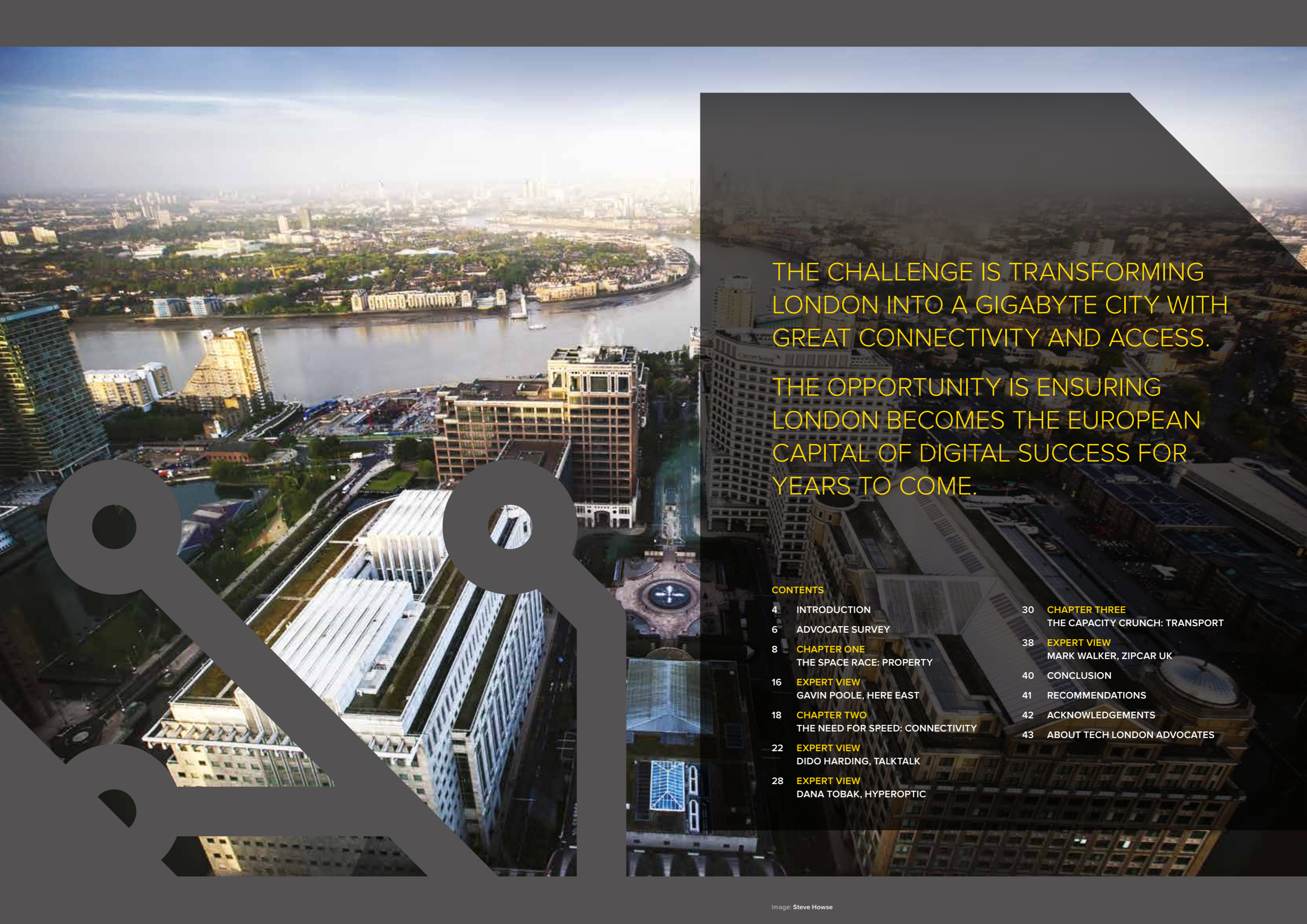TECH
LONDON
ADVOCATES

JOINING
THE DOTS

BUILDING THE INFRASTRUCTURE
FOR LONDON TECH

THE CHALLENGE IS TRANSFORMING LONDON INTO A GIGABYTE CITY WITH GREAT CONNECTIVITY AND ACCESS.

THE OPPORTUNITY IS ENSURING LONDON BECOMES THE EUROPEAN CAPITAL OF DIGITAL SUCCESS FOR YEARS TO COME.

CONTENTS

Image: **Steve Howse**

INTRODUCTION

In the two years since Tech London Advocates was created, the rate of start-up creation, growth and investment has been phenomenal. London is consolidating its position as one of the world's pre-eminent tech centres, bringing together people, ideas and capital from across the globe. This is something of huge importance to the London and UK economy, and is rightly celebrated and championed by our community.

Yet such growth is not without its consequences. Tech entrepreneurs have proved their ability to generate revenue, create jobs and attract significant investment – indeed, many of the UK's most exciting fast growing companies are digital. However, our once nascent digital economy is growing up and the city must keep pace if it is to fuel unprecedented growth. Across issues as diverse as funding, talent and office space, we are facing a challenge of scale.

Nowhere is this challenge more evident than with London's infrastructure. Our digital industry has sprung to life in an historic city, which was built for a very different purpose. The capital's culture and heritage plays a huge part in its attractiveness as a place to live and work. But planners, service providers and businesses alike nevertheless face the difficulty of seeking to retrofit 21st century networks into a city where the modern still lives side-by-side with the medieval.

It has become increasingly clear that a fundamental challenge facing tech companies in London is infrastructure. The tech sector has grown so fast that the provision of office space and digital connectivity is having to play catch up. Together with the citywide challenge of ensuring a sustainable transport network, these issues combine to create a major headache for many tech firms at all stages in their development. Start-ups and scale-ups want to be focusing their energies on the big problems: product development, innovation and marketing. They are held back when the seemingly simple tasks of finding a space to work and a suitable Internet connection become time-sapping and costly obstacles.

Tech London Advocates, as a private-sector led community of leaders, experts and investors, is committed to helping create an environment in which start-ups can thrive. Our infrastructure and property working groups have been working on exactly how these fundamental challenges can be addressed, amplifying the public sector work of the Greater London Authority, the local boroughs and Tech City UK. This report is our contribution to the debate: where the problems lie and how they might be solved through collective endeavour. It brings together insights from a broad range of Tech London Advocates, who generously gave their time to be interviewed, as they do to attend working group meetings and support our objectives as an organisation.

We have focused on what we believe to be the three main issues of property, connectivity and transport, looking at both the challenges facing start-ups and scale-ups, the work that is already being undertaken to address them, and how this might be added to.

Two underlying themes are collaboration and ambition. On the first, it is clear that these challenges can only be solved when the tech sector works closely alongside the industry providers, regulators and governmental authorities to align objectives and reach compromises. It is a commercial reality that the needs of start-ups and scale-ups will not always be consonant with companies providing digital infrastructure or developing property. The tech industry must find a way to work with those market forces, and vice-versa, to fulfill the significant mutual benefits.

The other necessity is a big vision for London and the infrastructure that is needed to power the city's potential. The networks we build must be designed to fulfill demand today while leaving capacity spare for tomorrow. If we are only ever working towards the infrastructure that business needs now, London will always be trying to catch up with its global competitors rather than leading the way. The recent London 2036 report from London First, the London Enterprise Panel and McKinsey, is a useful blueprint for us to analyse London's growth over the next 20 years, and how we tackle infrastructure issues for such an amazing world city.

The challenge is transforming London into a Gigabyte City with great connectivity and access. The opportunity is ensuring London becomes the European capital of digital success for years to come. I hope the findings represented here show how this can become a reality.

Our journey continues...

RUSS SHAW
FOUNDER, TECH LONDON ADVOCATES

ADVOCATE SURVEY

WE SURVEYED OVER 200 TECH LONDON ADVOCATES FOR THEIR VIEWS ON THE MOST PRESSING INFRASTRUCTURE ISSUES FACING LONDON'S TECH SECTOR

46%
BELIEVE SHORTAGE OF TALENT IS THE BIGGEST OBSTACLE FACING LONDON'S TECHNOLOGY SECTOR

IS BROADBAND PROVISIONING IN LONDON DAMAGING THE CITY'S REPUTATION AS A CENTRE OF DIGITAL EXCELLENCE?

YES 47%

NO 24%

NOT SURE 29%

WHAT IS THE SINGLE MOST IMPORTANT ISSUE THE NEXT GOVERNMENT NEEDS TO ADDRESS TO ENSURE THE CONTINUED GROWTH OF THE TECH SECTOR?

IMPROVED ACCESS TO FUNDING **25.5%**

IMPROVED BROADBAND CAPACITY IN LONDON **13.5%**

MORE OFFICE SPACE **4.3%**

GREATER COMMITMENT TO DIGITAL SKILLS TRAINING **26.1%**

IMMIGRATION POLICY REFORM **14.7%**

MAKING GOVERNMENTAL DATA MORE OPEN **2.2%**

INCREASED INVESTMENT IN TRANSPORT LINKS **2.2%**

OTHER **13.5%**

IN LIGHT OF RISING OFFICE RENTS, HAVE YOU CONSIDERED RELOCATING YOUR BUSINESS OUTSIDE OF LONDON?

✓ YES 25.7%

✗ NO 64.6%

ARE YOU CONFIDENT OFFICE SPACE IN LONDON WILL MEET THE GROWING NEEDS OF THE TECH COMMUNITY OVER THE NEXT FIVE YEARS?

YES 39%

NO 44%

NOT SURE 17%

71%
EXPECT OFFICE RENTS TO RISE 'SIGNIFICANTLY' IN THE NEXT THREE YEARS

01
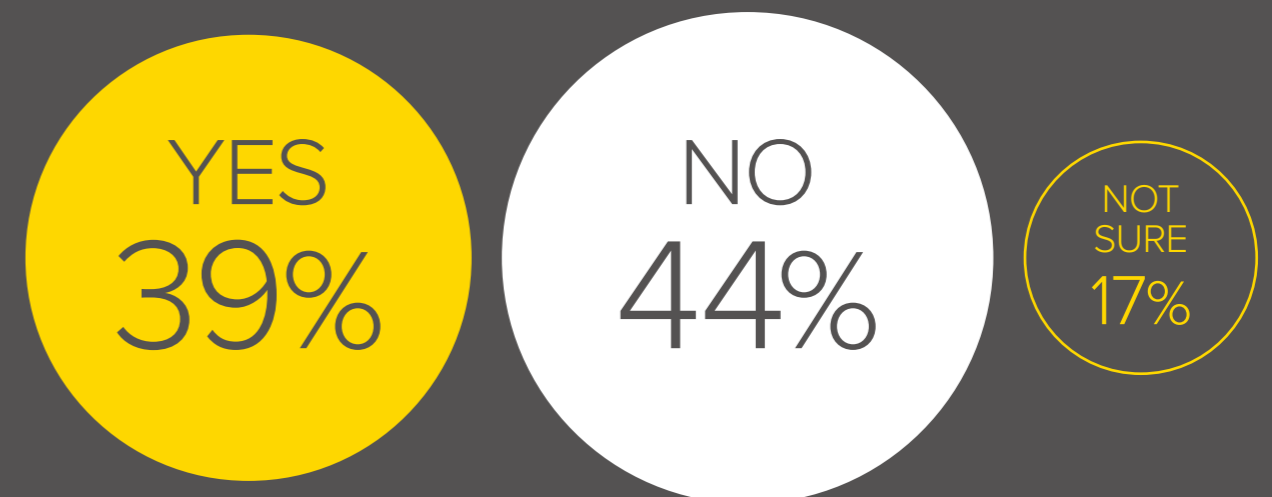
THE SPACE RACE:
PROPERTY

"There will be a space the size of Birmingham being added to London in the next ten years." That's the view of Juliette Morgan, partner at the real estate company Cushman & Wakefield and Head of Property at Tech City UK.

Indeed, few doubt that the capital is gearing up for a rapid increase in property development. "Right around Silicon Roundabout, all you see is cranes", says Sean Dooley, co-founder of tenant broker Perrins Dooley, while Morgan believes London is on the brink of a "once in 50 years market" in property.

Yet, while the commercial property market is heating up, to match the rise in business growth, it does not necessarily favour many London tech firms. Some are suffering the effects of rising rents as developers move into the East London areas where affordable space had encouraged thriving tech clusters. Start-ups whose ambition exceeds their tangible assets continue to struggle with the demands of landlords who put a premium on strong covenants and stable tenants. Scale-ups who have outgrown shared workspace accommodation can also feel the pinch of being forced to invest in their first leasehold, while those with exponential headcount growth face the challenge of balancing office space and company scale.

The rapid change in the size, nature and working habits of London's tech community creates inherent conflicts with the traditional property development and provision model. In some cases the market is already reshaping itself around new needs, particularly in the growing prevalence of co-working hubs and accelerators that serve predominantly small and early-stage companies. Yet as an increasing number of tech firms enter the growth phase, the question arises of where companies that have been successfully incubated can go next.

Similarly, what will the net effect of the commercial development that has followed the tech boom into East London be? Will Shoreditch prove a cluster dispersed or diversified and could rising prices even lead to an exodus from London?

Is it time that the property industry started to show a greater interest in the needs of an industry growing as quickly as London's tech sector?

THIS IS A ONCE IN 50 YEARS MARKET IN PROPERTY.

GROWTH PAINS

The growth of London's technology sector has been relentless in recent years and shows little sign of abating. Tech City UK's Tech Nation report showed that, of the estimated 228,572 digital companies in Inner London, a fifth were formed in 2013 and 2014 alone. And according to market researchers Experian, the number of people working in the media and technology industries in London will rise from approximately 400,000 to 475,000 by 2020.[1]

The increasing need for space from tech firms is clear to see: a February 2015 report from BNP Paribas forecast that an additional two million square feet of space will be needed to absorb growth in London's media and technology sector by 2017.[2] That is a continuation of a longstanding trend, with Deloitte research last year showing that the share of commercial property leased by TMT companies in the capital doubled between 2004 and 2013.[3]

The demand from tech companies may be undeniable, but that is not always a need easily met by the property industry. For some entrepreneurs, the challenge is striking a deal to get through the door in the first place. "The problem for start-ups is that they can have weak covenants, because they have limited trading history and no accounts," says Sean Dooley. "They tend to get asked, because of that, to pay twelve-month, nine-month or six-month rent deposits, which for a start-up business kills the deal."

"There are a lot of challenges around security deposits that are structurally quite challenging to growing technology companies," concurs Juliette Morgan. "If you are big then you are ok, but if you are growing then it's more difficult."

The fast-moving and high-risk nature of a sector dominated by young companies presents parallel problems for property owners, whose focus is on stability and security. "The investor and the landlord will have a set of priorities around their development and most of that will be around strength of covenant, the rent that they can achieve and a long lease term," says Chris Lewis, a Senior Director and Head of Tenant Representation at Deloitte Real Estate. "Those three key criteria, which the property market revolves around, are also three big challenges for this cohort [of start-ups]."

For investors especially, a market of many small firms poses problems. "A development will rely on there being a long-term lease at the end... If you take that 15 year lease away and replace it with 15 leases of two years or less, suddenly the ability for you to raise money against that and therefore satisfy banks is that much less," Lewis says.

How, then, can the increasing and changing demand among tech firms for office space be met by a property industry with its own competing needs? And what are the likely consequences of change in company geography, rental pricing and growth prospects?

THE RENT: RISING HIGH

Perhaps the most frequently lamented impact of London's technology upsurge has been the parallel acceleration in office rents, particularly in the East London heartland where affordability played an important role in attracting a critical mass of start-ups in the first place.

"Rents in East London have seen a dramatic increase," Sean Dooley reflects. "Last year it was staggering because it reached £50 per square foot for the first time in Shoreditch. If you cast your mind back two or three years ago, it was £20 to £25 per square foot."

Recent data from Knight Frank, the real estate consultancy, suggests that rents increased by an average of 5% last year alone, in what it defines as the 'Northern City' area, including Shoreditch and Clerkenwell.[4]

In part, the price hikes are a product of a classic supply-demand crunch: Knight Frank's data also shows that take-up of Central London office space rose by 16% in 2014, while supply fell by 20% to the lowest level since 2000.[5]

And in the areas where tech firms flourished out of the shadow of the 2008 recession, start-ups are no longer the only show in town. The flourishing of the digital industries in East London has seen the "opening up of new areas" for large businesses, according to Deloitte's Chris Lewis. "It's not just the whizz-bang start-ups looking for different spaces, it's some of the quite grown-up corporates too and that's all because, from a talent point of view, they're all after exactly the same person. They're after the same graduate and therefore the corporate has got to change the way it looks."

As established companies increasingly eye up the opportunity to house themselves alongside the start-up tribe, investment and new developments are increasingly following, driving a change in the nature and cost of occupancy.

"Around the streets of Shoreditch and around Old Street, there are enough quirky streets that will never get developed and that will always have good value space amongst them," is the view of Chris Lewis. The challenge, he says, is for companies who had been accustomed to low rents in larger, older buildings, now subject to redevelopment and out-of-reach rent rises.

Yet while the rent hikes are unarguable, their impact on growing tech firms may not be entirely linear. Sean Dooley, who represents technology firms in their negotiations with landlords, argues that many "would rather have a smaller amount of space and retain their existence in central London and Tech City than look to move out for a larger space in more cost-effective areas."

1   Colliers International, 'London's Tech City heartland under threat', 24.03.14: www.colliers.com/en-gb/uk/insights/property-news/2014/0324-london-media-tech-iq-released

2   BNP Paribas Real Estate, 'Media Tech London Survey', February 2015: www.realestate.bnpparibas.co.uk/upload/docs/application/pdf/2015-03/media_tech_london_survey_-_bnppre_uk_2015.pdf

3   Deloitte Real Estate, 'The London Business Footprint', 2014: www2.deloitte.com/content/dam/Deloitte/uk/Documents/real-estate/deloitte-uk-london-business-footprint.pdf

4   Knight Frank, '2014 the Best Year for London offices since 2000 – demand up 16%', 04.02.15:

5   Ibid

COMPANIES ARE MOVING
ABOUT AND SCATTERING
THE CONCENTRATION
OF CLUSTERS.

He also points out that redevelopment should mean a better quality of space as well as a higher price point. "The exciting thing about East London and property is the quality of space has been transformed. You're looking at buildings that have air-conditioning, lift-access, security, bike storage, gymnasiums, cafés; real grade A, purpose-built buildings growing into East London."

While some tech companies will undoubtedly be displaced in search of the more affordable rents to be found in areas such as Hackney, Haggertson and Brixton, others may be willing to accept increased costs as the price of an optimal business environment. "You get the networks where people come together and they want to be in a certain place," says Eddie Copeland, Head of Technology Policy at the think tank Policy Exchange. "They're willing to pay high office rents because it's really valuable for them to be able to step out for a coffee with the relevant investor or specialist or other part of the supply chain."

As with any industry, he says, tech companies will ultimately seek the best compromise between price and place: "As prices go up, you will see people looking to those pockets of London where you get the right combination of office price and space while still having access to the pool of talent."

Indeed, with new and increasingly specialised tech communities thriving across London, what we may be witnessing is less the dispersal of London's technology clusters than their diversification. "If you've got a fintech firm, somewhere near Canary Wharf is great," Copeland says, "and if you're in telecoms, you may want to be near Kings Cross so you can make a beeline towards Cambridge, where you've got some leading telecoms firms."

According to Cushman & Wakefield's Juliette Morgan, "we are already seeing that companies are moving about and scattering the concentration of the clusters" and what she calls the 'maturing of the market', with the likes of King's Cross, Hammersmith, Soho and Southbank emerging as 'lilypads'. "I think it is about districts, it is about the village green equivalent of these tech clusters, and if you aggregate them up you might see a necklace effect going across London."

If the effects of rising East London rents are encouraging tech companies to seek out more affordable and perhaps more specialised spaces, does that mean some will start to look beyond the capital? Not so, believes Sean Dooley: "I don't personally think price is driving start-ups out of London," he says. "It might be putting off start-ups coming to London, that's probably a more pertinent point." That is a view supported by our survey of Tech London Advocates, with 65% saying they have not considered relocating outside London due to rising rents, against 25% who have.

However, cautions Eddie Copeland, the ever-rising price point of London occupancy for tech firms may not be justifiable to all involved in the creation and growth of a start-up. Investors, he says, may increasingly be a factor in encouraging companies to consider locations like Manchester or Leeds, ensuring more of their capital can go towards growing the business rather than just paying the rent.

A PROBLEM SHARED?

That London's tech entrepreneurs have started shopping across the capital for office space is clear, but a widening horizon within the industry cannot escape the simple fact that, wherever you look, space remains at a premium. "There are supply constraints because nobody has really built anything since 2008," says Juliette Morgan. "If you look across the skyline, there are cranes everywhere, but in terms of new supply to the market, it's coming in towards the end of this year and in 2016 and 2017, because that's where we are in the investment cycle."

2015, she says, represents a "supply crunch. The entire economy has picked up, everyone's growing and competing for spaces but the industry hasn't increased supply. There is nearly a 10 million square foot shortfall of space needed in London."

Undoubtedly, a building frenzy is underway in the capital and the supply shortage is a temporary rather than long-term impediment. The geography of development is also being broadened by the imminent arrival of Crossrail, and radically improved east-west connectivity in London.

Yet the question remains whether the new space that is currently under construction will meet the needs of technology companies at various stages of growth.

One notable trend that has a part to play is the growth of co-working hubs. A Greater London Authority report published last year identified 132 of what it terms incubators, accelerators and co-working spaces (IACs) in London, half of which were established in the period 2012-2014.[6] Shared workspaces "will become a significant part of the market without a doubt and they will become the third way of occupying space," according to Chris Lewis. "You either lease space, you own space or you have co-working space."

There can be little doubt that co-working has played an important part in supporting the development of many tech start-ups in the last five years. The GLA's report estimates that at least 3,800 small and medium-sized businesses work from IACs on a given working day.[7]

PRICE ISN'T
DRIVING START-UPS
OUT OF LONDON.
IT MIGHT BE STOPPING
THEM FROM COMING HERE.

6   London.gov.uk, 'Supporting places of work: incubators, accelerators and co-working spaces', 15 September 2014: www.london. gov.uk/priorities/regeneration/ publications-guidance/supporting- places-of-work-incubators- accelerators-and-co-working

7   Idem
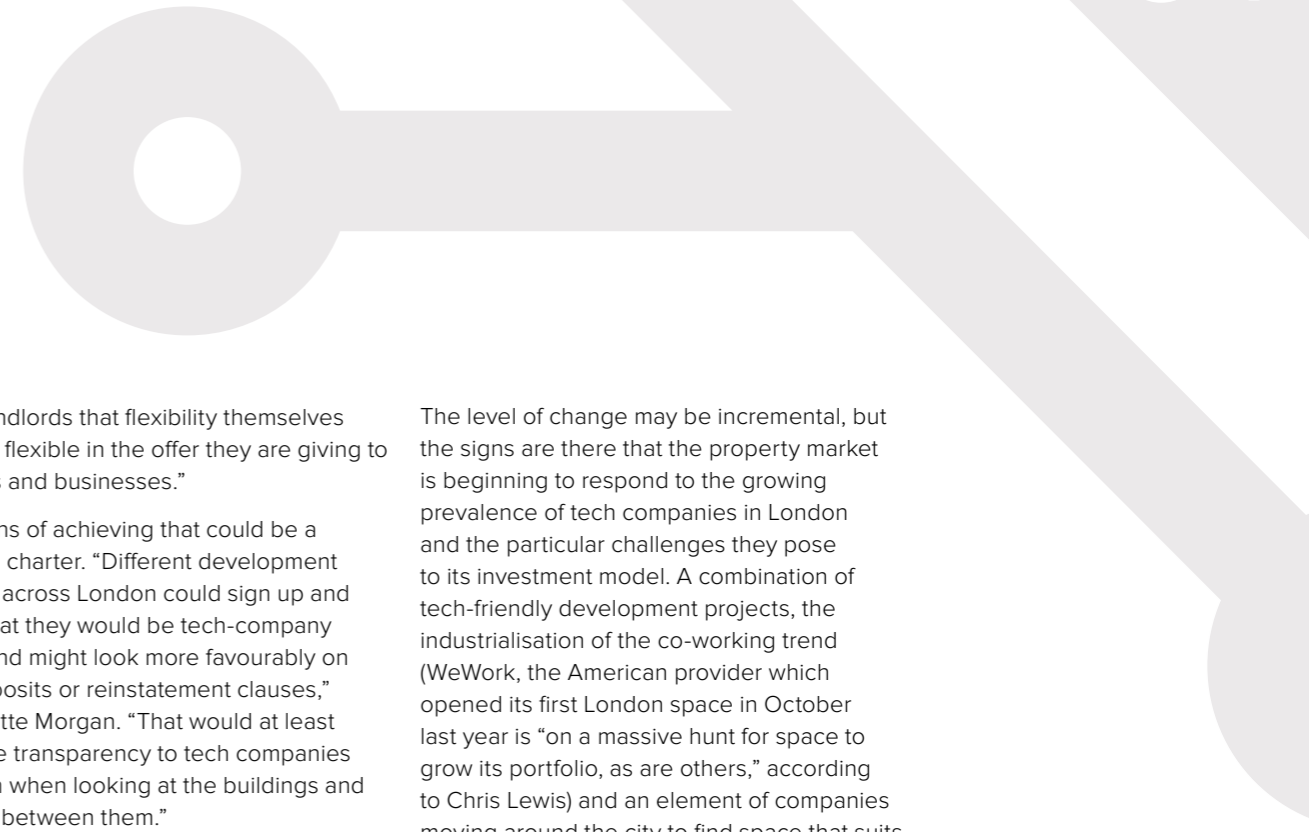
From relatively longstanding institutions such as Central Working, founded in 2010 and now with four London sites and one in Manchester; and The Trampery, launched in 2009 and now operating in locations across London, to more recent entrants such as Second Home and specialist incubators like ad-tech hub The Bakery and fintech accelerator Level39, the depth and variety of shared workspaces across London has rapidly increased.

The benefits of bringing like-minded entrepreneurs and creative minds together are well understood and documented. Shared workspaces such as Clerkenwell's White Bear Yard, where venture firm Passion Capital houses many of its portfolio companies, have helped incubate success stories including money transfer service TransferWise, payments app GoCardless and BuzzFeed UK.

With co-working now an established model supporting a large number of start-ups, the question becomes whether it is a template that can develop to sustain tech companies through the growth phase and provide the accessible and affordable space that many seek.

In the view of Juliette Morgan, co-working "services the early stage and the start-up community much better than the really high-growth firms that are looking much more like [a headcount of] 50 to 100." Policy Exchange's Eddie Copeland points to the Sharp Project in Manchester as an example of the sort of genuinely flexible space where companies large and small can be headquartered: "they can move people up and they can move people down in terms of size, depending on business successes," he says. "In London the provision tends to be good if you're up to ten people... [but] places that can host larger groups of people for a reasonable cost are harder to come by."

That throws into relief the challenges faced by the tech scale-ups whose headcount growth is hard to plan space around. As Taavet Hinrikus, co-founder of TransferWise, put it to Quartz in 2013: "Most landlords want you to sign a five-year lease. In five years' time I either need space for 200 people or none at all. But today I can't afford to sign a lease for 200 people."[8]

Companies that do not know how much space they will need next year, let alone in five, are by their nature anathema to landlords who count on steady tenants and long-term commitment. "Landlords are finding it incredibly difficult to restructure their portfolios such that they are able to offer massive flexibility," says Chris Lewis. He believes that the best compromise is a "hybrid, where it's still the landlord's to control, but they have some sort of structural mechanism that allows for there to be a co-working feel or flexible lease feel within new buildings."

Ultimately, he believes, "the whole way the market and the whole way investors and developers value property probably needs to go through something of a revolution in order

to give landlords that flexibility themselves and to be flexible in the offer they are giving to occupiers and businesses."

One means of achieving that could be a landlords' charter. "Different development landlords across London could sign up and pledge that they would be tech-company friendly and might look more favourably on lease deposits or reinstatement clauses," says Juliette Morgan. "That would at least give some transparency to tech companies in London when looking at the buildings and choosing between them."

Such a measure could help encourage the tendency emerging among some landlords to plan flexible and affordable space for start-ups, as part of wider developments. A notable example is Derwent's White Collar Factory. Due for completion in 2016, it will be a 16-storey tower, with 289,000 square feet of space, immediately adjacent to Old Street Roundabout. A spartan approach to interiors and energy efficient measures are allowing for what Derwent estimates to be a 10-15% reduction in construction costs, a saving set to be passed on to prospective start-up tenants: "It's offering a sizeable amount of space on flexible terms to the tech community and start-ups", says Sean Dooley, although he also points out that developments like this are "still few and far between".

Another development of note is Here East, which is taking advantage of the infrastructure built for the Olympic Park media centre to create a tech campus built around a data centre, that will ultimately provide 1.2 million square feet of space to companies small and large (see p16).

The level of change may be incremental, but the signs are there that the property market is beginning to respond to the growing prevalence of tech companies in London and the particular challenges they pose to its investment model. A combination of tech-friendly development projects, the industrialisation of the co-working trend (WeWork, the American provider which opened its first London space in October last year is "on a massive hunt for space to grow its portfolio, as are others," according to Chris Lewis) and an element of companies moving around the city to find space that suits their needs, can together help to ease the difficulties that have been caused by the rapid growth in the tech sector at a time when the property market stalled.

"THE WAY INVESTORS VALUE PROPERTY PROBABLY NEEDS TO GO THROUGH SOMETHING OF A REVOLUTION"

The challenges that many London tech firms undoubtedly face in finding space to launch and grow will not be solved unilaterally or immediately. But ultimately, greater convergence and understanding between the property and technology sectors is what will deliver results. Only by addressing and influencing the fundamental investment model underlying property development, can the tech industry start to turn the market in its favour.

8 qz.com, 'Why tech companies can't get office space in London – even though landlords are desperate to have them', 01.11.13: qz.com/138719/ why-tech-companies-cant-get-office-space-in-london-even-though-landlords-are-desperate-to-have-them/

THE QUALITY OF SPACE IN EAST LONDON HAS BEEN TRANSFORMED.

01

GAVIN POOLE
CEO, HERE EAST

The Olympic legacy was much talked about in the planning and delivery of the Games to East London, and at Here East, the spirit of collaboration and innovation remains as powerful as it was in 2012. We are redeveloping the former press and broadcast centres on the Queen Elizabeth Olympic Park to create a unique digital and creative cluster, bringing together technology, data, education, start-ups and established companies in one place.

Our 1.2 million square feet development will utilise the existing infrastructure built for the Games; infrastructure that makes it perfect not only for the tech industry but companies and individuals who are using new technologies to transform traditional business practices across a whole host of industries. Because it was built with digital broadcast in mind, the Olympic Park has phenomenal connectivity, amazing power and vast scale. It gives us a facility where digital companies can make, produce, post-produce, host and stream content all from one location.

The mission of Here East is simple: to provide exceptionally innovative space, not just for start-ups, but where the vibrancy, creativity and innovation of young companies can mix with the maturity and wisdom of larger, established companies. There is no other campus in London that seeks to deliver a passage of information both between small and large companies and universities and business.

Here East will be home to around 80,000 square feet of start-up space, where it will be easy for ideas to be shared and for fledgling companies to be supported. Loughborough University will open their first dedicated campus in London, delivering not just post-graduate, MBA and digital programmes, but business support and pioneering research.

The established innovation space is crucial for the tech industry, and particularly for the start-ups we want to help become stand-ups. The project will be driven by the concept of collaboration; technological giants, such as our already established partner BT Sport, working alongside the tech companies developing the innovative and game-changing products of tomorrow.

The passage of information flows both ways between large and small; large corporations are able to pass on invaluable experience and knowledge of the sector to start-ups, while simultaneously harnessing the creativity and talent that those start-ups possess. This co-operation is crucial for the tech sector, to both drive continued innovation and support the development of the best creative talent.

Alongside the relationship between well-known tech firms and young start-ups is the second cornerstone of the Here East project: to utilise the expertise of universities to support and generate innovation. As other clusters have shown, the co-location of education, research and business is vital to what we call the place of exchange; the knowledge transfer; the innovation spark.

A third tenet of what we are trying to achieve at Here East is to help tackle the wider issues facing tech companies in London. Across the capital, start-ups are having to look at relocating to find the affordable space they require to continue their growth.

The recent Scale-Up Report by Sherry Coutu CBE highlighted that one of the barriers to companies scaling rapidly in the UK is the norms of the property industry. Long leases with incentives not to break are great for larger companies and investment profiling, but for smaller companies looking for flexibility, a new approach is needed. Managed work environments of differing scales offer part of the solution with more flexibility to larger offices being asked for by the community. This is a conundrum many are looking at and will take a collective approach across many other sectors to resolve.

There is also the persistent need, with the inevitable pressures on infrastructure, to make sure that people can stay connected, both physically and digitally. Crossrail is brilliant for the physical side of that; it will help break the myth that geographical location matters, rather than the offer you can provide.

With people and companies looking to redistribute themselves across London, the opportunities arise to provide better access to space, easier access to living accommodation, cheaper access to services, and a collection of great minds coming together in a brilliant space.

However, Here East is not just about providing innovative space for tech companies and start-ups in East London. It is instead part of a much wider movement to ensure tech start-ups don't get suffocated in the true Tech City – London itself – and are given the space and opportunity to flourish and scale.

02

THE NEED FOR SPEED:
CONNECTIVITY

"By 2017, superfast [broadband] coverage will have reached 95% of premises, and we expect mobile operators to have achieved 4G coverage to 98%." So begins the Government's recently published Digital Communications Infrastructure Strategy, outlining how it seeks to deliver on a stated aim of equipping the UK with the "best superfast broadband network in Europe".[9]

First announced in 2010, the objective was amplified in last month's Budget, which added the goal of extending 'ultrafast' broadband of 100mbps (megabits per second) to the vast majority of UK premises.[10]

The headline figures would appear to suggest a smooth progress towards a robust, fit-for-purpose broadband infrastructure for the UK. A Department for Culture, Media & Sport press release from February this year further states that, "the UK already leads the EU 'big five' nations when it comes to superfast access".[11]

However, a raft of evidence indicates that the UK, and London especially, appears at best inconsistently served by superfast broadband. A recent House of Lords report highlighted research that found London's average broadband speed is more than 10mbps slower than the European mean.[12] A House of Commons research note, which breaks down broadband speeds by parliamentary constituency, further showed that only 32% of properties in the Cities of London and Westminster constituency have access to superfast (>24mbps) broadband. That places the City 612th out of 650 constituencies: other London hotspots fare considerably better, with Hackney South and Shoreditch servicing 86% of properties and Hackney North and Stoke Newington 93%, though Bethnal Green and Bow lags at 56%, in the bottom 100 constituencies.[13]

Against the Government's contention that the UK leads Europe in superfast broadband access, stands the quarterly barometer conducted by US cloud services provider Akamai, which ranked the UK 19th in the world for average broadband speed in Q3 2014, and 12th in Europe.[14] The 'Net Index Explorer', powered by broadband speed monitor Ookla, ranks the UK 30th globally and London 38th out of 45 major UK cities, with an average speed of 27.18mbps, compared to 46.88mbps in top-rated Bolton.[15]

9 DCMS, 'The digital communications infrastructure strategy', 18.03.15: www.gov.uk/government/publications/the-digital-communications-infrastructure-strategy

10 The Treasury, 'Budget 2015: documents', 18.03.15: www.gov.uk/government/publications/budget-2015-documents

11 DCMS 'Superfast broadband reaches 2 million more homes & businesses', 09.02.15: www.gov.uk/government/news/superfast-broadband-reaches-two-million-more-homes-businesses

12 House of Lords, Select Committee on Digital Skills: 'Make or break: the UK's digital future', 17.02.15, p.25: www.publications.parliament.uk/pa/ld201415/ldselect/lddigital/111/111.pdf

13 House of Commons, 'Fixed broadband: policy and speeds', 02.03.15: ref. SN06643

14 Akamai, 'The State of the internet', Q3 2014, p.46: www.akamai.com/dl/content/q3-2014-state-of-the-internet-report.pdf

15 explorer.netindex.com/

No-one doubts the need for better and more comprehensive provision of superfast broadband to business, least of all tech companies who rely on instantaneous upload and download capability as a matter of course. Yet the headline figures, while revealing noteworthy weaknesses, cannot tell the whole story of both the difficulties some businesses currently face in getting connected, and the multi-faceted effort being undertaken by both government and the telecoms industry to meet growing demand. To address the problem at root, there is a need to align the different and sometimes conflicting needs of London's tech firms, its local authorities and broadband providers. The challenge that poses, and the solutions that are beginning to emerge, are the subject of this chapter.

DIGGING FOR VICTORY?

If, as 47% of Tech London Advocates surveyed for this report agree, broadband provisioning "is damaging the city's domestic and international reputation as a centre for digital excellence", the most urgent question is where in the supply chain the problem is arising.

"The City of London floats on fibre," says Matthew Evans, CEO of the Broadband Stakeholder Group, an advisory body to the Government on broadband issues. "It's not as if you are going to need to dig up whole rows of streets. London, as a whole, has pretty good access to fibre."

The challenge, he says, is as much one of surface geography as of deep infrastructure. "There is often a very complicated process to get [cable] through that last metre and that is why it tends to cost so much… there are so many layers of bureaucracy to get through and that introduces a lot of uncertainty."

An example he offers is Rotherhithe, "where it is as mundane as there used to be a lot of docks, so copper wire still traces the old route that it used to take around the dock, rather than following the street layout of today." Such a circuitous route, he says, bleeds speed: "the longer the copper wire, the lower speed and bandwith you get at the end of it." Different local geographies, therefore, have led to varying broadband infrastructure, not all of which suits the needs of businesses.

Indeed, hyper-local factors such as this can have a significant impact in discouraging providers from making additional investment to secure superfast provision. If the business case looks uncertain for the providers, and the return of investment doubtful, the infrastructure is unlikely to follow.

Yet where the mainstream providers are unwilling to tread, those with alternative products and business models may be able to step in. One such provider is Optimity, whose networks of roof-mounted, point-to-point receivers offer wireless connections of up to 1gbps. "We had a client who was waiting for three months for a circuit from BT," says founder Anthony Impey. "The problem was not with BT, it was with permissions from the local

authorities. The property was near a TfL red route, which created a whole new set of permissions. They had been waiting for three months and still not got their circuit." His company was able to install a wireless connection within two hours.

Optimity is one of many challengers in the broadband space. "We see many new providers coming into the capital," says Sara Kelly, Senior Technology Policy Officer at the Greater London Authority. The key thing, she says, is to realise that there is no one-size-fits-all solution for the capital when it comes to broadband. "It's about creating a patchwork of different solutions that are best meeting the needs of the people in those particular areas. What's going to work out in rural areas of London boroughs, for example, is not going to be the same as what's needed in central London."

In the City, the dense population of larger companies willing to pay for higher priced, dedicated leased lines negates the appetite of providers to invest in FTTC (fibre to the cabinet) solutions more suited to small businesses, Kelly says. Likewise, where a wireless solution like Optimity works well for some, it relies on a line-of-sight between buildings that is not an option in all areas. Ultimately, the extension of superfast provision to the capital's tech firms is an incremental operation, undertaken by a variety of providers working around a breadth of local factors and constraints.

While the underlying infrastructure may be in place, and will increasingly become so thanks to major new investments such as Virgin Media's £3bn 'Project Lightning', the challenge of equipping companies with the connections they need is more immediately one of navigating a maze of street-level regulations and market realities for providers. How, then, can the right level of investment and provision be incentivised?

COPPER WIRE, RED TAPE

Given the nature of the infrastructure required for superfast broadband, from underground wiring to rooftop antennae, it is inevitable that the ambitions of providers sometimes clash with the regulations of local government.

"One of the things that [broadband] companies often say to us is that, across the UK and indeed across London, the regime and experiences surrounding planning permissions and related processes vary significantly. This translates to a significant cost on industry and is a disincentive for service providers to invest in the fixed and mobile broadband services that consumers want," says Raj Sivalingam, executive director for telecoms at industry body techUK.

"If there is one thing industry hates and if there is one thing investors hate, it is having to fill out different forms, engage with different processes and potentially look at different investment models," concurs Matthew Evans.

However, it can be too easy, cautions Sara Kelly of the GLA, to place blame at the door of the local authorities, and to assume that the commercial interest of providers should override the municipal one of planners considering the interests of the wider population. The issue, she points out, is probably less the volume of bureaucracy, which may be there for good reason, and more its differentiation. "One provider said they don't mind there are 33 boroughs, they would just rather it would be the same process for each borough," she recounts.

THE CITY OF LONDON FLOATS ON FIBRE.

DIDO HARDING
CEO, TALKTALK

The UK's digital economy is in good shape, with among the lowest fixed broadband prices and highest take up in Europe. In many parts of the country, the broadband provision is very good and getting faster. However, there is still so much further to go if we are to meet the needs of the nation's growing population of small businesses.

It is no exaggeration to say the UK has the potential to become one of the leading digital economies in the world, but to get there we need to focus on two core areas: universal, affordable, ultrafast broadband, and universal digital skills.

The problems of our digital infrastructure are perhaps better documented than their strengths. It is true that we have good coverage of super fast broadband in this country, but the take up is still relatively low. This is because the high-speed provisioning in the UK is too expensive, particularly for SMEs.

The solution to this problem is better competition; we need to make sure we have a diverse infrastructure network, with support from the government to generate healthy competition in the market. Without that competition, the monopolies created by the larger suppliers will continue to keep high-speed prices elevated and will hinder the UK's digital development.

Insufficient competition in the broadband market has meant that the rollout of superfast connectivity has all too often focused on the more profitable locations over achieving comprehensive coverage. The result of this drive for profit is that small businesses are underserved, with many business parks being missed out of the rollout entirely, even excluding London's Tech City.

Even the current superfast rollout is not enough, leaving the UK playing catch-up with the true world leaders in high-speed broadband. Hong Kong Telecom, for example, has recently announced the launch of Asia's first 10gbps broadband service, joining Norway's Altibox and American US Internet in the exclusive 10gbps club.

The UK must advance if it is to continue to be considered a strong digital economy. We believe it is an attainable goal to deliver affordable 1gbps broadband across the country within 10 years. At this speed, broadband would truly become the next utility, akin to electricity or water.

Indeed, that is a model we are trialling outside of London, with a joint venture project seeking to make York the first gigabit city in the UK, bringing rapid fibre-to-the-premises (FTTP) connectivity at affordable prices to an initial batch of 20,000 consumers and SMEs in York later this year. We are focusing on these segments of the market because FTTP provision is where the UK is at its weakest. Compared to its European counterparts, the UK lags well behind, not even registering on the EU's league table for coverage or take-up.

The second area for improvement is digital skills. While infrastructure is vital, we should not neglect the need for a universally skilled digital population. 84% of the population currently possesses basic digital skills, which means that roughly 12 million British adults don't. It would take a tiny percentage of the billions of pounds that will be invested in infrastructure for high-speed broadband provision to reach 100%, ensuring that no part of society gets left behind.

Ensuring universal inclusion in the digital sector is important for the health of the UK's digital economy, as is ensuring that our high-speed, super fast or ultrafast, broadband provision is available to everyone, not just those in an area considered profitable by their provider.

True infrastructure competition in this country could genuinely deliver affordable ultrafast broadband to the majority of the country in the next few years. Of course, reaching 100% of the population will require some governmental intervention, but if we are to make the next decade one in which London and the UK truly embraces the potential of ultrafast broadband connectivity, the real key is competition. More providers means more choice, stronger innovation and a better deal for the small businesses that underpin the UK's digital economy.

Whether it suits the industry or not, the needs and concerns of the boroughs are different, reflected in regulatory frameworks and planning processes. Yet some still call for a more integrated approach to help create certainty for investors: "A common framework or approach, underpinned by a positive presumption would be good," says Raj Sivalingam, while Matthew Evans points out a "lack of certainty in boroughs… due to the interpretation of the planning rules they have. It can also come down to which policy officer you deal with." He contrasts the experience of dealing with London's planning patchwork to Manchester, "which has one council body and is a better bet for investment. It is a more uniform process and therefore more attractive to those wishing to invest in communications infrastructure."

Whatever the rights and wrongs of more centralised planning processes and templates, the recent history of broadband roll-out in London reflects the intensely local nature of how investment is governed. To give one example, BT had to withdraw from plans to extend fibre broadband into Kensington and Chelsea in 2012, after the local authority rejected its planning application, objecting to the volume and design of the street cabinets.

In the City, which as highlighted suffers from particularly slow speeds, the boot has been on the other foot. Last November, the City of London Corporation announced plans to use its street furniture to host additional masts and connections, in an effort to provide infrastructure that meets the needs of residential and SME users. "This work could have been done by major suppliers themselves but their business with bigger firms is too easy for them and they are just ignoring the SMEs and residents. We will provide the infrastructure to help new suppliers come into the market," said Mark Boleat, the Corporation's policy chairman, when the programme was announced.[16]

Across London, therefore, it is equally possible to find broadband providers frustrated at the behaviour of boroughs, and local authorities that believe it is the providers who have fallen short. If nothing else, this serves to highlight that broadband provision in London is not a singular problem but one of many parts, which may require many different solutions.

PRIMING THE PIPELINE

Yet while the market for broadband investment in London may be closely aligned to local factors, that does not mean the role of central government is entirely negated.

One notable means by which government has sought to support the roll-out of superfast connectivity is the Broadband Connection Voucher scheme. An initial £100m commitment, supplemented with an additional £40m at last year's Autumn Statement, the programme offers subsidies of up to £3,000 to small businesses to invest in superfast broadband.

Optimity's Anthony Impey credits it as "an effective intervention in an important part of the economy," though some have questioned its impact: last September, ten months after the launch of the scheme and six before its now-extended deadline, only 7.5% of the available funding pot had been drawn down, by around 3,000 businesses.[17] Indeed, our survey of Tech London Advocates found that 68% were unaware of the scheme, which will now run until March 2016, with both the funding and the range of eligible cities widened.

If there is still some work to be done in raising awareness of the scheme, some companies who have taken up the option are making imaginative use of the funding. According to Matthew Evans, tech companies "have been good at aggregating the vouchers so firms can group together and potentially buy a line connection." Anthony Impey points to the example of the Bootstrap Company in Dalston, which is a shared workspace that houses creative, social and digital enterprises. "Individually they cannot get a broadband network that is fast enough… but as a collective they can get 1 gigabit of connectivity within that building. This is only possible through a community approach that collaborates to solve the problem of slow internet."

While the connection vouchers represent an attempt to stimulate the demand end of the market, government is also intervening on the supply side. The UK Guarantees Scheme, which helps infrastructure providers of all types raise debt finance, covers telecoms provision and is supporting Virgin Media's £3bn expansion of its cable network. And, according to DCMS, "there is capacity within the £40bn scheme to support significant further investment, and we are actively engaging with UK broadband operators to explore how the UK Guarantees Scheme can be used to support and accelerate their respective investment programmes."

Incentives are in place, therefore, on both the supply and demand sides, even if adoption from both businesses and broadband providers remains an issue. Yet some warn that well-intentioned programmes will only come to fruition if allied to a sufficiently long-term vision for the broadband infrastructure that businesses will need not just now but in the years ahead. "The broadband sector shouldn't only be building the minimum speeds needed today," says Anthony Impey. "For London to maintain its global digital leadership, we have to aim much higher," says Anthony Impey. "Our ambition should be to make London a Gigabit City, where every business can access 1 Gigabit speeds on demand."

Indeed, while the 2015 Budget committed the Government to an ambition of connecting the UK to 'ultrafast' broadband of 100mbps, it is gigabit connectivity (1gbps or 1000mbps) that is increasingly becoming the gold standard.

That is a speed currently offered by smaller UK providers including Optimity and Hyperoptic, which began rolling out its gigabit FTTP (fibre-to-the-premises) network on a limited basis in 2011, and has recently launched a suite of business products. BT is also trialling its 'G.fast' technology, with the capacity to deliver 1gbps connections.

16 City of London Corporation, 'Square Mile bosses act to secure superfast broadband for residents and SMEs', 13.11.14: news.cityoflondon.gov.uk/square-mile-bosses-act-to-secure-superfast-broadband-for-residents-and-smes

17 BBC News, 'UK broadband voucher scheme overhauled', 23.09.14: www.bbc.co.uk/news/technology-29325576

WE NEED A PATCHWORK OF SOLUTIONS THAT CAN MEET THE NEEDS OF DIFFERENT AREAS.

The technology underpinning gigabit broadband is not new, and was first utilised in Hong Kong a decade ago. Now Hong Kong Telecom, the territory's main provider, is set to unveil a 10 gigabit service available to over 80% of households. That may be a level of capacity far beyond the needs of most if not all start-ups as things stand. Yet given the rapid rise in required speeds over the last decade (Ofcom records that the average household connection in 2004 was 512kbps, just over 0.05% of the speed of a gigabit connection today), it seems unlikely that such capacity will not eventually be sought.

Only if London plans for speeds needed tomorrow, not just today, can its infrastructure sustain the continued growth and development of the technology industry.

GETTING SMART

If fundamental infrastructure, be it cable or wireless, is a necessarily significant part of the connectivity debate, another is the availability of information. Given the varied nature of provision across the capital, start-ups need to choose their location carefully. However, according to Policy Exchange's Eddie Copeland, too many are currently hamstrung by a poor availability of information. "If you're an average start-up, you sit there staring out of the window going, 'Well, I've heard of Shoreditch, maybe that's the right place; or look at where my customers are, maybe it should be somewhere near Oxford Street, but that's very expensive; or there's great, really cheap space out near Bethnal Green, so maybe I should be there, because cost is imperative.'"

The data that could help inform such decisions, he says, "is available, it's just in a lot of different hands at the moment...if you think of the combination of data you can now get from the likes of Google, from telephone companies, from TfL, from Companies House, there's a hell of a lot of really rich information, which would be very useful for start-ups."

> **"THERE'S A LOT OF DATA AVAILABLE THAT, IF BROUGHT TOGETHER, COULD BE VERY USEFUL FOR START-UPS"**

The GLA has acknowledged the need for better information with the creation of the Connectivity Rating Scheme. The programme, currently out to tender for a provider, will assess and score the connectivity of buildings in central London. It is modeled on New York's WiredNYC initiative, which awards four grades – platinum, gold, silver and connected – to buildings.

"In the internet connectivity market, there is imperfect information," begins the GLA's tender document for the Scheme. "There is imperfect information for local authorities developing strategic objects for their areas. There is imperfect information for property mangers about how to improve connectivity in their properties. In addition, there is imperfect information for small and medium sized enterprises (SMEs) about the levels of connectivity of a property prior to their moving in."[18]

The Rating Scheme, due for launch this summer, seeks to address that, building on previous attempts to broaden the availability of information from City Hall, which last October launched the London Datastore 2, an open data platform that collates over 580 datasets including on broadband connectivity.

Its predecessor has seen the creation of over 200 apps, including Citymapper.[19] The GLA has also pledged to undertake "a city-wide mapping exercise to ascertain existing levels of high-speed connectivity accessibility and the barriers to provision in 'not spots'."[20]

Moreover, an initiative launched last year is bringing the private sector to the table on the data challenge. HyperCat, funded by £8m from Innovate UK (formerly the Technology Strategy Board), is a consortium of 40 technology firms which has created a platform for connected devices to mutually share and interpret data, a so-called 'world wide web for machines'.[21] The follow-on HyperCatCity programme, announced in January, seeks to harness the platform towards addressing urban challenges.[22]

The opportunity to use data to help cities cope with the ever-increasing flows of population and commercial activity is well-recognised and the 'smart city' label has become near-universal: the GLA has a 'Smart London board' and a 'Smart London plan'; there is an All Party Parliamentary Group on Smart Cities; University College London even offers an MSc degree course on the subject.

However, while the potential of connected cities and devices is not in question, their immediate relevance and applicability is. Cushman & Wakefield's Juliette Morgan highlights the "unique opportunity for London" in developing the smart cities agenda, but highlights the significant infrastructural barriers in place, and the reality of its likely progression in line with the property industry's 8-10 year development cycle: "Hopefully by 2020 we

will have some superbly connected locations built up. The parallel challenge is to create interoperability between platforms and to create transaction protocols for data, which will take some time," she says.

Eddie Copeland, in turn, stresses the need for a more integrated approach to data management before the potential of smart – or data-driven – cities can be realised. "Until cities... start using the data they've already got in more sensible ways, they're never going to handle the data [that would be generated] if we stick a sensor on every single street corner, as it were."

While the smart cities debate is understandably attracting significant interest, the more immediate priority for tech firms is to have access to information that requires both public and private sector providers to pool and make available the data they hold. If the broadband challenge might be characterised as the need for speed, with connected cities London may be better trying to walk before it can run.

18 Greater London Authority, 'ITC 11958 Specification: Connectivity Rating Scheme', www.london.gov.uk/sites/default/files/ITC11958%20GLA%20Connectivity%20Rating%20Scheme.pdf

19 Telegraph, 'Boris Johnson launches second London Datastore', 23.10.14: www.telegraph.co.uk/technology/internet/11182059/Boris-Johnson-launches-second-London-Datastore.html

20 Greater London Authority, 'Mayor and Internet providers pledge to improve London's digital connectivity,' 16.09.14: www.london.gov.uk/media/mayor-press-releases/2014/09/mayor-and-internet-providers-pledge-to-improve-london-s-digital

21 Telegraph, 'UK funds development of 'world wide web for machines'', 20.08.14: www.telegraph.co.uk/technology/news/11043549/UK-funds-development-of-world-wide-web-for-machines.html

22 V3, 'HyperCatCity initiative looks to kickstart smart cities by opening up data', 27.01.15: www.v3.co.uk/v3-uk/news/2392084/hypercatcity-initiative-looks-to-kickstart-smart-cities-by-opening-up-data

DANA TOBAK
MANAGING DIRECTOR,
HYPEROPTIC

The smartphone provided a platform that paved the way for the innovations that gave us companies like Uber, WhatsApp and Snapchat. London is now in need of its own platform to catalyse innovation. That platform is superfast connectivity.

For 90% of London's workforce, going to work still means commuting to an office. If London can rise to meet the challenge of improving its broadband connectivity, that figure could be transformed along with the geography of an entire city.

What this means is that, for the capital's burgeoning tech businesses, the need for high-speed fibre optic connections goes far beyond the office. The truth is that, to realise the true innovative potential of a connected city, it's just as important that the homes of their employees and customers have access to the best connections.

One of the reasons that Silicon Valley has enjoyed such success in recent decades is that it benefits from a vast domestic market of over 300 million potential customers. With a much more modest market at it's disposal, it is vital that London makes the most of its customers by ensuring the population remains a step ahead on connectivity.

If we close our eyes and imagine a nation with ubiquitous gigabit access, what applications for healthcare and education – the biggest issues of our today and our tomorrow – would our entrepreneurs create and bring to market? Don't we all want to live in that world?

According to Akamai's State of the Internet Report, however, the UK is still far from achieving that goal. In the report's 2014 global ranking of countries with broadband speeds over 4mbps, Britain came a lowly 24th, outstripped by Poland, the Czech Republic and Romania.

The question of how this obstacle can be overcome comes down to three key factors: education, competition and vision.

Let's start with education. One of the biggest problems in rolling out better broadband speeds in the UK is that many people simply aren't aware of how much faster their connection could be and the benefits it could bring them.

One reason for this is the way that broadband is sold. People often think they are receiving better speeds than they in-fact are, or that they already have a fibre optic connection when the reality is that their home connection is copper, linked to a fibre source.

Indeed, the need to educate people about the potential boon that an improved broadband infrastructure offers isn't only at the consumer level. Government has also, at times, been frustratingly slow in coming to understand the importance of the technology.

A big part of this is the fact that, until recently, the answer to Britain's broadband problems has been seen to rest largely with a single provider, BT. This bring us to competition.

While BT remains a good provider in many areas, the focus on one company alone has often meant that the benefits of more agile and specialised altnets (alternative networks) have been underappreciated.

While companies like mine may not have the capability to connect customers to broadband in, for instance, highly rural areas, we have found that we are able to compete extremely effectively in urban locations by offering higher speeds and faster, less disruptive installations.

As with any market, opening the door to startups has meant that London's broadband landscape is seeing the emergence of a new breed of young companies that by their very nature must provide a better service than large incumbents in order to survive.

Take my own company, Hyperoptic, in bringing fibre connections with speeds of up to 1gb directly into people's homes we've been able to convince a growing number of major developers of the added value of offering residents connection speeds that barely existed in London previously – but do exist in gigabit cities internationally.

Much like other infrastructural projects, however, broadband needs the support of legislators as well as open markets if it is to meet its true potential.

With projects like HS2, government has already proven its ability to set out a bold and ambitious vision for a more connected economy; it should do the same for broadband.

We need a government to inject not only investment into the area but more importantly ambition. If a Prime Minister were to say that every household would have access to a 1gb connection in a decade's time the prize could be incalculable not only for business but also for public services.

It is only through this level of commitment that we will be able to unlock the true value of our technology businesses – not just to the sector itself, but to society as a whole. That's a prize worth fighting for.

03

THE CAPACITY CRUNCH:
TRANSPORT

In February this year, London finally broke a record that has stood for 76 years. With a population of over 8.6m, the capital is now home to more people than at any other time in its recorded history, surpassing the previous mark set in 1939. And this time there will be no demographic downsizing: the London population is set to rise to approximately 11m by 2050.[23]

The question that immediately follows is: will London grow itself to a standstill? In a city synonymous with commerce, how can transport and trade routes be enhanced to enable a sufficient flow of people and capital? That is a question for London as a whole, but especially the so-called Central Activities Zone (CAZ), across ten central boroughs where 30% of jobs are clustered into just 2% of the capital.[24]

City Hall is clear that this concentration is something that needs to be encouraged and not mitigated: "We have considered whether a more decentralised model of economic growth would offer benefits. We found that there would be major impacts on productivity and incomes as agglomeration benefits would be lost," concludes the London Infrastructure Plan 2050, published last year.[25] Like it or not, London needs to double down on its economic heartland, and find a transport infrastructure that can sustain its growth.

Given the rapid and sustained growth of the capital's digital sector, estimated by Tech City UK to account for 27% of all job growth in the capital,[26] the challenge of how to both bring more people into London and move them around the city is fundamental to the future prospects of digital start-ups and tech behemoths alike.

London's tech industry has thrived on the twin engines of talent and investment: the ability to cluster together the programmers, engineers and creatives needed to build companies and attract capital from around the world. London and Partners research has found that investment into London's tech start-ups increased twentyfold between 2010 and 2014, to $1.4bn last year.[27]

23 Greater London Authority, 'London population confirmed at record high', 02.02.15: www. london.gov.uk/media/mayor-press-releases/2015/02/london-population-confirmed-at-record-high

24 Greater London Authority, 'London Infrastructure Plan 2050: Transport Supporting Paper', 2014, p.9: www. london.gov.uk/sites/default/files/ transport_supporting_paper.pdf

25 Ibid, p.10

26 www.techcityuk.com/investors/

27 Financial Times, 'Venture capital funding on London tech start-ups doubles', 30.12.14: www.ft.com/cms/s/0/0ff8687c-8f52-11e4-b080-00144feabdc0. html#axzz3VRPpFvcs
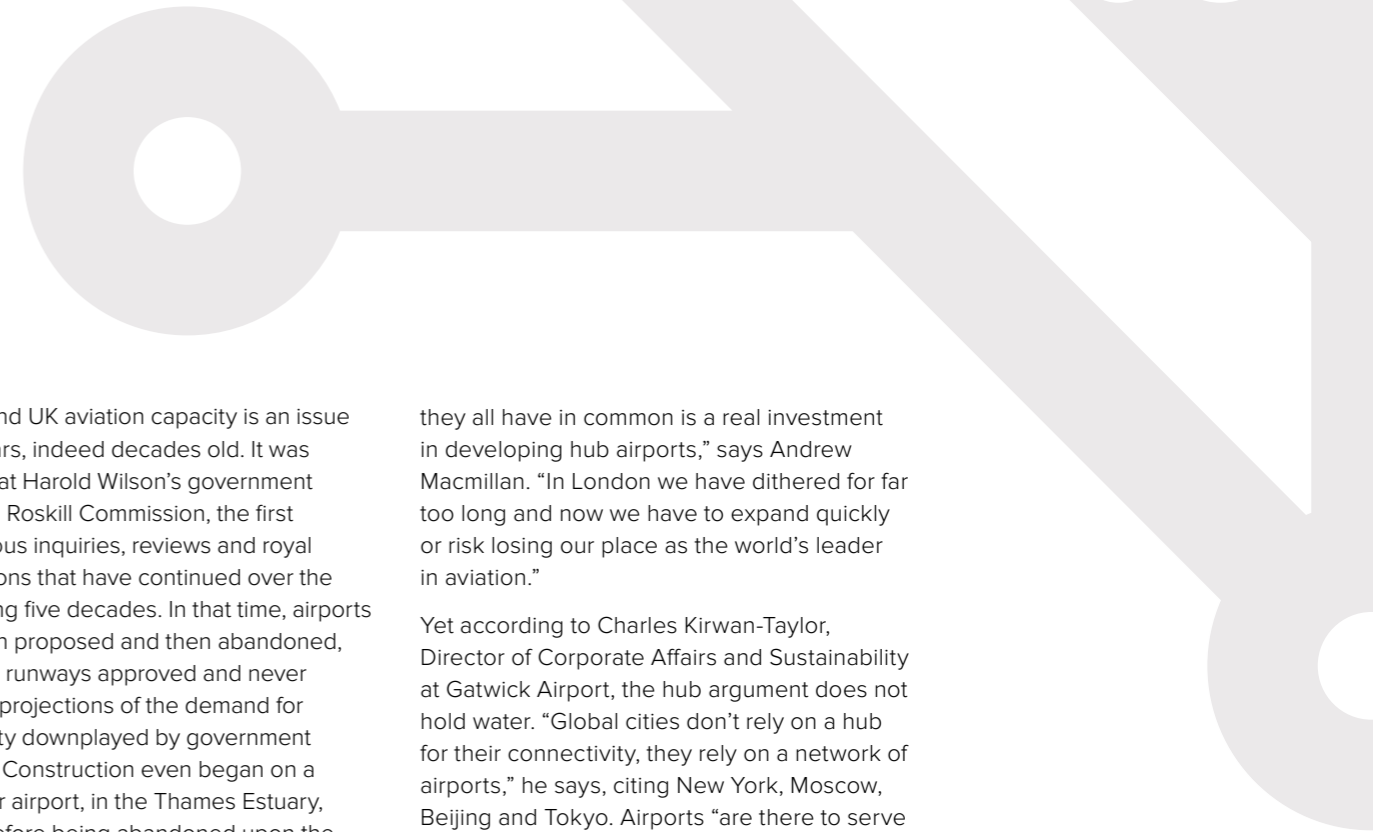
Just as London's historic power has come from its position at the heart of a world geared around maritime transport (the Port of London, dating back to the Roman occupation of Britain, was once the largest in the world), today it owes its success as the world's commercial capital to its ability to convene talent and ideas from across the globe. Even in a hyper-connected, more virtually-managed world, there remains a premium on a city's ability to bring people together physically: to meet, work and collaborate. Yet the much-publicised debate over UK airport capacity is casting a shadow on London's global position, and sorting the aviation problem remains a challenge central to the growth prospects of the city and its companies alike.

At the same time, getting people into the city is only half the battle. Like any other, the tech sector needs its people to be able to get to work, and navigate an ever-more congested network of bus, tube, train and road routes.

And while tech companies are as dependent as their peers on the central provisioning of a fit-for-purpose transport infrastructure, they are perhaps unique in being able to contribute to the solution, as well as add to the capacity

problem. The extent to which technological innovation, from autonomous vehicles to data-driven parking, can play a part in easing London's capacity crunch is something that is already high on the policy agenda, and deserves further consideration.

UP IN THE AIR

"People come to London because of its international connections. It is and always has been a global city that drives the world forward." So says Andrew Macmillan, Operations Director at Heathrow Airport.

In the 21st century, the surest way to achieve such international connectedness is through air travel. Indeed, the Civil Aviation Authority estimates that 140 million passengers passed through London's airports in 2013.[28]

Declan Collier, CEO of London City Airport, stresses the importance of businesses being able to physically access overseas markets, even with the technology available that might minimise the need: "It's particularly important for new businesses," he believes. "If you're a supplier and you're considering awarding a contract to a company that you've never met before but you're interested in, do you make that decision by operating over a high quality digital link or would you prefer to have the people involved sit in front of you and get a sense of who these people are, how they respond, [if there] is there a chemistry?"

Yet as has been well publicised, with the current aviation infrastructure in place, London's skies are all but full. The capital "is fast running out of capacity and it has run out of capacity at its major hub, Heathrow," says Collier. "It will continue to run out of capacity at the other airports over the next five to ten years. Gatwick will be at full capacity and the other airports will reach that within ten years."

London and UK aviation capacity is an issue that is years, indeed decades old. It was in 1968 that Harold Wilson's government set up the Roskill Commission, the first of numerous inquiries, reviews and royal commissions that have continued over the succeeding five decades. In that time, airports have been proposed and then abandoned, additional runways approved and never built, and projections of the demand for air capacity downplayed by government ministers. Construction even began on a new major airport, in the Thames Estuary, in 1974, before being abandoned upon the change of government that year; 40 years later, the Airports Commission, which is currently examining the issue, rejected another proposed aviation hub in the Estuary, championed by London's Mayor Boris Johnson.

The Airports Commission, appointed in 2012 to address the aviation question after the Labour-approved plan for a third runway at Heathrow was finally abandoned in 2010, is due to finally report this summer. It has narrowed the choice to a second runway at Gatwick, a third at Heathrow or an extension to one of Heathrow's existing runways.

What is clear is the decades-long delay in reaching a decisive decision has finally begun to catch up with London: Heathrow's crown as the world's busiest international airport was taken last year by Dubai International, and the threat of being overtaken by other international rivals looms large.[29]

To maintain the UK's competitive advantage, Heathrow argues that an expanded hub airport is essential: "If you look at any of the major, rapidly expanding cities, the one thing

they all have in common is a real investment in developing hub airports," says Andrew Macmillan. "In London we have dithered for far too long and now we have to expand quickly or risk losing our place as the world's leader in aviation."

Yet according to Charles Kirwan-Taylor, Director of Corporate Affairs and Sustainability at Gatwick Airport, the hub argument does not hold water. "Global cities don't rely on a hub for their connectivity, they rely on a network of airports," he says, citing New York, Moscow, Beijing and Tokyo. Airports "are there to serve the city, rather than the other way around."

"AIRPORTS ARE THERE TO SERVE THE CITY, NOT THE OTHER WAY AROUND"

A war of statistics provides the backdrop to the ongoing debate between the two major London airports: according to the Airports Commission the upper bracket of economic benefit from Heathrow's expansion is £214bn compared to £127bn for Gatwick; while it estimates that Gatwick's additional runway could be built for half the price of Heathrow's, £9.3bn to £18.6bn (leaving aside the third proposal under consideration, to extend Heathrow's northern runway rather than build one additionally).[30]

28 Civil Aviation Authority, 'Passenger numbers at UK airports increase for the third year in a row', 13.03.2014, www.caa.co.uk/application. aspx?appid=7&mode=detail& nid=2342

29 Telegraph, 'Dubai overtakes Heathrow to become world's busiest airport', 27.01.15: www. telegraph.co.uk/finance/newsby sector/transport/11372616/Dubai-overtakes-Heathrow-to-become-worlds-busiest-airport.html

30 Financial Times, 'Heathrow expansion to offer greatest economic benefit', 11.11.14: www. ft.com/cms/s/0/ad2918a4-6972 -11e4-9f65-00144feabdc0. html#axzz3VRPpFvcs

PEOPLE COME TO LONDON BECAUSE OF ITS INTERNATIONAL CONNECTIONS.

Fundamental to the argument is the question of whether capacity should be concentrated or diversified. Macmillan makes the point that 26% of UK exports currently leave via Heathrow, and that direct air connections between airports lead to a twentyfold increase in trade between the destinations.

Kirwan-Taylor contends that an expansion of Heathrow would constrict competition and raise costs. Fares to Silicon Valley remain inflated, he says, because of the paucity of routes to North America. "We've got studies which show that routes which are less competitive, where they are served by only one airport in the UK, are 30% more expensive than routes which are more heavily competed." A lack of competition, he says, is why it can be considerably cheaper to fly to Sydney than California, which is served by comparatively few direct routes.

Regardless of the decision the Commission reaches this summer, it will be a decade at the least before London and its businesses can enjoy the benefits of additional runway capacity. It puts 2025 as the estimated completion date of both the Gatwick and Heathrow runways, leaving at least ten years in which the current capacity will be increasingly saturated.

London City Airport's Declan Collier believes that projection is too optimistic by at least three years, and possibly five. He argues that smaller airports like his own, Luton and Stansted must be supported in more modest expansions that can fill the void in the meantime. Yet local protests and planning authorities are proving as much of a roadblock for the smaller airports

and London City's application for a £220m application was rejected by the Mayor in March this year, having previously been approved by the local council.

As London's aviation capacity reaches breaking point, the wait continues for a solution that can ensure a sustainable future for the trade, inward investment and business travel that the capital's high-potential tech firms rely upon.

ON THE RIGHT TRACK?

Getting people in and out of London by air is one challenge. Moving them around the city is quite another, and no less important. "Access to good public transport is one of the most crucial issues businesses face and is of key importance to London's economy and international competitive posiiton," says Andrew Phipps, a transport advisor at the City of London.

The problem of public transport is one that all commuters will recognise. Every weekday the London Underground carries 4.2 million people, with half of all tube and rail trips in the UK made on the Transport for London (TfL) network. Buses are similarly congested, with half of all bus journeys in England also running through the capital.[31] According to TfL, demand will continue to skyrocket, up 60% on the Underground and 80% on the rail network by 2050,[32] necessitating a 70% increase in rail and tube capacity by that time.[33]

This growth presents the city with a difficult challenge: how does London's public transport infrastructure keep up with the rapid rise in demand from commuters trying to get into work? For Phipps the question is one of targeted capacity easing. "We have a comprehensive public transport system but it faces increasing pressure around a number of pinch points. We need to address these by planning now for new infrastructure to ease capacity issues as they arise."

The development of such a pipeline is crucial. Crossrail is estimated to cost £14.8 million and is expected to increase the capacity of London's public transport network by 10%. It is expected to carry 200 million passengers per year across its 100km route, which traverses key destinations such as Canary Wharf, Liverpool Street and Farringdon. Even so, the consensus among the infrastructure community is that it will be full as soon as it opens – so quickly is London's working population growing.

Were it to wait until developments are finished before planning additional capacity, London would be in a state of chaos and businesses would leave the city in droves. However, it can be very difficult to know where to invest in extra capacity years in advance.

It is for this reason that Phipps sees clusters as a crucial advantage of the technology sector in providing a solid, predictable base on which to build a first-class transport network. Initiatives the size of Crossrail or Crossrail 2 depend on predictability. Achieving equal transport coverage across the city would be impossible and so infrastructure projects need to target areas where they can have the largest impact. If the Government wants to boost the technology sector, it knows where to focus its efforts.

"It's easier to improve existing clusters than it is to try to provide a uniform service across the city. Take the City of London or Stratford for example. It would be impossible to achieve transport links of their depth and scale across the entire city in one go," he says, "Some people may indeed work more flexibly, but that's not the answer on its own. People will always need to come into the office."

CAR CULL

Much of the transport infrastructure debate exists in a permanent inflationary bubble: ever-increasing demand and supply chasing each other's tails. Yet in one particular regard, London has seen retrenchment in recent times, and that is road use. While use of public transport increased by 39% in London from 2001-2011,[34] the share of Greater London journeys undertaken by car has fallen, from 50% in the early 1990s to 35%.[35]

31 Transport for London, Annual Report and Statement of Accounts 2013/14, www.tfl.gov.uk/cdn/static/cms/documents/annual-report-2013-14.pdf

32 Transport for London, 'Growth in passengers on London's transport network', 06.11.14: www.tfl.gov.uk/info-for/media/press-releases/2014/november/growth-continues-on-london-s-transport-network

33 Transport for London, 'Business Plan 2014', December 2014, p.30: www.tfl.gov.uk/cdn/static/cms/documents/tfl-business-plan-2014.pdf

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35 D.Begg, 'A 2050 Vision for London: What are the implications of driverless transport', 11.07.14, p.5: www.transporttimes.co.uk/Admin/uploads/64165-Transport-Times_A-2050-Vision-for-London_AW-WEB-READY.pdf

EACH CAR CLUB VEHICLE IS ESTIMATED TO TAKE 17 PRIVATELY OWNED CARS OFF THE ROAD.

Yet the reduced prevalence of car travel, driven by a combination of factors including the cost of fuel, the Congestion Charge and greater awareness of environmental concerns, has not been enough to free up much-needed space on London's roads. "If the population of London is to increase to around 12 million by 2050 it is imperative that car's share of the market falls to the 20% mark or even lower," wrote Professor David Begg, a former government advisor on transport, in a report last year.[36]

THERE WILL BE AN 80% INCREASE IN DEMAND ON LONDON'S RAIL NETWORK BY 2050

It is a view shared by many, including car club Zipcar, whose Car Lite London campaign posits that 79,000 cars can be taken off the capital's road by 2020 through greater use of vehicle sharing;[37] and Uber, whose founder Travis Kalanick told the Institute of Directors annual conference last year that a million cars can ultimately be taken out of circulation, a third of the city's total.[38]

It is no surprise to see tech companies coming more to the fore on this part of the transport debate. For while there is little they can do to support the development of fundamental rail and aviation infrastructure, at street level the needs of the city and the essentials of their business models begin to converge.

At present, around 140,000 people use car sharing services such as Zipcar, which estimates that each of its vehicles helps take 17 privately-owned cars off the road. Mark Walker, Zipcar UK's General Manager says that the ambition of TfL and City Hall is to get that figure to a million. "Because of the behaviour change that takes place when people use our service versus owning cars… they drive less and the bottom line is it helps TfL solve [the capacity] conundrum." Taxi app Uber's own ride-sharing service, UberPool – allowing users to combine trips and fares with passengers on a common route – is based on the same principle, and was the foundation of Kalanick's boast that a third of London's cars can be taken off the road.

If the pioneers of the sharing economy are leading one charge towards less congested roads in London, another tech contribution may come in the form of autonomous vehicles. For some time, the driverless car has been the symbol of Silicon Valley adventuring, particularly synonymous with Google's landgrab for pioneering tech. Now it increasing looks ready to hit UK roads, with the Government funding four pilot schemes to the tune of £19m and promising a review of the Highway Code and relevant legislation by 2017.[39]

And the driverless car can be much more than a techie fad. Professor David Begg's report, "a 2050 vision for London" highlights the role of autonomous transport in further easing the congestion crunch on the capital's roads. "AVs [autonomous vehicles] have the potential in the longer term to significantly increase highway capacity – by anywhere from 50 to 250% depending on the forecast," he wrote.[40] "Less distance will be required both between the vehicle in front and the vehicles in adjacent lanes. The days of cruising around looking for a parking space (which has been estimated can account for as much of 30% of traffic congestion in urban centres) will be a thing of the past."[41]

Another report published last month by management consultancy McKinsey suggested that AVs could lead to a 90% reduction in road accidents in the US, saving up to $200bn a year. Moreover, it argued that it could unlock productivity, saving owners up to 50 minutes a day, which could translate into as much as $140bn of economic value.[42]

Such change will not arrive quickly, with McKinsey estimating the driverless technology will not become a primary means of transport until the 2040s.[43] But it points to the fundamental role of the tech sector in addressing the infrastructure challenge London faces. It has lessons to teach planners on integration, shared services and flexibility that can help create a transport network that allows businesses to work wherever, whenever and however they need. While the wait will go on for some time for sufficient additional capacity to be plumbed into the rail and aviation networks, tech companies have a major role to play in helping London make the most of what it has got: bringing a dash of innovation into a debate that is fast moving beyond tracks and trains.

DRIVERLESS CARS COULD INCREASE ROAD CAPACITY BY UP TO 250%.

36   Idem
37   www.zipcar.co.uk/london-vision
38   Uber, 'The City of the future: one million fewer cars on the road', 03.10.14: blog.uber.com/city-future
39   BBC News, 'Driverless car review launched by UK government', 11.02.15: www.bbc.co.uk/news/technology-31364441
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MARK WALKER
GENERAL MANAGER, ZIPCAR UK

London is a fantastic place to do business, but there are some serious and growing problems about road transport that we need to urgently address. The roads are congested, costing the city £4bn a year according to TfL, and the air quality is poor. Given that London's population is now at a record high and set only to rise further, optimising use of the city's streets has to become a priority issue.

We need to reduce the number of unnecessary car journeys, encouraging people to be more thoughtful about when to drive and when not to. By so doing, we will enable the city to continue to function efficiently and people to continue to enjoy living and working here.

To free up space on London's roads, we need to encourage genuine and lasting behavioural change. The current model of private car ownership means a high volume of vehicles, used inefficiently. What we have discovered at Zipcar is that car club members make smarter choices about how they travel. Our research shows that a single car club vehicle removes an average of 17 privately owned cars from the streets. Moreover, car club users make seven times fewer short journeys, of fewer than five miles, and make greater use of public transport.

Taking car club use mainstream has the potential to be a game-changer for how people approach getting around the city, and in particular their driving habits. We have done a good job over the last decade in attracting early-adopters to car clubs, with around 140,000 members in London. We want to work with the GLA and TfL to take that number to a million and realise the resulting positive impact at scale.

In particular, we would like to see car clubs integrated into the London transport network. Car club use should be included in the next generation of TfL ticketing technology, so it is an option as part of someone's season ticket. You should be able to access a Zipcar with an Oyster card, and the same for the cycle hire scheme. Some vision from the city and the transport planners can help make a major contribution to the behavioural change that we need around travel and car use. If anything, what we will see in the next five to seven years is road capacity decrease rather than increase, with, for example, the increasing prominence of cycle superhighways. So it's imperative that everyone plays their part in helping free up the finite space we have for more efficient use.

Ultimately, the future of London travel will rely on people using public transport as much as possible, or cycling. New services, such as Crossrail, will help. It may well be the case that we see greater regulation of car use over time, and restrictions on where you can drive certain types of car. You can already see examples in Paris and Beijing of where car use has been rationed according to whether the license plate ends in an odd or even number.

Car clubs provide a flexible and affordable model that matches the needs of many different businesses, from start-ups to public sector organisations. When Croydon Council replaced its old grey fleet scheme of individuals expensing mileage in private cars with a Zipcar solution, they saved over £500,000 per year, saw the number of miles driven decrease by 42% and emissions reduce by 38%. It's a great example of the behavioural change that a shared model can create. Only by continuing to encourage people to change their travel habits, and weaning the city off its dependence on private car ownership, can we create the space that London and its business community desperately needs.

CONCLUSION

The infrastructure challenges facing London, and in particular its technology firms, are many and varied. Yet there are common threads, and perhaps common solutions to be found.

The realities of property, broadband and transport provision in London may not always favour start-ups trying to establish a toehold for themselves in a competitive landscape. But the future of the city does: London is becoming a connected city, a data-driven capital and one where technology will play an ever-growing role. The role of the tech industry in bringing the city squarely into the digital era is greater than perhaps any other business sector.

The capital's tech industry has a major opportunity, therefore, as well as a challenge. It may not be able to lay fibre networks, build train tracks or construct office blocks. But it can work with industry and government to provide the information, the ideas and the solutions that will help them build a more efficient London for business.

It is the technology sector that can meet the challenge of bringing together the many data silos that could become an information goldmine; that can provide the innovation to meet gaps in the broadband network; and that can free up space on London's streets to ease the burden on a creaking transport infrastructure.

Tech London Advocates is committed to fostering the collaboration between the tech industry and government, the property, telecoms and transport sectors, that is needed to meet these challenges and find common solutions. We want to help build on the progress that is already being made, and ensure the voice of tech companies is heard and acted upon.

Based on the research behind this report, we are making five initial recommendations that we hope can positively contribute to the debate:

RECOMMENDATIONS

01
A LANDLORDS' CHARTER

The nature and profile of start-up and scale-up tenants pose inherent problems for landlords. Yet not all are indisposed to digital and tech companies, and some new developments are seeking to cater specifically for them. A voluntary charter allowing landlords to make commitments to prospective tech tenants – for instance minimising security deposits – would help amenable landlords to market themselves to the sector, in line with the intention of the Connectivity Rating Scheme, and provide better information on the options for start-ups.

02
DEVELOPER DATING

Information and ideas sharing between the tech and property industries can only be a good thing. We propose facilitating sessions for property investors, developers and landlords to meet with start-ups and scale-ups, to allow both to better understand each other's priorities and to highlight specific planned developments which may benefit tech companies; this could be supported by the TLA Property working group. We would also like to explore a specific stream of the TLA Triage service where start-ups and scale-ups can access expert property and brokerage advice for free.

03
STANDARDISED PLANNING PROCESS

A constant theme across all infrastructure provision is that the economic case must be right for investors. When it comes to broadband networks, the contrast between a single urban authority such as in Manchester, and London's 33 boroughs, is all too clear. While we acknowledge that local authorities will always have individual concerns, which must be reflected, we would like to work with the boroughs, in conjunction with the GLA, to explore the potential for a more integrated process for planning applications, and to see where it can be harmonised and the needs of telecoms investors met.

04
THE LONDON TECH DATABASE

It is clear that better availability of information has the potential to be of major benefit to tech start-ups and scale-ups seeking the best location within London. Yet while the relevant data on property rents, uses and connectivity is available, there is no one-stop-shop bringing it together. The GLA has proposed a connectivity map for London, which is a very important step, and TLA would propose to go further with them in exploring the creation of a database that gives start-ups and scale-ups all the information they might want when they are deciding where to base themselves.

05
FUTURE PROOFING POLICY

From autonomous vehicles to gigabit broadband, technological innovation is changing the way infrastructure will be provided in London. That presents challenges to policy and regulation, of which the Government and relevant agencies are well aware: Ofcom recently announced a review of its Electronic Communications Code, while the Department for Transport is working to update the Highway Code. It is important that the tech sector has a strong voice in these reviews, and Tech London Advocates plans surveys of its members to contribute our voice to the process, and help ensure that infrastructure policy is fit for the future.

TECH
LONDON
ADVOCATES

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Tech London Advocates is a private sector led coalition of over 1,400 expert individuals from the tech sector and broader community who have committed to championing London's potential as a world-class hub for tech and digital businesses. It strives to support London's tech start-ups and high-growth businesses in finding new investment, new talent and continued success.

Tech London Advocates is an independent not-for-profit organization, sponsored by City of London Corporation, Penningtons Manches LLP, techUK, Russell Reynolds Associates, London First, Here East and Central Working.

OUR CORE OBJECTIVES

There are now more than 1,400 Advocates dedicating time, knowledge and contacts to London's tech startups.

This is what we do:

WE ASSIST

Early stage ventures to get airborne

WE HELP

Remove roadblocks

WE CHAMPION

The sectors where London has a genuine competitive adbantage

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