

# Making it:

The advanced  
manufacturing economy in  
**Sheffield and Rotherham**

Louise McGough, May 2015

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## Acknowledgements

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All views expressed in this report are those of the Centre for Cities and do not necessarily represent the views of those we interviewed. Any mistakes are the author's own.

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## Executive Summary

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Building on a historical manufacturing sector specialising in heavy steel, companies in Sheffield and Rotherham are developing bespoke products and services for the aerospace, nuclear, transportation, oil and gas and medical engineering sectors, driven by innovation and research and development (R&D) in software, data, robotics and other technologies.

The cluster of advanced manufacturing in the Sheffield-Rotherham economic corridor, anchored around the industry-led innovation and R&D conducted at the Advanced Manufacturing Park (AMP) and Sheffield Business Park (SBP), is a key economic asset for the area. It presents a wider opportunity to boost growth and productivity and to showcase the region.

The Innovation District model, as developed by Bruce Katz and colleagues at the Brookings Institution, provides a useful set of principles for developing a strategy to boost growth and innovation in this cluster, or ecosystem. This has focused on a business-led approach to place-making, transport and skills at the Sheffield Business Park, the Advanced Manufacturing Park and more widely in the Sheffield-Rotherham innovation ecosystem.

Policies and interventions developed as part of an Innovation District strategy should focus on supporting existing businesses as well as attracting new businesses, and be based on robust evidence of what advanced manufacturing companies across the whole supply chain need to grow and innovate.

Place-making and transport decisions in particular should be firmly rooted in the needs of current and future businesses and employees, the benefits of co-location and idea sharing, and be seen as a means through which innovation activity is supported, encouraged, and accelerated.

An Innovation District strategy to boost growth and innovation should focus on policies that support advanced manufacturers and will boost innovation in the sector, and interventions that are part of a wider strategy to support economic growth in Sheffield-Rotherham.

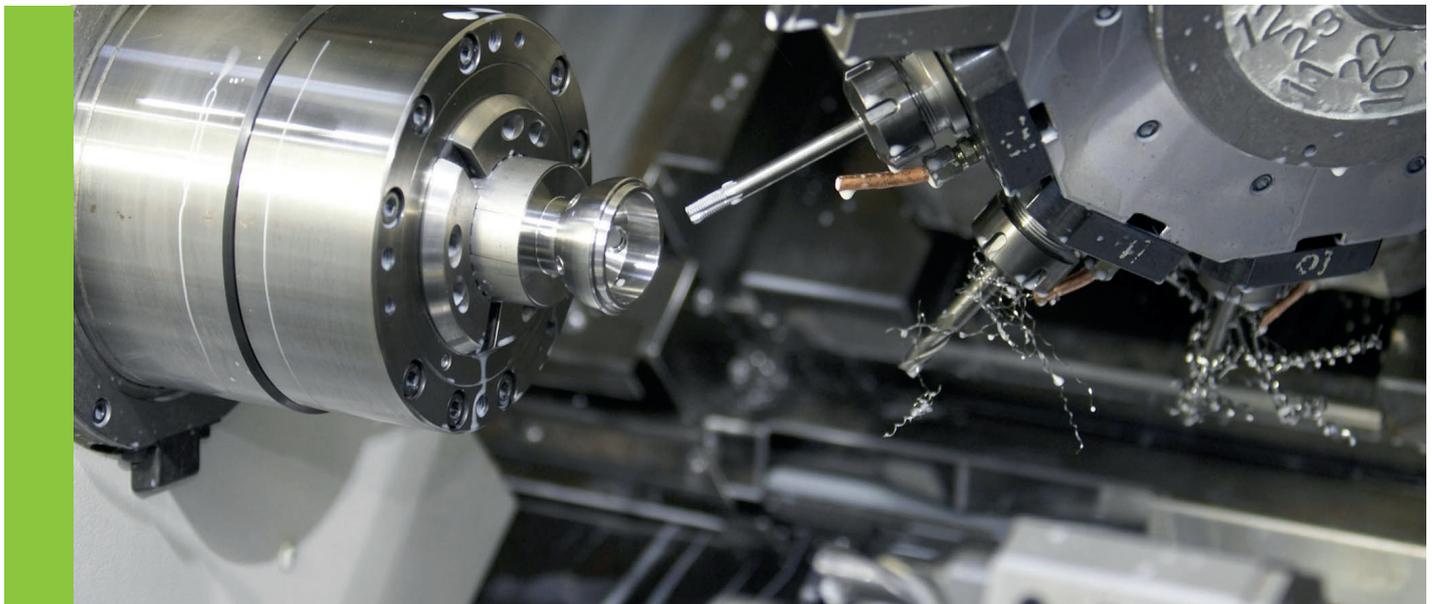
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## Introduction

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In January this year, Bruce Katz, co-author of *The Rise of Innovation Districts* and Director of the Metropolitan Programme at the US Brookings Institution, and Kelly Kline, Economic Development Director of the City of Fremont, California, visited the Sheffield-Rotherham area of South Yorkshire to explore how the principles of an Innovation District might be relevant for the cluster of innovation in high value manufacturing concentrated in the area.

This report was supported by the Sheffield International Economic Commission (SIEC) and provides insights for partners to take forward an Innovation District strategy. The report focuses on recommendations for supporting advanced manufacturing growth and innovation, based on the principles put forward in *The Rise of Innovation Districts* and Centre for Cities' expertise.



## What is an Innovation District and how does advanced manufacturing fit in?

Innovation Districts bring together leading research institutions such as universities and R&D companies with large firms and small start-ups in well connected, mixed-use, urban locations that are attractive places to live, work and play. In many countries, including the UK, this marks a shift away from the past few decades where companies chose to, or were encouraged to, locate in out-of-town business parks. Advanced R&D in particular was conducted in out-of-town science parks to enable firms to guard their intellectual property.<sup>1</sup> The Innovation District concept captures the emergent importance of the geography of innovation to the urban fabric.<sup>2</sup>

According to Katz and Julie Wagner, most Innovation Districts fit into three broad models or trends of development:

- “The ‘anchor plus’ model, primarily found in the downtowns and mid-towns of central cities, is where large scale mixed-use development is centred around major anchor institutions and a rich base of related firms, entrepreneurs and spin-off companies involved in the commercialization of innovation.”
- “The ‘re-imagined urban areas’ model, often found near or along historic waterfronts, is where industrial or warehouse districts are undergoing a physical and economic transformation to chart a new path of innovative growth. This change is powered, in part, by transit access, a historic building stock, and their proximity to downtowns in high rent cities, which is then supplemented with advanced research institutions and anchor companies.”
- “The third model, ‘urbanized science park,’ commonly found in suburban and exurban areas, is where traditionally isolated, sprawling areas of innovation are urbanizing through increased density and an infusion of new activities (including retail and restaurants) that are mixed as opposed to separated.”

In their report, the authors describe Innovation Districts as bringing together economic, physical and networking assets:

- **Economic assets** refer to the cultivators and drivers of innovation.
  - **Innovation drivers** are the universities, research centres, large firms and start-ups that develop cutting-edge products and services.
  - **Innovation cultivators** in turn support these activities and can be anything from a school or training centre (providing the skilled labour to innovation cultivators) to the lawyers and venture capital firms required to support innovation to market.

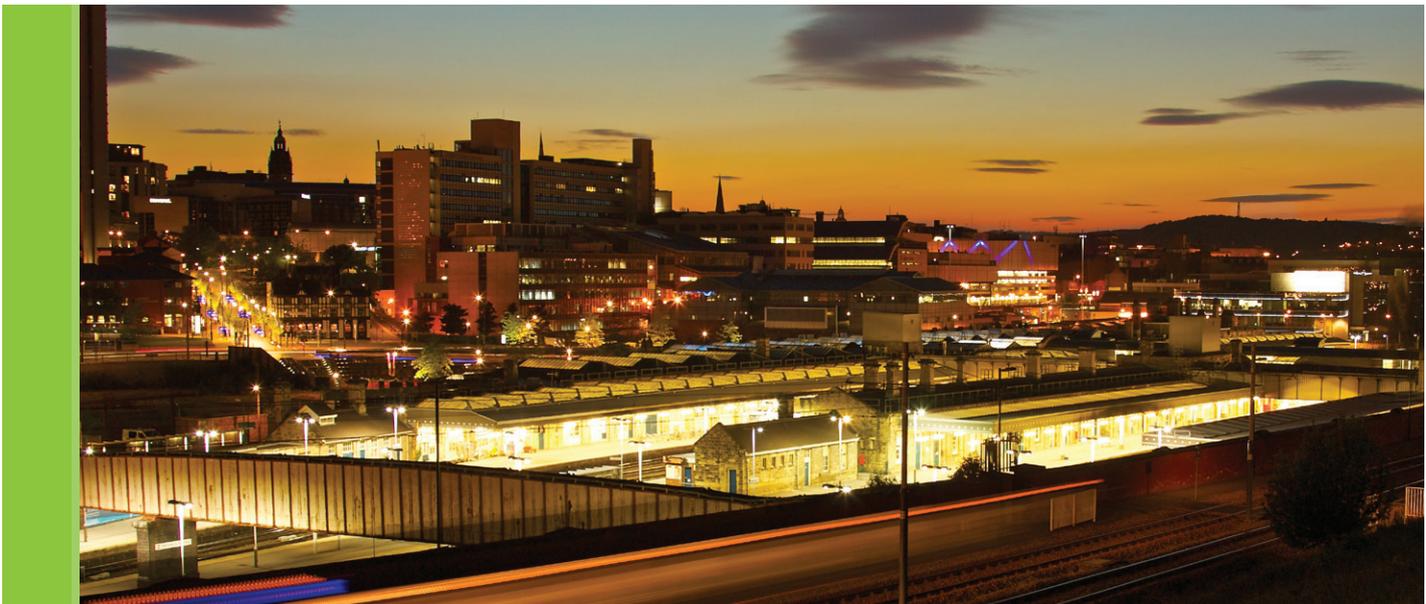
Local amenities such as shops, restaurants, cultural amenities contribute to the overall ‘liveability’ that is central the mixed-use city centre quality of the Innovation District.

1. Katz B and Wagner J (May 2014), The Rise of Innovation Districts, Metropolitan Policy Programme, Brookings Institution: Washington DC  
 2. Bruce Katz public lecture, January 2015, Sheffield Cathedral

- **Physical assets** refer to the quality of the public realm in the Innovation District area, the quality of private realm within companies and campuses, but perhaps crucially, they also refer to the quality of the assets that link the Innovation District with the broader city and residential areas – including broadband, public transport, bicycle and pedestrian paths.
- **Networking assets** refer to the ties between people and companies in the Innovation District. These are the relationships that foster the cooperation and competition vital to innovation, especially in knowledge-intensive sectors.

The story of Innovation Districts is primarily one of change in the industrial structure of advanced economies: the decline of mass manufacturing, rise in professional and knowledge-intensive services as engines of growth and job creation, and related re-urbanisation trends. But some cities have maintained a position in manufacturing by specialising in advanced manufacturing, combining applied research and R&D to traditional industries and carving out competitive advantages in high-tech, bespoke and complex processes.

As this report shows, although the geography of innovation in advanced manufacturing is different to the Innovation Districts found in many cities, based on business, professional and financial services (BPFS) and creative and digital industries (CDI), the principles that underpin the concept of an Innovation District do seem to provide useful insights for thinking about innovation in advanced manufacturing as well. The next section provides more detail and context on the economy and advanced manufacturing sector in Sheffield-Rotherham.

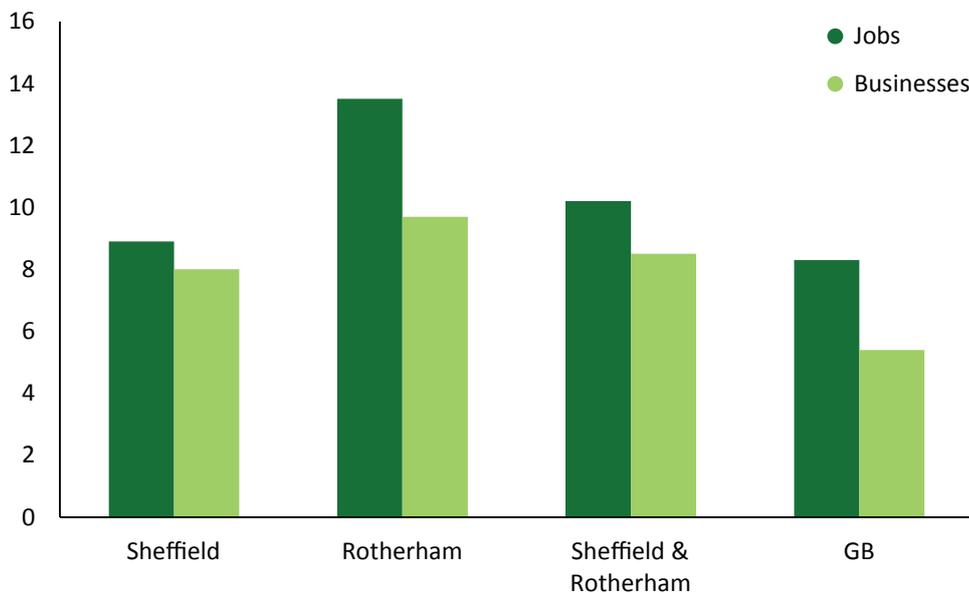


## The Sheffield and Rotherham context

Sheffield and Rotherham local authorities sit within the Sheffield City Region (SCR), which comprises nine local authorities. Of 76,000 jobs in the SCR,<sup>3</sup> 11.4 per cent are in manufacturing compared to the 5.4 per cent average in Great Britain.<sup>4</sup> In the Sheffield-Rotherham area, manufacturing accounts for 10.2 per cent of private sector jobs and 8.3 per cent of all private sector businesses.

Figure 1 shows the share of manufacturing activity as a share of total private sector economic activity in Sheffield, Rotherham, the two cities together and the UK as a whole. Both in term of jobs and businesses, Sheffield and Rotherham have a higher share of manufacturing activity than the UK average.

**Figure 1: Manufacturing activity as a share of total private sector economic activity**



Source: NOMIS, Business Register and Employment Survey 2013 and UK Business Counts 2013

Manufacturing in the UK does not look the same as it did 30 years ago. In 2009, Rolls Royce and Arcelor Mittal reported 49 per cent and 29 per cent of revenue from services respectively.<sup>5</sup> This is a growing phenomenon: while in 2007 only 24 per cent of UK manufacturers (with over 100 employees) derived value from the services associated with their products, in 2011 this had risen to 39 per cent of UK manufacturers.<sup>6</sup>

As Bruce Katz and Kelly Kline wrote in their recent blog, “advanced manufacturing has mastered the innovation side of the Innovation District”.<sup>7</sup> Alongside more traditional steel forging and casting, innovation and modern technologies are integral to the bespoke and high tech products and services for the aerospace, nuclear, transportation, oil and gas and medical engineering sectors that are manufactured in the area. Advanced manufacturing companies in Sheffield-Rotherham are increasingly operating across more elements of the manufacturing value chain,<sup>8</sup> including in research, design and development of products and services prior to production.

3. Source: NOMIS, Annual Population Survey, 2013-2014 data  
 4. Source: NOMIS, Business Register and Employment Survey, 2013 data  
 5. Foresight (2013), The Future of Manufacturing: A new era of opportunity and challenge for the UK, Project Report, The Government Office for Science: London  
 6. Innovation district.  
 7. Katz B and Kelly K (March 25, 2015), An advanced manufacturing innovation district grows in Sheffield, England, Brookings blog (accessed 8 April 2015: <http://www.brookings.edu/research/opinions/2015/03/25-manufacturing-innovation-district-sheffield-england-katz-kline>)  
 8. BIS (2010), Manufacturing in the UK: An economic analysis of the sector, BIS Economics Paper No 10A, Department for Business, Innovation and Skills: London

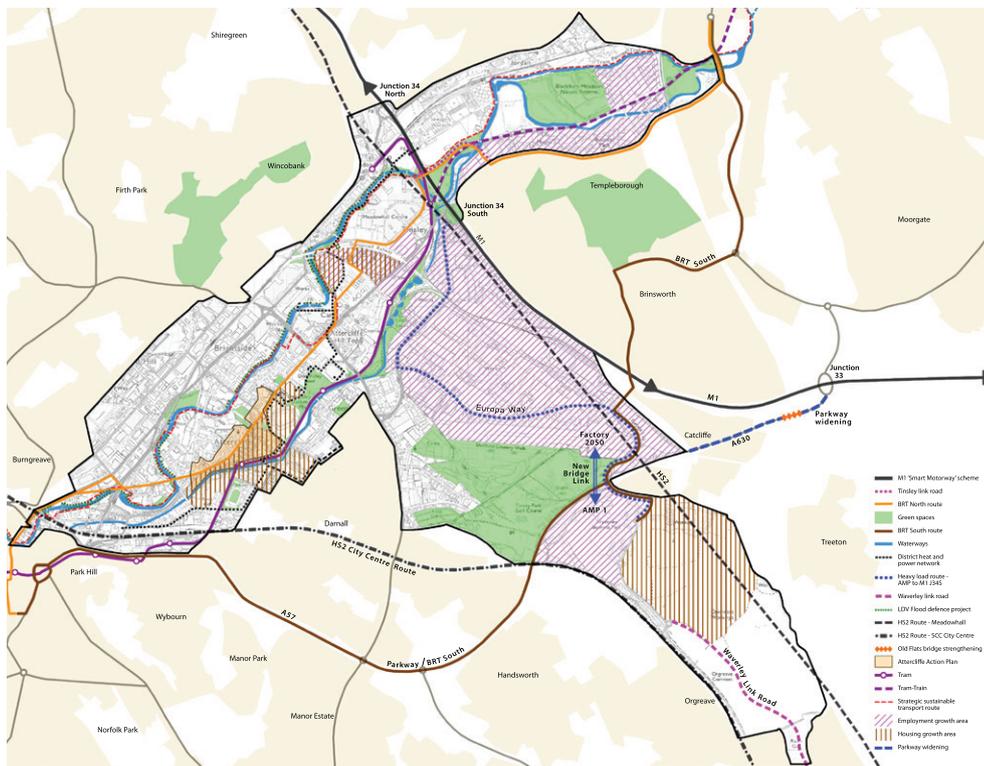
R&D and industry-led innovation in Sheffield-Rotherham has been driven by the Advanced Manufacturing Research Centre (AMRC) and led by the University of Sheffield, a UK leader in advanced manufacturing and research and located in the Advanced Manufacturing Park (AMP). The AMRC has over 80 partner companies including Boeing, Rolls-Royce, BAE Systems, TATA and Forgemasters, located both on the AMP site and in the wider Sheffield-Rotherham area. The AMP site is also home to the Nuclear AMRC, Welding Institute, Castings Technology International, AMRC Knowledge Transfer, Training and Design Prototyping and Testing Centres.

Bordering the site of the AMP (but separated by a motorway) is the Sheffield Business Park (SBP) which hosts a number of companies including business, financial and accounting services. The SBP will also be the site of the new Factory 2050 facility which will bring new advanced manufacturing activity to the SBP.<sup>9</sup>

9. Hereafter the report refers to 'AMP-SBP' to mean the combined area of the two sites as the focal point of innovation and R&D in the advanced manufacturing ecosystem

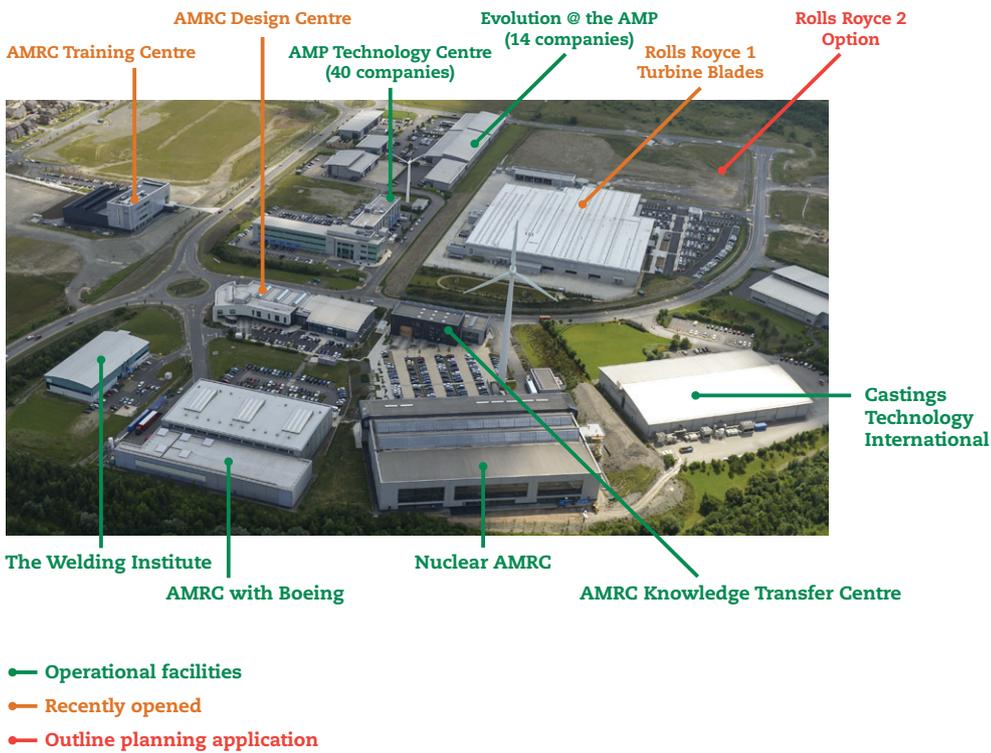
10. Katz B and Wagner J (May 2014), The Rise of Innovation Districts, Metropolitan Policy Programme, Brookings Institution: Washington DC

**Figure 2: Sheffield and Rotherham economic corridor**



The AMP-SBP site itself is located between Sheffield and Rotherham and sits within a broader corridor of manufacturing and engineering firms. Figure 2 above shows how the geography of innovation and economic activity in advanced manufacturing in Sheffield-Rotherham differs from the urban, high-density and mixed-use business, professional and financial services (BPFS) or creative and digital industries-based Innovation Districts in other cities. But the growth of highly innovative firms and cluster of activities does closely resemble the ‘urbanized science park’ model, where science parks originally designed to ensure seclusion, isolation and to protect intellectual property (IP) are re-developed to meet the needs of modern innovative businesses.<sup>10</sup> The next section will examine in more detail the principles that underpin the Innovation District concept and how they relate and are useful in boosting advanced manufacturing in Sheffield-Rotherham.

**Figure 3: The Advanced Manufacturing Park, Sheffield-Rotherham**



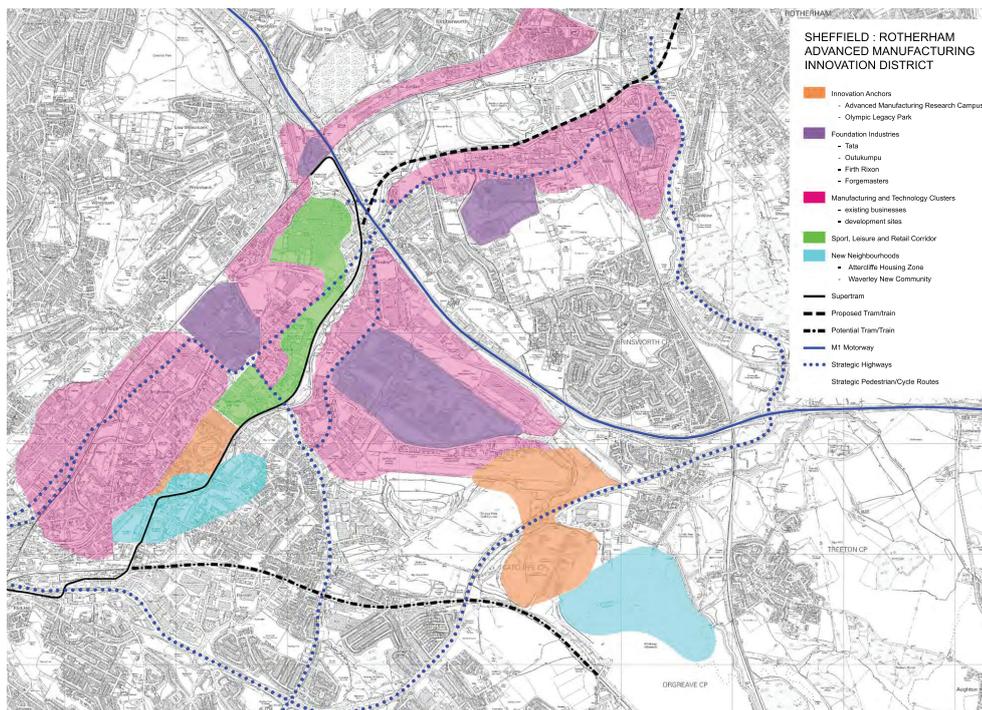
## The Innovation District concept: how does it apply to the advanced manufacturing innovation sector in Sheffield-Rotherham?

Many of the principles that underpin the Innovation District concept explored in Bruce Katz' and Julie Wagner's paper are useful for thinking about how to maximise the impact of the sector to the city region and national economy. This section examines some of the key principles and explores how they can inform the development of an Innovation District in and around the AMP and SBP.

### Clustering of innovation assets

The Sheffield-Rotherham area contains an agglomeration of advanced manufacturing and technology firms, with a clustering of advanced manufacturing R&D and innovation assets. Both the AMP and SBP have grown as the AMRC has expanded to partner with large private sector firms to create innovative new products to release to the market.

**Figure 4: Innovation assets in Sheffield-Rotherham**



The wider Sheffield-Rotherham economic corridor also houses international brands in materials technology, engineering and manufacturing such as Forgemasters International, Tata, Outokumpu, Alcoa and other firms in the advanced manufacturing supply chain. Many of the industrial production plants in Sheffield-Rotherham specialise in high tech, bespoke or precision work destined for use in aerospace, nuclear, oil and gas and renewables that are highly dependent on the innovations and technologies developed at the AMRC. Integration and synergy in the supply-chain appears to be strong, with firms benefitting from their location in and around the AMP-SBP area.

Anecdotal evidence from manufacturers in the wider Sheffield-Rotherham area also indicates that being physically located in the area is important to remaining at the cutting-edge of industrial design and production technologies, as well as for the wider ‘Made in Sheffield’ reputational benefits. In addition, for some firms co-location on the site would appear to provide very tangible benefits not found elsewhere. Keith Ridgway, Executive Dean of the AMRC, recalled re-locating a facility to the AMP proper after only a few months of being only a 10-minute drive away, because it was felt to be damaging business prospects. This type of co-location within the supply chain was identified as a priority for the Government, who have sought to introduce greater co-location of advanced manufacturing supply chains through funding incentives,<sup>11</sup> as a means of encouraging more manufacturers to operate in the UK. **Gaining a more precise and robust understanding of the benefits of co-location or proximity to the AMP-SBP for different businesses should be the priority for developing an Innovation District strategy.**

The location of an innovation anchor in the form of the AMRC within the wider Sheffield-Rotherham economic corridor suggests a node and networks geography of innovation in the area: the nucleus of innovation and research-led advanced manufacturing is located at the AMP-SBP, but the business connections and sector span out into the wider area. While the geography of advanced manufacturing in the area is less dense than in the business and professional financial service sector-based Innovation Districts, proximity and co-location appear to benefit a range of firms in the advanced manufacturing sector and supply-chain. Companies benefit from the cluster of advanced manufacturing R&D on the AMP-SBP site, the network of advanced manufacturing companies in the area, as well as other innovation assets. This includes the universities of Sheffield and Sheffield Hallam, business, professional and financial services (BPFS) and creative and digital industries (CDI) sectors in the city-centre. **These nodes of economic activity in advanced manufacturing and complementary activities suggest an ‘innovation ecosystem’ or triangle in Sheffield Rotherham that presents significant opportunities for economic growth.**

*“A tour of Sheffield revealed the existence of an “innovation triangle” connecting the park, key companies in the broader Don Valley, and the city center’s downtown area—with its ample amenities, university campuses, and focus on creative design. To this end, the Advanced Manufacturing Park appears to be the fulcrum of a broader innovation district rather than the sum total.” – Bruce Katz and Kelly Kline*

## Business and research-led

One of the particular strengths of the centre and development of the AMP are the strong ties between the university, global firms and local businesses. The AMRC was born out of the University of Sheffield and remains staffed and led by university employees. Business involvement has been crucial to its success from the start, with Boeing, Rolls-Royce and others providing the funding, R&D expertise and links to the market that have driven the growth of the Centre and the expansion of the AMP. The close integration of the university and the private sector companies that form the membership of the Centre are integral to the growth of the advanced manufacturing sector.

The AMP Technology Centre hosts start-ups and SMEs that benefit from being on the site for both use of the facilities and the networks that it provides. The access to high tech testing facilities and close proximity to other innovators in related fields enables these businesses to develop. Testimony from businesses indicate that they benefit from public lectures and networking events that foster collaboration – the AMP provides networking assets to advanced manufacturing firms located on the site. **Understanding how the current networking assets benefit these SMEs and what interventions would further support this environment, is key to maximising innovation assets on the AMP-SBP site.**



The AMRC Training Centre located on the site also benefits from the proximity to, and reputation of, the AMRC both in attracting apprentices and the value of their training to future employers. It provides practical as well as academic training, and apprenticeship training at the AMRC makes available different pathways, equipping young people with the advanced STEM skills needed to succeed in advanced manufacturing. Young people in particular seemed attracted to the idea of working in the same environment as big-brand companies such as Rolls-Royce and Boeing. But interestingly, as a result of apprentices of SMEs training side-by-side with the better known global companies, partners at the Training Centre also reported noticing an increased appetite for apprenticeship opportunities within SMEs. The

Centre opened in 2014 and partners reported that the benefits of business-led training available to local firms, and those located on the site, are already being felt.

**Understanding how this element of the skills system supports innovation in Sheffield-Rotherham, how other skills and training assets such as the University Training Centre work alongside it, and what the skills gaps are for individuals and businesses to continue to drive innovation in advanced manufacturing, is vital.**

When asked what single thing would make the biggest difference to the success of the AMRC, but also boost advanced manufacturing in the area, Executive Dean Keith Ridgway answered that attracting a new global large-scale production facility, or ‘OEM’, would be a “game-changer”. This insight, and others from existing companies on what would boost growth and innovation for them and the wider advanced manufacturing sector, should underpin public sector interventions in the area.

**Supporting the university-business relationships and innovative firms that have driven the development of the AMRC and continue to power innovation on the AMP-SBP site should be the focus of interventions as part of an Innovation District strategy in Sheffield-Rotherham.**



## Liveability and place-making

While mixed-use development and the close proximity to amenities (within walking distance or public transport access) is a feature of the city centre BPFs and CDI-based Innovation District, the dynamics of an advanced manufacturing cluster appear to be very different.

Many advanced manufacturing firms (from industrial design to production) stated that they benefitted from being located on the AMP-SBP site, or in close proximity to it. To a large extent this would appear to be because of the access to resources and expertise. Some companies also cited regular coffee mornings at the AMP and public lectures at the AMRC as beneficial to them. But while the AMRC buildings provide some private public realm amenities including a canteen for apprentices within the Training centre, the parks do not encourage people to come together to mix, network

professionally or socialise outside of their own buildings. **Given the benefits of co-location for many of the innovative firms already on site, more spaces to both share materials, equipment and ideas (and also to socialise) between the buildings would support innovation at the AMP and SBP.**

*“Improving the connectivity between the two parks is another element of the smart place-making that is essential to realizing the full innovation potential of the companies, researchers, and supportive institutions located in this relatively compact area of the region.”* – Bruce Katz and Kelly Kline

Within the central innovation hub of the AMP and SBP, connections between places are poor. Currently the two sites are separated by a dual carriageway which poses a challenge for supporting the networks and engagements that underpin innovation, especially as the new AMRC Factory 2050 will be located on the SBP site. For the area to function as a coherent space, to facilitate networks and create a more pleasant public realm for day-time occupants and employees, improving the access across the site is important. The proposed HS2 line will also run across the current site of the AMP-SBP. This route poses a challenge in terms of improving connections between the two current sites, and potential expansion of the current sites in the future. **Given the expansion of the AMRC and the potential for future advanced manufacturing investment, improving connectivity between AMP and SBP is important – this might require engagement with national agencies such as the Department of Transport and HS2 Ltd.**

The more dispersed geography of innovation and the requirements of firms in advanced manufacturing means that residential or mixed-use development would not support growth and innovation in the same way as in more densely populated city centre Innovation Districts. This implies that efforts to improve physical assets or place-making at the AMP-SBP should not be to emulate a city centre environment, but to focus on providing new and existing innovative advanced manufacturing firms with the physical and networking assets that will support them to grow. **Place-making should be seen as a means through which innovation is supported, encouraged and accelerated.**

For example, the housing offer in the Sheffield-Rotherham area might be an important part of the wider strategy for the region, and be important in meeting future housing demand as a result of the projected growth in the advanced manufacturing sector. However, it is worth noting that this should not be thought of as a key part of the strategy to drive innovation. Sheffield city centre, as well as Rotherham town centre, which are part of the innovation ecosystem from a jobs point of view, also provide attractive city centre amenities within the broader ‘innovation ecosystem’ in Sheffield-Rotherham. Boosting the ability of the city centre to attract businesses and employees forms parts of a wider strategy to boost economic growth in the area that will have an important effect on the future growth of the innovation ecosystem.

## Connectivity and transport

Currently the AMP and SBP are both edge-of-town science and business parks located between Sheffield city centre and Rotherham town centre. The site is served by road infrastructure and primarily accessed by car. There is an infrequent bus service but it is not used by most employees or visitors.

Evidence of significant business and economic ties between companies on the AMP-SBP and others in the city centre could support greater investment in access and transport connections between the two. Many people we spoke to during the Commission visit felt that improving the public transport access was vital to driving growth at both the AMP and SBP. Feedback from existing employees and businesses highlighted the potential benefits of improved transport links from Sheffield city centre, and indicated that greater accessibility would enable ambitions to dramatically increase apprenticeship numbers to be realised.

To build the case for improved public transport, and specifically a tram extension from the existing Sheffield city centre line to the AMP-SBP site, robust data and evaluation is required to assess how such investment would support or unlock a large labour force and support economic growth. **Further analysis and evidence gathering should be a priority for building the case for increased investment in transport infrastructure, including public transport access, to respond to growth in firms and jobs at the AMP-SBP and to feed into public programmes such as the Sheffield City Region Infrastructure Investment Programme.**



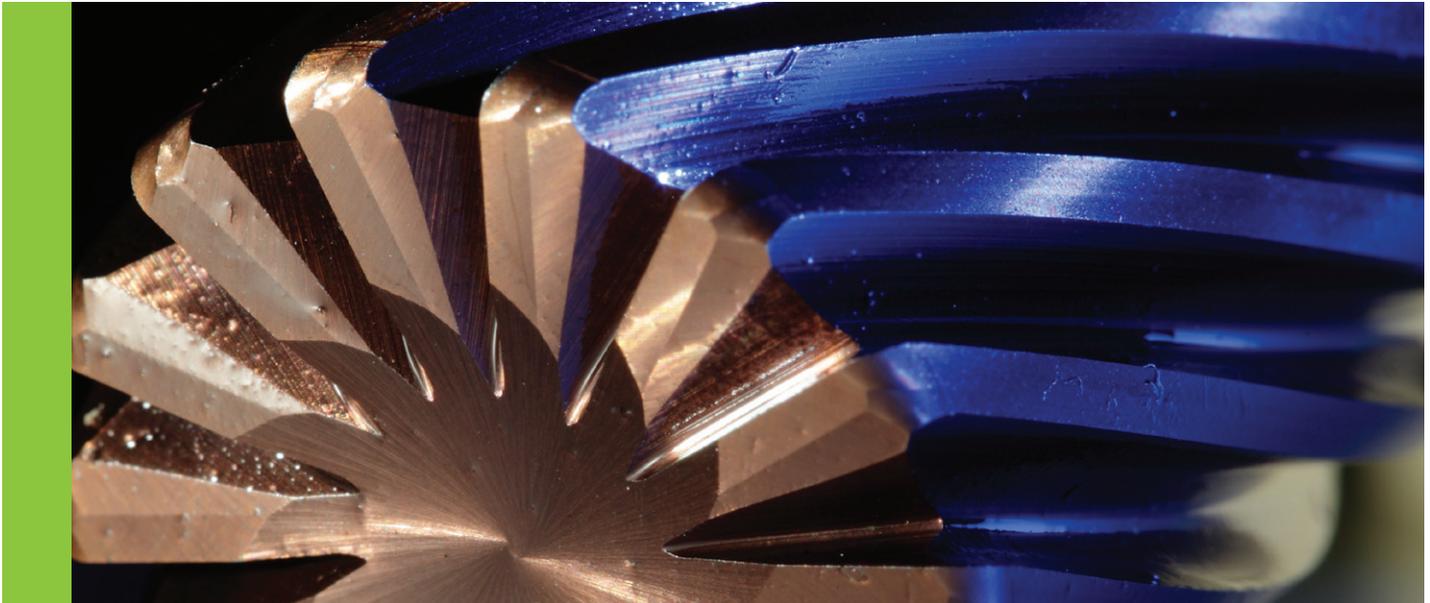
Finally, the consideration of HS2 in the area is not confined to the impact on land values and the attractiveness of the AMP-SBP by the line running through the site itself. The location of an HS2 station will also have economic implications for the wider region and should be given careful consideration. In order to make the most of the opportunities that the investment in high-speed rail presents, HS2 should be integrated as much as possible into existing local transport networks and HS2

stations should be in city-centres.<sup>12</sup> The wider economic benefits projected as a result of HS2 are not best served by the proposed Meadowhall location for HS2. This poses a challenge to boosting economic growth in the area, and therefore innovation and growth in the advanced manufacturing sector in Sheffield-Rotherham.

The principles that underpin the Innovation District model are useful for thinking about how to boost innovation and growth in advanced manufacturing in Sheffield-Rotherham. **While the geography of innovation might be different to the urban and BPFS or CDI-based Innovation Districts found in some cities, being business-led and ensuring place-making focuses on boosting innovation are important for thinking about how to grow and support the manufacturing innovation ecosystem observed in Sheffield-Rotherham.**

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12. Centre for Cities (October 2013), HS2 Policy Briefing, Centre for Cities: London

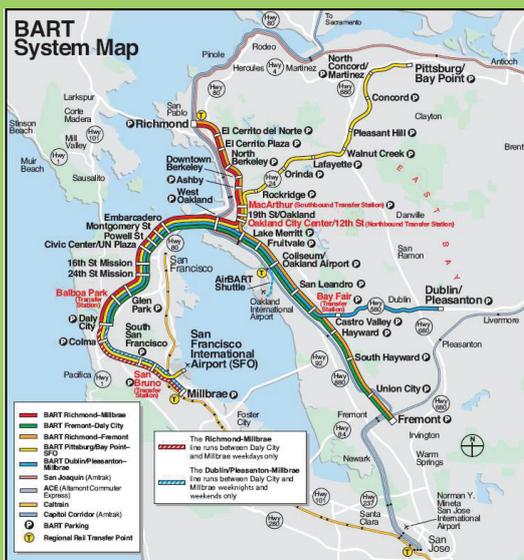


The final sections of this report will focus on the three guiding principles that partners should take forward, followed by practical next steps for implementing a strategy to boost innovation and growth in the advanced manufacturing district, or ecosystem in Sheffield-Rotherham.

### Box 1: Case study – Fremont, California USA

The City of Fremont is the industrial heart of the San Francisco Bay Area in Northern California. Building on a legacy of manufacturing, Fremont has a strong cluster of innovation in advanced industries, with companies such as Tesla Motors, Lam Research, Delta Products, Seagate, Western Digital, ThermoFisher, Boston Scientific as well as a number of start-ups in clean technologies, life sciences, and advanced manufacturing located in the area.

Fremont and Sheffield share certain characteristics; taken together, they might even point towards a new model of Innovation District based around a concentration of innovation in advanced industries rather than BPFs. Both cities are national and regional hubs for innovation in advanced industries, with clusters of innovation that look very different to the mixed-use, high density models observed in BPFs-based Innovation Districts. And like the cluster of innovative firms in and around the AMRC in Sheffield-Rotherham, Fremont’s innovation zone is a drive away from the downtown (or city centre) area and does not currently feature a densely urban ‘coffee-shop’ environment.



The Fremont Innovation District branding and strategy is part of a wider effort to build awareness of this growing cluster of advanced industries and which highlights the concentration of these large and small innovative businesses. Perhaps the most important lesson for other cities is the business and innovation-led approach to developing the district. As an illustration of this, the opening message on the website is an invitation and call to action for companies to engage with the city to ensure policies work for them.

As part of the Innovation District Strategy, Fremont is undertaking significant regeneration and place-making in the area, focused around a new station that is being built as part of an extension to the Bay Area Rapid Transit (BART) line which serves the wider metro area around San Francisco. The extension of the BART line and new station, along with the high demand for housing in the wider Bay Area, provides the stimulus for development around the station. In turn, improved

market forces will enable improvements to the public realm, spur more housing opportunities in the innovation area, and bolster the broader strategy to attract new companies and people to the area. But the investment in housing and public realm surrounding the station is integral to, and dependent on, the new station and the BART line extension rather than an approach to stimulate growth in the cluster of innovation in the area.

While the wider geographic and economic context in the two cities are different, there are useful lessons for Sheffield-Rotherham in the clear, business-led approach to, and rolling out of, the concept of an Innovation District in Fremont.

## An advanced manufacturing Innovation District in Sheffield-Rotherham: guiding principles to take forward

In *The Rise of Innovation Districts*, Bruce Katz and Julie Wagner consolidate the reflections of practitioners that have been at the forefront of efforts to drive and develop Innovation Districts. Although varied, their reflections come under five common headings that are explored in more detail below:

1. Build a collaborative leadership network
2. Set a vision for growth
3. Pursue talent and technology
4. Enhance access to capital
5. Promote inclusive growth.<sup>13</sup>

As the authors state, these principles apply across a wide range of Innovation Districts, despite their varied nature. One particular model stands out as being especially relevant to consider in the Sheffield-Rotherham context: the ‘urbanized science park’ typified by the Research Triangle Park (RTP) in North Carolina’s Raleigh-Durham region. Katz and Kline identify the RTP as a model for Sheffield-Rotherham to look to for improving amenities, such as public spaces as well as green spaces, cycling and walking paths, to ‘urbanise’ the AMP-SBP site.<sup>14</sup>

RTP identified that building and strengthening relationships between innovators was a challenge because of a lack of places for people to meet. In order to support innovation and growth, RTP are focusing on creating these spaces and delivering the increased amenities to support the sharing of ideas and socialising, although not at a density found in the city centre. This is reflected in their vision which includes creating a greater concentration of buildings, amenities and a more vibrant central district, with a possible construction of a light rail transit line to connect the park with the larger Raleigh-Durham region, including the universities.<sup>15</sup> **In other words, the RTP led with a clear vision for increasing interaction ‘between the buildings’ and proceeded to take the practical steps for delivering according to these priorities based on boosting innovation.**

Building on these insights and recommendations but tailoring them to the specific situation, challenges and context in Sheffield-Rotherham, the rest of this section explores three guiding principles that should help inform the Innovation District strategy in Sheffield-Rotherham. They are:

- Support existing businesses as well as attract new businesses
- Strengthen linkages in the ‘innovation ecosystem’ and don’t be limited by boundaries
- Set priorities and determine which interventions will achieve the best impacts.

**13.** Katz B and Wagner J (May 2014), *The Rise of Innovation Districts*, Metropolitan Policy Programme, Brookings Institution: Washington DC

**14.** Katz B and Kelly K (March 25, 2015), *An advanced manufacturing innovation district grows in Sheffield, England*, Brookings blog (accessed 8 April 2015: <http://www.brookings.edu/research/opinions/2015/03/25-manufacturing-innovation-district-sheffield-england-katz-kline>)

**15.** *ibid*

## **1. Support existing businesses as well as attracting new businesses**

**Gain an in-depth understanding of the reasons existing businesses have for locating on the AMP.** Finding out whether the benefits for companies of being located within the advanced manufacturing ecosystem are derived from co-location on the site or from simply being located in the wider Sheffield-Rotherham advanced manufacturing corridor is important, as the most effective policy responses will vary accordingly. Many of the SMEs at the AMP Technology Centre were positive about the coffee mornings at the AMP and regular public lectures at the AMRC for example, suggesting firms benefit from of co-location. Understanding how the current ‘networking assets’ benefit the companies on the AMP and SBP sites and what interventions would further support this environment is important.

In the context of the visit and what partners such as Keith Ridgway have expressed, this might include attracting the next OEM to the area that will boost jobs and economic growth, for example. Attracting the next generation of innovative companies to the site will rely on the AMP-SBP site and area being more attractive and desirable to those firms (from an economic perspective) than other areas, not only in the UK, but also globally.



## **2. Strengthen linkages in the ‘innovation ecosystem’ and don’t be limited by boundaries**

**Strengthen linkages between innovation drivers and cultivators across the innovation geography.** Supporting the benefits of the ‘innovation ecosystem’ in Sheffield-Rotherham requires an understanding of the role of the AMRC anchor institution located on the AMP-SBP site and how it functions in the wider ecosystem and supply chain.

An agglomeration of the ‘innovation drivers’ in advanced manufacturing are located on the AMP-SBP site and the AMRC serves as an anchor for the advanced manufacturing sector in the Sheffield-Rotherham corridor. This geography should inform the strategy for an Advanced Manufacturing Innovation District to support existing businesses and attract new innovative firms to locate on the site itself.

Understanding exactly what drives businesses to locate on the AMP-SBP itself (as discussed above) might point to a specific geography that merits it being designated as the nucleus of the 'Innovation District', but defining boundaries should not be the focus of an Innovation District strategy.

**Develop a clear vision but don't be limited by boundaries.** Practically it might be useful to think of AMP-SBP as the nucleus of the Innovation District, but it is highly interrelated and dependent on the wider area. Rather than a defined district, the innovation ecosystem in Sheffield-Rotherham is made up of nodes, anchored at the AMP-SBP site and including businesses and stakeholders in the wider advanced manufacturing corridor, Sheffield city centre and Rotherham town centre. This means the impacts of policy decisions that affect the wider economy, such as efforts to boost growth in Sheffield citycentre or the location of a new HS2 station, need to be considered.



### ***3. Set priorities and determine which interventions will achieve the best impacts***

**Base policy decisions and sequencing on qualitative and quantitative evidence of how to support business to grow and innovate.** In the current economic climate – where tough decisions will need to be made about where to direct resource – robust information and strategy is vital to informing these decisions and making the case to local and national partners for investment. Partners should also have a clear ambition for the impact of the existing advanced manufacturing cluster in the area, including the future role and size of the AMP-SBP site in order to guide long-term policy interventions around transport infrastructure and housing, for instance.

**Set short-term goals as well as focusing on longer-term strategy.** As the anchor in the broader advanced manufacturing Sheffield-Rotherham economic corridor, direct interventions in place-making to improve the ability of companies to innovate and do business on the site are vital – such as improving the connections 'between the buildings' by better linking the AMP and SBP sites, for example. At the same time, and requiring a more long-term strategy, many local partners have

identified securing an OEM as a key ambition. The long-term strategy for the area will have a direct as well as an indirect impact on the growth of the Innovation District anchored at the AMP-SBP, by generating significant employment in the area as well as adding to the wealth of advanced manufacturing expertise. Similarly, there are long-term objectives that form part of a wider economic strategy – including boosting growth in the city centre and improving transport connections across the area, as well as directly to the site – that will have an important impact on the growth of the innovation ecosystem.

The principles outlined in this section should help guide the strategy for maximising the impact and contribution of the advanced manufacturing cluster to the economy – centred around the innovation hub of the AMRC – through an Innovation District approach. In summary, local partners should support the AMRC and businesses to continue to grow and innovate by setting a clear vision for the future of the economy in the area and by creating the environment in which innovators will continue to grow, or be attracted to locate to.

Gaining the evidence and information from the advanced manufacturers and innovators themselves is the first step to determining which interventions are required and where support from the public sector and other partners is needed most. The next section provides some more tangible actions that public sector partners can implement to drive the Innovation District strategy forward.

## Practical next steps

The rest of this section focuses on three practical next steps which include:

1. Gathering a more robust evidence base,
2. Identifying champions for the Sheffield-Rotherham Innovation District approach, and
3. Developing key messages.

### 1. Build the evidence-base

Building the qualitative and quantitative evidence base to provide an understanding of the economy of the advanced manufacturing cluster in Sheffield-Rotherham is vital to developing a strategy for an Innovation District. The focus should be on gathering:

- **Qualitative data** on businesses currently operating with the AMRC and located on the AMP-SBP to inform the policy interventions that will most support innovation, especially in the context of place-making within the site: why did they locate there, what are the benefits, what are the challenges, what would support them drive innovation even more.

### Box 2: Key questions for building a qualitative evidence base

- Are better recreational facilities or more organised events, important to supporting these businesses to sharing ideas, competing and driving innovation in advanced manufacturing?
- How can place-making interventions support more networking between innovative firms between the buildings?
- What are the specific challenges of boosting networking assets in advanced manufacturing?
- What are the benefits to co-location that partners can help maximise to attract new businesses? And what are the barriers that are preventing more companies from locating at the AMP-SBP?
- What are the skills gaps or challenges that companies face in growing their staff?

- **Quantitative data** that provides robust information on the economic linkages within the ‘innovation ecosystem’, including supply-chain integration, is also required to underpin the Innovation District strategy. Furthermore, this would help to understand the exact geography of innovation, specifically the connections between the new advanced manufacturing industry and ‘old steel’, as well as the relationship between the city centre university campus and the AMP, and the wider business links between the AMP and Sheffield city centre. While it would appear that there are strong economic ties between the innovation hub at the AMP-SBP and wider advanced

manufacturing corridor in Sheffield-Rotherham, in order to better understand how to approach a strategy to support this innovation and drive growth in the sector, more robust evaluation is needed.

- **Economic analysis** of the role of the Innovation District in the wider economy and projections for future growth and impact would also support partners in Sheffield-Rotherham to set a clear vision for advanced manufacturing in the area, investment in the AMP-SBP innovation hub and focus activities from a wider range of local partners on supporting this innovation. This information should also inform the case for specific policy interventions or investments, such as a tram extension for example.

## ***2. Identify top spokespeople***

Identifying a small group of top business spokespeople who can help carry the message is also important. With over 100 partner companies including Boeing, Rolls-Royce, BAE Systems, Hitachi, TATA and Forgemasters, located both on the AMP site and in the wider Sheffield-Rotherham area, partners have a significant opportunity for developing the case for Sheffield-Rotherham as a hub of innovation in advanced manufacturing, and a strong voice to deliver that vision.

## ***3. Develop key messages***

There is also a case for investing in branding and messaging, based on robust evidence and clear vision, in order to gain buy-in from local and national stakeholders, as well as national and global investors. The City of Fremont, for example, invested funds in order to produce the materials that would help 'shop' their vision and draw attention to the area. In Sheffield-Rotherham, this might include needing to re-articulate what is meant by advanced manufacturing by painting a clearer picture of how high-tech and industrial design links to the more traditionally perceived manufacturing and production in the area.

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## Conclusion

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Supported by the Sheffield International Economic Commission, this report provides recommendations for boosting innovation and growth in the advanced manufacturing ecosystem observed in Sheffield-Rotherham: a nucleus of innovation and research-led activity at the AMP-SBP located within a wider ecosystem of businesses and employees in the Sheffield-Rotherham economic corridor and Sheffield city centre. The geography of economic activity in advanced manufacturing is different to some of the urban and BPFs or CDI-based districts observed in other cities. Instead, many of the principles of the Innovation District model should guide partners in Sheffield-Rotherham.

Building on the concept and reflections of Innovation Districts explored in *The Rise of Innovation Districts*, but tailoring them to the particular context, opportunities and challenges in Sheffield-Rotherham, this report has identified three key principles that should help guide an Innovation District strategy in the area.

- **Support existing businesses as well as attract new businesses.** Supporting existing businesses should guide a significant proportion of interventions designed to boost the performance of the AMRC. To do so partners should gain an in-depth understanding of the reasons existing businesses have for locating on the AMP and their priorities for growth and driving innovation. Strategies for attracting new business should be informed by the need to boost growth and innovation, and be based on evidence of the benefits and barriers for businesses locating on and around the AMP-SBP site.
- **Strengthen links between innovation drivers and cultivators across the innovation geography.** The Innovation District strategy should be based on a clear vision for supporting innovation and not be limited by boundaries. Understanding and developing the linkages across the ‘innovation ecosystem’ and supporting businesses and employees to engage and network ‘between the buildings’ at the AMP-SBP anchor, as well as across the wider area, is vital.
- **Set priorities and determine which interventions will achieve the best impacts.** Policy decisions and sequencing should be informed by robust qualitative and quantitative evidence of innovation drivers and the businesses in the area. This should help partners to distinguish between policies that support the growth of the advanced manufacturing cluster more widely, and interventions businesses would like to see implemented in the short-term to support them to grow.

Building on these principles, partners should focus on building a robust evidence-base to inform the vision for an Innovation District and make the case for investment, identify private sector and industry champions who can be the voice for innovation in advanced manufacturing locally, and deliver improvements that support and strengthen innovation.

The challenge and opportunity for local partners is to support this business and innovation led cluster, and realise an ambitious vision, capitalising on what is already there.



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