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Driving growth:

Supporting business innovation in **Coventry & Warwickshire**

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Executive summary

Innovation, broadly defined as the 'successful exploitation of ideas', is a fundamental driver of economic growth. Nearly two thirds of productivity growth is driven by innovation. Support for innovation has been identified as a key priority for the Coventry and Warwickshire Local Enterprise Partnership (CWLEP). Crucial to effective policy design and delivery is an in-depth understanding of business innovation capacity and performance within the sub-region.

"Support for innovation has been identified as a key priority for the Coventry and Warwickshire Local Enterprise Partnership"

Coventry and Warwickshire boasts some world class innovation-related assets. It is home to several of the UK's most innovative companies and universities producing cutting-edge research. There is a large concentration of research and development (R&D) activity in Coventry and Warwickshire, and it has one of the highest rates of international patenting in the country. A range of initiatives and partnerships have built up around the area's assets aiming to further exploit its innovative potential but, despite some positive results, the diffusion of innovation could still be significantly improved. There continues to be a long tail of less innovative, less productive businesses in the sub-region and it is crucial that they are supported to engage in more innovative activity in order to increase the area's economic resilience and rates of sustainable growth.

While it is important that policy makers support every business to innovate, there are twin opportunities for Coventry and Warwickshire to build on its specialisms in automotive and advanced engineering. The first is to build on inward investment and use existing assets as a magnet for global companies and their R&D facilities as firms increasingly recognise the importance of co-locating these activities. The second relates to supply chain development. As a result of increasing investment by original equipment manufacturers (OEMs) the UK market for suppliers is expected to increase from £11 billion in 2012 to £21.5 billion in 2016. This represents a potential missed opportunity if firms are not in a position to win contracts.

If businesses are to exploit these opportunities, the CWLEP and its partners need to address the innovation barriers that businesses face and support the diffusion of knowledge and ideas. Barriers identified relate to access to finance, skills and specialist labour, business support, and engagement in forms of open innovation.

These barriers will not only impact on innovation in the automotive or advanced engineering sectors but on the wider business base in Coventry and Warwickshire.

Policy makers need to address these barriers in ways that respond to the spatial divides within the sub-region. The economies of northern parts of the sub-region – Coventry, North Warwickshire and Nuneaton and Bedworth – are shaped by their historical specialisms in manufacturing and mining. Areas in the south of the CWLEP – Stratford-on-Avon and Warwick – are more affluent with higher levels of innovative activity in the service sector.

"Local public sector organisations need to ensure there is a shared understanding of how businesses innovate"

For the **CWLEP and local partners** to effectively support business innovation and growth in Coventry and Warwickshire they should:

- **Aim to build on the area's niche strengths and encourage diversity.** Growth in the market for automotive and advanced manufacturing suppliers is a clear opportunity for businesses within the CWLEP. Policy makers also need to ensure business innovation and growth is supported across different types of business and sectors if it is to achieve long-term sustainable growth.

- **Embed innovation across all policy areas rather than develop innovation as a specialist policy area.** The barriers to innovation faced by businesses relate to a range of policy areas, from skills to transport. Local public sector organisations need to ensure there is a shared understanding of how businesses innovate and the potential impact of policy decisions on business innovation. As part of this, the CWLEP should continue to improve levels of engagement and communication with the local business base.
- **Ensure policy is formulated at an appropriate geographic scale and builds on existing initiatives.** A functional economic area based on business links and innovation can span regional and even national borders. CWLEP should collaborate with other LEPs on specific initiatives to achieve greater efficiencies and capitalise on assets in the wider region.
- **Ensure resources are pooled in order to deliver fewer projects on a larger scale where possible.** The LEP should play a coordinating role across the Coventry and Warwickshire area to limit duplication and maximise

the impact of funds available. The LEP also needs to ensure that central government, EU and private sector funds are aligned.

"The LEP should play a coordinating role across the Coventry and Warwickshire area to limit duplication and maximise the impact of funds available"

There are a number of specific interventions to support innovation amongst the wider business base in Coventry and Warwickshire:

- **CWLEP should work with Coventry and Warwickshire local authorities to strengthen current business support by combining funding streams into a Business Innovation and Growth Hub.** Access to finance, trade and investment and business advice should be integrated into a single Hub, which can either be virtual or in one physical location. The Business Hub should also operate as a single point of reference for local businesses trying to navigate innovation support.
- **The Business Innovation and Growth Hub should focus on encouraging interaction between businesses (predominantly through supply chains) and innovation assets, including universities.** The Hub should support more open innovation by helping business identify external partners and funds to support collaborative projects. These should build on the successes of past programmes such as the Premium Automotive Research and Development (PARD) Programme run by WMG and the Coventry and Birmingham Low Emission Vehicle Demonstrator (CABLED). Partners should collaborate more with other LEP areas and national government departments and agencies, such as the Department for Business, Innovation and Skills (BIS) and the Technology Strategy Board (TSB), where appropriate.

- **CWLEP should build on its existing Memorandum of Understanding with UKTrade and Investment (UKTI) to promote Coventry and Warwickshire as a global R&D Hub.** Partners should take a proactive and targeted approach to inward investment to build on the area's existing assets and the increasing propensity of global manufacturing companies to co-locate R&D activity.
- **CWLEP should partner with local education and training providers to establish a Skills and Apprenticeship Hub that works with business to address shortages of graduate and specialist labour.** The Skills Hub should promote career opportunities within the automotive and advanced manufacturing sectors and work with labour market intermediaries to improve

job matching. As part of this, the LEP should build further links with major engineering universities and colleges across the country. Partners should also explore how apprenticeship programmes run in other cities might be applicable to the sub-region.

- **Local authorities and the CWLEP should continue to prioritise funding for improvements to Coventry city centre, alongside improvements to north-south transport connections.** The city centre is a gateway to the sub-region and acts as a hub for businesses. Other priorities for investment should include increasing the availability of small, flexible workspaces. Partners should pool resources in order to invest in infrastructure priorities in the sub-region.

"The complexity of public sector initiatives to support innovation needs to be addressed"

National government and agencies should support business innovation in Coventry and Warwickshire by:

- **Encouraging more intelligent procurement across national and local government to stimulate business innovation.** The public sector needs to maximise the potential impact of spending to incentivise and support business innovation. Procurement officers should avoid over-specific development for the domestic market and improve dialogue with potential suppliers.
- **Ensuring initiatives are sufficient in focus, scale and duration to support business innovation.** The complexity of public sector initiatives to support innovation needs to be addressed in order to help businesses navigate the support available.
- **The Technology Strategy Board (TSB) should improve engagement with the CWLEP to identify opportunities to support business innovation.** Specifically, the TSB and CWLEP should explore ways to build on the successes of past demonstrator projects in the region.

Introduction

The ability of firms to innovate is fundamental to the UK's economic recovery – and city regions have a central role to play. Innovation is the successful exploitation of ideas. It can come in many forms, from new or significantly improved products, goods or services to new workplace organisation. It is about new ideas, as well as the ability to draw on a variety of sources of knowledge and exploit ideas regardless of where they were created.

City regions act as engines of innovation, providing business with access to ideas and the means to exploit these ideas. They provide access to markets, supply chains, institutions, skills and specialist labour.[1] Innovation in Coventry and Warwickshire is the result of multiple interactions between these actors and institutions, including a dense network of high-tech manufacturing companies and engineers.

Innovation policy continues to be nationally led in the UK, reflecting the importance of a holistic approach to innovation that allows support to be provided to individuals and businesses regardless of their location. Nonetheless, given the importance of networks to innovation, and the role that proximity can play in generating and sustaining them, local areas can have an important role to play in supporting innovation. As such, it is an important feature of Coventry and Warwickshire Local Enterprise Partnership's (CWLEP) strategy to support economic growth.

The Government is also giving LEPs responsibility for the delivery of a significant part of the new round of EU Structural and Investment Funds for 2014-2020. One of the key priorities for the Funds is 'innovation, research and technological development'. Strategies for smart specialisation that identify an area's unique characteristics and assets are a precondition of using the 2014-2020 European Regional Development Fund (ERDF) to support investment in innovation.[2]

Both national and local strategies need to be based on a full understanding of what drives innovation in different places, how barriers to innovation vary and what types of policy are likely to be most effective. With these issues in mind, **this report focuses on the key innovation assets and barriers to innovation and economic growth in the CWLEP area and what role the LEP and other public sector partners play in supporting innovation.** While the report explores factors that will impact on business innovation more generally, it focuses on the automotive sector as a key specialisation in the area in order to gain more in-depth policy insight.

This report is structured as follows:

- Section one examines the economic characteristics of the CWLEP area;
- Section two summarises the analytical framework for understanding innovation capacity and performance;
- Section three examines business innovation in the CWLEP area;
- Section four examines the wider conditions for innovation in the CWLEP area;
- The final section sets out a series of recommendations for the CWLEP and other local partners, and national government.

1. Centre for Cities (2007) *Innovation and the city: How innovation has developed in five city regions*, London: Centre for Cities

2. See http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_en.pdf for further information

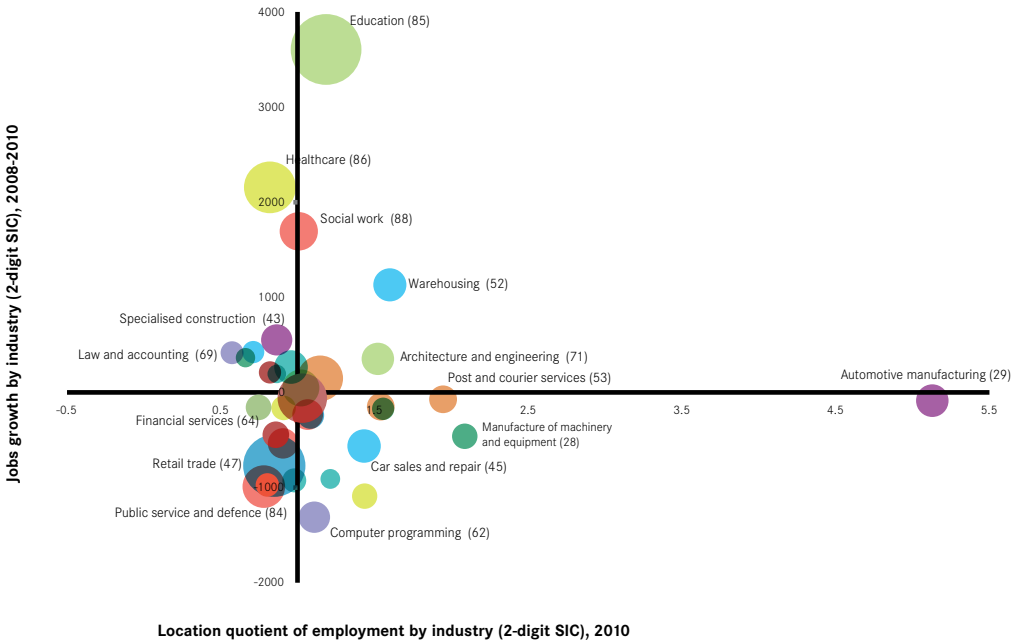
The Coventry and Warwickshire Economy

The economic landscape of the CWLEP area is shaped by its traditional strength in manufacturing and in particular the automotive sector. Parts of the north of the LEP area were transformed during the 19th century with the rise of manufacturing. By the turn of the 20th century, the majority of jobs (66 per cent) in manufacturing in Coventry were in cycle and other vehicle production. The city's skills base, transport connections and proximity to collieries made it an attractive location for manufacturers. During the post-war years, Coventry was the third fastest growing city in the UK, behind London and Birmingham, due to the rapid expansion of the automotive sector.

Growing dependence on the automotive sector and on a few large employers within it made the city less resilient in the face of economic shocks during the 20th century. A large number of small firms had become dependent on a small number of very large firms. When the automotive industry collapsed in the 1970s and 80s, the share of employment in manufacturing shrank from 57 per cent in 1976 to 44 per cent in 1986. This had a significant overall impact on the economy and led to rising unemployment and levels of deprivation in the city.[3]

Today, the automotive sector still has a strong presence in the economy of the region. While only 10 per cent (national average is 8.8 per cent) of employment in the LEP area is in manufacturing overall, automotive manufacturing accounts for a five times greater share of employment in the LEP area than on average in the country (Figure 1).

Figure 1: Industrial structure in Coventry and Warwickshire, 2008-10



Source: BRES 2012

3. Myles Mackie (2008) *Coventry's Economy 1976 to 2026*, Coventry City Council

Other specialisations in the CWLEP area include sectors part-related to automotive manufacture, such as engineering and machinery manufacture, repair services and logistics. Retail is one of the largest private sectors in the area but is not over-represented as a proportion of total employment. Other key sectors include computing, cultural and creative and specialist business services.[4] The public sector is a large employer in the area, particularly education, and saw the largest employment growth between 2008 and 2010. The public sector currently accounts for 33 per cent of jobs in Coventry, which is above the GB average of 28 per cent.[5]

Sustained specialisation in automotive manufacturing has helped the area accumulate a significant amount of specialist knowledge and expertise. It has attracted a highly skilled engineering and technical workforce.[6] Today, while few cars are produced in the area, the region remains a centre of expertise and knowledge creation for automotive design and R&D.

Institutions that are linked to the automotive industry today make up the cornerstones of the innovation system of the region. These include large manufacturers who run their global operations from the area (Aston Martin and Jaguar Land Rover), private sector R&D specialists (Tata Motors European Technical Centre (ETC), MIRA) and university-based research and business support institutions (WMG at the University of Warwick, Manufacturing Technology Centre, Coventry University).

Yet the historic dominance of a small number of large companies has impacted in the entrepreneurial culture of the north of the sub-region. Start-up rates in the north of the CWLEP area (Coventry, North Warwickshire and Nuneaton and Bedworth) are below the national average. Dependency on the public sector and lack of diversity means the resilience of Coventry economy remains poor. As a result, the area was hit hard in the most recent recession: claimant count rates rapidly climbed from 7 to over 11 per cent in 2008/09.

Economic growth rates (as measured by GVA) in Coventry have been slowing relative to the national average and other parts of the sub-region since the early 2000s (Figure 2). This economic slowdown can be attributed to a sharp fall in

4. Hill, D, (2010) *Understanding future sectoral growth in the Coventry, Solihull and Warwickshire Sub-Region*, Warwickshire County Council

5. Public sector includes public adminstration, education and health

6. Hill, D. (2010) *Understanding future sectoral growth in the Coventry, Solihull and Warwickshire Sub-Region, Coventry and Warwickshire economic assessment*, Warwickshire County Council.

output from manufacturing in the city: manufacturing accounted for 40 per cent of economic output in Coventry in 1999 but over the next decade saw output halve.

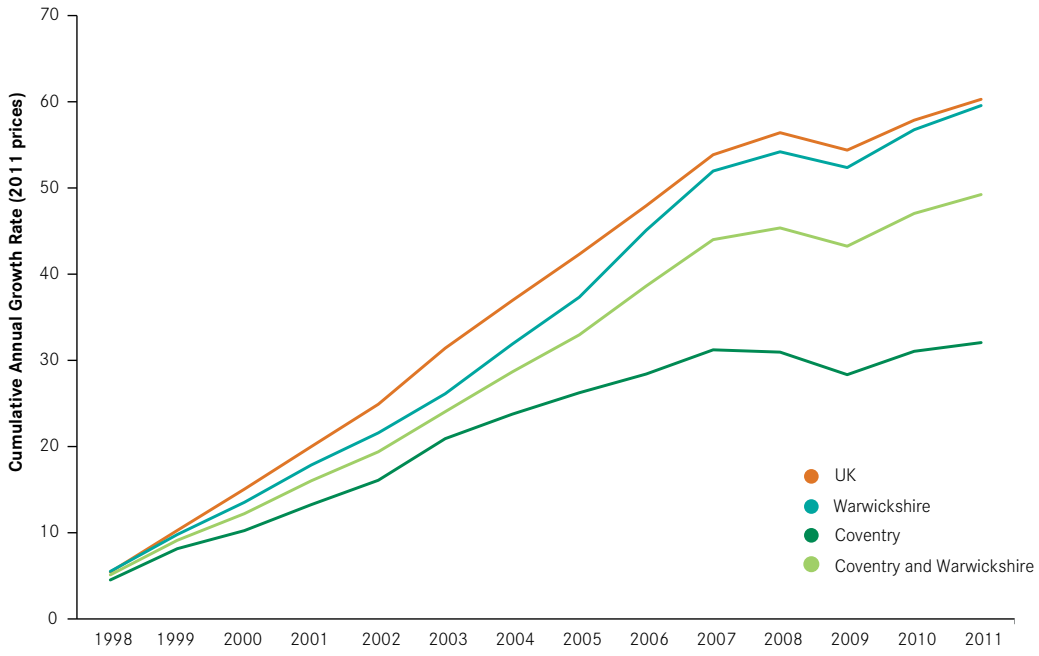
The industrial legacy in Coventry and Warwickshire has resulted in strong spatial divides within the sub-region. In contrast to the north, southern parts of the LEP area grew more significantly after the Second World War and specialised in more 'modern' types of manufacturing and services.[7] Over time Stratford-on-Avon and Warwick Districts have attracted more knowledge-intensive services, which currently account for 23 per cent of jobs compared to the national average of 19 per cent. These industries have seen higher rates of growth over the last decade.

As Figure 3 illustrates, the presence of manufacturing remains stronger in the north of the CWLEP area and it is more reliant on the public sector. The economies in the south of the CWLEP area, by contrast, are private service sector based. This north-south divide can be tracked across a range of socio-economic indicators, such as skills, enterprise and unemployment. As a result, levels of deprivation are far higher in the north of the CWLEP area (Figure 4).

The relatively high dependency on the public sector and weak entrepreneurial culture in Coventry and surrounding areas is likely to continue to impact on the growth prospects for the CWLEP area. While there has been a return to growth more recently, productivity rates lag behind the national average. The next section looks at innovation as a driver of economic growth.

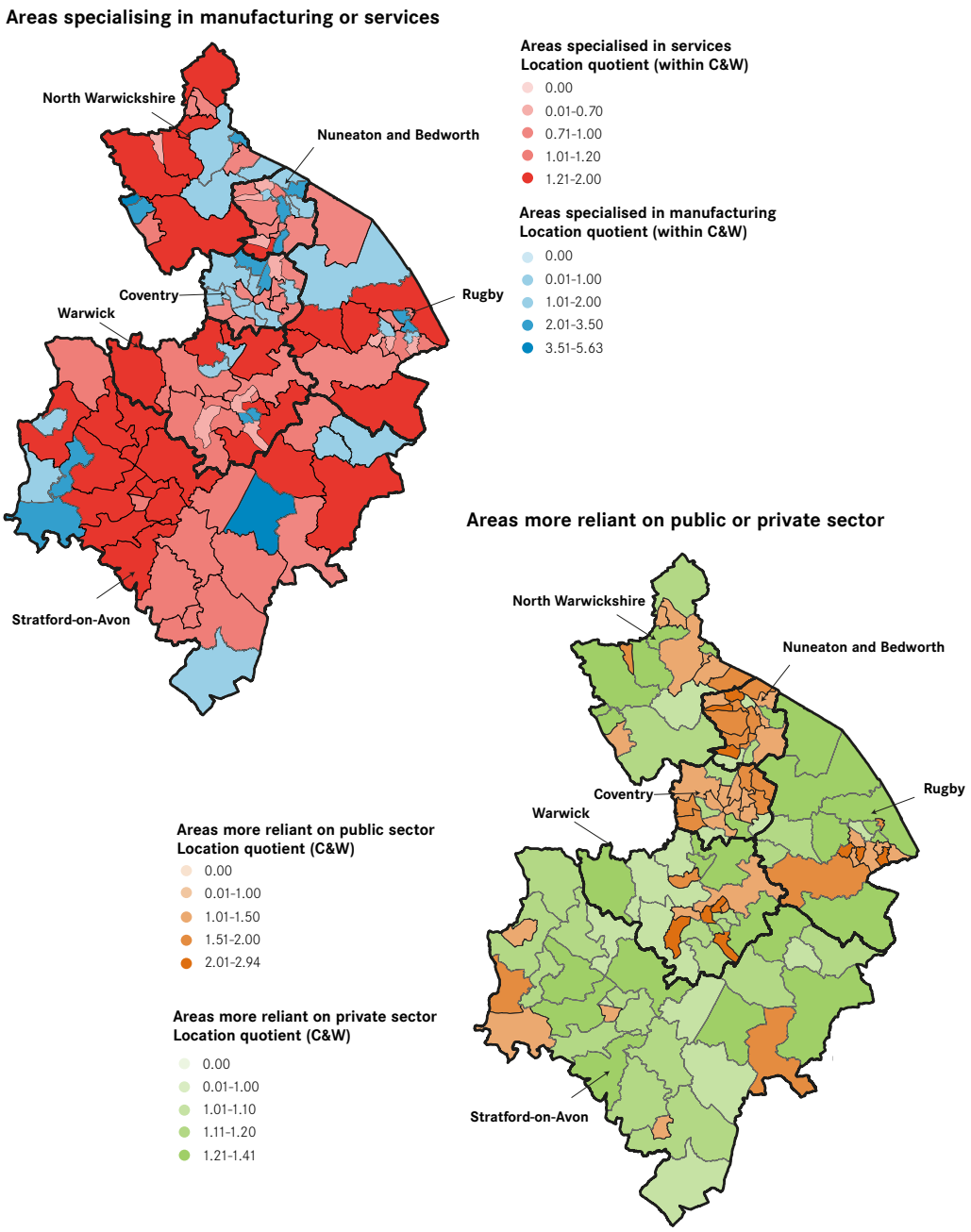
7. Warwickshire County Council and Coventry City Council (2011) *Coventry and Warwickshire Economic Assessment*

Figure 2: Cumulative annual GVA growth in Coventry and Warwickshire, 2011



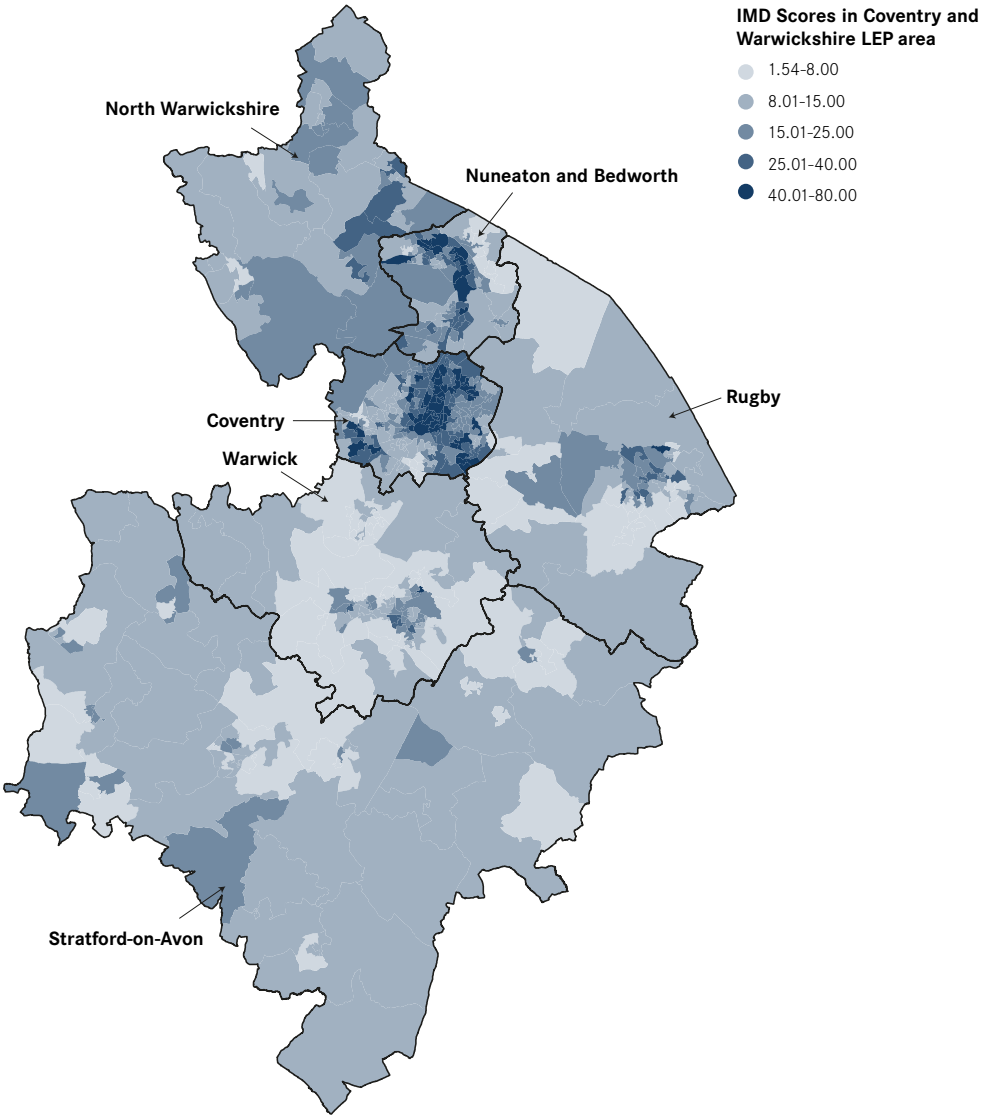
Source: ONS GVA, BRES, Census

Figure 3: Sector specialisation, 2012



Source: BRES, Ordnance Survey

Figure 4: Levels of deprivation across Coventry and Warwickshire LEP area, 2010



Source: IMD scores, CG, Ordnance survey

Innovation and the economic recovery

The ability of firms to innovate is fundamental to a sustained economic recovery in Coventry and Warwickshire, and the UK. Innovation, broadly defined as the 'successful exploitation of ideas', is a fundamental driver of economic growth. Innovation creates new markets, drives up the competiveness of firms and increases productivity through more efficient use of labour, land and capital. Nearly two thirds of productivity growth in the last decade was driven, either directly or indirectly, by innovation.[8]

Innovation matters to all sectors and places. At an individual firm level, companies across a range of sectors that invest in innovation tend to grow faster, both in terms of employment and turnover, than those that do not.[9] Innovation increases the adaptability and resilience of firms, and the places in which they are located, which ultimately leads to economic growth.

Defining 'innovation'

It is important for policy makers use a broad definition of innovation if they are to support all firms to grow and contribute to the economic recovery. The US Advisory Committee on Measuring Innovation in the Twenty First Century Economy provides a useful starting point: *"the design, invention, development and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for customers and financial returns for the firm."*

Cities provide the conditions for innovation. Cities act as hubs, offering proximity to suppliers, consumers, knowledge institutions and highly skilled workers. They also act as connectors, connecting businesses to national and international suppliers, institutions and markets through networks and infrastructure.

Yet innovation capacity is highly uneven across different cities. For example, there were more patents granted per 100,000 residents in Cambridge than the next six most innovative cities combined in 2010. More broadly, firms in Cambridge are nearly six times more likely to introduce novel products than firms in Swansea; firms in Oxford are twice as likely to introduce new processes as firms in Norwich; and firms in Warrington are nearly three times more likely to implement new marketing strategies than firms in Wakefield.[10]

All city economies need to be supported to increase their innovative capacity, if the UK as a whole is to significantly increase innovation and economic growth. Innovation will not be the same in every city. Some cities will benefit far more from supporting firms to improve their ability to adopt innovations from elsewhere rather than create new innovation. Neither does the support of innovation necessarily require innovation-specific policies at local level. It does, however, require an understanding of how firms innovate and what policy makers can do to improve the conditions for innovation.

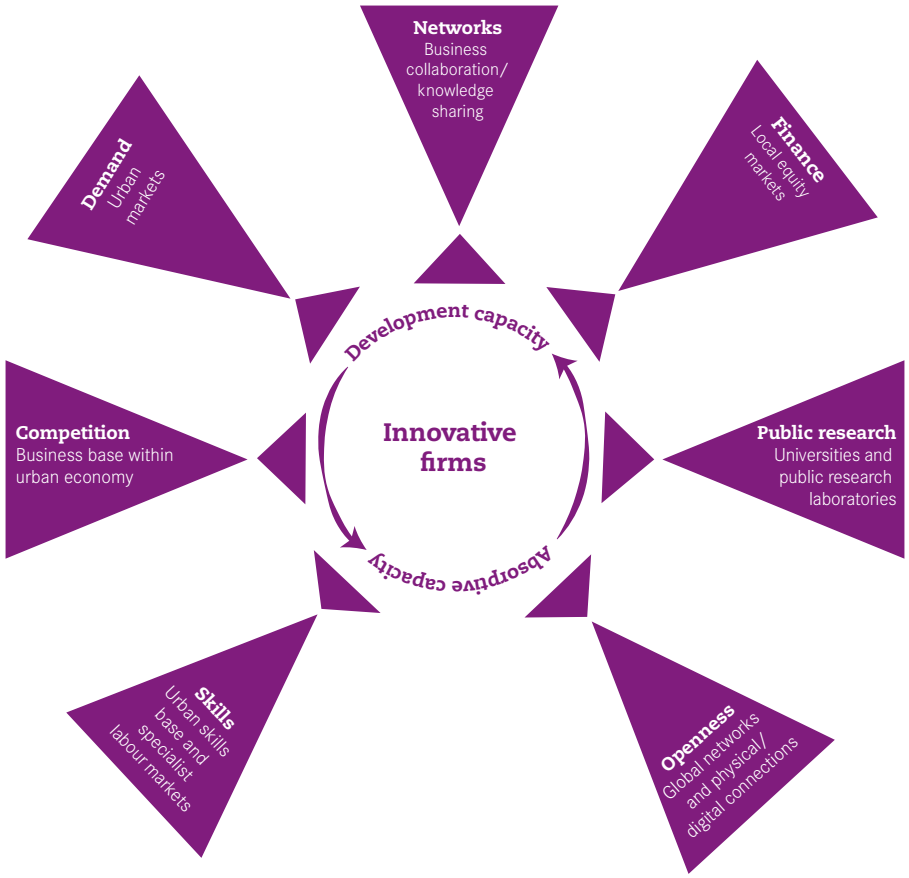
8. NESTA (2010) *Plan I: the case for innovation-led growth* London: NESTA
9. NESTA (2010) *Plan I: the case for innovation-led growth* London: NESTA
10. Simmie, J. et al (2008) *History Matters: Path dependence and innovation in British city-regions*, London: NESTA

Innovation is a dynamic and iterative process. Traditional analysis understands innovation as a more linear process. For example, a university creates new knowledge which it passes to a firm and the firm takes the innovation to market. Innovation is now more commonly understand to be the outcome of a complex set of local and global interactions between actors and institutions.

This system is summed up succinctly by Nauwelaers (2011): *"The innovation system approach pictures innovation as a complex and uncertain process, has enterprise dynamics at its core, places a premium on interactions and learning between actors, and emphasizes the importance of institutions, formal and informal, for the generation, diffusion and use of knowledge. It incorporates the idea that firms do not innovate in isolation, but rather through interactions with other firms, with users and with their environment".*[11]

More traditional views of innovation are still reflected in the use of the internationally agreed indicators, such as expenditure on research and development (R&D), patents and Science, Technology, English and Maths (STEM) graduates. These narrow measures are likely to underestimate levels of innovation activity within a defined area: R&D activity has been found to account for just 11 per cent of innovative activity within firms.[12] Firms' ability to innovate is also dependent on a broad range of factors. As a result, this report uses a broad range of metrics to understand the innovation capacity and performance in the CWLEP area.

Figure 5: Understanding innovation performance in Coventry and Warwickshire



Source: Centre for Cities, 2012

11. Nauwelears, C. (2011) 'Intermediaries in regional innovation systems: role and challenges for policy' Chpt. 34 in Cooke, P., Asheim, B., Boschma, R., Martin, R. Schwartz, D. and Tödtling, F. (2011) *Handbook of Regional Innovation and Growth*, Cheltenham, Edward Elgar, pp. 467-481

12. NESTA (2009) *The Innovation Index: Measuring the UK's investment in innovation and its effects*, London: NESTA

Firms lie at the heart of any innovation system (Figure 5). Business innovation is dependent on 'development' and 'absorptive' capacities. 'Development' capacity relates to a firms' ability to create and exploit knowledge and ideas. A firm's 'absorptive' capacity - the ability to absorb and utilise knowledge from elsewhere – is also critical. Indeed, the creative imitation and exploitation of existing knowledge accounts for most innovation and economic development.[13]

13. Arnold, E. and Bell, M. (2001) *Some New Ideas about Research and Development*, Technopolis

Firms' 'development' and 'absorptive' capacities are in turn dependent on the wider conditions for innovation.

- Access to appropriate **skills** is fundamental to any firms' ability to innovate
- The quality of **public research** – most commonly the research produced at universities – will impact on a firm's capacity to develop and access new knowledge and innovations.
- **Access to finance** has implications for all stages in the innovation process, from proof of concept stage to the expansion into new markets.
- **Networks and collaboration** matter to the exchange and diffusion of knowledge and innovation.
- **Demand** and **competition** provide the incentive for firms to innovate.
- **Global connectivity** (the connectivity of organisations and the facilitating infrastructure) impacts on firms' understanding of, and access to, global markets and their ability to access cutting-edge knowledge and technologies.

Before going on to examine the conditions for innovation in Coventry and Warwickshire, the next section looks at innovation amongst firms located within the area.

Business innovation in Coventry and Warwickshire

This section examines business innovation in Coventry and Warwickshire. The analysis uses traditional measures of innovation (R&D and patents) in combination with broader measures from the Community Innovation Survey (CIS) and the Business Register and Employment Survey (BRES) to examine the nature of business innovation in the sub-region. The CWLEP area is compared to select comparator areas in addition to the regional and national averages. These were selected on the basis of location, size and sectoral composition, and include: Birmingham and Solihull, Leicester and Leicestershire, and the North East LEP areas.

Firms' investment in R&D provides a good indication of the resources being channelled into the generation and development of new ideas and innovation. R&D is defined as "any project to resolve scientific or technological uncertainty aimed at achieving an advance in science or technology."[14] Research has also shown that R&D activity increases a firm's ability to absorb knowledge from elsewhere.[15] It is likely to be a particularly good measure of innovation in Coventry and Warwickshire given the area's manufacturing strengths, as the sector is more likely to invest in R&D.

R&D indicators suggest that Coventry and Warwickshire's business base is among the most innovative in the country. Total R&D employment in private sector in the area is far higher in the sub-region compared to comparator LEP areas; it is almost two times higher than in Birmingham and Solihull despite being smaller in size (Figure 6). Expenditure on R&D is also far higher. Average total in-house R&D expenditure per business in 2010 was £15,000 in Coventry and Warwickshire compared to £2,500 in Birmingham and Solihull (Figure 7).

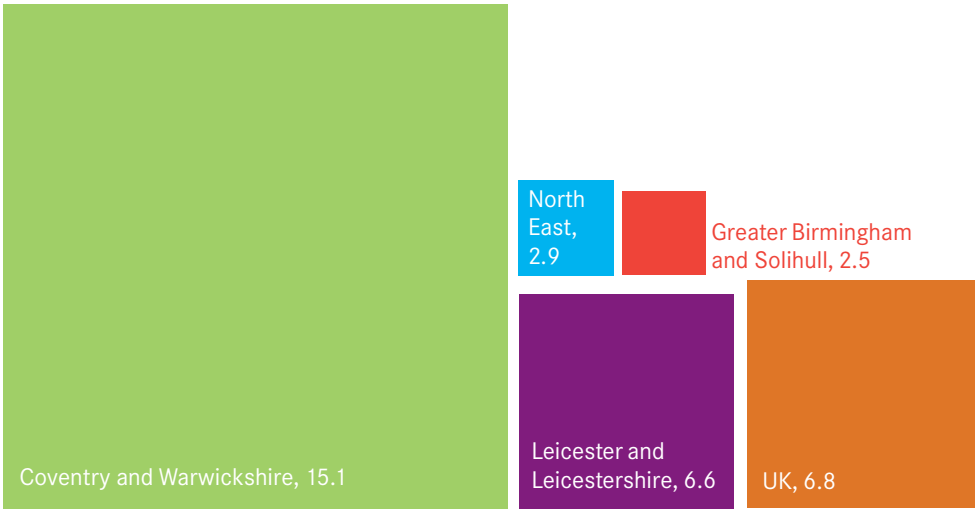
Figure 6: R&D employment by LEP area, 2010

Source: BERD

14. See Department for Business Innovation & Skills Guidelines available here http://www.hmrc.gov.uk/manuals/cirdmanual/cird81900.htm

15. Cohen, W. M. and Levinthal, D. A. (1989) *Innovation and Learning: The Two Faces of R&D*, The Economic Journal, Vol. 99, No. 397, pp.569-596

Figure 7: Average total in-house R&D expenditure per business, 2010

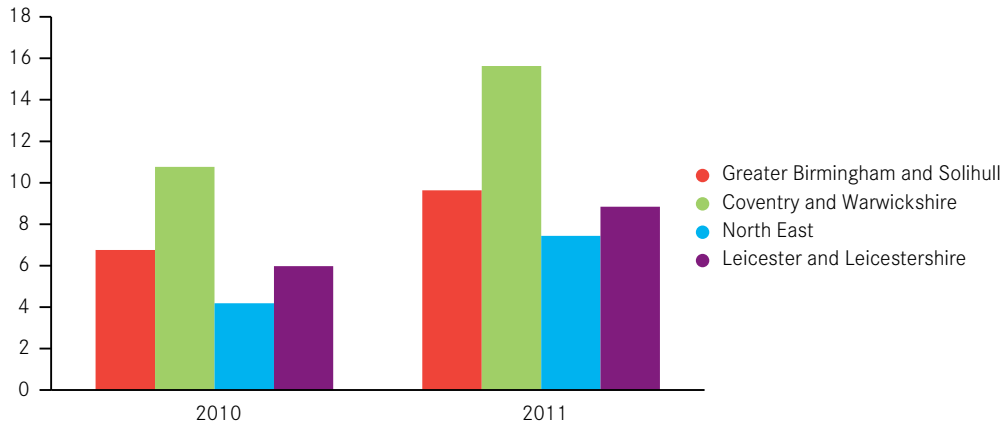


Source: BERD, ONS Business demography, 2012

Businesses in the CWLEP area have been granted more patents in the last two years than businesses in the comparator areas per employee (Figure 8).[16] The number of patents, another commonly used indicator, represents an output of the innovation process rather than an input. Coventry and Warwickshire performs better than comparator areas, with 15 successful patent applications per 100,000 employees in 2011. The national average is 10.7 per 100,000 employees.

16. Patent registration data is also sector biased, as patents are much more common for new products rather than for new services.

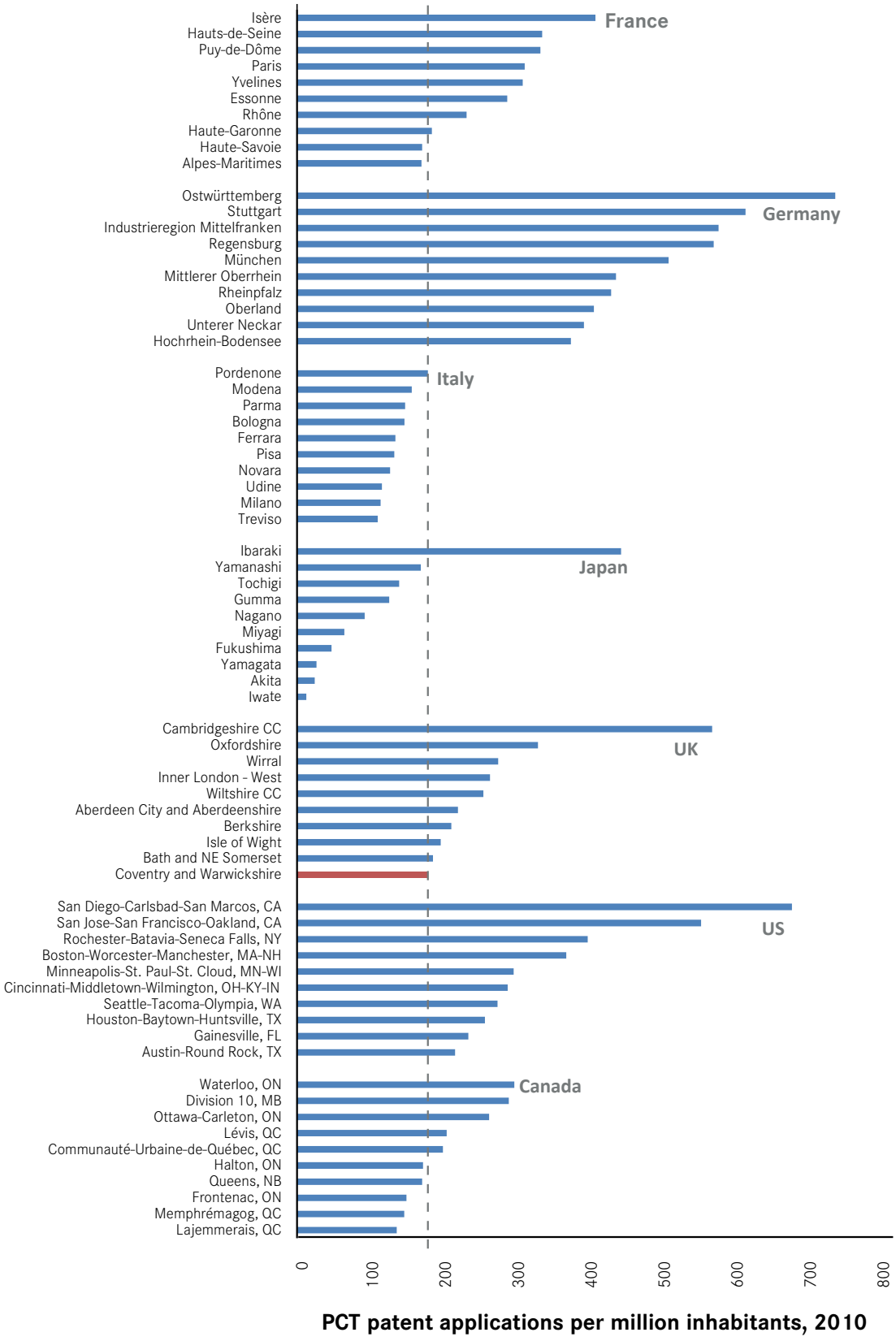
Figure 8: Patent applications granted per employee, 2010 and 2011



Source: Intellectual Property Office, 2012

Rates of patenting activity in Coventry and Warwickshire also stand out internationally. The CWLEP area ranked 136th out of 1,310 sub-regions internationally, with 176 international patent applications per million inhabitants in 2010, and in the top 10 sub-regions in the UK (Figure 9). While the area performs well compared to counterparts in Italy and Japan, it falls some way behind the most innovative sub-regions in Germany and the US.

Figure 9: International patent applications per million inhabitants in the top ten G7 sub-regions, 2010

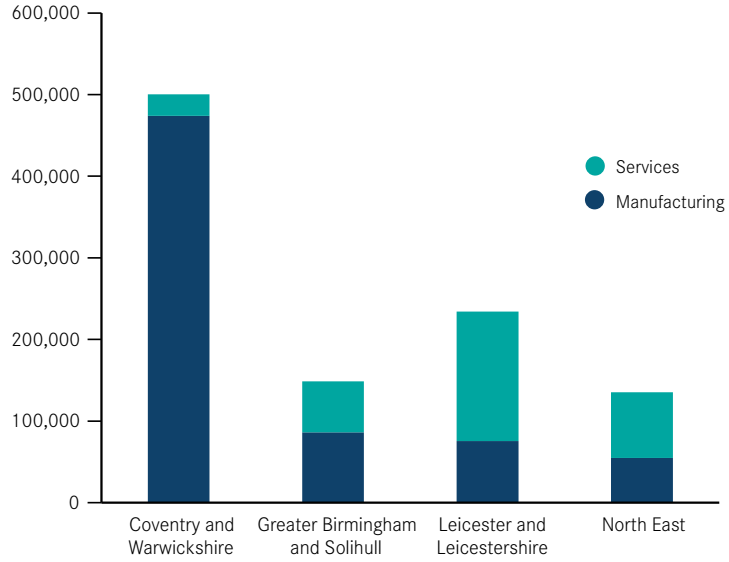


Source: OECD, REGPAT Database, 2013

The manufacturing sector makes a disproportionately large contribution to R&D activity in the CWLEP area, indicating the strength of the automotive sector and its importance for the local economy (Figure 10). The service sector accounts for 5 per cent of private sector R&D expenditure in Coventry and Warwickshire, while nationally it accounts for 55 per cent of R&D investment.

The distribution of R&D activity across Coventry and Warwickshire reflects the geography of automotive supply chain and associated research facilities and institutions. R&D expenditure and employment in the CWLEP area are concentrated in Coventry and Stratford. WMG, JLR, Tata Motors ETC, Coventry University and a number of other automotive R&D facilities are located in Coventry. As a result, 44 per cent of R&D expenditure and 42 per cent of R&D employment in the LEP area is concentrated in the city. A relatively large proportion of private sector R&D is concentrated in Stratford-on-Avon with several large automotive R&D campuses (including Jaguar Land Rover (JLR)) based in Gaydon in the north east of the district. Stratford-on-Avon accounts for 47 per cent of R&D expenditure and 41 per cent of R&D employment. Patent activity follows a similar pattern: from 2001 to 2011 nearly half of all successful patent applications were registered in Coventry and Stratford-on-Avon.

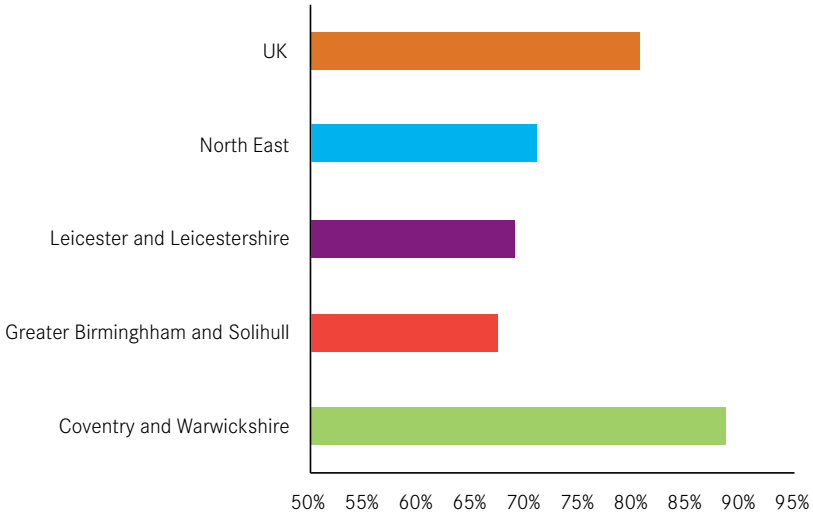
Figure 10: Total R&D expenditure in manufacturing and services, 2011



Source: BERD, 2012

Innovation activity in the manufacturing sector is heavily concentrated amongst a small number of highly innovative companies in the CWLEP area. While registered R&D activity generally tends to concentrate in a few firms, it is far more concentrated in Coventry and Warwickshire compared to other areas. 89 per cent of R&D employment and 94 per cent of in-house R&D expenditure in the LEP area is accounted for by the top 5 per cent largest R&D investors (Figure 11). The top 5 per cent represents just 16 firms or 0.05 per cent of the business base. At a national level the top five per cent (940 companies or 0.04 per cent of the business base) account for 81 per cent of R&D employment and 90 per cent of in-house R&D expenditure.

Figure 11: Share of total R&D employment in the area in the top 5 per cent of firms engaging in R&D activity, 2010



Source: BERD, 2012

The concentration of innovative activity amongst a few firms is also revealed in data on patent registrations and design applications. The top 5 per cent of companies with the most prolific levels of patenting activity accounted for over a third of total patents between 2001 and 2011. In Nuneaton and Bedworth, two companies (Gibbs Technologies and Triton) accounted for nearly 80 of successful patent applications over the 10 year period. Nearly a quarter of designs were registered by just 10 firms (0.03 per cent of the business base) in the LEP area between 2000 and 2010.

The nature of innovation activity in Coventry and Warwickshire presents both an opportunity and a challenge for the LEP. On one hand there is huge potential for further growth in R&D and high tech manufacturing linked to automotive supply chain. Around £6 billion of investment has recently been announced by OEMs in UK production. As a result of these increasing levels of investment, the aggregate supplier opportunity in the UK market is expected to increase from £11 billion in 2012 to £21.5 billion in 2016.[17] The challenge is to ensure that the wider business base in Coventry and Warwickshire is able to capitalise on these opportunities.

As discussed, R&D and patenting activity captures types of innovation activity more common in manufacturing. **While a large share of R&D activity is concentrated in the north of the LEP area, the economy of the south has a more dynamic and productive business base which indicates stronger innovation performance.**

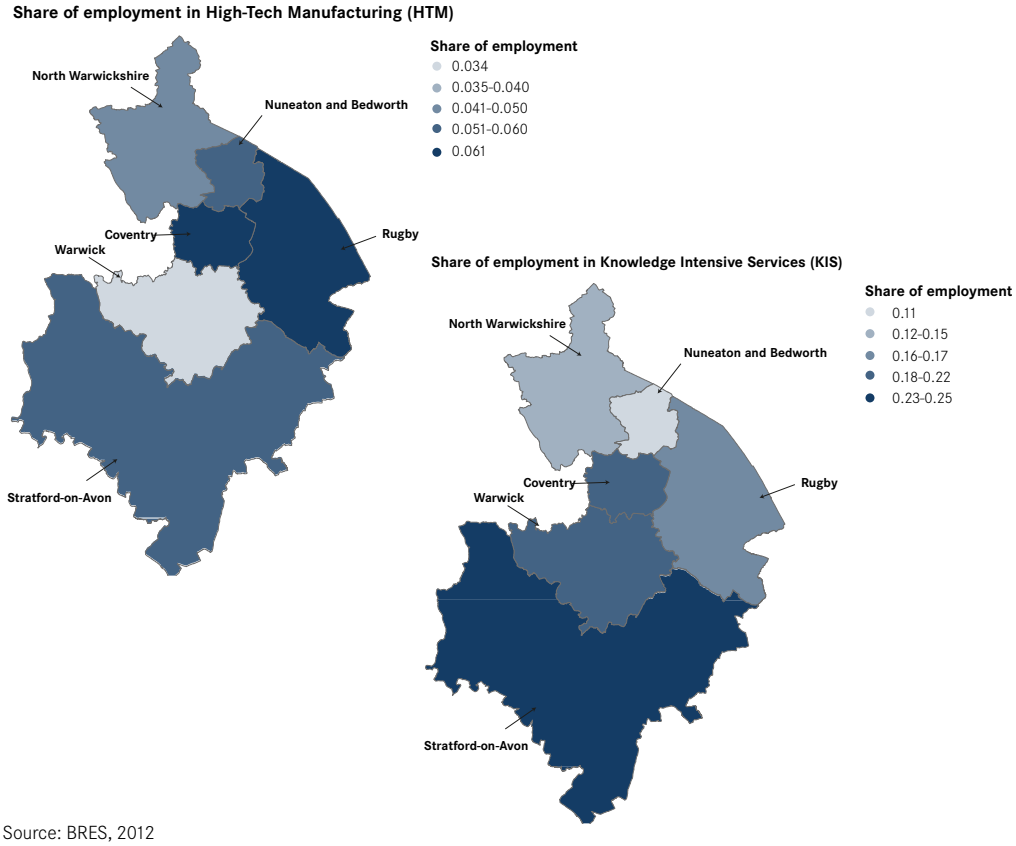
Knowledge-intensive services are highly productive and are usually sources of significant amounts of innovation difficult to identify through traditional metrics. High-tech manufacturing activity is more concentrated in the north of the LEP area, whereas knowledge-intensive service activity is more prominent in the south (Figure 12). Knowledge-intensive services make up 38 per cent of the service sector employment in the south of the LEP (Stratford and Warwick districts). This falls

17. KPMG (2012) *Capturing Opportunity: An assessment of the supply chain opportunities in the automotive sector*

below the South East and the London, where 45 per cent and 51 per cent of service jobs respectively are knowledge-intensive.

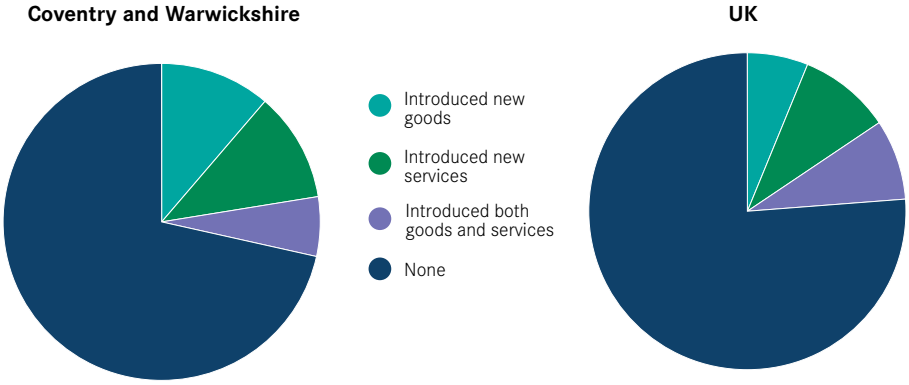
Firms in Coventry and Warwickshire are just as likely to introduce new services as new products. This highlights the diverse nature of the innovation system of the area and suggests that it goes beyond technological innovation, despite the emphasis on products that might be expected as a result of Coventry and Warwickshire's manufacturing strengths (Figure 13).

Figure 12: Geography of high-tech manufacturing and knowledge-intensive services in Coventry and Warwickshire, 2011



Source: BRES, 2012

Figure 13: Goods and services innovators in Coventry and Warwickshire vs. UK



Source: Community Innovation Survey, 2010

The combination of service and product innovation is important for the UK's more knowledge intensive 21st century economy. Modern manufacturers can gain market share and improve productivity by delivering better services (insurance, guarantees and repairs for example). Similarly, an IT-related innovation protected by patents may lie at the heart of productivity improvements in a financial or business services firm.

An efficient regional innovation system will combine strengths across both sectors and use knowledge exchange between them to generate mutually beneficial productivity gains.

Uneven distribution of innovation activity appears to be a common challenge across all sectors of the Coventry and Warwickshire economy. The area's strength in knowledge generation appears to be concentrated in a few leading institutions and companies. Slow knowledge diffusion and poor absorptive capacity amongst the broader business base in Coventry and Warwickshire restricts innovation and limits economic growth. Only a small share of business in the area is high growth, partly as a result of poor knowledge diffusion, which has direct implications for economic growth and wealth creation.[18]

18. Warwickshire County Council, Coventry City Council (2011) *Coventry and Warwickshire Economic Assessment*

Supporting innovation in Coventry and Warwickshire

It is crucial that businesses in the CWLEP area are supported to engage in more innovative activity in order to increase the area's economic resilience and rates of sustainable growth. Policy responses need to recognise the complexity of the innovation process and that businesses do not innovate in isolation.

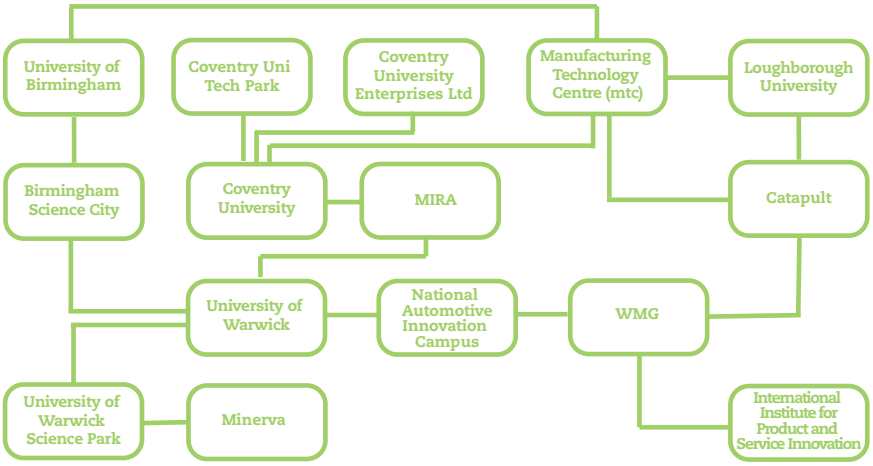
While it is important that policy makers support every business to innovate, there are twin opportunities for Coventry and Warwickshire to build on its specialisms in automotive and advanced engineering. The first is to use its existing assets as a magnet for more global companies and their R&D facilities.

The second relates to the development of the supply chain. Increasing levels of investment from OEMs, and subsequent demand for suppliers, represents a potential missed opportunity if firms are not in a position to win contracts.

If businesses and other local organisations are to exploit these opportunities, the CWLEP and its partners need to address the innovation barriers that businesses face. These relate to: access to finance; skills and specialist labour; business support; and engagement in forms of open innovation. Partners also need to address these barriers to support innovation throughout the wider business base in order to support emerging sectors and encourage greater diversity.

Any attempt to support business innovation in Coventry and Warwickshire needs to build on existing institutional support. There are a number of existing institutions and partnerships within Coventry and Warwickshire and the wider region that support business innovation. Figure 14 maps a selection of institutions related to the automotive sector. Institutions supporting business innovation span a range of sectors. The area is also home to the Serious Games Institute at Coventry University and the International Digital Laboratory at the University of Warwick, for example. Some of these institutions lie outside of the Coventry and Warwickshire area but within the wider region and are linked to the area's key specialisms. Loughborough University, for example, is 45 minutes by car from Coventry and is world-leading in aspects of engineering research.

Figure 14: Selection of institutions supporting business innovation in Coventry and Warwickshire and the links between them

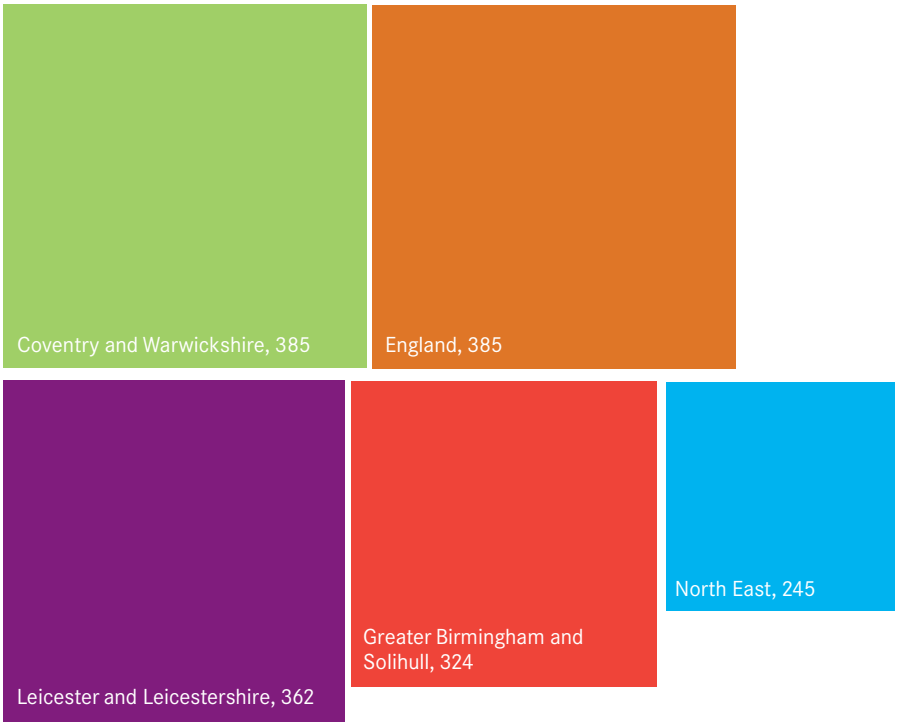


Source: Centre for Cities

Recommendation: ***Ensure policy is formulated at appropriate geographic scale and builds on existing initiatives.***

This rest of this section looks at the wider conditions for innovation in Coventry and Warwickshire as detailed in Figure 5.

Figure 15: Businesses per 10,000 population, 2011



Source: ONS Business Demographics

Competition and business environment

Pressure from competitors is one of the key drivers of innovation in a local economy, acting as an incentive for firms to introduce new products and services or ways of working in order to maintain or gain comparative advantage.[19] Businesses in areas with higher levels of competition tend to be more innovative.[20]

The geographical dimension of competition varies according to breadth of markets. Local shops tend to compete on the scale of the high street, while other businesses often compete nationally or globally. Yet local competition is still an important factor that defines the robustness and competitiveness of local businesses even if they operate nationally or globally. Firms operating in areas with high levels of local competition are often more able to adjust to changes in global markets.[21] Business density,[22] start-ups and closures are used as measures of local competition.

Business density in Coventry and Warwickshire indicates high levels of competition. Business density (businesses per 10,000 population) is relatively high in Coventry and Warwickshire, which indicates high levels of competition within the local business environment (Figure 15). The LEP area is also more entrepreneurial than the comparator areas as indicated by the relatively high number of business start-ups. Yet the high rate of business closures in the sub-region means that

19. Blundell R, Griffith R & Van Reenen J (1995) 'Dynamic Count Data Models of Technological Innovation', *Economic Journal* 105 (March): 333-44

20. Van Stel A & Suddle K (2005) *The Impact of New Firm Formation on Regional Development in the Netherlands*, Erasmus Research Institute of Management (ERIM) Research Paper; Davis S, Haltiwanger J & Jarmin R (2008) *Turmoil and Growth: Young Businesses, Economic Churning, and Productivity Gains*, Kansas City: Ewing Marion Kauffman Foundation

21. Porter, M.E. (1998) *On Competition*, Boston: Harvard Business School, 1998

22. Business density is calculated as total business count divided by total population of the area.

business density is falling relative to the national average. The shrinking business base will impact on job growth and lead to a gradual loss of competitiveness.

Business dynamics vary considerably across the CWLEP area. Overall, levels of competition are higher in southern parts of the LEP area, which indicates its high innovation potential. Business density and start-up rates are much higher in the south compared to the north of the sub-region. Lower business density and levels of entrepreneurialism in Coventry and neighbouring areas can be explained by lack of skilled labour, and industrial heritage and historic reliance on large companies. Relatively high rates of closure in Stratford-on-Avon and Warwick in the south, however, have resulted in a small contraction of the business base in these areas (0.35 per cent), while the total business base has grown by 1.5 per cent (Figure 16).

Figure 16: Business demography of the CWLEP area, 2011

	Starts 2011	Closures 2011	Business density 2011	Churn
South C&W	56.1	57.9	564.9	-0.35%
North C&W	36.5	32.3	308.2	1.50%

Source: ONS Business Demographics

Demand

Demand from customers is important in stimulating and sustaining business innovation. Demand-side interventions (i.e. procurement) are believed to be more important than supply-side ones (i.e. R&D subsidies) by many firms,[23] yet policy often focuses on the latter rather than the former. Government (local and central) is a major purchaser, spending £238 billion each year on the procurement of goods, works, and services.

The supply chain plays an important role in demanding innovation and diffusing knowledge. A fifth of companies in Coventry and Warwickshire cite clients as the key source of knowledge and information. Intelligent procurement can have a significant impact on innovation in the UK.

Georghiou (2007) identifies some the characteristics of intelligent procurement. The recommendations apply to both the public and private sector:

- Avoid over-specific development for the domestic market
- Improve dialogues between the purchaser and the supplier
- Specify requirements in terms of functional performance or standards rather than the specific end product or service
- Train purchasers in innovative procurement principles
- Place emphasis on whole-life costs.

Given the long tail of smaller and less innovative companies in Coventry and Warwickshire, particular emphasis should be placed on the potential to stimulate

23. http://www.proinno-europe.eu/sites/default/files/

innovation amongst small and medium sized enterprises (SMEs) through public procurement. SMEs should be given the chance to bid for parts of the larger contracts and local partners in the CWLEP area should ensure businesses are aware of contract opportunities. The West Midlands Collaborative Commerce Marketplace (WMCCM), an EU-funded website run by the University of Warwick, publishes public and private contracts and is regarded as being highly successful.[24]

Recommendation: Local partners should consider how they can build on existing portals and support SMEs to bid for contracts.

Local partners may have a role to play in establishing and part-funding pre-commercial or demonstrator projects as very close interaction between the customer and supplier is required. The LEP should work with local firms and the Technology Strategy Board to identify opportunities and build on the successes of past demonstrator projects, such as the Coventry and Birmingham Low Emission Vehicle Demonstrator (CABLED).[25] As part of this, the LEP should explore how the Small Business Research Initiative (SBRI), which offers public sector procurement contracts to businesses to research and develop new products and services to address public sector challenges, can be utilised. Partners should ensure they are working with new firms and ensure there are opportunities for local SMEs to become involved as well.

Recommendation: CWLEP should work more closely with TSB to explore ways to build on the successes of past demonstrator projects in the region.

The majority of firms operate in global markets. Coventry University Enterprises has run the Enterprise Europe Network Midlands since its inception in 1993 which aims to support businesses to access new markets and develop transnational partnerships. Building on this, the CWLEP and local partners should work with UKTI and global companies in the areas to support SMEs to access international markets. Taking a targeted and proactive approach to inward investment to attract global firms is also likely to stimulate demand for innovation in the local economy.

Recommendation: Build on the LEP's existing Memorandum of Understanding with UK Trade and Investment (UKTI) to promote Coventry and Warwickshire as a global R&D Hub and support SMEs to access international markets.

24. Interview
25. For further information see http://www.birminghamsciencecity.co.uk/case-studies/case-studies/cabled-project/Innobarometer_2009.pdf

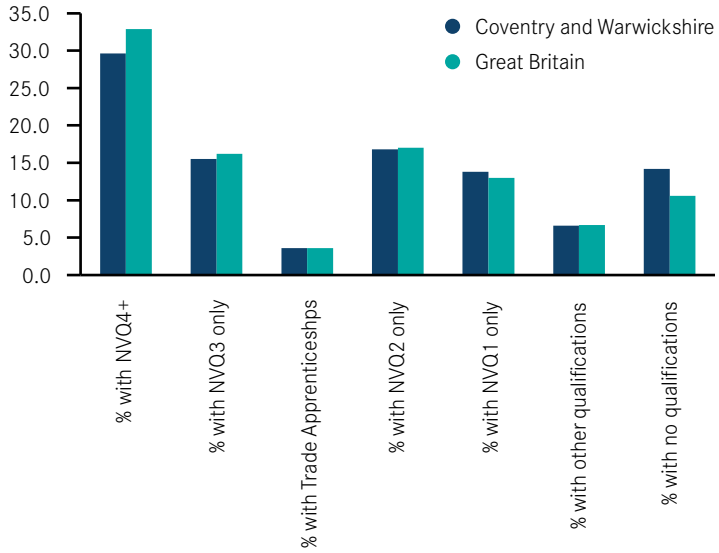
The concentration of large car manufacturers in the area creates a market for those selling specialised components. It may be beneficial for local partners to work with locally based multi-national companies to encourage buyer consortia in the private sector to provide scale and greater expertise.

Skills

The shortage of engineers and graduates hampers innovation activity in Coventry and Warwickshire. A highly skilled workforce, with the ability to generate new knowledge, and adopt and develop existing ideas, is a fundamental driver of business innovation. While the proportion of residents qualified to at least graduate level is higher than the comparator LEP areas, Coventry and Warwickshire falls behind the national average on higher level skills (Figure 17). In addition, a relatively large proportion of residents have no formal qualifications.

There is large variation in skills profiles across the sub-region. The proportion of the resident population qualified to at least degree level is far higher in in Warwick and Stratford-on-Avon, 41 per cent and 33.3 per cent respectively. In contrast, 22.4 per cent in Nuneaton and 24.3 per cent in North Warwickshire are graduates. The proportion of residents with no qualifications in North Warwickshire (18 per cent) is two times higher than in Stratford-on-Avon (9 per cent).

Figure 17: Coventry and Warwickshire skills profile, 2011



Source: Annual Population Survey, 2012

Spatial patterns of educational attainment are similar, reinforcing the socio-economic divides within the CWLEP area. Levels of attainment are far higher in the south: 70 per cent of students gain at least five A*-C GCSEs including Maths and English in Stratford and Warwick, compared to 49 per cent in North Warwickshire. Policy makers should work collaboratively to address low levels of educational attainment at GCSE level[26] and place greater emphasis on Maths and English, particularly among more disadvantaged pupils, with the Pupil Premium and in careers advice.[27]

26. The City Challenge was successful in improving levels of educational attainment in London, Greater Manchester and the Black Country. See https://www.education.gov.uk/publications/RSG/publicationDetail/Page1/DFE-RR215 for further information.
27. Clayton, N. (2012) *Top Marks?*, London: Centre for Cities

Linked to the skills profile of the sub-region, a relatively high proportion of local employers report skills gaps. A fifth of employers in Coventry and 7 per cent in Warwickshire reported skills gaps (regional and national averages, 8 and 7 per cent respectively).[28] In absolute terms the largest skills gaps were in the manufacturing sector. This may reflect individuals' perceptions of the career opportunities available in the sector.

Local partners can help widen the pool of graduate labour more generally by working with universities and businesses to increase the number of student and graduate internships and placements available. Graduate Advantage[29] is an example of an existing initiative aiming to place graduates with internships with local employers.

Local businesses reported shortages of specialist labour, particularly engineers, in Coventry and Warwickshire.[30] In the wider region, over 50 per cent of companies reported difficulties in recruiting skilled tradespeople and technicians, while almost 40 per cent were struggling to hire professional engineers. Local partners can help address the shortage of skilled technicians and professional engineers by promoting career opportunities[31] and by working with labour market intermediaries to improve job matching. It may also be appropriate to increase the availability of modular training to provide greater flexibility for employers through the extension of the Advanced Skills Accreditation Scheme (ASAS) run by WMG.[32]

Lack of experience is the most often cited reason for skills gaps, which is unsurprising given that many employers report large gaps in the technical and practical skills which tend to be specific to sectors or industries. Many of these skills are learnt on the job. Increasing the number of apprenticeships available in the local area would open up alternative career opportunities and help address local skills shortages. The Leeds Apprenticeship Hub[33] and Michelin on-site apprentice training centre (Box 1) are two public sector innovations that seek to increase the number of apprenticeships available locally.

Box 1: Michelin's Modern Apprenticeship programme, Dundee

In an attempt to fill the skills gap between engineers and engineering jobs, the French tyre manufacturer, Michelin, has set up its own apprenticeship scheme in Dundee.

The Modern Apprenticeship program, supported by Skills Development Scotland, seeks to increase knowledge, experience and practical exposure for young engineers in order to facilitate having trained engineers for the future. The scheme is not only open to Michelin employees but also to firms in the surrounding area i.e. Michelin will train other firms' employees too.

Large firms providing this level of training for employees in the region is a useful method to future-proof skills for the industry.

There are a number of organisations in the sub-region and surrounding area providing vocational training. Coventry University College provides vocational-based education to support the needs of local businesses and MIRA Technology Park has launched the MIRA academy to train engineers and technicians. Local partners have also been working together to establish University Technical Colleges,

28. Source: UKCES National Employers Skills Survey, 2009
29. See http://www.graduateadvantage.co.uk/ for further information
30. Interviews
31. See Inside Manufacturing is an example of a national initiative that might be replicated at a local level.
32. See http://www2.warwick.ac.uk/fac/sci/wmg/education/prof-ed/asas/ for further information
33. See http://www.leedscityregion.gov.uk/news/news-landmark-deal-to-boost-jobs-and-apprentices/ for further information.

including the WMG Academy for Young Engineers at the University of Warwick, which will widen the provision of vocational education. It is important that core skills – literacy, numeracy and ICT – are integrated into these courses to improve individuals' employment prospects and long term flexibility in the labour market.

Local businesses highlighted the impact that national immigration caps had on their ability to access skilled labour.[34] With many global businesses in the area, immigration caps also restrict the movement of staff between offices and act as a disincentive for firms locating in the UK. The diversity of a workforce is also linked to higher levels of innovation.[35]

Skills shortages were also reported at management level, including project managers.[36] The CWLEP should work with the Manufacturing Advisory Service and SMEs to develop owner-manager skills through the Business Growth Hub.

Recommendation: CWLEP should create a Skills and Apprenticeship Hub bringing together local education and training providers to work with business to address shortages of graduate and specialist labour.

University research

University research is widely regarded as an integral part of innovation systems and has been found to have a positive association with firms' R&D and patenting activity. Recent research has shown that different measures of research 'power' and 'excellence' positively affect the patenting of small manufacturing firms within the same postcode area.

The Research Assessment Exercise (RAE), the most reliable indicator of the quality of the research carried out in UK universities, classifies a high proportion of the research carried out at the University of Warwick as world-leading. The university ranks second in the country for the quality of research in the fields of business and management studies, and economics and econometrics, and in the top five for statistics and operational research, general engineering and pure mathematics. Overall, 15 departments at University of Warwick rank in the top 10 nationally.

Research specialisms at both universities align relatively closely to sectoral specialisms in the local economy. The share of employment in high tech manufacturing and engineering sectors is 1.5 times higher in the CWLEP area than the national average. In addition to the specialisms at the University of Warwick, Coventry University specialises in materials, automotive and aerospace engineering and electronics, and is home to an award-winning automotive design school. As a result, there is potential for high levels of interaction between the universities and the local businesses.

Collaboration and knowledge exchange

The movement of ideas, information and knowledge between individuals, firms and institutions takes place through a variety of mechanisms, including inter-firm cooperation, collaboration with universities, formal and informal networks. **Collaboration allows firms to achieve economies of scale and scope, to access complementary resources and leading edge research knowledge and test industrial capabilities.**[37]

34. Business interviews
35. Forbes (2011) *Global Diversity and Inclusion: Fostering Innovation Through a Diverse Workforce*
36. ERS (2011) *Employer demand for skills in Coventry and Warwickshire*
37. Cunningham, P. and Gök, A. (2012) *The Impact and Effectiveness of Policies to Support Collaboration for R&D and Innovation*, London: NESTA

Coventry and Warwick universities play a key role in facilitating local exchange within the region. With global links, universities often operate in markets much broader than the functional economic area. They cannot be expected to engage exclusively with the local business base, but their role is crucial in providing a space where local businesses can exchange knowledge and access knowledge generated elsewhere.

The nature and level of business interaction varies between the two universities. Overall, data on research quality and business engagement of the universities in the area suggests that University of Warwick is strongly research-oriented and Coventry University is highly business-focused (Figure 19). As such, the two universities within the CWLEP area, Coventry University and the University of Warwick, are widely regarded as being complementary.[38]

The University of Warwick is among the top ranking universities in the country for research quality and in 2010/11 was contracted to carry out a relatively high number of research projects. WMG is one of the largest collaborative research centres operating in the automotive sector, with JLR as a major collaborator.

Coventry University received the Times Higher Award for Entrepreneurial University of the Year in recognition of the University's work with the business community.[39] Coventry University has a very high number of staff devoted to business engagement and it generates very high levels of revenue from consulting projects. This has been driven by a focus on applied research aligned to global societal challenges, for example, low carbon vehicles and integrated transport. Coventry University Enterprises also provides business innovation support services to SMEs both on and off the Technology Park. In recognition of the University's work with the business community, it received the Times Higher Award for Entrepreneurial University of the Year. Policy makers need to recognise the different ways in which the two universities are likely to contribute to business innovation locally.

38. Stakeholder interviews
39. See http://www.coventry.ac.uk/primary-news/coventry-university-crowned-entrepreneurial-university-of-the-year-/ for further information
40. NB. Data on contracts within the sub-region is unreliable due to the variability in reporting by universities. 'Research power' combines a weighted average of research quality scores from the Research Assessment Exercise 2008 with the number of FTE Category A employees

Figure 19: University research and business interactions, 2008 and 2010/11[40]

	University of Coventry	University of Warwick
Business		
'Research Power' 2008 (rank out of 160)	251.4 (91)	2704.7 (16)
Total number of contracted research projects, 2010/11	119	848
Research		
Staff devoted to engagement with business, 2010/11	250	40
Number of research and consultancy contracts with SMEs (rank out of 164)	9490 (2)	100 (46)
Total revenue from consulting projects (thousands), 2010/11	7222	2107

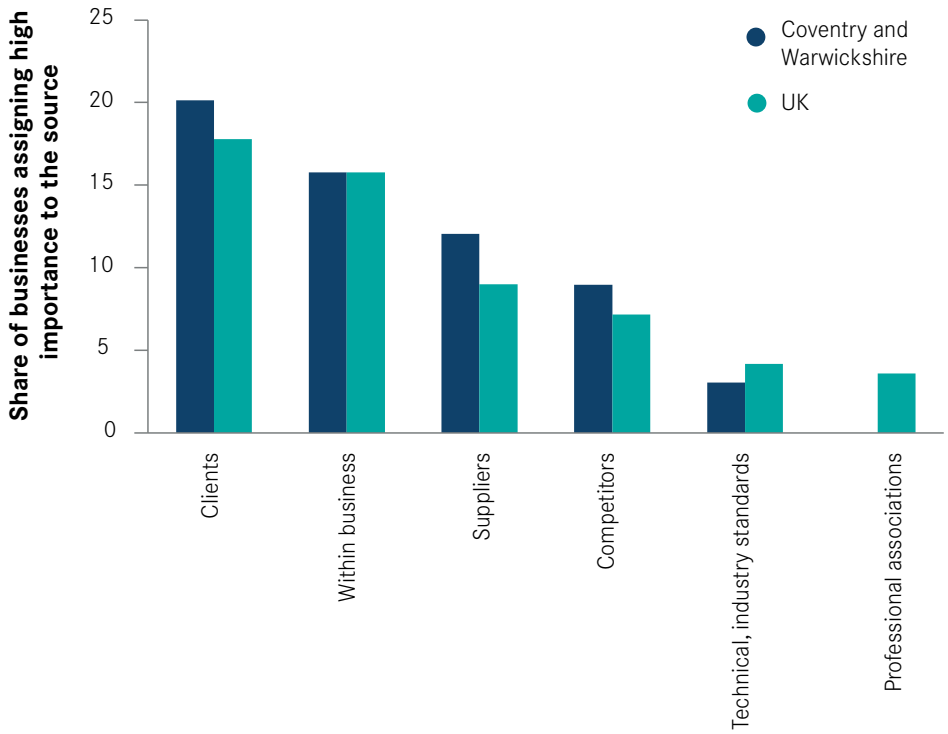
Source: Research Assessment Exercise, 2008; Higher Education Statistics Agency, 2010/11

Policies to foster greater interaction and knowledge diffusion between the university and business sectors form a significant part of the Government's portfolio of measures to support innovation. Partners in Coventry and Warwickshire have a strong history of partnership working and there are a number of existing initiatives to build on. For example:

- The Government, JLR, Tata Motors ETC and HEFCE have announced a £92 million investment in the creation and operation of the National Automotive Innovation Centre at WMG, University of Warwick;[41]
- The Manufacturing Technology Centre at Ansty Business Park near Coventry is working with six other partners, including WMG, to form the High Value Manufacturing Catapult centre;[42]
- TSB has recently re-introduced Innovation Vouchers, grants for SMEs to purchase services from universities with a view to introducing innovations to their business.
- The Health Design Technology Institute and Serious Games Institute at Coventry University which deliver applied research, innovation support, business incubation and learning within a holistic environment that brings together SMEs, MNCs, researchers, charities, and public sector organisations.

41. http://www2.warwick.ac.uk/newsandevents/
42. https://catapult.innovateuk.org/high-value-manufacturing

Figure 20: Key sources of innovation information



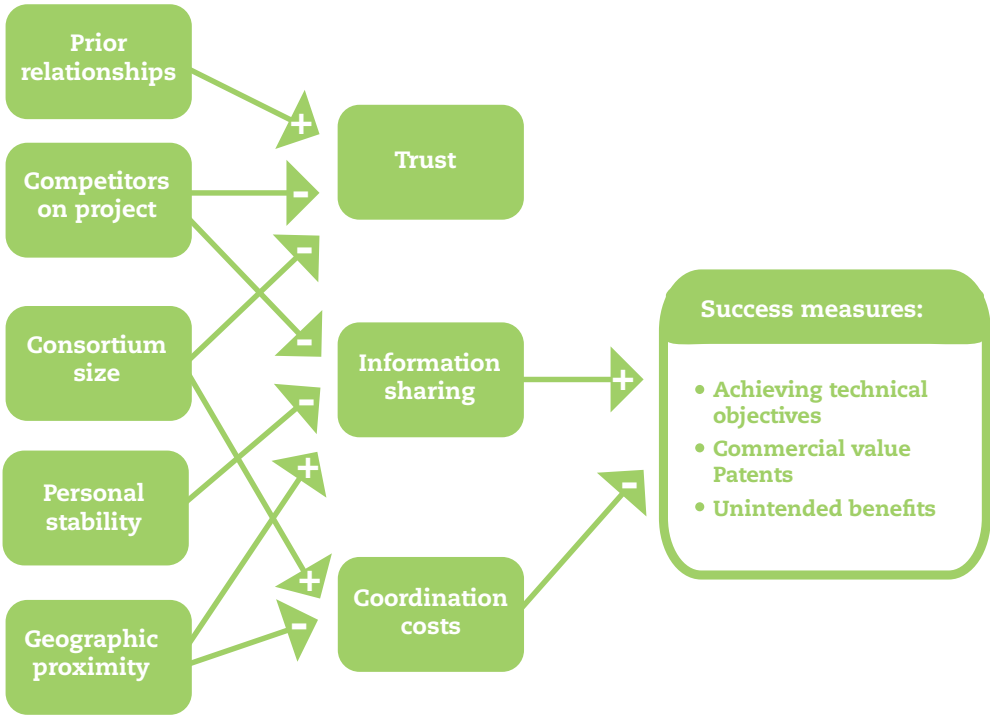
Source: Community Innovation Survey, 2010

As discussed previously, the CWLEP and partners should aim to build on these existing collaborative initiatives for the benefit of local businesses. TSB-funded Vouchers are limited to businesses operating in the following sectors: agrifood, built environment, energy, water and waste, space and open data. Yet a number of universities also offer their own Innovation Vouchers. For example, Coventry University offers contributions of up to £3,000 (or 60 per cent) to businesses seeking to collaborate in the fields of basic design, manufacture and life sciences, and Loughborough University offers vouchers to regional businesses working in transport. Local stakeholders should also encourage organisations to pool innovation vouchers to foster collaboration on larger innovation projects where appropriate.

The knowledge transfer that takes place through supply chains is also fundamental to business innovation in Coventry and Warwickshire. A third of businesses (32 per cent) in the area attach high importance to the knowledge and information exchanged with clients or suppliers compared to the national average of 27 per cent (Figure 20).[43] No firms within the sub-region reported conferences, trade fairs or professional associations as being highly important sources of information for innovation; relatively few firms attach high importance to these sources at national level.

Organisations within Coventry and Warwickshire have partnered on several successful collaborative initiatives (see example in Box 2). A number of the organisations involved in collaborative projects, such as the Coventry and Birmingham Low Emission Vehicle Demonstrator and Low Carbon Vehicle Technology project, had previously worked collaboratively together meaning they had already developed strong relationships with a degree of trust. The geographic proximity between the actors will have also positively impacted on the ability of these organisations to collaborate effectively (Figure 21).

Figure 21: Key factors influencing collaborative success based on 18 automotive manufacturing projects



Source: Dyer and Powell, 2001

43. UK Innovation Survey

Box 2: Premium Automotive Research and Development (PARD) Programme

The £72 million PARD Programme was launched in 2003 with the purpose of improving the design and manufacturing capability of the West Midlands automotive supply base.

At its height a multi-disciplinary team of over one hundred professional engineers and academics worked on nineteen separate projects within WMG. Direct funding of £38 million was provided by Advantage West Midlands and this was matched by contributions of staff time and resources from several hundred companies of various sizes.

Over 600 businesses were assisted as part of the programme, resulting in 258 new products and processes being introduced and £55.5 million of added value being generated. Over 3000 individuals undertook 30 or more hours of training and nearly 5,500 jobs were safeguarded.[44]

Local business representatives reported that collaborative initiatives and networks often involved the same organisations.[45] To improve innovation performance throughout the wider business base in Coventry and Warwickshire it is important that future initiatives engage and involve new organisations. Coventry University Enterprises Ltd manages the EU-funded Innovation Networks scheme which offers grants to SMEs in the West Midlands working with at least two other companies to develop new products or services.[46] It also runs an Innovation University Enterprise Network to support businesses access new business opportunities through open innovation.[47] Local stakeholders should also consider introducing a scheme similar to the Innovation Voucher approach that encourages business to business knowledge transfer (see Box 3 for an example of an initiative established in Manchester).

Box 3: Manchester Creative Credits

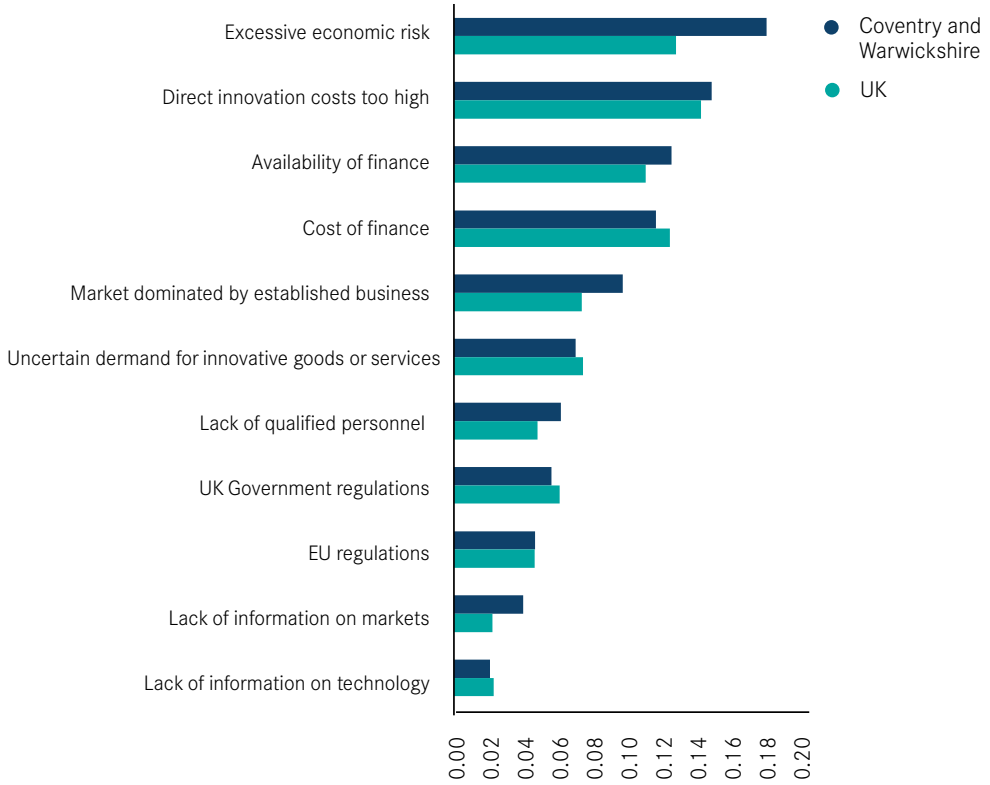
The National Endowment for Science, Technology and the Arts (NESTA) designed a system of 'creative credits' in Manchester, where small businesses looking to invest in innovation could receive up to £4,000 to work with a creative company in Manchester. The Creative Credits scheme was funded by NESTA, ESRC, NWDA and Manchester City Council to encourage business to business collaboration.

The credits had to be matched with at least £1,000. Partners were also careful to keep administration and brokerage costs low.

The project was structured as a randomised controlled trial to enable partners to more accurately evaluate its impacts. The evaluation found that 80 per cent of collaborative relationships would not have formed without the scheme; it supported cross-sector collaboration; 93 per cent of firms achieved all their innovation objectives and gained new commercial and strategic insight; 80 per cent increased innovation strengths and 75 per cent stimulated ideas for new innovation projects.

44. See http://www2.warwick.ac.uk/fac/sci/wmg/research/pard/ for further information
45. Business interviews
46. For further information see www.innovationnetworks.co.uk
47. For further information see www. coventry.ac.uk/business/supporting-your-business/helping-your-business-innovate/

Figure 22: Barriers to business innovation, 2009



Source: UK Innovation Survey, 2009

Recommendation: CWLEP should support more open innovation by helping business identify external partners and funds to support collaborative projects. This should include business-to-business interaction.

Finance

A number of businesses in Coventry and Warwickshire cite lack of access to finance as a major barrier to innovation.[48] It also ranks as the most constraining factor in business innovation on the UK Innovation Survey (UKIS): 12 per cent of firms in Coventry and Warwickshire cite lack of finance as a barrier to innovation. The figures, covering the period 2006-2008, suggest that access to finance is a long-standing problem, rather than a result of the recent economic downturn. Access to finance is an important factor in determining a firm's ability to develop and commercialise new innovations.

Nationally, private equity investment remains heavily concentrated in London and the South East.[49] Private equity and venture capital only account for a small proportion of the finance available to firms,[50] yet data from the British Venture Capital Association (BVCA) indicates that levels of investment are particularly low in Coventry and Warwickshire. While increasing elsewhere, levels of investment in the West Midlands almost halved down from £910 million in 2010 to £496 million in 2011. Figures also suggest that only a small proportion of that investment, 5 per cent, is made in Coventry and Warwickshire.[51] Levels of investment were slightly higher in Birmingham and Solihull in 2011 and more than

48. Business interviews
49. In 2011 a thousand firms received private equity and venture capital funding across the UK as a whole (NB. BVCA members only)
50. 62 per cent of total investment was received by companies in London and the South East
51. BCVA, 2012

twice as high in the North East LEP area.[52] Business angel networks, such as the Minerva network based at Warwick Science Park, continually look for new investors. The CWLEP should promote investment opportunities in Coventry and Warwickshire to attract finance from investors across the UK and abroad.

Internationally, the ease with which UK firms can get loans and venture capital is rated very low and is found to have a "particularly compounding effect for early-stage businesses that may be more capital intensive and require financing."[53] This is likely to be a particular issue for Coventry and Warwickshire given the high proportion of manufacturing firms that require capital intensive investment.

Several schemes have been established in the CWLEP area or the wider West Midlands in an attempt to address business finance gaps. The Coventry and Warwickshire Enterprise and Business Growth package, for example, provides grants of up to £100,000 to local businesses. Financial support for business innovation is also available national agencies, such as the Technology Strategy Board. The also EU provides direct financial support for innovators through several programmes including the Structural Funds. Yet interviews revealed that businesses are often unaware of the support available. It is crucial that partners work together to maximise the capacity and impact of existing finance schemes.

Recommendation: CWLEP should work with local partners to identify and promote different funding options available to local businesses.

It may be necessary to support business to develop business and financial plans in order to access loans or grants. It is also important to raise awareness of the cost savings that can be made through the R&D tax credit[54] and other capital allowance schemes. The rate has recently increased to 225 per cent for SMEs; yet just 3 per cent of SMEs in the manufacturing sector claim for relief.[55] National government should also explore ways to simplify existing funding and finance streams.

Physical and digital infrastructure

Physical and digital infrastructure facilitate interactions between businesses, workers and institutions, which lead to the exchange and diffusion of knowledge and innovation.

Transport

Businesses in Coventry and Warwickshire benefit from the area's central location and good external links. A number of key highways cross the LEP area and provide good south and eastbound links (M6, M40), southwest bound links (M5) and northbound links (M6). The total length of highways crossing Coventry and Warwickshire LEP area is significantly larger than in any of the comparator areas. The West Coast Main Line also runs through the sub-region and providing access from Coventry to London in less than an hour. It also links Coventry to Manchester and Liverpool in the north.

Birmingham Airport is seen as a key asset for the local economy, which helps local businesses build international connections. Yet the airport is currently heavily underutilised.[56] In the long run, the construction of High Speed 2 (HS2) will put the

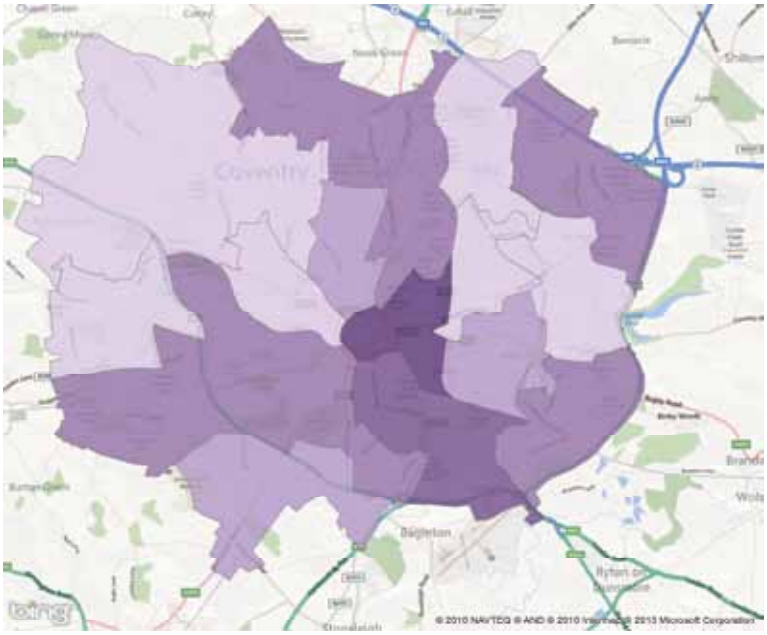
52. BCVA, 2012
53. Global CEO Survey, NESTA report
54. For further information see http://www.hmrc.gov.uk/ct/forms-rates/claims/randd.htm
55. Article from The Manufacturer. Available here http://www.themanufacturer.com/articles/just-3-of-manufacturing-smes-claim-rd-tax-credit-relief/
56. In 2010 8.6 million passengers travelled via Birmingham Airport. A report commissioned by the airport in 2011 has suggested that airport has spare capacity for 9 million more passengers, which suggests that it is only used to 50% of capacity. http://www.caa.co.uk/default.aspx?catid=80&pagetype=88&sglid=3&fld=2011 Annual

Birmingham Airport into a much better position to compete for hub status as the travel times to central London will be much shorter than to Luton airport.[57] Work on runway extension has recently started at the airport and will be completed in 2014. This is the first step towards improving the Birmingham Airport offer.

Public transport links within the region are not as strong, particularly from north to south. The fastest train journey from Stratford to Coventry takes 64 minutes. By comparison, it takes 59 minutes to get to Coventry from London Euston. Trains between London and Coventry also more frequent. Improvements to public transport will strengthen the economic links between the north and the south of the sub-region by increasing effective density.[58]

57. http://www.balancedaviationdebate.com/connectivity/pressreleases/16392_million_national/
58. Coventry and Warwickshire Economic Outlook (2011)

Figure 23: Geography of employment in Coventry by ward, 2011 and 2003 to 2008



Source: BRES, 2012

City Centre offer

Coventry city centre's offer is poor compared to other cities of similar size. Despite being the 11th largest city in the UK, Coventry's town centre is only ranked 49th in the UK on total retail sales.[59] Rateable values of commercial properties in Coventry city centre are more than 10 per cent below rateable values in the rest of the city, which suggests that demand for this space from business is low. By comparison, rateable values in Leicester city centre are 10 per cent higher than in the rest of the city.[60]

A weak city centre offer limits the business density in the area and restricts possible agglomeration effects, which undermine the potential of the urban economy in the future.[61] The city centre is an important location for knowledge intensive service business (KIBS) which benefit from being in close proximity to each other. Over time employment in KIBS has been dispersing away from the city centre (Figure 23). It also has a negative impact on the overall attractiveness of the area as a place to live and work.[62]

Job density in Coventry city centre is significantly lower than in more economically vibrant cities, such as Reading. Dense city centres create an environment where exchange of knowledge within formal and informal networks can facilitate innovation. Research conducted in US has shown that density of employment is strongly associated with patenting rates across US metro areas.[63] Increasing density amongst firms and other organisations through improvements to the city centre may lead to a significant increase in innovation capacity in the area. The £300 million scheme to regenerate the southern part of the city centre is an important first step in tackling these challenges.[64]

Workspace and Utilities

Lack of flexible workspace for SMEs has been identified as a factor constraining the growth of innovative businesses in the LEP area. Interviewees suggested that, while office space units larger than 1,000 ft. are easily available on the market, flexible offers for small enterprises are limited. The problem is amplified by the shortage of land open for commercial developments.[65] The inability to find space to expand can force local start-ups out of the area.

59. http://www.coventry.gov.uk/citycentresouth
60. Neighbourhood Statistics 2011, Commercial and Industrial Floorspace and Rateable Value Statistics.
61. Swinney, P. and Carter, A. (2012) *Hidden Potential*, Centre for Cities, London.
62. Interviews
63. Carlino. G, Chattergee, S. and Hunt, R. (2006) *Urban Density and the Rate of Invention*, Federal reserve Bank of Philadelphia
64. http://www.coventry.gov.uk/citycentresouth
65. Interview

Interviewees identified a shortage of start-up and incubation facilities across the CWLEP area. The University of Warwick Science Park and Coventry University Technology Park have proven successful at attracting innovative businesses and helping them expand in recent years. Interviewees highlighted demand for more incubation facilities to support new businesses. It was suggested that local authorities can engage more actively with developers to facilitate delivery of workspace for SMEs.

Several interviewees also highlighted that there are very few manufacturing premises with spare power grid capacity. Manufacturing processes are often energy intensive, so shortages of power grid capacity may become a significant growth barrier for businesses. For larger firms investment in energy generation and distribution capacity only leads to a marginal increase in the overall costs. For small- and medium-sized manufacturing firms, on the other hand, this type of investment can be prohibitively large.[66]

Digital

Digital infrastructure acts as a foundation for a multitude of innovative technologies and services.[67] Direct benefits of broadband access are particularly high in certain sectors where growth and job creation is reliant on access to a high speed connection. Yet the benefits of simplified knowledge exchange and diffusion that broadband facilitates apply to knowledge-intensive activities across all sectors.[67] Research has previously shown that, during the period of active introduction of broadband, a 1 per cent increase in broadband penetration increased innovation by between 3.5 and 5.3 per cent.[68]

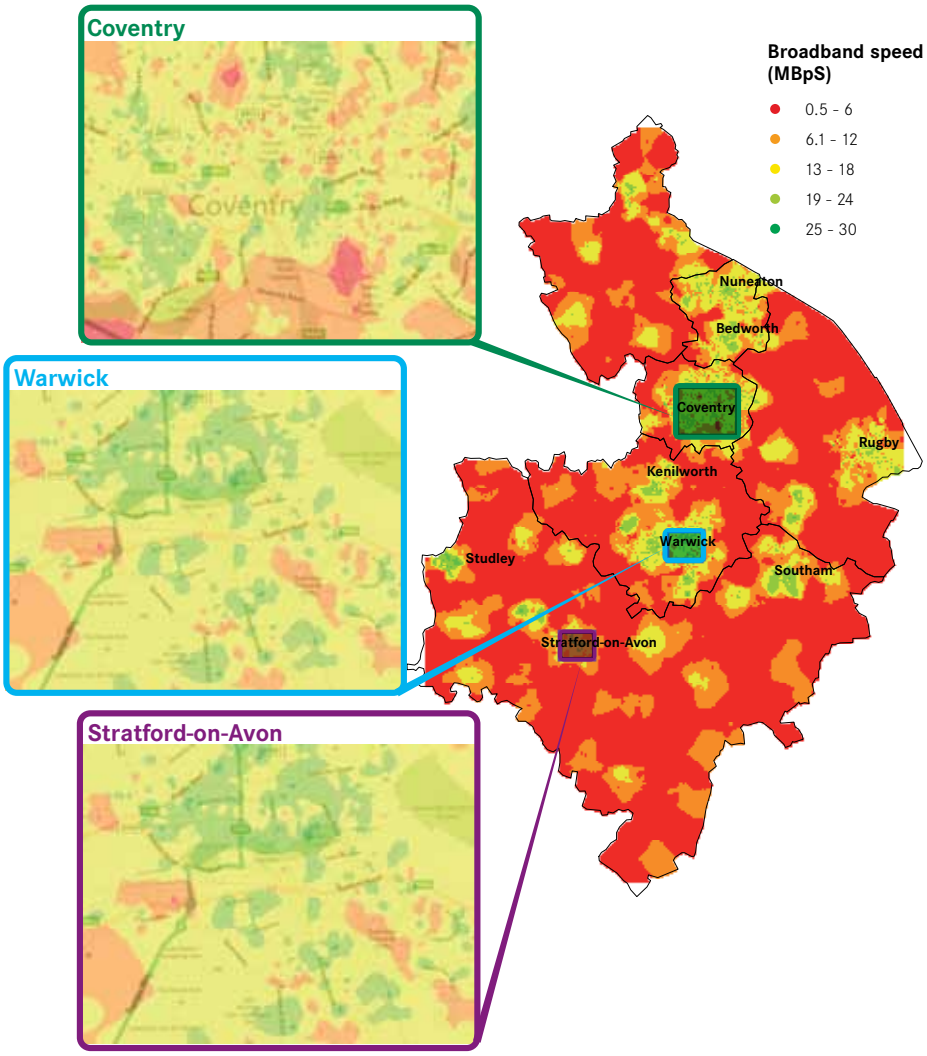
Limited access to broadband has been identified as one of the secondary barriers to innovation in Coventry and Warwickshire. The city has faster average internet speeds 8.3mbps than Warwickshire County (6.3mbps) and broadband speed data at a postcode level shows that internet connection is faster in dense urban areas across the LEP area (Figure 24). Take-up is lower in Coventry than in Warwickshire, however, which indicates that the demand for fast internet is rather higher across more rural parts of Warwickshire.

The Coventry, Solihull and Warwickshire (CSW) Superfast Broadband project, funded by central and local government, aims to achieve 90 per cent coverage at superfast speeds and a minimum of 2mbps elsewhere.[69] Basic training in e-skills for everyone at work and at home should also be provided where appropriate to ensure the effective use of superfast broadband.[70]

Recommendation: Partners should pool resources in order to invest in infrastructure priorities, including Coventry city centre, flexible workspace and north-south transport connections, in the sub-region.

66. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1396687
67. http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/broadband_impact_2008.pdf
68. http://www2.lse.ac.uk/businessAndConsultancy/LSEConsulting/pdf/Costs-and-Benefits-of-Superfast-Broadband.pdf
69. For further information see http://www.cswbroadband.org.uk/
70. For further information see http://www.cswbroadband.org.uk/

Figure 24: Average broadband speeds in Coventry and Warwickshire



Source: Ofcom 2012, Contains Ordinance Survey data and database right 2013, Contains Royal Mail data © Royal Mail copyright and database right 2013 uses Microsoft Bing maps.

Policy Recommendations

Coventry and Warwickshire boasts some world class innovation-related assets. It is home to several of the UK's most innovative companies and universities producing cutting-edge research. A range of initiatives and partnerships have built up around these assets aiming to further exploit the area's innovative potential. In spite of these efforts, the diffusion of innovation is not strong and there is a long tail of less innovative, less productive businesses in the sub-region. It is crucial that these businesses are supported to engage in more innovative activity in order to increase the area's economic resilience and rates of sustainable growth.

"Aim to build on the area's niche strengths and encourage diversity"

For the **CWLEP and local partners** to effectively support business innovation and growth in Coventry and Warwickshire they should:

- **Aim to build on the area's niche strengths and encourage diversity.** Growth in the market for automotive and advanced manufacturing suppliers is a clear opportunity for the CWLEP. Policy makers need to ensure business innovation and growth is supported across different types of business and sectors if it is to strengthen the area's resilience and achieve long-term sustainable growth.

- **Embed innovation across all policy areas rather than develop innovation as a specialist policy area.** The barriers to innovation faced by businesses relate to a range of policy areas, from skills to transport. Local public sector organisations need to ensure there is a shared understanding of how businesses innovate and the potential impact of policy decisions on business innovation. As part of this, the CWLEP should continue to improve levels of engagement and communication with the local business base.
- **Ensure policy is formulated at appropriate geographic scale and builds on existing initiatives.** A functional economic area based on business links and innovation can span regional, and even national borders. It may be appropriate to collaborate with other LEPs on specific initiatives to achieve greater efficiencies and capitalise on assets in the wider region.
- **Ensure it pools resources to deliver fewer projects on a larger scale where possible.** The LEP should also play a coordinating role across the Coventry and Warwickshire area to limit duplication and maximise the impact

of funds available. The LEP also needs to ensure that central government, EU and private sector funds are aligned.

"Partners should continue to prioritise funding for improvements to Coventry city centre"

There are a number of specific interventions to support innovation amongst the wider business base in Coventry and Warwickshire:

- **CWLEP should work with Coventry and Warwickshire local authorities to strengthen current business support by combining funding streams into a Business Innovation and Growth Hub.** Access to finance, trade and investment and business advice should be integrated into a single Hub, which can either be virtual or in one physical location. The Business Hub should also operate as a single point of reference for local businesses trying to navigate innovation support.
- **The Business Innovation and Growth Hub should focus on encouraging interaction between businesses (predominantly through supply chains) and innovation assets.** The Hub should support more open innovation by helping business identify external partners and funds to support collaborative projects. This should include business-to-business interaction.

- **CWLEP should build on its existing Memorandum of Understanding with UK Trade and Investment (UKTI) to promote Coventry and Warwickshire as a global R&D Hub.** Partners should take a proactive and targeted approach to inward investment to build on the area's existing assets and the increasing propensity of global manufacturing companies to co-locate R&D activity.
- **CWLEP should partner with local education and training providers to establish a Skills and Apprenticeship Hub that works with business to address shortages of graduate and specialist labour.** The Skills Hub should promote career opportunities within the automotive and advanced manufacturing sectors and work with labour market intermediaries to improve job matching. As part of this, the LEP should build further links with major engineering universities and colleges across the country. Partners should also explore how apprenticeship programmes run in other cities might be applicable to the sub-region.

- **Local authorities and the CWLEP should continue to prioritise funding for improvements to Coventry city centre, alongside improvements to north-south transport connections.** The city centre is a gateway to the sub-region and acts as a hub for businesses. Other priorities for investment should include increasing the availability of small, flexible workspaces. Partners should pool resources in order to invest in infrastructure priorities in the sub-region.

"Partners should pool resources in order to invest in infrastructure priorities in the sub-region"

National government and agencies should support business innovation in Coventry and Warwickshire by:

- **Encouraging more intelligent procurement across national and local growth to stimulate business innovation.** The public sector needs to maximise the potential impact of spending to incentivise and support business innovation. Procurement officers should avoid over-specific development for the domestic market and improve dialogues with potential suppliers.

- **Ensuring initiatives are sufficient in focus, scale and duration to support business innovation.** The complexity of public sector initiatives to support innovation needs to be addressed in order to help businesses navigate the support available.
- **The Technology Strategy Board (TSB) should improve engagement with the CWLEP to identify opportunities to support business innovation.** Specifically, the TSB and CWLEP should explore ways to build on the successes of past demonstrator projects in the region.

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