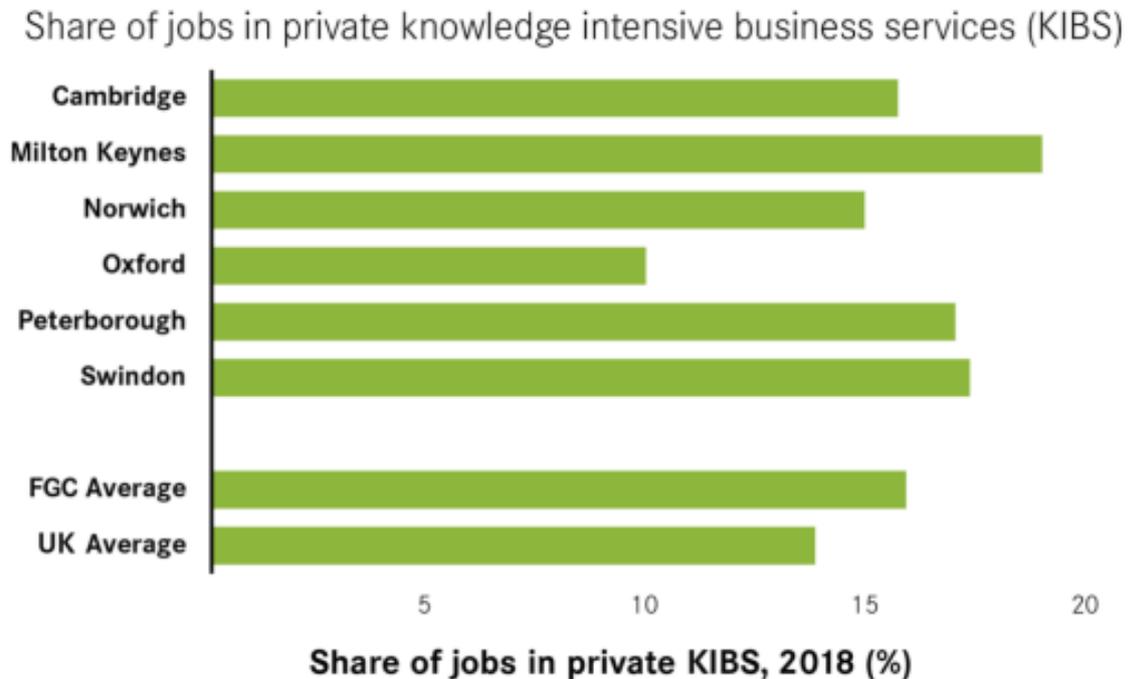
Source: **Grant Thornton, 2014**

From this, Cambridge Econometrics claims that: “the quality based index tells an even more positive story. It shows that the area to the north and west of Greater London almost completely dominates the rest of the country in terms of growth quality”. Taken literally this might be true as most of the UK is north and west of the capital and it includes Manchester, Warrington, Bristol, Newcastle upon Tyne, Nottingham, Derby, Liverpool, Coventry, Swindon, York, Reading, Leeds, Bradford etc..

Assertion is easy, but others suggest the share of private knowledge-intensive jobs in the four leading Arc cities is mostly only a little above the UK average and, in Oxford’s

case, below it. Here’s the Centre for Cities’ *Fast Growth Cities – 2021 and Beyond* report, for instance.

Figure 4.2: Centre for Cities’ assessment of high-quality employment in selected cities



Source: ONS, Business register and employment survey 2018

Note: Cities like Cambridge and Oxford have considerably higher shares of employment in higher education which is also a knowledge intensive sector.

Source: Centre for Cities, 2021

This suggests that, even for employment underpinning what it defines as “quality growth”, Milton Keynes, Peterborough and Cambridge are marginally ahead of the national average and Oxford below it.

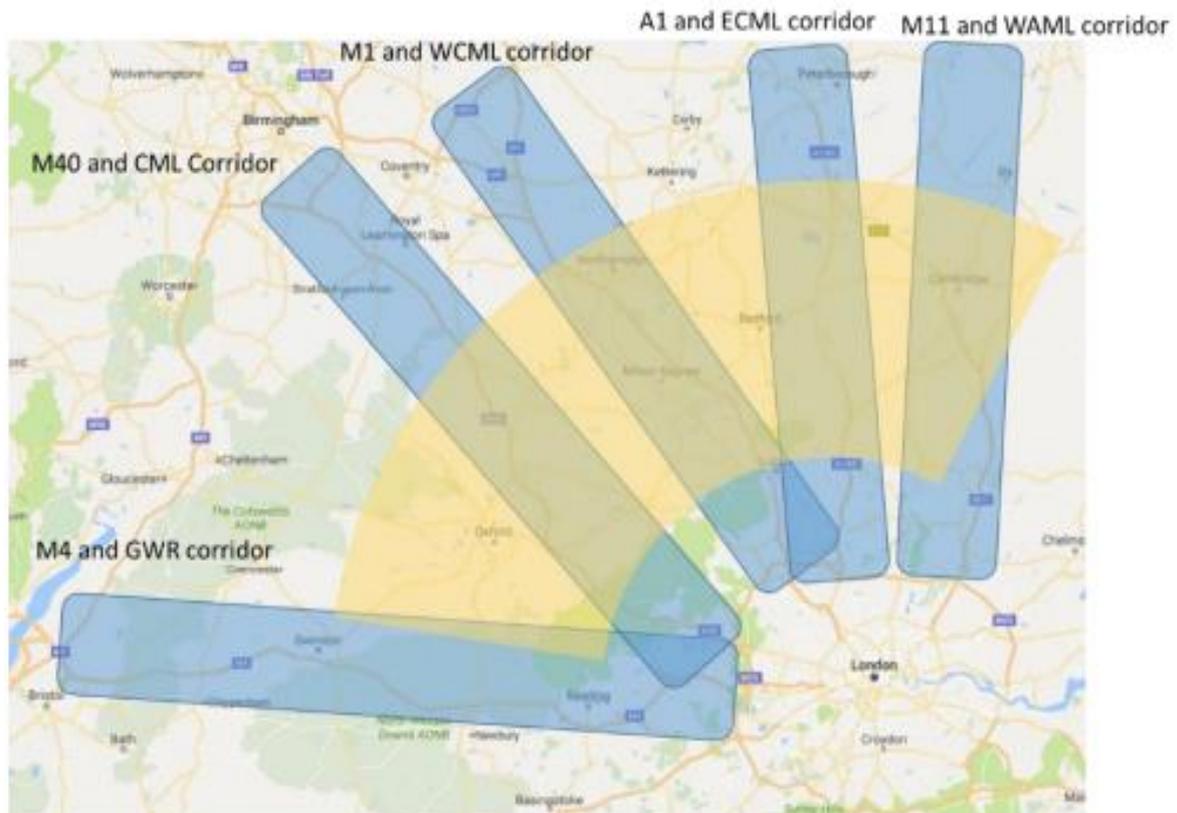
Agglomeration and the Five Counties: Having accepted, of necessity, the idea of a “growth corridor”, it is clear that even the narrower geographical definition of the Arc’s area that Cambridge Econometrics/SQW was using failed to fulfil any real definition of a growth corridor. Indeed, the consultants conceded this.

“The area currently operates principally as several largely independent ‘wedges’, extending outwards from London on radial routes, with the transport infrastructure providing several major road and rail routes cutting across the area,” it admits. “It is entirely possible that the study area comprises a number of *neighbouring, but largely economically independent sub-regions, that share similar characteristics purely because of their similar geographic proximity to (and functional interconnections with) a major world city.*” [Our italics]

Growth corridors, it says, are “high performing areas extending along major routes from major metropolitan centres” so, as the Arc lacks a major metropolitan centre, it plainly can’t be considered a growth corridor.

The report, however, identifies five growth corridors which it claims cross the Cambridge-Oxford region. But these are only narrow strips of the Arc and exclude the Cambridge-Oxford axis they were supposed to be identifying as a growth corridor.

Figure 4.3: Cambridge Econometrics’ “transport corridors”

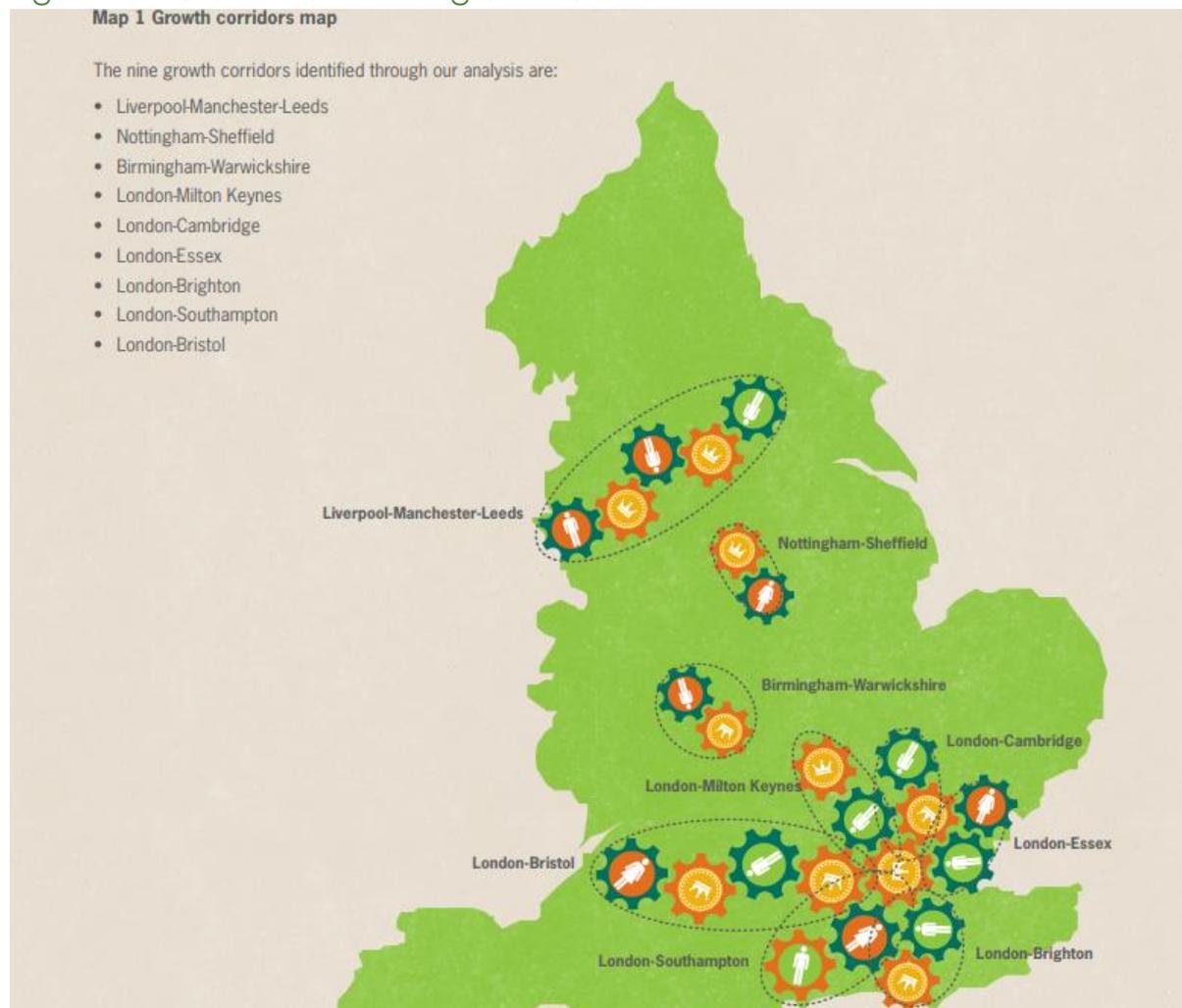


Note(s): GWR = Great Western Railway, CML = Chiltern Main Line, WCML = West Coast Main Line, ECML = East Coast Main Line, WAML = West Anglia Main Line

Source: Cambridge Econometrics/SQW, 2016

These, it claims “are also identified in Grant Thornton’s report”. Once again this is, however, a little economical with the truth. The Grant Thornton report identified nine growth corridors in England, but only three of them cross the Arc, not the five in the Cambridge Econometrics report.

Figure 4.4: Grant Thornton's "growth corridors"



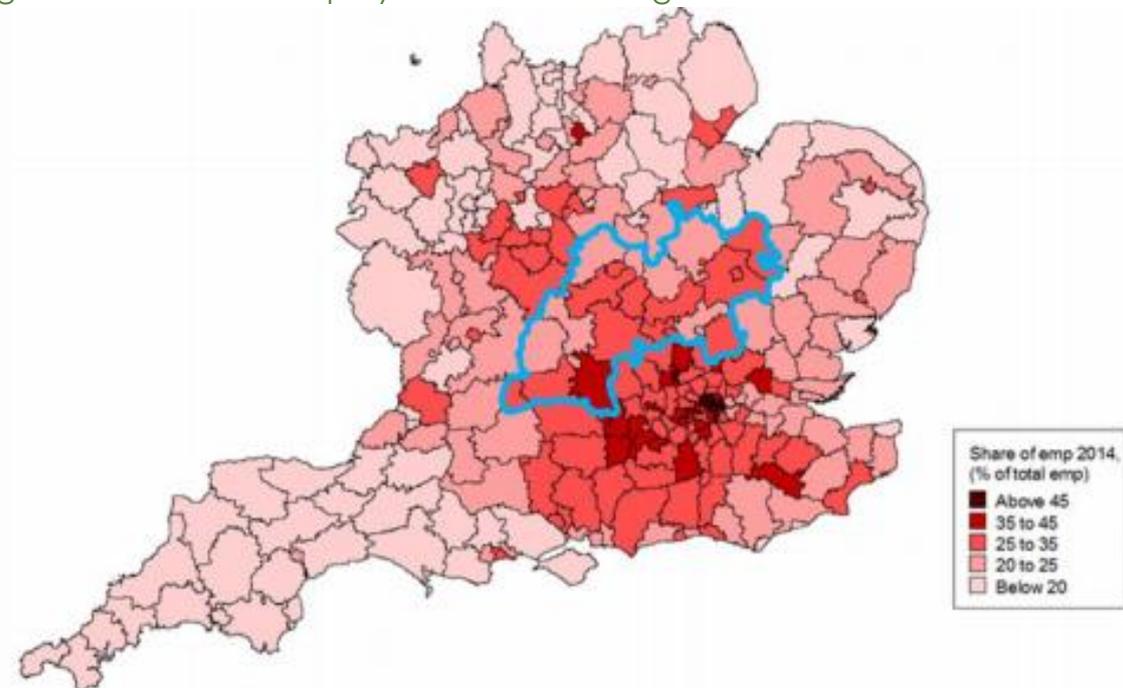
Source: Grant Thornton, 2014

The attempt to identify "growth corridors" across what was supposed to be a single "growth corridor" had, in any case, already been firmly torpedoed in the report's opening section.

Given that this report was supposed to provide a rationale for the Oxford-Cambridge Arc "growth corridor", its findings are worth quoting in full.

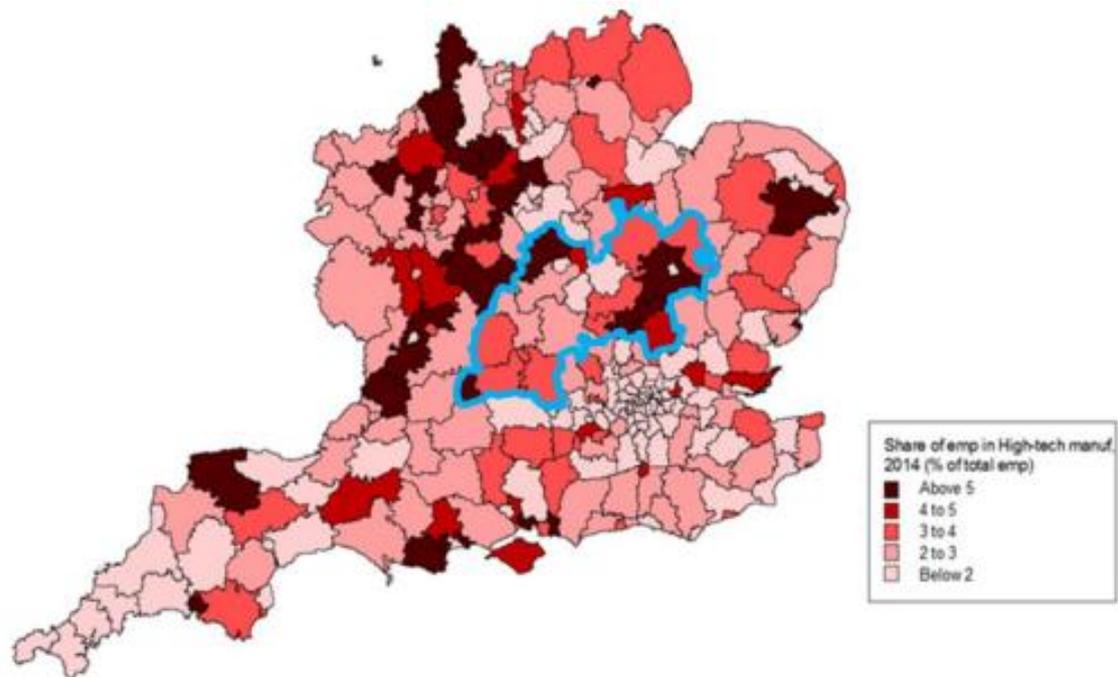
"Putting the sectoral concentration data together, as seen in Figure 1-6, provides limited evidence of an area with knowledge-based industrial specialisations activity stretching from Swindon in the South West, via Oxford, the M1 corridor region and across to Cambridge in the East," it admits.

Figure 4.5: Share of employment in knowledge-intensive business services



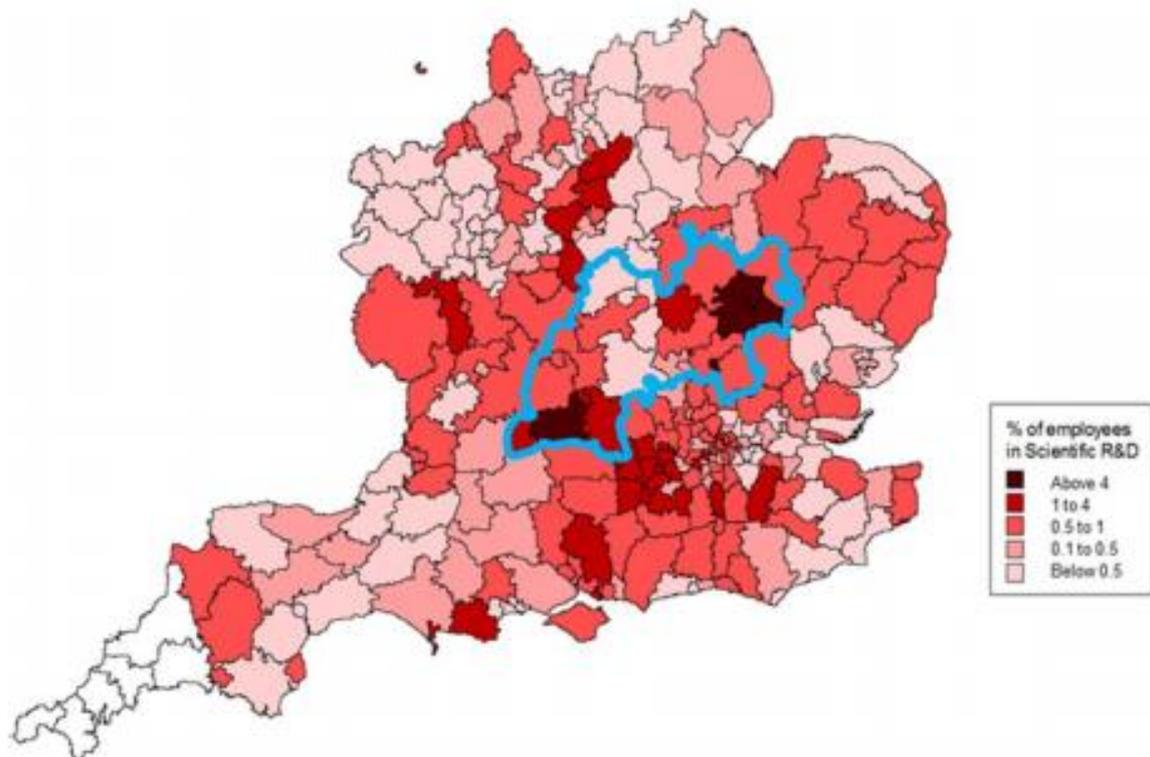
Source: Cambridge Econometrics/SQW, 2016

Figure 4.6: Share of employment in high-tech manufacturing



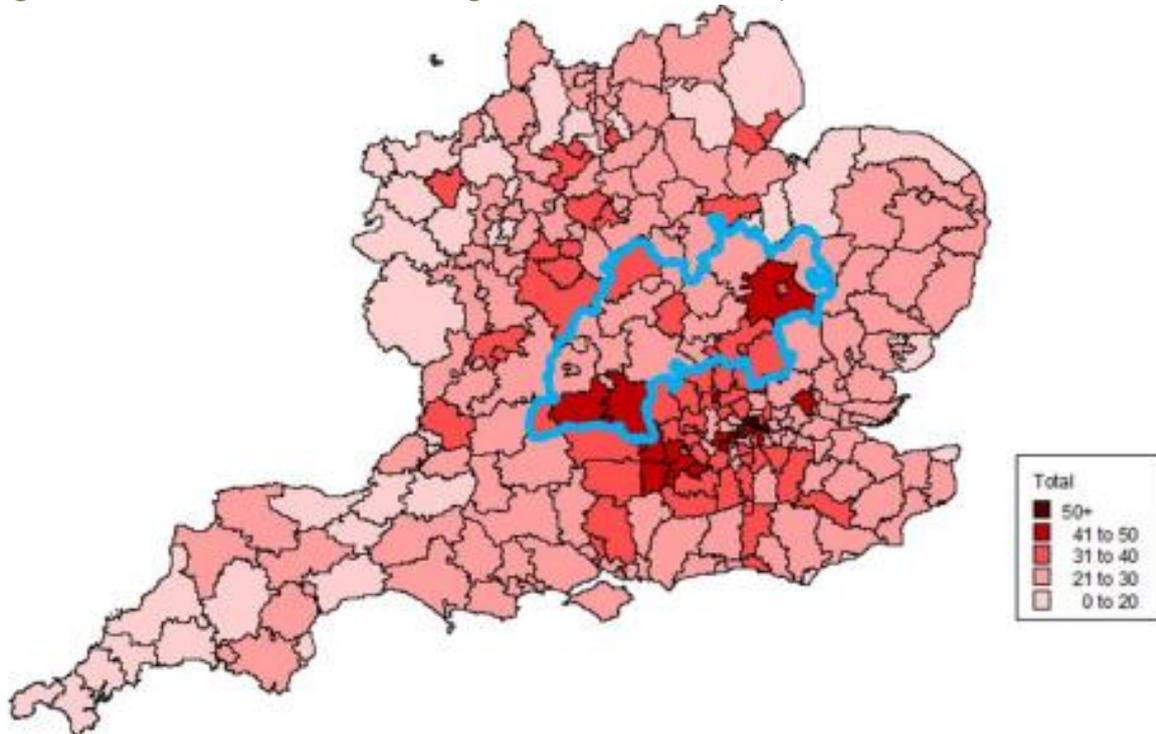
Source: Cambridge Econometrics/SQW, 2016

Figure 4.7: Scientific R&D employment shares



Source: Cambridge Econometrics/SQW, 2016

Figure 4.8: Combined knowledge-intensive sector specialisation



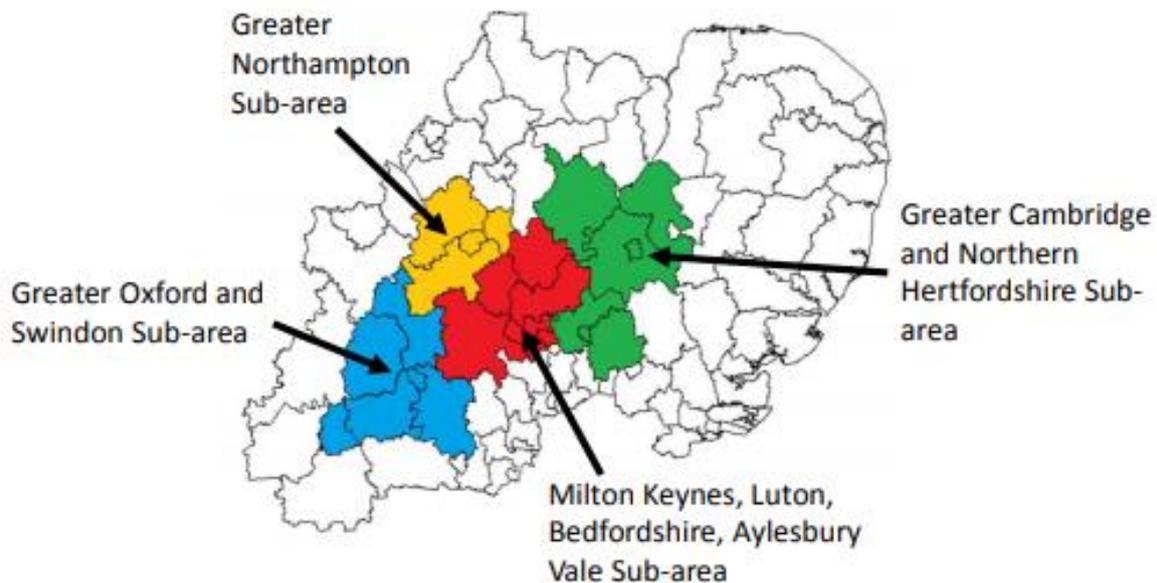
Source: Cambridge Econometrics 2016

None of these is at all reassuring about the Arc's supposed excellence apart, perhaps, from the concentration of scientific R&D employment in Cambridge and Oxford. However, as the entire north of England has been omitted, even that case is weak.

"Arguably, *the study area appears to be made up of three or possibly four distinct economic areas, [our italics]* with Oxfordshire and Swindon in the west, and much of Cambridgeshire and northern Hertfordshire in the east, both appearing to have a diversity of strengths across KIBS, scientific R&D and high-tech manufacturing. Milton Keynes and Daventry are also visible," it continues. "The evidence so far suggests very limited evidence for a single knowledge-based cluster."

Having thus destroyed the agglomeration argument for the Arc, it goes on to consider reality and says the four "distinct economic areas" or "sub-areas" are based on "similarities in industrial structure and sectoral specialisations in KIBS [knowledge-intensive business services], high-tech manufacturing or scientific R&D".

Figure 4.9: Cambridge Econometrics' four distinct economic areas



Source: Cambridge Econometrics 2016

By this stage having also blown apart the view the area it was considering is any kind of "growth corridor", the report still set about trying to make sense of it, as instructed. Reviving work done in 2008 by London Oxford Cambridge Ltd, it suggested there was a "golden triangle" between London, Oxford and Cambridge, crossed by three corridors from London to Cambridge, Milton Keynes and Oxford. About all this achieved was some additional support for the long-standing plan to reopen the Oxford-Cambridge railway line throughout, but the Cambridge Econometrics report still tried to find a way to make sense of the Oxford-Cambridge Arc concept.

The key it identified was road building.

Citing a recent DfT report advocating expansion of the road network between Cambridge, Milton Keynes and Oxford, it noted that “all three areas enjoy very good connections with London but the transport infrastructure between them is limited and heavily congested. The report thus concludes that a new highway between Oxford and Cambridge through Milton Keynes would do much to improve connectivity between the areas as well as improving economic efficiency by increasing commuting and the dispersion of skilled labour”.

So car-dependent sprawl was identified as a central necessity of the Arc from the start and Cambridge Econometrics claimed that linking its three radial corridors might yield “unique opportunities”. It was, however, fairly scathing about the three cities’ suitability for major expansion without major sprawl.

“While Cambridge and Oxford benefit greatly from being hosts to two world class universities, as well as numerous branches and headquarters of industry leading businesses, both cities are constrained by a number of factors,” it says.

“These constraints are especially apparent in the case of Oxford, which suffers greatly from a lack of buildable land, expansion being halted by flood risk, the designated green space around the city as well as a general lack of publicly held land upon which to launch new developments. In order to alleviate these problems, the city has tried to redirect new developments to the rural areas around it. However, due to the transport system in and around the city being insufficient to accommodate these developments it has left the city as one of the most congested in the country...

“Cambridge faces the same problems, although to a lesser extent, housing prices within the city having skyrocketed over the last couple of decades...

“Milton Keynes on the other hand, while it may not possess any world leading universities (although it does have a vibrant economy despite this), has plenty of room for expansion. In fact, the city was the fastest growing economy in the United Kingdom from 1981 to 2013, both in terms of output and employment. This growth has to a large part been driven by the city’s role in fulfilling the housing needs of its neighbours.”

The answer it came up with was, of course, road building, agreeing that: “a new highway between Oxford and Cambridge through Milton Keynes would do much to improve connectivity between the areas as well as improving economic efficiency by increasing commuting and the dispersion of skilled labour. Increasing the connection between these three corridors specifically, as opposed to any of the others around London, may offer some unique opportunities.”

The “Expressway” was the outcome of this and was, until recently, absolutely central to the Arc concept and the “string of pearls” – in reality a string of Milton Keynes sized greenfield settlements – along its route.

In March 2021 the DfT responded to local pressure by “cancelling” the Expressway. In reality the cancelled “Expressway” only referred to the section of new road proposed between Milton Keynes and Oxford.

The Expressway as originally conceived was always supposed to be a major trunk road link between the M4 at Newbury and the M11 at Cambridge, partly through capacity increments on existing roads and partly through new build like the MK-Oxford section. The latter apart, this remains very much alive, with a completely new 16km dual-carriageway stretch of the A428 between the A1 at the Black Cat roundabout and the A1198 at Caxton Gibbet.

Elsewhere in the Arc are numerous road schemes and it has recently seen the opening of the £1.5bn A14 improvement between Cambridge and Huntingdon.

England’s Economic Heartland recently released its transport strategy for a slightly larger area than the Arc which includes a range of studies for “connectivity corridors”, technically multi-modal but, in practice, most are likely to be essentially new highway construction, including between Oxford and Milton Keynes and Oxford, Northampton and Peterborough.

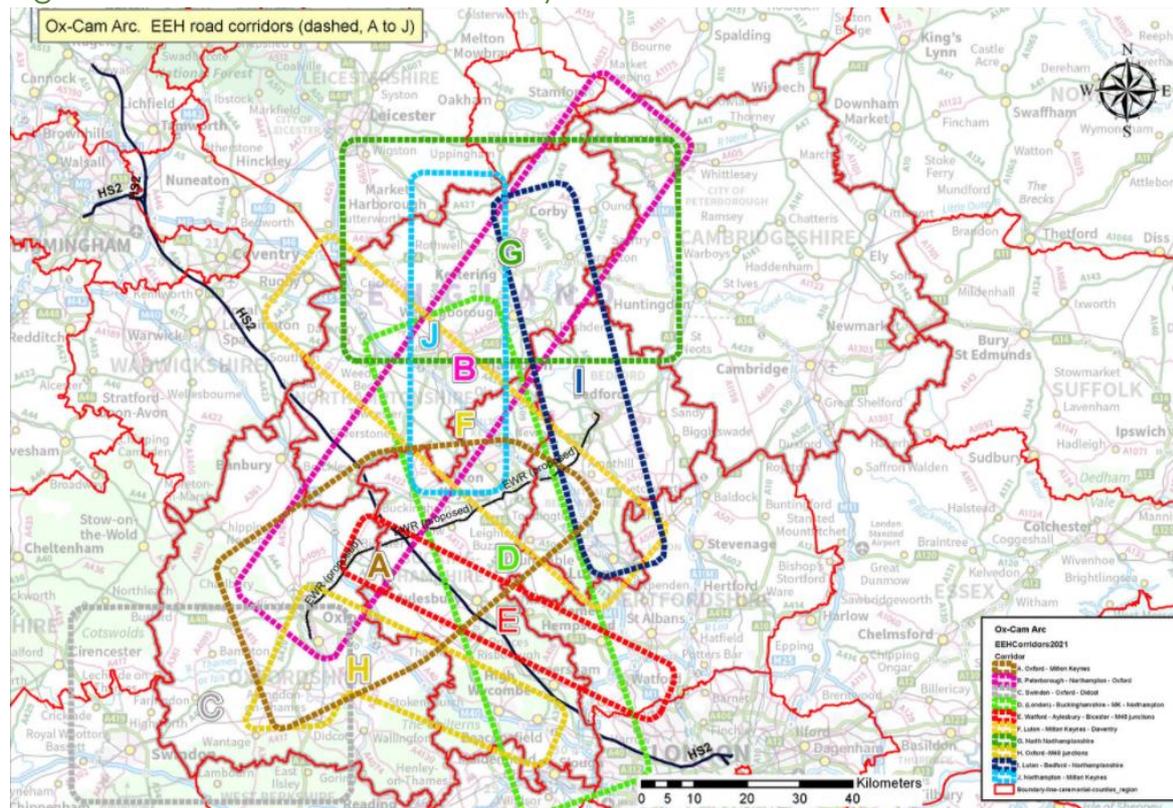
The Expressway – and much other road construction – was thus central to the Arc concept from the start.

“Increasing the connection between the corridors therefore might serve to benefit all the areas,” said Cambridge Econometrics. “The growth in Cambridge and Oxford would be higher since business and workers will be less constrained by the lack of new housing and infrastructure. Milton Keynes on the other hand could benefit both from an influx of highly skilled workers as well as businesses which might choose to relocate there to be close to both Oxford and Cambridge.”

Essentially, Cambridge Econometrics was arguing that increasing connectivity could create an agglomeration effect with geographically separated centres, a difficult case to prove.

So, should it mean that “cancelling” the Oxford-Milton Keynes section of the Expressway makes these ambitions dead? Not a bit of it. Just a week after MHCLG launched its latest spatial plan proposals for the Arc, England’s Economic Heartland, the sub-regional transport body for the area covering the Arc, launched its regional transport strategy *Connecting People, Transforming Journeys*¹⁷. A key element of the strategy was “connectivity studies”, including 10 road corridors for development.

Figure 4.10: EEH's road connectivity studies



Source: England's Economic Heartland/No Expressway Group, 2021

Tellingly, EEH's priorities for 2021 are the Oxford-Milton Keynes (Corridor A) and Oxford-Northampton-Peterborough (Corridor B) studies. But in a seminar held on the day following the strategy's publication, EEH's head of technical programme Naomi Green was quoted as saying: "The road schemes that we've identified in the transport strategy are necessary not to enable growth in the future but only to meet existing needs". Adding a million homes to the region – up to 2.5 million people – would plainly necessitate more, given the diffuse nature of the development proposed and the very limited rail-based public transport under consideration.

5. Do research and development levels justify the Arc?



“There are many areas – even those in close proximity to research clusters – that may not be engaged with R&D activity” [Stella Stafford]

Research and development (R&D) has been a repeated element in the business cases put forward for the Arc. But two questions are prompted by this:-

1. Are the levels of R&D across the Arc so high as to justify its special treatment as a unique cluster?
2. Could levelling up of the rest of the economy ever happen with any concentration of R&D within the Arc?

Some light on both these questions was cast by a recent study by researchers at UCL¹⁸ for the Higher Education Policy Institute (HEPI). This looked at the role of research funding in tackling UK regional inequalities and, as its Preface wryly notes: “Some readers may raise their eyebrows when they see that the authors are from UCL: one of the UK’s larger universities, based within the ‘golden triangle’ of London, Oxford and Cambridge and attracting over £500 million in research funding annually.”

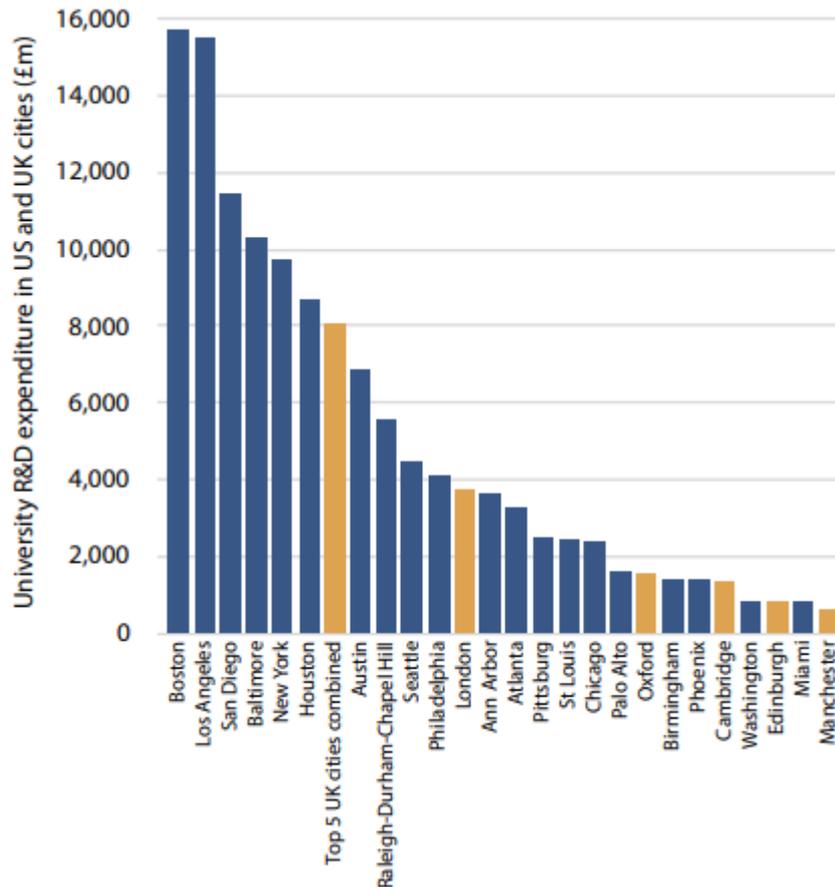
Smart Growth UK has always argued that the supposed “golden triangle” is, in reality, mostly a green triangle and, as the report accepts: “bold actions are needed to address unacceptable inequalities in UK wealth and opportunity”.

Is the Arc uniquely strong in R&D? The report demonstrates that R&D funding in many nations is concentrated geographically and, while this is slightly less pronounced

in the UK and China than in the USA, Germany and the EU, it is only slightly less so; South East England attracts 19% of the UK total. But feeble overall UK spending on R&D has long been recognised as a key economic weakness. Currently it is well below 2% of GDP, around \$43bn in 2017 compared to \$105bn in Germany and \$151bn in California alone. The Government says it wants to increase that to 2.4%.

And although Cambridge and Oxford feature strongly in UK university cities' R&D expenditure, the sums are modest internationally.

Figure 5.1: University R&D Expenditure in US and UK cities (total of 2016-2018)



Source: HEPI, 2021

As the report notes, the total combined university R&D spend in Cambridge, Edinburgh, London, Manchester and Oxford is about the same as that in Houston, Texas, and about half either Boston or Los Angeles. There certainly is world-leading university-led research in Arc universities, but while the quality may be high, the quantity isn't, which undermines the claims by the Arc's proponents.

The HEPI report says UK R&D investment is heavily concentrated in London, South East England and the East of England (most of the Arc falling within two of these) but even within the higher performing regions, there is big variation. "One explanation for this pattern is that a small number of exceptionally high-performing research institutions or

clusters in research intensive regions stand out from the overall level of investment in those regions,” it notes.

Within regions, says the HEPI report, there are often geographical concentrations of R&D activities around academic institutions or specific high-technology industries and knowledge-based services.

“Some, such as Silicon Valley or Singapore, can be traced to specific decisions or events,” it says. “Others – in Edinburgh, Oxford or Cambridge, for example – are the products of long histories.” It agrees that UK clusters of academic or business research have emerged around one or two universities: “Cambridge or Sheffield, for example” but there are also more federated regional partnerships: “the GW4, Midlands Innovation, N8, Science and Engineering South and others”.

And it says the growing use of video-conferencing may create new types of cluster such as the Welsh universities’ new approach to collaboration.

But although the universities in Cambridge and Oxford emerge as rare centres of comparatively high university-led R&D in the UK, it is only by comparison with the rest of the UK and, even in the UK, they are by no means unique.

Overall, even the best in the UK scores badly internationally. And the R&D activities spinning off higher education institutions in Cambridge and Oxford occupy a tiny part of the space in the Five Counties that make up the Arc.

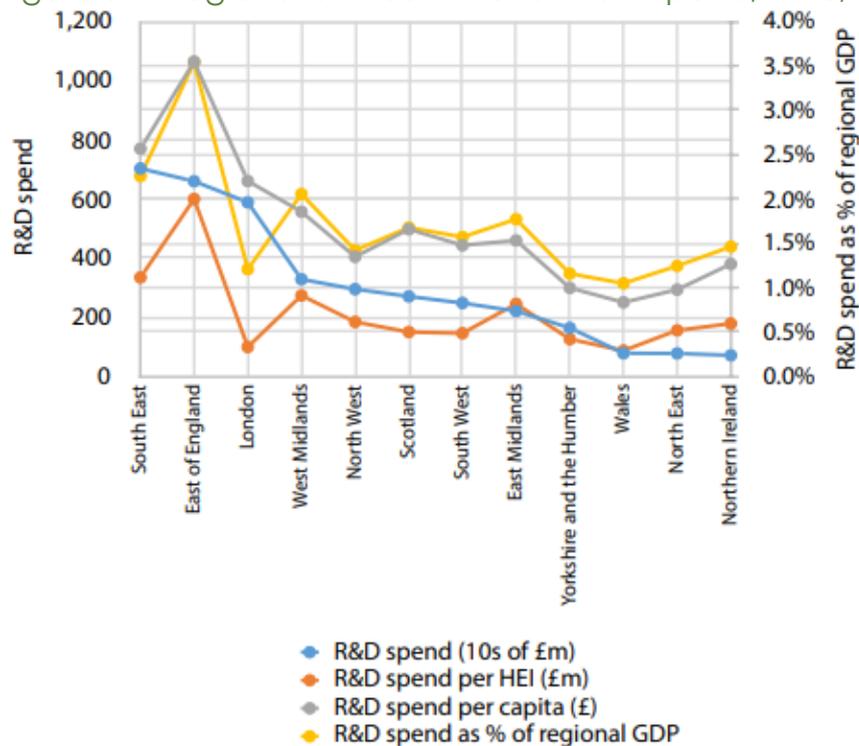
Research & development is seriously underfunded in the UK, so the apparent strength of Cambridge and Oxford is not reflected in international comparisons. Almost half of UK research council funding goes to Cambridge, London and Oxford, so they have a very unfair share of the very small UK funding pot.

The answer to whether levels of R&D across the Arc are so high as to justify its special treatment as a unique cluster, either within the United Kingdom or internationally, can only be a firm “No”.

Is concentrating R&D in the Arc compatible with “levelling-up”? The HEPI report examines the regional distribution of R&D spend on various metrics which shows the East of England and South East England are well funded in overall terms, per higher education institution, per capita and as a percentage of regional GDP.

Greater London fares less well per institution, given their number in the capital and as a percentage of its high GDP. But outside the south and east of England, the picture is poor across all metrics.

Figure 5.2: Regional distribution of UK R&D spend, 2018, comparing metrics

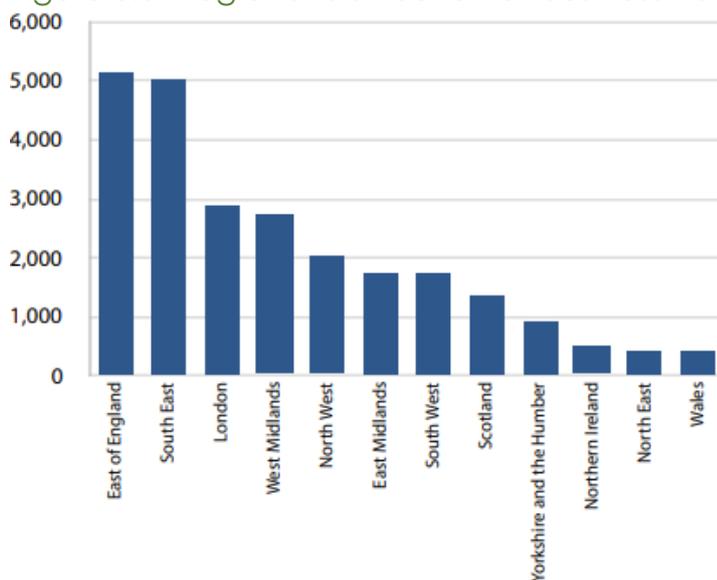


Regions listed in order of overall R&D spend (blue line)

Source: HEPI, 2021

Nevertheless, the report points out there are huge variations within regions, with towns of the comparatively well R&D funded East of England showing huge variation and the same regional pattern emerges with business R&D spend.

Figure 5.3: Regional distribution of business R&D spend, £m, 2018



Source: HEPI, 2021

There has long been a debate, reflected in the HEPI report, over whether to redirect R&D resources from places of proven success (and, as it wryly admits, “presumably political influence on matters relating to R&D”) to less successful areas, in the belief this would stimulate benefits there.

On the one hand, the HEPI report says research clusters can be magnets for business investment in R&D, with about half of such UK investment now coming from companies with overseas HQs, and it is sceptical of Government aspirations to raise overall R&D to 2.4% of GDP without foreign investment. Unless new facilities which don’t compete with existing locations, such as the proposed Advanced Research and Invention Agency, are developed, continuing overseas investment will be needed.

“Policymakers face the challenge of balancing the allocation of resources for the further growth of existing, high-performing clusters against resources for smaller clusters with high potential for the future,” says the HEPI report.

But on the other hand, says HEPI: “The existing geographic distribution of R&D investment evolved as part of a complicated mix of market behaviours and policy choices in domains such as housing, transport, business investment and skills. Unsuccessful attempts to use R&D for regional development often seem to make R&D choices in isolation from these other factors.”

Given the Arc’s obvious deficiencies in housing, transport etc., this should be a powerful argument against it. Regeneration, of course, involves many factors, of which R&D spending is only one. But HEPI says this conflict is noted by the Council for Science and Technology which has advised the prime minister not to “diminish the success of the outstanding knowledge-based economies in some parts of the UK” but also to note the “inter-connected factors influencing the success of R&D funding”.

Currently, however, says HEPI, R&D policy is weakly represented in central government (and in the devolved administrations) and regional interventions are often just retrofitted to the national system. Various initiatives continue to be deployed but the UKRI Strength in Places Fund is the only one so far dedicated to R&D investment for levelling-up. The Shared Prosperity Fund makes no mention of R&D. It is difficult to avoid the conclusion that R&D isn’t considered central to any efforts to level-up the economy, even if it is used as an argument to promote the Arc project.

Is university R&D funding contributing to levelling-up? The R&D spending picture is also bad in universities, where funders such as UKRI, business and charities are currently providing an average of 71% of the cost of research when all overheads are taken into account. Universities must meet the rest from fees. Much of this comes from overseas students, confidence in which has been shaken by the pandemic (diplomatically, it does not mention Brexit).

“Government and funders are hesitant to cover a higher proportion of research costs because this would reduce the number of research projects they could fund with a given pot of money,” notes HEPI. “In other words, it would give them less bang for their buck.”

UK universities’ research funding deficit had already reached £4.5bn by 2018-19 and the model is now unsustainable. Traditionally London and Scotland were heavily dependent on international students’ fees, while London and the East of England universities received around a quarter of their research funding from charities and 27% of Wales’ came from the EU.

The colleges of the universities of Cambridge and Oxford are blessed with historic investments, many of them in land holdings, and several of the colleges have been keenly advocating Arc developments which could plainly add to their already substantial incomes through promoting urban sprawl. But while this might be seen as favouring concentration on the Arc (or at least two small areas within it), it would seriously militate against “levelling-up”.

The HEPI report examines objectives, strategies, outcomes and metrics for levelling-up regional R&D investment. It points to challenges in creating new clusters of research excellence and these will require long-term investment, empowerment of local actors and, it says, “investment in existing centres of excellence to maintain research performance across the UK”, though why exactly it doesn’t say.

But although it says every UK region has at least one research intensive university, “there are many areas – even those in close proximity to research clusters – that may not be engaged with R&D activity”.

It is an astonishing admission that some UK regions have only one “research intensive university” – however defined. The 2021 Research Excellence Framework (REF) results are not due out until next year, but the 2014 results suggest this takes a very narrow view of “research intensive”. And whether wholly accurate or not, it places a serious question mark over any regeneration initiative, like the Arc, based centrally around multiple universities.

“Increasing the number of large research centres in the UK while neglecting the areas around them will not automatically change the lives of people locally,” admits HEPI. So plainly it would need to be part of a suite of measures aimed at evening out the large and growing imbalance in UK wealth.

The report suggests more inter-regional collaboration and investment in research funding experiments and it notes the existence of regional networks of research-intensive institutions such as Yorkshire Universities, London Higher, the Capabilities in Academic Policy Engagement initiative and Universities in Wales. It sets out ways in which increased R&D funding could aid regional initiatives and allow benefits to be shared.

But its conclusion that “concentration is a characteristic of research globally rather than an idiosyncrasy of the UK” (where R&D investment is concentrated in the south and east) is perhaps less of an obstacle to levelling-up than might be supposed, given the relatively weak concentration of R&D in existing centres.

“The case for a wider geographic diversity of strong research capabilities can – and should – be made, not least by developing robust evidence and persuasive responses to persistent questions about the relationship between public spending on research and the economic performance of geographic regions,” it recommends.

So are R&D levels across the Arc sufficient to justify special treatment? Going back to the two questions with which we began this section, HEPI suggests that the *small areas* in the Arc housing “research-intensive universities” do show characteristics of clusters, in contrast to most (though not all) of the rest of the UK. But this is not the same as saying levels across the Arc make it unique – or uniquely deserving of attention.

And could levelling-up in the rest of the UK stand further concentration in the Arc? Spreading R&D to other areas of the country will be a challenge that must be met if levelling-up is to mean anything and should not be deterred by the belief that Cambridge and Oxford could reach the quantity, in the way they match the quality, of the biggest international clusters of research.

So should we go on favouring the Arc (or at least its very small number of “research-intensive universities”) with Government investment in research, infrastructure and development, whatever the environmental damage of such a course? And could alternative policies accelerate development of the research field in other regions (or even other parts of the Arc) given the weakness of UK funding for R&D?

Government policy is clearly trying to have this cake and eat it too. The Arc project presupposes accelerated investment in at least Cambridge and Oxford Universities and urban development in the lands surrounding them to house population growth. But the Government is also committed to levelling-up an economy which gets ever more regionally unbalanced.

But this would be an over-simplification. Even if it is true that R&D in all countries tends to be concentrated in certain areas, UK levels of R&D are so poor that even the miserable levels in the rest of the UK doesn’t mean it is internationally strong in Oxford and Cambridge, let alone anywhere else in the Arc.

Nor, comparatively speaking, is it so very weak in the rest of the UK. There are many areas with strong research-intensive universities and research institutions, as our *Overheated Arc Part 2* report began to demonstrate. Such areas may be few, as in other countries, but they are not confined to the Arc, most of which lies far from those institutions anyway.



And it raises another issue not covered in the HEPI report – why are we happy to accept a two-tier university system divided between “research-intensive universities” and the rest?

All universities engage in research – are we happy for the majority of them to languish with low-funding and wasted potential?

A large majority of UK universities, whether “research-intensive” or not, lie outside the Arc. Dismissing them as second-class, even very fine and long-established ones, simply because they don’t happen to be located within five arbitrarily designated counties would be a perfect route to prevent “levelling-up”.

A two-tier university system?

[Stella Stafford]

So, in answer to our two questions:-

- The Arc is only comparatively strong in its R&D resources thanks to imbalance of funding towards a handful of its universities and these resources are relatively small by international standards.
- Levelling up R&D funding presents enormous challenges, especially given the low-levels in the UK historically, and simply concentrating inadequate levels within the Arc would effectively undermine levelling-up.

6. Would jobs growth justify the Arc?



“A transformational growth scenario”

[Stella Stafford]

As mentioned above, given the NIC’s intensely prescriptive instructions, the Cambridge Econometrics/SQW researchers decided that analysis of the knowledge-based sector (KBS) meant concentrating on “high-tech manufacturing” (HTM) and “knowledge intensive business services” (KIBS). “The former is a key driver of productivity growth, but the latter is what drives knowledge-based jobs in most areas,” it noted.

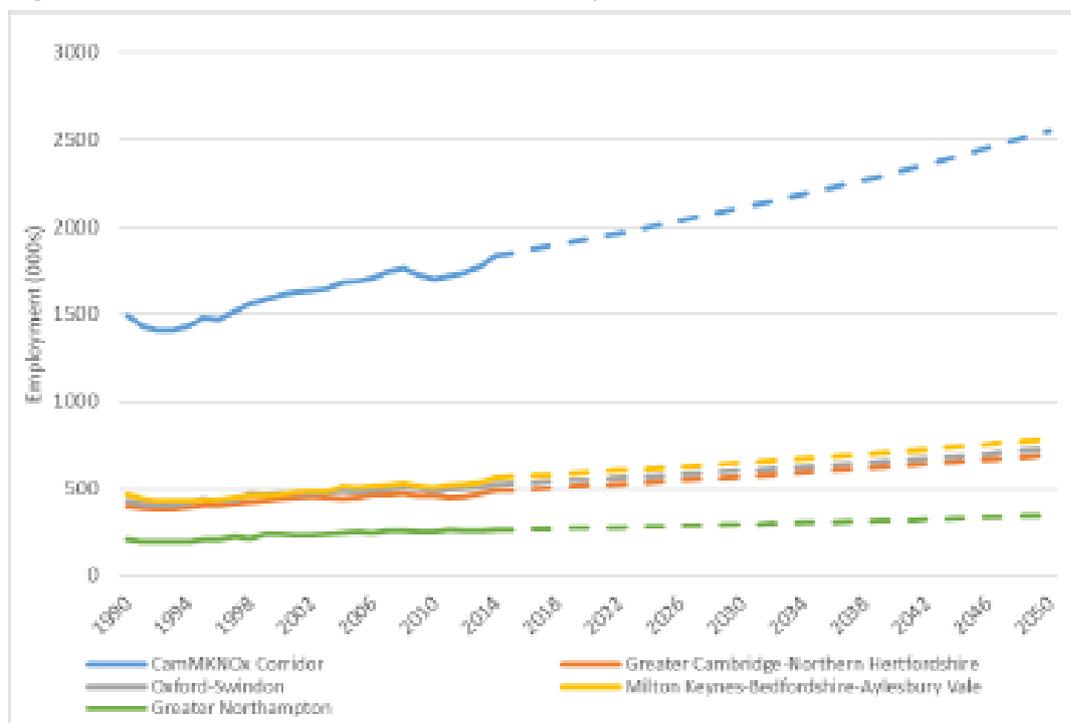
As things stand it projected that: “KBS employment growth is expected to be driven by growth in KIBS which averages 0.7% pa over 2014-50 in most city-regions (equivalent to a total of 80,000 additional jobs by 2050). Meanwhile, HTM employment is projected to decline at 1% pa within the Corridor (a loss of 20,000 jobs), where the decline is more apparent in the Milton Keynes-Bedfordshire-Aylesbury Vale area (at -2.5% pa) and the Greater Northampton area (at -2.2% pa).”

The report considered two other scenarios, an “incremental growth scenario” and a “transformational growth scenario”. Compared with the 2014 population estimate of their study area of 3.3 million, by 2050, this figure was anticipated to have increased to 4.3m in the baseline scenario, while the incremental and transformational scenarios used projected totals in 2050 of 4.5m and 4.8m respectively. “This represents a significant increase over the baseline – the transformational scenario is anticipated to bring an additional half a million people to the area.”

The area they looked at was slightly different to the final Five Counties iteration of the Arc - Bedfordshire, north Buckinghamshire, north Hertfordshire, Swindon, Cambridgeshire, most of Northamptonshire and Oxfordshire – thus including both some areas that made the eventual list and others that didn't (north Hertfordshire and Swindon) and excluding others that did, such as south Buckinghamshire and parts of Northants.

On top of business-as-usual, the “incremental growth scenario” included housing and transport investments “to relieve or reduce several of the key employment growth constraints in the individual sub-areas, but not significant enough to represent a major shift in the labour productivity of different industries or the economic geography of the corridor”. These projections resulted in an estimated 0.9%pa growth in employment 2014-50.

Figure 6.1: “Incremental scenario” projections for employment



Source: Cambridge Econometrics/SQW

But suppose the full environment-destroying investments in housing and transport proposed for the Arc project were made and incorporated in a “transformational growth scenario”? Could the limitations imposed by the very different and separate four sub-area economies the consultants identified start to function as a “knowledge-based functional economic corridor”? They postulated a “triangular trade” between the different sectors and aggregations.

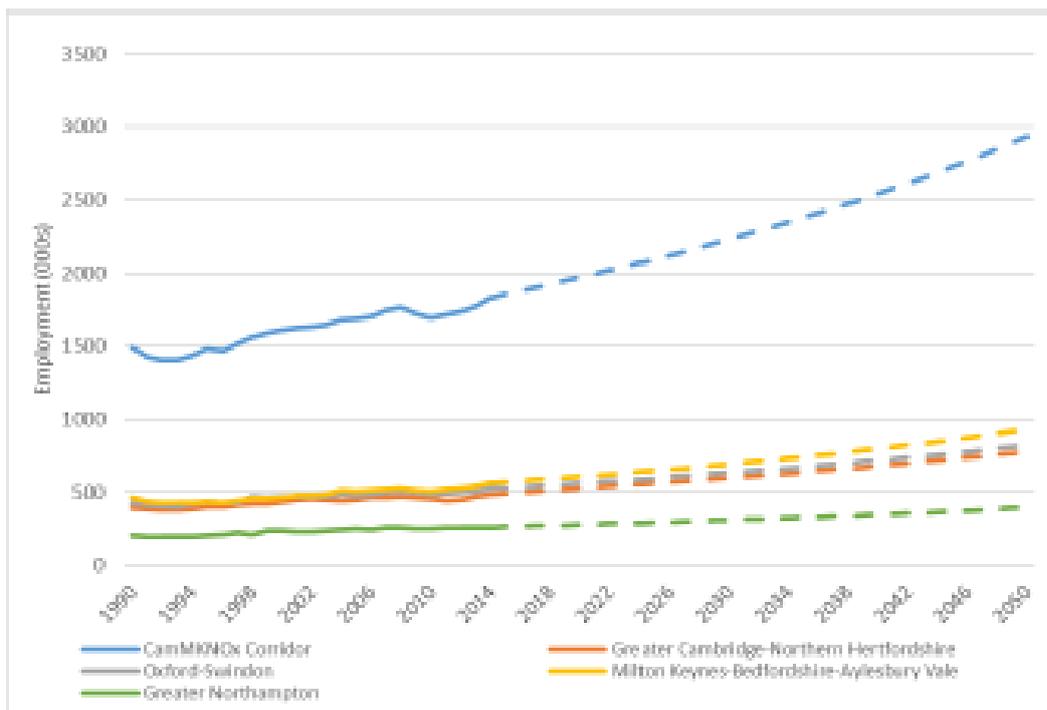
“We could envisage that greater interaction between the knowledge and innovation generating sectors of R&D around Cambridge and Oxford, the (currently spatially distributed) clusters of high-tech manufacturing that are able to convert these

innovations and knowledge to marketable products, and the KIBS sectors based within the major study area cities that are able to provide key business services, could potentially create a dynamic, synergistic system that provides world-class innovative products and services,” opines the report. “This could, in theory, revolutionise the knowledge-based employment potential of this corridor and create the kind of globally competitive cluster that was envisaged in the Chancellor’s statement.”

That “potentially” and “in theory” should not be ignored, of course. This scenario would require rail improvements including East-West Rail and new links with London and the Midlands, as well as “a fully realised Oxford-Milton Keynes Expressway” and new radial road links to London. There would need to be substantial new housing too – the million homes of the Arc (and though excessive for an increased population of 1.5 million, the Arc is also expected to accommodate around 230,000 houses for London overspill).

With the motorways and radial roads in place, employment growth of 1.3%pa from 2014-50 was projected.

Figure 6.2: “Transformational scenario” projections for employment

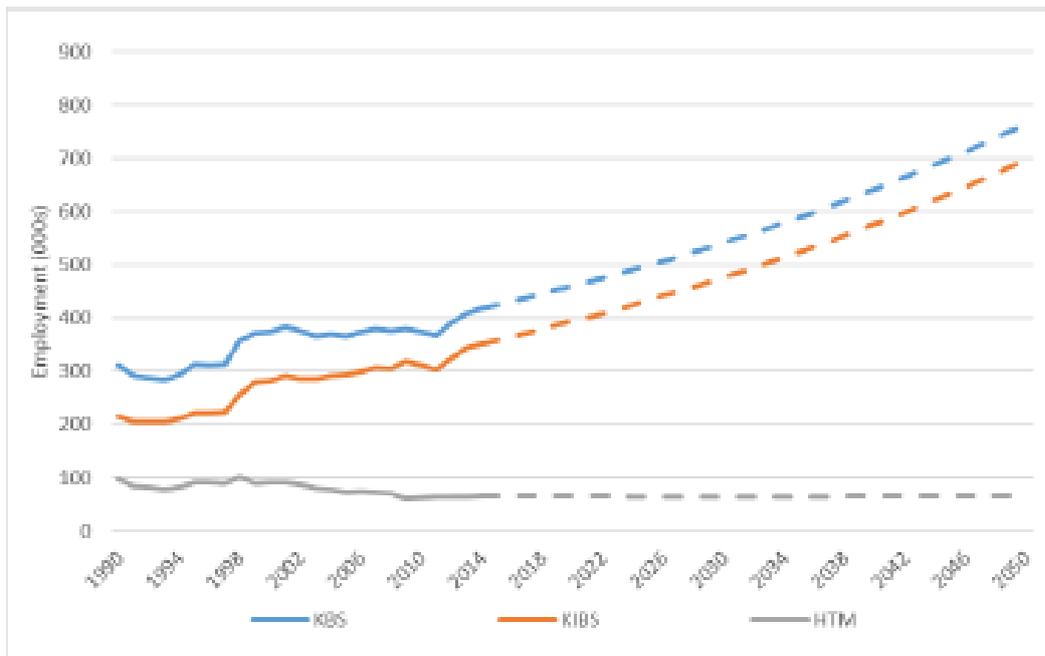


Source: Cambridge Econometrics/SQW

But while the consultants projected KIBS employment growth would drive overall growth in the knowledge-based sector, how many would be working in the key HTM sector, the imagined driver of the transformational Arc project? High-tech manufacturing was projected to remain virtually static for the whole 36-year scenario, with declines in Milton Keynes and Northampton counteracting slight growth in Cambridge and Oxford.

“The transformational scenario sees a further increase in the number of KIBS jobs, with the current trend being extended onwards, and 700,000 jobs being realised by 2050,” said the report. “This scenario also sees no further reduction in the number of jobs in HTM, despite the ongoing increases in technology-driven productivity enhancements that are expected to continue.”

Figure 6.3: “Transformational scenario” projections for employment in KIBS and HTM sectors



Source: Cambridge Econometrics/SQW

The report projected that KIBS jobs in 2050 would account for 23% of employment in the baseline scenario, 25% in the incremental and 26% in the transformational. This, the consultants estimated, would result in productivity per worker increasing by £4,000 per worker in the incremental and £6,000 in the transformational.

But while HTM employment was projected to remain static, the consultants had good news for business, predicting huge growth in productivity (i.e. output per worker) in the sector, though not for employment. Productivity increases are much greater for HTM than for KIBS as a whole according to BEIS, 2.6-2.7% against 1.5-1.8%. In a paper by Christopher Kask & Edward Sieber¹⁹, in the US, for HTM between 1987 and 1999 the figure was 9.5% p.a., compared with 3.2% in the manufacturing sector as a whole. Such returns, against a background of economic bad news about almost zero HTM employment growth, might at least keep business happy.

7. Are there better places for an arc?



“Aspiring cities or regions require a critical mass of certain fundamental ingredients”

[Stella Stafford]

Our 2019 report *The Overheated Arc Part 2 – Sustainable Alternatives*²⁰ looked at the criteria on which the Arc had been based and asked if there are other parts of the country where such qualities exist as well as a range of sustainability criteria largely absent from the Arc. Our answer was a clear “yes”.

We assumed the specific qualities which prompted identification of the Arc were:-

1. outstanding universities and research institutions;
2. knowledge-intensive businesses;
3. a skilled workforce;
4. historic cities.

We then tried to identify a selection of places which possess these qualities and five sustainability criteria:-

5. availability of brownfield development land;
6. no acute shortage of housing;
7. high-quality public transport;
8. a need for economic regeneration.

We examined five strong contenders in some detail:-

- Wolverhampton-Birmingham-Coventry
- Newcastle-Sunderland-Middlesbrough
- Nottingham-Derby
- Manchester-Salford-Bolton
- Leeds-Bradford-Huddersfield

All met our eight criteria and it was clear the list was far from exhaustive. To start with, as the Arc is a Whitehall policy, we didn't look at the devolved administrations. And secondly all these areas are much geographically smaller than the Arc (though as populous) and larger areas like Manchester-Liverpool or Glasgow-Edinburgh might serve, following careful analysis.

The Connected Places Catapult has also been thinking about where to locate growth centres. In a report²¹ last year with the Centre for Cities, it looked at which areas in Great Britain could absorb R&D funding and related activities. *Identifying Potential Growth Centres across Great Britain* looked at the factors that affect innovation and how these play out in the most successful places. Then it applied its "innovation models" to identify places in which R&D investment has the greatest potential for impact.

The report identified three "super cities" which it excluded on the basis they already receive disproportionate R&D spend. It also said its potential growth towns and cities should have populations above 200,000 to facilitate agglomeration. Despite this, although London was identified as the obvious "super city", the other two were Cambridge and Oxford, despite having populations well below 200,000, presumably on the basis of their very high R&D funding.

The report's best places would also need to score strongly on at least four of the indicators they chose. On this basis they identified eight "regional innovation hubs":-

- Bristol
- Cardiff
- Coventry
- Derby
- Glasgow
- Leeds
- Manchester
- Newcastle upon Tyne

It also identified five "regional alliances":-

- Bournemouth-Southampton
- Coventry-Birmingham
- Derby-Nottingham
- Liverpool-Birkenhead
- Reading-Aldershot

These bear more relation to arcs and include two of those we identified as well as two in areas which could not really be said (despite localised deprivation) to be areas requiring significant regeneration.

The Catapult says that, over the past 20 years, around 100 places in the UK have tried to build an innovation node or hub but only around 10 have achieved real scale and

maturity. In contrast, the north-west corridor of the US eastern seaboard (from Boston to Washington DC) with a slightly smaller population has seen around 20 locations scale up to hubs.

It has also laid out a global review of innovation hubs²², identifying 10 types of hub and their features and differentiators. It identifies around 500 innovation hubs, more than a third now in Asia-Pacific, a proportion that is rising. More than 80% of its hubs are in cities and metropolitan areas and its 10 types of innovation location are mostly in such areas but it also includes “innovation campuses around universities”, “innovation triangles connecting three different locations”, “out-of-town innovation zones”, “innovation corridors” and “innovation landscapes”.

Each of the 10 types of location includes three UK examples. Only three of the 30 are wholly or partially within the Arc. The innovation campuses are in Birmingham, Cardiff and Edinburgh, the triangles are Bristol-Gloucester-Swindon, Edinburgh and Salford, the out-of-town Lancashire, north Kent and (within the Arc) Cambridge’s “Silicon Fen”, and the innovation landscapes Anglesey, Hull and Stoneleigh. The type that might have come closest to the Arc, innovation corridors, includes Cheshire Science Corridor, Sheffield’s Global Innovation Corridor and (partially within the Arc) the London-Stansted-Cambridge corridor.

It says aspiring cities or regions require a critical mass of certain fundamental ingredients. “In the UK, many places clearly have the knowledge, R&D, and skills drivers (world-class university, talent pool, academia-business porosity) in abundance, as well as sector and inter-firm drivers,” it says. “Others have the market and investment drivers (consumer base, institutional presence, airport) supported by expanding knowledge anchors.”

Which suggests, at best, the Arc is only one of many places that could become an innovation hub. As we have seen in earlier reports, however, other places are much better placed to accommodate such hubs sustainably and many other areas actually need the growth on offer.

The Catapult looks at the potential to apply innovation to areas to stimulate economic progress. The other half of our concern, however, was whether other parts of the UK actually *need* that growth more.

Inequality across the UK is reaching crisis point. As the prime minister very recently noted²³: “It is an astonishing fact that 31 years after German unification, the per capita GDP of the North East of our country, Yorkshire, the East Midlands, Wales and Northern Ireland is now lower than in what was formerly East Germany”.

Mr Johnson shouldn’t have been too surprised. A string of reports has made the same point. The UK2070 Commission, for instance, issued its final report²⁴ in February 2020 demonstrating the decline of productivity in former industrial regions and their need

for long-term investment in infrastructure, skills, research, development and local economies.

“If we continue on our current trajectory then the threats to regional livelihoods and the pressures on London and the south-east will become so severe that everybody will lose out,” said Commission chair Lord Kerslake. “We also need to recognise that the price of failing to reverse this decline will far outweigh the cost of investing now in creating greater opportunities. Properly investing in levelling-up will come at a cost – but so will doing nothing about it.”

The Commission followed up with a post-covid action plan²⁵ which showed how the pandemic had exposed the UK’s dependency on London and the wider south-east. It said a balanced growth plan is needed for what is presently the most centralised major developed economy.

“We’re saying what is missing is a clear plan setting out the scale and form of levelling up, the actions required to deliver it, and measures and milestones to success,” said Lord Kerslake.

Inequality doesn’t affect just the economy, of course. In June 2021, the Institute of Health Equity issued a report²⁶ which revealed a “jaw-dropping” finding that the coronavirus death rate in Greater Manchester was 25% higher than the English average. It said deteriorating health equalities in the region and across similarly deprived areas of the country were the result of long-standing, avoidable, socio-economic inequities, exacerbated by a decade of spending cuts and amplified by the pandemic.

“If the Government is serious about levelling-up health inequities, equity of health and well-being must be at the heart of government and business strategy rather than narrow economic goals,” said IHE director Prof Sir Michael Marmot. “Greater Manchester has high levels of avoidable health inequalities as a result of longstanding economic and social inequities, and as across the country, ethnic disadvantage.”

In this report, as in its predecessors, we take no view as to whether the arc concept - accelerated development in parts of the country with especial potential for knowledge-intensive growth - is a sound one or not. But *if* (and only if) it is, then it needs to be done in places that would have the most economic benefit and which could accommodate such growth in the most sustainable way. The Oxford-Cambridge Arc is unlikely to satisfy the first of these tests and is a miserable failure on the second.

8. The economy they never mention



Agriculture is the Arc's dominant economic activity

[Stella Stafford]

One very curious fact about the whole Arc project since its inception is that the economic activity which dominates a huge majority of the Five Counties is virtually never mentioned. That activity is, of course, farming.

The NIC's *Partnering for Prosperity* makes just one reference – a complaint that agricultural land is only worth around £25,000 per hectare while land with planning consent varies from £1.6m per hectare in Northampton to £2.7m in Milton Keynes and £5.7m in Cambridge. It suggested there would be a case for land value capture, about which the Government remains as cool as ever. *Partnering for Prosperity* only mentions one farm – an educational family farm in Letchworth.

The NIC's two consultants' documents are similarly reticent. The Cambridge Econometrics/SQW report makes three references: a note about Northampton from its coverage of the 1966-69 Royal Commission on Local Government in England, a footnote about land acquisition in the post-war new towns and a reference to Chinese agriculture in a case study of the Guangzhou-Hong Kong corridor. The Savills report on the Arc property market makes no mention at all.

The "*Radical Regeneration Manifesto*" has just one mention - in a section by Bidwells' head of planning Mike Derbyshire arguing for more development in green belts. "If you develop 50 acres of green belt, you must buy and return another 50 acres of land to

green use – not farmland, but real public green space, such as woodland, somewhere else along the Arc,” he wrote. So, a 100% net loss of farmland.

The *Oxford-Cambridge Arc Economic Prospectus* has a map entry for the High-Tech Agriculture Zone outside March and a picture of Cranfield’s Agriculture Technology Centre. It also proposes a Doubling Nature Fund “to protect and enhance the environment and increase investment in natural capital assets working with major landowners and our important agriculture sector across the Arc” - though this would presumably be at the expense of the “important agriculture sector”. MHCLG’s *Introduction to the Oxford-Cambridge Arc Spatial Framework* makes no mention at all of farming or agriculture, while *Creating a Vision for the Oxford-Cambridge Arc* creates a vision which also makes no mention of the Arc’s most extensive economic activity.

Even the important food and drinks industries, which depend heavily on agriculture, scarcely rate mentions. The Cambridge Econometrics/SQW report does mention that Aylesbury’s “early industries” included “printing and publishing and food processing” though it says the town is now dominated by service activities. The Savills report makes no mention of either sector. The NIC’s *Partnering for Prosperity* reflects the advice it received; its only mention of food is the profound insight that city layout is shaped by human behaviour including “the various flows of people, goods, food, water and energy that are required to sustain towns and cities”. Flows of drink are ignored.

The “*Radical Regeneration Manifesto*” makes no less than 12 references to food, but most are about food outlets in cafes and restaurants. A section by Rowan Asset Management CEO Nick Jacobs on well-being and healthy towns bemoans the fact that junk food is cheaper than healthy. Legal & General Capital CEO Kerrigan Procter urges a focus on “sustainable use of land, environmental resources and adaptation to climate change. An efficient low carbon system, resourceful water usage, sustainable food production, waste avoidance and recycling”. Neither, however, seems able to make the jump to protecting the ecosystem services that undeveloped countryside provides.

The *Oxford-Cambridge Arc Economic Prospectus* does admit that “capabilities in defence, electronic sensors, medical devices, food and drink and technologies such as cryogenics, in which Oxford is a world leader, are critical to underpin our longer-term competitive potential in high value manufacturing and engineering”. But that’s about it; no mention of food and drink’s importance to other sectors of the economy. The two 2021 publications from MHCLG ignore these industrial sectors altogether.

So here we have publications purporting to examine the present and future of the economy of the Five Counties and, in the main, they don’t even mention its most widespread economic activity. They certainly don’t mention its huge contribution to the country’s food security, nor that much of the best and most versatile Grade 1 and Grade 2 land is located within the Arc. It’s as if farming didn’t exist.

Indeed, we had to wait for the highly technical *Oxford-Cambridge Arc Spatial Framework Sustainability Appraisal Scoping Report*²⁷ for even brief and grudging mentions of the ecosystem services farmland provides and even then the Government couldn't resist knocking it. It admits that the Arc's rich loamey and clayey soils and high fertility support large areas of the highest quality farmland and it accepts farming as the dominant land use, with around 54% classes as cultivated/disturbed and 20% grazing. It also notes this was the reason for early settlement and rich archaeology. But it can't resist buying into the "green desert" mythology.

"Agriculture has been the leading cause of net biodiversity loss over recent decades and the resulting intensification of land management is continuing to add pressures now," it notes. "Agriculture is also the dominant source of nitrate in water with high nitrate concentrations contributing to nutrient enrichment which can adversely affect surface water habitats such as rivers and lakes and sensitive terrestrial habitats and ecosystems. Given the Arc is a key agricultural area, this is of particular relevance, although farmers and landowners are being encouraged to adopt more sustainable practices through the new Agricultural Act 2020 to recover and restore biodiversity losses, and contribute to the UK Government's *25 Year Environment Plan*."

Having thus identified farming as a major villain, it then mentions the big threat the Arc poses to biodiversity as an afterthought: "Increasing population and development has also led to habitat fragmentation and species disturbance, and as sites become smaller, they become more vulnerable to pressures, and are therefore more likely to result in biodiversity loss," it admits. "For example, only 47% of the area covered by habitats designated as SSSI are considered to be in a favourable condition."

Grudgingly perhaps the *Scoping Report* does include "Land Use and Landscape" as a theme in the proposed scope, including "loss of soil and its quality from increased development with implications for food production, biodiversity, flood management, water quality and carbon storage". It admits here that protecting highest quality farmland from disturbance and loss could be an opportunity.

Yet agriculture is probably the most important economic activity in the Arc. It occupies more than two-thirds of its total land surface. It's not a huge employer - modern agriculture is extremely efficient - but direct farm employment does not include the huge workforce in food and drink industries, agricultural supplies and farm machinery.

But it also worries that: "Many parts of the Arc's natural environment are relatively inaccessible to the public", as if that were a threat to them.

The *Scoping Report* admits (though few will have read it), that agriculture is by far the dominant land use in the Five Counties. But it's hard to find agricultural statistics for individual local authority areas - the last time such figures were published for England was 2016. Most are routinely presented on a regional bases, but it's symptomatic of

what a wholly artificial construct the Arc is that its five counties straddle no less than three English regions.

Table 8.1: Farming in the Five Counties

Authority	Total Farmed Area (hectares)	Total Area of Authority (hectares)	Percentage of Land Farmed	Total Labour
Buckinghamshire	106,327	187,358	56.8%	3,114
Cambridgeshire	244,264	305,275	80.0%	6,839
Luton & Bedfordshire	76,787	123,500	62.2%	2,112
Northamptonshire	182,644	236,400	77.3%	4,256
Oxfordshire	191,126	260,500	73.4%	4,182
Peterborough	23,770	34,338	69.2%	479
Total	824,918	1,147,371	71.9%	20,982

Source: DEFRA, 2016²⁸

Agriculture is of huge economic importance to the country. It makes a massive contribution to the security of a heavily indebted country which needs to import more than a third of its food from an increasingly politically uncertain world facing a climate emergency. This wilful neglect of the Arc's importance as a food producing region – to facilitate largely unsustainable forms of housing development - can really only be described as shocking.

9. Conclusions



If the arc concept is a sound one, are there better places for it?

[Stella Stafford]

In our second Arc report, we asked a couple of serious questions:-

- 1. If the Arc, as formulated was a good idea;**
- 2. If so, whether it was being developed in the right place.**

It's astonishing that, despite the millions still being wasted on developing the Arc project, there has been little effort expended on answering the first of these and absolutely no-one involved in promoting it has made the slightest attempt to answer the second.

So we must ask once again whether any of the Arc's cheer leaders can say whether the arc concept is a good idea and, if so, whether it's being developed in the right place.

It may be that the arc concept is a sound one, as the Connected Places Catapult believes. We take no view on this. But in our first two Arc reports, we said that the Oxford-Cambridge Arc was "founded on sand" because the area is unsuitable and because there are plainly places which need the growth and which could accommodate it more sustainably.

Now, in this third report, we've examined the economic arguments which supposedly underlie the concept and found them wanting.

So now we must ask a third question:-

- 3. If the Arc proceeds in the Five Counties, would it undermine urgently needed "levelling-up" elsewhere?**

As noted in the Introduction, prime minister Boris Johnson's 15 July speech²⁹ on "levelling-up" firmly agreed projects like the Arc could undermine levelling-up, saying: "the process of levelling up is not just aimed at creating opportunity throughout the UK, it is about relieving the pressure in the parts that are overheating,".

Mr Johnson admitted the UK has a more unbalanced economy than almost all immediate European competitors and "pretty much every major developed country" and he compared Germany's success in levelling-up East and West over the past 30 years with our own failures. He singled out the West Midlands for praise - an area which includes one of Smart Growth UK's "alternative arcs" - and he very firmly agreed with our contention that alternative arcs could work in such areas, thanks to sustainability opportunities the Arc lacks.

"They know that one of the problems holding the West Midlands back has been the lack of mass transit, public transport, the basic difficulty of getting from your home to your place of work," he said. "And so that's why I support the mayor's plan to put in those new metro lines, and that's why today I am fulfilling my promise to give eight city regions like the West Midlands the funding to start making their bus and train networks as good as London by launching our city region sustainable transport fund with £4.2bn that local leadership can spend on projects like contactless ticketing, new tramlines, bike lanes - massively popular in this country, believe me as part of the biggest infrastructure investments in history."

Yet despite such clear criticism of projects like the Arc and such a strong case for investment elsewhere, the Government is still absurdly committed to it. In a Westminster Hall debate on the Arc just two days earlier, housing minister Christopher Pincher vigorously defended the Government's commitment to it. "We are fundamentally committed to the Arc and the economic opportunities it presents," he said.

But, as this report has made clear, the Five Counties are not "the greatest scientific constellation anywhere in this hemisphere" of the prime minister's dreams. It is, however, plainly one of the "parts that are overheating" of his nightmares.

The Arc project, ill-founded and destructive, is clearly as big a threat to the Government's commendable ambition to level-up the economy as it is to the environment of the Five Counties involved. It's time to call out the inflated claims about its agglomerative potential, its supposedly high productivity and the ability of developers to build low-density, car-dependent sprawl sustainably. It's time to ask whether the whole arc concept is a sound one and, if it is, where could it be implemented sustainably.

That won't ever be the Five Counties under threat from the Arc project. It's time to drop the scheme before any more public money is wasted on it.

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