THE WORK FOUNDATION
PART OF LANCASTER UNIVERSITY

Streets Ahead: what makes a city innovative?

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Innovation – the successful exploitation of new ideas – is critical to the UK's future prosperity. Innovation is a major drive of economic growth. To be able to rise to the challenge of dealing with public sector debt as well as a decade of low economic growth, the UK must harness innovation led growth.

Cities don't innovate – but they provide the support environment for firms, entrepreneurs and institutions within them to innovate. But cities are vital for innovation, they foster the creation of knowledge by bringing businesses, people and institutions together – the innovation ecosystem. They help the flow of ideas, facilitate localised knowledge spillovers and enable innovation.

Different cities support very different types of innovation, and some cities are more successful than others. Some cities have a focus on technology led innovation, others support the creation of new products in the service or creative industries. And there is divergence of innovation performance between cities in the UK: London and cities in the greater South East have developed highly successful innovation ecosystems while cities in the north of England, as well as some coastal towns and ports, have struggled.

The coalition has put in place a localism agenda which may provide some of the levers to support growth. Local authorities are being incentivised to drive economic growth and will receive new powers to raise finance. The government is committed to simplifying the planning system and shifting power to businesses and communities. This will help cities reflect distinctive local circumstances across a range of policy areas.

Yet despite the localism agenda, innovation policy is becoming increasingly centralised – threatening the ability of cities to create innovation-led growth. Regional Development Agencies (RDA's) are closing, to be replaced with a network of business-led Local Enterprise Partnerships (LEPs). However, LEP's are unfunded and the majority of functions, including innovation, are not being transferred and are to be led nationally instead. At the same time the mandate for universities, one the key institutions in the innovation ecosystem, is changing as well as the incentives that shape the way they do businesses, while many of the direct funding streams they draw on to support innovation related activities are ending.

A renewed focus on innovation led-growth is required to ensure that the current round of government spending cuts alongside weak overall economic growth does not jeopardise the recovery. Local authorities are struggling to recover from the recession and dealing with intense spending pressures. The current lack of place based innovation policy is likely to be most severe in cities where the economy is worse, leading to increased disparities in economic performance.

In order to better understand the geography of innovation in the UK we have developed an innovation typology of cities. These are: high performing innovative cities, service sector innovators, technological innovators, innovative potential, and low innovation cities.

- **High performing innovative cities** are highly productive, specialised in a range of knowledge intensive innovative sectors, and benefit from a concentration of skilled labour. This set of cities includes London as well as other cities located near London in the greater South East: the cities of Guildford, Cambridge, Peterborough, Southampton and Swindon.

- **Service sector innovators** have highly productive economies but are specialised in high tech services and businesses services activities. They include the cities of Milton Keynes, Glasgow, Manchester, Reading and Bristol.

- **High technology innovators** generate significant economic output and are specialised in high tech manufacturing activities. They include Coventry, Derby, Northampton, Preston and Warrington. These high tech clusters are often anchored by one large global firm, such as BAE in Preston and Rolls Royce in Derby and Coventry.

- **Innovation potential cities** may have some strong niches, but do not yet have strong innovation ecosystems**.** They are places where we have identified some strengths but if they are to become successful they have challenges to overcome. This set of cities include: Gloucester, Birmingham, Ipswich, Sunderland, Newcastle and Worthing.

- **Low innovation cities** are those cities which have failed to sustain innovative firms and adjust to the knowledge economy. These cities include ex-coalmining cities (Barnsley, Mansfield), seaside towns (Blackpool, Plymouth and Hastings), port towns (Hull, Birkenhead and Middlesbrough), ceramics (Stoke-on-Trent) and textile manufactures (Bolton, Blackburn, Huddersfield and Rochdale).

These typologies provide a framework with which to consider potential policy responses:

- **High performing innovative cities** – managing the consequences of growth, ensuring adequate housing and infrastructure development, and that everyone is able to benefit from the opportunities available;

- **Service sector innovators** – the diversity of the service sector highlights the importance of building a robust evidence base to tailor solutions, building networks and links to universities/intermediary institutions, and using public procurement to stimulate markets and develop new innovative solutions;

- **High technology innovators** – enhance export and trade linkages, develop supply chain networks and knowledge partnerships, and create manu-services centres of excellence;

- **Innovation potential –** Identifying strengths and building on what it is already there, and removing barriers to innovative firms looking to expand; and,

- **Low innovation cities** – connecting the economy and labour market to areas of growth, identifying hotspots of innovation, creative use of public sector assets to stimulate innovative companies, improving skills and supporting young people to enhance occupational and geographical mobility.

The report also sets out a series of more general policies to support innovation-led growth in cities.

Meeting the wider conditions for innovation:

- Remove barriers to growth by ensuring that the wider conditions for innovation are met; and,
- Develop a robust and realistic understanding of urban innovation ecosystems.

Targeted policies for innovation – recommendations for firms, institutions, and for developing the skills and networks needed to support and drive innovation led growth:

- Cities should use Local Enterprise Partnerships (LEPs) to put businesses at the heart of leading and co-ordinating local innovation policy;
- Government should offer an Innovation Fund for LEPs;
- Cities need to create a system of effective networks and embedded innovation intermediaries;
- Local government should drive innovation through public procurement, shaping the market for innovative solutions;
- Developing the skills for innovation; and,
- Universities need to engage effectively with businesses and maximise their role as anchor institutions.

1. Introduction

As the economy slowly, and shakily, recovers from the deepest recession for sixty years, new sources of growth must be found to drive the recovery. For Britain's cities, harnessing innovation-led growth is more important than ever. Yet we know that innovation is highly concentrated in space, and that cities support very different types of innovation. Some cities, such as London and cities in the greater South East have highly innovative and competitive economies whilst others, particularly in the north, have struggled to create successful innovation ecosystems.

Successful cities are ones which have developed innovation ecosystems – where networks of entrepreneurs, firms, institutions, and supporting services come together to produce new goods and services.

Places innovate in different ways, **and national level policy is often not flexible, or nuanced enough, to provide appropriately localised solutions.** For example, a very different set of policy responses will be required for an economy based on knowledge intensive services to one still dominated and driven by clusters of high-technology manufacturing companies. The same is true of what is needed in an economy dealing with the consequences of growth compared to one which is adjusting to industrial restructuring and economic decline.

Despite these facts place based innovation policy is becoming increasingly centralised, is in flux, or is being disbanded altogether. After coming to power the coalition government announced the closure of the Regional Development Agencies (RDAs) the main agency tasked with shaping innovation policy below national level. These have been replaced by business led Local Enterprise Partnerships (LEPs). However, LEPs remain unfunded and the majority of functions – including inward investment, sector leadership, business support, access to finance and innovation – have not been transferred and are to be led nationally instead. Alongside this many local authorities are dealing with intense spending pressures and are having, in many cases, to wind down or curtail economic development activity. The mandate of universities is also changing, as new incentives shape the way they work.

At the same time, the coalition government has set in motion what it sees as a radical localism agenda. Local authorities are being incentivised to drive economic growth and are to be given new powers to raise finance. The Regional Growth Fund has been introduced with the aim of leveraging private sector investment to create economic and employment growth. Enterprise zones have been introduced with liberalised planning and broadband access in areas with strong growth potential. And the government has argued that the economy needs to be rebalanced away from London and the South East.

Whilst these measures might provide cities with some of the levers they need to stimulate growth, **a renewed focus on innovation led-growth is required to ensure that the current round of government spending cuts, alongside weak overall economic growth, does not jeopardise the recovery**.

In an era of dramatically reduced resources local policy makers need to be identifying niche strengths, building on local assets and making the best of what's on the ground. But to be able to do this policy makers need to understand the *potential to innovate* of different areas. With this in mind, this paper has sought to:

- Outline what makes up a successful innovation ecosystem;
- Map the innovative performance across the UK's cities;

- Develop a typology of cities to provide a framework for understanding the difference between the UK's urban innovation ecosystems; and,

- Set out how cities can stimulate innovation led growth.

The rest of the report is structured as follows

1. **The innovation challenge** – the next chapter sets out a definition of innovation and why innovation is essential for the future prosperity of the UK economy, before turning to look at how the UK currently measures up;

2. **Innovation and cities** – looks at the importance of cities for innovation and what comprises a successful urban innovation ecosystem;

3. **Innovation performance of cities** – this chapter presents a typology of British cities to better understand the geography of innovation and to provide a framework for potential policy responses;

4. **The changing policy environment** – outlines the government's approach to driving economic growth and current state of innovation in place policy;

5. **Building an effective urban innovation ecosystem** – sets out a series a recommendations for local and sub-regional government, firms, institutions, and for developing the skills and networks needed to support and drive innovation led growth;

6. **Conclusions.**

Innovation – the successful exploitation of new ideas – is critical to the UK's future prosperity. The UK faces an era of unprecedented challenges – the economy has been badly scarred by the economic crisis and is facing a decade of low growth alongside a long process of deleveraging as public/private debt is reduced. To rise to these challenges the UK must harness the next wave of innovation led growth.

Defining innovation

Innovation can be a difficult concept to define and there are number of competing definitions. For the purposes of this report we broadly define it as the commercially successful exploitation of new ideas. A more detailed definition is set out in Box A.

Box A: Innovation – a definition

Innovation means the successful exploitation of new ideas.

- **Innovation comes in many forms:** new or significantly improved products (goods or services), processes, marketing techniques, organisational methods in business practices, workplace organisation or external relations all constitute forms of innovation.[1]
- **Innovation does not only refer to radically new ideas:** radical and revolutionary innovation may have the greatest immediate societal impact, but new ideas do not have to be novel. An idea that is new to a firm rather than a new invention also counts as innovation – and can have significant benefits for that firm's productivity.
- **Innovation can mean adopting ideas from elsewhere:** innovation does not have to be devised in situ; the ability to draw on a variety of sources of knowledge and exploit ideas created in other city regions, universities and firms is critical.
- **Innovation is important to all sectors:** whilst often associated primarily with science and technology, innovation is in fact a major economic driver within all sectors of the economy.

Source: OECD (2005) Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data

All the evidence suggests that innovation creates new markets, generates comparative advantage for companies and increases productivity through more efficient use of labour, land and capital.[2]

Innovation simply means doing things better in new ways. It might be the result of years of research, or the result of a chance discovery; it is important to, and can happen in, any part of the economy from high tech manufacturing or knowledge intensive sectors to basic service sectors such as retail. Innovation comes in many forms and includes product, process or organisational innovation. It can be radical or incremental and includes ideas which are new to the market as well as ideas which are new to the firm.

[1] OECD (2005) *Oslo Manual: Guidelines for collecting and interpreting innovation data*
[2] Athey, G., Glossop, C., Harrison, B., Nathan, M. and Webber, C. (2007) *Innovation and the City: How innovation has developed in five city-regions*, NESTA

Innovation involves many actors – people, enterprises and institutions – and is a complex and recursive process involving multiple interactions in order to turn an idea into a process, product or service on the market. This complex set of actors and interactions has given rise to the term the **innovation ecosystem.**

Measuring innovation

Measuring the level of innovation in an economy is difficult. Much of research has focused on measuring inputs, such as the level of investment in research and development, investment in human capital, and outputs of innovation such as productivity growth, citations of academic journal articles and the number of patents produced.

Whilst important, these measures ignore major areas of innovation in which the UK has some strengths.[3] For example, traditional innovation indicators fail to capture innovation in services, or organisational innovation, yet these make up a significant proportion of productivity growth. And measuring the number of patents, for instance, does not tell us the value or commercial success of the idea. It is also difficult to capture the level and success of innovation at the local level from data.

Innovation is critical for growth and prosperity

Research by The Work Foundation[4] has shown how the global economy has changed radically over the past 40 years. Across the world countries have shifted away from economies dominated by manufacturing towards ones dominated by, and reliant on, the service sector for growth and employment. Economies have become much more 'knowledge intensive' and the ability to produce, use, share and analyse knowledge has become increasingly important as a source of economic growth and wealth creation. Amongst the evidence cited for this change is an increase in the supply of highly skilled workers and the expansion of 'knowledge intensive' industries.[5]

In 1970 'knowledge workers' accounted for around one fifth of the UK workforce.[6] This compares to around two fifths today, and by 2020 it is expected that over half of the workforce will be knowledge workers.[7] The workforce has also become better educated over the past 40 years, from one dominated by no formal qualifications and a few people with degree level qualifications, to one where relatively few workers have no qualifications and degrees are much more commonplace.

Knowledge intensive services have acted as the main driver of economic growth in the past decade and have generated more jobs than other sectors. There has been a 90 per cent increase in employment in knowledge intensive industries over the past 30 years, compared to less than 15 per cent in all other industries.[8]

[3] NESTA (2008) *The Innovation Gap*: *Why policy needs to reflect the reality of innovation in the UK*. London : NESTA
[4] Brinkley, I. (2008) *The Knowledge Economy: How Knowledge is Reshaping the Economic Life of Nations*. London: The Work Foundation
[5] High/medium tech manufacturing; transport and communications; financial services; high-tech services; business services' public knowledge-sectors; cultural and sporting activities
[6] As defined by the top three SOC codes: Managers and senior officials; professional occupations; associate professionals and technical occupations
[7] Brinkley, I. (2010) *Innovation, Creativity and Entrepreneurship in 2020*. London: The Work Foundation
[8] Brinkley, I. (2010) *From Recession to Recovery*. London: The Work Foundation

The changing nature of the economy has resulted in a shift in the patterns of business investment. In 1970 firms invested just £4 on 'intangible' investments – such as research and development, software, marketing, training and design – for every £10 on traditional investment in 'tangible' – machines, tools, and buildings. Spending on the creation and exploitation of knowledge and other intangible assets has tripled over the past thirty years so that in 2004, for every £10 that firms invested in tangibles such machinery, tools, and buildings, they invested £13 on the intangible investments to raise competitiveness and encourage innovation.[9]

Innovation has always been important to economic success, but there is now a consensus that it is the major driver of economic growth and competitiveness. For example, NESTA has estimated that between 2000-2007, innovation accounted for two-thirds of the UK's labour productivity growth. Labour productivity grew by 2.25 per cent over the period, of which innovation contributed approximately 1.8 per cent. Breaking down the contribution of innovation shows that 23 per cent can be attributed to investment in intangibles, 40 per cent resulted from knowledge spillovers (innovation by adoption/absorption) and a further 7 per cent came from improvements in the quality of labour.[10]

The UK's innovation challenge

In *Making the UK a Global Innovation Hub*[11] we argue that the UK economy faces an era of unprecedented challenges. The economy has been badly scarred by the economic crisis and faces a decade of low growth alongside a long process of 'deleveraging' as public/private debt is reduced. Despite this, our research identified new sources of economic growth that present enormous opportunities – the digital and low carbon economy, life sciences and health economics – and which underpin the current and next wave of innovations and new technologies.

To take advantage of these opportunities, the UK needs to create an effective innovation ecosystem. However, according to recent research by NESTA [12] the UK currently lags behind its major competitors in a number of key areas. Figure 1 shows the key functional steps in the innovation process in the center of the diagram, around which there are key related framework conditions.

The research suggests that the UK performs well on both competitively and in entrepreneurship. For example, compared to international comparators, the UK has a higher than average level of new company formations.

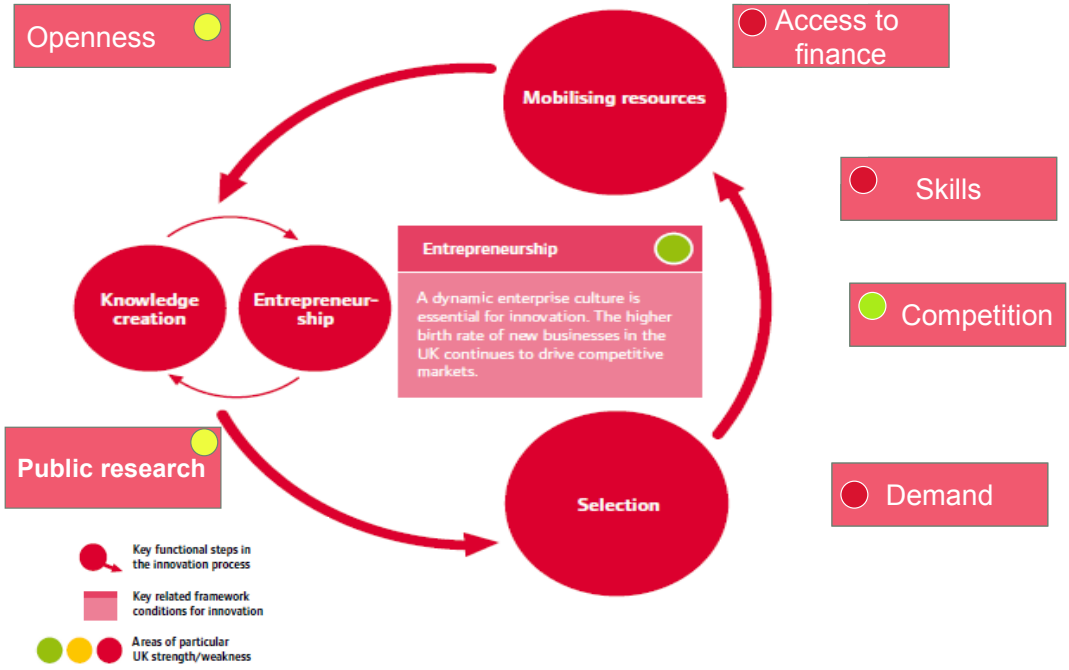
[9] Brinkley, I. (2008) *The Knowledge Economy: How Knowledge is Reshaping the Economic Life of Nations*. London: The Work Foundation

[10] NESTA (2009) *The Innovation Index: Measuring the UK's investment in innovation and its effects*. NESTA

[11] Anderson, B., Brinkley, I. and Hutton, W. (2011) *Making the UK a Global Innovation Hub: How business finance and an enterprising state can transform the UK*. Big Innovation Centre

[12] Miles, N., Wilkinson, C., Edler, J., Bleda, M., Simmonds, P. and Clark, J. (2009) *The Wider Conditions of Innovation in the UK: How the UK compares to leading innovation nations*, NESTA

Figure 1: Assessment of the UK's wider conditions for innovation



Source: NESTA

Where the UK performs less well is the quantity and quality of public research and the level of openness – referring to levels of trust and collaboration. These are both areas which will differ importantly at the city level, with cities such as London having a diverse, open economy helping the city create new product innovations.[13]

Yet the UK as a whole has some important weaknesses – the supply of specialist and technical skills does not meet the needs of firms, and the demand for innovation is lacking. For example, evidence suggests that UK customers are less open to new products/services, and since the recession and banking crisis the UK is close to bottom of the table in terms of access to finance for businesses.

[13] Nathan, M. and Lee, N. (2011) Does cultural diversity help innovation in cities? Evidence from London's firms. SERC Working Paper 69. LSE

Innovation does not take place in a vacuum; rather it is the result of a series of complex interactions between people, businesses and institutions. Cities are vital to this as they provide the environment and the infrastructure to support innovation, through access to workers, skills and consumers.

Why cities are important to innovation

Cities contribute to economic growth and prosperity because they foster the creation of knowledge by bringing businesses, people and institutions together. They help the flow of ideas, facilitate localised knowledge spillovers and enable innovation.

The UK is one of the most urbanised economies in the world with almost 82 per cent of England's population living in urbanised areas.[14] Research by The Work Foundation has shown that knowledge intensive employment is heavily concentrated in cities with 89 per cent of private sector knowledge intensive employment being located in urban areas in England and Wales.[15] Businesses are attracted to clusters of skilled workers and consumers. The concentration of highly skilled people in one place promotes the exchange of ideas and learning, facilitating the process of innovation. A large amount of the value generated by innovation comes from knowledge spillovers[16] – that is firms generating value via the absorption of innovation from external sources without having to pay for it. Jane Jacobs, for example, argued that creativity and innovation flourishes when the environment allows people of all different backgrounds to come together and mix.[17]

There are two prevalent explanations for why cities are important based around the ideas of agglomeration and specialisation – or as some have put it, urban hubs and local links.[18] It is argued that agglomeration provides: a more encouraging environment for firm formation by providing businesses with access to consumers and to a wide and deep pool of highly skilled workers; offers an environment that is attractive to highly skilled workers; and allows individuals and businesses the chance to exchange ideas and information.[19] Highly specialised economies, on the other hand, allow for extensive inter-firm collaboration, better labour matching and labour mobility between firms, and the ability to share supply chains. It should be noted that these two types of economies are not mutually exclusive and often coexist, especially in large urban areas.

Successful cities are places which have developed innovation ecosystems where networks of firms, universities, government and other institutions come together to create new products and services. Where innovation is successful it tends to be because an 'institutional thickness' has developed, 'the ensemble of local, social, and cultural conditions conducive to economic growth'.[20]

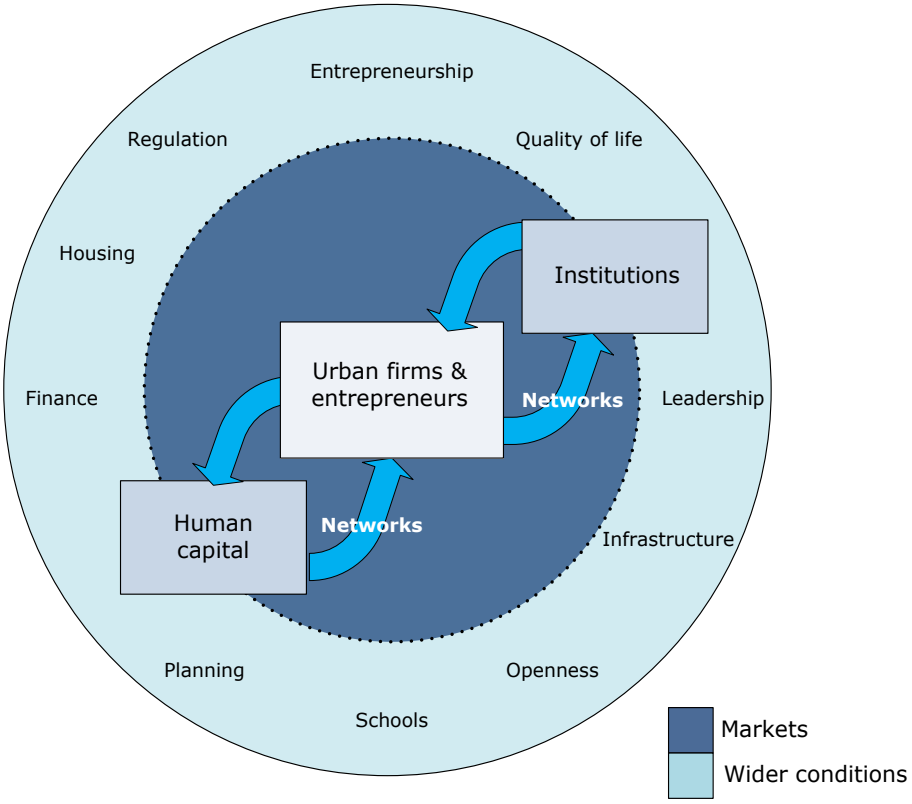
[14] Source: Urban Rural Definition DEFRA 2005; Population data 2001 Census, Office for National Statistics
[15] Morris, K. (2010) Flat or Spiky: The Changing Location of the British Knowledge Economy. London: The Work Foundation
[16] NESTA (2009) *The Innovation Index: Measuring the UK's investment in innovation and its effects*. NESTA
[17] Jacobs, J. (1969)
[18] Athey, G., Nathan, M., Webber, C. and Mahroum, S. (2009) *Innovation and the City*, Innovation: Management, Policy & Practice, Vol. 10, issues 2-3, p156-169
[19] Marshall (1920)
[20] See Amin and Thrift (2001); Rode et al., (2010)

Box B: Different roles for different cities

Duranton and Puga have highlighted the different roles cities can play in the life cycle of a product. Larger urban areas act as nurseries, incubating new ideas, encouraging and facilitating experimentation and learning and enabling the cross-pollination of ideas between people in different industries, with ideas moving between sectors as well as within them. They compared this to smaller specialised cities which had the added benefits of clustering in terms of shared supply chains and benefits accrued from sharing and matching of labour.

Spurce: Duranton, G. and Diego, P. (2001) Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products, American Economic Review

Figure 2: The urban innovation ecosystem



Urban firms and entrepreneurs are at the heart of the system, this is where the demand for and supply of innovation takes place.

Companies and entrepreneurs are the central element of the urban innovation ecosystem. They drive private sector innovation and are at the centre of where the demand for, and supply of, new ideas takes place.

Businesses generate new knowledge, uses 'old knowledge in new ways' and adopt knowledge from elsewhere.[21] Different firms do this in different ways. For example many large science and technology based manufacturing firms

[21] Mahroum, S., Huggins, R., Clayton, N., Pain, K. and Taylor, P. (2008) *Innovation by Adoption: Measuring and mapping the absorptive capacity in UK nations and regions,* NESTA

invest heavily in research and development activities, often in large internal research labs.[22] Service sector firms, on the other hand, spend less on visible R&D, and are more likely to innovate via collaborative relationships with other firms, new business models and strategies, coordinating supply chains, and adoption of new technologies.[23]

Institutions create and facilitate the spread of new knowledge, as well as setting the conditions for innovation.

Where innovation is successful it tends to be because an 'institutional thickness' has developed – where there are multiple innovation-driven public or private sector organisations and institutions.[24] These institutions include local and sub-regional government, further and higher educational establishments, business representative organisations, economic development consultancies and research centres.

Universities play an increasingly important part in knowledge generation, application and diffusion. This has been conceived in terms of a 'triple helix.'[25] As well as their traditional roles of research and teaching, universities are becoming increasingly entrepreneurial, developing innovation infrastructure such as incubator spaces and science parks. They are also becoming involved in the commercialisation of new ideas via spin out companies and operating licensing and patenting activities.[26]

As well as creating and diffusing new knowledge, evidence suggests that universities, along with other large institutions such as teaching hospitals and military institutions, can act as 'anchor institutions'.[27] These are institutions of a sufficient scale to have a large impact on the economy of an area – anchoring growth and jobs – and generating additional spillover effects via their supply-chain relationships.

Human capital represents the skills of the labour force – and includes key researchers and scientists.

In today's knowledge intensive economy human capital is more important than ever.[28] Businesses are attracted to clusters of skilled workers and consumers. The concentration of highly skilled people in one place promotes the exchange of ideas and learning, facilitating the process of innovation. For places to be successful they need to be able to create and retain talented people and create an environment that encourages and rewards risk taking behaviour.[29]

[22] NESTA (2007) *Hidden Innovation: how innovation happens in six 'low' innovation sectors, NESTA*
[23] Forfàs, (2006) *Services Innovation in Ireland – Options for innovation policy,* Forfàs
[24] Lagendijk, A. and Lorentzen, A. (2007) *Proximity, knowledge and innovation in peripheral regions: on the intersection between geographical and organizational proximity*, European Planning Studies
[25] Etzkowitz, H (2003) *Innovation in Innovation: The Triple Helix of University-Industry-Government Relations*, Science Policy Institute, State University of New York
[26] Moore, B., Ulrichsen, T. and Hughes, A. (2010), *The Higher Education Knowledge Exchange System in the United States*, PACEC/CBR
[27] Maurrasse, D. (2007) *City Anchors: Leveraging Anchor Institutions for Urban Success*, CEOs for Cities: Chicago, IL
[28] Levy, C. and Hopkins, L. (2010) *Shaping up for Innovation: Are we delivering the right skills for the 2020 knowledge economy?* London: The Work Foundation
[29] Florida, R. (2003) *Entrepreneurship, Creativity and Regional Growth;* The Emergence of Entrepreneurship: Governance, Start-ups, and Growth in the U.S. Knowledge Economy

Networks are vital for innovation, they help to generate a flow of new ideas and facilitate the spread of knowledge.

Networks can be an important mechanism for stimulating innovation via collaboration and the developing of new business models. They facilitate the diffusion of ideas, skills, and expertise – providing a forum for collaboration and learning. There are various types of networks, such as business to business, university-business, public and private, formal and informal, global and local, as well as supply chain linkages.

A review[30] of networking and the innovation capacity of firms identified benefits such as risk sharing, access to new markets and technologies, speeding products to market, pooling complementary skills, safeguarding property rights and access to external knowledge. The review also showed that *'those firms which do not cooperate and which do not formally or informally exchange knowledge limit their knowledge base on a long-term basis and ultimately reduce their ability to enter into exchange relationships'.*

Markets are a major driver of innovation.

Demand and markets play a critical role in the innovation ecosystem.[31] Consumer markets determine the success of new products and services and drive demand for new and improved goods and services.[32] For example, a report to the European Commission[33] found that changes in customer needs were three times more important in creating innovation opportunities for companies than other factors. The research also found that companies involve customers in the innovation process in a variety of ways – with the majority of businesses using customers as sources of new ideas, as feedback to refine and evaluate ideas and as the route to test out new prototypes.

The public services, as one of the UK's businesses largest customer, can help shape demand and supply of innovation in this way. Public procurement of goods and services can help stimulate the market for new goods and services, shaping and driving the development of new innovative solutions.[34] Finally, mobility in the labour market facilitates the diffusion of knowledge, as people move within and between companies contributes to knowledge spillovers.

A focus on the wider conditions that make a successful innovation ecosystem is essential.

The circle around the outside of Figure 2 represents the **wider conditions** that are important for cities and places to be successful. This is about making sure the basics are right:

[30] Pittaway, L., Maxine, R., Kamal, M. and Denyer, D. (2004) *Networking and Innovation: A Systematic Review of Evidence,* Institute for Entrepreneurship and Enterprise Development, Lancaster University Management School
[31] Athey, G., Glossop, C., Harrison, B., Nathan, M. and Webber, C. (2007) *Innovation and the City: How innovation has developed in five city-regions*, NESTA
[32] NESTA/The Work Foundation, (2010) *Demand and innovation: how customer preferences shape the innovation process,* NESTA
[33] Business Decisions Limited (2003) *The Power of Customers to Drive Innovation*, Report to the Enterprise Directorate General, European Commission
[34] CBI (2006) *Innovation and public procurement: a new approach to stimulating innovation*, CBI

- That there are good quality schools to attract and retain talented and skilled individuals and provide new skills;
- That schools and organisations foster a culture of entrepreneurship and openness;
- That firms can access finance;
- That there is a clear and collaborative leadership which fosters a shared vision and leverages public-private collaboration;
- That infrastructure and planning issues are dealt with effectively and the public realm is well maintained; and
- That there is a sufficient and mixed supply of housing available.[35]

[35] Nathan, M. (2010) *Munich: Staying Ahead on Innovation*, LSE Cities/ Brookings Metro Program Next Urban Economy Report, London: LSE

Innovation in the UK is highly concentrated in space. In particular London and many cities in the greater South East have developed highly successful urban innovation ecosystems. This is in stark contrast to cities in other parts of the country which have failed to harness innovation led growth and adjust to the knowledge economy.

Innovation performance is spiky

There are long standing and well documented differences in the innovation performance of the UK's regions.

Growth in GVA per head, a common measure of labour productivity, gives an insight into the level of innovation in an economy.[36] Figure 3 on the nest page highlights the difference in performance between the regions of the UK. London is the most productive and innovative region in the UK and the South East also outperforms the other regions in terms of output per head and growth in output per head:

- Output per head in London grew by 108 per cent over the period 1995-2008; and,
- The South East region recorded the second highest increase in output per head growing by 92 per cent over the period.

Other parts of the country are much less productive and despite a period of sustained investment and regeneration in lagging regions disparities in performance have actually widened.

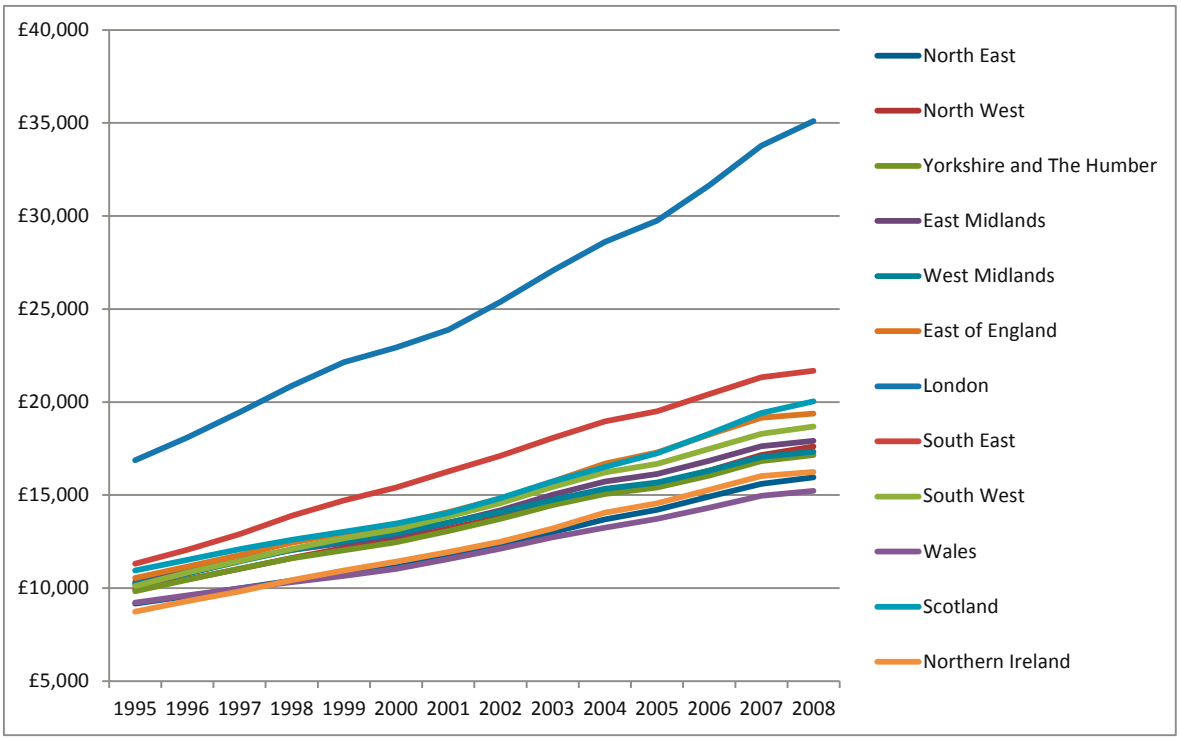
Research and development spending (R&D) is a commonly used proxy for the level of investment in innovation in an economy. In 2009, £15.6 billion was spent on R&D by UK businesses, a decrease of 2.5 per cent[37] compared with the 2008 total. Total R&D expenditure in 2009 represented 1.1 per cent of GDP, in line with recent years.[38]

Some sectors are more R&D intensive than others however. There was more R&D performed in the pharmaceuticals sector than any other, with expenditure in 2009 at £4.4 billion, 28.4 per cent of all spending. Other sectors with significant R&D expenditure were aerospace, computer and related activities, motor vehicles and parts and telecommunications.[39]

Investment in innovation by businesses varies significantly between the regions of the UK. In 2009 the UK regions with the largest R&D expenditure were: the East of England (24.9 per cent of the total) the South East (23.0 per cent) and the North West (13.1 per cent). The regional breakdown for business R&D in 2009 is shown in Figure 4 on the next page.

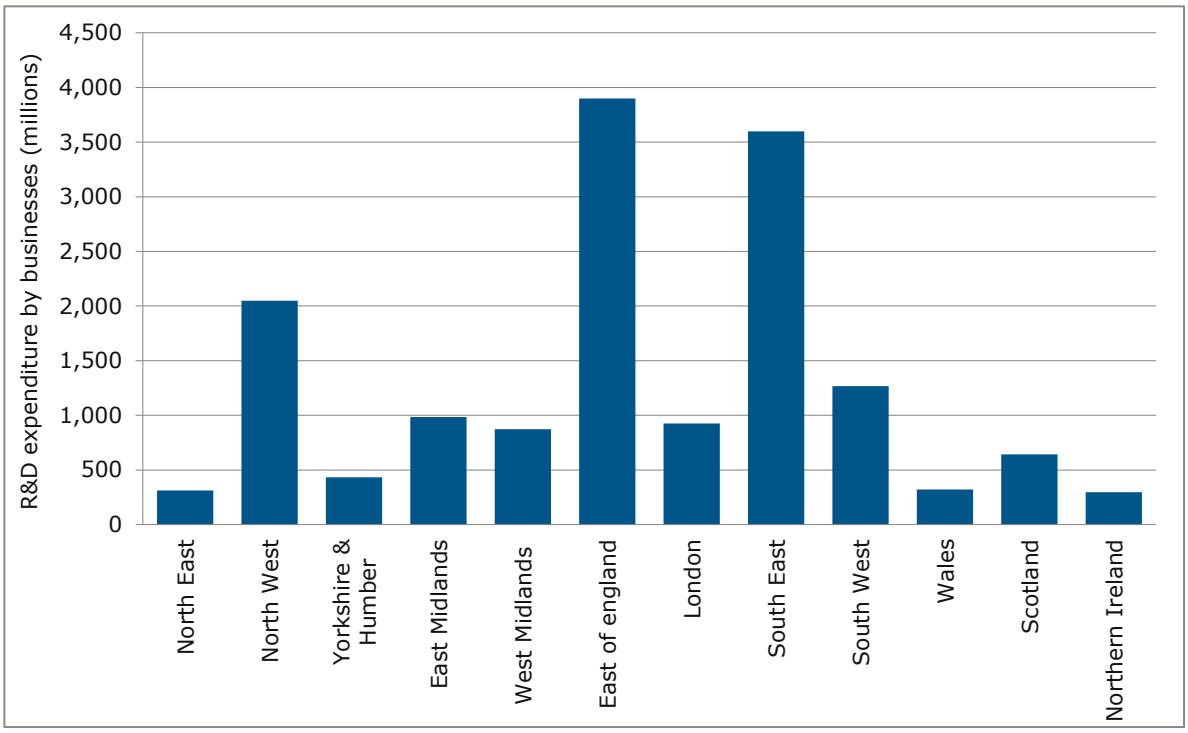
[36] As noted in the previous chapter NESTA estimated that innovation accounted for 2/3rds of productivity growth between 2000-2007
[37] At cash current price
[38] Source: Business Enterprise Research and Development Survey; ONS
[39] Source: Business Enterprise Research and Development Survey; ONS

Figure 3: GVA per capita, 1995-2008



Source: Regional Accounts; ONS

Figure 4: R&D expenditure by UK businesses (millions), 2009



Source: Business Enterprise Research and Development Survey; ONS

Across the UK as a whole R&D expenditure in the services accounts for 3.7 billion, or just 24 per cent of total R&D expenditure. The East of England (£1.1 billion), London (£600 million) and the South East (£801 million) together account for almost 70 per cent of the total investment. However, it should be noted that R&D figures for services significantly underestimate investment in innovation as they ignore investments in intangible assets, such as human capital, business development and organisational improvements.

Innovation – as well as being spiky across place – is also uneven across different sectors of the economy.

Although innovation is prevalent in all sectors of the economy evidence suggests that some sectors are more innovation intensive than others. A recent study[40] found the following sectors (3 digit SIC) to be high performing in terms of the number of new and adopted innovations over the three periods of the Community Innovation Survey:

- 24.4 – Manufacture of pharmaceuticals, medicinal chemicals and botanical products;
- 32.3 – Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods;
- 72.2 – Software consultancy and supply;
- 72.6 – Other computer related activities;
- 73.1 – Research and experimental development on natural sciences and engineering;
- 74.5 – Labour recruitment and provision of personnel.

However, data for the CIS shows that it is not just the high tech services firms that are the major innovators. There are innovative activities in all branches of services and the adoption of technologies produced in other sectors is a major form of innovation within the sector.

Innovation in cities

Innovation performance across the UK's cities is highly uneven and highly concentrated in space. For example in 2008 45 per cent (2,043) of UK registered patents were concentrated in just seven of the 133 NUTS3 Areas (London, Oxfordshire, Surrey, Hampshire, Hertfordshire and Berkshire).[41]

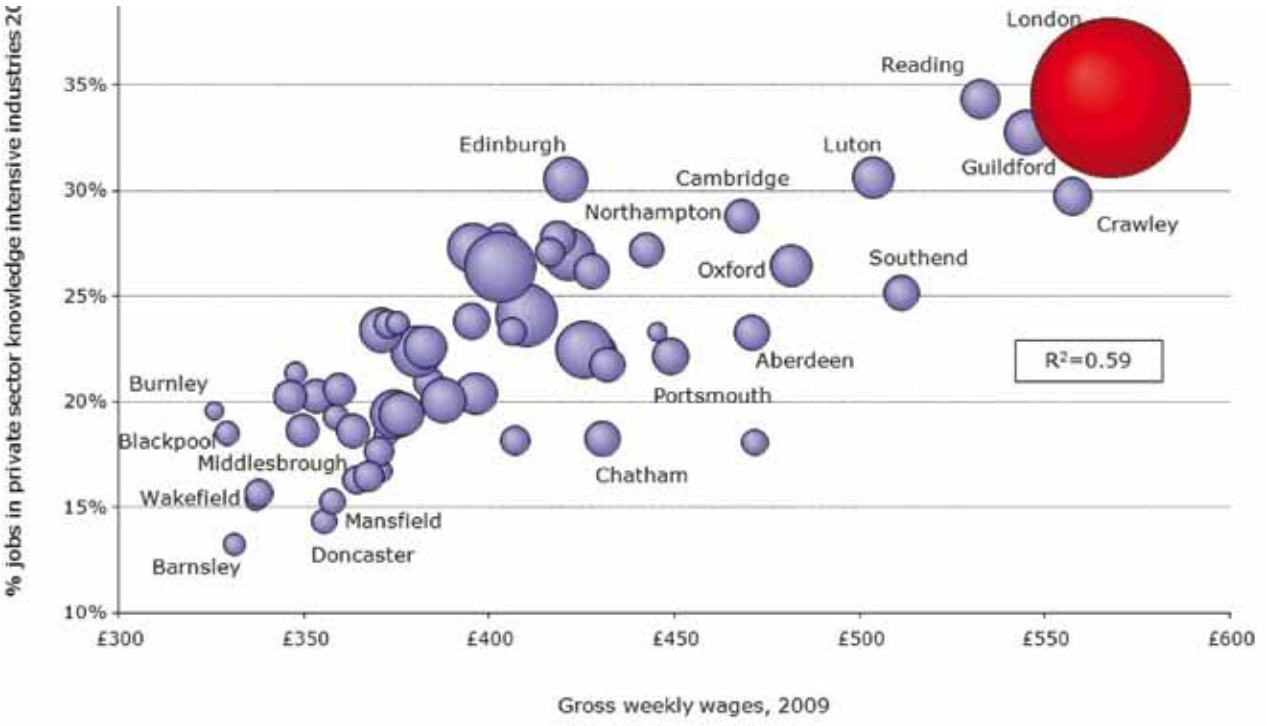
Figure 5 shows a strong relationship between the proportion of employment in private sector knowledge intensive industries and workplace wage levels – a commonly used proxy for the level of productivity and innovation in an economy.

[40] Richard Adams (2011) *The distribution of Innovation activity across the UK industry: Final Report*, Department for Business Innovation and Skills

[41] Source: Public Governance and Territorial Development Directorate, OECD

What is clear is that those places which are most successful outside of London are mainly concentrated in the greater South East and include places like Guildford, Luton, Reading and Crawley. On the other hand cities in the North of England, as well as many coastal cities in other parts of the country, are struggling – these include Burnley, Middlesbrough, Barnsley and Blackpool.

Figure 5: Weekly wages and the proportion of jobs private sector knowledge intensive industries



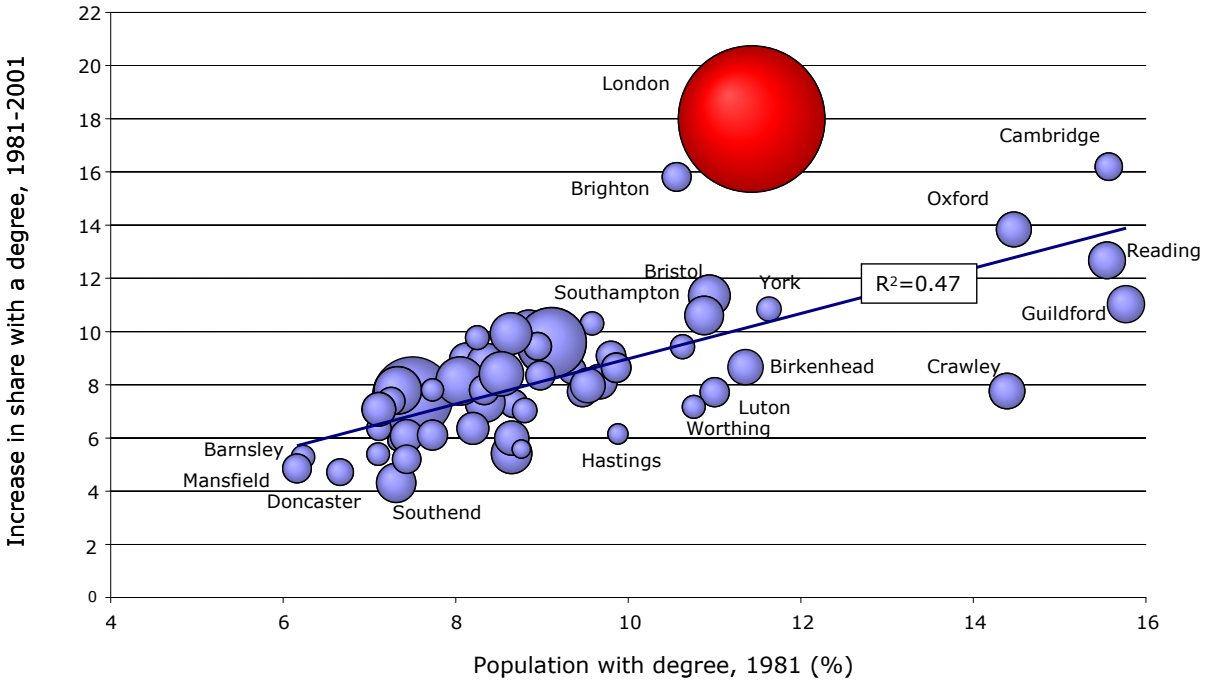
Source: Annual Population Survey Micro-data; BRES, ONS

Skills are incredibly important for innovation.[42] Evidence suggests that skilled labour has become increasingly concentrated in certain cities – the cities which were initially skilled have extended their lead. Figure 6 below shows that English cities with highly qualified workforces in 1981 have seen the greatest rise in the share of the population with degrees in the following twenty years.

As highlighted earlier the report, universities are a key part of the innovation infrastructure. Yet their contribution to innovation varies enormously between city to city and institutions to institution. Recent research[43] suggests that the most productive and innovative universities are located in the most competitive regions: nine of the top ten universities with the highest labour productivity were based in London, with the University of Cambridge placed third. All the universities with the lowest levels of labour productivity were located outside the greater South East, apart from two relatively small institutions in London, and a number were located in the UK's least competitive regions.

[42] Florida, R. (2008) *Who's Your City? How the creative economy is making where you live the most important decision of your life*, Basic Books, New York
[43] Johnston, A. and Huggins (2009) *The economic and innovation contribution of universities: a regional perspective*, Environment and Planning C: Government and Policy

Figure 6: Degree qualifications in 1981 and 2001 in English cities



Source: Wright, J (2011), Cutting the Apron Strings, The Work Foundation

We can also look at the contribution of universities to innovation through a 'research power' score, which combines the 2008 research quality scores with the number of research staff entered into the Research Assessment Exercise (RAE) and therefore takes scale effects into account. As Table 1 below shows, research power in London is very high so placing the city at the top on the table, and even with scale taken into account London remains by far the best performing city.

Towards an innovation typology for cities

As we have seen, innovation in the UK is highly concentrated in space. In an era of dramatically reduced resources policy makers in cities need to be realistic, they need to focus and build on what's already there. However, a very different set of policy responses will be required for an economy based on services to one still dominated and driven by clusters of high-technology manufacturing companies. The same is true of what is needed in an economy dealing with the consequences of growth compared to one which is adjusting to industrial restructuring and economic decline.

With this in mind, in order to better understand the differences between the successes, or otherwise, of urban innovation ecosystems, we have developed a simple classification of cities. This section presents the typologies as a framework for understanding the difference between the UK's urban innovation ecosystems and what potential policy responses might look like. This doesn't mean that the criteria we have applied are perfect, or will not change over time, but dividing cities in this way is useful for policymakers in assessing comparator cities and helping learn from appropriate policies elsewhere.

Table 1: Combined University Research Power of the UK Core Cities

City region	Staff entered	Linear RAE score	Research power	Research power of city region (population*/staff)x RAE
London	9,999	2.42	24,242	1,856
Edinburgh	3,127	2.26	7,076	836
Leeds	2,498	2.15	5,382	770
Birmingham	2,760	2.22	6,133	694
Glasgow	2,065	2.27	4,694	609
Bristol	2,063	2.38	4,911	585
Newcastle	2,034	2.34	4,760	547
Manchester	2,248	2.23	5,016	536
Sheffield	1,491	2.38	3,551	482
Nottingham	1,652	2.42	3,994	482
Liverpool	1,343	1.88	2,525	319

* Mid-year population estimate 2008
Original Source: *2008 RAE Results. Adapted from The Work Foundation, 2009.*[44]

Taking a mainly sector based approach – reflecting the availability of data at a city level – we have looked at a range of indicators to assess urban innovation ecosystems in the UK to develop the following typology of places:

- **High performing innovative cities** – high GVA, high productivity, strong private sector led growth, specialised in a range of knowledge intensive activities;
- **Service sector innovators** – high GVA, high productivity, specialised in high tech services and business services, and highly skilled;
- **Technological innovators** – high GVA , high productivity, and specialised in high-tech manufacturing;
- **Innovative potential** – evidence of key sector strengths in either services of high tech manufacturing but relatively low GVA and low wages; and,
- **Low innovation cities** – below average GVA and productivity, low skilled, negative private sector jobs growth and over-reliance of the public sector for jobs and growth.

This typology provides a useful starting point and framework for cities to start thinking about how they respond. However, it should be noted that there is no one size fits all approach to supporting innovation in cities – that it why it is essential that policy makers in cities develop a **robust and realistic understanding of their urban innovation ecosystems** and prioritise their policy responses accordingly.

[44] The Work Foundation (2009), *Innovation and the Future of Leeds City Region Economy*. London: The Work Foundation

Table 2: A typology of urban innovation ecosystems

Cities categorised by typology (and typology alphabetically)				
Highly innovative cities				
High performing innovators	**Service sector innovators**	**Technological innovators**	**Innovation Potential**	**Low innovation cities**
Guildford	Aberdeen	Coventry	Birmingham	Barnsley
Cambridge	Bournemouth	Derby	Cardiff	Blackburn
London	Brighton	Northampton	Gloucester	Blackpool
Oxford	Bristol	Preston	Ipswich	Bolton
Peterborough	Crawley	Warrington/Wigan	Leicester	Bradford
Southampton	Edinburgh		Liverpool	Birkenhead
Swindon	Glasgow		Newcastle	Burnley
	Leeds		Norwich	Doncaster
	Luton		Portsmouth	Grimsby
	Manchester		Sheffield	Hastings
	Milton Keynes		Southend	Huddersfield
	Nottingham		Sunderland	Hull
	Reading		Telford	Maidstone
			Worthing	Mansfield
			York	Middlesbrough
				Plymouth
				Rochdale
				Stoke-on-Trent
				Swansea
				Wakefield

Cities are defined using 2001 Travel to Work Areas

1. High performing innovative cities

London is a world class global city and one of the key drivers of the UK's economy. It has the greatest concentration of business services activity than anywhere in the UK, clustered in around the Central Activities Zone. The city is highly knowledge intensive with a highly skilled pool of labour.

The other high performing cities in this category form part of the London super-region and are clustered around the capital, located along the major transport arteries leading out of the city. They too have diverse, highly successful, and highly skilled economies. The London super region benefits from concentration and co-location of numerous innovative sectors and firms, many of which have international trade inks.[45]

[45] Simmie, J. and Sennett, J. (2001) London: International Trading Metropolis, in - Innovative Cities (2001), Spon Press

These cities have fared better than elsewhere in the recession and have led in the recovery.[46] However, a renewed focus on innovation led-growth is required to ensure that the current round of government spending cuts alongside weak overall economic growth does not jeopardise the success of these cities.

Part of this means ensuring that the wider conditions for innovation are met and that barriers to further growth are removed. This means making sure that there is adequate house building and infrastructure investment, that issues of overcrowding are dealt with effectively, and they need to work to ensure that those who have not benefited from growth – such as those in deprived communities – are able to take advantage of available opportunities.

2. Service sector innovators

Together these cities account for 21 per cent of all the UK's jobs.[47] Many of these cities have grown rapidly, achieving a rate of private sector jobs growth that has outperformed the national average. For example, between 2003 and 2008 private sectors growth in Aberdeen, Milton Keynes, and Glasgow was 10 per cent, 7 per cent and 5 per cent respectively against national growth of just +2 per cent.[48]

This category contains the financial services centres of Manchester, Edinburgh, and Leeds – which outside of London have the highest number of jobs in financial services – as well as high tech business services cities like Glasgow and Milton Keynes.

Innovation in the service sector has been a topic of growing interest amongst policy makers and academics, reflecting the shift in the economy from manufacturing to services which now account for the lions share of both employment and output growth. The service sector covers an incredibly diverse range of activities. However, firms within the sector share a number of commonalities – they are generally interactive and intangible in nature and the focus is interactions and serving the customer rather than producing physical goods.

Service sector innovation is distinct and different to the types of innovation that are prevalent in manufacturing and process activities. Service innovation includes innovation through the development of new business models, customer interfaces and new services products.[49] Studies suggest that service innovation is best described as a process of collective problem solving in which learning within organisations and connections between organisations play a major role.[50] Research has found, for example, that firms within the business services sector are characterised by exceptional levels of external networking and inter-firm linkages.[51] Services innovation is most often incremental and multi dimensional and often involves technological and non-technological elements.

[46] Lee, N. et al., (July 2010) *No City Left Behind*. London: The Work Foundation
[47] Source: BRES, ONS, 2009
[48] Source: Annual Business Inquiry, 2002-2008, ONS
[49] Forfàs, (2006) *Services Innovation in Ireland – Options for innovation policy*
[50] Love, H., Roper, R. and Hewitt-Dundas, N. (2008), *Service Innovation, Embeddedness and Business Performance: UK Regional Evidence*
[51] See Bryson et al., 1993/1997, Keeble et al 2001

Box C: Service innovation – a definition

A new or considerably changed service concept, client interaction channel, service delivery system or technological concept that individually but most likely in combination leads to one or more (re)new(ed) service functions that are new to the firm and do change the service/good offered on the market and do require structurally new technological, human or organisational capabilities of the service organisation.

Source: van Ark B. and den Hertog, P. (2003) Service Innovation, Performance and policy: A review, Ministry of Economic Affairs, The Hague, Netherlands

As with many other parts of the economy a key characteristic for service sector innovation is the trend towards greater use of external specialist skills. Service sector firms are also more likely to be involved in inter-firm collaboration and strategic partnerships allowing firms to share the risk associated with bringing a new idea to market.[52]

Networks can be an important mechanism for stimulating innovation via collaboration and developing of new business models. They facilitate the flow of ideas, skills, and expertise – providing a forum for collaboration and learning. Types of networks include: local networks, informal and formal business to business networks, university-business links and public/private networks. Because of the internationalisation of knowledge of production, many firms will increasingly depend not on the creation of knowledge but on its absorption from elsewhere. Therefore, there is a need for service businesses to create not just local but global links.

Links with customers are very important for service innovation so that businesses have the ability to capture and diffuse customer information within an organisation and then use it to develop new and improved products and services and implement organisational changes. It is also crucial that places build effective links to supporting services, such as banks, business support, legal and accounting.

Policy recommendations include:

- **Build an evidence base.** The service sector is incredibly diverse. It is crucial that cities develop a robust evidence base, or draw on existing sources of information, to identify those parts of the services sector they have particular strengths or competitive advantages in. Effective policy responses will be very different for a cluster of creative industries businesses compared to, for example, a telecommunications cluster;

- **Develop university-business links.** Service businesses tend to have weaker academic linkages, particularly non-technological services firms. To stimulate innovation places should support links, and knowledge transfer, between business and universities;

[52] Keeble, D. and Nachum, L. (2001) *Why do business services firms cluster? Small consultancies, clustering and decentralization in London and southern England*, Centre for Business Research and Department of Geography, University of Cambridge

- **Use public procurement to create markets for new goods and services.** Through its procurement function local government can develop the market for innovative goods and services leveraging private sector investment at the same time as creating more efficient public services; and,

- **Develop a effective networks of local firms, intermediary institutions, and universities.** Ensure that the right type of sector networks exist and that there is an effective network of supporting services available – ie banks, legal and accounting, and auditing.

3. High technology innovators

This group of high technology innovator cities have strengths in sectors such as pharmaceuticals, chemicals, automotive, and aerospace. In many cases they are the location for a large, high profile manufacturer with large outsourced supply chains.[53] They are strategically located along the UK's main motorway and railway network which means that many of these cities also fulfil the function of key distribution and logistic hubs.

Manufacturing is extremely important to the UK economy, as the sixth largest manufacturer globally by output and a leading exporter of technology intensive manufacturing goods.[54] Based on GVA the UK's aircraft and aerospace industry is the largest in the world behind the USA and UK's chemical sector is the seventh largest producer globally.[55]

The aerospace industry in Britain is highly clustered – for example Derby and Preston together account for well over a third (39 per cent or 25,250 jobs) of all of GB's aerospace jobs. Coventry has a large automotive sector while Northampton benefits from the presence of pharmaceuticals companies as well as high performance engineering and motor sport activities clustered around the Silverstone motor racing circuit. These high tech manufacturing clusters are often anchored by one large, global firm such as BAE in Preston, and Rolls-Royce in Derby and Coventry.

Recent government research[56] into the advanced manufacturing sector in the UK suggests that innovations in the sector are not diffused widely enough. This suggests that policy makers should seek to build on – or support the creation of– supply chain networks and knowledge transfer partnerships which can help build trust and increase the level of collaboration between firms. Export and trade links are also extremely important for the future success of advanced manufacturing firms. However, the difficulty in gaining access to overseas networks and clients, due to unfamiliar business environments, trade barriers and different IP and regulatory frameworks, has also been identified as a barrier to the growth of the sector.

[53] Sissons, A. (2011) *More than making things: A new future for manufacturing in a service economy*. London: The Work Foundation
[54] UNCTAD Handbook, Statistics, 2010
[55] Source: GVA by Industry, ONS
[56] Department for Business, Innovation and Skills (2010), *Manufacturing in the UK: An Economic Analysis*, BIS Economics Paper NO. 10A

Box D: Importance of manu-services to the UK economy

Manu-services are important to the UK economy for a number of reasons:

- Manu-services are becoming the standard in markets for some manufactured goods, and this is likely to spread into other markets. If UK businesses are to compete in these markets, they must be able to combine services with manufacturing effectively;
- Manu-services help to support the long and complex supply chains involved in manufacturing advanced goods;
- Manu-services provide new opportunities for firms to innovate and capture extra value by creating new packages of goods and services and introducing new business models;
- Manu-services fit in closely with the UK's strategic strengths, and could be a significant area of competitive advantage for the UK; and
- Manu-services may have more potential to create jobs in manufacturing than traditional production activities because service activities tend to be more labour intensive and less easily replaced by technology.

Source: Sissons, A. (2011) More than making things: A new future for manufacturing in a service economy, The Work Foundation

In our recent research[57] we set out how the manufacturing sector has 'moved beyond just making things'. That increasingly firms are turning to a new manu-services business model involving meeting customer needs through the combination of goods and services. In *More than Making Things* we argued that these new business models demand new policy responses that can help support firms to develop advanced business models and service capabilities.

Policy recommendations:

- **Enhance exports and trade linkages.** Policy makers should seek to identify those high technology firms who are seeking to develop their export bases, networking these firms together, and building links with UK Trade and Investment;
- **Develop strong supply chain networks and links with innovation intermediaries and institutions.** Use supply chain development work to drive and diffuse innovations. Universities can act as neutral intermediaries to develop inter-firm collaboration and linkages; and,

[57] Sissons, A. (2011) *More than making things: A new future for manufacturing in a service economy*. London: The Work Foundation

- **Develop manu-services centres of excellence.** Look at how universities, Manufacturing Advisory Service and Technology Innovation Centres can come together to support high tech manufactures develop advanced business models and service capabilities.

4. Innovation potential

This category encompasses a diverse range of cities. They are cities where we have identified some strengths but if they are to become successful they all have particular challenges to overcome. Cities such as Birmingham, Cardiff, Liverpool and York have economies that are dominated by, and have been reliant on, the public sector for growth and jobs. Others, for example, Sunderland have experienced strong private sector jobs growth but still lags behind on key measures of success such as productivity levels, skills and earnings.

However, many of these cities have niche strengths and clusters of highly innovative firms. For example, Gloucester has a strong advanced engineering/aerospace cluster with companies such as aircraft landing gear manufacturer, Messier-Dowty, along with a number of other high tech innovative firms such as GE Aviation, Bond Aviation Group and Moog Controls. Sunderland retains a large automotive cluster based around the Nissan plant, while Telford and Portsmouth have large defence sectors.

Policy responses include:

- **Identifying strengths and building on what is already there.** It is crucial that cities develop a robust and realistic understanding of their urban innovation ecosystems. In an era of few resources, cities need to be strategic in their approach and priorities. The focus needs to be on building upon what is already there and helping existing firms increase their capacity for innovation rather than trying to attract companies from innovative sectors;

- **Removing barriers to innovative firms looking to expand**. To understand the barriers facing businesses and seek to remove/minimise these. This could mean working with schools and businesses to ensure that the right skills are available, mapping supporting services to make sure that there are no gaps in provision, or identifying and overcoming barriers to innovation such as procurement rules or planning policy.

5. Low innovation cities

The final group of cities have been classified as low innovation cities. That is not to say no innovative activity exists; as demonstrated earlier in the chapter there are innovative firms in all parts of the country and in all sectors of the economy. However, the scale of activity is not sufficient to counteract their economic decline.

These cities have failed to sustain innovative clusters of firms and include ex-coalmining cities (Barnsley, Mansfield), seaside towns (Blackpool, Plymouth and Hastings), port towns (Hull, Birkenhead, and Middlesbrough), ceramics (Stoke-on-Trent) and textile manufactures (Bolton, Blackburn, Bradford, Huddersfield, and Rochdale). The seaside resorts of Blackpool, Plymouth and Hastings have suffered from the rise of less expensive, foreign package holidays,

eroding the customer base that they depended on for their trade. And in Lancaster for example, in the 1960s/70s mills closed at a rate of almost one a week as cotton production shifted to the Far East.

The loss of employment in these traditional industries in these cities has, in part, been counterbalanced by the growth in the public sector over the last few decades, which also acted as a buffer towards higher levels of unemployment in the recession.[58] This means that the austerity measures being introduced by the coalition government are likely to have further negative consequences on the economies of many of these places.

Policy responses include:

- **Making the best of geography.** Many of these cities are located near areas of growth. Policymakers need to look to strengthen transport linkages connecting businesses and residents with the wider the economic hinterland;

- **Identify hot-spots of innovation** and put measures in place to scale up and provide support for innovative firms who are wanting to grow;

- **Managing the consequences of decline**. These cities are still struggling to recover from industrial decline and subsequent economic restructuring. Place-shaping activity such as the creative use of underused public sector assets and empty spaces can help transform deprived neighbourhoods and provide spaces for creative and innovative firms; and,

- **Supporting young people and improving skills.** Education is essential to improve both the occupational and geographical mobility of residents. Skilled individuals are more likely to relocate or to access opportunities further afield. Cities should seek to improve vocational education, information and advice within schools and links to business, as well as encouraging residents to take up training opportunities.

[58] Lee, N. (2010) *No City Left Behind? The geography of the recovery and the implications for the coalition.* London: The Work Foundation.

5. Policy context

This paper is being written at a time of major change in policy and a massive reduction in public sector funding. This is impacting on place based innovation policy and initiatives as well as the supporting institutional landscape in quite fundamental ways.

Before the recession and subsequent change in government, innovation policy in the UK was crystallising. The Labour government had recently published the *Innovation Nation*[59] White Paper, which emphasised the importance of innovation for the UK's future prosperity. Alongside a growing recognition of innovation as a major driver of economic growth the importance of place was increasingly being emphasised by policy makers. For example, Innovation Nation proposed setting up New Partnerships for Innovation at a regional level, as well as, where appropriate, the use of Multi-Area Agreements (MAAs) to promote innovation at a sub-regional level.

The importance of place was also being stressed in broader economic development as well. Emphasis was placed on more local control and devolution of powers to sub-regions, as evidenced by Multi Area Agreement's, City Region Pilots, Employment and Skills Boards and City Strategy Pathfinders to name but a few initiatives.

The coalition government is yet to publish its innovation strategy, however their approach to driving economic growth has been set out in the Local Growth White Paper.[60] The main focus of policy is on rebalancing the economy towards private sector employment, particularly in those places that have been heavily reliant on the public sector. The Local Growth White Paper emphasises driving and removing barriers to economic growth at the sub-national level, a shift of power to communities and businesses, and a new and different relationship with business.

Regional Development Agencies (RDA), one of the main organisations which shaped innovation policy below national level, have been abolished by the coalition government. They are being replaced by Local Enterprise Partnerships (LEPs), sub-regional partnerships tasked with driving economic growth. However, many of the functions have not been transferred and are to be led nationally instead, in particular, inward investment, sector leadership, business support, access to finance (such as venture capital funds) and innovation. This means a lot of place based innovation infrastructure is being disbanded, is influx, or is becoming increasingly centralised.

At the same time the mandate for universities is changing, as well as the incentives that shape the way they do businesses. Many of the direct funding streams for innovation related activities such as Knowledge Transfer Partnerships are ending – although the government has committed £150 million to support the Higher Education Innovation Fund.

On the other hand, the government has put in place what it sees as a radical localism agenda. Local authorities are being incentivised to drive economic growth and are to be given new powers to raise finance.[61] The Regional Growth Fund has been introduced with the aim to lever private sector investment, create economic growth and sustainable employment. Enterprise zones have been introduced with liberalised planning and broadband access in areas with strong growth potential. And the government has argued that the economy needs to be rebalanced away from London and the South East.

[59] Department for Innovation Universities & Skills (2008), *Innovation Nation* White Paper
[60] HM Treasury (HMT) and Department for Business, Innovation & Skills (BIS) (2011) *The Plan for Growth*, London, HMT
[61] Department for Communities & Local Government (DCLG) (2011) *Local Government Resource Review: Terms of Reference*

However, local authorities are struggling to recover from the recession and dealing with intense spending pressures. In many cases this means that a lot of economic development activities, which are discretionary rather than statutory functions, are wound up or cut. Whilst some of the measures set out in the Local Growth White Paper may provide part of the tools required for local policy makers to support economic growth, the impact of the loss of direct funding for place based innovation policy is likely to widen economic disparities between areas.

The UK's economy is facing an era of unprecedented challenges. These include dealing the consequences of a decade of low growth, intense pressures on public sector spending, as well as societal – such as an aging population – and environmental changes. To be able to rise to these challenges there must be a renewed focus on innovation led growth to ensure that the current round of government spending cuts alongside weak overall economic growth does not jeopardise the recovery.

This paper demonstrates that there is a distinctive geography of innovation in the UK – different places have different strengths as well as different challenges. In order to overcome these local challenges, cities need a policy mandate alongside the financial capability to respond. Unfortunately government policy has acted to centralise some of these powers at the same time as committing to reducing the structural deficit, resulting in limited financial capacity to deal with some of these challenges.

We think that given this era of austerity radical changes need to happen to the architecture of innovation: new networks and new relationships across the public and private spheres need to be created, government needs to stimulate the market for new innovative solutions via public procurement, businesses need to be put at the heart of co-ordinating and leading innovation policy and universities need to forge new relationships with local firms and entrepreneurs.

The following section sets out a series of recommendations to support this agenda.

Policy recommendations

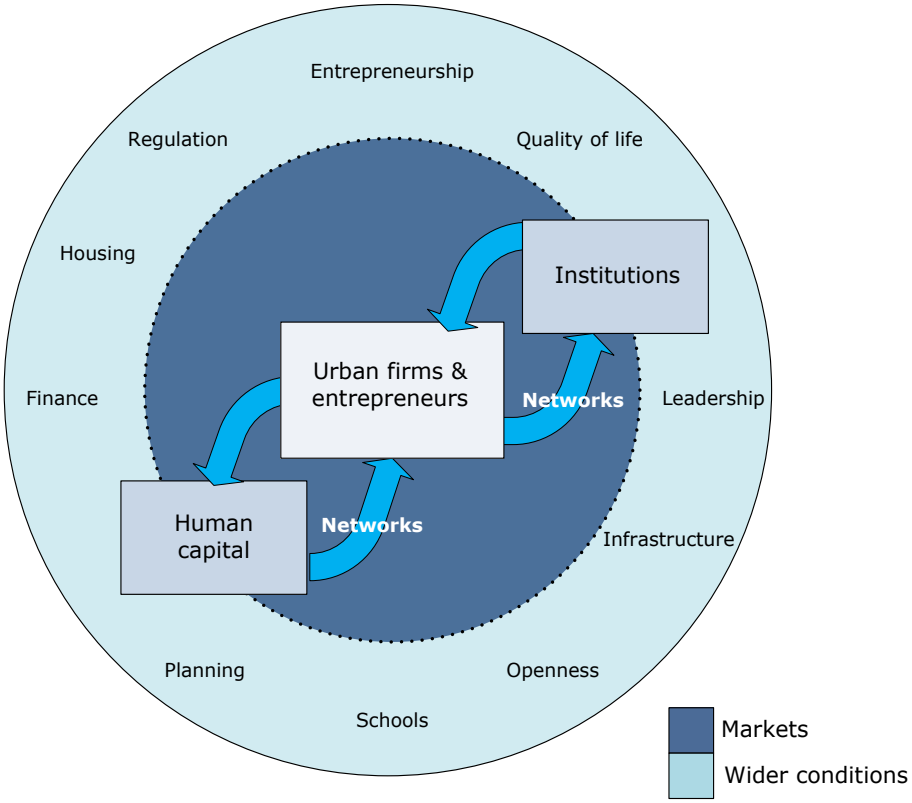
The previous chapters have emphasised that different places innovate in different ways. However, national policy frameworks are often too inflexible to respond to these differences. Previous government policy has focused on the levelling up of uncompetitive regions via sustained investment in place through Regional Development Agencies as well as targeted local funding streams. Despite this, disparities in performance have not reduced, in fact – as shown in Chapter 4 – the gap between rich and poor regions has actually widened.

In an era of dramatically reduced resources local policy makers need to identify niche strengths, build on local assets and make the best of what's on the ground. Some of the coalition's policies, set out in the previous chapter, might provide cities with some of the levers to stimulate growth. However, to ensure that the current round of government spending cuts alongside weak overall economic growth does not jeopardise the recovery, a renewed focus on targeted policies for innovation is required. With this in mind we look at the following areas:

- **Meeting the wider conditions for innovation** – understanding and removing barriers facing innovative firms; and,

- **Targeted policies for innovation** – recommendations for firms, institutions, and for developing the skills and networks needed to support and drive innovation led growth.

Figure 7: The urban innovation ecosystem



Meeting the wider conditions for innovation

In all cities a focus on 'place-shaping' is still critical. This is the basics of economic development and involves ensuring that the wider conditions for innovation are met and that barriers facing innovative firms are understood and removed.

Recommendation 1. Remove barriers to growth by ensuring that the wider conditions for innovation are met.

Local policy makers need to understand the barriers facing businesses and seek to remove/minimise these. This is the basics of place-shaping and economic development and includes ensuring that there is a sufficient supply of suitable housing to meet economic growth, that schools are of a sufficient quality, that there is a supply of skilled labour, that transport infrastructure and digital connectivity is up to scratch, and that the public realm is well maintained.

Excellent schools provide a feedback loop that help to attract and retain talented workers and their families, the firms they work in as well as generating new talent. Investment in physical and digital infrastructure is critical to connect firms to each other as well as national and international markets.

The importance of clear and collaborative leadership for innovation has been highlighted by academics[62] and policy makers alike.[63] [64] System leaders play a key role in opening doors for innovators and creating the space for innovation to happen. Cities need to develop a mobilising long term strategic vision and engage businesses and the community.

Local Authorities need to deploy their planning policies effectively, reducing the regulatory burden on business, and maximising the potential growth. Planning policy can also be used as a lever to design the 'soft innovation infrastructure' by creating the kind of built environment and workspaces that encourage mixing and collaboration.

Recommendation 2. Cities need a robust and realistic understanding of their urban innovation ecosystem.

In an era of few resources cities need to be strategic in their approach and prioritise. To do this policy makers need to develop a robust and realistic understanding of the strengths of their innovation ecosystems and identify areas with the potential to drive growth in the future. Places need to build on what is there rather than trying to attract companies in innovative sectors from elsewhere. Policy makers need to seek to maximise where strengths exists, and where innovative activity can be identified and scaled up. But they need to be realistic – not everyone can be next digital hub or centre for green technology.

Beyond place-shaping – targeted policies for innovation

Targeted policies for innovation – recommendations for firms, institutions, and for developing the skills and networks needed to support and drive innovation led growth.

Recommendation 1. Cities should use Local Enterprise Partnerships (LEPs) to put businesses at the heart of leading and co-ordinating local innovation policy.

Firms are at the heart of any urban innovation ecosystem. Local Enterprise Partnerships present an opportunity to engage businesses in a new way, leveraging in private sector expertise and resource. Business leaders can be used as catalysts to forge new relationships and kick start sector-networks, supply chain development work, lead on the delivery of pro-bono business mentoring, advice and guidance. LEPs should also provide a **single point of access** for local businesses and inward investors.

In geographic terms the UK is relatively small and many LEP's lack the scale needed to deliver support for some sectors and groups, for example, the UK biotech cluster. With the demise of regional bodies LEPs should consider **pan-LEP alliances** on innovation activity projects where appropriate.

[62] Nathan, M. (2010) *Munich: Staying Ahead on Innovation*, LSE Cities/ Brookings Metro Program Next Urban Economy Report, London: LSE
[63] OECD (2010), *Measuring Innovation: A New Perspective*, OECD, Paris based on OECD, Innovation microdata project
[64] Maddock, S. and Robinson, B. (2010) *Place Based Innovation*, The Whitehall Innovation Hub, National School for Government Sunningdale Institute, BIS

Investment in physical infrastructure and digital connectivity is critical to connecting all firms in an urban innovation ecosystem, as well as connecting to international markets. LEPs need to ensure that cross-boundary working on key strategic issues like housing and transport infrastructure happens. This could involve developing shared services around planning and economic development.

Recommendation 2. Government should offer an Innovation Fund for LEPs.

The Regional Growth Fund[65] and Local Enterprise Partnerships are part of the government's agenda for replacing Regional Development Agencies (RDAs) and promoting growth in the private sector. However, RGF is not targeted to support innovation and the reduction in RDA budgets means that much of the support and funding available for place based innovation policy has ended.

To help to plug this gap, the government should offer an **Innovation Fund**, of a similar value to RGF (£1.4 million), for LEPs to support innovation related policy and delivery.

Recommendation 3. City leaders and LEPs should seek new powers from government to support local innovation policy where the need is identified.

The UK has one of the centralised systems in Western Europe, and evidence from elsewhere suggests that where cities have more local control of resources and functions they are better able to drive growth.

Under new clauses in The Localism Bill, city leaders, alongside LEPs, can make the case to be given new powers to promote economic growth and set their own distinctive policies. Cities seeking the transfer of functions will need to demonstrate for example, private sector buy-in, robust governance structures, cross boundary work and capacity to deliver.

Recommendation 4. Cities need to create a system of effective networks and embedded innovation intermediaries.

Knowledge spillovers contribute significantly to productivity growth. Developing a strong network of businesses, universities, intermediary institutions, banks, and supporting services, will facilitate the flow of ideas, expertise and knowledge. Networks help foster the conditions for inter-firm collaboration and the development of new strategic partnerships. This will improve the chances of spreading innovative activity as well help reduce the risk associated with introducing new services or products. A strong embedded network of innovation intermediaries can support innovation by providing the bridging, brokering and knowledge exchange role necessary to bring together the range of different organisations. Policy makers should seek to **map out the networks that exist to identify gaps and co-ordinate and rationalise** where appropriate.

[65] RGF is worth £1.4bn in total and was set up with the aim to support economic growth and sustainable employment particularly for those places which have public sector dependent economies. The second round of bidding to the Regional Growth Fund ended on the 1 July 2011

Recommendation 5. Local government should drive innovation through public procurement shaping the market for innovative solutions.

Local government procurement is a key source of demand for businesses in various sectors – sanitation, leisure facilities, road maintenance, construction, and community services, for example. Through this function local government can develop the market for innovative goods and services bringing in private sector investment and creating more efficient public services. Local government should produce **innovative procurement plans** setting out how it will drive innovation through procurement and innovative procurement practices.

Local authorities should also maximise their planning functions to encourage growth and development. They should engage with schools to promote enterprise education to inspire a culture of entrepreneurship and creativity, use links with local businesses to encourage corporate social responsibility with a focus on increasing apprenticeships and use public sector assets to support growth.

Recommendation 6. Universities need to engage effectively with businesses and maximise their role as anchor institutions.

Universities, as set out in Chapter 4, are a crucial part of the innovation infrastructure. They not only provide a flow of skilled labour which is critical for creating effective innovation ecosystems, but they also anchor local economies and drive economic growth through research and development. It is important to recognise the diversity of roles played by the sector within local economies.

Universities role in knowledge exchange is particularly important for innovation and its ability to cut across geographic and sector boundaries. The reduction in funding streams to support this type of activity means that higher education establishments need to find ways of using their own infrastructure and physical assets to incubate, support and pilot new approaches. There is a role for universities in both catalysing innovative activities as well as a providing a strategic lead as partners on, for example, Local Enterprise Partnerships.

Recommendation 7. Developing the skills for innovation.

Skills are essential for innovation. Cities need to ensure that local businesses are able to access the skilled labour that they need to innovate and grow. By linking up businesses and education providers places can ensure that skills needs are dealt with effectively. There is an opportunity for LEP's to monitor skills provision and identify the particular skills needs of businesses. Local authorities can use there links with businesses and engage and encourage them to develop CSR responses with a particular emphasis on apprenticeships to increase the level of specialist skills.

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