HM Government

INDUSTRIAL STRATEGY

South East Midlands Local Industrial Strategy

A Partner in the Oxford-Cambridge Arc

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SEMLEP
South East Midlands
Local Enterprise Partnership

Contents

Foreword

The South East Midlands Local Enterprise Partnership (SEMLEP) area is a rapidly-growing £50bn economy at the nexus of London, Birmingham, Oxford and Cambridge.

In the last century the work of the Government Code and Cypher School at Bletchley Park, including that of the now famous code breakers such as Alan Turing, Joan Murray and Gordon Welchman saved countless lives and pioneered the birth of modern computing. What began as a small scale enterprise grew rapidly to over 10,000 mainly female staff, many working at the cutting edge of computing, designing and testing new technology, and applying it in ways which have changed the world and shaped the course of history.

80 years on, The South East Midlands is a place where business and higher education institutions work together within and across industrial sectors to push technological boundaries. In the last two years, the UK's first 5G Transport Network test tracks, a digital air traffic control centre, a 'flying car', and a vehicle testing centre with climatic and altitude capability have all been developed here.

Excitingly, the future offers even more potential. Unlike other parts of South East England, the SEMLEP area has the space to embrace further growth. Employment growth was over three times the national average in 2016, and the local population is growing at a faster rate than any other LEP area outside London[1]. In 2017, over six per cent of new homes in the country were built here[2] and there is an ambition to build significant numbers of new homes across the Arc by 2050. This presents an opportunity to further attract high quality labour, develop new construction skills, design places in a way that promotes health and wellbeing and address the Clean Growth Grand Challenge mission to at least halve the energy of new buildings by 2030.

However, this must not just be a story of housing growth. Business growth should lead residential growth, and not the other way around. The remarkable innovation, assets and expertise in the area – across engineering design, technical testing, motorsport, aerospace, advanced engineering, digital technologies, autonomous vehicles, robotics, additive manufacturing, electronics, agri-tech and food and drink – should be allowed to flourish, generating important multiplier effects for the rest of the local and wider economy.

The role of this Local Industrial Strategy is not to dictate how this happens, but rather to facilitate it, with a focus on increasing productivity across all sectors and geographies within the SEMLEP area, thereby supporting the aims of the national Industrial Strategy.

This means improving energy, transport and digital infrastructure, and being

smarter about how this infrastructure is used. Supporting the development of a balanced mix of commercial premises. Linking up businesses and universities across the SEMLEP area and the Arc. Acting now to put in place a pipeline of skills that will match the future needs of local employers, particularly in the digital and wider STEM realm. Supporting businesses not just to start up, but to scale up, grow and prosper.

Increasing productivity within the logistics sector by supporting local SMEs to adopt automation and artificial intelligence technologies, addressing the Artificial Intelligence and Data Grand Challenge. Piloting new ways of living and working, and of moving people and freight around.

The possibilities for the future are immense. As the high-knowledge economies and clusters of expertise within the Arc become better integrated, the SEMLEP area can act as its Connected Core: a place to collaborate, with the space to test new ideas and capitalise on commercialising new technologies. And a place where people want to live, not just because of its exciting job opportunities, innovation and national and global links, but also because of its attractive cultural assets, natural environment and green credentials.

In the last century, the SEMLEP area was famous for Bletchley Park: the birthplace of computing and the site of the World War II codebreakers.

This Local Industrial Strategy aims to put in place the conditions to ensure that, over the course of the twenty-first century, the area remains every bit as ground-breaking.

Rt. Hon. Greg Clark MP
Secretary of State for Business Energy & Industrial Strategy

Peter Horrocks CBE,
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MRIA, DSc, Chief Executive and Vice-Chancellor, Cranfield University

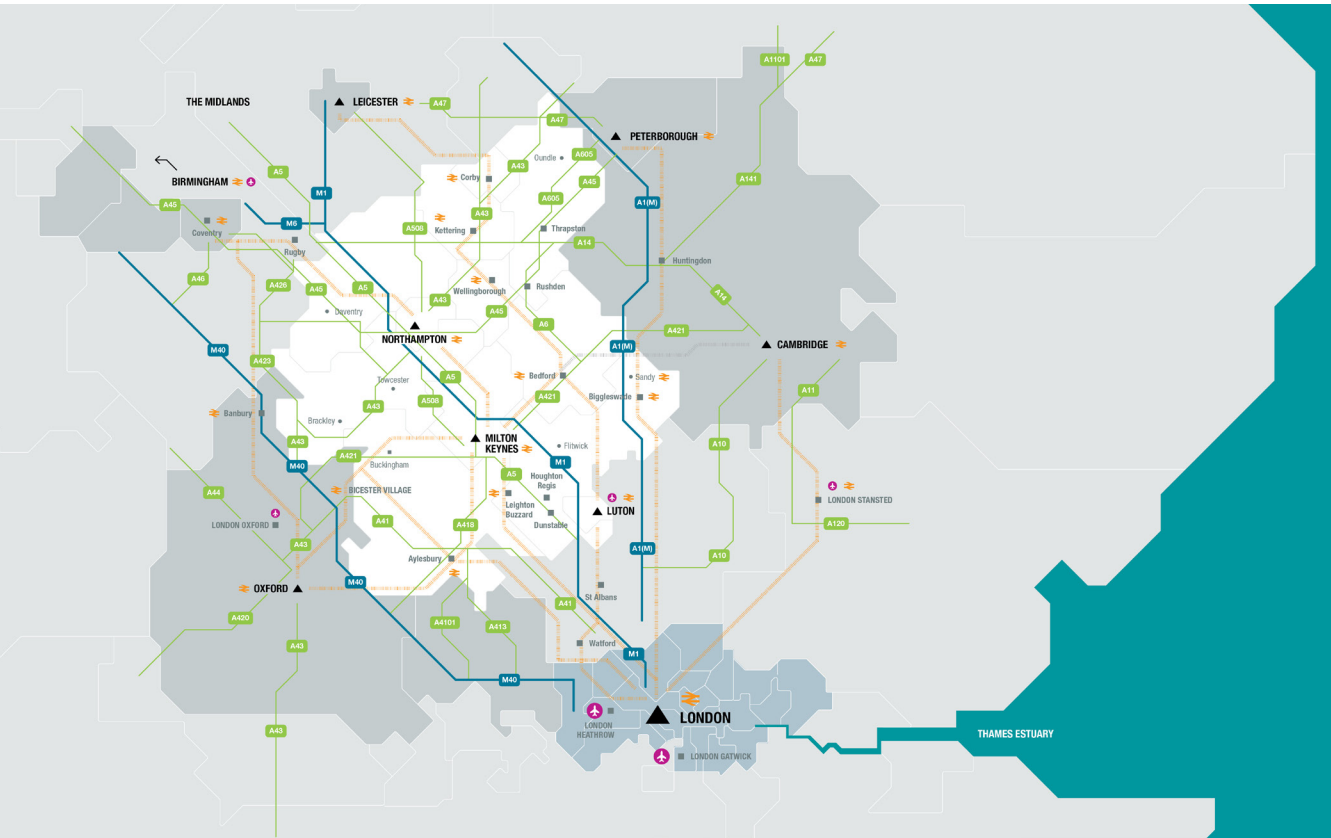
Executive summary

The South East Midlands Local Enterprise Partnership (SEMLEP) area is a rapidly-growing and innovative £50bn economy at the nexus of Oxford, Cambridge, London and Birmingham.

It is located at the centre of the Oxford-Cambridge Arc, and acts as an international gateway to the area through London Luton Airport, rail links to Gatwick airport and St Pancras international rail services, and proximity to London Heathrow, London Stansted and Birmingham International airports.

It covers 13 local authority areas, and is home to a network of urban areas including: Milton Keynes, Northampton, Luton, Aylesbury, Bedford, Kettering, Daventry, Wellingborough and Corby, interspersed with more rural areas, including high-quality natural environment such as the Nene Valley and Forest of Marston Vale, and attractive market towns such as Ampthill, Oundle and Towcester.

While growth in the SEMLEP area is already impressive – it has the highest population growth outside London, and one in 25 new businesses in England are started in the area – plans to improve connectivity across the Arc present exciting opportunities for this growth to go even further, and faster, with the area building



on its current expertise to act as a testbed for new technologies. This Local Industrial Strategy is about harnessing these opportunities, while simultaneously ensuring that growth is undertaken in a sustainable manner, with an accompanying increase in inclusivity and achieving net environmental gain. The goal is to achieve growth that does not leave people or places behind, and which makes the SEMLEP area, along with the wider Arc, an even more attractive location in which to live and work.

This Local Industrial Strategy therefore sets out collective ambitions for the whole of the Oxford-Cambridge Arc, as well as specific ambitions for the SEMLEP area within it. It supports the aims of the national Industrial Strategy which is government's long-term plan to boost productivity by backing businesses to create high-quality, well paid jobs throughout the United Kingdom, with investment in skills, industries and infrastructure.

The ambitions for the SEMLEP area within the Oxford-Cambridge Arc

- To become the 'Connected Core' of the Oxford-Cambridge Arc: the place with the space, and connectedness between key innovators and markets, to enable ideas and inventions to be tested, enhanced, commercialised and spun out into high growth ventures.
- To lead the way on the Future of Mobility Grand Challenge, through continued investment in the area's aerospace and advanced engineering excellence, and by pioneering the use of innovative freight technologies and demand-responsive transport.
- To put employers at the heart of innovative skills provision and to become the Oxford-Cambridge Arc's core provider of digital skills, attracting and training the next generation to lead the global digital revolution.
- To improve productivity and sustainability in tandem, fuelled by renewable energy, smart and connected transport solutions, and greener vehicles, buildings and design principles.
- To provide an exemplary business environment, with high-quality commercial premises and support for incubator, scale-up, innovation, trade and investment activity within the Arc.
- To trial new approaches to place-making, through the 'Settlements of the Future' agenda, and work with partners to promote and enhance natural capital, clean growth, culture and inclusivity.

The approach to achieving these ambitions

SEMLEP has conducted extensive analysis across the five foundations of productivity set out in the national Industrial Strategy, through a combination of stakeholder engagement and research, and in conjunction with government and Arc colleagues. By identifying the area's unique strengths and challenges, and thinking about what is necessary to develop and address them respectively, this Local Industrial Strategy sets out a portfolio of interventions and priorities that will help to realise the ambitions set out above.

Ideas

The SEMLEP area is a place where ideas become reality. At the cutting-edge of research and expertise in aerospace and automotive testing, advanced manufacturing and engineering, software development and more, the area's businesses and universities are among the most successful in the country at working together to commercialise knowledge and test new technologies. However, this innovation excellence has a low profile both nationally and globally, acting as a barrier to accessing finance and further growth opportunities. Furthermore, it is not universal: for example, despite the SEMLEP area having a strong comparative advantage in the logistics sector, this sector has relatively low productivity and innovation.

As a result, SEMLEP will:

- strengthen the linkages between existing business networks, innovation centres, groups and sectors within the SEMLEP area;
- engage with innovative businesses across the SEMLEP area to understand their needs and help them to access funding and support through SEMLEP's Growth Hub, such as through knowledge exchange and projects like Growth Curve and Innovation Bridge;
- work with local authorities and universities to support the development of new research and development assets and expertise within the SEMLEP area;
- continue to be at the forefront of the Future of Mobility Grand Challenge, bringing forward locally led development of new facilities and test beds to pilot solutions and linking these to wider residential and commercial growth in the area, as part of the Settlements of the Future agenda;
- work with local partners to expand the innovation capabilities and productivity of the local logistics sector. SEMLEP will continue to support plans for a 'Logistics 4.0 Centre of Excellence' at Cranfield University; and
- transform the branding and promotion of the SEMLEP area, to attract further investment.

People

The SEMLEP area's headline labour market indicators, in terms of the rate of employment and employment growth, outperform national averages. SEMLEP and its partners have also been very successful at engaging employers in the skills agenda and in delivering skills infrastructure, such as the Buchanan Centre at Bedford College, which provides training in advanced engineering. However, skills shortages remain the top constraint on business growth, resulting in hard to fill vacancies and skills gaps in the existing workforce. Automation risks also exist for people working in low and medium skilled jobs, which can be mitigated by understanding what future skills will be required and ensuring the appropriate training opportunities are provided and promoted.

As a result, SEMLEP will:

- work with local businesses, stakeholders and education institutions through its newly formed Skills Advisory Panel (SAP) to build on the successes of the 'Growing People' Skills Plan in supporting skills provision in the area;
- drive greater business engagement with educators and students through the 'Growing Talent' campaign;
- ensure employer-led development of the talent pipeline through effective careers information, inspiration and advice in schools and colleges, building on current successes;
- promote all relevant pathways based on employer needs; and
- focus on the development of digital and STEM skills, including working with government and local partners to develop ambitions for the UK's first STEM skills-focused university in Milton Keynes. This project will complement the new Institute of Technology in Bletchley, supported by up to £28m from the Department for Education, who will work closely with Milton Keynes College to deliver the project.

Infrastructure

As evidenced through the area's high popularity with logistics firms and Future of Mobility innovators, the SEMLEP area is extremely well located in order to connect with key markets in the UK and abroad. Less than an hour from London by train, easy access to international airports, and good north-south transport linkages are local infrastructure highlights. However, the quality of the area's east-west linkages are far weaker, and growing traffic congestion is increasingly impeding productivity. Similarly, energy and water infrastructure improvements have failed to keep up with population and business growth, which puts further growth at risk, and digital connectivity needs to be enhanced if the area is to remain at the forefront of testing and commercialising new technologies.

As a result, SEMLEP will:

- identify, support and disseminate best practice from energy 'beacon projects' – such as distributed generation and active network management - in line with SEMLEP's Energy Strategy;

- bring together major energy stakeholders in the area to discuss their role and requirements to support the necessary energy provision and transition outlined in SEMLEP's Energy Strategy;
- support SMEs to engage in energy-related innovation and to adopt energy-efficient practices, through the dissemination of information and funding opportunities, and increased networking with relevant partners;
- work with local authorities and other local partners to support the development of strategic transport links, greater first-mile-last-mile connectivity, and increased electric vehicle infrastructure within the SEMLEP area;
- stay at the forefront of the Future of Mobility Grand Challenge by supporting the development of new facilities and test beds piloting solutions – such as Demand Responsive Transport and innovative freight technologies – and linking these with SEMLEP's 'Settlements of the Future' agenda;
- work with local authorities and other partners to support full-fibre connectivity in the SEMLEP area; and
- work with organisations involved in managing flood risk and water scarcity to develop plans for water infrastructure.

Business environment

The SEMLEP area is an attractive place to do business, as evidenced by the high ratings that businesses give to the local business environment and supply chain availability, and also by the area's high start-up rates, private sector jobs growth, and FDI. However, many local businesses cite a lack of suitable employment premises as a constraint upon their growth, and business scale-up in the area is also relatively weak.

As a result, SEMLEP will:

- work with partners to support an extensive and balanced pipeline of employment land and premises in the area, which takes account of market intelligence and strategic infrastructure and seeks to underpin wider aims such as the regeneration of local cultural heritage and the furthering of the 'Settlements of the Future' agenda;
- increase promotion of the SEMLEP area to prospective investors, including through the preparation of relevant materials to encourage inward investment, and by working in partnership with local authorities, developers and commercial agents to help match prospective businesses with appropriate employment land;
- promote and provide, through SEMLEP's Growth Hub, a single access point for business support in the SEMLEP area, including one-to-one support for company leaders, delivery of workshops, and information on funding sources and wider business support schemes;

- through SEMLEP's Growth Hub, work with local universities to provide tailored and targeted support to scale-up SMEs in the local area. This programme will include: university modules on scaling businesses up; business coaching; establishment of a SEMLEP Scale-Up Forum; and peer to peer networking groups to encourage knowledge share and support among the scale-up community; and
- work with DIT and other local partners through SEMLEP's Growth Hub to continue to actively attract inward investment and support further exporting.

Places

Places provide the foundations on which the area is able to attract and retain all other drivers of productivity. Attractive, well-designed spaces for living and working reduce brain drain and make the area more appealing to potential investors. They also bring positive impacts upon health and wellbeing, which in turn have a knock-on effect upon life expectancy, labour force participation and productivity, as evidenced by Public Health England. The SEMLEP area already has a wealth of cultural, creative and natural assets and a strong track record of designing attractive green spaces and built environments but, as with its innovation and commercialisation expertise, these strengths are not widely known. Furthermore, there is a real challenge ahead in ensuring that, as the Arc's growth ambitions are realised, these assets are strengthened, not lessened.

As a result, SEMLEP will:

- work with local partners to pilot 'Settlements of the Future' concepts, including: smarter, greener energy systems and infrastructure; new spatial approaches to living and working, which support community engagement and incorporate Sport England's Active Design principles; modern methods of construction, including adaptability for the needs of an ageing population; and advanced digital technologies;
- work with the area's Local Nature Partnerships and those leading on local developments to support and protect natural capital, in line with the government's 25 Year Environment Plan to realise net gains in biodiversity. As part of this, disseminate and promote best practice from key exemplar developments such as Tresham Garden Village and Kingsbrook;
- support cultural activity and other initiatives to bring people closer to, and into, the labour market, and to regenerate relatively deprived areas; and
- improve connectivity in rural areas, in both digital and transport terms, and develop the rural visitor economy, building on proposals such as the Bedford to Milton Keynes Waterway Project.

The SEMLEP area's role in addressing the national Grand Challenges

This Local Industrial Strategy also sets out how SEMLEP area capabilities and interventions will help to address the four Grand Challenges detailed in the national Industrial Strategy: the Future of Mobility; Artificial Intelligence and Data; Clean Growth and the Ageing Society.

Future of Mobility

The SEMLEP area is extremely well placed to address the Future of Mobility Grand Challenge, with access to a wealth of diverse assets to tackle the challenge in a number of ways.

The SEMLEP area's rich motorsport heritage – with three Formula One teams based locally – has led to its developing expertise in energy efficiency, autonomy, data capture and light weighting. As a result, within an hour's radius of Silverstone, there are now over 4,000 High Tech and Innovation companies, and the SEMLEP area is home to major transport innovators, including the Silverstone Technology Cluster, the Connected Places Catapult, Millbrook Proving Ground's vehicle and battery testing facilities, the Catesby Aerodynamic Research Facility, and many more.

In addition, it is at the forefront of the Future of Flight Aerospace Sector Deal, which aims to make the UK a leader of hybrid-electric and electric propulsion, and to exploit related new markets such as drones and Urban Air Mobility vehicles.

Cranfield University, which has the Aerospace Integration Research Centre, is building a Digital Aviation Research and Technology Centre that will spearhead the UK's research into digital aviation technology, and is home to the UK's Aerospace Technology Institute. Bedfordshire contains a cluster of leading aerospace organisations, while the National Space Propulsion Test Facilities at Westcott Venture Park in Aylesbury Vale allows the simulation of high-altitude testing of thrusters and is a key component of the UK's space technology ambitions.

Using this expertise, the SEMLEP area aims to be a leader in addressing the Future of Mobility Grand Challenge by:

- trialling cutting-edge, mobility-enabling technologies, such as deployment of the UK's First 5G Transport Network, and broader developments around, and testing of, connected and autonomous vehicles;
- piloting new freight technologies, including autonomous vehicles, drones, first-mile-last-mile delivery and more, and supporting the embedding of such technologies into the operations of local logistics SMEs;
- piloting the use of demand-responsive transport and mobility as a service more broadly, and linking these to plans for wider residential and commercial growth at the outset; and

- building on the electric vehicle (EV) successes of Milton Keynes, which has the highest number of charging stations outside London and one of the highest EV uptake rates in the UK, to promote EV uptake across the SEMLEP area and help the area become a green transport exemplar.

Artificial intelligence and data

The SEMLEP area has a strong heritage in artificial intelligence and data dating back to the pioneering work at Bletchley Park during World War II. Today, the area continues to be at the forefront of developments in the field, with The Open University and Milton Keynes having played a key role in using big data to help pioneer the 'Smart City' movement, and the Smart Commuting project in Northampton optimising the use of the existing transport network by deploying sensors and capturing 'floating data' to gather intelligence on how the network is operating.
The University of Buckingham houses the UK's First Institute for Ethical artificial intelligence in Education, and the University of Bedfordshire offers courses in the combining of artificial intelligence with robotics systems.

The SEMLEP area has particular strengths in the application of artificial intelligence and data analysis to the Future of Mobility Grand Challenge. Cranfield University, The Open University and the University of Northampton are all doing cutting-edge work to test and support autonomous vehicle readiness, and Millbrook Proving Ground is the first UK business to test the applications of 5G data connectivity in transport, with significant backing from government. Meanwhile, the £67m Digital Aviation Research and Technology Centre (DARTeC) at Cranfield is researching methods for integrating drones into UK airspace, as well as using big data to improve airport efficiency.

The SEMLEP area aims to contribute to addressing the Artificial Intelligence and Data Grand Challenge by:

- developing proposals for the country's first STEM-skills focused university in Milton Keynes (MK:U), to complement an Institute of Technology at Bletchley Park and existing local university expertise, ensuring the provision of digital and STEM skills to drive artificial intelligence and data technologies in the Arc;
- improving the productivity of the logistics sector, through the use of artificial intelligence and data innovations to streamline backloading, lorry platooning, distributed ledger technologies, autonomous drone delivery systems and more; and
- continuing to trial cutting-edge, mobility-enabling technologies – such as deployment of the UK's First 5G Transport Network.

Clean Growth

SEMLEP and its local partners are strongly supportive of the ambition set out in the national Industrial Strategy to ensure that everyone feels the benefits of clean growth. Milton Keynes has been an exemplar in this regard, with the highest level of electric vehicle infrastructure outside of London. The SEMLEP area is also home to two of the UK's garden communities (Tresham Garden Village and Aylesbury Garden Town), which are supporting housing growth while simultaneously enhancing natural capital. In addition, the area is home to unique and cutting-edge emission testing facilities, including the UK-leading emissions test centre at MAHLE Powertrain.

The SEMLEP area aims to build on this success, tackle carbon emissions and address the Clean Growth Grand Challenge by:

- identifying, supporting and disseminating best practice from energy 'beacon projects' – such as distributed generation and active network management – in line with SEMLEP's Energy Strategy;
- supporting SMEs to engage in energy-related innovation and to adopt energy-efficient practices, through the dissemination of information and funding opportunities, and increased networking with relevant partners;
- staying at the forefront of the Future of Mobility Grand Challenge by supporting the development of new technologies, facilities and test beds piloting solutions – such as zero emission vehicles, Demand Responsive Transport and innovative freight technologies – and linking these with SEMLEP's 'Settlements of the Future' agenda;
- working with organisations involved in managing flood risk and water scarcity to develop plans for water infrastructure;
- utilising the area's food and drink, waste, packaging and logistics expertise to lead initiatives around efficient food processing, sustainable packaging and improved waste utilisation strategies;
- working with local authorities and other partners to identify opportunities to pilot 'Settlement of the Future' concepts, including smarter, greener energy systems and infrastructure; supporting the delivery of the Clean Growth Grand Challenge mission to at least halve the energy use of new buildings by 2030; and
- working with the area's Local Nature Partnerships and those leading on local developments to support and protect natural capital, in line with the government's 25 Year Environment Plan to realise net gains in biodiversity.

Ageing Society

The SEMLEP area recognises the challenge of an ageing population. Using ONS projections, the local old-age dependency ratio of 289 per thousand workers, is below the UK average of 298. However, it is projected to grow at a faster rate than the rest of the UK, overtaking the national average by 2030. Also, baseline forecasts from Cambridge Econometrics indicate that Caring and Personal services jobs will be the fastest growing occupation from 2016-2045 in the area, growing at 2.9 per cent per year.

There has already been some progress towards improved adult education in the area. Local support for reskilling in later life is provided by the Open University's recent successful funding for the Bringing Learning to Life programme, through the Flexible Learning Fund. This collaboration between the OU, Bedford College Group, Middlesbrough College, West Herts College and DfE includes four courses targeted specifically at adults who lack basic skills in maths and English. Furthermore, the Active Blended Learning techniques trialled at the University of Northampton could be used to design courses better suited to adult learners.

The SEMLEP area aims to contribute to addressing the Ageing Society Grand Challenge by:

- promoting 'Strengthening the Workforce' through the use of open recruitment and a culture of life-long learning, by showcasing the talents and business benefits of hiring people from differing backgrounds, abilities and ages;
- signposting employers to relevant schemes such as Disability Confident, the National Retraining Scheme, Fuller Working Lives, and the Armed Forces Covenant;
- ensuring people can re-engage with work following an absence, as well as up-skill and re-skill in response to changes in business skills needs. SEMLEP will also continue to work with partners to encourage the development of promising potential pathways for sectors such as construction, food and drink production, and digital;
- working with the Department for Education and the Department for Work and Pensions to tailor adult skills funding to local needs, as identified by the Skills Advisory Panel; and
- working with local authorities and other partners to identify opportunities to pilot 'Settlement of the Future' concepts, including adaptability for the needs of an ageing population, and other developments that will support an ageing population, including demand-responsive transport, and improved physical and digital connectivity to local health services.

This strategy is one of a family of four linked strategies covering the Oxford-Cambridge Arc ('the Arc'), with the other strategies covering Oxfordshire, Buckinghamshire and Cambridgeshire and Peterborough. It therefore includes a summary of the wider economic context and identifies those priorities within each Local Industrial Strategy which can be developed at scale across the Arc, complementing the specific SEMLEP strategic objectives which sit at the heart of this strategy. This includes:

- Working together collaboratively across all of the foundations of productivity to ensure that the implementation of the four Local Industrial Strategies maximises the economic potential of the wider Arc region.
- Harnessing the collective strength of the Arc's research base – driving greater collaboration on science and research; developing a network of 'living labs' to trial and commercialise new technologies; and growing the role of the Arc as a global research and innovation hub.
- Bringing employers and skills providers together to understand the current and future skills needs, and planning provision to meet them.
- Maximising the economic benefits of new transport, energy and digital infrastructure within the Arc.
- Developing an improved business support and finance programme for high growth companies, a shared approach to commercial premises and an Internationalisation Delivery Plan to encourage greater trade and inward investment in the Arc.
- Embodying Government's 25 year Environment Plan and contributing to the Clean Growth Grand Challenge Mission to halve the energy use of new buildings by 2030.

Together, the strategies reflect the close collaboration and partnership working between Local Enterprise Partnerships (LEPs) across the region.

Oxford-Cambridge Arc: Economic context

The role of this strategy

This Local Industrial Strategy for SEMLEP articulates government and local partners' shared ambitions for the area at a sub-regional level, outlining how specific interventions in the local area will drive future growth in the SEMLEP area and across the Arc more widely.

These local ambitions sit alongside a range of work which will be progressed collectively at an Arc level.

Each of the Local Industrial Strategies across the Arc should be read as 'local chapters' of the national Industrial Strategy - outlining not only the ambitions for the local areas, but also how their strengths and assets will contribute to national objectives.

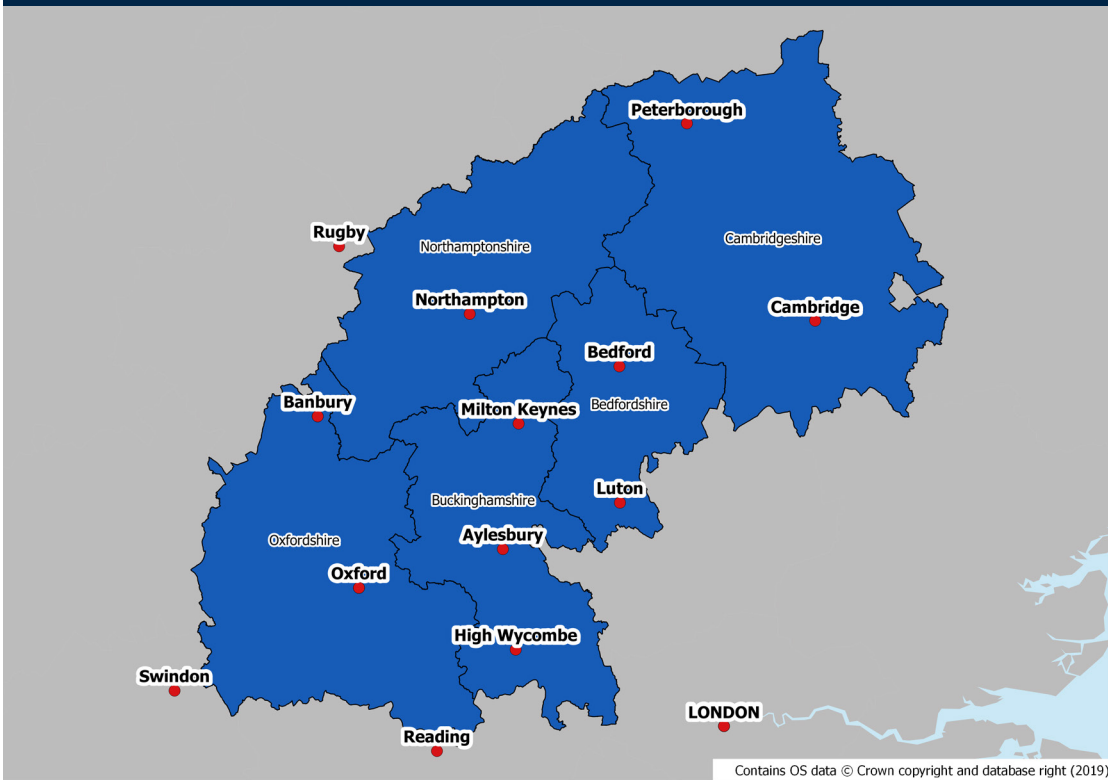
The economic opportunity presented by the Arc is significant. But it will not happen by itself. It will take concerted and coordinated work by both government and the local areas to ensure that the Arc remains an economic asset of international standing over the coming decades. This Local Industrial Strategy for the South East Midlands, published alongside those for Buckinghamshire, Cambridgeshire and Peterborough and Oxfordshire, shows how this will be done.

Introduction to the Arc

The Oxford-Cambridge Arc is a world leading economic area, underpinned by a high-quality environment. It has the potential to deliver transformational growth that will create knowledge-based jobs and boost local and regional economies for the benefit of existing and future communities. It currently has 3.7 million residents and over two million jobs, contributing £111bn of annual Gross Value Added (GVA) to the UK economy per year[3] and the transformative economic potential to contribute nearly £200bn by 2050. It is a highly productive and prosperous region with global strengths in science, technology and high-value manufacturing.

The Arc covers the ceremonial counties of Oxfordshire, Buckinghamshire, Northamptonshire, Bedfordshire and Cambridgeshire. The economic landscape is covered by the Oxfordshire, Buckinghamshire and South East Midlands Local Enterprise Partnerships and the Cambridgeshire and Peterborough Mayoral Combined Authority's Business Board.

The Oxford-Cambridge Arc ceremonial counties map



The Arc as a whole is a strongly knowledge-intensive economy. It contains ten diverse universities[4], including the Universities of Oxford and Cambridge, two of the world's greatest and most internationally recognisable centres of learning, and a network of cutting-edge science parks, research institutions, businesses and incubators.

The Arc is home to world-leading R&D and is already renowned as a place of global firsts – pioneering cures for disease, forging breakthroughs in engine technology, innovation in future energy and transport systems, and developing world-leading strengths in technologies that are shaping the twenty-first century. But it has the ambition and ability to go further. Its continued success will be critical if the UK is to meet its target of 2.4 per cent of GDP being spent on R&D by 2027 and its knowledge and innovation assets enable the area to be world-leading in industries that have rapidly global growing markets.

The Arc today: Key growth sectors

Transformational growth of the scale envisaged across the Arc will need to build on the breadth of existing assets and strengths found across the local area.

The Arc is home to two globally renowned life sciences clusters in Oxford and Cambridge – the most productive life sciences clusters in Europe, which already compete internationally with the global leaders in San Francisco and Boston, Massachusetts. These clusters feature prominently in the UK's Life Science Sector Deals, published in 2017 and 2018. The Cambridge life sciences cluster alone is home to over 400 companies, with 15,500 employees and contributing around £2.9bn annually to the UK economy[5]. Oxfordshire is home to a world-leading bioscience cluster, with an estimated 180 R&D companies and over 150 companies in associated industries. It has world-class R&D facilities, with four new innovation centres at the Oxford BioEscalator, the Begbroke Accelerator, Harwell Science and Innovation Campus and Culham Science Centre. Buckinghamshire is also home to a growing med-tech sector and the county also houses national facilities such as the spinal centre in Stoke Mandeville.

The Arc has strengths across the field of space. The Harwell Science and Innovation Campus in Oxfordshire comprises 89 space organisations employing nearly 1,000 people and is the largest space cluster in Europe incorporating the European Space Agency, the Space Applications Catapult and the National Satellite Testing Facility.

This is complemented by Westcott Venture Park in Aylesbury Vale, which has a growing space cluster with particular strengths in upstream space and is also home to the National Propulsion Test Facility. In aerospace, Cranfield University, which has the Aerospace Integration Research Centre, is building a Digital Aviation Research and Technology Centre that will spearhead the UK's research into digital aviation technology, and is home to the UK's Aerospace Technology Institute.

The Arc is a world leader in advanced manufacturing, with particular specialisms in high-performance technology and motorsport engineering. Silverstone is home to 80 high technology and advanced manufacturing companies, testing facilities for materials and vehicles and the iconic F1 Circuit. More widely, there are over 4,000 businesses operating in 'Motorsport Valley'[6], which extends from Northamptonshire into Oxfordshire and beyond – a £6bn global cluster of automotive, motorsport and advanced manufacturing companies.

Responding to the Future of Mobility Grand Challenge features heavily across the Arc as a whole, specifically in the research, development and commercialisation of Connected and Autonomous vehicles (CAV). Key assets include the RACE Centre at Culham Science Centre, which is a UK centre of excellence of robotics and autonomous systems, Millbrook Proving Ground in Central Bedfordshire and, at Milton Keynes, a hub of the Connected Places Catapult and the UK Autodrive project.

There are several leading creative and digital clusters within the Arc. In Buckinghamshire, Pinewood Studios and the National Film and Television School comprise two globally renowned state-of-the-art facilities. Bedford is home to Millennium and Cardington Studios, the latter of which has worked on a number of global blockbusters including the Star Wars franchise. Milton Keynes, Peterborough, Cambridge, Luton, Northampton, Oxford, High Wycombe, South Bucks and Aylesbury all have highly concentrated creative and digital clusters with diverse specialisations. Oxfordshire is home to a range of strengths including computer games, software development, cybersecurity, high performance computing as well as film and TV including the new £78m studio facilities at Didcot opened by Rebellion. In Cambridge, the information and digital technologies cluster is highly concentrated, with a strong track record of establishing and growing globally significant companies. This high concentration of modern and creative industries has led to Arc businesses featuring heavily in the UK's Creative Industries Sector Deal.

Policy context

The government has already made significant investment in recent years to support local growth and productivity in the Arc. This has included:

- committing over £400m of Local Growth Funding to the LEPs in the Arc from 2015/16 to 2020/21, to fund growth enabling projects;
- agreeing over £800m of funding for economic growth, transport and skills through the Cambridgeshire and Peterborough Devolution Deal;
- continuing to invest in the four LEPs' Growth Hubs to provide business support across the Arc and investment in the Greater South East Energy Hub;
- supporting the accelerated development of key sites through the Enterprise Zone programme, including in Science Vale, Northampton Waterside, Aylesbury Vale and Alconbury Weald; and
- investing, through Innovate UK, £670m in 1000 businesses in the Arc since 2010 to help them develop and innovate new products and services.

Recognising the importance of the Arc, in 2016 the government commissioned the National Infrastructure Commission (NIC) to undertake a study to strengthen the collective understanding of the area's economic growth potential. The NIC published its report[7] – Partnering for Prosperity: A new deal for the Cambridge–Milton Keynes–Oxford Arc – in 2017. They concluded that, with the right interventions, the Arc could harbour transformational growth, even against its existing levels of output. It explained that meeting this long-term potential would require both significantly more homes to be built and significantly improved east-west transport connectivity.

In its response to the NIC report[8], published in 2018, the government designated the Arc as a key economic priority, outlining a breadth of actions to seize the opportunity for growth identified in the NIC's report. The government also affirmed its ambition to deliver more homes in the Arc, supported by measures such as the £215m Oxfordshire Housing and Growth Deal and the recent confirmation of £445m Housing and Investment Funding for the Arc. The government has committed to deliver transformational infrastructure projects to improve east-west connectivity across the Arc, most notably by completing the £1bn East West Rail scheme and the Expressway. Government is also working with partners to identify what utilities, digital and environmental infrastructure, planning and investment is required.

Importantly, the government's response to the NIC recognised that delivering ambitious growth on this scale had to go hand in hand with environmental enhancement to maximise the benefits to local people and leave the environment in a better state for future generations.

Since then, the government and local leaders have been working in partnership across the Arc to match the level of ambition for the area. This includes working collaboratively to realise the area's potential through four inter-related policy pillars:

- **Productivity** – ensuring businesses are supported to maximise the Arc's economic prosperity, including enhancing the skills needed to enable communities to benefit from the jobs created;
- **Place-making** – creating places valued by local communities, through the delivery of sufficient, affordable and high-quality homes, to increase affordability and support growth in the Arc, as well as wider services including health and education;
- **Connectivity** – delivering the infrastructure communities need, including transport and digital connectivity, as well as utilities; and
- **Environment** – investing in environmental infrastructure and ensuring growth leaves the environment in a better state for future generations.

The SEMLEP area

Headline evidence

The SEMLEP economy was valued at approximately £52bn in 2017, more than doubling in size since 1998 in nominal terms[9]. The quality of this growth has been strong, with employment rates, and start-up rates above their respective national averages. SEMLEP has consistently been among the top LEP areas for the proportion of firms engaged in product and service innovation and is also one of the strongest LEP areas in terms of the percentage of firms undertaking R&D and collaborating for innovation (ERC, 2017 and 2019). Milton Keynes also had the highest productivity (GVA per filled job) of all local authorities in the Arc in 2018 (Oxford Economics, 2018), and Luton was the top performing city for private sector jobs growth in the UK (Centre for Cities, 2018). However, despite some productivity hotspots, low productivity across the SEMLEP economy remains a key challenge: in 2017 GVA per hour worked was 3.3 per cent below the UK average and has not recovered to pre-recession levels. And while GVA per filled job is stronger, one per cent above the national average, it is also below pre-recession levels.

Economic Headlines

2nd **fastest population growth** of all LEP areas

78% **employment rate**

£50bn **gross value added**

93% **new businesses survive** their first year

£7bn **goods exported p.a.**, plus c£4bn service exports

1/25 new businesses in England **started in SEMLEP area**

Furthermore, the economy is experiencing growth bottlenecks, most notably around the supply of utilities, commercial premises and connecting infrastructure, which may constrain additional productivity growth[10]. This Local Industrial Strategy sets out the interventions that are needed to address these challenges.

Developing and monitoring the Local Industrial Strategy

The SEMLEP area LIS ambitions have been arrived at through a combination of extensive evidence gathering and stakeholder engagement, building on the work done and foundations laid in the area's Strategic Economic Plan, Where Innovation Fuels Growth. SEMLEP's LIS Evidence Base[11], and a SEMLEP paper which sets out how this evidence base was used to arrive at the LIS ambitions, SEMLEP LIS: Policy Themes and Propositions[12], should be read in conjunction with this document, as an empirical basis and visual aide for the contents herein.

SEMLEP will monitor progress in meeting the area's Local Industrial Strategy ambitions through a two-pronged framework. First, there will be a set of SMART LEP deliverables, which will be measured and reported on as part of the LEP's Annual Delivery Plan. Second, there will be a set of wider economic indicators, which the LEP can track and report on, and which will – if deviating from projected trajectories – serve as a prompt for discussions with the SEMLEP Board, government and other stakeholders around possible corrective action.

Geography

It is important to recognise that the current geographies of the SEMLEP area and Buckinghamshire LEPs overlap, meaning that both Local Industrial Strategies include data from, refer to assets within and outline ambitions for, Aylesbury Vale district, such as the University of Buckingham and Silverstone Park. Data used within this document also covers Cherwell District Council which, as of 1 April 2019, is no longer part of the SEMLEP area.

Structure of this document

The rest of this document follows the structure of the national Industrial Strategy, Building a Britain fit for the future, by examining each of the five Foundations of Productivity. For each of the Foundations, this document sets out how SEMLEP and its partners will build upon the SEMLEP area's strengths and address its challenges to raise productivity and secure a better future for the local population, the Arc and the country more widely.

Ideas

The SEMLEP area is a place where ideas become reality.

At the cutting-edge of research and expertise in aerospace and automotive testing, advanced manufacturing and engineering, software development and more, the area's businesses and universities are among the most successful in the country at working together to commercialise knowledge and test new technologies. However, this innovation excellence has a low profile both nationally and globally, acting as a barrier to accessing finance and further growth opportunities. Furthermore, it is not universal: for example, despite the SEMLEP area having a strong comparative advantage in the logistics sector, this sector has relatively low productivity and innovation. Future priorities include: establishing a 'Cluster of Clusters' across the Arc; developing a Logistics Centre of Excellence; and using the SEMLEP area as a test bed for addressing the Future of Mobility Grand Challenge.

Strengths

Highly innovative, with world-class clusters of expertise and testing assets

The SEMLEP area has a highly innovative economy. It is consistently among the top LEP areas for the proportion of firms engaged in product and service innovation and is also one of the strongest LEP areas in terms of the percentage of firms undertaking R&D and collaborating for innovation (ERC, 2017 and 2019)[13]. It specialises in high-tech capabilities across a wide range of industrial sub-sectors. It has specialised expertise in engineering design, technical testing, motorsport, aerospace, advanced engineering, digital technologies, software development, autonomous vehicles, robotics, additive manufacturing and electronics, which make it a leader in the Future of Mobility field, as well as having notable strengths in logistics and agri-tech, and the food and drink sector more broadly.

This specialisation is reflected in the grants offered to the area by Innovate UK across the March 2014-18 period, with the SEMLEP area being awarded larger grants than the LEP average across agri-tech, the built environment, electronics and electrical systems, energy, food supply, infrastructure, space and transport[14].

With regards to technical testing and the Future of Mobility, the area has a number of cutting-edge assets. These include the Silverstone Technology Cluster, which

Case Study: TotalSim - Catesby Aerodynamic Research Facility

Building the Catesby aerodynamic test tunnel

Adapted from a 1.7 mile straight and flat former railway tunnel, the Catesby Tunnel will allow full scale vehicle testing in constant conditions due to the naturally stabilized environment generated from being underground. The tunnel will also be fitted with automated turntables at either end to allow for return testing. The Catesby Aero Research Facility will also lead to the creation of a 4.5 acre science park with offices, workshops and a research facility as well as creating new jobs. The project was awarded funding from SEMLEP's LGF programme and is expected to open in 2019/20. The project is expected to deliver 226 new jobs by 2025.

The Tunnel is aiming to become a worldwide benchmark for aerodynamic testing, capable of providing accurate, affordable and accessible full-scale aerodynamic performance data. The facility's testing conditions are fully controllable allowing for wind and simulated weather impact, aerodynamics and emissions-based testing options. The tunnel will be suitable for both automotive and motorsport applications and will be an important asset available to all businesses in the area, capable of testing: vehicle performance, vehicle aerodynamics, noise, soiling and cooling performance.

covers a large swathe of the SEMLEP and BTVLEP areas, the Connected Places Catapult in Milton Keynes, the National Space Propulsion Test Facilities at Westcott Venture Park in Aylesbury Vale, the Multi-User Environment for Autonomous Vehicle Innovation (MUEAVI) experimental facility for autonomous solutions, the Aerospace Integration Research Centre (AIRC) and the UK's Aerospace Technology Institute (ATI) at Cranfield University, aerospace and defence engineering at Lockheed Martin in Ampthill, Aircraft Research Association in Bedford, Nissan's Technical Centre Europe (NTCE), Millbrook Proving Ground's cutting-edge vehicle and battery testing facilities in Central Bedfordshire, the Catesby Aerodynamic Research Facility in Daventry, and MAHLE, the UK's first Real Drive Emissions vehicle test chamber, in Northampton.

In addition to this, many of the area's smaller firms have produced globally significant innovations, often working across traditional sector boundaries with, for example, high-precision engineering expertise being applied to the medical and agricultural sectors. Such innovative excellence is supported by the SEMLEP area having three Enterprise Zones (Aylesbury Vale EZ, which includes Aylesbury Woodlands, Silverstone Park and Westcott Venture Park; Luton Airport EZ; and Northampton Waterside EZ), plus a number of science parks, innovation centres and Research and Technology Organisations.

Innovative education

The SEMLEP area is home to some excellent and unique Higher Education Institutions (HEIs), with particular expertise in supporting businesses to innovate and grow:

- Cranfield University is a specialist postgraduate university which runs its own Global Research Airport and is internationally renowned for its strengths in technology and management. It is the UK number one for aerospace, production and manufacturing postgraduates, and for its one-year MBA and management MSc[15].
- The Open University is the largest university in Europe and a leading innovator in digital learning and educational technology. It is currently supporting the development of 5G test infrastructure, and is a partner in UK Autodrive, the UK's largest connected and autonomous vehicle (CAV) initiative.
- The University of Buckingham is the only independent university in the UK, and the successful pioneer of two-year degrees. It has an increasing focus upon artificial intelligence and provides training in venture creation at undergraduate and masters levels.
- The University of Bedfordshire has a reputation for providing expert practical advice to local businesses; it has engaged with over 800 SMEs in the last two years. With a £40m investment and set out over four storeys and incorporating 6000m^2 of teaching and laboratory space, its new STEM building allows the University of Bedfordshire to build on its already strong STEM offering to students and business. It hosts the National Centre for Cyberstalking Research, and has research expertise in, amongst other subjects, robotic technology, artificial intelligence and data management.
- The University of Northampton has won multiple awards for social impact; it offers apprenticeships from levels 5 to 7, as well as supporting progression from levels 2 to 5. It is also the first university in the UK to trial Active Blended Learning (ABL). Its Institute of Logistics, Infrastructure, Supply and Transportation (LIST) is collaborating with the Connected Places Catapult and commercial organisations to forecast future logistics capacity and support autonomous vehicle readiness. The institution also has access to a world leading waste material testing centre and has strengths in high-tech computing research.

Case Study: MAHLE Powertrain - Vehicle Emissions Test Centre

MAHLE Powertrain is a global leader in engine development solutions, which has its UK base in Northampton. The business has been awarded £2.1m towards the construction of a state-of-the-art climatic vehicle emissions test centre at its UK base in Northampton. The funding, provided by SEMLEP through the Local Growth Fund, will create new opportunities for highly skilled engineers.

The new centre will see MAHLE Powertrain, which works with vehicle manufacturers across the world, offer an even broader range of test services. From on-the-road PEMS (portable emissions measurement system) through to dyno-based road simulations, altitude testing and comprehensive emissions testing, manufacturers will be able to complete full testing regimes in the UK, meeting stringent new air quality and environmental targets. The facility is one-of-a-kind in the UK and has enabled job and business growth in the automotive sector.

Commenting on the funding, Dave Beecroft, director of sales and marketing at MAHLE Powertrain, said: 'We have worked hard with SEMLEP to secure this investment as part of an ongoing plan to expand and enhance vehicle emissions testing capability in Northampton. This funding will allow us to grow the business and create employment opportunities by placing us at the forefront of the requirements of the new Real Driving Emissions legislation.'

Not only are these institutions important in their own right; they also help to drive commercialisation in the SEMLEP area, through strong links with local businesses. 79 per cent of local HEI research contract income originates from the large businesses, nearly 2.5 times the rate for England; Cranfield is currently ranked number one in the UK for income generated per academic from research and working with business[16].

Furthermore, HEIs in the SEMLEP area have significant research specialisms, compared to those in other LEPs, in agriculture, computer science and engineering and technology[17].

Local partners also want to extend the HEI offering in the SEMLEP area and are exploring the scope to introduce the UK's first STEM-skills focused University: MK:U.

Waterside Campus, University of Northampton

Unrivalled location

The SEMLEP area sits at the nexus of London, Birmingham, Oxford and Cambridge, with excellent access to the first two of these, and access to the last two set to improve as a result of planned new East-West infrastructure. Several parts of the SEMLEP area (Milton Keynes, Bedford, Flitwick, Luton) have journey times to London of 40 minutes or under, so much of the area is able to benefit from easy access to the capital's financial markets, as well as its international connectivity. With regard to the last point, London Luton Airport sits within the SEMLEP area, while London Heathrow and London Stansted airports are in close proximity, and there are good rail links to Gatwick airport, Birmingham International Airport and St Pancras international rail services. These links to the capital and beyond support company, and wider, economic growth.

This unrivalled location has also led to the area building up an extensive portfolio of logistics assets, including the Daventry International Rail Freight Terminal (DIRFT), the Magna Park distribution centre in Milton Keynes, Midlands Logistics Park in Corby, with links to the east coast ports, the A421 logistics cluster in Bedford and Prologis Logistics Park at Marston Gate in Central Bedfordshire.

However, while the development of East West Rail and an Oxford to Cambridge Expressway have important implications for the SEMLEP area's logistics sector, they offer vast potential in other sectors too, by facilitating greater joint working between businesses and universities across the entirety of the Arc. This will strengthen specific sectoral clusters: for example, the SEMLEP area shares agri-tech and aerospace specialisms with Cambridgeshire (and Cambridge's life sciences specialism is starting to be realised in the SEMLEP area too), Future of Mobility specialisms with Oxfordshire, and digital and creative specialisms with Buckinghamshire. Yet, perhaps more importantly, it also offers potential for greater joint working and cross-fertilisation of ideas across some of these sectoral specialisms, which may lead to the emergence of new sectors altogether.

Challenges

Barriers to harnessing the full potential of the SEMLEP area and the Arc more broadly

The opportunities presented by the increased networking of business clusters across the Arc are potentially huge. Analysis by Cambridge Econometrics, commissioned by the National Infrastructure Commission (NIC), projected that, under a transformational growth scenario, the Arc could support around 1.1m new jobs, and increase economic output by c. £160bn per annum, almost double the growth under a 'business as usual' scenario[18].

However, this high projected growth is contingent on SEMLEP and the wider Arc being able to attract very considerable amounts of inward investment through advancement of existing specialist clusters.

Moreover, even if such investment could be realised, its growth potential would – in the absence of sizeable interventions to improve local infrastructure and skills – be hindered by other constraints. With regards to the infrastructure element within the SEMLEP area, many existing transport routes in the area already suffer from congestion, there have been several cases of housing developments and business expansion being delayed or not going ahead due to a lack of sufficient power, and market failure means there is a supply shortage of small to medium industrial units.

Innovation and high productivity are not universal

Although there are some very innovative and high productivity sectors and geographies within the SEMLEP area – most notably Milton Keynes– this is not a universal feature. For example, at the national level, GVA per hour worked in the warehousing and support activities for transport sector is 34 per cent below the all-sector average[19], which the evidence suggests is due in part to a lack of digital culture and training in the sector. Related to this, while a quarter of businesses in the SEMLEP area introduced new products, services, patents or processes in the 12 months to June 2017, just 13 per cent of logistics businesses did. Similarly, only three per cent of logistics businesses have links with universities or colleges for research and development purposes, versus eight per cent of SEMLEP area businesses overall[20]. Meanwhile, other high-employment, lower-productivity sectors in the area include food and drink service activities and retail. This has contributed to the SEMLEP area economy having a lower overall GVA per hour worked than that of its neighbouring LEP areas in the Arc and necessitates upskilling and reskilling if the long tail of low productivity is to be addressed.

Interventions

Facilitate a cluster of clusters across the SEMLEP area and wider Arc

There is work to do to transform the branding and promotion of the Arc as a whole, particularly on the global stage, in order to attract the sorts of level of investment to the area that the NIC believes is possible. As part of this, it is necessary to be clear about the SEMLEP area's positioning and unique selling points within the Arc. Evidence gathering and stakeholder engagement have highlighted that the SEMLEP area's main selling points are its connectedness, its innovation, its welcoming environment (including its people, its business networks and its relative affordability) and its potential for further growth.

Thus, as part of the wider work between local partners in the Arc and the Department for International Trade, SEMLEP will work with government to promote the SEMLEP area as the Connected Core of the Arc: a place to collaborate, with space to capitalise on commercialising new technologies, both within and across sectors. This offering from the SEMLEP area is already starting to appeal to business: for example, Pharmaron (involved in the research and development of innovative medicines) has invested in Rushden in East Northamptonshire, due to its proximity to Cambridge life sciences specialisms, as well as its affordability of commercial premises and general quality of life for residents.

There is also a role for SEMLEP and other partners in the Arc to do more to facilitate greater networking and joining up between businesses, clusters and universities across the Arc, to spur innovation and productivity growth both within and across sectors, including those in the 'long tail' of low productivity industries, and to maximise domestic and international trade opportunities. In addition to boosting high-tech business growth, such activity will also lead to positive multiplier effects for the rest of the local and wider economy.

Advanced logistics hub of excellence

Cranfield University, in conjunction with SEMLEP, John Lewis, Connected Places Catapult, Millbrook Proving Ground, Network Rail and FiveAI, has outlined an ambition to develop a Hub of Excellence in advanced logistics. The aim is to promote a collaborative approach to innovation and development of new technologies in the logistics sector, particularly among SMEs, so as to increase productivity and reduce congestion.

The SEMLEP area is well placed to implement this, given the high concentration of logistics businesses and unrivalled connectivity to London, Birmingham, Oxford and Cambridge.

The hub would offer local businesses knowledge, expertise, and testing facilities to improve their supply chain processes and operations. Productivity improvements could be realised through introducing automation and artificial intelligence to logistics and supply chain activities, using predictive analytics to better match supply with demand, aligning operations to cope with greater service customisation, and utilising the latest technologies for last-mile delivery such as drones, autonomous vehicles, and robots, in line with government's Future of Mobility Urban Strategy.

Silverstone Technology Park

The Artificial Intelligence and Data Grand Challenge

The SEMLEP area has a strong heritage in artificial intelligence and data analysis dating back to the pioneering work of Bletchley Park during World War II. Today, the area continues to be at the forefront of developments in the field, with The Open University and Milton Keynes having played a key role in using big data to help pioneer the 'Smart City' movement, and the Smart Commuting project in Northampton optimising the use of the existing transport network by deploying sensors and capturing 'floating data' to gather intelligence on how the network is operating. The University of Buckingham houses the UK's First Institute for Ethical AI in Education, and the University of Bedfordshire offers courses in the combining of artificial intelligence with robotics systems.

The SEMLEP area has particular strengths in the application of artificial intelligence and data analysis to the Future of Mobility Grand Challenge. Cranfield University, The Open University and the University of Northampton are all doing cutting-edge work to test and support autonomous vehicle readiness, and Millbrook Proving Ground is the first UK business to test the applications of 5G data connectivity in transport, with significant backing from government. Meanwhile, the Digital Aviation Research and Technology Centre (DARTeC) at Cranfield is researching methods for integrating drones into UK airspace, as well as using big data to improve airport efficiency.

Looking ahead, this Local Industrial Strategy outlines local partners' ambitions to develop the country's first STEM-skills focused University in Milton Keynes (MK:U), to complement an Institute of Digital Technology at Bletchley Park. In combination with the area's existing universities, these institutions will ensure the provision of digital and STEM skills to drive artificial intelligence and data technologies in the Arc. There are also opportunities to radically improve the productivity of the logistics sector, through the use of artificial intelligence and data innovations to streamline backloading, lorry platooning, distributed ledger technologies, autonomous drone delivery systems and more.

Use the SEMLEP area as a test-bed, including for innovative transport technologies

The SEMLEP area already has world-class strengths in technical testing, and in commercialising products for the market place. It also has relatively affordable land for further testing and commercialisation, and good access to London and Birmingham, with planned new transport infrastructure that will increase access to other parts of the SEMLEP area, as well as to Oxford and Cambridge. It thus makes sense to build upon these strengths in future, by further developing the area's role as a test-bed for innovative technologies, particularly in the Future of Mobility and Clean Growth Grand Challenges. This will also make a significant contribution to the national Industrial Strategy national ambition of achieving 2.4 per cent GDP in R&D spending.

In light of local logistics assets and expertise in the field of autonomous vehicles and the Future of Mobility, the SEMLEP area is particularly well-placed – in conjunction with government and local players such as the Connected Places Catapult – to test innovative freight technologies. These could include automated yards, the creation of a shared mobility database, shared business freight, or the development of a Land Corridor.

UAV Lab, Cranfield University

Case Study: IRIS IoT Solutions Limited - an example of cross-fertilisation between sectors

The use of antibiotics in the global food supply chain remains an ethical, health and social challenge. A challenge that Northamptonshire based IRIS IoT Solutions, working in partnership with agri-tech specialist Prognostix UK Limited, is seeking to overcome by enabling the effective use of a natural antibiotic substitute in managing the health and wellbeing of Poultry.

The IRIS cellular LTE wireless sensor Gateway, SenseHub, is cornerstone to a network of environmental, water and weight management sensors that ensure optimum environmental and health conditions within the Poultry Shed and successful administration of essential, non-antibiotic, medications.

Realtime data is securely delivered, analysed and transformed within the Predict and Prevent Platform into clear, visual representations that provides farmers, farm advisors, nutritionists and veterinary surgeons information in an easy to read format, enabling immediate and pro-active decision-making and action, from both on-site and remote management locations. Allied to embedded artificial intelligence and deep learning, this data transforms professionals' abilities to predict and prevent the causes of diseases and manage the wellbeing of livestock.

Predict and Prevent was awarded Best Poultry Supply Chain Innovation 2018.

Case Study: Amazon Robotics

As a centre for Advanced Logistics, the SEMLEP area houses two of Amazon's 17 Fulfilment Centres in the UK. Over the past 20 years, Amazon has developed from a small seller working from a garage in Seattle, to a global company with 300 million worldwide active customer accounts. Amazon has a rich history of developing and introducing cutting-edge technology into their fulfilment centres.

These innovations include technology enabled environments where the technology is used to improve processes and assist employees doing their daily role, ranging from random stow and pick through to box sizing algorithms, software that determines the shortest, most efficient walking route from one place to another and the SLAM process (Scan, Label, Apply, Manifest), which was developed by Amazon and remains a revolutionary innovation for customers because it speeds up the packing process and helps ensure accurate deliveries.

Amazon Robotics was introduced to the Dunstable, Central Bedfordshire site when it opened in 2016, pioneering this technology in the UK. The robots slide under a tower of shelves where products are stowed, lift it and move it through the fulfilment centre. Robots help speed order processing time and reduce walking by employees by moving the shelves to employees, reducing the time taken to stow items for sale or pick them for new customer orders. They also save space, allowing for 50 per cent more items to be stowed per square foot.

Amazon have over 2,000 permanent positions at their centres in Central Bedfordshire and continue to invest in new logistics centres and jobs in the region.

Case Study: Cranfield's Multi-User Environment for Autonomous Vehicle Innovation (MUEAVI)

MUEAVI is a purpose-built experimental facility for the rapid development of on- and off-highway, ground and airborne autonomous solutions, running through the middle of Cranfield University. The facility was awarded £3m through SEMLEP's Local Growth Fund programme. The facility allows experimentation across the full ecosystem of vehicles, infrastructure, data, logistics, environment, sensors and their implementation and management. Data from MUEAVI is relayed in near real-time from the communication network running alongside both sides of the road into a control tower. MUEAVI is also part of the campus wide 'Living Lab' project which is being led by academics in Cranfield University's School of Water, Energy, Environment and Agrifood.

The MUEAVI road is being actively integrated into campus life and when not being used for controlled, closed-trials, is opened for staff, students and visitors to use. The facility features a range of surfaces and characteristics from new tarmac, junctions, parking areas and a roundabout to a weathered and off-road section.

It is supported by a wide range of instrumented vehicles ranging from electric cars to sports cars; and from freight and agricultural vehicles to a heavily-instrumented bicycle. In addition to vehicle test programmes the facility is also being used for infrastructure sensor development and advances in V2V and V2X communications capabilities. A layer of sensing technologies is now being added to the MUEAVI capability in the form of extremely high resolution and thermal imaging cameras, LIDAR sensors and MUEAVI bespoke RADAR components.

The facility has already played a key role in major research projects including HumanDrive - in collaboration with the Nissan European Research Centre (based in Cranfield), Cogshift with West-Midland based Jaguar Land Rover and the ATi funded Large Landing Gear of the Future programme in collaboration with Safran. New jobs have been created in the growing autonomous vehicle and electric propulsion areas and new students have been attracted to Cranfield to conduct research using the facility.

Future of Mobility Grand Challenge

The Future of Mobility Grand Challenge looks to reduce carbon emissions and congestion, and make mobility available 'when we want it, where we want it, and how we want it.' The SEMLEP area is extremely well-placed to address this challenge, as it contains a wealth of relevant assets and expertise, along with the space and willingness to test new technologies in a real-world setting, and as part of any new or expanded settlements.

The SEMLEP area is at the forefront of the Future of Flight Aerospace Sector Deal, which aims to make the UK a leader of hybrid-electric and electric propulsion, and to exploit related new markets such as drones and Urban Air Mobility vehicles. Cranfield University has the Aerospace Integration Research Centre, is building a Digital Aviation Research and Technology Centre that will spearhead the UK's research into digital aviation technology, and is home to the UK's Aerospace Technology Institute.

Nearby, Bedford contains a cluster of aerospace-related organisations, including: Aircraft Research Association, which provides a range of specialist services to the aerospace industry; Bluebear Systems, a leading supplier of unmanned systems solutions; and Hybrid Air Vehicles. Meanwhile, the National Space Propulsion Test Facilities at Westcott Venture Park in Aylesbury Vale allows the simulation of high-altitude testing of thrusters and is a key component of the UK's space technology ambitions.

Beyond aerospace, the SEMLEP area's rich motorsport heritage – with three Formula One teams (Red Bull Racing, Mercedes AMG Petronas and Racing Point Force India) based locally – has led to its developing expertise in energy efficiency, autonomy, data capture and light weighting. This, when combined with its agile and rapid response delivery, has proven to be attractive to parallel industries, such as defence and automotive.

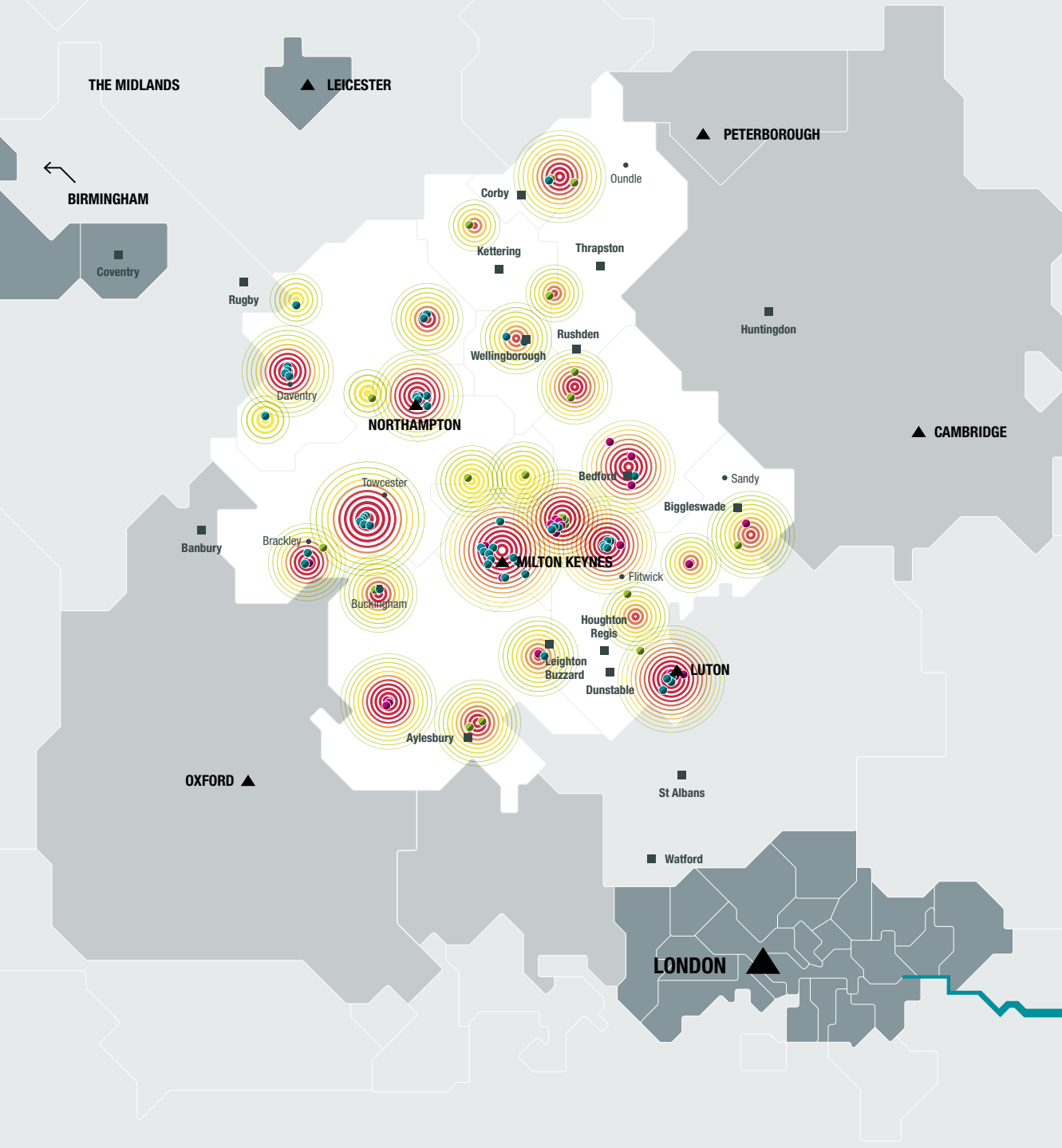
As a result, within an hour's radius of Silverstone, there are now over 4,000 High Tech and Innovation companies, and the SEMLEP area is home to major transport innovators, including the Silverstone Technology Cluster, the Connected Places Catapult, the MUEAVI experimental facility for autonomous solutions, Nissan's European Technical Centre, Millbrook Proving Ground's vehicle and battery testing facilities, the Catesby Aerodynamic Research Facility, and MAHLE, the UK's first Real Drive Emissions vehicle test chamber.

Using this expertise, the area is already trialling cutting-edge, mobility-enabling technologies – such as deployment of the UK's first 5G transport network – and is looking to pilot further innovative approaches, including new freight technologies, the electrification of aircraft, the use of demand-responsive transport, and Mobility as a Service more broadly.

Local partners in the SEMLEP area also aim to build on the electric vehicle (EV) successes of Milton Keynes, which has the highest number of charging stations outside London and one of the highest EV uptake rates in the UK, to promote EV uptake across the SEMLEP area and help the area become a green transport exemplar. Future Housing Growth deals might offer potential opportunities to further this agenda, with scope for new mobility technologies to be linked in to plans for wider residential and commercial growth at the outset.

Innovation cluster map

This map shows a selection of businesses and assets involved in innovation in Future of Mobility and Clean Growth industries



Future of Mobility

Milton Keynes

1 Integral Powertrain HQ
2 Red Bull Racing (F1 team)
3 UK Autodrive Project and MK:Smart
4 The Open University
5 SBD Automotive
6 Honda R&D Europe UK Ltd - Honda Racing
7 Connected Places Catapult (formerly Transport Systems Catapult)
8 Network Rail HQ
9 Prodrive Composities
10 EV Experience Centre
11 Intertek Transportation Technologies

Bedford Borough

12 Bedford College Advanced Engineering Centre

Central Bedfordshire

13 Navistar, Millbrook
14 FiveAI, Millbrook
15 Calsonic Kensei, Millbrook
16 Multi-User Environment for Autonomous Vehicle Innovation, Cranfield University
17 Millbrook Proving Ground
18 Barclay's Eagle Labs: aviation technology, Cranfield University
19 Nissan Technical Centre Europe, Cranfield

Luton

20 BP Chargemaster
21 Luton DART (under construction)
22 University of Bedfordshire

Aylesbury Vale

23 Racelogic, Buckingham

Northamptonshire

24 Mercedes AMG Petronas (F1 team), Brackley
25 TotalSim, Brackley
26 RS Components, Corby
27 Cummins Engine Plant, Daventry
28 Henry Ford Academy, Daventry
29 Volvo Training Centre, Daventry
30 Daventry International Rail Freight Terminal
31 Catesby Aerodynamic Research Facility, Daventry
32 JRM Group, Daventry
33 Ilmor Engineering
34 Mercedes Powertrains
35 GE Precision Engineering Ltd, Northampton
36 Smart Move Northamptonshire
37 Cosworth, Northampton
38 Mahle Powertrain, Northampton
39 Institute of Logistics, Infrastructure, Supply and Transport, University of Northampton
40 Silverstone UTC, Towcester
41 Silverstone Technology Cluster, Towcester
42 Racing Point F1 Team, Towcester
43 PUNCH Flybrid, Towcester
44 Delta Motorsport, Towcester
45 National College for Motorsport, Tresham College, Towcester
46 RML Group, Wellingborough

Aerospace

Milton Keynes

47 Franklin Products Ltd
48 Aero Tech Laboratories

Bedford Borough

49 Aircraft Research Association
50 Bluebear Systems

Central Bedfordshire

51 Brinkley Propellers, Biggleswade
52 Brinkley Aircraft Services Ltd
53 Rockwell Collins, Leighton Buzzard
54 Aerospace Technology institute, Cranfield
55 Samad Aerospace Ltd, Cranfield
56 Aerospace Integration Research Centre, Cranfield University
57 Avalon Aero Ltd, Cranfield
58 Digital Air Traffic Control Centre, Cranfield University
59 Lockheed Martin
60 Hybrid Air Vehicles
61 Cranfield University

Luton

62 Gulfstream Aerospace
63 Leonardo UK Engineering Training Academy
64 Harrods Aviation

Aylesbury Vale

65 Westcott Venture Park
66 Reaction Engines Test Site 1, Westcott
67 Airborne Engineering, Westcott

Nothamptonshire

68 Safran, Brackley

Clean Growth

Milton Keynes

69 Clayhill Farm Solar PV (10MW)
70 Littlewood Farm Solar PV (14MW)
71 Rectory Farm PV (9MW)

Central Bedfordshire

72 Langford Solar Farm (13MW), Biggleswade

Luton

73 RENEW project Luton Borough Council
74 The Centre for Competitive Creative Design, Cranfield University
75 Urban Water Hub, Cranfield University
76 Facility for Airborne Atmospheric Measurements, Cranfield University

Aylesbury Vale

77 Aylesbury Garden Town
78 Kingsbrook Housing Development
79 Gawcott Fields Farm (9.2MW), Nr Buckingham
80 Turweston Solar Farm (16.7MW)

Northamptonshire

81 Tresham Garden village (project under development)
82 CNG Biomethane Refuelling Station, Northampton
83 Etopia Corby project - Electric Corby
84 Kettering Energy Park
85 Gaultney Solar Farm (20.5MW), Nr Kettering
86 Odell Glebe Solar Farm (16.8MW), Wellingborough

Commitments

Ambition

The SEMLEP area will become the place with the space, and connectedness between key innovators and markets, to enable ideas and inventions to be tested, enhanced, commercialised and spun out into high growth, with a particular emphasis on the Future of Mobility.

To drive progress towards achieving this priority, SEMLEP will:

- Work with and support existing business networks, innovation centres, groups and sectors within the SEMLEP area to strengthen their linkages with one another (e.g. work to increase the linkages between the local food and drink and logistics sectors, and between the creative and high-tech industries in the area).
- Engage with innovative businesses across the SEMLEP area to understand their needs and help them to access funding and support through SEMLEP's Growth Hub, such as through knowledge exchange and projects like Growth Curve and Innovation Bridge.
- Continue to work with local authorities and universities to support the development of new research and development assets and expertise within the SEMLEP area.
- Continue to be at the forefront of the Future of Mobility Grand Challenge, by working with businesses and partners to bring forward locally led development of new facilities and test beds to pilot solutions. Where possible, these will be linked, to wider residential and commercial growth in the area, as part of the Settlements of the Future agenda.
- Transform the branding and promotion of the SEMLEP area, to attract further investment.

Working across the Arc:

- Partners recognise that harnessing the collective strength of the Arc's research base will be essential. The new Arc Universities Group will act as the focal point for cross-Arc collaboration on science and research, identifying and delivering joint R&D projects and providing a pipeline of talent to knowledge-intensive businesses.
- The Arc will strengthen its ability for businesses to commercialise ideas coming out of its universities and others. Key to this will be a network of 'Living Laboratories' that both trial technologies linked to new developments across the Arc and help address the Grand Challenges, developed by industry and local partners across the Arc. Arc partners will also use assets such as Harwell, Silverstone and Cranfield to establish new networks that support the convergence of technologies across sectors and seek to develop emerging districts such as West Cambridge.
- Finally, the Arc will seek to grow its role as a global research and innovation hub, acting as a UK magnet for international talent, R&D, foreign direct investment and research collaborations. The LEPs and MCA will work with the Department for International Trade, the Arc Universities Group and others to channel foreign investment in the assets and projects that will make the biggest impact on Arc-wide and UK growth.

Government is working in partnership with SEMLEP to support the delivery of this priority by:

- Investing £265m Local Growth Fund in the SEMLEP area, which is delivering, for example:
  - MUEAVI autonomous vehicle testing facilities at Cranfield University;
  - innovation space around aerodynamic testing for the automotive sector at Catesby; and
  - altitude automotive testing at Mahle in the Enterprise Zone in Northampton.
- Investing £118m to support research and innovation in SEMLEP through Innovate UK's competitive bidding rounds.
- Supporting ambitions for the future of the logistics sector: A bid for the Logistics 4.0 centre of excellence at Cranfield University has already been shortlisted and provided with £50k development funding by Innovate UK through the Strength in Places Fund. SEMLEP and local partners will support the development of the final bid, which UKRI will consider through the competitive process of this funding programme.
- Supporting research and development of new transport systems and technologies across the Arc through investment by the Centre for Connected and Autonomous Vehicles (CCAV), the Office for Low Emission Vehicles (OLEV), UKRI, Zenzic (formerly known as Meridian Mobility) and Innovate UK.

Working with the LEPs within the Arc and other local partners, including England's Economic Heartland, to:

- Utilise the considerable R&D assets within the Arc to meet the Future of Mobility Grand Challenge and government's Road to Zero strategy. This will put the UK at the forefront of the design and manufacturing of zero emission vehicles, supporting government's commitment to end the sale of new conventional petrol and diesel cars and vans by 2040;
- Build on the Arc's existing role as a testbed for new transport technologies, such as automated vehicles and drones, working with HMG and Zenzic to competitively access existing research and development support, and scoping further opportunities to trial mobility services within the Arc.
- Support local authorities within the Arc, as set out in the Future of Mobility Urban Strategy, by providing guidance on design and planning to ensure new communities are designed and built to enable new approaches to mobility.

EDM, Silverstone Park

People

The SEMLEP area's headline labour market indicators, in terms of the rate of employment and employment growth, outperform national averages.

SEMLEP and its partners have also been very successful at engaging employers in the skills agenda and in delivering skills infrastructure, such as the Buchanan Centre at Bedford College, which provides training in advanced engineering. However, skills shortages remain the top constraint on business growth, resulting in hard to fill vacancies and skills gaps in the existing workforce.

Automation risks also exist for people working in low and medium skilled jobs, which can be mitigated by understanding what future skills will be required and ensuring the appropriate training opportunities are provided and promoted. Future priorities thus include: greater shaping of skills provision by employers; provision of new skills infrastructure, particularly in the digital realm; upskilling and re-skilling workers to resolve skills gaps.

Strengths

High employment and employment growth

The SEMLEP area has both high employment and high employment growth. In the 12 months to June 2018, the employment rate for 16-64 year olds was 78.6 per cent, compared to 75.2 per cent in England. Meanwhile, employment growth from 2015 Q2 to 2018 Q2 was 0.9 per cent higher than the rate for England[21]. The population is growing at a faster rate than any other LEP area outside London. The quality of employment is also above average.

In 2018, approximately 5.8 per cent of employees aged 16+ were paid the national minimum wage (NMW) or less, below the rate for Great Britain of 6.9 per cent. Milton Keynes led in this regard, with only about 2.8 per cent of employees being paid equal to or less than the NMW[22].

'Growing People' successes

Meeting employers' needs is the fundamental driver behind SEMLEP's 'Growing People' Skills Plan, which has already achieved several successes:

- **Labour Market Information:** SEMLEP has produced a range of detailed information packs for its showcase sectors, clearly outlining careers, future trends and skills and employment pathways.
- **Employer engagement with schools:** over 100 schools – representing over 77 per cent of mainstream schools across the area – are working with SEMLEP as part of the Careers and Enterprise Company network to improve employer-led careers education for young people. In September 2018, Bedford Academy became the first school in the area to meet all of the Gatsby national benchmarks for providing students with high quality careers guidance.
- **Capital investment to increase skills capacity and provision:** through the Local Growth Fund, SEMLEP has supported a number of skills capital projects, including: the University of Buckingham's Centre for Medicine, which provides state-of-the-art teaching and simulation facilities on the Milton Keynes hospital site; the Food and Drink Innovation Centre at Moulton College, which provides a bespoke facility to meet the skills and development needs of the food and drink sector; and Bedford College's Buchanan Centre, which provides training in advanced engineering, with the aim of addressing skills gaps in the engineering and construction industries.
- Supporting people into employment: from 2014-2017, 25 projects in the SEMLEP area received a share of nearly £30m from the European Social Fund to assist local people and businesses. For example, the 'In to Work' project supports unemployed people living in Milton Keynes, Luton, Dunstable, Bedford, and Aylesbury Vale, with particular support for those on Employment and Support Allowance (ESA), older workers, migrant workers and people living in rural areas.

Challenges

Skills are the number one constraint for local business growth

In the 2017 SEMLEP Business Survey, local businesses identified a lack of skilled labour as their number one growth constraint. A third of all businesses cited skills as a constraint[23], and of all businesses with at least one hard-to-fill vacancy, 85 per cent attributed this to skills shortages. Hard-to-fill vacancies are particularly an issue for firms with 5-49 employees, and businesses are most likely to report a lack of job-specific and technical and practical skills.

Buchanan Centre, Bedford College

In addition, against a backdrop of continued rapid projected growth in demand for housing and an ageing population in the area, skills shortages in the construction and health and social care sectors present a real challenge: in 2017 these sectors alone made up about 16 per cent of total employment in the SEMLEP area[24]. Skills shortages also need to be considered in light of exit from the European Union (EU), as some 6.5 per cent of those aged 16-64 originate from other EU countries. The degree to which the local economy employs other EU nationals varies considerably by sector, with the local construction, logistics and food and drink sectors particularly dependent upon their labour.

Changing skills requirements

Analysis by Deloitte[25] suggests that automation and technological advances have had a positive economic impact overall in the UK, contributing to the loss of over 800,000 lower-skilled jobs, but helping to create nearly 3.5 million new higher-skilled jobs in their place. However, this has clearly led to a change in skills requirements, so the key to realising inclusive economic success in the SEMLEP area is to ensure that people are equipped with the skills they need to navigate this new and ever-evolving technological landscape.

Ageing Population Grand Challenge

The SEMLEP area recognises the challenge of an ageing population. Using ONS projections, the local old-age dependency ratio of 289 per thousand workers, below the UK average of 298, is projected to grow at a faster rate than the rest of the UK, overtaking the national average by 2030. Also, baseline forecasts from Cambridge Econometrics indicate that Caring and Personal services jobs will be the fastest growing occupation from 2016-2045 in the area, growing at 2.9 per cent per year.

SEMLEP will continue to promote 'Strengthening the Workforce' through the use of open recruitment and a culture of life-long learning, by showcasing the talents and business benefits of hiring people from differing backgrounds, abilities and ages, and through signposting employers to relevant schemes such as Disability Confident, National Retraining Scheme, Fuller Working Lives, and the Armed Forces Covenant. SEMLEP and its local partners will aim to ensure people can re-engage with work following an absence, as well as up-skill and re-skill in response to changes in business skills needs. SEMLEP will also continue to work with partners to encourage the development of promising potential pathways for sectors such as construction, food and drink production, and digital.

There has already been some progress towards improved adult education in the area. Local support for reskilling in later life is provided by the Open University's recent successful funding for the Bringing Learning to Life programme, through the Flexible Learning Fund. This collaboration between the OU, Bedford College Group, Middlesbrough College, West Herts College and DfE includes four courses targeted specifically at adults who lack basic skills in Maths and English. Furthermore, the Active Blended Learning techniques trialled at the University of Northampton could be used to design courses better suited to adult learners.

Working with the Department for Education and the Department for Work and Pensions to tailor adult skills funding to local needs, as identified by the Skills Advisory Panel, would greatly support this work.

Reflecting the national picture, the SEMLEP area has already witnessed a 'hollowing-out' of its labour force: since the early 2000s, managers and professional occupations have increased their share of occupations in the area, while the share of administrative and elementary occupations has reduced. This trend looks set to continue: projections suggest that, over the period to 2024, nearly two-thirds of local jobs will require an NVQ Level 4 qualification or higher[26].

Digital and creative skills, as well as the intersection between them, are becoming increasingly important. Despite the area employing approximately 14,000 in computer consultancy activities, 13 per cent of businesses with skills shortages listed 'advanced IT skills' as a gap, and 9 per cent listed 'basic IT skills' as an issue. Looking to the future, the Midlands Engine Science and Innovation Audit identified advanced digital design and digital manufacturing as two key areas for growth in the Future of Mobility field.

In addition to supporting growth in knowledge-intensive sectors, digital and creative skills are also needed to boost productivity in lower-wage sectors that sit in the long tail of low-productivity industries, and to improve the adaptability of the workforce to increased automation.

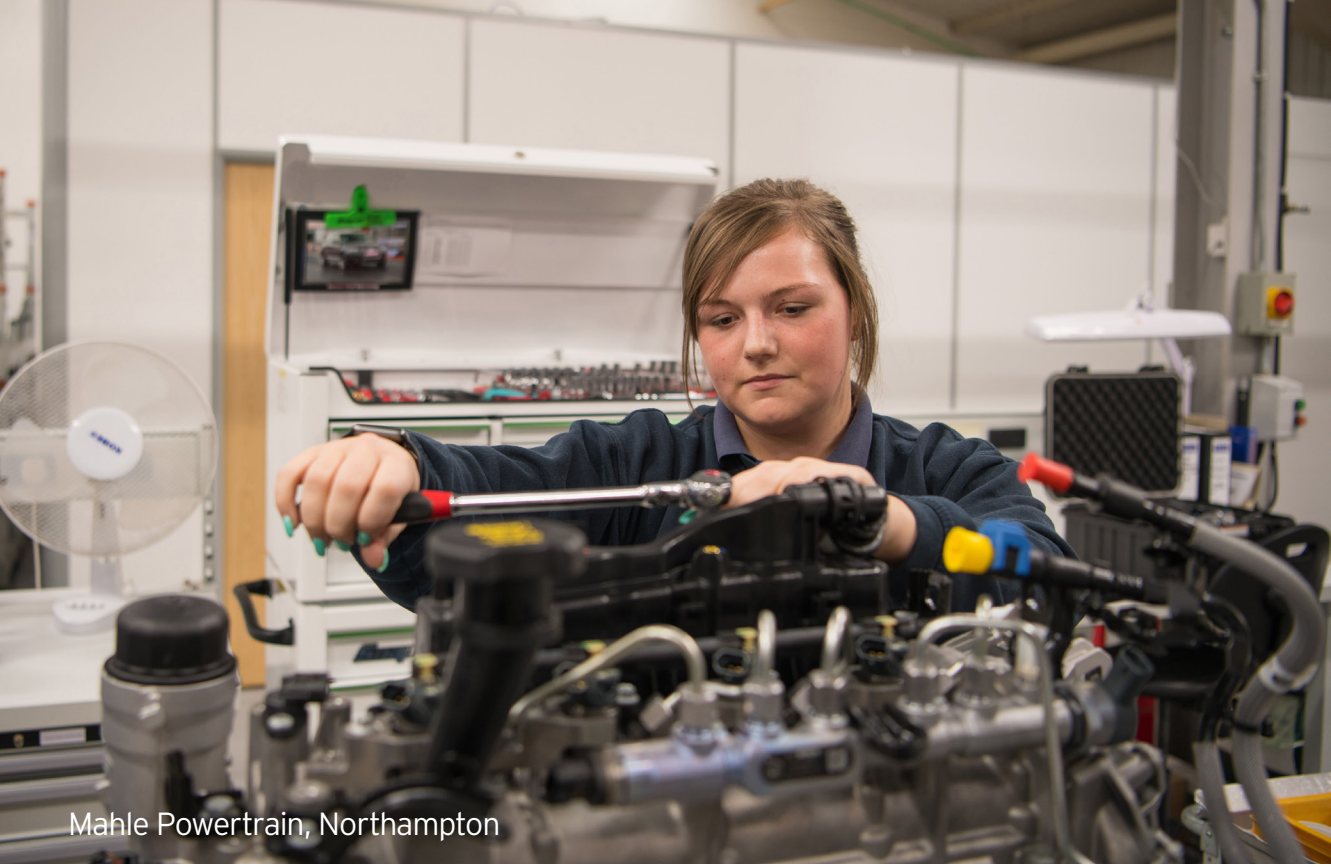
Labour market opportunities for vulnerable groups are also an issue in the SEMLEP area. While in 2018 the employment rate for 16-64 year olds was 78.6 per cent, compared to 75.2 per cent in England, the proportion of 16-17-year olds NEET (not in education, employment or training) is above the national average in parts of Northamptonshire, Luton and Central Bedfordshire[27]. And while the area has an employment rate among the work-limiting disabled of 53.5 per cent, above the national rate of 47.2 per cent, this rate is a long way below the overall employment rate of 78.6 per cent[28].

Interventions

Build on employer-led skills provision

SEMLEP will continue to work with local businesses, stakeholders, Jobcentre Plus and education institutions to build on the successes of the 'Growing People' Skills Plan in supporting employer-led skills provision in the area.

The SEMLEP Skills Board, formed in January 2018, will be subsumed by the SEMLEP Skills Advisory Panel (SAP), with a strategic role, advising on local skills and employment provision in line with employer needs, informed by the acquisition and analysis of labour market intelligence.



Mahle Powertrain, Northampton

A network of priority skills groups, contributing to the delivery of 'Growing People' will be represented within the SAP including the:

- Growth sectors and SMEs and independent training providers;
- SEMLEP Careers and Enterprise Company network;
- SEMLEP Apprenticeship Ambassador Network;
- SEMLEP Growth Hub;
- ESFA and DWP/Jobcentre Plus;
- Independent training provider, Further and Higher education; and
- Adult education via third sector, social/ community and local authorities.

The development and promotion of relevant pathways to occupations and sectors with need will continue. This includes highlighting the opportunities and benefits of technical education, both apprenticeships and T levels, in rural and urban areas, through promotion in schools using resources aimed at young people, parents and carers. Work is ongoing to develop and update digital Labour Market Information resources for young people and those seeking work to help inform careers and pathway decision making.

SEMLEP's campaign, #GrowingTalent, will continue to increase the number of businesses that engage with young people and educators to help inspire, raise aspirations and develop core competencies and skills for careers in growth sectors, with the attitudes and behaviours expected by employers, and the mindset needed for entrepreneurial success.

Focus will be placed on underrepresented cohorts in sectors, such as women in engineering.

Businesses will be supported through best practice from the SEMLEP Apprenticeship Ambassador Network, linking local SMEs and independent training providers businesses with SEMLEP's Growth Hub advisers and employer engagement with the Further Education establishments.

SEMLEP is committed to supporting people, especially those at risk of losing their job due to a health condition, age or automation, to remain in employment and progress whilst in work. Driving progression, through retraining and in work training, is a priority and in order to deliver this SEMLEP will work with employers, providers and Jobcentre Plus to support local people to remain and progress in employment.

SEMLEP will promote a culture of life-long learning to ensure people can re-engage with work following an absence, as well as up-skill and re-skill in response to changes in business skills needs. Supporting adult skills provision to meet local needs, as identified by the SAP, is an important part of this process. Furthermore, the Active Blended Learning techniques trialled at the University of Northampton could be used to design courses better suited to adult learners.

SEMLEP will also continue to promote 'open recruitment', by showcasing the talents and business benefits of hiring people from different backgrounds, and through signposting to relevant schemes, to address skills shortages and increase diversity in the workplace.

This includes focusing on promising potential pathways for sectors such as construction, food and drink production, and digital.

Employer skill needs will be captured through a biennial survey, sector working groups, Business Engagement Group and SEMLEP's Growth Hub. Social media groups will also be used to increase inclusion and encourage more SMEs and independent training providers engagement. A new digital skills working group will be created with the aim of hosting a Local Digital Skills Partnership to reflect the activity and needs of the area.

Employers needs and feedback will be passed on through the SAP via networks including FuSE (further education), SEMU (higher education), Skills Forum (independent training providers) and Careers and Enterprise (schools).

Sector Deals

SEMLEP will ensure continuous engagement with key sectors in the local area, helping to adapt skills provision to local employers' needs and underpinning commitments in existing Sector Deals:

- Construction: engage with CITB to promote construction related roles in the area, such as pathways, diversity, re-skilling and up-skilling. Activity will be based around the new further education facilities at Bedford, Leighton Buzzard and Northampton, together with the CITB Construction Skills Academies

at Wellingborough and Luton. Recently awarded Construction Skills Funds will provide opportunities for pathways into the sector.

- **Life sciences:** work with the Science Industry Partnership to identify and address skills needs and promote pathways.
- **Automotive:** participate with the Automotive Council and local stakeholders to contribute to plans to address skills needs and promote pathways for the automotive sector and ensure the development of engineering and design capacity.
- **Food and drink:** the Food and Drink LEP Network (FDLN), which includes SEMLEP representation, is working with Defra to develop a deal for the sector, which will focus on exports and skills.
- **Creative industries:** promote opportunities and pathways within the sector in schools through labour market information and employer engagement, with a focus on diversity, and work with the Creative Industries Federation to address skills needs in the sector.
- **Artificial intelligence:** highlight opportunities in STEM and pathways within the sector in schools and support the creation of new digital educational facilities within the area for Higher, Degree and Doctoral levels, such as Bletchley Institute of Technology and the proposed MK:U. Developing a start-up culture within these institutions is also key.

Skills capital investment

SEMLEP will also continue to support skills infrastructure provision. In addition to the other skills capital projects already being supported by SEMLEP, in July 2018, the SEMLEP Board announced investment for the following new projects, supported through the Local Growth Fund:

- Bedford College Group's Wellingborough Campus Renewal: a £14.4m project, due to complete in 2020, which will facilitate access for over 1,000 new learners per year; and
- Northampton College's Advanced Construction Engineering College: a £4.75m project, aimed at developing the skills needed for the most up-to-date construction and engineering technologies, which will provide quality space for 659 additional new learners by 2025/26.

Looking ahead, modern, industrialised methods of construction are likely to be key to delivering low carbon buildings across the area at scale, and in line with government's planned Future Homes Standard. The government is already promoting greater use of off-site manufacture, with a 'presumption in favour' of off-site manufacture for all projects involving public funding. Given the SEMLEP area's strategic location, logistics strengths, road network and available land for siting manufacturing facilities, there is a real opportunity to establish offsite manufacturing facilities, and the requisite skills required, locally.

Therefore, if the SEMLEP area is able to develop this knowledge on the back of local demand for new homes, as well as supporting wider skills acquisition in environmental technologies and management, this could prove a major boon both locally and for the wider Arc.

Introduce the UK's first STEM-skills focused university in Milton Keynes

In Milton Keynes, several partners, including Cranfield University, Microsoft, and Tech Mahindra, are looking at options to develop the country's first business-led, STEM-skills focused University, MK:U, at the centre of the Arc. The partners' aim is to have an undergraduate curriculum focused on issues such as digital and cyber skills, design thinking, robotics and artificial intelligence, and business and entrepreneurship. The education would be flexible, inclusive and applied, offering accelerated and standard degrees as well as part-time/ apprenticeship pathways. MK:U plans also to offer professional development courses and to be committed to 'learning for life', encouraging people to return to the University periodically to refresh their skills as workplace needs change.

Case Study: Addressing the Construction Skills Challenge

There has already been a 56 per cent increase in new construction related apprenticeships per year in the South East Midlands, from 2012-2016, with 1,520 new apprentices in 2016. However, certain areas have lagged behind, such as Wellingborough which saw a 20 per cent fall in new apprenticeship starts between 2012-2016. There is also a shortage of apprenticeships in certain construction subsectors, including (but not limited to) scaffolders, painters & decorators and roofers. Through facilitating a combination of research, analysis, stakeholder engagement and investment, SEMLEP is leading a coordinated approach to addressing the skills needs of employers in the construction sector.

Analysis of the needs of the sector have resulted in £7.25m investment through the Local Growth Fund and Skills Capital Fund in Bedford, Central Bedfordshire and Northampton Colleges. The Construction Industry Training Board (CITB) has provided support for two new academies in the region: the VFK Luton Dart Project (valued at £225m) and a spoke and hub model in Northamptonshire. Combined, these two National Skills Academies for Construction will support over 2,700 people with construction skills, training, qualifications and will help new entrants and apprentices to join the sector. These two academies are also the focal point for monies from the DfE Construction Skills fund, administered by CITB. In addition, the latter funding has been awarded to the High Speed 2 project running through the west of the area.

With support from Luton Borough Council, CITB has commissioned a new report on the skills and provision in the area, identifying key professional trades requiring focus on provision and the development of a talent pipeline. SEMLEP and CITB, along with other partners, will work to address these needs over the coming months.

SEMLEP is promoting the opportunities within the sector to young people using sector-focused labour market information and presentations in schools as part of the SEMLEP Careers and Enterprise network. Apprenticeships are also being highlighted through the ASK project, Young Apprenticeship Ambassadors and SEMLEP's Enterprise Coordinators. Employers offer 'open doors' weeks through the CITB GoConstruct programme.

Block D, Bletchley Park

Moreover, the intention is for business partners directly to shape the curriculum, working closely with MK:U to identify skills gaps and help design and deliver the education that will fill those gaps, ensuring that students acquire the skills that local and national employers need, both now and in the future, as technologies evolve further. MK:U's ambition in Phase 1 is to grow to 5,000 registered students in five years (not counting delegates attending professional development courses) and its mid-term aim is to reach 15,000 students within 20 years.

Introduce an Institute of Technology (IoT) at Bletchley Park

SEMLEP and Department for Education are supporting the development of an IoT at Bletchley Park, led by Milton Keynes College, to build on Bletchley Park's momentous history and inspire a new generation to further their digital skills. This will focus on NVQ Level 4 and 5 provision, including higher-level apprenticeships, thus supporting pathways to employment, addressing the digital skills needs of businesses within the Arc and potentially providing a stepping stone to MK:U qualifications. In addition, the IoT will have further sites in Reading and Oxford, thus helping to improve skills provision and linkages across the Arc.

Commitments

Ambition

To put employers at the heart of innovative skills provision and to become the Oxford-Cambridge Arc's core provider of digital skills, attracting and training the next generation to lead the global digital revolution.

To drive progress towards achieving this priority, SEMLEP will:

- Continue to work with local businesses, stakeholders and education institutions through its newly formed SAP to build on the successes of the 'Growing People' Skills Plan in supporting skills provision in the area.
- Drive greater business engagement with educators and students through the 'Growing Talent' campaign.
- Ensure employer-led development of the talent pipeline through effective careers information, inspiration and advice in schools and colleges, building on current successes.
- Promote all relevant pathways based on employer needs.
- Place focus on the development of levels of digital skills and STEM.

Working with local partners across the Arc SEMLEP will also:

- Review labour market intelligence across the Arc, to gain a better understanding of how skills provision is currently delivered and funding utilised. This will include working closely with the Department for Education and providers across the Arc to consider how local provision supports the ambitions set out throughout these strategies.
- Work with local employers to increase apprenticeship uptake across the Arc, supporting employers to maximise their Apprenticeship Levy contributions and drive social mobility.
- Work with local employers to support the effective role of T levels and utilise local labour market intelligence to work with providers to consider how the local T level offer will support local businesses.
- Establish an Arc-wide skills marketplace, enabling the LEPs to continue to build on the positive working relationships with the Careers and Enterprise Company and other careers services. This will utilise the evidence provided by each Skills Advisory Panel, connecting businesses with skills providers and people with targeted support including apprenticeships, STEM skills, T levels, technical and degree apprenticeships.

Government is working in partnership with SEMLEP to support the delivery of this priority by:

- Investing £265m Local Growth Fund allocation in the SEMLEP area, which is delivering new Further Education facilities based on employer-led needs:
  - Northampton College, New Daventry campus;
  - University of Buckingham, Academic Centre, Milton Keynes Hospital;
  - Bedford College, Buchanan Centre;
  - Moulton College, Food and Drink Innovation Centre;
  - Tresham College, Wellingborough Campus renewal; and
  - Northampton College, Advanced Engineering Centre.
- Focusing on increased capacity for provision and learners, including apprenticeships, for growth sectors such as Construction, High Tech and Innovation, Advanced Manufacturing and digital skills.
- The Department for Business, Energy and Industrial Strategy will continue to work through sector councils and groups to engage key local sectors in current and future Sector Deals, ensuring that SEMLEP's businesses have the opportunity to contribute to these groups.
- Government will commit to discussing with Cranfield University and partners how best to make the case for creating a new university in Milton Keynes (MK:U). Pending successful discussions, fundraising will be taken forward locally.
- Department for Education announced up to £28m funding on 10 April 2019 to create the new Institute of Technology in Bletchley and will now work closely with Milton Keynes College to ensure the project is delivered.

Infrastructure

As evidenced through the area's high popularity with logistics firms and Future of Mobility innovators, the SEMLEP area is extremely well located in order to connect with key markets in the UK and abroad.

Less than an hour from London by train, easy access to international airports, and good north-south transport linkages are local infrastructure highlights. However, the quality of the area's east-west linkages are far weaker, and growing traffic congestion is increasingly impeding productivity. Similarly, energy and water infrastructure improvements have failed to keep up with population and business growth, which puts further growth at risk, and digital connectivity needs to be enhanced if the area is to remain at the forefront of testing and commercialising new technologies. Future priorities thus include improving energy, water, digital and transport infrastructure in a sustainable manner, focusing on the opportunities provided by renewable energy, smart transport solutions, and greener vehicles, buildings and design principles.

Strengths

North-south linkages and global connectivity

The SEMLEP area has excellent north-south links, including the M1, M40 and A1(M) and major rail routes (including the Midland, West Coast and East Coast Mainlines). It also benefits from international connectivity through London Luton Airport, rail links to Gatwick airport and St Pancras international rail services, and proximity to both London Heathrow and London Stansted airports.

A leader in clean growth technologies

The SEMLEP area has extensive Electric Vehicle (EV) uptake and infrastructure. Over the period 2014 Q1 - 2018 Q2, the average growth rate in new EV registrations was 4.5 per cent above the UK growth. The area also punches above its weight when it comes to electric charging points: it accounts for 5.8 per cent of national charging points, vis-à-vis around 3.5 per cent of the national population. Milton Keynes has the highest number of EV charging points of any area outside London.

Case Study: London Luton Airport

London Luton Airport (LLA) is the UK's fifth largest airport, and one of the fastest growing, having seen an increase in passenger numbers of 75 per cent over the last five years, and now looking to top 17 million in 2019. It is the only major UK airport to remain wholly in the ownership of the public sector through Luton Borough Council's airport company, London Luton Airport Limited (LLAL). LLAL, with the support of the Council, has recently embarked on a £225m investment in the Luton DART (Direct Air-Rail Transit), a mass passenger transit system connecting the airport terminal with the national rail system at Luton Parkway station, which will make LLA the easiest and quickest airport to reach from Central London when it opens in 2021.

LLA is operated by a consortium of which the majority shareholder is AENA, the world's largest airport operator, and AMP Capital, a specialist global investment manager. The airport employs over 9,400 staff and is a major economic driver for the region. Its route network serves more than 140 destinations in Europe, Africa, and Asia, with 11 airlines flying from the airport, including easyJet, Wizz Air, Ryanair and TUI. A £160m transformation programme is nearing completion which will increase capacity to 18 million passengers per year by 2020. The airport has also published a vision for sustainable growth for 2020-2050, which includes an environmental strategy to address the air quality and noise implications of the expansion through high-tech solutions. LLA is well on its way to achieving its ambition of becoming the airport of choice for north London and England's Economic Heartland.

Electric Charging points in Milton Keynes

In addition, as the only university in Europe with its own airport, aircraft and air navigation service provider, Cranfield offers a unique spectrum of relevant capabilities, expertise and facilities for the development of aircraft electrification.

There is also local commitment to renewable energy in the area, outlined in SEMLEP's Local Energy Strategy. For example, the Kettering Energy Park is leading the way in renewable energy investment to strengthen the green economy. It aims to provide virtually all of the area's current and future energy requirements – including those of East Kettering's Sustainable Urban Extension – through a variety of zero-carbon distributed energy resources and offers an opportunity to diversify Kettering's industrial base.

Meanwhile, as of end-2016, Central Bedfordshire and East Northamptonshire generated 146MW and 135MW respectively of energy from renewable sources, well above the 84MW UK local authority average.

In addition, thanks in large part to its motorsport heritage, the SEMLEP area has become a leader in energy and low carbon transport technologies, with specialist expertise in lightweight vehicles, efficient power systems, aerodynamics testing to improve fuel economy, vehicle emissions testing, use of automation to improve transport products, and dynamic routing and data to support the green economy. SEMLEP is also the top LEP area in terms of energy research publication output[30].

Challenges

Energy capacity and water supply constraints

Electricity capacity is constrained in certain parts of the SEMLEP area, acting as a brake in several instances on commercial investment and housing development. Five per cent of the Western Power Distribution Network in the area has zero or little headroom, while 20 per cent of sub-stations have demand headroom of less than 5MW.

Given growth ambitions across the SEMLEP area and wider Arc, where the possibility of significant numbers of new homes, and an accompanying major expansion in business, is being considered, these energy capacity issues look set to become increasingly problematic.

While the overall spare capacity available (around one quarter of current network capacity) is considered to be relatively healthy in terms of providing for traditional, incremental growth, it is not sufficient for any sort of step change in growth, including new settlements, or significant expansions to existing ones. Furthermore, although EV charging infrastructure is good in the area, there is a need to increase it to promote continued EV uptake and prepare for an EV-dominated future, and this brings with it further challenges in terms of energy capacity. To add to this issue, inefficient buildings increase demands on the energy network, making it more difficult to meet environmental goals, and raising heating costs for businesses. There is evidence that new buildings are failing to achieve their basic design energy performance targets in the SEMLEP area, with typical performance gaps of 200 per cent[31]. Furthermore, despite some areas performing well in terms of renewable capacity installed, the average local authority in SEMLEP only has 76MW installed, below the national average of 84MW.

Flood risk and water supply constraints also exist in the SEMLEP area. Only a few parts of the area have more water available for extraction, while several other parts are actively over-abstracted. Furthermore, water resilience challenges are set to become increasingly acute over the coming half-century as global temperatures rise.

Traffic congestion and poor East-West transport links

East-west transport links across the SEMLEP area are weak, with slow east-west road connections, and east-west rail journeys that often require routes via London. These poor transport connections contribute to a lack of integration of labour markets: only 1.7 per cent of the resident workforce in the SEMLEP area works in Oxford or Cambridge, versus 5.1 per cent in London; similarly, under one per cent of the resident workforce living in Cambridge works in the SEMLEP area[32].

Kettering Energy Park

There are also local challenges around rural transport connectivity, with the SEMLEP Business Survey pointing to greater dissatisfaction with public transport quality in rural areas.

Meanwhile, although the SEMLEP area has excellent north-south links, traffic congestion is getting worse, particularly around Northampton, Milton Keynes and Luton. Highways England forecasts a 34 per cent increase in average annual daily traffic across the Arc by 2035, based on a do-minimum scenario. This acts as a significant barrier to addressing other challenges, such as improving productivity in the logistics sector, accessing land for new settlements and dwellings, and promoting the area as a connected core.

Variable digital infrastructure

Digital infrastructure has improved significantly in the SEMLEP area since 2015: in 2017, four per cent of businesses stated that digital infrastructure was a constraint on business, compared to 26 per cent two years earlier[33]. But this improvement has not been universal: specific business types and sectors within the area still cite digital infrastructure as a key growth constraint. This is most notably the case for businesses in rural areas, where premises are less likely to have adequate speeds than more urban areas, in the education sector, and among businesses with five to nine employees[34].

Interventions

Improved energy infrastructure, in line with Clean Growth agenda

As outlined in SEMLEP's Energy Strategy, improvements to local energy capabilities are key to the future productivity of the area, while also offering growth potential in the 'clean growth' space. In particular, support will be prioritised for the implementation of Distributed Energy Resources and the development of Active Network Management (ANM), both of which can help simultaneously to mitigate supply constraints and reduce carbon emissions. Similarly, the area will look to build on the existing strengths of Milton Keynes' electric vehicle (EV) and Smart City infrastructure, and Bedford's ambitious EV infrastructure plans, with the aim of becoming a green transport exemplar at the heart of the Arc, supporting the Future of Mobility Grand Challenge.

Trialling low-carbon energy innovations (e.g. energy storage technologies), improving electric vehicle infrastructure, installing heat networks, and retro-fitting existing stock will be important, and SEMLEP will look to work with local partners, as well as the Greater South East (GSE) Energy Hub, to support all of the above, as well as backing changes to energy regulation to facilitate step changes in growth. SEMLEP will also support the dissemination of best practice case studies, such as Etopia Corby, and information on schemes to incentivise the implementation of energy efficiency measures by households and businesses. There is also an opportunity for the SEMLEP area to become a leader in the production of low carbon dwellings at scale and pace, through the potential establishment of offsite manufacturing facilities.

Through this proposed approach the SEMLEP area aims to at least catch up with the national average of renewable capacity installed per local authority, as well as meet the projected 111 to 130 per cent rise in energy demand by 2050 through increased distributed generation.

In addition, alongside resourcing energy (and wider) infrastructure planning and delivery, SEMLEP wants to work with organisations involved in managing flood risk and water scarcity to develop water infrastructure plans. For example, flood risk in the Tresham Garden Village masterplan was mitigated through the use of increased woodland coverage on flat land with permeable soils. This approach could be used as best practice for other settlements, reducing flood risk more widely.

ZEB homes, Electric Corby

Developing strategic east-west links and enhancing the road and rail network as a whole

SEMLEP is currently working with partners to support the delivery of East West Rail and the Oxford to Cambridge Expressway. These are essential pieces of infrastructure that will need to be delivered in a way that enhances the opportunities for sustainable development. Improvements to other important east-west links are also vital, including to the A14, where additional schemes such as J10A will help to support growth, the A45 north of the M1 and the links from the A421 to the A428 at the Black Cat roundabout. At the same time, SEMLEP will continue to work with England's Economic Heartland (EEH), as the emerging Sub-Regional Transport Body for the Arc, to support other critically-needed strategic transport improvements, so as to reduce congestion and increase connectivity. These include upgrades to the A1 Corridor between the M25 and the A14, and improvements to the Major Roads Network (for example, the A413/A355 that links Aylesbury to the M40 and the A418/A505 route from Oxford to Cambridge via Luton/Dunstable).

There is also a pressing need to improve orbital connectivity around Northampton to address congestion and facilitate continued economic growth of the greater urban area. This is being realised with the proposed Local Growth Fund support for the Northampton North West Relief Road.

Case Study: Electric Corby - the Etopia Corby project

Electric Corby CIC has led the formation of a consortium of like-minded partners seeking to deliver 47 new Net Energy Positive homes at Priors Hall Park, Corby. Etopia Corby (formerly Glendale Ecohomes) was established in order to eliminate the 'performance gap' that exists across the traditional volume housing market – the gap between 'as designed' and 'as built' energy consumption. Research across the SEMLEP area 'revealed performance gaps of two, three or five times the amount of energy foreseen at design stage, with almost all buildings failing to deliver what they were designed to' (Chartered Institute of Building, 2016).

The Etopia Corby project is providing the housing market with highly energy efficient homes using modern methods of construction, off-site manufactured panels to create close to passive house performance cost effectively, and micro-generation. This includes energy storage, combined with heat and electricity storage technologies, all within a more spacious and convenient home design with the target of Energy Positive Living for residents. These elements are all expected to reduce the average home energy bill of £1,450 per annum to zero.

The ambition has been recognised by BEIS, as the scheme has been pre-selected for the Building for 2050 programme to support the development of homes that are better by design while remaining affordable. Construction has started at Priors Hall Park in Corby, a mixed use Sustainable Urban Extension which will deliver 5,100 dwellings, and the first homes will be available to occupy from the early summer of 2019.

Clean Growth Grand Challenge

SEMLEP and its local partners are strongly supportive of the ambition set out in national Industrial Strategy to ensure that everyone feels the benefits of clean growth. Milton Keynes has been an exemplar in this regard, with the highest level of electric vehicle (EV) infrastructure outside of London. The SEMLEP area is also home to two of the UK's garden communities (Tresham Garden Village and Aylesbury Garden Town), which are supporting housing growth while simultaneously enhancing natural capital. In addition, the area is home to unique and cutting-edge emission testing facilities, including the UK-leading emissions test centre at MAHLE Powertrain. However, performance in the SEMLEP area is patchy in terms of carbon emissions. The aim is to address this and move towards clean growth through a number of measures, including greater use of Distributed Energy Resources and Active Network Management, and the trialling of innovative freight technologies and demand-responsive transport. In addition, the area would like to use its food and drink, waste and packaging expertise to be at the forefront of initiatives around efficient food processing, sustainable packaging and improved waste utilisation strategies. There are also plans underway to improve the links between the logistics and food and drink sectors in the area, so as to start addressing some of these issues.

Smart Commuting, Northampton

Case Study: Woodside Link Road

Completed in 2017, the Woodside Link Road connects the Woodside industrial area in Dunstable to the M1 motorway and the A5 via Highways England's A5-M1 link (North Dunstable Bypass).

The key aims of the project were to divert heavy traffic away from towns and villages to ease congestion and improve air quality, and to access land for employment and housing development. It is part of the Dunstable Town Centre Masterplan, which includes the A5-M1 Link and the Luton and Dunstable Guided Busway. The project received £20m in funding from SEMLEP's Local Growth Fund programme.

To date, the link road has created over 2800 jobs and has led to 97 homes being built in the wider Houghton Regis area.

First-mile-last-mile connectivity considerations are key, building on local logistics specialisms and trialling innovative approaches to improve air quality within settlements and reduce congestion. SEMLEP will work with EEH and other partners to ensure that settlements within the SEMLEP area are able to benefit from large-scale transport infrastructure developments.

It will also work with partners to support smarter and greener modes of transport, in line with the principles set out in government's Future of Mobility: Urban Strategy: for example, Local Growth Funding has been provided by SEMLEP to the Smart Commuter project in Northampton, to support optimal use of the city's existing transport network and thus reduce congestion.

Meanwhile, Starship Technologies, partnered with the Co-op, is currently piloting last-mile delivery of groceries and packages via a fleet of six-wheeled autonomous robots in Milton Keynes.

SEMLEP and its local partners would like to see the SEMLEP area used as a test-bed for Demand Responsive Transport and Mobility as a Service more broadly, so as to provide greater accessibility – particularly for young people in education and employment, for the ageing population in rural areas and for new developments – in a sustainable way. Moreover, these approaches present an opportunity to mitigate the high up-front costs of EV ownership, enabling both higher and more inclusive uptake.

SEMLEP is currently working with the Connected Places Catapult and the University of Northampton to develop a pilot project to provide better access to Silverstone Technology Cluster.

The Bedford to Milton Keynes Waterway Project, an ambitious 16 mile waterway linking the Grand Union Canal in Milton Keynes with the River Great Ouse in Bedford with complementary green infrastructure, is an example of key east west infrastructure that will enhance the environment and improve local quality of life by providing opportunities for healthy exercise, tourism and leisure at the heart of the Arc.

Improving digital connectivity

There is appetite to do more to improve digital and data connectivity in the SEMLEP area, particularly in those parts that currently have poor connections. Provided that digital skills are also supported, this will both boost productivity and help to attract and retain labour. The Central Bedfordshire, Bedford Borough, Milton Keynes and Luton 'Superfast Central' broadband project – funded by the Broadband UK (BDUK), and SEMLEP Local Growth Fund monies – aims to provide 98 per cent of premises with superfast broadband by mid-2019. Furthermore, Vodafone and CityFibre have proposed substantial investment in digital infrastructure in Milton Keynes, which is expected to substantially improve local speeds and coverage.

Meanwhile, the Superfast Northamptonshire project has provided over 60,000 premises with Fibre broadband and aims to bring over 6,000 rural premises fibre coverage by end-2019.

Despite these successes, local partners want to do more to improve the area's full-fibre connectivity, which is key to wide-scale Future of Mobility testing and implementation. SEMLEP will support local body activities, with the market, to increase full fibre and 5G coverage in the area.

Case Study: Smart Commuting – part of Smart Move Northamptonshire

Northampton is a rapidly growing urban centre, but with a largely historic road pattern. This means that there is limited scope to create additional road space to meet growing demand. The Smart Commuter project looks to optimise the use of the existing network and different modes of travel. It does this by deploying sensors and capturing 'floating data' to gather intelligence on how the network is operating. This is then used to provide live information to enable motorists, public transport users, cyclists and pedestrians to make smart decisions and plan their journey more effectively, so reducing congestion.

The project has already seen the installation of over 120 journey time sensors, the latest digital totems displaying travel and event information, variable message signs, 30 digital real time public information displays on key routes, and the introduction of ten 'smart junctions' which enable buses to operate more effectively particularly during peak times. The aim is also to introduce an electric bike scheme and Low Emission Charging Points across the urban area. Central to the project is the http://www.smartmovenorthamptonshire.net portal which provides a single access point for live travel and transport information from a variety of sources and for all modes, including tips on some of the 'smart tools' which are available. Other innovations are also being explored to help journey planning and improve the customer experience across all modes. In the short-term, the project will help to accommodate plans for 2,700 new homes within the urban centre of Northampton by March 2022.

Case Study: Millbrook Proving Ground: Deployment of the UK's First 5G Transport Network

Advanced 5G network deployment has begun at Millbrook Proving Ground. This is part of the AutoAir project, led by Airspan Networks, and signals the future of testing and validation of Connected and Autonomous Vehicle technologies. Representatives from DCMS, which is part-funding the ambitious project, were present during the first, crucial step in the deployment in July 2018.

Over the coming months AutoAir will deliver pervasive 4G and 5G connectivity at Millbrook Proving Ground though a dense network of base stations around the test tracks. This will provide real-time connectivity and enable accurate location and connectivity trials on site for the first time. A digital model of its proving ground is also being made available to vehicle manufacturers and CAV developers to take full advantage of its facilities.

Case Study: CityFibre

Milton Keynes is racing ahead in its quest to become the UK's digital leader. Thousands of homes are now able to connect to a new full fibre network after MK was announced as the first UK city to benefit from CityFibre's 'fibre to the premises' programme. Delivered via a strategic partnership with Vodafone, CityFibre will bring Gigabit-capable broadband to up to 1 million UK homes and businesses by 2021.

Made possible by a £40m city investment from CityFibre, impressive progress has been made in the roll-out of the MK gold-speed network. It now extends to more than double the initial network - around 350km, with further fibre being laid every day.

Full fibre is already supporting businesses to enable greater innovation and productivity, while bolstering the city's economic growth. It will drive MK's growing reputation as a tech hub and underpin a range of new business ventures including new hotels and apartments, plus support plans for a new city university, MK:U, and Institute of Digital Technology.

CityFibre itself has also underlined its commitment to the city and region by investing in a new Centre of Excellence in MK and employing local talent to push forward the vision of full fibre connectivity supporting growth.

CityFibre, laying full fibre in Milton Keynes

Commitments

Ambition

To improve productivity and sustainability in tandem, fuelled by renewable energy, smart and connected transport solutions, and greener vehicles, buildings and design principles.

To drive progress towards achieving this priority, SEMLEP will:

- Identify, support and disseminate best practice from energy 'beacon projects' (those implementing early-mover future energy systems and technologies – including new distributed energy resources, active network management, innovative energy storage and low-carbon housing) in line with SEMLEP's Energy Strategy.
- Bring together major energy stakeholders in the area to discuss their role and requirements to support the necessary energy provision and transition outlined in SEMLEP's Energy Strategy.
- Support SMEs to engage in energy-related innovation and to adopt energy-efficient practices, through the dissemination of information and funding opportunities, and increased networking with relevant partners.
- Work with local authorities and other local partners to support the development of strategic transport links, greater first-mile-last-mile connectivity, and increased electric vehicle infrastructure within the SEMLEP area.
- Continue to be at the forefront of the Future of Mobility Grand Challenge, by working with businesses and partners to bring forward locally led development of new facilities and test beds to pilot solutions. Where possible, these will be linked, to wider residential and commercial growth in the area, as part of the Settlements of the Future agenda.
- Work with local authorities and other partners to continue to support full-fibre connectivity in the SEMLEP area.
- Work with organisations involved in managing flood risk and water scarcity to develop plans for water infrastructure.

Working across the Arc:

- Local partners will collaborate with the Department for Transport, Highways England, East West Rail Company and England's Economic Heartland to expand the economic benefits of planned strategic transport links and improvements to the Major Roads network across the Arc and develop the first-mile-last-mile connections to them.
- Government and local partners will conduct a review of recent evidence work at local, regional and national-level, to develop a shared evidence base for the current and future energy needs of the Arc. This could provide opportunities to test new energy policies or approaches within the Arc.
- Government and local partners will work to identify and diffuse best practice on digital infrastructure planning in the Arc and explore opportunities to align new transport infrastructure with digital infrastructure in the Arc. This will aim to support industry to accelerate the roll-out of full fibre networks, enabling accelerated growth of 5G technologies across the Arc.
- Local partners will work to standardise public data where possible - such as through the opportunity created by local government unitarisation in Buckinghamshire and Northamptonshire - and with support from government policy experts, to ensure that the opportunities to collect and capitalise on data are utilised. This will be done with a view to addressing Grand Challenges around the Future of Mobility, the Ageing Society, and Clean Growth.
- Government and local partners will work together across the wider Arc to explore proposals for new approaches to funding infrastructure, as set out in Government's response to National Infrastructure Commission Report at Autumn Statement 2018.

Government is working in partnership with SEMLEP to support the delivery of this priority by:

- Investing in significant new transport infrastructure through East West Rail and the Expressway, and first-mile-last-mile connectivity, as detailed in the Joint Statement on the Arc published at Spring Statement 2019.
- Investing £265m of Local Growth Fund in the SEMLEP area, including:
  - £4m investment in Broadband to ensure more businesses are connected to the high speed network;
  - Woodside Link joining Woodside Estate in Houghton Regis to J11A opening up land for employment and homes;
  - A43 dualling north from Northampton towards Kettering to open land for homes and jobs; and
  - Daventry Development Link speeding up journey times from the M1 J16 opening up land for new homes and employment in the town.
- Funding SEMLEP to develop its local Energy Strategy and supporting implementation via the Greater South East Energy Hub.

Business environment

The SEMLEP area is an attractive place to do business, as evidenced by the high ratings that businesses give to the local business environment and supply chain availability, and also by the area's high start-up rates, private sector jobs growth, and FDI.

However, many local businesses cite a lack of suitable employment premises as a constraint upon their growth, and business scale-up in the area is also weak. Future priorities thus include: improving the quantity, quality and balance of commercial premises; working through the SEMLEP Growth Hub, local universities and other partners to support business scale-up; and working with the government and Arc partners to further trade and inward investment.

Strengths

Start-ups and business survival

The SEMLEP area currently has an excellent business environment, with the third highest start-up rate of all LEPs in 2017[35]. Indeed, 2017 saw record high levels of business births in the UK, and SEMLEP contributed 4 per cent of those new businesses in England. Also, survival rates outperform the UK average: in 2017, the one-year, two-year and three-year survival rates in the SEMLEP area were all above UK rates. The highest one- and two-year survival rates within the area were in Corby (95.1 per cent and 80.2 per cent respectively) and Daventry had the highest three-year rate (67.7 per cent), significantly above the national average[36].

An attractive place to do business: strong private sector growth, FDI and trade

The SEMLEP area has a thriving business environment, with two of the UK's top ten cities for recent private sector jobs growth: Luton (ranked first) and Milton Keynes (ranked fourth). Businesses also rate the area very highly. In the 2017 SEMLEP Business survey, about two thirds of businesses rated local schools and colleges as good or very good, over a quarter rated supply chain availability as very good, and a third gave the SEMLEP area's business environment a perfect score (5/5) overall.

Case Study: Innovation Bridge - Dyslexia Matters

Innovation Bridge is a three-year £3.9m economic development project, funded through the European Regional Development Fund, running until summer 2019. The project offers free support to help all businesses in the SEMLEP area innovate and grow through linking businesses with specialist university expertise from the University of Bedfordshire, Anglia Ruskin University and University of Suffolk, as well as providing a grant programme to support the implementation of a growth plan. These grants can cover up to 30 per cent of a project's cost, capped at a maximum of £15,000.

An excellent example of how this project enhanced innovation, supported scale-up and addressed inclusive growth was through their work with Dyslexia Matters. Started in 2010 by the joint head teachers of a specialist school for children with dyslexia, Julia Hewerdine and Liz Blackburn, the business provided training courses to address the shortage of teachers able to teach children with dyslexia. After identifying that their training courses took too long, thus dissuading potential teachers from taking these courses, Julia and Liz approach Innovate UK for help. The project linked them with Professor Janice Wearmouth, Professor of Education at the University of Bedfordshire, one of the country's leading authorities on special needs education.

Along with receiving a grant to develop an action plan, the businesses successfully design a more streamlined course to add to their range, and were launched at SENCo'17, the education special needs exhibition, with great success: the new courses were well received, and Dyslexia Matters came away with a long list of new contacts. The new streamlined courses have opened up the market to more potential customers, and the businesses is currently taking on more employees to handle the increase in demand.

Looking ahead, there are some developments in train that will further support this, such as plans for a new Enterprise Centre in East Northamptonshire.

The SEMLEP area also has a strong record on Foreign Direct Investment (FDI) and trade. In 2017, the area attracted 69 successful FDI projects, creating 2,094 new jobs and safeguarding an additional 896.

The main investor nation was the USA (21 per cent of FDI; also the UK's main investor nation), followed by Germany (14 per cent), with significant investment in a number of key sectors, including electronics and communications, the automotive sector, software and computer services, and food and drink[37]. The area also has a strong goods export market, specialising in machinery and transport equipment. The total value of goods exports in 2016/17 was c£7bn[38].

Challenges

Commercial premises

The lack of suitable employment premises was the third most commonly reported constraint on business growth in the SEMLEP area, with 27 per cent of businesses citing this as a constraint in 2017. The issue disproportionately affects smaller firms: although 38 per cent of businesses with 5-9 staff said availability of suitable premises was good, almost as many (32 per cent) rated it as poor. Some industrial sectors are particularly affected: the SEMLEP Food and Drink Forum has identified the lack of food-grade, business-ready space for businesses to move into as a key constraint upon SME growth in the sector. Similarly, the SEMLEP Inward Investment Group has said that investment is being lost and investor interest unfulfilled as a result of the market not delivering speculative property supply for grade A premises.

Indeed, the type of commercial premises coming forward is a key issue: there is a significant undersupply of small to medium industrial units in many parts of the SEMLEP area, including Daventry, where vacancy rates are very low, and frustrated demand in the market is estimated at 25,000 sqm[39]. This indicates a market failure: without specific land use planning restrictions, or higher rent market comparators to reassure investors, these types of units are not being provided, with the market focusing instead on large-scale warehousing, which is cheaper to build and manage.

Scale-ups

Despite the SEMLEP area's impressive start-up rates, this is not translating fully into scale-up. Over the 2014-17 period, only 1.6 per cent of SEMLEP businesses scaled from <£500,000 to £1m+ turnover, relative to 1.9 per cent of businesses in England[40]. In addition, the Scale-Up Institute's 2017 annual review identified SEMLEP as one of nine 'cold-spots' for scale-up. The report identified that while Milton Keynes, Central Bedfordshire, Luton and Daventry had above average scale-up growth rates (turnover based, 2013-2015) all other areas saw their scale-up rate fall.

The report also identified scope for improving business support in overcoming talent, skills and financial barriers. In particular, a lack of signposting to scale-up finance; confusion over eligibility for incubator programmes; a low profile for the benefits of investing at scale; and difficulties for businesses writing strong bids for funding, were identified as specific financing barriers. Poor access to larger firms in supply chains was also identified as an issue.

Interventions

Funding for more or expanded commercial premises

SEMLEP and its stakeholders want to support an extensive and balanced pipeline of employment land and premises in the area, to ensure that local growth is not held back due to a lack of suitable premises, nor skewed in favour of large warehouses at the expense of the opportunity to plan strategically for the use of key sites. Strategic planning for land close to rail nodes and interchanges along the east-west rail route is particularly vital if the SEMLEP area's ambition of becoming the high-tech Connected Core of the Arc is to be achieved.

Where warehouses are developed – and a 2017 report by CBRE and SQW suggests continued strong demand for both industrial and logistics floorspace along the M1 corridor and at J10a – this should be undertaken in a manner that is sensitive to the local environment and compatible with LIS goals to increase innovation and productivity in the logistics sector.

I-Worx, Bedford Commercial Park

There are several SEMLEP-supported Local Growth Fund projects in train to increase and improve the local range of employment premises available, including the development of an SME industrial workspace area on the Leyland Trading Estate in Wellingborough, and the I-WORX project, which is developing modern engineering and work shop spaces at Bedford Commercial Park with the aim of catalysing business and skills development in the high-tech sector. In addition, SEMLEP is supporting infrastructure projects, such as the A421 dualling, that enable the private sector to invest in commercial space.

Looking ahead, there are a number of Local Growth Fund projects in the pipeline to expand commercial space alongside the regeneration of local cultural heritage. These include the creative industry regeneration offered by the Luton Hat District project, as well as the Vulcan Ironworks centre and cultural regeneration work alongside One Angel Square in Northampton.

However, there is potential to go much further than this as pan-Arc infrastructure is developed. Oxford and Cambridge are hitting against land supply constraints for commercial expansion, while the SEMLEP area is less constrained.

As such, SEMLEP wants to work with local partners and government to promote the SEMLEP area as the Connected Core of the Arc: a place to collaborate, with space to capitalise on commercialising new technologies. The potential prize from making the most of this central area in commercial terms is huge, both from a local perspective, and from the perspective of the contribution it can make to UK plc.

Realising this prize will necessitate working with partners and using market intelligence to identify key strategic sites in the SEMLEP area, as well as thinking innovatively about the role that town centres might be able to play, within the context of planned improvements to transport links across the Arc. These sites will have the potential to become flagship development areas for the Arc, where ideas and inventions can be rapidly commercialised and spun out into high growth ventures, within and across sectors.

Business support, including comprehensive scale-up support and promotion of exports and inward investment

Through its Growth Hub, SEMLEP is promoting and providing a single access point for business support in the SEMLEP area. This support includes one-to-one support for company leaders, delivery of workshops, and information on funding and wider business support schemes.

While local start-up initiatives and support to increase business productivity will remain in place, to help maintain and further strengthen the area's entrepreneurial momentum, SEMLEP's Growth Hub also intends, in conjunction with local universities, to provide tailored and targeted support to scale-up SMEs in the local area. The University of Northampton and the University of Bedfordshire have designed modular programmes aimed at potential scale-ups, which will cover the barriers to scaling businesses, while Cranfield University has developed a programme to support current scale-up businesses. Business coaching support will be procured from the private sector, and peer-to-peer forums will be established. In addition, SEMLEP intends to establish a local Scale-Up Forum to improve co-ordination among organisations which provide support to scale-up businesses, and to identify gaps in provision. The forum would include representation from banks, accountants, the Department for International Trade (DIT), Universities, Innovate UK, and more.

SEMLEP's Growth Hub will also continue to work with the DIT and local Chambers of Commerce to support exports and encourage businesses to explore new markets. SEMLEP will also continue to work with local and wider Arc partners and with DIT to improve the area's inward investment offer.

Hatworks, creative skills hub in Luton's Hat District. Illustration by Fleet architects

Case Study: Luton Hat District

The Hat District Project, by Luton Culture Trust, was awarded over £3m from SEMLEP's Local Growth Fund programme. It consists of four Hat Factory buildings: Hat House, Hat Works, the existing Hat Factory Arts Centre and a new-build which will be called Hat Studios. The vision for the project is to create more work opportunities, amplify cultural vibrancy, preserve important heritage buildings and breathe new life into the town. The Hat District will create a bustling neighbourhood where artists, makers, students, producers, audiences, visitors and creative businesses can share their knowledge and skills. The creative ecosystem will nurture and develop creative business start-ups and entrepreneurs whilst also providing SME creative industries with an environment in which to grow and thrive.

The Hat district is located between Luton Station and Luton Town Centre which is an ideal location for businesses within walking distance from Luton's mainline train station, offering access to London in under half an hour, as well as the North and the Midlands. The district also benefits from a large car park nearby, Electric Vehicle charging stations, bike racks, bus station and good road access to the M1 and A6.

The Hat District is expected to enhance Luton's already strong reputation as a national creative enterprise cluster. Due to be completed by 2021, the district is projected to deliver 133 new jobs, provide 2400m^2 new creative industry space, 11 new business start-ups per annum and over 1,700 new opportunities for skills based learning-by-doing.

Case Study: ICT Escalator – Uptime Systems Ltd

ICT Escalator is a European Regional Development Fund business support programme connecting SMEs with academic expertise to drive innovation and growth online. Uptime Systems Ltd, a Bedfordshire-based pump controls and telemetry company, turned to the University of Bedfordshire to explore solutions that their company could use commercially. They realised that the maintenance of pumps and (on a much wider scale) all electric motors in industrial use could be revolutionised through artificial intelligence, machine learning and internet-of-things developments. Barry and Jake from Uptime knew that the energy saving potential of artificial intelligence isn't yet commercially available on standard electric motors (responsible for c.45 per cent of global electricity consumption), so the impact could be internationally significant.

Dr Vladan Velisavljevic conducted an initial piece of research testing different types of signal processing transforms, splitting data into packets for testing whether the electrical signature can reliably signal mechanical problems. Beginning with research into the latest technological developments, they devised a model that has the potential to be an industry-shifting development for the entire sector. The initial results were hugely encouraging, and more exciting still was the realisation that the algorithms will be self-learning, so they can apply to any pump in any industry. For Uptime, the commercial impact is from predictive maintenance, software as a service and from sales of the IP. Uptime are now commissioning a major piece of research in this regard.

Case Study: Food Enterprise Advisory Support Team (FEAST)

The FEAST project has already seen more than £100k distributed in grants to some 22 companies across the SEMLEP area, while many more businesses have also received tailored mentoring and technical support, including expertise on: food standards and auditing (including SALSA and BRC), packaging, labelling and nutritional advice, internal audit and food safety management systems. The grant programme has encouraged over £0.5m of SME spend in the region.

Through European Regional Development Fund funding, and the support delivery partners, The Mallows Company will continue to offer a range of useful services to food and drink manufacturers over the next three years, including; grant funding which can be turned around in 24 hours in certain cases, business mentoring, industry events and technical support.

A Northamptonshire brewery has enjoyed its best year yet thanks to collaring two new awards and a grant which will prompt a 40 per cent increase in production. Gun Dog Ales, based at Woodford Halse near Daventry, received £2k from FEAST and co-owner James Pickering says he'd have been barking mad not to apply to the scheme. 'Securing the grant was a really simple process as we were helped every step of the way by the FEAST advisor and we were told we'd been successful within three weeks of submitting the forms, so there's really nothing to lose in applying,' explained James.

Commitments

Ambition

To provide an exemplary business environment, with high-quality commercial premises and support for incubator, scale-up innovation, trade and investment activity within the Arc.

To drive progress towards achieving this priority, SEMLEP will:

Commercial premises

- Work with partners to continue to develop an extensive and balanced pipeline of employment land and premises in the area, which takes account of market intelligence and strategic infrastructure (e.g. new rail nodes and interchanges) and seeks to underpin wider aims such as the regeneration of local cultural heritage and the furthering of the 'Settlements of the Future' agenda.
- Increase promotion of the SEMLEP area to prospective investors, including through the preparation of relevant materials to encourage inward investment, and by working in partnership with local authorities, developers and commercial agents to help match prospective businesses with appropriate employment land.

Business support, including comprehensive scale-up support

- Continue to promote and provide, through SEMLEP's Growth Hub, a single access point for business support in the SEMLEP area, including one-to-one support for company leaders, delivery of workshops, and information on wider business support schemes.
- Through SEMLEP's Growth Hub, work with local universities to provide tailored and targeted support to scale-up SMEs in the local area. This programme will include:
  - university modules on scaling businesses up;
  - business coaching;
  - establishment of a SEMLEP Scale-Up Forum to improve co-ordination among organisations which provide support to scale-up businesses; and
  - peer to peer networking groups to encourage knowledge share and support among the scale-up community.
- Work with DIT and other local partners through SEMLEP's Growth Hub to continue to actively attract inward investment and support further exporting.

Working across the Arc:

- Local partners will work with government, within existing budgets, to develop improved, joined-up business support for high-growth firms across the Arc, developing an Arc-wide offer to different kinds of business.
- Local partners and the British Business Bank will work together to help SMEs in the Arc to access the finance they need to grow their businesses. Local partners across the Arc will also explore the existing landscape and any gaps in finance for businesses, as well as the establishment of an Arc-wide business angel network to better engage with early-stage investors.
- Work with government to develop a shared understanding of market failures in creating new commercial premises within the Arc, bringing together a range of analysis already being undertaken locally, regionally, and nationally.
- Work with the Department for International Trade to encourage greater trade and inward investment, building on existing engagement at LEP level and including the development of an Oxford-Cambridge Arc Internationalisation Delivery Plan.

Government is working in partnership with SEMLEP to support the delivery of this priority by:

- Investing £265m Local Growth Fund in the SEMLEP area, including creation of new business premises such as I-Worx (Bedford), Vulcan Ironworks (Northampton) and the Hat District (Luton).
- Funding SEMLEP's Growth Hub including existing programme of DIT support on export and inward investment.
- Supporting the development of three Enterprise Zones in Northampton, Aylesbury and Luton.

Places

Places provide the foundations on which the area is able to attract and retain all other drivers of productivity.

Attractive, well-designed spaces for living and working reduce brain drain and make the area more appealing to potential investors, as well as having positive impacts upon health and wellbeing, which in turn have a knock-on effect upon life expectancy, labour force participation and productivity, as evidenced by Public Health England[41]. The SEMLEP area already has a wealth of cultural, creative and natural assets and a strong track record of designing attractive green spaces and built environments but, as with its innovation and commercialisation expertise, these strengths are not widely known. Furthermore, there is a real challenge ahead in ensuring that, as the Arc's growth ambitions are realised, these assets are strengthened, not lessened. Future priorities thus include: trialling new approaches to place-making, through the 'Settlements of the Future' agenda; and working with partners to promote and enhance natural capital, clean growth, culture and inclusivity.

Strengths

Cultural and creative assets

The SEMLEP area has a number of excellent and diverse cultural assets. Visitor attractions include Woburn Abbey, Whipsnade Zoo, Rushden Lakes, Waddesdon Manor, Wrest Park, Althorp House, Bicester Village, Rockingham Castle, Stanwick Lakes, Stowe House and Landscape Gardens, and Bletchley Park. In addition, there are arts organisations such as Aylesbury Waterside Theatre, The Stables and the Milton Keynes Theatre and Gallery, and a range of elite sporting activities, with professional football clubs such as Luton Town FC, MK Dons, and Northampton Town FC, rugby at Northampton Saints RFC and Bedford Blues RFC, motorsport at Silverstone, and horseracing at Towcester. Milton Keynes is home to Badminton England and Table Tennis England and hosts major sporting and music events at stadium:mk. The SEMLEP area also boasts key creative assets, including Bedford's Cardington Studios, which worked on The Dark Knight trilogy and Rogue One: A Star Wars story, and Millennium Studios, which developed music videos for One Direction and Leona Lewis.

Continued investment in the creative and cultural sector is key for strengthening the SEMLEP area's visitor economy, but also – when combined with a strong employment offering – for attracting and retaining a skilled work force, and for supporting social inclusion. In the 2017 SEMLEP Business Survey, 57 per cent of businesses in the area rated the attractiveness of their surroundings as 'good' or 'very good', and the area has an ambition to increase this rating over time.

Creativity is also projected to become increasingly important in its own right, with business leaders citing it as one of the top three skill sets that will be required in future by businesses and public sector organisations[42]. Not only are creative aptitudes relatively resilient in the face of increasing automation (using estimates by Frey and Osborne, and when excluding food and drink service activities, less than one third of jobs in the creative and cultural sector are at risk of computerisation by 2035, compared to nearly half of jobs in manufacturing[43]), they also offer major potential for growth through developing valuable transferable skills in young people. For example, The Stables at Milton Keynes hosts the National Youth Music Camps, which provide an excellent opportunity for young people to develop confidence, teamwork and interpersonal skills, for both volunteers and players, whilst also supporting the development of budding musicians. Local sports offerings offer similar benefits, as well as playing an important role in inspiring behavioural shifts towards more active lifestyles.

Case Study: MK Gallery Expansion

Located in Milton Keynes, MK Gallery is a key UK public art gallery, which presents a programme of international and contemporary visual art. The new expansion– part funded through the Local Growth Fund – has helped create an innovative and inspirational space, that businesses in the creative and cultural sector can use.

The expanded Gallery has doubled the exhibition gallery spaces for exhibitions of historical and modern art. It also includes a new auditorium (which hosts an independent film programme) and spaces for performances and events, dedicated community and education facilities, as well as a new café and shop.

The projected outcomes of the expansion are 13 new jobs, two apprenticeships, up to 100 new volunteer roles and annual visitor numbers of 70,000 resulting in wider economic outputs and benefits to the city.

MK Gallery

Case Study: The Exchange – Aylesbury

The Exchange is an exciting new public square in a mixed use development which will change the footfall and way in which people visit and use Aylesbury town centre. The public square was awarded £3.3m by SEMLEP's Local Growth Fund programme. The scheme will also deliver 47 apartments in the heart of the historic market town, four restaurants, additional flexible commercial space and the stunning new public square where people can sit and relax as well as enjoy a range of thought-provoking sculpture. 83 jobs are also expected to be created from the development.

As part of the ongoing transformation of Aylesbury town centre, these new apartments will offer modern, hi-spec homes close to the Market Square, shopping centres, cultural and entertainment venues, and all the excellent day-to-day amenities that Aylesbury has to offer.

Environmental assets

The SEMLEP area offers a plethora of accessible scenic rivers, waterways and canal networks, country parks, gardens, landscapes and historic town centres, which play a key role in providing quality of life for residents, as well as supporting wildlife and providing other benefits, such as flood risk mitigation, higher air and water quality, and carbon reduction.

In 2018, the Outdoor Recreation valuation model estimated the value of these assets at over £220m, with 75 million visitors per year, 28 per cent of which were new visits[44]. For example, the Upper Nene Valley Gravel Pits are an accessible and globally recognised Ramsar site and SSSI, which facilitate scientific research, provide a habitat for water fowl, reduce flood risk in Northampton, and support recreational activity[45].

Case Study: Tresham Garden Village

Tresham Garden Village, one of 14 garden villages in the UK, is a new settlement proposed to be built in East Northamptonshire. The settlement will provide 1,500 homes housing 3,655 people and includes business space and a new school for residents. The settlement is being developed with a major focus on protecting and enhancing the existing natural capital as much as possible.

Eleven categories of benefit were modelled and mapped, comparing the baseline plan and draft masterplan, by Natural Capital Solutions – covering carbon, air, water and noise regulation alongside agricultural and timber production, biodiversity and public access to nature. Changes in demand for accessible nature and pollution control were also mapped to account for the additional demand created by new residents.

This modelling suggested that, under the proposed masterplan, the delivery of most ecosystem services is expected to increase, particularly carbon storage and water quality.

Furthermore, a subsequent natural capital account report for the project found that over 30 years 'the net value of the natural capital assets under the masterplan would be £14m, an increase of £12m compared to the baseline.' This translates to a cost-benefit ratio of £6.50 for every £1 invested, primarily through public health and recreation benefits.

The aim is to make Tresham an exemplar development, where success – in terms of design, quality, place-shaping and community buy-in – can be replicated elsewhere in the SEMLEP area, and beyond.

Kempston Mill, Great River Ouse

Another asset is the Forest of Marston Vale in Bedfordshire. A 2015 review found that the area contributed £14m per annum to the local economy through recreation and health benefits, as well as contributing to carbon reduction targets by increasing forest cover from 3.6 per cent to 10.6 per cent from 1995-2015[46].

Three Local Nature Partnerships operate in the SEMLEP area (Northamptonshire; Bedfordshire; and Buckinghamshire & Milton Keynes) helping to manage, maintain and enhance the natural environment. In addition, the SEMLEP area is developing two garden communities.

Tresham Garden Village in East Northamptonshire and Kingsbrook development (part of Aylesbury Vale Garden Town) will jointly provide nearly 4,000 homes with access to greenspaces and wildlife, which are highly valued by residents.

Challenges

The strengths and assets of the SEMLEP area are not widely known

The SEMLEP area is a diverse composition of places: instead of being dominated by one major settlement, it is composed of a network of urban areas interspersed with a more rural environment. While this polycentricity is a positive in many ways, it means that the area is less well known, particularly on a global stage, than other parts of the Arc, and so there is a challenge for local policymakers and businesses, not just to ensure that the area's current strengths and assets are sufficiently marketed and promoted, but also to generate new assets, particularly in the form of attractive green spaces and built environments where people will want to live, work and spend their leisure time. The SEMLEP area has a strong track record on this front, with the likes of Milton Keynes Parks Trust managing over 6,000 acres of parkland and green space in and around Milton Keynes, but developing this legacy alongside the scale of growth now being considered for the Arc will require long-term vision, innovative thinking and joined-up working, with due attention given to the future of 'land-based' rural businesses, and the role of the rural economy within the Arc more broadly.

Realising net environmental gain and greater inclusivity alongside higher growth

The SEMLEP area is one of rapid housing growth: in 2017, it contributed over six per cent of national housing completions, despite accounting for only around 3.5 per cent of the national population. And there are aspirations for even higher growth in the future, with potential for significant numbers of new homes across the Arc by 2050.

The challenge is to ensure that this growth is realised in a way that allows for net environmental gain, and without excluding residents from the benefits of growth. There are already pockets of relative deprivation within the SEMLEP area: the 2015 Index of Multiple Deprivation shows Corby, Luton, Northampton and Wellingborough as the most deprived areas across the patch in terms of income, education and crime. Healthy life expectancy follows a similar trend, with individuals in Luton and females in Northamptonshire having fewer expected years of healthy life than the national average[47]. Similarly, while employment statistics are strong for the SEMLEP area as a whole, there are certain groups with disproportionately high labour market inactivity, most notably ethnic minority females[48].

Newlands Park development plans, Luton

Interventions

Settlements of the future

As outlined in the government's Garden Communities Prospectus, it is necessary to design 'resilient places that allow for changing demographics, future growth, and the impacts of climate change including flood risk and water availability, with durable landscape and building design planned for generations to come. This should include anticipation of the opportunities presented by technological change such as driverless cars and renewable energy measures.

The SEMLEP area offers a natural fit for trialling some of these new approaches to place, given its major contribution to national housing growth, relative affordability and availability of land compared to other parts of the Arc, high innovation levels, and solid track record of business-university collaboration, engineering and technical testing.

In particular, there is enthusiasm from local partners across the area in trialling: smarter, greener energy systems and infrastructure; new spatial approaches to living and working, which support community engagement and incorporate Sport England's Active Design principles; modern methods of construction, including adaptability for the needs of an ageing population; and advanced digital technologies. There is also an opportunity to integrate Active Network Management into new settlements, helping to resolve energy capacity constraints and lower the cost of living for residents.

As part of piloting new settlements for the future, possibly through projects such as the Tresham Garden Village, SEMLEP and its partners aim to encourage better future-proofing of settlements for older generations, including improved physical and digital connectivity to local health services (including, potentially, the use of innovative digital healthcare technologies). As part of the affordable housing ambitions in its Investment Framework, North Northamptonshire has set out an aim to provide extra care housing options at scale. SEMLEP and its partners also aim to increase access for all workers and residents to health-improving green spaces and natural capital.

Promoting natural capital, clean growth, culture and inclusivity

SEMLEP will work with the area's Local Nature Partnerships and those leading on local developments to support and protect natural capital. This will ensure that growth across the area supports the ambitions of the government's 25 Year Environment Plan to realise net gains in biodiversity and natural capital. There are currently proposals for a pan-Arc Local Natural Capital Plan, which will: enable the mapping of environmental risks and opportunities across the Arc; integrate natural capital and the concept of environmental net gain into decision making; minimise environmental risks; and ensure that every opportunity is taken to protect and enhance the environment. This plan will also encourage further buy-in to the Arc concept from local residents, as well as supporting investment: indeed, the area's natural, creative and cultural assets should form a key part of any promotional activity for the Oxford-Cambridge Arc.

There is a local appetite within the SEMLEP area to build on its strengths in green technologies, food and drink and logistics to become a test bed for innovations in clean transport and waste utilisation including, potentially, more efficient food processing technologies, zero waste manufacturing, sustainable packaging, advanced freight technologies and demand-responsive transport.

SEMLEP will also continue to support cultural activity and initiatives to bring people closer to, and into, the labour market. The goal is to achieve growth that does not leave people or places behind, and which makes the area an even more exciting and attractive place in which to live, work and visit. Cultural activity presents an opportunity to regenerate high streets in the area; events such as the Luton Carnival Arts festival and the Made in Bedford artisan fair play an important role in attracting businesses and people to the high street, while Corby and Kettering both have visions for regeneration with green space and cultural attractions at their heart.

To continue to support rural areas, a combination of interventions – including greater digital connectivity, support with increasing digital skills, increased first-mile-last-mile transport connectivity, the potential trialling of demand-responsive transport, and the development of the rural visitor economy – will be important. Meanwhile, SEMLEP is working with government to help shape the UK Shared Prosperity Fund, which will be a key source of future funding to help people move into employment, and to promote social inclusion more broadly.

Commitments

Ambition

To trial new approaches to place-making, through the 'Settlements of the Future' agenda, and work with partners to promote and enhance natural capital, clean growth, culture and inclusivity.

To drive progress towards achieving this priority, SEMLEP will:

- Work with local authorities and other partners to identify opportunities to pilot 'Settlement of the Future' concepts, including: smarter, greener energy systems and infrastructure; new spatial approaches to living and working, which support community engagement and incorporate Sport England's Active Design principles; modern methods of construction, including adaptability for the needs of an ageing population; and advanced digital technologies.
- Work with the area's Local Nature Partnerships and those leading on local developments to support and protect natural capital, in line with the government's 25 Year Environment Plan to realise net gains in biodiversity and natural capital. As part of this, disseminate and promote best practice from key exemplar developments such as Tresham Garden Village and Kingsbrook.
- Continue to support activity and other initiatives to bring people closer to, and into, the labour market, and to regenerate relatively deprived areas.

- Identify ways to support increased connectivity for rural areas within the SEMLEP area, in both digital and transport terms, and ways to support development of the rural visitor economy, building on proposals such as the Bedford to Milton Keynes Waterway Project

Working with local partners across the Arc SEMLEP will also:

- Consider ways to contribute towards the government's Clean Growth Grand Challenge mission to at least halve the energy use of new buildings by 2030, supporting the Arc's wider ambition to create clean, energy efficient and sustainable communities for all.
- Ensure that the environment in the Arc is left in a better state for future generations:
  - embodying England's 25 Year Environment Plan which sets out our comprehensive approach to improving landscapes and habitats, and the aspiration to move to a policy of net environmental gain in future;
  - engaging with government to co-design a local natural capital planning approach for the Arc, ensuring that the wider work on productivity is aligned;
  - using intelligent and sensitive design in new housing and infrastructure developments; and
  - considering ways to maximise environmental expertise across the Arc and to empower the business community to champion and support the Arc's natural assets.

Government is working in partnership with SEMLEP to support the delivery of this priority by:

- Investing £265m Local Growth Fund in the SEMLEP area, including:
  - Transporting Bedford 2020 improving journey times for business across the town including technology and public realm
  - The Exchange at Aylesbury, opening up a new accessible square and space for new business and evening economy alongside a retail and residential offer
- Investing £1.5bn, since 2010, through Homes England, to support housing delivery across SEMLEP.
- Developing opportunities to embed the 'Settlements of the Future' concept into future placemaking opportunities, including new settlements and Housing Deals within the SEMLEP area. SEMLEP will work with local authorities and Ministry for Housing, Communities and Local Government through the local Arc placemaking group to achieve this.

Priorities across the Oxford-Cambridge Arc

This Local Industrial Strategy has started to set out how shared priorities for the SEMLEP area fit with a wider range of activity being taken forward locally, regionally and nationally.

The Arc cuts across boundaries and affects each of the four areas in the Arc in similar ways. These offer government and local partners the opportunity to act at scale with a consistent approach across the Arc and, as with the preceding local priorities, they can be structured around the Foundations of Productivity:

- **Ideas** – Innovation, including the Future of Mobility
- **People** – Skills
- **Infrastructure** - Energy and Digital
- **Business environment**
- **Place** – including Environment

Ideas

The Arc has unrivalled science and technology capabilities – from the renowned research centres in Oxford and Cambridge, to their surrounding technology campuses such as Harwell, and commercial testbeds in the 'Connected Core' of the Arc. Bringing these many assets together at scale would create a driver of growth and innovation for the UK.

However, the Arc is not yet a single innovation ecosystem and has potential to drive greater economic growth and productivity: more can be done to connect its numerous assets in a manner which demonstrably adds value. Achieving this will involve both building existing strengths such as life sciences and providing the best environment possible for the emergence of disruptive technologies. The prize is higher R&D investment in support of the Industrial Strategy's 2.4 per cent R&D target, UK leadership in transformative technologies, and a continued post-EU Exit future as a global centre for science, research and innovation.

In order to achieve this, Arc partners will work with government, UK Research and Innovation and others on the following priorities:

- Harnessing the collective strength of the Arc's research base will be essential. The new Arc Universities Group will act as the focal point for cross-Arc collaboration on science and research, identifying and delivering joint R&D projects and providing a pipeline of talent to knowledge-intensive businesses.

- the Arc will strengthen its ability for businesses to commercialise ideas coming out of its universities and others. Key to this will be a network of 'Living Laboratories' that both trial technologies linked to new developments across the Arc and help address the Grand Challenges, developed by industry and local partners across the Arc. Arc partners will also use assets such as Harwell, Silverstone and Cranfield to establish new networks that support the convergence of technologies across sectors and seek to develop emerging districts such as West Cambridge.
- finally, the Arc will seek to grow its role as a global research and innovation hub, acting as a UK magnet for international talent, R&D, Foreign Direct Investment and research collaborations. The LEPs and MCA will work with the Department for International Trade, the Arc Universities Group and others to channel foreign investment in the assets and projects that will make the biggest impact on Arc-wide and UK growth.

As outlined earlier, the Arc's R&D strengths also makes it well placed to address the Future of Mobility Grand Challenge, with many assets such as Culham, Cranfield, Millbrook and Silverstone playing an important role in developing and testing new transport technologies.

To achieve this, government will work with the LEPs within the Arc and other local partners, including England's Economic Heartland, to:

- utilise the considerable R&D assets within the Arc to meet the Future of Mobility Grand Challenge and government's Road to Zero strategy. This will put the UK at the forefront of the design and manufacturing of zero emission vehicles, supporting government's commitment to end the sale of new conventional petrol and diesel cars and vans by 2040;
- build on the Arc's existing role as a testbed for new transport technologies, such as automated vehicles and drones, working with HMG and Zenzic to competitively access existing research and development support, and scoping further opportunities to trial mobility services within the Arc; and
- support local authorities within the Arc, as set out in the Future of Mobility Urban Strategy, by providing guidance on design and planning to ensure new communities are designed and built to enable new approaches to mobility.

People

The Arc is starting from a strong position with a well-functioning labour market - across the Arc employment is high compared to national averages and education attainment rates are generally good. The Arc is home to many world-leading higher education institutions that drive the knowledge rich economy.

It is vital that the Arc continues to build on this solid foundation in order for all people and communities across the Arc to have access to these opportunities and businesses have access to the workforce they need to meet future ambitions.

Businesses across the Arc consistently cite attracting and retaining a sufficiently skilled workforce as a particular challenge. Through the newly established Skills Advisory Panels, LEPs will bring local employers and skills providers together to understand current and future skills needs and put in place activity to address these local challenges. Through these Panels the four LEPs and government will work together to understand the challenges that businesses across the Arc face in securing the workforce they need to meet their future ambitions.

Whilst recognising the strong overall employment position of the Arc, it is also essential that work to drive growth across the region considers how best to address inequalities and challenges certain groups face in accessing and progressing in the labour market.

Delivering transformational growth necessarily requires actions to support the key growth sectors identified in the economic context chapter above. But doing so in an inclusive and sustainable way will also require all partners to consider how best to: encourage good quality employment across the whole economy; support progression for those in low pay and low skilled employment and, support workers to stay in employment when they are at risk of losing their jobs due to issues such as age, health or automation.

To do this the LEPs will continue to build on the well-established relationships with local partners to address these deep-rooted challenges. This will include ongoing engagement with Jobcentre Plus, local education providers and community organisations.

Across the Arc the LEPs will work with government through Skills Advisory Panels to:

- review labour market intelligence across the Arc, to gain a better understanding of how skills provision is currently delivered and funding utilised. This will include working closely with the Department for Education and providers across the Arc to consider how local provision supports the ambitions set out throughout these strategies;

- work with local employers to increase apprenticeship uptake across the Arc, supporting employers to maximise their Apprenticeship Levy contributions and drive social mobility;
- work with local employers to support the effective role of T levels and utilise local labour market intelligence to work with providers to consider how the local T level offer will support local businesses; and
- coordinate the work of Skills Advisory Panels to bring together training providers from across the Arc, with a view to establishing an Arc-wide skills marketplace. This will build on the LEPs' positive working relationships with the Careers Enterprise Company and other careers services, and work to improve provision across the Arc. This will utilise the evidence provided by each Skills Advisory Panel, connecting businesses with regional and national skills providers and people with targeted support including apprenticeships, STEM skills, T levels, technical and degree apprenticeships.

There will also be continued collaboration across the higher education sectors through the Arc Universities Group to ensure alignment between the higher education offer and the emerging needs of breakthrough businesses, including top quality leadership and management training supported by the business school network.

Infrastructure

The Arc as a whole is already experiencing infrastructure constraints – especially in energy, transportation, water and housing. Realising shared ambitions around economic and community growth will require the development of the right infrastructure to meet the needs of existing and new communities, supporting the economy of the Arc and championing the UK's global competitiveness.

As well as getting the basics right, there is the opportunity for a step-change in connectivity. Government and Arc partners are working to deliver East West Rail and the proposed Expressway which are central to enabling the long-term housing and business growth ambitions within the Arc. However, greater connectivity will not be fully delivered without the challenge of the 'first-mile-last-mile' being addressed. The Arc suffers from significant congestion which local partners are looking to address through innovations such as the proposed Cambridge Autonomous Metro and Luton DART (Direct Air Rail Transit).

The LEPs have already produced local energy strategies, documenting the energy needs of their local areas. These will be the starting point to consider the energy needs of the Arc as a whole; drawing in new evidence, joining up local energy strategy delivery and using the opportunities created through the growth of the Arc as a catalyst for a transformation of energy generation, distribution and use across the Arc.

Digital and data coverage in the Arc is good relative to much of the UK – with world-leading infrastructure in some of the region's specialist facilities – though it remains patchy, especially in rural areas. This holds back growth given the opportunities for knowledge-intensive home-working and 5G-enabled innovations in the rural economy throughout the Arc.

The area's natural capital and environmental infrastructure underpins and supports the local economy, offering flood protection and providing clean water and natural spaces. The changing climate will affect existing infrastructure resilience and future infrastructure needs, requiring us to create climate resilient places and infrastructure. In addition, the Arc presents a unique opportunity to deliver flood risk and water management through strategic activity across local authority and LEP boundaries.

The growth anticipated across the Arc gives us a chance to test innovative approaches to: improving digital and data connectivity; minimising energy demand and increasing energy supply; and addressing the Grand Challenges. The scale of growth also offers the chance to explore new ways of coordinating and funding the delivery of new infrastructure across the Arc. To seize these opportunities, the Arc Local Industrial Strategies announce that:

- local partners will collaborate with Department for Transport, Highways England, East West Rail Company and England's Economic Heartland to expand the economic benefits of planned strategic transport links, improvements to the Major Roads network and the first-mile-last-mile connections across the Arc;
- government and local partners will conduct a review of recent evidence work at local, regional and national-level, to develop a shared evidence base for the current and future energy needs of the Arc. This could provide opportunities to test new energy policies or approaches within the Arc;
- government and local partners will work to identify and diffuse best practice on digital infrastructure planning in the Arc and explore opportunities to align new transport infrastructure with digital infrastructure in the Arc. This will aim to support industry to accelerate the roll-out of full fibre networks, enabling accelerated growth of 5G technologies across the Arc;
- local partners will work to standardise public data where possible - such as through the opportunity created by local government unitarisation in Buckinghamshire and Northamptonshire - and with support from government policy experts, to ensure that the opportunities to collect and capitalise on data are utilised. This will be done with a view to addressing Grand Challenges

around the Future of Mobility, the Ageing Society, and Clean Growth; and

- Government and local partners will work together across the wider Oxford-Cambridge Arc to explore proposals for new approaches to funding infrastructure, as set out in Government's response to National Infrastructure Commission Report at Autumn Statement 2018.

Business environment

The Arc is home to a dynamic business base and a range of high-growth and innovative firms. However, businesses across the Arc still encounter barriers to growth, particularly in accessing the support they need to scale-up rapidly, securing the right finance and access to the right commercial premises to start and grow.

The Arc's collective ambition is to become a world-leading ecosystem for high-growth businesses: with an environment that enables them to commercialise technologies, grow to scale, and export. Central to the Arc's approach will be developing a Global Growth Network of internationally-focused businesses, scale-ups and sectoral clusters. Together, this will foster a breakthrough growth region and a driver for the UK economy.

Partners across the Arc will work with government and others across the following priorities:

- local partners will work with government, within existing budgets, to develop improved, joined-up business support for high-growth firms across the Arc. Central to this will be a network of the four Growth Hubs across the Arc, who will work together and with existing support programmes to develop an Arc-wide offer to different kinds of business. They will profile the firms that can deliver the biggest shift in growth, productivity and exports in places, diagnosing barriers to growth in the firm's capacity to innovate and increase productivity. As part of this, Arc partners will identify new ways to establish peer-to-peer networks linking firms within and between sectoral clusters;
- local partners and the British Business Bank will work together to help SMEs in the Arc to access the finance they need to grow their businesses. Local partners across the Arc will also explore the existing landscape and any gaps in finance for businesses, as well as the establishment of an Arc-wide business angel network to better engage with early-stage investors;
- local partners will work with government to develop a shared understanding of market failures in creating new commercial premises within the Arc. This will bring together a range of analysis already being undertaken locally, regionally, and nationally. This will ensure that the right premises are planned for, prioritised locally within any bids for future government funding, and built; and

- finally, partners across the Arc will work with the Department for International Trade to encourage greater trade and inward investment. This will build on existing engagement at LEP level and include the development of an Oxford-Cambridge Arc Internationalisation Delivery Plan and quarterly meetings of the Arc-wide trade and inward investment group. However, much more needs to be done if the Arc is to reach its potential as a global player able to compete with innovation-growth zones like Seoul, Helsinki, San Francisco and Toronto. This will include an Arc presence at MIPIM Cannes in March 2020 and an updated capital investment led Oxford-Cambridge Arc Brochure and Investment Prospectus which identifies investable opportunities. Work will also continue to better integrate Arc sector propositions into the Department for International Trade's sector and market priority campaigns, linking the Arc's key sectors into the ten highest potential export and inward investment markets to drive Arc growth globally. This will involve analysis of available data on success across the Arc by sector and market. Each of the partners will work with the Department for International Trade to develop a LEP-level 'chapter' for the Internationalisation Delivery Plan, based on the priorities and assets set out in their Local Industrial Strategy.

Place

Taken as a whole, this package of Arc-wide interventions, which sits alongside existing interventions being progressed by government and local partners, will support sustainable growth across the region, benefitting its residents, communities, businesses and the country more widely. Delivering transformational growth in this way will create opportunities across the Arc – spreading the benefits both to its prosperous centres and its more deprived communities, and across its urban and rural areas.

Doing so will require a holistic approach and partnership working with government and industry, to achieve growth and improve place-making, developing sustainable, resilient and culturally vibrant communities. This aims to provide a high quality of life for residents - now and in the future. The scale of growth envisaged across the Arc also offers the opportunity to plan for and build exemplar developments with high design standards; places where people want to live and work.

Heating and powering buildings accounts for 40 per cent of the total energy usage in the UK. By making new communities within the Arc more energy efficient and embracing smart technologies, energy demand and household bills can be cut, and economic growth boosted while meeting the country's targets for carbon reduction.

Conserving and enhancing the natural environment is at the heart of ambitions for the Arc; growth offers an opportunity for environmental enhancement, in turn driving productivity and innovative place making. Government and local partners have agreed to embed 'natural capital' thinking throughout the approach to the Arc; harnessing nature to adapt to climate change, manage flood risk and deliver broader benefits to businesses and communities.

Working through existing partnerships, government and partners across the Arc will consider ways to contribute towards the government's Clean Growth Grand Challenge mission to at least halve the energy use of new buildings by 2030, supporting the Arc's wider ambition to create clean, energy efficient and sustainable communities for all.

Ensure the environment is left in a better state for future generations:

- aiming to be an exemplar for England's 25 Year Environment Plan which sets out our comprehensive approach to improving landscapes and habitats and the aspiration to move to a policy of net environmental gain;
- using intelligent and sensitive design used in new housing and infrastructure developments to create or enhance habitats;
- working with government to explore natural capital thinking and opportunities for local delivery of the 25 Year Environment Plan; and
- engaging with government to co-design a local natural capital planning approach for the Arc, ensuring that the wider work on productivity is aligned.

As the national Industrial Strategy set out, we will work not just to preserve, but to enhance our natural capital – the air, water, soil and ecosystems that support all forms of life – since this is an essential basis for economic growth and productivity over the long term. To ensure that the environment in the Arc is left in a better state for future generations, local partners and government agree that:

- England's 25 Year Environment Plan sets out our comprehensive approach to improving landscapes and habitats, and the aspiration to move to a policy of net environmental gain in future. The policy for the Arc should embody this approach in line with national policy, so local partners will work with government to explore opportunities for local delivery of the Plan within the Arc, including considering issues such as climate resilience, water management and biodiversity net gain;

- local partners will also engage with government to co-design a local natural capital planning approach for the Arc, ensuring that the wider work on productivity is aligned;
- intelligent and sensitive design should be used in new housing and infrastructure developments to create or enhance habitats in line with national policy; and
- government and the LEPs will also consider
  - ways to maximise environmental expertise across the Arc, creating opportunities to share best practice across public and private sectors and;
  - how to empower the business community to champion and support the Arc's natural assets, working together to attract and retain the skilled workforce of the future.

As the national Industrial Strategy set out, we will work not just to preserve, but to enhance our natural capital – the air, water, soil and ecosystems that support all forms of life – since this is an essential basis for economic growth and productivity over the long term.

Therefore, through the Local Natural Capital Planning, government and LEPs will consider:

- ways to maximise environmental expertise across the Arc, creating opportunities to share best practice across public and private sectors; and
- how to empower the business community to champion and support the Arc's natural assets, working together to attract and retain the skilled workforce of the future.

Implementation and evaluation

This Local Industrial Strategy will set the direction for SEMLEP's economy.

Built upon solid foundations of clear evidence, it highlights where SEMLEP and government will work together to maximise key strengths and tackle major challenges.

Governance

At the local level, SEMLEP's Board will lead the implementation of this Local Industrial Strategy through its existing governance and delivery structures, embedding the Strategy's priorities into its annual Delivery Plan and wider programme of activity. The Cities and Local Growth Unit will work with the LEP to engage government in delivery at the local level as necessary.

At a regional level, the four LEPs, supported by the MHCLG Oxford-Cambridge Unit and Cities and Local Growth Unit, will collaborate through the productivity group of the wider Arc governance to deliver the shared Arc level commitments set out in all four Local Industrial Strategies for the Arc. This work will report to the Arc leaders' Board, ensuring this workstream is aligned to shared work on place-making, connectivity and the environment, as well as central government's national governance structures, such as the Local Industrial Strategy Implementation Board and the cross-Whitehall Oxford-Cambridge Arc inter-departmental board and Arc advisory group.

Funding

This Local Industrial Strategy does not include any new spending commitments outside of existing budgets. Instead, it will inform the strategic use of local funding streams and, where relevant, spending and decisions at the national level. It will also help SEMLEP decide on its approach to maximising the long-term impact of the new UK Shared Prosperity Fund once its details and priorities are announced at Spending Review.

To demonstrate progress towards the long-term vision set out by this Local Industrial Strategy, the Strategy contains a number of specific actions. Where these actions are locally-led, these will be drawn from local budgets which exist for those purposes; where actions are shared between SEMLEP and government, they will be funded from existing local and departmental budgets, with funding allocated for those specific purposes.

This Strategy does not represent all the priorities and action being developed in SEMLEP. As detailed in this Strategy, SEMLEP will regularly review the latest evidence to continue designing the most effective approaches and interventions to be at the forefront of the future UK economy.

This Strategy sets out long-term ambitions and will continue to evolve as the economy changes.

SEMLEP will comply with all of the monitoring and evaluation requirements of each particular funding source, in addition to the wider requirement to monitoring the implementation of the Local Industrial Strategy as a whole.

Monitoring outcomes

As well as setting out specific short-term actions, this Local Industrial Strategy has also set out SEMLEP's long-term aspirations and the specific outcomes local partners are aiming to achieve. These will help guide future action and evaluate progress.

By 2050, the SEMLEP area will aim to have secured:

- Recognition as a pioneer of new approaches to living, working and moving people and goods around, which support carbon neutrality, wellbeing and biodiversity net gain, while also helping to overcome traditional infrastructure constraints upon growth.
- Greater collaboration between businesses, universities and other partners in the SEMLEP area and the Arc, and more connectivity of workers and flows of investment between these areas, as well as greater inflows of investment to the Arc from overseas.
- A significant increase in the percentage of firms scaling up across the SEMLEP area, and an improved match between the demand for, and supply of, commercial premises.
- Skills provision which is more aligned to, and responsive to changes in, employer needs.
- Increased productivity across sectors, including the logistics sector, and wider successful adaptation to technological change – including greater mainstreaming of digital skills – which supports inclusivity across the SEMLEP area.

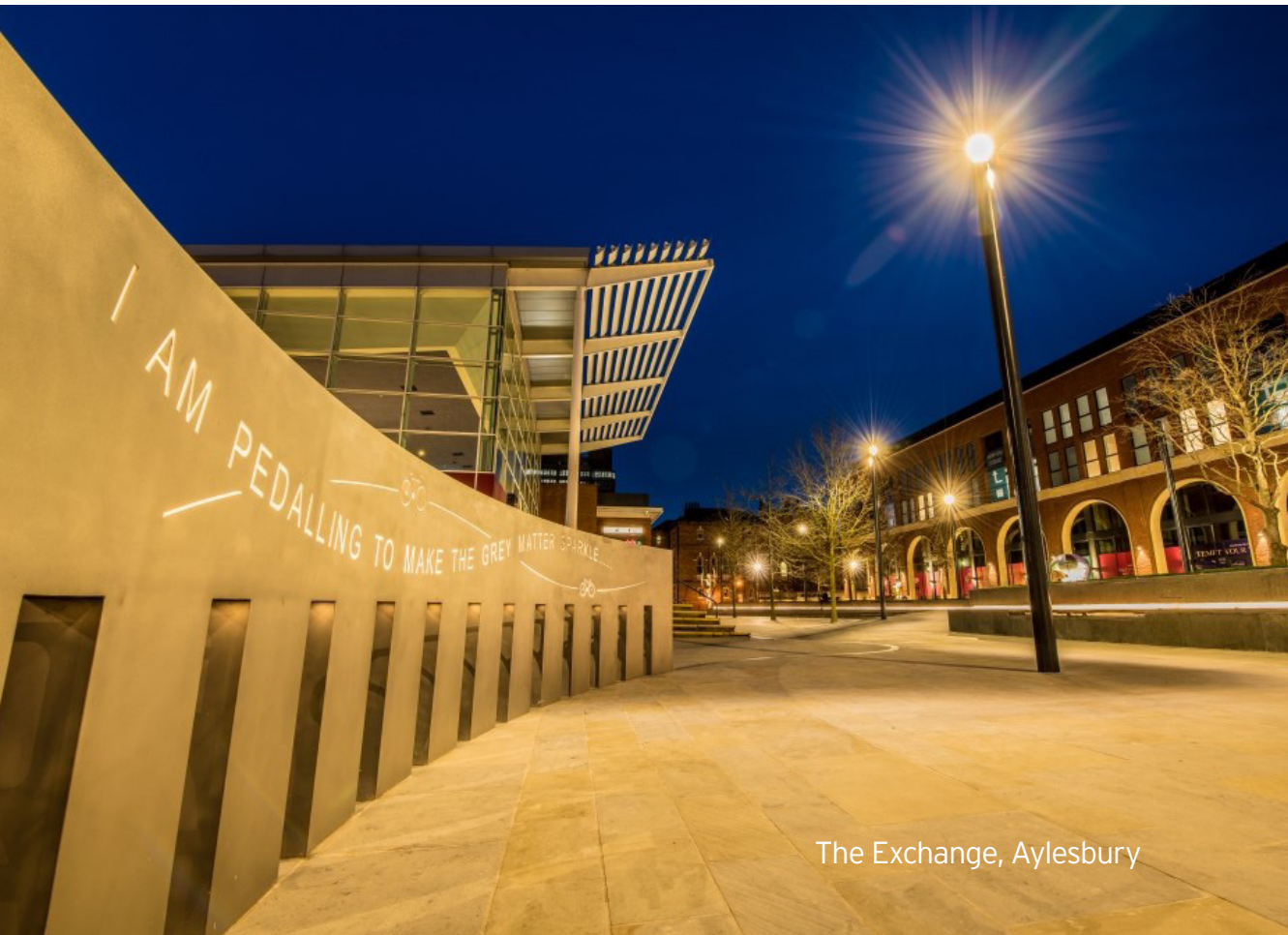
In order to ensure the opportunities in this Local Industrial Strategy are met, SEMLEP will monitor the progress of the outlined commitments by developing a local Implementation Plan setting out clear milestones, deliverables and timings for the actions set out in this strategy. In line with the national Local Enterprise Partnership Assurance Framework, SEMLEP will produce an annual delivery plan and a qualitative end-of-year report to evaluate how they and other partners have contributed towards achieving Local Industrial Strategy objectives.

Evaluation

The government is committed to devolution where there is a strong evidence-base, robust governance and delivery track-record in place. Robust evaluation is an essential element of demonstrating the effective use of existing public funding.

SEMLEP proposes that progress in meeting the area's Local Industrial Strategy ambitions is monitored through a two-pronged framework. First, there will be a set of SMART LEP deliverables, which will be measured and reported on as part of the LEP's Annual Delivery Plan.

Second, there will be a set of wider economic indicators, which the LEP can track and report on, and which will – if deviating from projected trajectories – serve as a prompt for discussions with the SEMLEP Board, government and other stakeholders around possible corrective action. It will examine opportunities to embed evaluation into programmes and policies where possible. The LEP will also continue to assess the latest evidence on 'what works' for interventions, in collaboration with independent experts.



The Exchange, Aylesbury

Annex A: Monitoring indicators

The following section contains a summary of some of the possible indicators available to monitor progress in meeting the Local Industrial Strategy ambitions.

- **'Connected Core':** maintain SEMLEP's strong start-up rates, measured using various IDBR sources. Also measures of networking and innovation, analysed through the Enterprise Research centre, and qualitative examples of cross-sectoral working, picked up through the SEMLEP Business Survey (SBS).
- **Logistics productivity:** use the regular SEMLEP Business Survey (SBS) to track new patents and services produced by the local logistics sector. Benchmark performance against EEFM baseline forecasts for productivity (GVA per worker) in the 'Land Transport' and 'Wholesale' sub-sectors. Externalities of improved logistics productivity on local supply chains could also be tracked qualitatively through business engagement.
- **Employer-led skills provision:** use the SBS to track reductions in the skills gaps reported by businesses. Performance could then be benchmarked against national performance, via the Employer Skills Survey (ESS). Particular indicators could be the proportion of businesses reporting hard to fill vacancies and the proportion of staff with skills gaps (both are monitored in the SBS and ESS)
- **Sector Deals:** when agreed, publish regular updates of progress on SEMLEP's website.
- **Skills capital investment:** track increases in new learners and education space from LGF projects.
- **Improved energy infrastructure:** track, using BEIS renewable capacity statistics at local authority level, the gap between renewable capacity in the average SEMLEP LA with the national average LA. The current gap is 76MW (SEMLEP average LA) against 84MW (national average LA). As for ANM, although smart meter installation data is not currently available at the sub-national level, there is potential to develop a metric as BEIS continues with their Smart Metering Implementation Programme.

- **Transport connectivity**: there is scope to use a range of indicators to monitor road network quality, such as 'Average delay on locally managed 'A' roads: by local authority in England' and 'Average Annual Daily Flow traffic counts', produced by the Department for Transport. There is also an opportunity to review business road network satisfaction rates via the SBS. Demand Responsive Transport and Mobility as a Service activity could also be tracked through local turnover, growth and business counts in these emerging sectors, but only when appropriate SIC codes become available.
- **Digital connectivity:** use Ofcom's annual Connected Nations report to track the percentage of premises, commercial and non-commercial, in each SEMLEP LA unable to receive the Universal Service Obligation connection speed (10MBps) and Full-Fibre deployment.
- **Commercial premises:** as with skills capital investment, track improvements in commercial floorspace through LGF projects. Business satisfaction with premises will be tracked through SBS. The EEFM also produces forecasts for commercial floorspace by type, which can be used as a performance benchmark going forward.
- **Scale-up:** SEMLEP aims to remove its status as a scale-up 'cold spot' tracked through the Scale-Up Institute. A business scale-up is defined as a business whose turnover increases from less than £500k to over £1m in 3 years.
- **Biodiversity net gain:** achieve biodiversity net gain by 2045, measured jointly by SEMLEP's Local Nature Partnerships using a range of metrics. Linked to this, aim to use water runoff and supply analysis from SEMLEP's LNPs to track the impact of blue infrastructure projects.
- **'Settlements of the future':** The benefits of these settlements and live-work models will manifest across a range of monitoring indicators, such as travel time, distributed generation, hard to fill vacancy rates, environmental net gain etc.
- **Social inclusion:** improve SEMLEP's IMD ranking, closing the gap between SEMLEP and the other LEPs and Combined Authority in the Arc. The IMD is expected to update in 2020. Healthy Life Expectancy will be tracked alongside this, given that it is updated more frequently.

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