

Grand Challenges for Hertfordshire

Towards our Local
Industrial Strategy



**INDUSTRIAL
STRATEGY**

Hertfordshire
Local Enterprise Partnership

PERFECTLY PLACED FOR BUSINESS

Grand Challenges for Hertfordshire

The Industrial Strategy White Paper...

The **Industrial Strategy White Paper** was published by Government in autumn 2017. **Five Foundations of Productivity** underpin a series of policies and measures defined fundamentally to boost productivity across the UK – in part in anticipation of the impacts surrounding Brexit.

But the White Paper also identifies four **Grand Challenges**. It is these that really signal the need for something different. They are:

- **Artificial Intelligence and Data Economy** – putting the UK at the forefront of the artificial intelligence and data revolution;
- **Clean Growth** – maximising the advantages for UK industry from the global shift to clean growth;
- **Future of Mobility** – becoming a world leader in the way people, goods and services move;
- **Ageing Society** – harnessing the power of innovation to help meet the needs of an ageing society.

The Grand Challenges are strongly future-facing. They are developments in technology that will transform industries and societies around the world and in which the UK could play a leading role.

...moving towards Local Industrial Strategies

The White Paper also commits to working with local areas to co-develop Local Industrial Strategies that build on local strengths and deliver economic opportunities. Within the White Paper, the Government states that it will:

- agree the first Local Industrial Strategies by March 2019;
- prioritise areas with “the potential to drive regional growth, focusing on clusters of expertise and centres of economic activity”.

Hertfordshire needs to be in the vanguard.

Our Local Industrial Strategy will build on our Strategic Economic Plan (SEP) which was refreshed in 2017. It is evidentially sound and up-to-date. It has been agreed and endorsed by our principal partners and stakeholders, including local authorities, University of Hertfordshire and four further education colleges. It has also been well-received by the Department for Business, Energy and Industrial Strategy. Now we need to define our own response to the four Grand Challenges.

...developing our response

The Grand Challenges have not been debated fully in Hertfordshire previously and yet they will shape our economic future. Led by the business community, we need an informed debate, focusing on:

- how, and to what extent, the Grand Challenges might affect us (i.e. current and future generations of people and businesses within Hertfordshire);
- how our businesses and research organisations might galvanise national responses to the Grand Challenges (recognising the depth of our asset base and the potential for international impact);
- what the wider consequences might be in relation to our Foundations of Productivity (i.e. priorities for skills, place, business environment and infrastructure across Hertfordshire).

Questions for debate

In relation to the Grand Challenges:

- what really sets Hertfordshire apart – either in terms of assets or potential, and who are our “unsung heroes” in this context?
- what might hold businesses and other organisations back in responding to the emerging opportunities?
- who should we be collaborating with – elsewhere in the UK or internationally – to deliver maximum impact?

Hertfordshire's Grand Challenge Commission

The questions set out in this paper are big and complex. No individual or organisation has all the answers. Instead the questions need a collective response and debate.

Our Grand Challenge Commission...

To this end, we are delighted that John Gourd (Johnson Matthey) has agreed to lead Hertfordshire's Grand Challenge Commission which will host a series of conversations on the four big issues posed in this paper over the spring and summer of 2018.

Four high level questions for debate include:

- how, and to what extent, should the four Grand Challenges shape the future of our businesses and our communities?
- what are Hertfordshire's principal assets and potentials in responding to these and driving them forward?
- what might hold us back?
- what wider collaborations should we be looking to forge to shape our own future to optimal effect?

...and our Grand Challenge Champions

In leading the Commission, John will be supported by four Grand Challenge Champions, each of whom works in Hertfordshire and has globally recognised expertise in relation to one or more of the Grand Challenges.

How the "conversations" will work...

Our Grand Challenge champions will lead a simple but structured process to animate the conversations over the coming months, involving:

- an early call for evidence through which we will welcome any material (data, reports, etc.) that is relevant to the conversations and, specifically, to the four main questions set out above;
- early one-to-one conversations with business leaders, academics researchers, and politicians to develop a Grand Challenge "asset map";
- a short questionnaire survey which will gather expert views on the principal opportunities, assets and potentials across the Grand Challenges as they apply to Hertfordshire.

The findings from the survey and the evidence-gathering will then provide the agenda for a one-day symposium for each Grand Challenge. This will be chaired by the relevant Champion.

Having considered each Grand Challenge in turn, we will hold a Hertfordshire-wide conference in the autumn – to review and debate the overall findings, and to agree our next steps. We will invite Government ministers and senior officials to attend as a key stage in the development of our Local Industrial Strategy.



John Gourd

Grand Challenge Commission Chair

A close-up photograph of a person wearing a white lab coat, meticulously working on a complex electronic circuit board. The person is using a screwdriver with a black handle and orange accents to adjust a component on the board. Simultaneously, their other hand uses tweezers to hold a small, dark component. The circuit board is densely packed with various electronic components, including integrated circuits, capacitors, and connectors. Several colored wires (red, yellow, black) are connected to the board. The background is blurred, showing more of the lab coat and the workspace. The image is framed by a teal triangle in the top right and a blue triangle in the bottom right.

Grand Challenge 1

Artificial Intelligence
and Data Economy

Why this matters for Hertfordshire

Artificial intelligence and machine learning are transforming the economy – and they are impacting profoundly on many aspects of life. They are concerned fundamentally with the use of data to achieve particular outcomes more quickly, more accurately and more efficiently. They are central to all aspects of productivity (i.e. using finite resources more efficiently) and – used well – they should improve our quality of life.

However, there are complex ethical issues relating to the use of data. There are also major concerns about cyber security. So, the technology is not uncontroversial. But its transformative potential is beyond debate – if it can be harnessed appropriately.

For Hertfordshire, it could and should deliver a wide range of direct, indirect and wider economic, social and environmental impacts.

For example:

- Hertfordshire is very well placed to grow the sector, building on the assets set out below and generating new jobs and prosperity;
- artificial intelligence and machine learning should be a key “enabler”, supporting other sectors which are already of global significance. It could, for example, play a substantial role in relation to drug discovery processes, further galvanising the strengths of our world-leading life sciences sector;
- more broadly, the better use of artificial intelligence and machine learning should play a major role in relation to managing the resource constraints that currently dog the county, not least our highly congested transport infrastructure and our over-stretched public services.

Hertfordshire’s assets

Hertfordshire has substantial and wide-ranging assets in the broad domain of artificial intelligence and data economy.

For example:

- the county is home to a group of businesses – like **Ocado** (Hatfield) and **Tesco Labs** (Welwyn Garden City) – which are using data to transform elements of logistics, warehousing and retail into knowledge intensive, high value-added functions.
- **Sopra Steria** – with its HQ in Hemel Hempstead – is focused on digital transformation; it has many specialisms and is working with collaborators to ensure data security across the Internet of Things.
- Hertfordshire’s film and TV sector (through **Elstree Studios, Warner Bros. Studios Leavesden, Gravity Media Group**, etc.) is already world-leading and benefits from growing specialisms at the **University of Hertfordshire**, particularly in relation to animation (including the Games and Visual Effects Research Laboratory (G+VERL)).
- the Agri-Metrics Centre at **Rothamsted Research** is undertaking pioneering work in data analytics to underpin precision agriculture.
- Hertfordshire has a generally well-qualified and IT-literate workforce and – via the **University of Hertfordshire** – a flow of graduates in data sciences.

Grand Challenge 2

Clean Growth



Why this matters for Hertfordshire

Hertfordshire is a county which has seen – and will see – substantial growth (of population, housing and jobs). Yet large areas are within the Metropolitan Green Belt and some are within the Chilterns Area of Outstanding Natural Beauty. The quality of the environment is held very dear across Hertfordshire and it cannot be compromised.

Looking ahead, it is essential that growth is done well. Two of the early priority areas from the Industrial Strategy White Paper are important in this context.

One relates to the commitment to transform construction techniques and dramatically improve efficiency. Hertfordshire needs to continue delivering housing at scale. In particular, the Garden Town at Gilston on the Hertfordshire-Essex border must be developed in an exemplary fashion; development in and around Stevenage needs to contribute to the town's long term regeneration and fully realise the economic potential of its science-based specialisms; and Hemel Hempstead needs to see similarly aspirational planned housing growth. Large numbers of smaller schemes also need to move forward. Given the scale of house building, construction processes must be exemplary – in terms of materials, techniques and all aspects of design.

The second priority area reflects the importance of high-efficiency agriculture. The county is home to a substantial land-based economy which must continue to be competitive as the Common Agricultural Policy is replaced. In addition, Hertfordshire has real expertise in the technologies surrounding high-efficiency agriculture and this is a source of global competitive advantage.

Hertfordshire's assets

Hertfordshire's assets in relation to clean growth are of international significance. For example:

- **Renewable Energy Systems (RES)**, with its HQ in Kings Langley, is a major renewable energy company with substantial expertise in energy storage, solar power and wind energy.
- **Johnson Matthey** – with a major site in Royston – is a leading environmental technologies company which specialises in clean technologies to reduce the impact of industrial production and harmful emissions on the environment.
- **BRE** (near Watford) has over 600 members of staff and an R&D spend of £3m per year with specialisms relating to sustainable construction (including materials, sustainability, energy, waste, fire and intelligent buildings).
- there is a cluster of major construction/civil engineering businesses with major sites (often HQs) in Hertfordshire (e.g. **Aecom**, **Skanska** and **Willmott Dixon**).
- **Rothamsted Research** is developing transformative approaches to the way food is produced (particularly the sustainable intensification of arable and grazing-livestock systems) and advances in precision agriculture.
- the **Enviro-Tech Enterprise Zone** (located mainly at Maylands, near Hemel Hempstead) is providing a focus for businesses in the sector within the context of the wider Green Triangle initiative (led, inter alia, by University of Hertfordshire, Rothamsted and BRE).

Grand Challenge 3

Future of Mobility



Why this matters for Hertfordshire

Hertfordshire occupies a unique position in relation to the national transport infrastructure: it is traversed by the West Coast Main Line and East Coast Main Line; there are three radial motorway routes (M1, A1(M), M11) together with an orbital one (M25); and – looking ahead – Crossrail 2 should extend into southern Hertfordshire.

This transport infrastructure is a real asset for business and it is a defining feature of the economy. However, it brings challenges too:

- levels of congestion are high (particularly on the M25 towards Heathrow Airport and between Junctions 6 and 8 on the A1(M));
- with planned growth – in, for example, Hemel Hempstead – there is considerable pressure on key motorway junctions.

In addition, Hertfordshire's settlement structure means that while there are already moves towards "smart" motorway solutions (not least on the A1(M)), patterns of movement across the county are complex and distributed. Large parts of Hertfordshire are rural. Innovative transport solutions which are fundamentally premised on a high density of urban demand (as seen in central London) need to be re-engineered in this context. Intelligent mobility is therefore challenging for Hertfordshire – yet Hertfordshire's economy is defined around "flows" and advances in this field will be imperative.

Hertfordshire's assets

Hertfordshire's assets need to be galvanised in response to this third Grand Challenge.

Real opportunities surround the following:

- Hertfordshire has world class expertise in space science in general and satellites in particular – and hence the fundamental underpinnings of intelligent mobility: **Airbus** in Stevenage and the on-going legacy of **British Aerospace** in Hatfield (including through current key specialisms at the **University of Hertfordshire**) are substantial assets in these terms.
- **Ocado** is trialling a new self-driving truck with the aim of pioneering the UK's first autonomous delivery system.
- the county has growing specialisms in gaming and virtual reality, particularly through the **University of Hertfordshire**.
- Hertfordshire's socio-economic structure should accommodate evolving patterns of living and working – which (in turn) link closely to innovative and smart transport systems.
- the county has committed to substantial planned growth. Much of it is in and around New Towns with a distinctive transport infrastructure and which potentially lends itself to new low emission transport systems and other forms of mobility.
- Hertfordshire has an institutional structure that should support intelligent mobility (notably through Hertfordshire County Council's different functions).



Grand Challenge 4

Ageing Society

Why this matters for Hertfordshire

Hertfordshire's population is ageing. Increasingly, older people are at the heart of local communities. They are bringing significant experience and insight, playing a key (if often unrecognised) role as volunteers and providing "the glue" within places that are changing quickly and in which social capital may otherwise be limited (and/or under pressure). Through (often unpaid) childcare, older people also do much to increase economic activity rates across the generation below them, and this, too, is an important contribution to well-being, both for individual families and more generally.

But there are challenges too. More older people are having to work for longer given changing pension arrangements, and this is demanding some level of adaptation in relation to patterns of work. Employers need, perhaps, to be more flexible and accommodating, allowing working practices to evolve. And older workers also need to adapt and acquire new skills.

In addition, the cost of social care is placing a burden on the public purse. New approaches and new funding arrangements are needed – and IT must play a role – but the social dimensions must be recognised too: frail and elderly people can be very isolated and lonely.

Hertfordshire's assets

With regard to the ageing society, Hertfordshire has some very important assets. These need to be leveraged fully.

In particular:

- through **GSK** (Stevenage, Ware), **Eisai** (Hatfield) and a raft of smaller companies (e.g. **Heptares Therapeutics, Aglaris**), Hertfordshire has a globally significant life sciences sector. **Stevenage BioScience Catalyst** and the **Cell and Gene Therapy Catapult Manufacturing Centre** are supporting its growth. It is unlocking the range of possibilities linked to precision medicine, leading to improved health outcomes for older people and more generally. There is an opportunity and an imperative here, both for big pharma and smaller businesses within an open innovation ecosystem that is well developed within Hertfordshire, and which includes Cambridge and London.
- in addition (and related), businesses in Hertfordshire are playing a leading role in the use of health-related data.
- with population growth in new/expanded settlements, there is scope for radical innovation in healthcare delivery models: these must be "designed in" from the outset and Hertfordshire needs to take a lead.
- Hertfordshire's businesses are very diverse and many of them are highly adaptable and innovative; they ought to be role models in developing employment practices that are attuned to an ageing workforce.
- Hertfordshire's four further education colleges are all playing key roles in relation to workforce skills, and there is scope to flex this further in response to the ambitions of older workers.
- there are strong relationships across public sector bodies and voluntary sector organisations with an interest in health and social care. All are facing budget pressures and, again, this ought to be a catalyst for innovation.

Keep up with our progress

#HertsForGrowth

www.hertfordshirelep.com/industrial-strategy