

Policy
Papers

Planning and tech

Planning for the growth of the technology and
advanced manufacturing sectors



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Executive summary

The economic downturn of the previous decade toppled expectations about global economic security and is set to have a long term impact on the way we work and live. With a gradual recovery occurring in a number of city regions, questions about what form the post downturn economy will take and how policy should react are now prevalent in public debate. The next economy¹ is still taking shape and while there are predictions as to its makeup we are nevertheless in an age of uncertainty with many questions unsettled. Will we embrace a low-carbon economy? Do the economic benefits of agglomeration outweigh the costs of congestion? Will the workplace of the future be based on clustering or mobile working?

Given the pressures that a fresh bout of economic growth will put on cities' infrastructure, the structure of the new economy will require the alignment of metropolitan priorities. This means that economic growth can not be isolated from the growth of public infrastructure. In reality economic growth needs to enable the delivery of city level, public resources such as transport, education, and housing. This involves equipping cities to be environments for sustainable growth while also ensuring that the growth that does take place is beneficial to the whole city.

The next economy may be uncertain in many respects, but planning can help cities to adapt to looming changes. In a fast-changing economy, it is no longer possible for planners or decision-makers merely to 'predict and provide', if it ever was. As the RTPI points out in *Planning Horizons*,² in the twenty-first century it is precisely because of the uncertainties of the future rather than in spite of them that cities need to have a plan-led vision of their own future.

Alongside other professions, planners have a critical role to play in creating and sustaining successful places – liveable, accessible, connected, vibrant places that attract people and investment, and generate healthy economies and equitable societies. Indeed, planners are in a unique position to identify the qualities of places that can be built on, keeping in mind current and future generations. In these ways and others, planners can be at the forefront of a much broader approach to the economic development of places, helping policy and decision-makers, and communities themselves, to avoid complacency and to prepare for the next economy.³

As a discipline that brings together a range of interests, planning is well placed to be the agent that drives coherent, holistic growth in cities. The collaborative nature of planning enables it to help cities acclimatise to the multifaceted consequences of further economic growth.⁴ Through distributive, horizontal, integrative leadership and management,⁵ planning facilitates the kind of multi-actor collaboration that is needed if growth is to happen in a holistic way that benefits the whole city and all of its inhabitants.

A sectoral snapshot

A common thread running through the narrative of the recent economic resurgence of many cities is a burgeoning technology sector. Indeed the Information Technology (tech) sector and the advanced manufacturing (AM) sectors are among the main drivers of growth in metropolitan areas today.

- Digital job growth is predicted to outperform all other occupation categories by 2020⁶
- Britain's technology sector is set to grow four times faster than GDP this year⁷
- There are over 47,000 digital technology companies across the UK⁸
- Tech is the UK's fastest-growing occupation category⁹
- The total turnover for the AM sector across the UK was £309 billion (9% of the whole economy). There are over 1.6 million people employed in AM in Great Britain. This represents 6% of all employment across the whole economy¹⁰
- 1.46 million people – 7.5% of the entire British workforce – are currently employed in the digital industries across the UK¹¹
- 50% of digital companies in the UK have been founded since 2008¹²
- The UK internet economy is the largest of the G-20 countries as percentage of GDP¹³
- In Ireland since 2012 17,500 jobs have been announced by technology companies and tech is responsible for 40% of national exports

In the current context of a weak, often imbalanced^{15 16} recovery, business and policy leaders need to take advantage of these trends to accelerate structural shifts towards a stronger and more sustainable economic future that creates new jobs and opportunities.¹⁷

From a planning point of view the striking growth of these industries means that the tech and AM spatial footprint is increasingly evident in urban areas, which raises the question of how cities should respond.

This paper argues that planning has a key role to play in ensuring not only that the conditions are in place for the flourishing of tech and AM, but also that the benefits of the accompanying growth are spread across the local economy.

The role of planning

In the *Death and Life of American Cities* Jane Jacobs promotes:

*“the need of cities for a most intricate and code grained diversity of uses that give each other constant mutual support, both economically and socially... the science of city planning and the art of city design, in real life for real cities, must become the science and art of catalysing and nourishing these close-grained working relationships”*¹⁸

In the context of tech and AM, planning can nurture each sector’s working relationship with the city and ensure mutual support between their growth and the city’s growth. The increased prevalence of ‘innovation districts’¹⁹ in urban areas illustrates how planned infrastructure and spaces are providing the conditions for tech and AM to flourish, while many cities are harnessing the growth of these industries to address long term challenges such as skills shortages, congestion, overloaded public transport systems, and lack of affordable housing stock.²⁰

Case study: Chicago Technology Plan. In this context an interesting model is provided by Chicago where the successful implementation of ‘the City Technology Plan’ has provided a roadmap for the sector and the city to work together to deal with challenges facing the city. The public-private technology plan lays out a roadmap to realize Chicago’s potential as a city where technology fuels opportunity, inclusion, engagement, and innovation for all. The plan has accelerated job creation, improved the quality of life for Chicagoans, generated cost savings in government operations, provided increased digital access and skills, and encouraged civic engagement.



Broadly speaking planning has two roles to play in ensuring balanced growth from tech and AM

An attractor; to make a place attractive as a base for tech and AM firms to locate. At the city level this includes measures such as providing affordable office space, social and physical infrastructure, implementing connectivity, initiating partnerships with academic institutions, and reintegrating declining areas.²¹ This role is about the planned investments that make cities attractive to firms in the first place.

In explaining tech and AM growth the literature typically cites factors such as spatial clusters, the growth potential of universities, connectivity, and quality of life.²² While all of these are important factors, what is often overlooked is the role planning plays in bring these assets together to deliver the kind of physical environments that facilitate the growth of tech and AM. Due to the wide ranging needs of tech and AM firms (highly skilled employees; areas that are technically wired, transit accessible, and physically compact), these spaces require a range of stakeholders: city councils, land owners, infrastructure providers, and academic institutions. Planning often mediates between these groups in order to deliver multi-purpose environments for tech and AM firms to operate in.

A distributor; one line of argument in the literature champions high-technology industries as having the potential to help city economies flourish, while also increasing incomes and reducing poverty.²³ Others highlight the potential difficulties of tech and AM-led urban growth, arguing that that the sector is economically insular; its profits are spatially and socially concentrated, and that the benefits of growth in the tech-sector may not spread across the local economy.²⁴ This need not be the case. Tech and AM are not untameable forces of nature. Their impact on a city and who gets to share in the potential benefits are grounded in the choices we make as a society. The question is, as these industries grow, what are the best policy decisions to enhance opportunities on offer to the greatest number of people?

Experience shows that if there is proactive leadership and public decision making about who should feel the benefits of tech and AM growth, it can be balanced across the local economy and can be used to deal with long term challenges.

For city leaders, pursuing tech and AM growth may lead to aggregate gains, but if these gains are to reach the wider metropolitan population, decisions need to be made about how to ensure these gains are widely shared.²⁵ By providing long-term strategies to use the burgeoning tech sector to enhance social as well as economic

opportunity, planning can ensure that the city as a whole benefits from the presence of tech and AM.

Planning and tech

The sustained and accelerated growth of tech and AM means that cities need to consider ways of organising which value cooperation and mutual support between the economic growth of these sectors and social progress. Planning as a profession integrates spatial thinking and social outcomes into its decision-making; planners aim to look beyond individual policies and decisions in order to take a broader and longer-term view. As a future-oriented activity with political vision²⁶ planning is therefore well placed to be the tool that shapes the inclusive growth of tech and AM within the wider urban context.

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Recommendations

To attract tech and AM firms

- Monitor the local economy using company registration data
- Employ a team to engage with the sector
- Ensure adequate housing and infrastructure capacity

To ensure spillover benefits from tech and AM growth

- Use technology to deliver public services
- Train the local community
- Take advantage of firms particular skills and resources to address a city's infrastructural challenges
- Collaborate with tech and AM firms in urban regeneration projects
- Include metrics about the local economy in firms' strategic targets

Part 1: Definitions and mapping

Defining tech

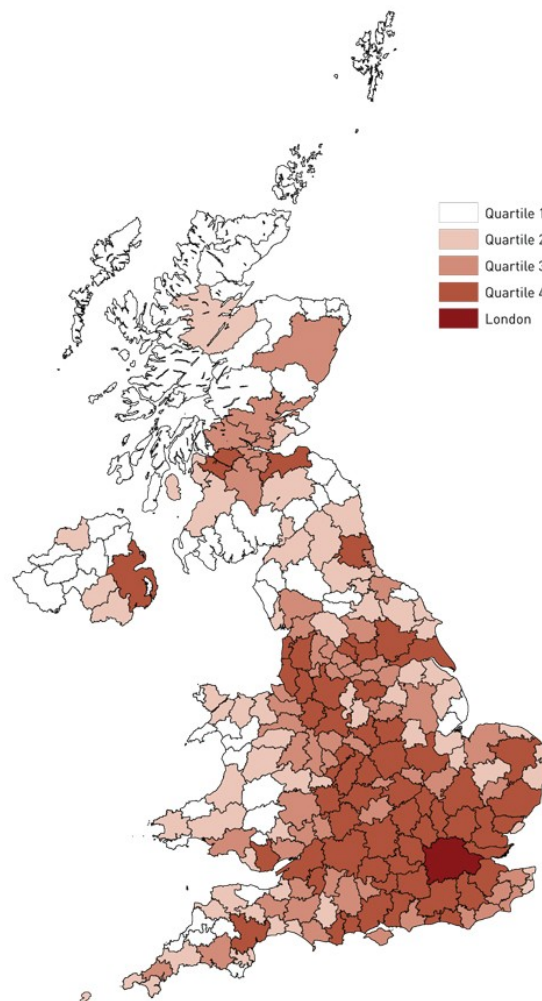
Definitions of the tech sector are variously based on the type of employees, outputs, and production methods of firms; or industrial categories, such as biotech, ICT services, and ICT manufacturing and information tech. The current study seeks to capture the set of firms that are based on digital computing technologies and have a rapidly growing spatial footprint in urban areas. With this in mind below is a broad definition, which is a blend of outputs, inputs and types of firms;

“Tech encompasses a set of industries, outputs and inputs used at varying intensities across the economy as a whole. In sectoral terms, digital businesses include information and communications technology (Microsoft, Oracle, IBM, Accenture) and ‘digital content’ industries (Apple, Google, Facebook).”²⁷

The location of tech firms

An NIESR study²⁸ finds that in the UK the digital economy is heavily concentrated in urban Travel to Work Areas (TTWAs),²⁹ with a lot of colocation in London, Manchester and the Greater South East. The 10 TTWAs with the most tech firms are London (64,630 firms), Manchester (7,324), Guildford and Aldershot (6,158), Luton and Watford (5,147), Wycombe and Slough (4,979), Birmingham (4,695), Reading and Bracknell (4,914), Bristol (4,714), Crawley (3,867) and Brighton (3,730). Underneath this group is another 50 TTWAs with over 1,000 digital economy companies, followed by a very long tail: over half the areas on the map have less than 600 companies, and 25% have fewer than 200.

Counts of digital economy companies by Travel to Work Area, 2012 ³⁰



Advanced manufacturing

Similarly to tech, AM is not a clear cut sector and does not allow of a straightforward definition. AM tends to refer to the higher end of the manufacturing sector as a whole, and is often characterised by the type of technology used in the manufacturing process, or the utilisation of new materials, rather than its end products.³⁰

The business of advanced manufacturing is typically to develop new technology-based products and new technological processes to develop products. 3-D printing is often given as an example. AM is also about changing processes of production and the way these are systematically connected, informed and controlled. This is the field commonly referred to as 'Industry 4.0', the 'Digitalisation' of Manufacturing or – with respect to their connection – the 'Internet of Things'.³¹

There is therefore a distinction to be made when defining advanced manufacturing

- Advanced manufacturing processes with a main focus on the development of either new products or new methods to work on such products (including new materials, nano- or micro-enabled processes, 3-D printing or more general laser processes)
- Advanced manufacturing systems with a main focus on the new methods to coordinate production processes (including industry 4.0, innovative measurement and control technologies, computing, internet of things.)

Location of advanced manufacturing

The distribution of advanced manufacturing activity as a sector (as measured by patent applications in the map on the left) is less focused in urban areas when compared to tech. Although there are some areas of concentration, the spread is generally more even across the UK and Ireland. When it comes to advanced manufacturing systems (as illustrated by the map on the right) the distribution is slightly more concentrated and there is a clear hotspot in the South of England.

Regional distribution of patent applications in the field of advanced manufacturing processes and systems ^{32 33}



Part 2: Planning as attractor

The recent growth of tech and AM has led to a proliferation of clusters, enterprise zones and innovation and business centres³⁴ as economic policy interventions in local visions, master plans and economic development strategies.³⁵ These spaces require a range of stakeholders: city councils, land owners, infrastructure providers, and academic institutions. Planning mediates between these groups in order to deliver suitable multi-purpose environments for tech and AM firms to operate in.

In addition to large scale projects such as innovation districts and Live Work Play areas,³⁶ there are a range of tools available on a smaller scale to attract and foster tech and AM growth. These include de-risking sites by making sure that planning requirements are practical, clear and known in advance of specific proposals coming forward, and using public money for assembling and servicing more challenging sites. Local authorities are well placed to carry out these measures thanks to planning and compulsory purchase powers, although at the moment arguably lack the resources to play this more proactive role.³⁷ Other smaller scale interventions include provision of Wi-Fi in specific locations, and making areas walkable and accessible by bike.

Public Private Partnership (PPP) models can also be leveraged to build digital infrastructure and to ensure that ubiquitous broadband and Wi-Fi connectivity is available across city landscapes. Effective PPPs have the potential to channel the private sector's risk-taking capacity and access to funding, while ensuring that the economics of the arrangement still serves the public good.³⁸

Case study: Small scale intervention – Horsham

Horsham is a rapidly expanding town with Gatwick to the north-east and Brighton to the south-east. This puts it in range of the Brighton City Deal and the Brighton Digital Catapult. In 2014 Horsham lost Novartis as a major employer and therefore needed to find new businesses to fill that gap.

Hack Horsham has been formed with the objective of making Horsham into a Tech Hub. This project brings together schools and businesses to work together to kick-start the development of the town's digital community. There are several organisations in the town who are major players in the Tech field, including Creative Assembly, who are supporting the project. Tanbridge House School hosts meetings for stakeholders as part of the project.

The School is currently expanding its facilities to include a Futures Room so that students and the wider population can have access to the latest technology and be ready for the opportunities that exist in the Tech sector.

In addition, Horsham Blueprint has been designated as the neighbourhood forum for Horsham Town with a business neighbourhood area. The Tech Hub will be a key feature of the neighbourhood plan and the future growth of the local economy.

Planning for tech

To a large extent the different knowledge bases and ways of working that produce innovation in the tech and AM sectors dictate the kind of physical environments that allow them to thrive.

Tech firms value face to face interaction, divergent thinking, large social networks, and inter firm communication. These agglomerative preferences result in firms concentrating in dense, multi use areas in central urban locations, where exchanges of ideas between individuals and firms are facilitated by proximity to other firms as well as surrounding supporting activities and amenities such as cafes, restaurants, and bars. The generation of ideas that results from these interactions is a key factor in the level of innovation and the high rate of productivity and growth currently being experienced by the sector.

This shift to dense multi-use central urban locations is in contrast to patterns of the past 50 years, during which time the landscape of innovation and employment growth has been characterised by isolated corporate campuses, research parks, accessible only by car. Apart from proximity and clustering facilitating the generation of ideas,³⁹ one of the main reasons for this shift is access to talent.

The kind of people tech firms want to employ like to cluster in dense urban areas because of the access to employment options, abundant amenities and services, and a vibrant social life. The attraction of cities as oppose to corporate campuses is also based on the changed nature of the technology itself. Previously tech startups have been focused on hardware, but today's most successful startups tend to be in fields like social media and mobile apps. Cities have more designers, musicians, marketers, and copywriters, who are just as important to contemporary tech firms as professions such as engineers have been to successful tech firms in the past.⁴⁰

Tech employee preferences and planning

From a planning and built environment point of view this preference for dense multi-use environments in central urban locations encourages the creation of dynamic physical realms that support proximity, knowledge spillovers, and provide appropriate housing options.⁴¹ Although there is a live debate about whether clusters can be created or need to just be allowed to happen,⁴² today there is enough evidence of planned small and large scale innovation districts to indicate that the spatial preferences of these firms are now well known enough to be planned for.

This is not to say that planning or public policy can bring tech and AM firms to an area in which they don't already operate.⁴³ Rather that within an area where tech firms are already located planning can provide the kind of environments that invite the agglomerative benefits on which tech and AM firms thrive. In our Value of Planning work the RTPI explains how planning as 'market maker' provides an important context for decisions taken by other market actors. Successful planning has the potential to create markets in which decisions are integrated and coordinated. This produces real benefits that transcend individual developments by way of better transport connections, more efficient spatial arrangements, improved public realm and so on, all of which produce the kind of compact multi-use districts that are attractive to tech firms and their employees.

The growing preference of young skilled employees for vibrant neighbourhoods that offer choices in housing, transportation, and amenities has made urbanising areas increasingly logical from the point of view of City Authorities. These preferences have provided an incentive to regenerate previously neglected parts of cities, and have led to a number of successful urban regeneration projects focused on attracting tech firms.

Case study: Temple Quarter Bristol

An Enterprise Zone is a planning tool which sees firms receive tax breaks and other incentives to locate or expand in specific areas. Enterprise zones offer firms five-year rebates on business rates, simplified planning regulations, business rate retention for local authorities, and the government provided superfast broadband. Bristol Temple Quarter is home to rapidly growing clusters of start-up businesses, particularly in the creative, digital and hi-tech sectors. The Zone has three unique spaces where small, innovative businesses can locate and grow: The Paintworks, Temple Studios and the Engine Shed.



The mix is diverse, from micro-electronics companies to media and digital production companies to animators, accountants and consultants.

Alongside incentives for business growth and jobs creation, the Zone is benefitting from significant investment in its infrastructure, including £21 million to improve the vehicle, cycling and pedestrian access in the area, £11 million to provide superfast broadband for companies and £200 million for the citywide MetroBus scheme, which will further connect Temple Quarter to the rest of the city. All of which chimes with tech firms preferences for transit accessible, technically wired environments.

The delivery of this Innovation district has required the cooperation of a range of stakeholders: the city council, the land owner (Homes Communities Agency), infrastructure providers (Network Rail), the West of England Local Enterprise Partnership, and the University of Bristol. Planners have mediated between these different organisations, and facilitated their coming together over a well coordinated plan to deliver a multi-purpose environment.

Case study: Dublin's Docklands

Although originally driven by The Finance Act 1986 which introduced incentives to encourage urban renewal investment by the private sector, Dublin's Docklands is now a Strategic Development Zone and in recent years has been master planned. The regeneration policies of the past two and a half decades have delivered high quality housing and cultural amenities to the area, and have made it an ideal setting for large firms such as Google, Facebook, and LinkedIn. The council's proposal for the next phase in the evolution of the Docklands is to encourage innovative designs for, and successful models of, multiple-unit developments.



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The aim is to create an environment that attracts a new population, while allowing existing residents more choice within the locality. There are a number of strategic planning dimensions: the building of an addition to the expanded inner city and the reconnection of the capital with the sea and the bay.

The preferences of tech employees for compact, central, liveable areas are also providing an opportunity to regenerate other parts of the city, and Dublin City Council are commissioning an urban space study of Newmarket in Dublin 8 with a view to replicating the success of the Docklands.

Planning for advanced manufacturing

AM firms have traditionally valued intra rather than inter-firm interaction,⁴⁵ convergent thinking, and specialisation.⁴⁶ Knowledge spillovers in the AM sector tend to occur within specialized firms⁴⁷ rather than between different types of firms, which has led to homogenous concentrations of firms in single use neighbourhoods. AM firms need floor space and this has pushed them out of the urban core to cheaper, more spacious, affordable suburban locations. AM workers tend to live in suburban neighbourhoods and commuting is typically done via highways. In terms of the built environment these factors have placed an emphasis on spacious, low density clusters of firms in car-centric suburban areas, with cheap floor space.

There are however often spillover benefits for central urban locations from AM firms that locate in suburban areas. AM firms whose main operation is in suburban areas sometimes co-locate in central urban locations where different, less space demanding, operations are carried out.⁴⁸ This results in job creation in both suburban and central areas of a city region.

Nevertheless the more dispersed geography and typical spatial requirements of AM firms means that residential or mixed-use development in city centre areas would not invite growth of AM in the same way it does with tech firms. Place-making for AM should not seek to emulate a city centre environment, it should focus on providing new and existing AM firms with the specific physical and networking assets that will support their growth.

The RTPI's forthcoming research on Location of Development will analyse how new housing proposals relate to jobs and infrastructure in different areas of the UK. It will do so by mapping recent housing permissions (2012 to 2015) against areas of major employment and public transport infrastructure in cities and their surrounding areas. The spatial research will provide the basis to examine whether housing developments are located in sustainable locations with access to employment and major economic centres. It will also look at the relationship between the scale of development and infrastructure funding.

Case study: Advanced Manufacturing Park, Rotherham

The Advanced Manufacturing Park (AMP) is a manufacturing technology park in Rotherham, South Yorkshire. It is part of Sheffield City Region Enterprise Zone. Technology developed on the AMP is already being utilised in leading edge projects, such as within Formula One and the next generation of military and commercial aircraft. Organisations currently located on the AMP include; Nuclear AMRC, The Advanced Manufacturing Research Centre (AMRC), a Boeing / University of Sheffield partnership; and Rolls-Royce.



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The AMP is a planned regeneration project the vision for which emerged from the decline that South Yorkshire had seen in its traditional industries of coal and steel over the last twenty years. Despite this decline the region had retained established skills and expertise in the areas of advanced manufacturing, backed by materials research expertise within the two Sheffield universities, and other independent research organisations. Yorkshire Forward and UK Coal created a joint venture to reclaim land on the former opencast colliery at Waverley, Rotherham and to develop the AMP. Funding from the European Union's European Regional Development Fund have also supported the project.

The most recent development in the region is a plan to create the first Advanced Manufacturing Innovation District in the UK centred on the Sheffield-Rotherham corridor. The project will support advanced manufacturing companies in the region to grow and innovate.

Case study: Northampton Waterside Enterprise Zone

In 2011 South East Midlands Local Enterprise Partnership (SEMLEP) launched the Northampton Waterside Enterprise Zone and regenerate nearly 120 hectares of brownfield land along the town's river front. Based in a large area of previously under-developed land in Northampton, SEMLEP's Enterprise Zone has also attracted £152million of private sector investment; again well ahead of the original target.



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SEMLEP's investment in the Enterprise Zone has included £5m towards the new railway station, £3m to improve the road infrastructure in the area and £3.6m towards improvements to St James Mill Road. It has also played a pivotal role in securing borrowing of £46m for the new University campus.⁵¹ The zone's new Innovation Centre which will support the University and provide a new home for up to 55 start-up businesses.

As part of the enterprise zone Cosworth's new Advanced Manufacturing Centre manufactures components and assembles some of the world's most advanced engines to global automotive manufacturers. The centre received funding from SEMLEP and support and funding from Northampton Borough Council. The Department for Communities and Local Government helped provide funding towards the cost of the manufacturing machinery. Cosworth is now primed to manufacture components and assemble some of the world's most advanced engines to global automotive manufacturers.

Attracting tech and advanced manufacturing

While local authorities cannot create tech or AM clusters, they can use the policy levers that are within their grasp to plan an environment that fosters innovation.⁵² The RTPI has previously emphasised the importance of identifying the geographical scale at which a policy will have an impact and putting in place devolved governance arrangements so that these decisions can be made and implemented in the most effective way possible by the most appropriate body.⁵³

The recommendations made here and how they are implemented will differ depending on the area in question. For that reason the employment of a Chief Technology Officer (CTO) is possibly the most important as the CTO will be able to take the pulse of the local economy and make decisions as to which of these measures in particular would facilitate the growth of tech and AM. In the context of the UK the role could be created and devolved as part of a City Deal.

Recommendations

Monitor the local economy using company registration data

Whether an area will need a large scale intervention such as an innovation district or a smaller scale intervention such as de-risking of sites for affordable office space will depend on the complexion of the local economy. For that reason it is essential to monitor local economic drivers in order to have a sense of what the local growth industries are.

During our roundtable discussions in the research phase of this project a number of local authorities told us they are performing this monitoring exercise by using company registration data. This information allows local policies to adapt to and facilitate local economic growth, and to avoid policies, such as Permitted Development Rights in England, with unintended consequences for local high growth firms.⁵⁴

This recommendation is particularly pertinent in England at the moment, where many local authorities are reliant on increasingly ageing, pre National Planning Policy Framework (NPPF) data on employment land. This data is unlikely to reflect commercial demand and business needs in the post-recessionary period. Research shows that in London 60% of councils have pre-NPPF evidence bases; the East of England, 60%; Yorkshire and Humber, 57%; the North West, 56%; the South West, 56%; and the West Midlands, 53%.⁵⁵

Employ a team to engage with the sector

In order to attract and assist the growth of tech and AM it is crucial to get a sense of firms' spatial preferences, particularly when putting together a local plan. One measure that can be employed in this context is the employment of an individual or team at local level whose specific remit is to engage with local firms in order to get a sense of what planning policies would facilitate their growth. The Dublin Commissioner for Startups and the Amsterdam Chief Technology Officer provide interesting models in this context.

Case study: The Dublin Commissioner for Startups

The Commissioner works in conjunction with Dublin City Council to maximise the potential of Dublin's existing business ecosystem which already supports a wide range of tech and innovative start-ups and acts as a base for many global tech companies. A key responsibility in the position is to develop international recognition of Dublin as an innovation hub where companies will start-up, scale faster and create long-term sustainable jobs and added value to the economy. The role is the first point of contact between the tech sector and the city, and involves identifying office space and funding for tech startups.

Ensure adequate housing and infrastructure capacity

Above all else, the ability of a city to house and transport employees is crucial. While the measures discussed above have a role to play in attracting tech and AM firms, a consistent message from our roundtable discussions and interviews has been that affordability of office space and housing, along with transport infrastructure capacity are the dynamos behind local economic growth in any sector.

If there is a lack of affordable housing and office options and pressures on transport infrastructure no amount of other interventions will attract firms to an area. Therefore, from a planning point of view, if a city is to be attractive to tech and AM firms it is essential that the fundamental ingredients for an economically successful city (housing, transport, office space) are present. The RTPI's Strategic Planning policy paper makes a series of policy recommendations around how best to deal with issues of strategic importance such as housing and employment land.⁵⁶

Part 3: Planning as distributor

The growing spatial concentration of tech and AM firms in cities and city regions, and the fixation of policy makers on attracting these firms raise questions about why growth in these sectors is so desirable and who gains from it. Governments devote significant effort and finances to attracting tech and AM firms to their jurisdictions or to retaining existing businesses that threaten to move.⁵⁷ Intuitively it seems a good thing to invite this growth, but the wider effects of these policies are not fully understood, and research on spillover benefits is divided.

Optimists argue that policies to attract tech and AM firms are justified on the basis that benefits from tech and AM growth go beyond those employed in the sector, reach out to the rest of the local economy, and play an important role in employment growth, poverty reduction, and educational attainment. One line of argument within the optimist camp is that innovation and new technology have the potential to significantly reduce overall poverty.⁵⁸ Others find a multiplier affect for other types of employment in the local economy when there is growth in the tech and AM sectors.⁵⁹ These spillover benefits make tech growth particularly appealing to policymakers, in so far as they indicate the potential for tech and AM growth to address wider economic challenges such as unemployment and low wages.

More pessimistic analyses suggest that the presence of tech and AM can lead to a two-speed economy, and that tech sector growth is insular, with low-wage service workers employed to service affluent workers whose rising wages inflate the cost of living. Generally speaking large, successful, high growth cities tend to have marked rates of economic segregation, and tech hubs seem to experience this more than other areas.⁶⁰ Studies find that the share of tech jobs is positively associated with income inequality.⁶¹ In other words, the higher the share of tech employment in a city, the more unequal it is. In short pessimists argue that a technology-driven economy greatly favours a small group of talented and lucky individuals, and thus exacerbates economic segregation in cities⁶²

Planning for a tech and advanced manufacturing dividend

Whichever side of the optimist—pessimist divide one falls on, it is clear that in some cities tech and AM growth is divorced from wider social, economic, and environmental issues. In London for example tech growth has increased the cost of living in parts of the city which, coupled with a lack of housing options and office space, means smaller firms as well as individual households are being displaced

from central areas, and are missing out on the agglomerative and social benefits of being close to other firms and households. Industrial gentrification has been a particular problem in recent years with the introduction of permitted development rights placing the need for new homes in direct competition with that for business space.

A recent (2015) Tech London Advocates survey highlighted the negative impact of the surge in prices for start ups working within the tech sector. The majority of those surveyed believed that office space in London would not meet the growing needs of the tech community over the next five years. Furthermore over a quarter said they would consider relocating their office outside of London as a result.

A survey by the Federation of Small Businesses found that half of the 7,000 London-based small businesses they surveyed said that business property costs require urgent reform. Firms can now expect to pay an average of £55.34 per square foot for office space, an increase of over 7% from peak 2014 figures. High prices are translating into shifting employment patterns; the number of new Silicon Roundabout start-ups has fallen by a third as rising rents price them out of market.

Therefore one of the potential consequences of tech and AM growth for businesses as well as households is an entrenchment of regional inequality. Higher wages in cities with more tech employment tend to create greater incentives for more skilled workers to migrate to these cities. As housing costs rise, service and manufacturing workers and startups are displaced to the outskirts or to less expensive cities, which have smaller concentrations of tech and AM jobs. This has the potential to create a cycle in which the advantaged become more advantaged over time, while the disadvantaged sink further into poverty. It also poses a very real threat to innovation and growth within the sector as startups are forced into areas with lower concentrations of other tech firms, thus threatening the current pace of generation of ideas in tech and AM.

Existing measures

In England and Wales attempts to secure infrastructural spillover benefits from tech and AM growth rely on section 106 planning obligations and the Community infrastructure Levy (CIL). In Scotland the equivalent is a Section 75 planning obligation. Both are focused on site specific mitigation of the impact of development.⁶³ Although no CIL has been set up for Scotland, planning authorities can still impose obligations on developers to provide funding for (or themselves to deliver) infrastructure and community facilities, via the Section 75 mechanism. In

Ireland development contributions are payable under section 48 and section 49 of the Planning and Development Act 2000.

However not all of the potential spillover benefits of tech and AM growth are captured by S106/S75 and CIL or development contributions. This is because not all tech and AM growth involves new development, and crucially many of the potential benefits are social rather than financial in nature. Furthermore viability negotiations are increasingly resulting in fewer contributions to local infrastructure (and therefore fewer spillover benefits) than are being sought by local authorities.⁶⁴

Tax

Governments' commitment to encouraging the technology and AM sectors is reflected in the favourable corporation tax regimes that exist. In the UK measures such as the patent box and transfer pricing buttress an already generous rate of corporation tax. In Ireland the introduction of the Knowledge Development Box in 2016, and the new corporate tax credit of 25% for companies that conduct research in Ireland, along with an extended three-year relief from corporation tax for start ups beginning operations in 2015, will make the already generous tax environment ever more welcoming to tech and AM firms.⁶⁵

While these measures attract tech and AM firms, the low rates of tax they pay arguably mean that that the jurisdictions in which they locate are losing out on a whole suite of spillover benefits. All of which means that many tech hubs are experiencing economic growth alongside economic segregation, and a decrease in affordable office space, housing, and transport capacity.

Achieving balanced growth

Planning can pre-empt this trend by recognising and understanding current economic factors and growth trends so that strategic decisions surrounding development and local policy making add value to the local area, rather than increasing pressure on already stretched infrastructure and exacerbating economic segregation. By understanding the needs of an area, planners - working closely with leaders from within the tech and AM sectors and neighbouring authorities - can assist with harnessing the benefits of a technology driven economy to achieve successful, balanced growth.

The marked growth of the tech sector, its resources and – in many cases – the profitability of tech and AM firms, means there is clearly more which could be done

by these firms to help address challenges in the local economies in which they are based.⁶⁶ This should have significant repercussions for policy. For local and national policy makers, pursuing a tech growth agenda may lead to aggregate gains, but – if it is to address longer term city challenges – growth needs to be combined with efforts to ensure these gains are widely shared.

Cities experiencing tech and AM growth and concomitant infrastructure challenges need to go beyond reliance on existing planning and tax obligations and put together a clear City Technology Plan, taking into account the potential for wider benefits than financial receipts from tech and AM growth. The plan could lay out clearly the longer term challenges faced by the city and possible synergies that exist between the tech and AM sectors' resources and metro level challenges.

Capturing spillover benefits

The potentially unequal nature of the next economy provides a substantial challenge to policymakers. It is clear, given the high revenues being generated and the innovative technologies being developed in the tech and AM sectors, that there is a dividend to be had from their growth. While the debate about whether or not this growth produces spillover benefits for the local economy is ongoing, we argue that there are measures that can be taken to ensure that some of these benefits are secured, rather than simply hoping they will naturally accrue.

Recommendations

Recommendation 1: Use technology to deliver public services

Local government continues to face enormous fiscal challenges, which means that the cost of delivering public services must be substantially reduced. The growth of the tech and AM sectors has led to the development of products that can deliver public services in a more efficient, cost effective manner. Therefore at a time of squeezed Local Authority budgets, collaborations with these sectors can create efficiencies in public service delivery.

Case study: Waste collection by local authorities

In the face of budget cuts, increased tax burdens for landfill, and challenging targets to improve recycling, councils are exploiting GPS mapping technology to improve the quality and cost of waste collection, achieve better procurement, and develop more efficient service partnerships. Forest Heath District Council and St

Edmundsbury Borough Council save £300,000 annually and have improved services, the District of East Northamptonshire Council save £200,000 annually, and Middlesbrough Borough Council save £150,000 a year, all using similar technologies.⁶⁷

Recommendation 2: Train the local community

Research suggests that human capital is vital for the growth of high-tech employment.⁶⁸ However one of the biggest problems facing Tech and AM is a shortage of coders and software developers. Many tech firms' central urban locations often place them close to distressed, unskilled communities, which creates an enormous opportunity to make the local community tech literate in order to deliver the skills tech firms need.

Case Study: Tech City Apprentices

City governments are using their organising power to grow their local skills base in order to remain relevant to the needs of the tech sector. In London, apprenticeships are at the heart of the city government's drive to equip young people with the skills that employers need to grow and compete.

Hackney Community College has set up a new company, Tech City Apprentices, which has placed apprentices with tech companies such as Thomson Reuters, the advertising agency, Mother, digital developers, Poke, and leading online printing firm, Moo. These schemes are aimed at Londoners to fuel the growing skills demands of London's Tech Sector while concurrently growing the local skills base.

Recommendation 3: Collaborate with tech and AM firms in urban regeneration projects

The preference of tech firms and their employees for transit accessible, walkable, multi use districts provides a clear opportunity to re-imagine urban areas. In some cities previously industrial districts are undergoing a physical and economic transformation to chart a new path of innovative growth.

Case study: Cwmbran, South East Wales



In 2015 an ageing factory in Cwmbran, South East Wales, transformed into a world wide centre of excellence for vehicle breaking systems won an RTPI Cymru Wales Planning Award. Council planners working closely with the local workforce used the planning system to trigger regeneration of the factory site which has safeguarded 1170 jobs, cleaned up contaminated land and improved the pedestrian links to the town centre and train station. As a result of the planners' intervention the factory owners decided to re-invest in advanced manufacturing on the site as their principal research and development centre. The company, recognised by the Welsh Government as an important anchor company, has since had strong orders for its products manufactured at the site.

Recommendation 4: Use firms' particular skills and resources to address cities' infrastructural challenges

There is a huge potential for the products produced by tech firms to deal with the infrastructural challenges faced by cities. While there has been recent hostility towards the idea of smart cities and data for data's sake,⁶⁹ if data is gathered and products are developed with a particular city level challenge in mind this will give a practical grounding to the smart cities agenda.

Case Study: Bitcarrier in Barcelona

Bitcarrier uses Bluetooth and Wi-Fi signals generated by mobile telephones and global positioning system devices to provide highly intricate, real-time traffic information to cities. In 2012, Bitcarrier piloted a network of traffic sensors that helped Barcelona improve traffic flow in the city

Case study: Future City Glasgow

Future City Glasgow is an ambitious £24million programme aimed at using technology to make life in Glasgow smarter, safer and more sustainable. Glasgow is now embarking on a programme to deliver practical benefits for residents and visitors as well as attracting hi-tech jobs. Partners in the project include: Glasgow City Council, Glasgow Community & Safety Services, Sustainable Glasgow, health providers, energy suppliers and universities. The programme is far-reaching and encompasses several different projects. They include:

- Sustainable Glasgow - addressing issues such as energy conservation and generation, greater use of green technology such as white street lighting, air pollution and the integration of active transport (walking and cycling) routes with public transport networks.
- The creation of a Big Data Store collecting and analysing information from previously unconnected databases to influence future city services and developments and make it more accessible to more organisations.
- Setting up a centralised City Dashboard giving agencies and the public real time information on subjects like traffic flow, weather alerts, accident and emergency waiting times, rail and bus services and roads gritting. Access will be via smartphone apps.

Recommendation 5: Include metrics about the local economy in firms' strategic targets

In a similar vein to what this paper is proposing, Universities are now being encouraged to demonstrate a deep and long term commitment to making a local contribution. One way of doing this would be to include metrics about the locality (economic and/or social) in firms' strategic targets. The principle is the same for both sectors, namely to tie their success to the area in which they locate.

Tech and AM firms now have extraordinary potential to enhance economic growth in their host regions. Incentives should be strengthened to encourage maximum engagement in an enhanced Third Mission alongside Innovation and growth, and tech and AM firms should make facilitating local economic growth a core strategic goal.

Case study: Digital City, Tees Valley



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DigitalCity is a multi-partner initiative to create a high-growth digital cluster in Tees Valley, North East England. Led by Teesside University, it capitalises on academic expertise in digital media and technology and a strong enterprise agenda, providing a unique environment for the development of digital start-ups.

Since it began, DigitalCity has seen purpose-built facilities spring up on the campus and in the town centre, with a network of new buildings in development further afield. It is a cornerstone of the Local Enterprise Partnership's economic development strategy.

The initiative is defined by a joint investment by the university, local authorities and LEP. This partnership helps facilitate a number of key features. For example, an innovative fellowship programme aims to capture the best graduate talent and encourage the startup of new businesses. Meanwhile, the national and international virtual and physical networks provide benefits such as the transfer of digital skills and knowledge to businesses, a creative environment for entrepreneurs, postgraduates and established companies, and access to inward investment, innovation and trade partnerships. Local schools and communities also benefit from initiatives promoting social inclusion, raised aspirations and the sharing of digital skills.

4: Conclusion

While a lot of policy makers are trying to attract tech and AM firms to their jurisdictions, there is an increasing recognition of the fact that tech and AM growth can be insular and may not spillover to the local economy. The mistake would be to think that this is a conscious decision on behalf of firms rather than the result of a lack of dialogue between a sector which thrives off well planned spaces and a buoyant local economy, and local authorities.

As a first step there needs to be an acknowledgement of the symbiotic relationship that exists between tech and AM, and the local economies in which they locate. This then needs to be crystallised in more formal interactions where the city's needs coalesce with those of industry.

This means that growth within tech and AM should not be isolated from the growth of cities' physical and social infrastructure. Rather it needs to enable the delivery of city level, public resources such as transport, education, and housing. It also means that the delivery of these resources must be aligned, so that metropolitan areas, as the drivers of the new economy, can function in a coherent, holistic way.

This involves equipping cities to be environments for sustainable growth while also ensuring that the growth that does take place is beneficial to the whole city. In the context of tech and AM growth we have made a series of recommendations as to how this can be made to happen.

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