ON TRACK WITH **INNOVATION IN THE WEST MIDLANDS**

The West Midlands
One region, many worlds

GREAT
BRITAIN & NORTHERN IRELAND

CONTENTS

At the heart of the UK, the West Midlands is the best-connected region in the country. At the centre of an exceptionally well-linked transport network, the region has proximity to London and is within a four-hour drive for 90% of the UK population.

RAIL TECHNOLOGY **HUB OF THE UK**

Served by Birmingham Airport, the UK's fastest-growing airport, a £5.1 billion investment is enhancing local connectivity to expand rapid transit systems.

As the region pulls on its renowned heritage in industrial engineering, technology-based R&D is rapidly expanding, with various skills and knowledge hubs helping to advance the future rail sector and address the challenges of digitisation and decarbonisation.

Infrastructure is being adapted to enable trialling and testing crucial to our industry. Our 5G multi-city testbed allows for never-before-seen connectivity trials.

The region is also at the centre of an expanding network of Light Rail through the West Midlands Metro; with up to 50 new trams planned as part of an £83.5m investment. This will also create opportunities in new control, communications and passenger information systems. And as the home of HS2 we are becoming the epicentre of a large-scale supply chain of specialist rail expertise.

Centres of Excellence

The Birmingham Centre for Railway Research and Education (BCRRE)

Based at the University of Birmingham, BCREE is leading critical research into alternative fuels for rail. In 2020, and in partnership with Porterbrook, it launched the UK's first Hydrogen train – HydroFLEX.

Alongside decarbonisation, the centre is advancing digitisation as the home of the Centre of Excellence for Digital Systems, working with the UK Rail Research and Innovation Network to advance simulation tech, data integration, cybersecurity and smart monitoring. They are also making important advances and are making important advances in the development of driverless and eventually autonomous trains.

HORIBA MIRA and MIRA Technology Park

Located in Nuneaton, HORIBA MIRA leads engineering, research and test services for the automotive, defence, aerospace and rail industries. Electrification and energy, powertrain and emissions, vehicle resilience (cybersecurity) and CAV are among its leading expertise. The park hosts several UK-first, real-world testing facilities specialising in battery safety and abuse testing, climactic vibration, electric cycling, and self-driving technologies.

Quinton Rail Technology Centre

The UK rail industry's only privately-owned and independent testing site. Based in Warwickshire and connected to the national rail network, the centre facilitates impact testing, product development and training, and is currently working with Cisco on an exclusive "trackside to train" data transfer project.

The Very Light Rail National Innovation Centre

Supporting the growth of the VLR industry, the VLR Innovation Centre offers an on-site 2.2km test track, conference space, research labs and advice bureau for local authorities and transport planners. The centre's facilities explore the latest development of autonomous trains and 5G applications for enhancing safety.

The Manufacturing Technology Centre (MTC)

Based in Coventry the MTC is part of the High-Value Manufacturing Catapult (HVM Catapult) established by Innovate UK and supports research commercialisation with real-world testing facilities in additive manufacturing, digital manufacturing and robotics and autonomous systems.

Warwick Manufacturing Group

Part of the University of Warwick, WMG is pioneering research together with industry across the energy, materials & manufacturing, digital technologies and intelligent vehicles markets.

The UK Battery Industrialisation Centre

The £130m (UKBIC) in Coventry is the UK's leading battery development facility from prototype scale to mass production. UKBIC is a key part of the UK Government plan to fast track the development of cost-effective, high-performance, durable, safe, low-weight and recyclable batteries.

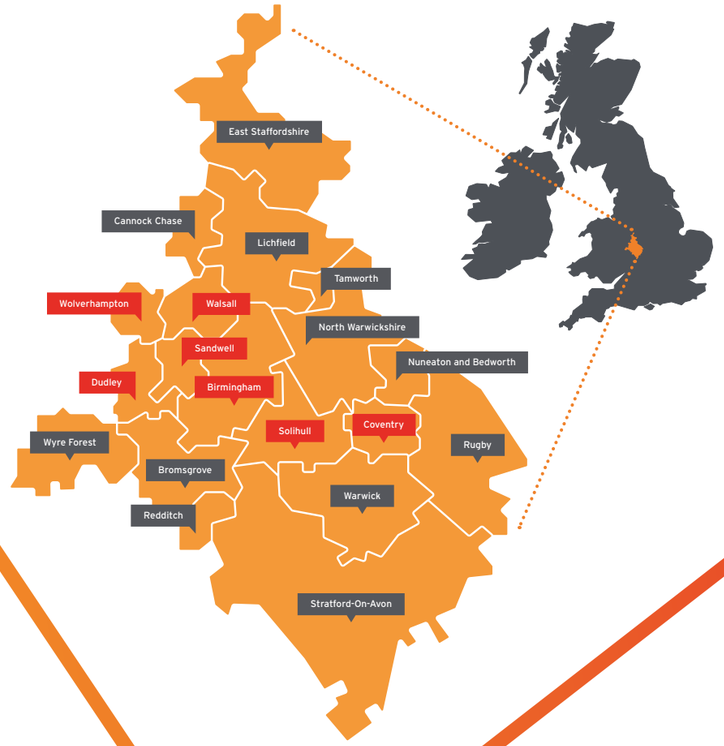
40,000
rail sector jobs – the highest of any UK region

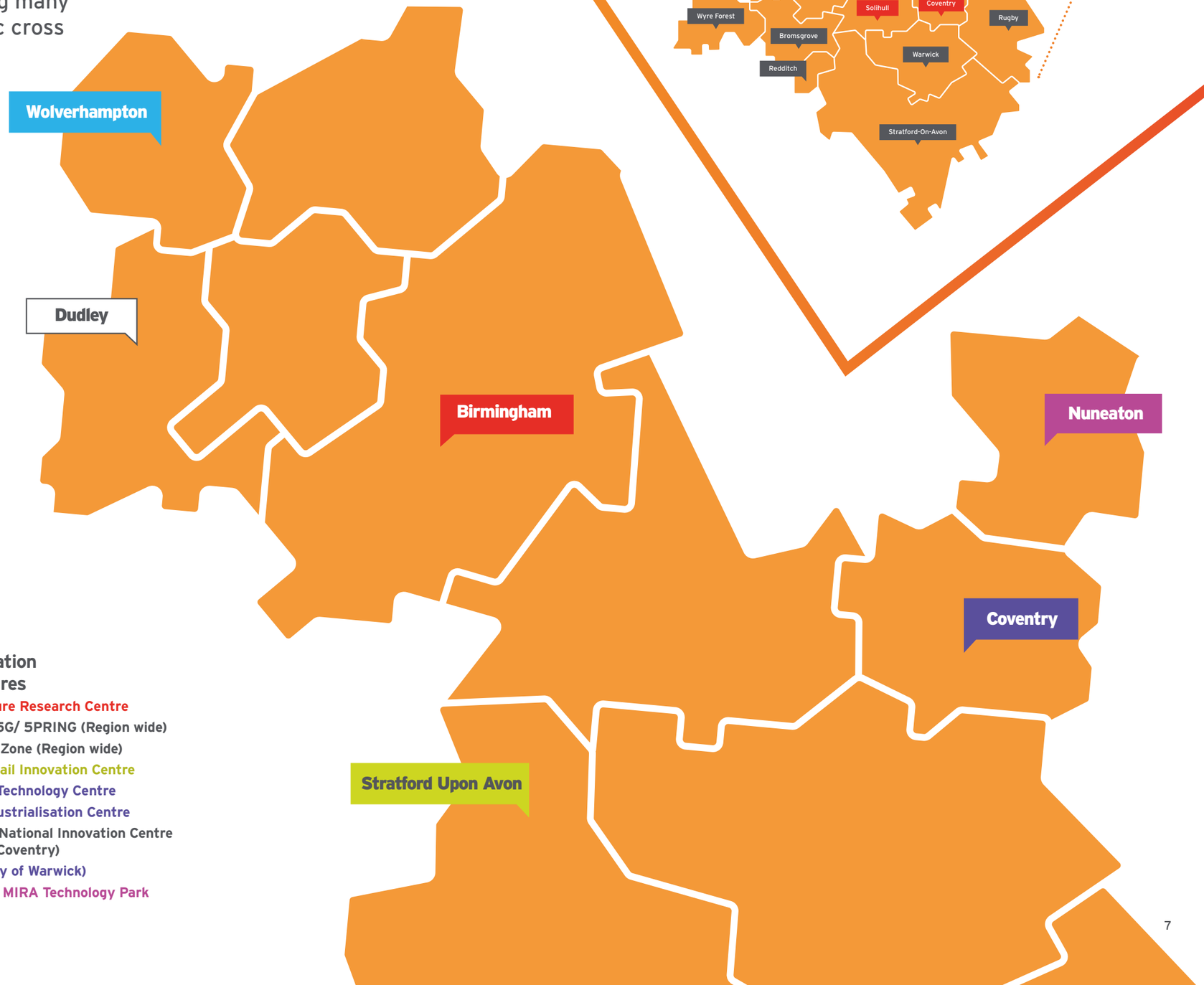
THE WEST MIDLANDS: **FUTURE MOBILITY**

The centre of the UK's largest rail, automotive and aerospace clusters, the West Midlands is at the vanguard of solving many global future mobility challenges and providing dynamic cross sector collaboration opportunities.

Area key:

- Birmingham
- Coventry
- Dudley
- Nuneaton
- Stratford Upon Avon
- Wolverhampton





World Class Universities with Leading Research Centres

- Aston University
- Birmingham City University
- University of Birmingham
- Coventry University
- University of Warwick
- University of Wolverhampton

Technology & Research Centres

- Aston Institute of Photonic Technologies
- Birmingham Centre for Railway Research & Education
- Birmingham Energy Innovation Centre
- Centre for Fuel Cell & Hydrogen Research
- Energy and Bioproducts Research Institute
- Vehicle Technology Centre
- Advanced Propulsion Centre
- Automotive Composites Research Centre
- Centre for Future Transport & Cities
- Centre for Low Carbon Propulsion Systems
- Institute for Advanced Manufacturing & Engineering
- National Transport Design Centre
- Centre for Engineering Innovation & Research

Specialist Innovation & Research Centres

- High Temperature Research Centre
- West Midlands 5G/ 5PRING (Region wide)
- Future Mobility Zone (Region wide)
- Long Marston Rail Innovation Centre
- Manufacturing Technology Centre
- UK Battery Industrialisation Centre
- Very Light Rail National Innovation Centre (project site in Coventry)
- WMG (University of Warwick)
- HORIBA MIRA/ MIRA Technology Park

HS2 will transform the region's connectivity and economic landscape – the country's new high-speed rail network has started and is one of Europe's largest infrastructure projects. It will create the heart of a central hub bringing faster connections between UK cities.

HIGH SPEED 2 (HS2): THE £3 BILLION OPPORTUNITY

HS2 is a huge opportunity for R&D and investment. In total, there are about 350 businesses currently in the local HS2 supply chain: ranging from large corporates and consultancies to small and medium-sized businesses.

Rolling stock procurement provides openings in areas of design, engineering, technology, and customer experience. More widely within Railway Systems, there are considerable commercial opportunities ranging from power systems and transformers to the data transmission network and SCADA (Supervisory Control and Data Acquisition) systems.

Opportunities exist in a wide range of specialisms including:

- Track and Overhead Catenary Systems
- Tunnel and Open Route Mechanical & Electrical Fit-out and Ventilation
- HV Power Distribution
- Telecommunications (including Data Transmission Network and Emergency Services Radio Network)
- Command Control Signalling & Traffic Management
- Network Integrated Control Centre (NICC)

The HS2 mainline train control will be ERTMS, (European Railway Traffic Management System) and controlled by the NICC in Birmingham. HS2 will have a high-tech monitoring system to enable the remote supervisory control of railway assets and systems by key operational personnel. The Engineering Management System (EMS) will provide an integrated SCADA consolidating multiple SCADA systems. This enables the monitoring of railway assets and systems in real-time from the HS2 Network Integrated Control Centre in Birmingham.

Innovation at Every Point

HS2 builds on an already strong hub of local rail expertise; the West Midlands is home to the highest number of railway related jobs of any UK region. Rail supply and systems are the region's largest sub-sectors, which HS2 has catalysed further investment in, establishing a 350-strong dedicated supply chain of businesses engaged in project works. All businesses are invited to bid for an additional £3bn of commercial contracts in areas such as railway systems and rolling stock services.

HS2 has established an Accelerator programme with the Connected Places Catapult and Innovation Birmingham to foster collaborative working with small and medium enterprises and the core members of the HS2 supplier network. The accelerator will drive innovation in the design and build of HS2, innovate railway operations to deliver world-class leading customer experiences, and build a legacy of knowledge, expertise and new commercial opportunities.

The accelerator is based at the Bruntwood SciTech Innovation Birmingham Campus and is already working with companies on circular economy solutions, addressing productivity challenges and improving the station 'experience.'

Companies such as Buildots, Dendra Systems, Sensat and Cloudcycle have participated in the accelerator and represent technologies ranging from drones, AI and the Internet of Things.

350

businesses currently in the local HS2 supply chain

CONNECTED DIGITAL RAIL SYSTEMS

The West Midlands R&D and innovation assets support the development of new digital technologies; key to HS2 and across the global rail industry.

£5.1BN
Investment in enhancing local connectivity

The West Midlands leads the way with opportunities in digital rail systems including:

- Connected Devices – predictive maintenance and remote condition monitoring systems using sensors to underpin a data-enabled railway.
- Connected Operations – from in-cab signalling and driver voice communications, to trackside worker warnings and enhanced level crossing safety.
- Connected Passengers - delivering the Internet connectivity needs of both passengers and Train Operating Company staff and systems.
- Connected Intervention - connected robotic devices and drones offering survey and delivery capabilities.

5G
The UK's first 5G testbed

The Centre of Excellence in Rail Digital Systems, University of Birmingham

The Centre of Excellence for Digital Systems in partnership with UK Rail Research and Innovation Network (UKRRIN) opened in 2020. This national centre sits within the Birmingham Centre for Railway Research and Education (BCRRE). It brings together academics and industry to collaborate on high-tech solutions for the rail industry and has established a collaborative partner with Siemens Mobility to advance the industrial research expertise.

Research specialisms include:

- Simulation technologies
- Future railway operations and control
- Data integration & cyber security
- Smart monitoring and autonomous systems.

WM5G – A live testbed for trialling 5G enabled digital rail technologies

The advancement of modern technologies enabled by 5G is critical to the rail industry for enabling effective real-time monitoring of entire train systems. Key developments are happening right now in key areas of predictive asset maintenance and condition monitoring as well as monitoring wear on the railway infrastructure, peak electricity consumption times and distribution.

A multi-million-pound programme by the West Midlands Combined Authority (WMCA) and the Government (DCMS) has set up the UK's first region-wide 5G testbed. WM5G manages projects to speed up the launch of 5G networks and test, prove and scale up new 5G products and services.

Turning aspiration into action, WM5G developed the UK's very first 5G-connected tram as part of a regional transport trial in partnership with West Midlands Metro, Transport for West Midlands (TfWM), GoMedia and Icomera.

FROM DECARBONISATION **TO VERY LIGHT RAIL**

The West Midlands leads the UK in electrification and decarbonisation technologies, developing new propulsion technologies for the rail industry.

Integrated Ecosystem

The local innovation ecosystem supporting the transportation industry is considerable – both from enabling a collaborative environment as well as providing access to state-of-the-art facilities and funding.

For instance, the Advanced Propulsion Centre (APC) invests in low carbon emission technology projects, provides technical support and has supported 36 major R&D projects worth a total of £589m. Whilst over at WM5G, work is well underway with the industry in managing collaborative industry projects to speed up the launch of 5G networks, supporting the industry to test, prove and scale-up new 5G products and services.

So, no matter what your cleaner technology needs are, the West Midlands has the network of skills and resources to help decrease carbon intensity in the transport sectors to reach ambitious net-zero emission targets.

Advanced Light & Very Light Rail

The expanding network of the West Midlands Metro will lead to an additional 50 new trams planned as part of an £83.5m investment. This will also include opportunities in new control, communications and passenger information systems; including a 5G project using connected technology and smart sensors to quickly identify track and power line defects on the region's rail and tram networks.

In addition to the test centre in Dudley, much of the R&D will be taking place at WMG at the University of Warwick. The first pilot line for the technology is planned to link Coventry's Railway Station with the University Hospital, reducing not only costs but also pollution from brake, rubber and tyre dust.

36

major R&D projects supported by the Advanced Propulsion Centre

50

new trams being introduced as part of an £83.5m investment

The Very Light Rail National Innovation Centre (VLRNIC)

The VLRNIC in Dudley is a dedicated facility to support the development and growth of the VLR industry. The centre includes a 2.2km test track and tunnel, conference space, research labs and an advice bureau to help local authorities and transport planners understand the benefits of VLR.

The centre's test track and tunnel explore the development of autonomous trains and the use of 5G enabled technologies. The centre is exploring how 5G can improve the safety of such autonomous trains through its real-time applications. The project will trial a 5G connected control system to which operators will be able to interact with and respond in real-time.

£83.5M

Investment in the West Midlands Metro

WEST MIDLANDS **GROWTH COMPANY**

West Midlands Growth Company, (WMGC) acts as the official Investment Promotion Agency for the WMCA Region.

We are a not-for-profit organisation funded by the West Midlands Combined Authority (WMCA), the seven metropolitan councils that make up the WMCA area and the region's six leading universities: Aston University, University of Birmingham, Birmingham City University, Coventry University, Warwick University and Wolverhampton University.

In the last five years, the West Midlands has attracted over 600 foreign direct investment (FDI) projects, creating almost 35,000 new jobs and safeguarding a further 5,000. An important part of attracting inward investment to the West Midlands is our support on offer to help businesses relocate and grow.

By working with regional partners we deliver comprehensive support packages to inward investors. Using a variety of campaigns and events WMGC work with investors to ease relocation or expansion plans and focus on future growth.

Our expert teams act as a strategic partner and consultant to investing companies to ensure they have the information they need and a comprehensive package of support, across all phases of their business plan.

Our work

We have vast experience of helping hundreds of companies to relocate to and expand within the West Midlands. We work with our partners on projects that deliver tangible growth and employment opportunities for the region.

"As the West Midlands' investment agency, we are committed to helping organisations of all sizes discover how the region and its people can benefit their business. I would encourage any company, no matter what stage they are at in their growth journey, to contact us and find out more about how the region could best serve their needs."

Adam Titchen
Senior Business Development Manager – Advanced Manufacturing
West Midlands Growth Company

Launched to coincide with and celebrate the Birmingham 2022 Commonwealth Games, the West Midlands Global Growth Programme offers a comprehensive 'Soft Landing Support' package for businesses around the world looking to establish in the UK or expand into the West Midlands for the first time.

Three tiers of value adding expert support	WMGC Investor Support	West Midlands Global Growth Programme (GGP)	GGP (Enhanced)
	All foreign companies investing in the West Midlands	30 high growth potential international investors	Five competition winners from within GGP
In-depth West Midlands research and tailored insights	✓	✓	✓
Consultative support throughout business case creation	✓	✓	✓
Comprehensive, impartial property search	✓	✓	✓
Tailored launch communications & PR support	✓	✓	✓
Facilitated access to universities – explore R&D and graduate talent	✓	✓	✓
Accessing private and public finance – sign-posting and support	✓	✓	✓
Network introductions to WMGC's 100+ commercial partners	✓	✓	✓
Nine-months fully-funded commercial office space		✓	✓
On-site, bespoke business and innovation support		✓	✓
Free UK company establishment & registered co. address within the West Midlands		✓	✓
Discounted accounting, payroll, legal and secretarial services		✓	✓
Peer-to-peer networking & knowledge transfer opportunities		✓	✓
Comprehensive calendar of industry events		✓	✓
Connections to prospective buyers, suppliers & R&D partners		✓	✓
Access to Bruntwood Sci-Tech's Investor Showcase programme		✓	✓
Extended market-entry focused business development support, delivered by a sector specialist 'Entrepreneur In Residence', to help your business scale quickly in the UK			✓

To see how we have supported organisations with growth into the West Midlands region, please visit: **investwestmidlands.com**

WHAT HAPPENS NEXT?

If you are looking to find out more about the West Midlands Future Mobility opportunities, please get in touch with a member of our Inward Investment team.

investwestmidlands.com

West Midlands Growth Company