

Worcestershire 5G
Testbed

Evidencing the
potential of 5G



5G Case Study

Worcestershire 5G Testbed

A white banner at the bottom of the slide containing several logos and text. From left to right: the WMA 5G logo; the West Midlands Combined Authority logo; the Midlands Engine logo; the Department for Digital, Culture, Media & Sport logo; the HM Government logo; the European Union logo with the text 'EUROPEAN UNION European Regional Development Fund'; and the text 'Supported by the Getting Building Fund (GBF)'.

Synopsis

The Worcestershire 5G Consortium, based at Malvern Hills Science Park, was awarded funding by the 5G Testbed and Trials (5GTT) Programme. Following the project, supported by technology partner BT, Worcestershire 5G has set up a 'Testbed as a Service' offering.

Led by a team of 5G and Industry 4.0 experts, the Worcestershire 5G Testbed provides a platform for UK industry to develop and test next-generation technology that will revolutionise the way businesses operate in the future.

Worcestershire 5G (W5G), partnering with WM5G, was selected to drive the manufacturing industry to better understand the opportunities and challenges of deploying 5G technology. The aim is to develop international standards for future 5G networks, the first cellular technology with features specifically designed for industrial and commercial use.

The primary purpose of the testbed was through a research and design approach, to assess and quantify how 5G can improve productivity in manufacturing. This includes enabling 'cyber safe' live 5G environments within an industrial setting to demonstrate potential and measure efficiency benefits - in turn improving productivity in the sector.

W5G can work with manufacturers, service providers and application developers alike, with an aim to improve productivity, operational efficiency, health and safety and other measurable benefits.



WORCESTERSHIRE
5Gtestbed



Problem

Manufacturing businesses face a range of operational requirements, including complex operating environments, safety and security considerations.

Many of these operational requirements take place manually or via technology that has limited support and capacity to share high-volumes of data.

The deployment and trial of a 5G private network provides a platform for technology led transformation in manufacturing processes, enabling the sector to deliver greater production efficiency, flexibility and scalability.



Solution

Installation of a 5G Testbed has allowed for the development of Industry 4.0 use cases across the industry to test and evidence how a 5G network can provide solutions to a range of operational inefficiencies.

The use cases have provided the sector with the critical evidence it needs to showcase that the adoption of 5G can translate into greater production efficiency.

The learnings will be used in the development of future investments and trials to identify the scope for extending the use of 5G across the supply chain.



Benefit

The Department for Digital, Culture, Media and Sport (DCMS) 5G Testbed and Trails programme enabled W5G partners to become early movers in the 5G ecosystem.

The new 'Testbed as a Service' operated by Malvern Hills Science Park and technology partner BT, ensures businesses have the opportunity to learn from the experience and findings developed from the original project. They can explore ideas for the implementation of 5G and also test 5G capabilities through a commercial 'first-to market' testbed.

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The 5G Testbed and Trials programme has shone a light on the role that 5G can play in both businesses and people's lives, with a recognition that there will be many more areas of benefit to be identified.

It's been a great honour to see Worcestershire and our partners establish themselves as leaders and an exemplar in how 5G can play a significant role in delivering increased productivity gains in manufacturing.

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Ste Ashton, Worcestershire 5G

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The Worcestershire 5G Testbed was able to demonstrate the benefits of 5G within manufacturing factories in the first UK 5G smart factory trials held with consortium partners Worcester Bosch and Yamazaki Mazak.

The findings show that, up to 2% efficiency gains can be possible through the adoption of 5G technology. These gains when extrapolated to the UK level would be equivalent to a contribution of £2.6 billion.

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Robert Franks, West Midlands 5G

Evidencing the potential of 5G

During the project, the 5G networked locations included the Yamazaki Mazak Corporation factory in Worcester - which tested Industry 4.0 use cases covering condition monitoring, visual monitoring and augmented reality.

The use case presented two key opportunities for Mazak, to work with local business partners to develop local opportunities in new technologies; and to be the first to take advantage of potential improvements through networking with 5G, particularly the Internet of Things (internet connected devices) and Industry 4.0, where Mazak have previously suffered networking and connectivity issues.

Mazak used 5G to test Augmented Reality, trialling enabled remote training to power effective interactive live streaming and communication between experts and remote field engineers. This enabled remote field engineers to complete required fixes immediately rather than waiting for an expert to arrive on site. This meant the expert could see, hear and advise in real-time.

The team also tested if 5G could support the prevention of maintenance work through remote monitoring. The trial involved testing to see if a spindle in operation could be stopped through a remote command to the machine to prevent damage to the spindle.

There were many learnings taken from the 5G project. Firstly, it broadened Mazak's exposure to new technologies in other industries, particularly in networking and telecoms. They recognise they now need to pay close attention to what is going on in other businesses, technology and machine tool technology. Secondly, Mazak have begun to create a development culture in their wider business, and going forward will take advantage of the broader pool of knowledge.

If the potential economic returns observed at Mazak (just over 2%) were extrapolated at a local, regional, and national level, the potential benefits would be significant. Mazak believe if 5G can become present in all factories, the management and maintenance services they can offer will deliver huge productivity gains to their customers.



Evidencing the potential of 5G

Another of the W5G networked locations was at Worcester Bosch, where the team trialled two use cases.

This included using 5G to test visual monitoring to see if the technology could support the use of ultra-high resolution live streaming, to enable remote monitoring of real-time conditions of working facilities in the factory.

Through the use case, it was found that 4G was insufficient and the visual monitoring test could only take place over 5G, with the increased capacity to support three 4K/UHD cameras.

The team also tested if 5G could support condition monitoring, analysing if the technology can enable automated remote monitoring of the status of production machines using multiple sensors.

Whilst 4G was found to be sufficient to support the use case at Worcester Bosch, when considered as part of a broader 'Factory of the Future' concept and deploying other live use cases, 5G would be required for all elements to work successful concurrently.

Post project, W5G has continued work with Bosch and other manufacturers on additional 5G supported use cases including 'Automated Guided Vehicles' and 'Racking Crash Detection' amongst others.



Takeaways

Sustain



Businesses are their own experts and must work with W5G to help recognise and identify problems and solutions to their operations. Through continuing use of the testbed, W5G will continue to analyse learnings and scalability for 5G in manufacturing.

Learnings



The legacy of W5G locally through established relationships will continue beyond the end of the project. Full learnings can be accessed via the [Worcestershire 5G Trial and Testbed report](#).

Contacts



West Midlands 5G Manufacturing Team
www.wm5g.org.uk/contact

More info



www.wm5g.org.uk



WM5G.org.uk

www.wm5g.org.uk/contact



West Midlands
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Department for
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