About this Report

This report is by a group of Cambridge-based entrepreneurs and investors inspired by the Mayor of London’s announcements in April 2014 about ‘MedCity’ (London and the greater South East as a medical research and innovation powerhouse) and the ‘Golden Triangle’ (the London-Oxford-Cambridge knowledge cluster).

We asked ourselves: what do these names mean, and how can they come to mean something real – particularly in the case of the long-discussed, but as-yet-unrealised, Golden Triangle?

We argue that there is a need for a coherent, inclusive, and forward-looking national innovation agenda. This agenda needs to:

- Focus squarely on people and connectivity, supporting bottom-up and creative social networking initiatives and experiments across a multiplicity of local networks, clusters, and platforms
- Invest boldly in infrastructure
- Develop an inclusive UK-wide branding strategy for innovation clusters.

In this report, we explore how this might look in the regional example we know best: the South East.

There is a role for government in making this happen – but also for a broad range of individuals and organisations interested in promoting innovation and creating growth. We hope to start this conversation, with the shared aim of creating in the UK a truly world-class innovation ecosystem.
Recommendations

The government should convene a broad range of individuals and organisations to plan how to:

I. Inspire initiatives and experiments that **connect people and ideas** – and achieve concentration – in creative ways

II. Invest in **infrastructure to improve connectivity** to London King’s Cross as the mega-hub for the South East & cut travel time between the corners of the Golden Triangle to well under an hour

III. Develop an inclusive UK-wide **branding strategy for clusters** that allows excellence to grow and prosper – no matter where it resides – and which empowers all participants equally
The impetus for this report is a growing belief that, if we are to grow the innovation clusters in the UK to a scale familiar from Silicon Valley, Boston, or the Research Triangle, we need to think big and invest in social and physical infrastructure.

We come at this from our collective experience and expertise as entrepreneurs and investors deeply integrated in the Cambridge cluster and the greater South East. We know that, above all else, interactions between people are critical in order for innovation ecosystems to flourish.

Drawing lines between places on a map and adding a label does not make them truly connected. Instead, you need to match reasons for connecting with the ease of doing so; you also need to empower all participants. This requires investing in social networks – in a way that is creative, iterative, participatory, and relentlessly people-centred – and dedicating serious resources to infrastructure that supports these networks and allows them to prosper. We want to see open, inclusive networks, clusters, and platforms that connect and concentrate skills, expertise, value, and growth.

Taking the South East example – it is currently as hard (if not harder) to work between Oxford and Cambridge as it is to work with Manchester, Amsterdam, or Paris. Oxford and Cambridge both connect to London, forming a ‘V’, but the so-called ‘Golden Triangle’ linking all three nodes simply does not yet exist. In the short run we need travel times between each node to be under an hour, and in the longer run significantly less. One hour’s travel time has to be the maximum to span a cluster. Further reducing the time taken to travel between these places would generate networks of unprecedented value.

But clusters are not created by infrastructure alone. So alongside this we propose a series of shorter-term, local, low-cost, creative initiatives bridging people and ideas within the South East.

We need to see ourselves as others see us: global inward investors see Cambridge, Oxford, and London as effectively a single location, and some think on even larger scales. We need to present the UK and its clusters in a more coherent and concentrated way.

So this is not just about the South East. Learning how to build clusters at scale is something that the UK needs to do as part of its world-class leadership in technology and innovation, and this applies just as much to TechNorth and to other regions throughout the UK. We recommend a fresh inclusive approach to branding and a cluster strategy for the whole of the UK that allows excellence to grow, connect, and prosper, no matter where it resides.

The ambition to see the UK recognised as a world-class leader in technology and innovation rises above politics, place, and personality. It requires bold vision – including experimentation and risk-taking – directed towards engaging, empowering, and enabling people, and investing significantly in infrastructure.
I. Connect People and Ideas

It's now generally recognised that clusters lead to more innovation and faster economic growth. It's the basis for TechCity and the new TechNorth initiative. In the South East, you are 12 times more likely to be employed in the technology sector in Cambridge than you are in London, and 18 times more likely than in the South East as a whole. This concentration of activity is at the heart of the magic of clusters.

To a large degree, clusters work because of their networks. In Cambridge – arguably Europe's leading technology cluster, with twice as many start-ups per head as any other city – we have over 60 networks that help empower individuals and businesses operating within the cluster and the broader region. These networks ensure a constant flow of lively events, re-investment, mentorship, and ambassadorship. They create a sense of being part of something bigger and better than any constituent part. The greatest value of clusters and networks is that, by concentrating expertise, support, and entrepreneurial culture, they provide a low-risk environment for individuals to embark on high-risk ventures (to adopt a well-known aphorism of one of the authors).

People drive clusters, and they need to have reasons, means, and opportunities to meet (often by chance), spark ideas, and work together. We need local, low-cost, creative experiments aimed at connecting people and ideas. Such experiments cost very little, and there are many places and groups which would jump at the chance to be part of such activity.

We see a critical role for platforms. By platforms we mean a collection of places, tools, and services that can be used to enable people to interact more easily and frequently and so foster collaboration and serendipity. It's an eclectic list: open spaces and hubs for meeting, working, lodging, and travel; virtual hangouts, PAs, connectors, and learning facilities; challenges, hackathons, prizes, and competitions; pre-packs and stacks for low-cost products, services, and support; placements, secondments, exchanges, and interchange schemes. In this sense, platforms combine physical and virtual space to enable networking to scale up.

By focussing on connecting people and ideas – and by identifying what works, abandoning what doesn't, and learning from best-practice – the UK can build a stronger innovation culture, resilient to changing fads, and responsive to needs and opportunities. We asked ourselves:

- How can we reduce the risks for individuals?
- How can we concentrate expertise, people, and connections?
- What could bring in investors and established companies?

We have four recommendations for connecting people and ideas…
A. Bring People Together

People learn from their peers. We should add to existing meet-ups and conferences with **more events at target locations** to bring people together. Camping festivals, solver weekends, out-of-term exchanges in universities, corporate after-hours or sleep-out events… all of these should be tried at the major nodes across the South East, with funding based on simple criteria (e.g. the number of meetings between people), and targeted at helping local enthusiasts.

These events could be augmented with **prizes and competitions** focused on specific areas such as cancer genomics, privacy and security, or the ‘Internet of Things.’

Bringing together like-minded people can increase the chances of innovation. When people travel, who do they travel with? Who do they stay with? Let’s encourage **apps for sharing** cars, houses, colleges, workspaces, and lodgings, Airbnb-style.

Post-graduate students are often pressured into ‘safe’ career options due to financing, immigration, or family constraints. University-rich locations should work to make more provision for creative freedom, support, and networking, in particular, through **living and working spaces for post-doc level researchers.**

And let’s not forget investors and established companies looking for open innovation. The success of initiatives such as Y Combinator and Seedcamp shows what can be done. Bringing senior corporate and finance-sector staff in as **mentors** to clusters could also make a big difference – both to them and to the start-ups and scale-ups they mentor.
B. Make More Hubs

Google has already shown how to create a successful hub with Google Campus London; similarly, the Trampery and others offer flexible working spaces. But more hubs are needed. The balance of work and meeting space needs to be diverse, with the emphasis on open meeting spaces at key locations such as King’s Cross (Crick Theatre, Google Campus, Guardian Space, the station itself…), Oxford (Saïd Business School, Milton Science Park, new hubs in tech-intensive locations…), and Cambridge (Judge Business School, Cambridge Science Park, West Cambridge, the stations, AstraZeneca HQ, Addenbrooke’s Forum…).

Hubs don’t need to be in fixed places: let’s have special carriages on trains designated as informal meeting places, and start with Oxford-London and Cambridge-London.

We envisage huge interactive video screens linking the hubs. Walking past such a screen, you might see someone you know (and had been meaning to have a chat with). You attract their attention – wave and say hello. The system should then allow you to talk as if you had met in the street or café, and to transfer that conversation seamlessly to your own smartphone or tablet.

There are already many pilots for these kinds of schemes, including Chat Stop (bus stops with interactive video) and the Wall of Discovery from John Hopkins University. The Innovation Growth Lab is also considering projects along these lines (e.g. a proposal for Rethinking Innovation Spaces from Christian Catalini and Ina Ganguli).
C. Share Best Practice

Much more needs to be done to share insights and best practice. Clusters grow because they accumulate and recycle experience and expertise. Companies that understand how to scale up – how to develop systems and processes to support 50, 100, 500, or 1000 employees with matching revenues and global operations – are the drivers of growth. Entrepreneurs and managers that have done it before are critical parts of a process that involves learning what works, what needs to be done, and how to do it effectively.

Work on this is already being done by Nesta, Innovation Growth Lab, Innovate UK, the Connected Digital Economy Catapult and the Centre for Cities. We propose that these organisations work together – preferably with a dedicated space (e.g. the new Catapult in Euston Road, within minutes of King’s Cross) – to assess best practice and provide training in what works, especially for scale-ups.

Clusters and scaling up are as vital as any technology for driving economic growth and need to be taken seriously, with research, implementation and learning going hand in hand. We also need training courses – both massive open online courses and bespoke. We can also help share best practice by appointing ambassadors for clusters, technologies, and regions; and building networks by placements and secondments, particularly between big and small institutions, or similar scale institutions in different application areas. Funding should reward evidence of collaboration, concentration, and networking.
D. Free up IP

Technology transfer and the role of universities in research and development are frequently held up as sources of innovation, but more often the predominant source of growth is companies founded by alumni and the subsequent recycling of IP and know-how. The Computer Lab at the University of Cambridge boasts 222 companies in its hall of fame, including Deep Mind and ARM, and their total market value is many tens of billions of pounds.

The Computer Lab – and indeed the whole University – has a relaxed attitude to intellectual property. Its alumni go on to create great companies, and their donations exceed IP licence revenue. This is in sharp contrast to most policies on technology transfer, which emphasise universities owning and controlling IP. One start-up recently reported that their university wanted 60% of their company for the IP; they are not going ahead with the plan as originally proposed.

Attempts to claim large chunks of value only stifle a venture and result in that value evaporating. But there are other ways:

**Golden Share**: Alumni who found companies should be able to donate a non-dilutable 1-2% of a venture to the university for core IP. If legally binding, the result will be more money for universities, more innovation, and more successful companies.

**Trading IP**: Researchers who have been funded by the public purse could, if they wished, use an alternative third party to do a spin out. So if the offer from their own university is unsatisfactory, they can try to get a better offer (in terms of support, speed of process, and commitment) elsewhere.

**IP Platforms** could be used to encourage collaborative public/private initiatives for practical tools, outreach, and best-practice for IP, particularly in view of the arrival of the new EU unitary patent scheme. In a competitive market we imagine these could include the provision of legal advice to start-ups; the development of tech platforms for legal analytics; and massive open online courses on IP and innovation. Discussions on these issues are already underway at Cambridge.

In the longer run we need to recognise that IP originates from many sources, and that its use and re-use need to be made as simple and easy as possible so as to encourage innovation and growth.
II. Connect Places

To a foreign investor, the principal South East clusters – Cambridge, Oxford, London, Stevenage, Stansted, Milton Keynes, the Thames Valley, Martlesham – are broadly one and the same place. The distance from San Francisco down to South San Jose at the far end of Silicon Valley is the same as the distance from Cambridge or Oxford to the southern suburbs of London. As well as connecting people and ideas within a single city, we need to be thinking about connecting nearby cities with a modern and effective infrastructure.

We welcome the new TechNorth initiative as recognition of the scale that needs to be achieved to compete on the world-stage with innovation clusters like Silicon Valley, Boston, Raleigh, or Shanghai.

Recent reports show that there are more people employed in tech in the South East than in California. But we must be frank: unlike their counterparts in Silicon Valley, Cambridge, Oxford, London, and their neighbours exist in relative isolation. We do not have the concentration of humming, continuous, multidirectional, and mutually-reinforcing corridors of innovation, spilling-over with people, ideas, investors and promise. That is what it would look like if the fabled ‘Golden Triangle’ were a reality.

Greater integration across the South East to achieve the integrated scale of Silicon Valley would spur the economy and accelerate inward investment into the UK. If we could connect people, stimulate entrepreneurial culture, and build fast transport links, then we have no doubt that this region could innovate at a globally unmatched scale.

Why is this? Because for centuries, this region has nurtured hard science and technology, politics, philosophy, law, economics, and cultural activities that have led the world and that are the foundation and lifeblood of innovation ecosystems. The diversity, vigorous independence, and world-class resources of this region remain as strong as ever; indeed they are growing, with ground-breaking new institutions from the Crick Institute at King’s Cross to the 17,000-employee, 140-acre biomedical campus at Addenbrooke’s in Cambridge. The South East region has the world’s best minds and institutions for tackling our biggest problems – from complex challenges in human health to the far reaches of pervasive computing and autonomous intelligence.

We have four ideas for connecting places…
A. King’s Cross as the Mega-Hub of the South East

The area around King’s Cross is the natural hub for science and technology in London, given its proximity to the Crick Institute, UCL, and a very dense network of large and small technology companies and institutions around Euston and Old Street. It is also within one hour of five international airports.

Less than 60 miles up the line, Cambridge (with nine million passengers a year, one-third the number of passengers through King’s Cross) is also a major UK station. We also note from UK Civil Aviation Authority data that residents of Cambridge and central London are the leading users of UK airports – with international travel per capita double the national average.

Whilst Liverpool Street is only a 12 minute walk from Old Street Roundabout, there are several reasons why we focus on King’s Cross. The marginal extra travel time to get from Old Street to King’s Cross compared to Liverpool Street is outweighed by the development of King’s Cross as a major employment hub: as a senior employee of Google said, they moved their HQ to King’s Cross because they then had eight million people within an hour’s commute. King’s Cross is already closer in travel time to Oxford and Cambridge, and that travel time can more readily be reduced. Eurostar is next door at St Pancras. It would take relatively little to enable trains to run direct from King’s Cross to Stansted. For all these reasons we believe that King’s Cross is the future mega-hub for the South East.

Serious work should be dedicated to having excellent connectivity between King’s Cross and London locations such as Olympic Park (UCL), Canada Water (KCL), and Imperial West, as well as key places such as Oxford, Milton Keynes, Cambridge and BT’s Research Centre at Martlesham near Ipswich. Oxford in particular suffers poor connectivity to King’s Cross; despite being a similar distance away, it takes approximately 30 minutes longer to get to Oxford from King’s Cross (75-80 minutes) than it does to get to Cambridge (45-53 minutes).

Source: http://www.kingscross.co.uk/
It takes over two hours by car to get from Oxford to Cambridge – even on a good day – and three hours by train. The distance between the two cities is less than 70 miles as the crow flies. But it takes more than three times as long, and costs three times as much, to get between them as it does to travel to London from either place. We believe that there is a compelling case to reduce this travel time to less than one hour.

Shaving down the Oxford-King’s Cross travel time to 50 minutes (whether by a CrossRail spur or other infrastructure) by 2020, and reducing the Cambridge-King’s Cross time to 40 minutes by 2016, would be a good start, making travel, work, and projects across the triangle much more realistic. But it is the direct ‘Oxbridge’ link that would make the greatest difference – It would concentrate interactions, thereby creating connections and communities, and enabling shared ideas, IP, and human capital.

So we welcome the recent announcement that the ‘central’ section of the East-West rail link will be planned for 2019-24. It is also welcome that Cambridge to Oxford and Cambridge to Reading are “high priority journey pairs” according to the August 2014 report, and that the Cambridge-Oxford link is classified as needing to be under 60 minutes.

Current approaches, however, will only get the journey time down to 75-85 minutes. It will take an ambitious new approach to bring Oxford and Cambridge to within 40 minutes of each other by 2024, making the Golden Triangle a physical reality.
C. Ambitious Times for Connecting Clusters

It’s not just Oxford and Cambridge and King’s Cross that need to be better connected by train. Looking more widely across the South East, and thinking a little further ahead, we suggest the following target times for 2024:

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We are also missing a crucial link that should intersect HS2, which would connect the Eastern region (and its ports and research clusters such as Martlesham) to the Midlands and beyond, providing a core and foundation to UK innovation both east-west and north-south.

We also believe that more thought needs to go into connections within clusters – after all, getting between major train stations is only part of the story. Key science and technology locations such as science parks, incubators, and leading hospitals in places such as Cambridge and Oxford should be considered for fast transport to their main stations. We note that this is already underway in Cambridge with a new station at the Science Park and another being considered for Addenbrooke’s.

Improving travel times – within and between clusters – would make it possible to share resources in ways not possible today. We all know of companies with employees from other clusters: for example, people who commute from London to Cambridge, and vice versa. Individuals reduce risk this way (they have more options if something doesn’t work out), and companies have a broader base of talent to draw on. But shorter travelling time would mean that couples would not have to choose one partner’s career above the other; or they could locate at intermediate points (e.g. in the case of Oxford-Cambridge, Milton Keynes) which then might then grow faster as a cluster. Reducing travel time has the potential to effectively concentrate the resources of the South East and make innovation and growth easier to achieve.

But in the longer run we need to do even better…
Our target times for travel between clusters may seem ambitious, but are pedestrian when compared to the plans recently announced for the Tokyo-Nagoya line – 178 miles in 40 minutes.

Implementing such a system in the South East would truly make it into a single cluster. Each side of the Oxford-Cambridge-King’s Cross triangle would take about 15 minutes.

But the real gains would be in connecting the South East with the rest of the country. London to Birmingham or Bristol would take less than half an hour, Manchester 45 minutes, and Glasgow 90 minutes. Connection times like this would truly knit together the regional clusters of the UK.

Source: http://www.ecozine.com/article/maglev-marvel
London is the nation’s capital, a global megacity, and the main locus of commerce, finance, people, and innovation. But the UK is much more than London; there are many centres elsewhere in the UK generating world-leading innovation and technology.

We need to communicate more clearly how all these centres fit together, and branding must be addressed as a priority. We are not convinced by the ‘Golden Triangle’ as a brand. We are also concerned about the potential for confusion: we have MedCityLondon.com, whilst Nottingham calls itself ‘MediCity’; Intellect changed its name to TechUK; and the adaptation of ‘TechCity’ into ‘TechCity UK’ (when no single city is denoted) is somewhat perplexing.

The launch of TechNorth may bring some clarity through contrast: but we fear that ‘Tech’ has come to be synonymous with web and apps, while there is much more to technology – wet and dry – than that. Mindful of comments from north of the border about TechNorth, we believe we need something that connects the UK as a whole, and which is contemporary, dynamic, and adaptable.

At the national level we have a superb brand: Britain is GREAT, and its component parts such as ‘Culture is GREAT’ and ‘Technology is GREAT’.

What we need is a comparable branding strategy for clusters that can support diversity – one that can be proudly owned, co-opted, and adapted locally, by Manchester or Glasgow as much as by Brighton; that can come to resonate in Wales or in the Midlands; that empowers, and that does not exclude. We need a branding strategy that enables clusters to:

- Retain their own identity
- Be recognised as part of a larger grouping of equals (for example, the South East or the North West)
- Be seen as part of the UK.

Branding runs deep. If we can solve the branding issue, we can be more effective in backing networks and clusters that show potential and promise; in supporting new and experimental ideas for connecting people and helping them to take flight; and in researching and evaluating what works and what doesn’t. If we can get this right then clusters will be able to work more effectively together and, in turn, to work more effectively for the UK as a whole.
What to do Next

Diana Coyle and Bridget Roswell capture the systems thinking behind this report in their October 2014 report *Investing in City Regions*. They set out the interlinked concepts that underpin city regions – connections, infrastructure, people, housing, amenities, supply chains, finance, and universities/research hubs – and discuss how these work as a network within the UK.

We have focused on a subset of these components – connections, infrastructure, people, and universities/research hubs. If we are to get close to realising the kinds of innovation and economic growth which could arise from the major clusters in the South East and elsewhere, we believe that we need to launch initiatives first and foremost under those headings.

The purpose of this report is to spark ideas and start a conversation. We would like the government to extend it as an invitation to explore what could be possible, both in developing the South East, and in fostering a powerful innovation strategy for the UK as a whole – a distributed, lively system of innovation connecting and empowering the nation’s entrepreneurs and businesses.
About the Authors

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Sources and Acknowledgements

We consulted the following documents in preparing this report:

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