

# Making the most of the Midlands

A long-term strategy for investment and infrastructure

Greg Clark MP / Andy Street / Sir John Peace





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# Boosting earning power everywhere

The Midlands is a region with huge international trading potential, according to **Greg Clark MP**



**A**t the heart of the Industrial Strategy for the Midlands is trade. The growing success of the economy here has been based on the rising demand for the goods and services produced by the people of the Midlands to be sold to customers on a global scale.

The Black Country, for example, promotes the strengths of its area under the slogan: “Made in the Black Country, sold around the world.” From cars to components, from financial services to computer games, from cultural excellence to food and drink, not forgetting the students who come from overseas to study at the universities, this region depends absolutely on trade with the world.

People who voted for Brexit did not vote to be less prosperous. And similarly in a region of trade in a nation of trade, people did not vote to trade less – including with our European neighbours. That is why we have been clear at the outset of the negotiations with the European Union that we want to see a comprehensive free trade agreement that will maintain tariff and barrier-free trade with our European partners.

And the Midlands is one of the best examples in the country of how each product created, in services as well as manufacturing, is part of a network. There is scarcely a product or a service made here for export that is not an advanced combination of components, capital equipment, design, expertise and intellectual property from a wide range of countries.

This theme will run through our modern Industrial Strategy. If every part of Britain is to prosper in the future we need to ensure that we become even

more specialist and expert and that we have the right policies and institutions in place to drive the productivity – which is to say, the earning power – of the economy, and the people and places that make it up.

An effective Industrial Strategy has to stand the test of time – a short-term strategy is a contradiction in terms. And if it is to endure it has to engage the experience and insights of the entrepreneurs, managers, workers, investors, consumers, scientists, researchers, local leaders – everyone who has a stake in a prosperous future.

To enjoy a high and rising standard of living we must plan to be more productive than in the past. Economists have pointed to what they have called a productivity puzzle in Britain. That we appear to generate less value for our efforts than, say, people in Germany or France.

It’s not that we want people to work longer hours. It’s that we need to ensure that we find and seize opportunities to work more productively – as a country, as cities and regions, as businesses and as individuals. With the introduction of the National Living Wage we have boosted the weekly earnings of the lowest paid workers. To further this approach, we need to boost earning power, too.

Working more productively requires higher skills, more investment, and business sectors raising their performance. The benefits must then feed through into higher pay, especially for people in parts of the country whose earnings have not kept pace with the best performing areas. And it means continuing with our success at boosting employment including by reaching people, such as those who are disabled, over 50, and in other groups, who find it harder to participate in the jobs market.

And through local industrial strategies, the government will help the business leaders, community representatives in each local economy to put a plan together to build on their strength and stimulate local growth.

*Greg Clark has served as the Secretary of State for Business, Energy and Industrial Strategy since July 2016.*

# The Midlands Engine Vision for Growth



**The Midlands needs better transport links and advanced broadband technology in order to flourish, writes Sir John Peace, chairman of the Midlands Engine**

**T**he Midlands Engine exists to harness the ambition of the Midlands, to address the challenges we face and to take advantage of the opportunities presented to us. Earlier this year, the government launched the Midlands Engine Strategy. This strategy was widely welcomed across the region and demonstrated the close alignment between the priorities of the government and the Midlands Engine.

As chairman of the Midlands Engine, I speak to businesses and people across the region every day and what they say to me is that the vast challenges the UK faces, from productivity to establishing new relationships with international partners, can be solved in the Midlands. We have world-class infrastructure and we have a plan for improving connectivity and unleashing international trade and investment. Our plan has culminated in The Midlands Engine Vision for Growth, an ambitious response to the government, setting out our challenges, our opportunities and our plans.

This is indeed an ambitious plan. I am the first to recognise the long path ahead, but I am also confident that not only can

we deliver for the Midlands, making the region a stronger more productive region, but also that we can deliver for Britain.

The primary challenge the UK faces is productivity. This is starkly seen in the Midlands and is a barrier to the growth we all need. Our plan contains five priority work packages, our areas for immediate action to increase productivity through investment and innovation. They will be our core focus as we work with government to power the overall UK economy.

Our first area of focus is connectivity. We are already central to the UK's most ambitious transport infrastructure project, HS2, which will be a catalyst for growth across the whole of the region. But we need more than this. We need to invest in world-class transport infrastructure to connect the Midlands across the region, as well as nationally and with global markets. Poor connectivity is holding the Midlands back and we are asking the government to prioritise and commit to the full delivery of the Midlands Connect Strategy.

This strategy is a bold new approach to connectivity. Autonomous cars will soon



**“The Midlands was built on innovation and enterprise”**

MIDLANDS ENGINE

be on the streets across the Midlands and we want to do more, becoming the UK’s testbed for future innovation, developing pilots and taking ideas from concept to reality. I know that these projects will represent a significant return on investment for the government. If enacted successfully, this strategy will boost the economy by up to £5 billion by 2040 and create 300,000 new jobs.

Our plan around strategic infrastructure will see the Midlands Engine investing in the most sustainable and advanced technology, which will meet growing demand and need from an influx of businesses and a growing population.

We are asking for government support so that we can invest in our long-term energy security, building upon Midlands expertise in research and development. And we want to work hard to continue developing a thorough and fully costed proposition to make the Midlands the UK testbed for 5G.

As we look forward to a post-Brexit world in which the UK must become more outward looking and form relationships with new international partners, international trade and

investment is a priority for the whole country. I know the Midlands can support the government’s ambitions and we are asking the government to triple their support for the Midlands Engine Investment Hub, which is charged with driving trade to the Midlands.

International trade and investment must be a focus for every region and we want to work closely with the government to power our economy and take advantage of the opportunities presented by the post-Brexit economy.

The Midlands was built on innovation and enterprise, and we need to instil a renewed focus on innovation in all Midlands businesses to accelerate growth and increase prosperity for all. We want to work with the government to develop an investment programme to support innovative projects and help SMEs to scale up and become global exporters.

I am truly proud to call the Midlands home and through this plan the Midlands Engine is seeking to show the world that our region is the best place in the UK to live, work and learn. We want to attract major events to the region as we promote the Midlands to the world. Birmingham is bidding to host the 2022 Commonwealth Games and Nottingham is vying to be European Capital of Culture in 2023.

There is a pressing need to build more homes in the Midlands to attract and retain the businesses and people who are looking to locate here. And we need the government’s support to continue the regeneration of our cities and towns.

We are Midlanders and we are committed to delivering for Britain. We have never been a region to shy away from a challenge and delivering the Midlands Engine Vision for Growth will achieve our ambition, power the UK economy and will ensure we can compete on the world stage. We are already a £207 billion economy, growing by 18 per cent over the last five years. With the right support from the government, as set out in this vision, we know we can deliver so much more because when the Midlands succeeds, Britain succeeds.

**For more information, please visit:**  
**[www.midlandsengine.org](http://www.midlandsengine.org)**

**Andy Street, the first elected mayor of the West Midlands, outlines his plan for greater investment and improved infrastructure in the region**

# Giving local authorities more authority

The Library of Birmingham is viewed by the city's council as a flagship project for the West Midlands' redevelopment. It is the largest public cultural space in Europe.



**I**'m proud to tell people that I come from the West Midlands. It is a powerhouse of talent, diversity and innovation. In these challenging and interesting times I believe the true potential of this region will be realised through the devolution of powers from central government to the West Midlands Combined Authority (WMCA) which I chair.

Devolution gives us the chance to change public services for the better and pool our resources and technology to help local people. We are already well on the way – the first devolution deal in 2015 resulted in £1.1 billion of funding over the next 30 years which we will use to drive an £8 billion investment package with a focus on skills, innovation, transport and inward investment through our strategic economic plan.

This is our vision for improving the quality of life for everyone in the West Midlands, ensuring the region punches

its weight on the national and international stage and helps steer the UK economy away from an over-reliance on London and the south east.

Drawing on our proud manufacturing history, central location and track record in innovation, devolution gives us a once-in-a-lifetime opportunity to change our region and focus on the issues that matter most to the people who live and work here. Therefore the WMCA is now in talks with government on striking a second devolution deal to continue delivering jobs, improved wages and prosperity. As Mayor I will oversee this process. I want to help build a strong economy raising people's living standards through better and more secure jobs.

Half a century ago, during the manufacturing heyday of the 1960s, there was an affluence to many parts of the West Midlands which in recent years fell away. There was no champion shouting up and making the case for the West



Midlands, either in London or around the world so over time the region got left behind by other parts of the country. I intend to see that change.

My role as Mayor gives me the chance to help drive forward the steady economic transformation I have witnessed across the region in more recent years. It's why I left a job I loved with John Lewis to work with MPs and councillors and give the West Midlands a more powerful voice. Being an ambassador for the region is something I particularly enjoy and in fulfilling that role I'm determined to

**“We could be the UK’s free trade capital”**

FLICKR/PETER BROSTER

attract companies here that can bring secure, well-paid jobs with them. This will create the strong economy we need to provide the sorts of jobs we used to see at the great factories and offices of the West Midlands, and in doing so raise people's quality of life.

I also want to make the West Midlands the free trade capital of the UK and will be calling on government to prioritise trade deals with the region's key export markets. Putting the focus on industrial strategy on the sectors where the West Midlands already leads the world will help businesses to market themselves and gain investment from overseas.

I and the WMCA will also be working with big employers like Jaguar Land Rover, HSBC and the National Grid to make sure they have what they need to continue to create jobs. But alongside our historic manufacturing and engineering base we also have new industries growing all the time, such as creative and digital.

Small businesses such as these face big challenges but they create a huge amount of prosperity and I intend to champion their interests. They create new jobs and by maximising the talents and drive of the entrepreneurs behind them we maximise their contribution to the economy.

I want to see these small and medium-sized companies being given every chance when bidding for goods or services under mayoral control and I will ensure that business support schemes in place to help them are flagged up at every opportunity.

We also need to make sure there is enough employment land available for businesses to set up and expand. We have just launched the Land Delivery Action Plan which aims to speed up the provision of hundreds of hectares of land for housing and commercial use which will underpin the WMCA's ambitious targets for new homes, jobs and economic growth.

Yet all of these commitments are not just about new office buildings. They are about closing the productivity gap and fostering innovation. Our great rail, road and air links give us a significant competitive edge – and that will be strengthened by development at Birmingham International Airport and the arrival of HS2, which will bring us even closer to London and the cities of the north, making us a world-class business location.

We have excellent research and development facilities to drive innovation, with the skills and resources of universities, science parks and research institutes that can help us change the way we work and improve people's lives.

There is a strong sense of pride in our home of the West Midlands and we will use that to help us deliver our plan and create opportunities for the years ahead. But despite all these strengths, forecasts show the gap between our output and the rest of the UK will widen between now and 2030 if nothing is done, with issues including low skill levels and poor mental health.

We have to tackle these issues. Devolution and the WMCA means we have an unprecedented opportunity to do so.

# Closing the growth loop: a holistic approach

**Ray O'Donoghue, managing director for the Midlands, Barclays Corporate Banking, says long-term economic success can only be achieved through cross-industry and cross-sector collaboration**

**H**ere's the essential challenge with regional regeneration. To set up a business you need to have customers. But to have customers you need someone else to have a business to sell to – or at least to their employees. In the Midlands, nearly a quarter of businesses are retail, a sector which is reliant on local spending power. But local consumer spending power is below the national average, driven by relatively weak employment in other sectors. Closing this growth loop is not easy.

Some of this is true regardless of where you are based. Interestingly, if you set up a business today, the chance that it will still be running in five years is less than a third. Many businesses cease trading for positive reasons, but it does illustrate how unusual – and how precious – businesses which grow to provide significant long term employment are.

The traditional way of closing the growth loop in the regions of the UK has been to attract large-scale investment, or to distribute government employment more efficiently across the country. Swansea and its surrounding communities have benefitted greatly

from the arrival of the DVLA, which employs 6000 people directly and many more through supply chains and the spending power of its staff. The Nissan plant in the North East is a vital tent pole employer in the same way. Successful industrial strategies by successive governments supported the expansion of the Sunderland plant to its current scale employing nearly 7,000 people. Barclays has several large employment sites in the Midlands including 3,000 staff in Northampton, and 1,500 in Birmingham.

These large investments will certainly be part of any successful economic strategy for the Midlands, but they can never be the whole story. Eventually you run out of government offices to relocate or large foreign investors to attract. So there is no doubt we also need to develop a diverse local business community, with the right balance of medium-to-large employers like the Jaguar Land Rover plant in Solihull which has 10,000 staff, small businesses and businesses who fit inside that magic 5-6 per cent with significant growth potential. It is diversity in scale, risk, innovation and stability which ensures long-term







economic success.

The strategic approach to achieving it – in the Midlands or elsewhere – will be correspondingly broad. However, there are three things in particular which are clear necessities. The first is a diverse finance base. Banks are the principal lenders in the economy and the biggest banks between them have around £100 billion lent to SMEs at any one time. But it is a common complaint that that the UK economy is funded

excessively through bank lending, with insufficient risk bearing equity finance so crucial for innovation. This gap is particularly acute outside the South East.

While bank finance is a highly effective and low-cost channel for most financing needs such as working capital or revenue generation, it requires a strong expectation of repayment which does not allow for the uncertainty associated with high-growth business plans. Nor are banks always the best partners for a high-tech innovator. An average high tech firm has an eight-year period between the “eureka” moment to that innovation showing a profit. In those early years, the interest repayments of a loan can seriously reduce the money available for research.

This is why the long-recognised gap in the UK for risk-bearing equity finance remains so crucial. There are areas where banks can help, and Barclays’ own co-investment with the European Union’s InnovFin fund has supported lending to over 50 of most innovative UK companies. But ultimately, the fastest growing companies – that vital 6 per cent – needs a vibrant equity alternative to bank lending.

We tend to look to the US for an example of a strong equity market. The venture capital market in the US stands at around £26 billion, which is five times the size of the European market. It would be a mistake to try and replicate that just in the UK, and even more so to do it at a regional level. Instead the lesson to be drawn from the US is concentration. Three-quarters of total US venture capital is located in only three financial centres, while in the EU, 13 countries share similar levels of VC as a percentage of their GDP.

So what is the solution? Rather than trying to build highly localised pools of risk finance in each region, we should aim to create highly consolidated, full-scale venture capital markets in a small number of areas across Europe, large enough to be effective. The UK will certainly be one of those centres. In parallel, we need to create mechanisms to help regional high potential firms

access those investment centres effectively. A couple of years ago the government legislated to require banks to refer businesses who are declined in their lending applications to an online platform where other lenders can find them. An obvious improvement would be to extend these to refer high-potential businesses to venture capital firms.

The second issue is improving infrastructure. Today, too many decisions about infrastructure are made at national level, which will always be less precise in identifying needs, and slower at fulfilling them. It is possible to devolve far greater discretion and direct fund raising powers to the regions. Investment banks are phenomenally effective channels for funding long-term, high value infrastructure projects from new roads, to new hospitals. Greater partnership between investment banks’ regional teams and regional leaders could improve the number of projects which get out of the ground.

And finally, trade is perhaps the most important way of closing the growth circle by allowing businesses to find customers outside of their immediate area. Small businesses have an advantage today that their predecessors didn’t have. Low-cost websites and shipping systems make it far easier to sell products internationally at an early stage, with far fewer risks and management time spent building customer networks. There is an increasing trend for businesses to make their first sale internationally.

However, we must not forget the central importance of larger exporters. The German “Mittlestand” network of mid-sized regional firms is often raised as a model for the UK to follow, and with good reason. What is so interesting about these firms is that there are relatively few of them, but they export at larger scale and to more diverse international markets than their British rivals. The lesson for UK exports is the value of a mid-sized exporter which can act as a local ‘tent pole’ firm, providing an efficient route to supply chain exporting. This is a natural model for the Midlands to adopt.

# How to create a digital ecosystem

Worcestershire is quickly establishing itself as a cyber hub, according to Gary Woodman, chief executive of Worcestershire LEP



Worcestershire is home to several internationally recognised cyber security companies that have located their business headquarters within the county, including QinetiQ, PCA Predict and Blackberry. The cyber sector is a key growth area for Worcestershire; it is widely recognised as being home to the “cyber valley” due to the high concentration of businesses in the area.

With excellent development and employment sites, as well as professional business support and expertise, Worcestershire-based companies have the opportunity to scale up their business and grow. Technation’s 2017 report found that cyber businesses’ second most valued advantage of working in Worcestershire is the fantastic sector growth potential that is available to them, with a focus on the Midlands Hills Science Park for investment and building expansion.

Steve Borwell-Fox, managing director of local cyber security business Borwell, highlighted some of Worcestershire’s strengths: “Worcestershire’s exceptional local skills base and ideal central location makes the area a world-class location for expanding businesses. We have been able to start up and grow a highly successful cyber security company in Worcestershire, thanks to the county’s fantastic digital infrastructure.”

Joseph Rowntree Foundation’s 2017 report shows that Worcestershire has once again achieved the strongest growth nationally in higher level workforce skills between 2010-15. Not only is Worcestershire’s workforce highly

skilled, it is also incredibly productive. Our latest figures by Office for National Statistics show that the county achieved the highest growth in productivity in England, between 2010 and 2015.

Worcestershire and the wider Midlands Engine are building strong links with the internationally recognised cyber sector in Baltimore, Maryland. In June, Sir John Peace, chairman of the Midlands Engine, joined the United States governor Larry Hogan and the Maryland Department of Commerce to sign a Memorandum of Understanding to formalise the strong relationship between the Midlands region and Maryland. The agreement is a substantial step in promoting economic development whilst also attracting investment in each of the regions.

The Midlands’ academic excellence was also on display with universities who offer specialist cyber security courses to other innovative companies and Coventry University and University of Wolverhampton have also taken part in the mission.

The signed Memorandum of Understanding followed a five-day cyber business delegation from the US, between, where companies from Maryland visited the Midlands to learn more about the opportunities available in business and academia between the two regions. As part of the delegation, Maryland businesses joined Midlands Engine businesses in attending Infosecurity Europe 2017 which attracted over 13,000 visitors in the duration of the exhibition.

The mission forms part of a three-year trade programme taking place between 2016-18. The programme has been hosted by the Worcestershire Local Enterprise Partnership (LEP), Marches LEP and Skylon Park Hereford Enterprise Zone in partnership with the Department for International Trade and Herefordshire and Worcestershire Chambers of Commerce.

**For more information on Worcestershire’s booming cyber sector and the three-year trade programme, please visit: [www.wlep.co.uk](http://www.wlep.co.uk)**

# Moving the Midlands forward

**Proposed Midlands rail upgrades would support a £2bn economy boost with more trains and better HS2 links, explains Maria Machancoses, programme director of Midlands Connect**



**A** major boost to the Midlands economy, supported by more trains and better connections, is expected if proposed Midlands Connect rail projects become a reality – with the prediction that the Midlands Rail Hub improvements would result in a £2 billion economic surge over the next 10 to 30 years. An estimated 24 million extra annual passenger journeys are forecast in the Midlands area by 2023, meaning continued investment in the railway is needed to meet future demand.

Midlands Connect knows it is essential that we plan now to tackle overcrowding on rail services and ensure sufficient capacity to meet future increases in demand and connect people to jobs in existing and growing labour markets.

The Midlands Rail Hub would see a raft of improvements around the Birmingham area which would allow up to 150 extra trains per day – providing an extra 85,000 seats across the Midlands – improving connectivity between the East and West Midlands and strengthening access to HS2. Four out of five main UK rail freight routes serve the Midlands and this work will also provide extra capacity for freight trains to access key terminals, removing lorries from the road network and helping to reduce road congestion.

## **Preparing the Midlands for HS2**

The Midlands will be the first region to benefit from HS2 with four HS2 stations (Birmingham Curzon Street, Interchange, East Midlands Hub and Crewe) and stations served by classic compatible trains (Chesterfield, Crewe and Stafford). Midlands Connect is actively preparing for its arrival, influencing the developing legislation,

focussing on maximising the benefits HS2 will bring.

## **Enhanced connectivity and capacity boosts productivity and competitiveness**

Thirty-three per cent of British heavy road freight goes to, from or through the Midlands so, along with forthcoming proposals on the Midlands Major Road Network and Motorway Hub, Midlands Connect is shaping the enhanced connectivity and capacity of both the road and rail network required to rebalance and grow the economy.

## **Delivering for the Midlands and UK PLC**

Midlands Connect is not just about delivering for the Midlands. The region's strategic position at the heart of the UK's transport network means infrastructure improvements in the Midlands will tackle the significant connectivity challenges impacting on the competitiveness of the wider UK economy. The Midlands is cementing its vital role in the UK's global export market and as an efficient and effective gateway to the rest of the UK and the world. We are improving transport links to and through nationally important ports such as Immingham and the Midlands' two international airports – Birmingham and East Midlands – the latter being the UK's busiest pure cargo airport.

## **Powering the Midlands Engine**

Midlands Connect brings together local authorities, Local Enterprise Partnerships, airports, Chambers of Commerce, Highways England, HS2 Ltd, Network Rail and our sponsor, the Department for Transport.

The government's Industrial Strategy highlighted the importance of infrastructure improvements. As the transport arm of Midlands Engine, Midlands Connect is shaping and delivering the enhanced connectivity and technological transformation required to boost economic growth, trade and productivity.

**For more information, please visit: [www.midlandsconnect.uk](http://www.midlandsconnect.uk)**

**Paul Russ, chair of Nottingham's bid to be crowned European Capital of Culture in 2023, says the project can breathe fresh ambition into the city**

# Nottingham's time to shine



Nottingham's 2023 bid launch event this summer included a colourful dance troupe.



**O**ver the summer Nottingham declared its intention to bid for the title of European Capital of Culture in 2023, joining Belfast, Dundee, Leeds and Milton Keynes in the running for the honour which will be shared with a city in Hungary.

The UK has twice held the title before – Glasgow in 1990 and Liverpool in 2008 – with the impact on regeneration, tourism, inward investment and local pride seen to be so beneficial that it led to the creation of the UK government's own City of Culture competition, in which Hull is currently enjoying the spotlight.

As well as fostering the contribution of culture to the development of cities, the European competition is designed to highlight the richness and diversity of cultures in Europe, and increase European citizens' sense of belonging to a common cultural area. Of course, this

is a rather delicate subject in a country which has just elected to leave the European Union, but as culture secretary Karen Bradley said on launching the European competition in December: "The United Kingdom is leaving the European Union, but we are not leaving Europe. We want that relationship to reflect the kind of mature, co-operative relationship that close friends and allies enjoy."

The team behind Nottingham's bid is particularly keen to use the year of cultural activity and exchange to reconsider and redefine the relationship of its citizens to Europe and the rest of the world. Of all of the contenders, it was most closely split on the referendum vote, electing to leave the EU on a minority of just 2,000.

Nottingham is also one of the UK's youngest and most diverse cities – with an average age of just 34 – so raising



the aspirations of the city's young people and helping them realise their place in the world post-Brexit is a central ambition.

On announcing the bid, I proposed cultural change programme that will transform the lives of people in the heart of the UK, harness the power

## “A digitally networked creative economy”

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of creativity, stimulate innovation, attract investment and create new international networks.

Once home to the global lace industry, nine out of 10 jobs in Nottingham are now in the service industry. The city is currently reinventing itself as a digitally networked creative economy for the 21st century; one of six UK Science Cities and a key player in the Midlands Engine Strategy. Alongside £1 billion of recent investment in infrastructure, a Creative Quarter was launched in 2013 as a catalyst for the city's economic recovery and growth. There are now more than 2,300 registered creative and digital businesses in Nottinghamshire, mainly concentrated in the city.

Nottingham has also seen significant investment in cultural venues in recent years, including the opening of Nottingham Contemporary and New Art Exchange, and an increased level of

collaboration between arts organisations across the city.

“Art, culture and the creative industries make a surprisingly large contribution to the Midlands economy already,” said Sir John Peace, chair of the Midlands Engine, also at the launch of the bid. “They have significant potential to grow, to become more productive and to create more jobs.”

Culturally, Nottingham prides itself on pioneering new ways of thinking. The city is home to two leading universities which play a key role in the cultural and creative fabric of the area. It was chosen as a UNESCO City of Literature in 2015, thanks to the legacy of rebellious writers Lord Byron, DH Lawrence and Alan Sillitoe, not to mention Man Booker Prize-nominated authors Alison Moore and Jon McGregor, and a thriving ecology of publishers, magazines and bookshops.

Innovative businesses include Boots, Raleigh Bikes, Games Workshop, Paul Smith and Experian, while the city can trace a digital lineage from the world's first computer programmer, Ada Lovelace, to the University of Nottingham's Mixed Reality Lab and an explosion of new digital start-ups such as GameCity, AppInstitute and Lockwood Publishing – all listed in Creative England's Top 50 Creative Companies and Individuals.

Nottingham also fosters a culture of grassroots collaboration, inclusive community building and access to the arts. Lakeside Arts is nationally and internationally recognised for its leading role in presenting great theatre and dance for children and families. Nottingham Trent University's Civic Exchange, a resource to connect people and to look at social and economic issues in new ways, was launched earlier this year, and a program of engagement activity is taking place to find out what the people of Nottingham would like to see realised through the European Capital of Culture award.

**To find out more about Nottingham's European Capital of Culture bid, visit: [www.nottingham2023.co.uk](http://www.nottingham2023.co.uk)**

# How robots are modernising the UK's food chain

Artificial intelligence is revolutionising the farming industry, according to **Martin Collison** of Collison Associates, agricultural consultant to the Greater Lincolnshire LEP



**T**he food chain is worth £108 billion GVA to the total UK economy. It employs 3.8 million people and is the UK's largest manufacturing sector – bigger than the automotive and aerospace sectors combined – but it is experiencing pressure on its labour supply.

As noted in the *Feeding the Nation* report from the EFRA Select Committee in April 2017, the challenge regarding labour supply in the food chain is real and growing. The committee stated that evidence “suggests the current problem is in danger of becoming a crisis if urgent measures are not taken to fill the gaps in labour supply.” Government ministers had further stated that “greater automation and mechanisation of the sector” is needed to address the problem in the longer term.

In its *Breaking the Chain* report published in August 2017, the Food and Drink Federation says that 55 per cent of

employers consulted thought that they would need to install more automation if labour supply fell. Research carried out for the Greater Lincolnshire LEP has also estimated that the National Living Wage will cost the food chain between £7-10 billion per year by 2020, providing further incentives for companies to automate. As many agricultural jobs are

**“Fleets of robots working alongside fruit pickers”**



still very labour-intensive – particularly complex tasks such as fruit and vegetable harvesting – the pressure to find new ways to complete these tasks is intense. For example, it has been estimated that in summer up to 85,000 seasonal staff are needed to pick fruit. That’s why the Lincoln Institute of Agri-food Technology (LIAT) at the University of Lincoln is working with the fruit industry on a large Innovate UK project to use fleets of robots working alongside fruit pickers to make the process much more efficient.

Innovation is absolutely key to addressing these problems, which means that businesses, farmers and researchers are working together to find radical new ways of performing familiar tasks through the advent of robotics.

The LIAT fleets of multi-purpose agricultural robots, modelled on the Mars Rover, are being developed so that they can support farmers with a whole range of tasks. Thorvald – the first of

these robots to be on the move – can be used as a lightweight robotic carrying platform, for example to support fruit pickers, as a sensor platform to monitor crops and soils and, potentially, as a platform to manage crops and for precision weed control.

Thorvald was recently retrofitted with portable cosmic ray sensors as part of a

major project measuring intergalactic cosmic rays to provide farmers and agri-tech researchers with near real-time data on soil moisture levels. The national Cosmic-ray Soil Moisture Observing System (COSMOS-UK) project, which has sites across the UK, includes a network of monitoring stations of which the University of Lincoln’s Riseholme Campus is now a key part.

In addition to the Thorvald field robot, researchers at Lincoln are also developing soft robotic grasping tools and manipulators to handle food and a fully automatic robotic broccoli harvesting system using cutting-edge 3D camera technology, as well as robotic weeding technologies.

And at the University’s National Centre for Food Manufacturing, APRIL the robotic chef is a pioneering robotics system which could dramatically change the way food is manufactured. Developed by food manufacturer OAL, it is a fully automated robotic system that can mix, load and cook ingredients like human chefs but on an industrial scale, by using modern cooking and material handling technologies. APRIL is designed to boost production and efficiency while improving the quality of the food produced.

From field to plate, robots are set to become a common feature on our farms and in our food factories. As the technology develops quickly, the next revolution in farming and food production is coming and will be driven by robots.

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