TEES VALLEY COMBINED AUTHORITY | TEES VALLEY MAYOR

TEES VALLEY
DIGITAL STRATEGY
APRIL 2022 – MARCH 2032

| Foreword

Building a Smart Region

The Tees Valley is on the rise, with major projects such as Teesworks, the Teesside Freeport and the new Treasury campus putting us firmly on the map.

This Strategy sets the scene for digital infrastructure, technology and skills for the next 10 years in a constantly evolving digital landscape and marks a move away from previous work which has focused specifically on the digital industry sector. Therefore, when we say 'digital strategy' we're not just talking about a strategy for the digital industry sector, but rather we're setting an ambitious target for the Tees Valley – *"By 2032, we will be the UK's first truly Smart Region – using world-leading digital infrastructure and innovation to create opportunities for all residents and businesses".*

The Tees Valley is home to the fastest growing digital sector of any Combined Authority area, with figures from the ONS showing the local sector now employs close to 7,000 people, a rise of 56% between 2019 and 2020.

Analysis also shows that the Tees Valley digital cluster has some of the highest levels of productivity in the UK – producing £85,200 of GVA per employee compared to a national average for the digital sector of £70,800. Being low-carbon, innovation-driven, scalable and exportable, it is an exemplar for the economy we are building in the Tees Valley.

Fast, reliable, and affordable digital connectivity is now a utility as vital as electricity and water. As Covid-19 brought home to us, modern life is increasingly impossible without it. Digital connectivity is critically important to both modern business and industry and everyday life – and will increase in prominence as the way we work and access services continues to evolve.

We know that our people and their capabilities sit at the center of our businesses so this strategy sets out how we will deliver digital opportunities for Our Business, Our People and Our Place, including:

- Encourage and support all of our businesses to adopt the best digital technology to drive digital innovation and productivity, allowing them to take the opportunities of artificial intelligence and big data

- Create space for new opportunities to emerge for the digital industry sector in Tees Valley

- Ensure that residents and businesses can access affordable connectivity and that everyone has access to the skills they need to flourish in a digitally driven economy

- Enable rapid movement of people and goods through digitally enhanced transport

- Empower better public services – from personalised services in health, safer care for the elderly at home, to tailored learning in education

Digital is critical to the delivery of projects that are revitalising and regenerating our region. It allows the swift transit of goods and people to, from and within the UK's largest Freeport; it enables the carbon capture and hydrogen fuel projects which will allow us to deliver the UK's first truly decarbonised industrial cluster; it allows industrial digitalisation to drive home our economic strengths in Advanced Manufacturing, Chemical & Process and Clean Energy. It supports a shift from innovative projects to innovative companies, boosting prosperity and productivity in every part of our economy.

At its core, this strategy has one ambition – to utilise digital infrastructure, digital innovation and digital inclusion to create a world-leading digitally enabled economy that works for every person and every business in Darlington, Hartlepool, Middlesbrough, Stockton and Redcar & Cleveland, attracting talent and making Tees Valley a great place to live, work and visit.

Ben Houchen,
Tees Valley Mayor

Mark South,
Chief Operating Officer for Double Eleven and LEP Board Member (Sector Champion for Digital)

| Executive Summary

A digitally connected region isn't just one of our ambitions for the Tees Valley economy – it's fundamental to achieving all of them.

■ Digital Infrastructure is critical for our global competitiveness whilst creating opportunity across business and communities

■ Digital Innovation will drive the success of our key industry clusters and support our transition to Net Zero, including clean energy production and Advanced Manufacturing

■ Digital Inclusion will ensure that there is access to opportunity for all

Digital is also a key driver for recovery, resilience and growth post-Covid. The switch to digital accelerated throughout the pandemic, increasing our dependence on reliable digital connectivity in every aspect of work, education, commerce and communication.

The Tees Valley already has a strong story to tell in terms of digital. No fewer than four of the top six UK local authorities for average download speeds are within our region. The Tees Valley is home to a number of internationally significant digital businesses, such as Double Eleven, Cubic, Visualsoft, Merlin Flex and Northgate. Thanks to assets such as Teesside University – not least its Industrial Digitalisation Technology Centre and the internationally renowned Animex Festival – we have a reputation of digital excellence.

However, historically a short-term, small-scale and uncoordinated approach to digital connectivity has resulted in a region where only 3% of premises have access to Full Fibre Broadband and where 29% of residents lack basic digital skills – a higher proportion than any other English region. At a time where the employment rates in the Tees Valley remain at 70%, 36% of the region's businesses have reported difficulties in recruiting digitally skilled staff.

That's why, for the first time, we are setting out a region-wide strategy to address the region's digital priorities, ensuring our businesses have the digital infrastructure they need to thrive and innovate while ensuring that no residents are left behind.

This strategy sets out a single ambition, supported by a concrete plan for action. That ambition is as follows:
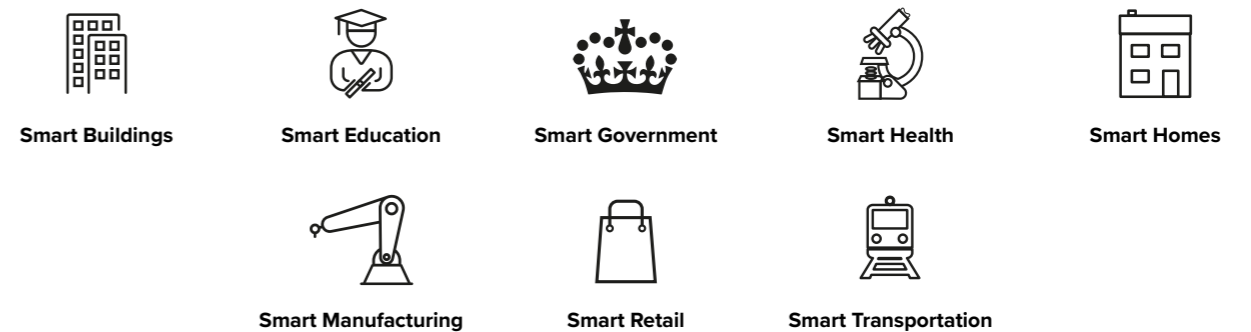
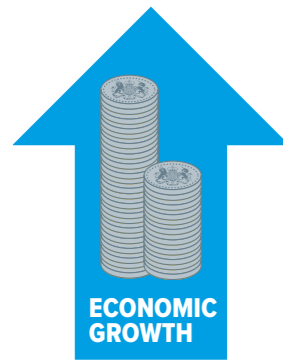## What Do We Mean by a 'Smart Region'?

The concept of a Smart Region is based on that of a Smart City, only placed upon the unique geographic, political and economic background of the Tees Valley. A Tees Valley Smart Region would make active use of the Internet of Things (IoT) and open data to optimise the flow of energy, people and data. IoT refers to a network of physical objects that contain, for example, software or sensors that allows the objects to be connected to the internet and each other. The objects can thereby interact and exchange data, as well as be remotely controlled or automated. IoT solutions may also involve cloud services and artificial intelligence (AI).

Common components of smart cities include:

■ Smart buildings to save and optimise energy

■ Smart education to ease the learning process

■ Smart government to make it easier for inhabitants to find information and influence decision-making processes in their area

■ Smart health services to simplify and optimise registration, diagnosis and medication of patients

■ Smart homes to make it easier for residents to monitor and control home attributes such as lighting, heating, appliances and security systems

■ Smart manufacturing and construction to increase production, optimise supply chains and improve processes

■ Smart retail to enable a faster, more personalised shopping experience

■ Smart transportation systems which enable more people to move around more quickly

Smart Buildings   **Smart Education**   **Smart Government**   **Smart Health**   **Smart Homes**

Smart Manufacturing   **Smart Retail**   **Smart Transportation**

Enabling the Tees Valley to become the UK's first truly Smart Region by 2032. Our economy will be underpinned by world-leading digital infrastructure and innovative technologies that enable access and opportunity for all residents and businesses

Our Strategy is Based on Three Key Foundations:

TEES VALLEY
SMART REGION

ECONOMIC GROWTH

INFRASTRUCTURE
ensuring high-speed connectivity for all businesses and homes across the region

INNOVATION
establishing the Tees Valley as a global centre of digital innovation, research and practice

INCLUSION
ensuring all communities are digitally connected, with the digital skills to access education, jobs, health, social care and other public services, wherever they live

Using these foundations we will deliver:

- Affordable, rapid and reliable digital infrastructure across the Tees Valley – including the creation of a local internet exchange and supporting data centres

- Universal 5G across the Tees Valley – including the deployment of digital innovation testbeds at locations like the Teesside Freeport

- Access to digital services for all residents and businesses – including low-cost connectivity options

- Intelligent transport systems which accelerate the movement of people and goods into, out of, and around our region

- A digitally-skilled workforce large enough – and with the right skills – to meet the needs of both our growing digital sector and wider economy

- A Tees Valley in which our cultural heritage is preserved and enhanced by modern technology – enhancing our cultural offer

- The necessary information systems to help our region achieve its ambition of delivering a net-zero industrial cluster by 2040

It is anticipated that the cumulative impact of delivering the Digital Strategy has the potential to add £119million[1] of net additional GVA over the next ten years, with follow-on-support in innovation and digital inclusion creating an average return on investment of 8:1[2].

This Strategy will act as a framework to inform all aspects of digital activity across the Tees Valley that support economic growth and levelling-up the economy. The Strategy is also intended to help shape discussions, facilitate partnership development with government, industry and other bodies, and help secure public funding and private investment to deliver current and future initiatives.

In identifying the long-term strategic aims and ambitions for the Tees Valley, this is intended to be a ten-year Strategy. However, digital technologies and their applications are constantly evolving and therefore detailed actions will be published in a separate Digital Strategy Delivery Plan which will be agreed and reviewed annually by the Combined Authority and partners across the Tees Valley to ensure we remain at the forefront of digital development. Digital will remain a cross-cutting theme in all Combined Authority Group plans and strategies.

What Do We Mean by Digital?

In the context of this strategy, digital means any piece of technology that connects people and machines with each other or with information – and how we use that technology to drive the economic development of the Tees Valley.

This strategy is wider than a strategy for just the digital industry sector. It's a regional digital strategy which addresses the wider investment required in digital infrastructure and innovation that will support the development of local businesses across all industry sectors now and in the future and allow for inclusive growth so that all residents and businesses can access digital technology.

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[1] TVCA Economic Impact calculation
[2] Sourced from CEBR report on economic impact on inclusion of digital investment

| Local and National Context

Combined Authority Context

The Digital Strategy will support the vision and ambitions set out in the Tees Valley Strategic Economic Plan and locally agreed Tees Valley Local Industrial Strategy, including the creation of 25,000 additional jobs and supporting an extra £2.8billion into the Tees Valley economy. It will enable our role as a global leader in clean energy, low carbon and hydrogen, while creating good-quality jobs with long-term prospects that local people can access.

This Strategy is not a standalone document. It builds on, and consilidates, priorities in complementary plans and strategies, with an integral role across priority themes of:

- Employment, Education and Skills
- Infrastructure – Transport and Digital
- Business Growth
- Inward Investment
- Innovation and Clean Energy
- Creative Place

It is also key to delivering the Teesworks Masterplan and Teesside International Airport Delivery Plan along with supporting our transition to Net Zero. The Tees Valley Investment Plan will reflect Digital Strategy priorities in the allocation of Combined Authority funding across all themes of delivery. Our priorities will also provide a framework to leverage additional resources from the private sector and government.

National Context

Delivery of this Strategy will support the UK's 'Build Back Better' Plan for Growth (published in March 2021). It includes infrastructure developments to build a diverse and resilient economy post-Covid; driving an innovation-led approach to achieve net zero targets and helping to establish Global Britain with the use of world-leading technologies in clean energy production.

Our Digital Strategy will also support the government's ambitions for levelling-up by increasing opportunity and improving access to services and improving living standards through enhanced digital connectivity.

There are a wider range of national strategies which sit under this overarching plan for growth, including the National Infrastructure Strategy and UK Innovation Strategy (2020). The UK Innovation Strategy sets the UK the target of becoming a global hub for innovation by 2035. Critical to this is adoption and diffusion of technology throughout our economy, delivering a cultural shift from innovative projects to innovative businesses.

The strategy in particular highlights how "better use of smart data will support innovation by enabling start-ups, scale-ups and existing businesses to enter

the market, develop and provide innovative services, and drive growth and productivity in relevant sectors. Smart data can also help smaller providers to grow and compete more effectively". Digital infrastructure and systems enabling the capture and analysis of this data will be critical in this process.

This is reiterated in Innovate UK's Action Plan for Business Innovation (2021) which sets out how digital technologies "warrant special focus" for innovation as they "provide the tools, connectivity and infrastructure needed to support product, process and service enhancements in all sectors of our economy. This includes the gathering, curating, storing, retrieving and analysis of data and their safe and secure use in cyber environments."

Both documents detail how the national evolution ecosystem – the space within which businesses, research institutions, academia, and government bodies exchange skills, knowledge and ideas – is a "critical national asset". There is strong strategic alignment between this position and this strategy.

Annex A contains more detail on the national policy and strategy which has fed into the development of the Tees Valley Digital Strategy.

| Digital Strengths and Assets

Fastest growing industry sector in the Tees Valley and the fastest growing digital sector of any Combined Authority area between 2019-2020[3], with 7,000 people employed in the digital sector in Tees Valley.

Specialisms in games development, mobile application and web development, IT support for the advanced manufacturing sector, IT consultancy and business application development

A strong heritage in computing with Teesside University's School of Computing, Engineering and Digital Technology one of the best-equipped in the country

A network of FE colleges and training providers supporting digital skills delivery

Large employers include Webworks Internet, Double Eleven, Visualsoft and Northgate, in addition to companies in related digital sectors such as EE, Virgin Media, MAP Group and Cubic

Recent investment from various Alternative Network Providers e.g. CityFibre £42million gigabit investment in Middlesbrough and £32million investment in Redcar & Cleveland and Hartlepool.

Digital connectivity which is well above the national average - especially for Ultrafast broadband for which 85% of all residential and business premises are covered, compared to 54% nationally

The Tees Valley has some of the fastest download speeds in the country, with three of our five local authorities' averaging over 100Mbit/second and all five areas in the top 15 average speeds nationally

[3] ONS BRES 2021

Animex

This is the Tees Valley's international festival of animation, visual effects and games with speakers from top studios across the world. Hosted by Teesside University for more than 20 years, Animex attracts some of the biggest names from animation, visual effects and games studios and features workshops for budding creators, student film screenings to an international audience, and networking opportunities with some of the brightest minds in the industry.

Boho

- Middlesbrough's Boho Zone is the region's digital, creative and business hub, providing digital companies with their own cluster to support the creation of additional jobs

- It nurtures the freshest new talent and skills within the digital sector and acts as a base for new businesses and industry start-ups

Industrial Digitalisation Technology Centre

- £1.8million Industrial Digitalisation Technology Centre based at Teesside University and part-funded by the Combined Authority

- It supports local SMEs to explore the opportunities Industry 4.0 technologies bring, such as the Internet of Things (IoT), big data analytics, modelling, simulation and sensor technology

- It connects local businesses to academic experts who have the skills and knowledge to help digitally transform their business, as well as providing open access to Industry 2, 3 and 4 technologies where SMEs can explore, evaluate and de-risk their investments

Teesside University

- Teesside has a strong heritage in computing. Teesside University's School of Computing, Engineering and Digital Technology is one of the best-equipped in the country, with cutting-edge technologies that provide a world-class learning environment

- Studios are equipped to industry standard for hardware and software, while specialist facilities include an AR/VR suite, recording studios, green screen and sound stage, motion capture and more than 30 specialised computing studios. Dedicated facilities are provided for VR, computer games, serious gaming, video editing and digital pre/post-production

- Subject areas such as computer science, games programming, games art, animation, and visual effects, deliver an excellent grounding in the immersive technologies that are transforming the way we live, learn and do business

Digital City

The Teesside University-led initiative DigitalCity connects people and businesses in the Tees Valley with the knowledge, skills and expertise needed to thrive in a digital future.

- Creating a new generation of digital businesses by nurturing start-ups and providing hubs where they can grow. Each year around 30 new businesses are supported through the Accelerator programme and have gone on to become some of the largest digital employers in the Tees Valley

- Supporting the growth of existing digital businesses as their potential for growth and innovation is unlocked through the provision of scale programmes, access to finance support and technical consultancy advice

- Transforming non-digital businesses with bespoke support to utilise innovative technology, tap into new markets and improve their competitiveness. Typically around 50 businesses a year are supported through advice and guidance on digital audits, UX/UI design, systems integration, cyber security, digital strategy and more

Teesworks

Teesworks is the UK's largest and first operational freeport, covering 4,500 acres of prime land south of the River Tees in the borough of Redcar and Cleveland. Developed by the South Tees Development Corporation, a Mayoral development corporation, the site's 20-year Masterplan sets out an approach to redevelop the area, creating 20,000 new jobs and the UK's first net-zero industrial cluster.

The plan will see the area transformed into a hotbed of new industry and enterprise, focused on the clean technologies of the future, including carbon capture, hydrogen, and offshore wind. This includes Net Zero Teesside, the UK's ground-breaking carbon capture, utilisation and storage (CCUS) project aiming to develop the UK's first decarbonised industrial cluster. The development of the site provides the opportunity to include high-end, reliable digital infrastructure at the heart of the site, allowing businesses on-site to develop and utilise digital technology, enabling digital innovation and attracting investment.
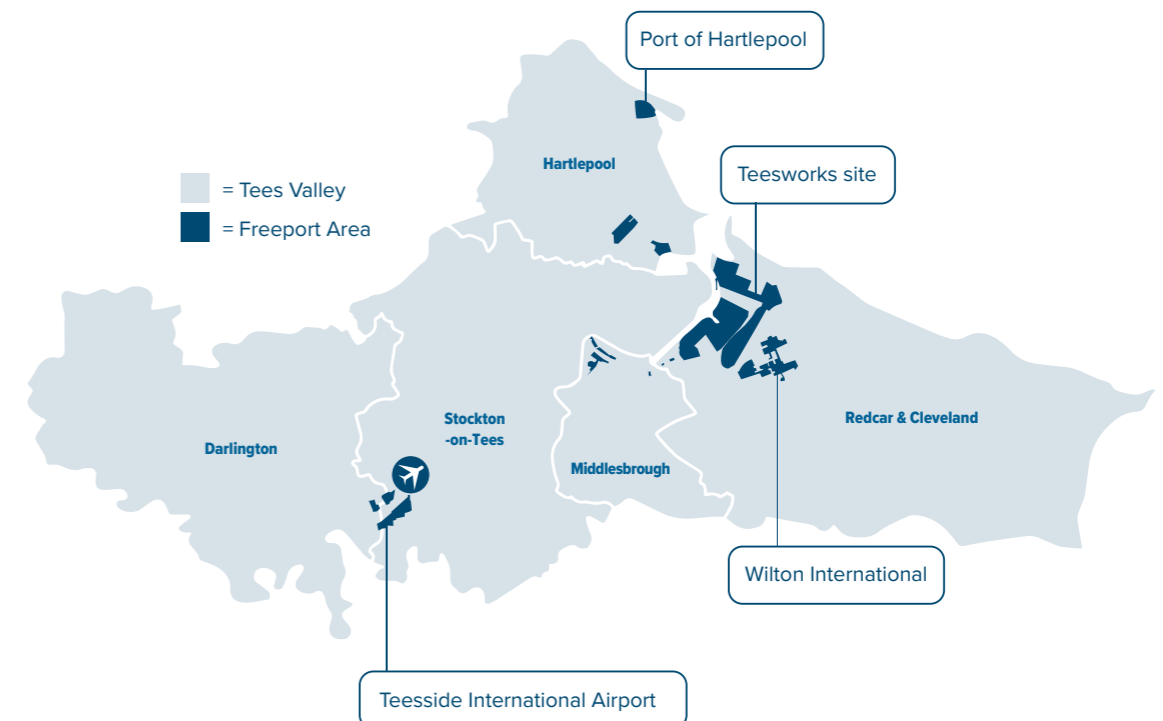

Teesside Freeport

In March 2021, the Tees Valley was announced as one of the first places to get freeport status under the new government policy to create freeports across the country. Covering 4,500 acres, the Teesside Freeport is the largest in the UK. It offers many advantages to businesses looking to invest, including a package of tax relief to help drive jobs, investment and growth, streamlined planning processes and simplified customs procedures.

The Teesside Freeport covers sites across the region, including Teesworks, Wilton International, Teesside International Airport, the Port of Middlesbrough, the Port of Hartlepool, Liberty Steel, LV Shipping and Teesport.

Digital innovation is at the heart of the Teesside Freeport, supported by the rollout of state-of-the-art digital infrastructure including fibre and wireless communications such as 5G. 5G, will also enable potential testbeds to be developed within the freeport, including in those supporting the development of autonomous vehicles, smart transportation, border control and digital twins. In particular we are seeking to develop a Centre for Frictionless Trade, a partnership between the Combined Authority, HMRC, and private sector stakeholders to utilise industrial digitalisation and blockchain technology to accelerate the movement of goods to and from Global Britain.

= Tees Valley
= Freeport Area

Port of Hartlepool
Teesworks site
Hartlepool
Stockton-on-Tees
Darlington
Middlesbrough
Redcar & Cleveland
Wilton International
Teesside International Airport

| Digital Challenges and Ambitions

Digital Innovation

The challenge:

- There is a lack of smart technology around the region and there is a lack of region-wide data platforms collecting smart data

- Local businesses require support to understand and undertake digital innovation, enabling business growth through technology-led decisions. The Tees Valley's rich industrial strengths will lead to opportunities in the fourth industrial revolution (Industry 4.0), with automation of traditional manufacturing and industrial practices using smart technology such as AI and the IoT to increase automation and improve communication and self-monitoring

- Digitisation of transportation services in the Tees Valley is currently low with investment required in smart transportation and logistics systems

- Digital technology should be used to help achieve local net zero ambitions and the central government target of reaching net zero by 2050

- Culture and tourism experiences could be enhanced though the increased use of digital technology, with technology ranging from digital preservation to assist cultural heritage to augmented reality and immersive virtual reality to enhance the tourism experience

Digital Infrastructure

The challenge:

- Pockets of poor digital connectivity provision still exist, especially in rural areas which are deemed commercially unattractive to suppliers, resulting in connectivity issues for residents and businesses in an increasingly online world

- Ensuring key industrial sites in the Tees Valley are at the global forefront of digital innovation will require resilient core digital infrastructure at its heart

- Rollout of Fibre to the Premises (FTTP or full fibre) is currently low, and the planned national retirement of the copper network will mean work is required to upgrade all networks to full fibre

Our Ambition:

Ensure affordable, high-quality digital infrastructure connecting people to each other, people to businesses, and businesses to markets, forming a foundation for economic activity and community prosperity, enabling the development of digital technologies, digitisation of business and investment.

This will be achieved by:

Proactive support and enabling of infrastructure investment in fibre and wireless delivery targeting hard to reach areas	Ensuring the Tees Valley is well-positioned to maximise opportunities for investment presented by UK Government e.g., DCMS Project Gigabit	Encouraging a collaborative approach to municipal asset usage to facilitate digital infrastructure deployment
Proactive support and enabling of infrastructure investment in key industrial and business sites	Encouraging a 'dig once' approach to all projects	Raising the profile of the Tees Valley as a hotspot for digital infrastructure

Our Ambition:

Drive digital innovation across the Tees Valley, enabling the development of a Tees Valley Smart Region, supporting business growth through digital innovation, enabling businesses to make technology-led decisions and raising the profile of the area as a hotspot for digital innovation.

This will be achieved by:

Supporting the local business community to understand digital technologies and how they can be used to improve business, building on existing strengths such as Boho, DigitalCity, IDTC and Made Smarter	Supporting the uptake of technologies that reduce carbon emissions and help restore biodiversity, giving local businesses the digital tools to reduce their own emissions as we drive forward a Green Industrial Revolution	Raising the profile of the Tees Valley through digital events such as Animex, esports, Tees Valley Games and other digital festivals
Supporting the development of a Tees Valley Smart Region using smart technology and the IoT, including intelligent transportation systems, smart homes, and uptake of smart technology to support public services, including healthcare	Considering and including digital technology, where appropriate, in the development of culture and heritage projects across the Tees Valley, supported where possible by local digital businesses	Promoting the Tees Valley's common regional digital identity

Digital Inclusion and Skills

> The challenge:
>
> - The growing move to online services (home working, home schooling, online appointments etc.) has highlighted issues with digital inclusion in local communities. The North East has the highest rate of non-internet users out of all English regions
>
> - The North East region has the highest proportion of the population with zero basic digital skills[4]
>
> - Solutions have arisen which are beginning to address access to digital devices, skills and connectivity, however these tend to be short-term local solutions, with the need for strategic coordination across the Tees Valley
>
> - There is a diversity and inclusion challenge in the region with an under-representation of women and BAME communities in the technology sector
>
> - Demand for digitally skilled workers is high nationally and locally with employers reporting a 'digital skills gap'

Our Ambition:

Ensure the benefits of the internet and digital technologies are available to everyone, while ensuring the supply of Tees Valley residents with high-level digital skills meets employer demand.

This will be achieved by:

Increasing the number of Tees Valley residents with access to basic functional digital skills provision through relevant funding streams and programmes	**Expand existing digital inclusion activities across the Tees Valley providing strategic coordination across the region to reflect local need**	**Encouraging and engaging in activities aimed at broadening digital diversity**
Identifying skills needs of local SMEs through business diagnostics and signpost to relevant digital skills training/ provision	**Supporting Tees Valley residents to access low-cost connectivity options**	**Ensuring the Tees Valley digital skills offer is better aligned to the needs of local employers**
		Raising the profile of the Tees Valley as a digital hotspot for skills – retaining and attracting talent

| Digital Infrastructure

Our Ambition:

We will ensure the Tees Valley has affordable, high-quality digital infrastructure which connects people to each other, people to businesses, and businesses to markets, forming a foundation for economic activity and community prosperity and enabling the development of digital technologies, digitisation of business and investment.

Context

High-quality resilient digital infrastructure is crucial for economic growth as well as boosting productivity and competitiveness. Digital infrastructure helps connect people to each other, people to businesses, and businesses to markets, forming a foundation for economic activity and community prosperity. Digital connectivity is unlocking new and previously unimaginable ways of working, and is now essential to facilitate public services, including healthcare and education.

The coronavirus pandemic has made internet access an essential condition of continued growth. ICT infrastructure has become critical to the functioning of an economy, alongside water, electricity and food supply networks, with reliable connectivity an essential element of the economic recovery process and a vital component to ensure better health and wellbeing, education and employment for residents. In emerging economies, according to the World Economic Forum, each additional 10% of internet penetration can give rise to a 1.2% increase in per-capita GDP growth.

In 2020 the government published the National Infrastructure Strategy (NIS) which brings together the government's long-term infrastructure priorities with the short-term imperative to build back fairer, faster and greener following the coronavirus pandemic.

> This includes:
>
> - £1.3billion to accelerate the rollout of electric vehicle charging infrastructure
>
> - £5billion to accelerate UK-wide gigabit broadband roll-out through Project Gigabit
>
> - A Shared Rural Network extending 4G mobile coverage to 95% of the UK
>
> - £250million to ensure resilient and secure 5G networks
>
> - £50million for the continuation of the 5G Testbeds and Trials Programme in 2021-22

[4] ONS Exploring the UK's Digital Divide March 2019

State of play

Current Coverage

- The Tees Valley is generally well connected through broadband services, with a £3.8million investment in improving Superfast Broadband[5] delivered through the Tees Valley Superfast Broadband programme. 95% of premises in the Tees Valley now have access to Superfast Broadband coverage from fixed broadband, compared to a national average of 94%[6], however pockets of poor broadband provision still exist, especially in rural areas which are deemed commercially unattractive to suppliers

- Access to Ultrafast Broadband[7] is lower, albeit still higher than national with 85% of premises in the Tees Valley having access to Ultrafast Broadband coverage from fixed broadband, compared to 54% nationally

- The rollout of Full Fibre is low within the Tees Valley, with only 3% of premises having coverage from a Full Fibre service from fixed broadband, compared to 18% nationally

- Traditionally, digital infrastructure has been provided by either Openreach or Virgin Media, however over the past few years various Alternative Network Providers have begun to operate in the Tees Valley

- In April 2021, EE confirmed that a further 35 towns and cities across the United Kingdom have started to go live on their new 5G ultrafast mobile broadband network, including Middlesbrough

- It is often assumed that the lack of internet services in remote areas is the main reason for the gap in internet use. The large majority of the global population (93%) lives in an area that is covered by at least a 3G mobile signal/service (and 82% covered by a 4G signal), based on data provided by national telecom operators. Hence there are other reasons why many people do not use the internet. These include quality of the connection, cost of the data packages, cost of devices to access the internet, and lack of education and skills, all of which are covered in more detail in the 'Digital Inclusion and Skills' section

Percentage of Tees Valley premises that have Superfast Broadband from fixed broadband – 2021

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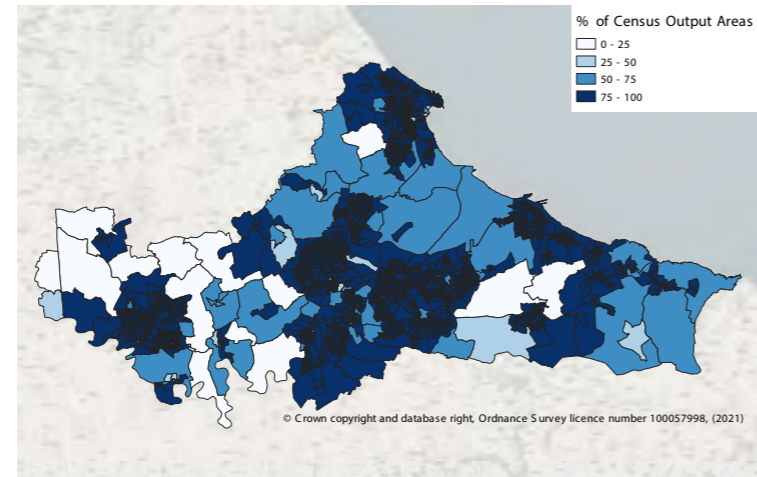
Percentage of Tees Valley premises that have Ultrafast Broadband coverage from fixed broadband – 2021
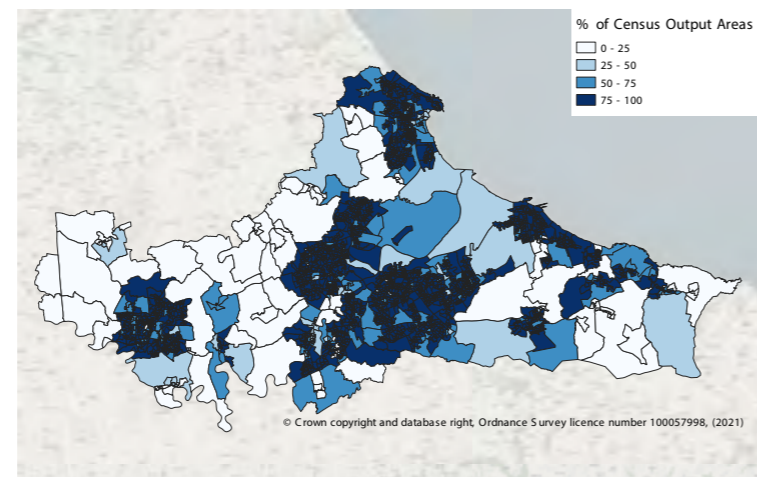
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Planned Coverage

Central government has announced a £5billion infrastructure project, Project Gigabit, which aims to deliver nationwide coverage of gigabit-capable[8] broadband to 85% of the country by 2025, with as close to 100% thereafter, providing more than one million hard to reach homes and businesses with access to next-generation gigabit broadband in phase 1. Currently only 3% of premises in the Tees Valley have gigabit capable services from fixed broadband, compared to 29% nationally.

In 2021 government announced that phase 1 of its delivery plan for Project Gigabit would **include the Tees Valley in the first regional supplier procurements.** These regional procurements allow telecoms providers to compete for subsidies to deliver gigabit capable networks, delivering gigabit coverage where the market would not otherwise be willing to invest because of high costs. Within the Tees Valley there are a number of areas without reliable broadband which are challenging to connect and which the commercial mode is unlikely to address without this intervention. The procurement areas have not yet been defined and an Open Market Review has been undertaken to determine where telecoms providers are already planning commercial investment without the need for public subsidy to minimise any prospect of public subsidised 'overbuild'. The extent of planned coverage for the Tees Valley will not be known until the results of the Open Market Review are shared, which will show gaps in existing infrastructure supply and the first regional supplier procurements have taken place and been allocated.

An extra £210million of the Project Gigabit funding will also go to boosting the government's **Gigabit Broadband Voucher Scheme**. This initiative makes it easier for rural residents and businesses to afford the installation of gigabit broadband at their property, without having to wait for Project Gigabit-funded providers to lay cables in the local area first. Vouchers are worth up to £1,500 for residents and £3,500 for businesses and may be "topped up" by local authorities and devolved administrations, raising their maximum value.

Digital Infrastructure Strengths

The Tees Valley has higher rates of broadband connectivity when compared to the wider North East and the UK. Broadband download speeds are generally higher than average with average download speeds in the Tees Valley at 97.8 Mbit/s, compared to 68.9 Mbit/s nationally. The North East has high rates of superfast connectivity compared to other English regions and is second only to the East Midlands in connectivity rates. With excellent Superfast Broadband coverage in our key urban centres, the Tees Valley accounts for no fewer than four out of the top six UK local authorities for median download speed of broadband users' connections (Stockton-on-Tees, Hartlepool, Middlesbrough and Redcar & Cleveland), with Darlington 12th out of 379 local authorities.

The Tees Valley contains a number of key physical infrastructure strengths which make the Tees Valley an attractive place to invest in digital infrastructure and innovation test beds, with potential test beds for autonomous vehicles, border control, smart transportation and digital twins, feeding into a Tees Valley Smart Region ambition across the wider Tees Valley area.

- The Port of Tees and Hartlepool – The deepest water port on the east coast of England and the largest English port in terms of outward tonnage, with deep-water-access, warehousing and open storage facilities

- Teesside International Airport – Tees Valley Combined Authority is the only Combined Authority to own an airport, with access to a 2,291-metre runway

- Teesworks – The UK's largest industrial zone, home to diverse, sustainable and low-carbon activity with access to its own internal railway system

Digital Infrastructure
Challenges & Opportunities

Digital infrastructure is a fundamental building block to enable the development of digital technologies and digitisation of business. Improving digital infrastructure across the Tees Valley would pave the way for digital innovation across private, public, and voluntary industry sectors, enabling hi-tech business development and attracting inward investors to the area. Improved digital infrastructure would also encourage local business start-up and growth with increased productivity gains, jobs, and training opportunities.

Key Industrial Sites

There are a number of key industrial sites across the Tees Valley for which reliable digital infrastructure would be a key economic enabler. Supporting the rollout of state-of-the-art digital infrastructure for these sites, including fibre and wireless communications such as 5G, will pave the way for digital innovation.

Proactive Support and Enablement of Private Sector Infrastructure Investment

Since the publication of the Project Gigabit Phase 1 delivery plan in March 2021 there have been substantial commercial investment plans announced with a number of private telecoms providers securing funding and accelerating plans for gigabit rollout over the next few years. INCA, the trade body for independent network providers, quotes that £5.6billion is now committed through independent telecoms providers (not Openreach or Virgin Media), with a target of up to 30million gigabit connections being available from independent telecoms providers by the end of 2025. CityFibre alone aims to deliver to 8-10million homes and businesses. In addition, Openreach has increased its target gigabit coverage from 20million UK premises to 25million by the end of 2026 and following approval of its Joint Venture with O2. Virgin Media reiterated its previous commitment to covering 7-10million premises with a potential investment in digital infrastructure of around £10billion in total.

Proactive support and enabling of commercial investment, including building positive relationships with infrastructure providers, is key to speeding up local connectivity rollout. The increase in commercial investment needs to be supported at a local level, with local authorities encouraged to proactively engage with infrastructure providers to assist in

any barrier busting, for example wayleave issues and access to municipal assets for deployment of wireless connectivity.

It's important to note that the Project Gigabit rollout plan is for a proportion of properties in each area, not every property. In December 2021 a DCMS Select Committee of cross-party MPs published the results of its inquiry into Project Gigabit targets, with a forecast that 100% UK Gigabit broadband coverage won't be reached until 2030. Therefore it is expected that there may be a number of areas in the Tees Valley which may still be outside the scope of Project Gigabit for the next few years.

Within the Tees Valley there are a number of areas without reliable broadband which are challenging to connect and which the commercial mode is unlikely to address. There is a concern that certain areas may fail to match the criteria for any intervention through Project Gigabit or will not be attractive commercial opportunities. As the Tees Valley, and its services, become increasingly digital, those communities and residents may become increasingly isolated.

Impact of Covid-19

The Covid-19 pandemic has put significant pressure on the UK economy, including the telecoms industry, through various negative effects, such as disrupted supply chains and limited access to premises which has impacted broadband rollout. At the same time, the pandemic has changed our daily life, including our increased dependence on reliable broadband for work and education. Research has found that a quarter of broadband consumers are concerned by a reduction in broadband quality since the start of lockdown and 26% believe inconsistent broadband is affecting their ability to work from home with a reliable connection considered more important than speed[9].

PSTN Switch-Off and Copper Retirement

- Migration of the Public Switched Telephone Network (PSTN – the system that is used by most residential and business telephone lines) to Internet Protocol (IP) technology and the withdrawal of traditional analogue telephony. This is expected to happen nationwide in December 2025. All residents and businesses will need a reliable internet connection and package in place by December 2025 to make and receive calls. Many public traffic lights, railway signals and motorway signs still rely on PSTN

- Full fibre rollout and the withdrawal of copper-based services. This is known as 'copper retirement'. At the moment, if a customer has full fibre broadband it is likely they have full fibre to their local cabinet (FTTC) and copper network to their premises. Openreach is planning to retire its copper access network on an exchange area by exchange area basis, after it has deployed full fibre to the premises (FTTP). It is expected that for most areas the complete retirement of copper services will take place some years after PSTN switch-off in 2025. Currently only 3% of Tees Valley premises have coverage from a Full Fibre service from fixed broadband, compared to 18% nationally

How we will achieve our ambition:

- Proactive support and enabling of infrastructure investment in fibre and wireless delivery targeting hard to reach areas

- Proactive support and enabling of infrastructure investment in key industrial and business sites.

- Ensuring the Tees Valley is positioned well to maximise opportunities for investment presented by UK Government e.g., DCMS Project Gigabit

- Encouraging a 'dig once' approach to all projects

- Encouraging a collaborative approach to municipal asset usage to facilitate digital infrastructure deployment

- Raising the profile of the Tees Valley as a hotspot for digital infrastructure

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[9] Ernst & Young Global June 2020

| Digital Innovation

Our Ambition:

We will drive digital innovation across the Tees Valley, enabling the development of a Tees Valley Smart Region, supporting business growth through digital innovation, enabling businesses to make technology-led decisions and raising the profile of the Tees Valley as a hotspot for digital innovation.

Context

Innovation is a key driver of economic growth through the development of new ideas, products and processes and their adoption and diffusion across the economy, bringing benefits for both residents and businesses. By embracing new technologies and practices, UK businesses can lower costs and become more internationally competitive.

When it comes to digital intensity, the UK is ahead of some major European competitors, but lags behind international leaders such as Denmark, Israel and Japan. There is evidence that UK firms are relatively slow to adopt basic digital technologies, such as customer relationship and e-commerce tools which have been shown to have significant productivity benefits[10]. However, through the National Data Strategy and upcoming Digital Strategy, government is taking steps to help UK businesses significantly improve their adoption of digital technologies, building on advantages in foundational technologies such as AI, quantum computing and digital twins.

In July 2021 government published the UK Innovation Strategy: Leading The Future By Creating It which focuses on how government will support businesses to innovate by making the most of the UK's research, development and innovation system. The national strategy recognises that 'AI, Digital and Advanced Computing' is one of the seven technology families that make up UK strength and opportunity. The strategy also recognises that digital infrastructure is a key enabler of innovation, with digital services and networks underpinning the UK's ambition to be a world-leading science, technology and cyber power, allowing industry to grow and innovate. It advocates better use of smart data to support innovation, enabling start-ups, scale-ups and existing businesses to enter the market, develop and provide innovative services, and drive growth and productivity in relevant sectors.

The government has also announced Help to Grow: Digital, a new scheme to help 100,000 SMEs save time and money by adopting productivity-enhancing software, transforming the way they do business. Launching in late 2021, Help to Grow: Digital will combine a voucher covering up to half of the costs of preapproved solutions up to a maximum of £5,000, and free impartial advice delivered through an online platform.

State of play

The Covid-19 pandemic has forced businesses to rethink their operations, how they engage with staff and their use of technology. It is estimated that three years' worth of digital transformation took place in three months when the required public health measures began in March 2020[11], with companies accelerating the digitisation of their customer and supply-chain interactions and their internal operations. Globally 72% of SMEs have accelerated their digitisation rates in light of Covid-19[12].

Many companies are now making investments in long-lasting digital solutions to stay competitive in this new business and economic environment with businesses recognising the strategic importance of digital technology. Companies who have been successful during the pandemic report a range of technology capabilities that others don't, most notably, filling gaps for technology talent during the crisis, the use of more advanced technologies such as AI, and speed in experimenting and research and innovation.

The Tees Valley Covid-19 and EU Transition Business Survey 2021 found that:

- 63% of Tees Valley businesses surveyed had undertaken or were planning to undertake investment in information systems, including cloud-based systems/remote working

- 71% had undertaken or were planning to undertake investment in e-commerce and marketing

- 62% had undertaken or were planning to undertake investment in cyber and data security

In addition, almost half of all respondents to the national COVID-19 Digital and ICT Impact Survey Report[13] had experienced increased productivity since moving to remote working. There are correlations between employees who reported increased productivity, having all the ICT tools they require and providing services that have adopted new ways of delivery to citizens, communities, at risk groups and businesses.

The Higher Education sector also plays an important role in helping to facilitate R&D and innovation activity within the local economy. Higher Education Research & Development (HERD) provides a broad measure of innovative research activity led by universities and was estimated to be in the order of £222 per FTE job in the Tees Valley, 6% higher than the LEP network average. However, in terms of the percentage of firms with product innovations, the Tees Valley is ranked last out of all LEPs, with only 13.7% of firms having recorded a new or significantly improved goods or services introduced. Similarly, the Tees Valley ranks last for process innovation (10% of firms). For 'blue-skies' innovation the Tees Valley ranks second-last with just 4.7% of firms. Without innovation and increased advancements, output gaps will continue to widen.

Digital Innovation Strengths

- The recently launched Industrial Digitalisation Technology Centre (IDTC), based at Teesside University, also aims to support SMEs to explore the opportunities Industry 4.0 technologies bring, such as the Internet of Things (IoT), big data analytics, modelling, simulation and sensor technology. It gives companies access to a serious play facility, sensors, cloud computing capacity and academic support to look at new technology applications with their company.

- Boho – The £30million Boho development in Middlesbrough represents the opportunity to design, enable, create, and grow new digital opportunities and put the Tees Valley at the heart of the most important and rapidly evolving industries in the world. Focusing around the key pillars of communication, innovation, and sustainability, Boho will act as a catalyst for social, economic and environmental change within the region. It will nurture the freshest new talent and skills within the digital sector and act as a base of new businesses and industry start-ups. Estimated to be finished by 2022, Boho will ensure the Tees Valley becomes a recognised centre for digital investment both nationally and internationally

- DigitalCity – This long-standing Teesside University-led initiative connects people and businesses in the Tees Valley with the knowledge, skills and expertise needed to thrive in a digital future, working with the digital sector on start-ups, scale-up and digital innovation

- Teesside University's digital research and development provides a strong platform for industry/public sector collaboration and knowledge transfer across IoT, Big Data, Artificial Intelligence and Machine Learning, all of which are key technologies for improved productivity in key sectors such as engineering, advanced manufacturing, construction, healthcare and energy. Examples include:

  - ▶ Bioinformatics and data science, a core strength of the National Horizons Centre in Darlington, whose multidisciplinary work uses innovative approaches to manage, analyse and interpret large amounts of data

  - ▶ Digital transformation of energy systems and construction through digital twins, blockchain, BIM and smart energy to reduce waste, decarbonise and improve energy efficiency

[10] ONS (2018), 'Information and communication technology intensity and productivity', (https://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/articles/informationandcommunicationtechnologyintensityandproductivity/2018-10-05)

[11] BeTheBusiness (2020), 'The UK's Technology Moment – why 2020 can be the year that changed our trajectory'; (https://www.bethebusiness.com/wp-content/uploads/2020/09/The-UKs-Technology-Moment.pdf)

[12] Cisco/IDC (2020), '2020 Small Business Digital Transformation: A Snapshot of Eight of the World's Leading Markets', (https://www.cisco.com/c/dam/en_us/solutions/small-business/resource-center/small-business-digital-transformation.pdf)

[13] Socitm & Socitm Advisory August 2020 - Digital readiness, challenges and opportunities for local authorities in response to COVID-19

Key forms of university support for digital R&D and innovation include two-year Knowledge Transfer Partnerships, working with companies on a full-time basis to develop and deliver transformative digital products and services; shorter one-year Graduate Associate Programmes; Enterprise Europe Network support with partner sourcing, joint R&D and product development; and joint bidding and collaboration on a wide range of UKRI and Horizon 2020 research programmes involving digital technologies. The application of digital to the net zero agenda is central to the University's new Net Zero Industry Innovation Centre, which will house a Digital Modelling and Simulation Lab to support SMEs with innovative product designs for full-scale production and provide access for the demonstration and adoption of maintenance strategies.

- The National Horizons Centre (NHC) based in Darlington, led by Teesside University in partnership with the Centre for Process Innovation (CPI) and FUJIFILM Diosynth Biotechnologies. The NHC is responding to industry needs by training people with the latest digital skills, across operations and R&D in biologics and other related sectors, creating a pipeline of graduate talent that matches industry need; as well as designing and delivering industry-informed programmes to address technical, leadership and digital skills issues; and developing an internationally competitive applied R&D capability

- CPI - Biologics Centre, based in Redcar, is also home to the High Value Manufacturing Catapult centre which provides R&D facilities across a range of industries, including the use of advanced digital technologies and platforms to help customers design products, devices, formulations and manufacturing processes

- The Materials Processing Institute (MPI) in Redcar has particular expertise in the processing of materials and is currently focused on four key areas of activity: advanced materials; low carbon energy; circular economy; and industrial digitalisation

Made Smarter

In the manufacturing sector, the Made Smarter programme supports SMEs with intensive one-to-one advice, training, network and co-funding for digital transformation. In 2021 government scaled up support in the North East, and Tees Valley Combined Authority has recruited a Made Smarter growth consultant to assist local SMEs with digital transformation.

The Tees Valley also contains a number of other innovative schemes which are enabled through the use of digital technology, such as the rental of e-scooters. The Tees Valley Combined Authority, in partnership with the UK based e-scooter company, Ginger, was the first pilot region to test the rental of e-scooters as a zero-emission alternative to conventional public transport for shorter trips. Scooters can be rented out via an app and usage is monitored via a geo fence perimeter. The Tees Valley Wheels to Work scheme also provides flexible access to electric motorbikes to enable residents to access employment and training.

Digital Innovation Challenges & Opportunities

Digital Innovation Business Support

- The Covid-19 pandemic has moved digital innovation to the forefront of business planning, with businesses accelerating the digitisation of their customer and supply-chain interactions and their internal operations. Tees Valley SMEs across all industry sectors would benefit from specialist support in understanding digital technologies and how they can be used to improve their business, in turn helping to drive technology diffusion and enhanced digital adoption across the Tees Valley. This support has begun through the launch of the Industrial Digitalisation Technology Centre, linked to the work of DigitalCity, and local support available for Tees Valley manufacturing SMEs through the Made Smarter programme. There is the opportunity to build on this further, expanding support where necessary package in place by December 2025 to make and receive calls. Many public traffic lights, railway signals and motorway signs still rely on PSTN

Tees Valley Smart Region

- The Tees Valley currently has a lack of region-wide data platforms collecting smart data. A Tees Valley Smart Region would make active use of the Internet of Things (IoT) and open data to optimise the flow of energy, people and data. IoT refers to the network of physical objects that contain, for example, software or sensors that allows the objects to be connected to the Internet and each other. The objects can thereby interact and exchange data, as well as be remotely controlled or automated. IoT solutions may also involve cloud services and artificial intelligence (AI). This would be used to collect data from across the Tees Valley region, bringing it together in a smart data platform which would be used to improve operational efficiency, share information with the public and provide a better quality of government service. This would be known as a Tees Valley Smart Region and would place the concept of a 'Smart City' over the unique geographic, political and economic background of the Tees Valley

- Developing a Tees Valley Smart Region would allow the Combined Authority and the five Tees Valley Local Authorities to interact directly with both community and local town infrastructure to monitor how towns and local areas are evolving. Technology would be used to enhance the quality, performance and interactivity of urban services, ultimately reducing costs and use of resources

Innovation in Key Industrial Sites

- With the development of Teesworks and the success of obtaining the largest freeport in the UK, the Tees Valley has the opportunity to place these key industrial assets at the global forefront of digital innovation in industrial sites, becoming a recognised testbed area in support of government priorities

- The Tees Valley's rich industrial strengths will also lead to opportunities in the fourth industrial revolution (Industry 4.0), with automation of traditional manufacturing and industrial practices using smart technology such as AI and the Internet of Things to increase automation and improve communication and self-monitoring. In the manufacturing sector, the Made Smarter programme supports SMEs with intensive one-to-one advice, training, network, and co-funding for digital transformation

Digital Transport Innovation

- As part of its devolution deal, the Combined Authority has responsibility for developing transport infrastructure within the Tees Valley, with the aspiration to deliver a world-class transport system to underpin our economic transformation. This includes investing in intelligent transportation systems, using the latest technology to provide innovative services relating to different modes of transport and traffic management, enabling users to be better informed and make safer, more coordinated and smarter use of transport networks. In addition to this the Combined Authority has successfully secured a funding allocation from the City Region Sustainable Transport Settlement (CRSTS) along with seven other metropolitan areas. The settlements are aimed to be used to develop mass transit networks and sustainable transport options, open up new areas of the region for employment, leisure and housing, and create real innovation in transport to solve problems. As part of the Tees Valley CRSTS we have developed a Transport Digital Strategy which will support the development of a Tees Valley Smart Region, aiming to improve physical and digital access to employment and skills opportunities through innovation-led growth of industry and commerce

- In addition, in 2020 the government announced plans to develop the UK's first multi-modal hydrogen transport hub in the Tees Valley with a £3million investment in the area. The hub is bringing together government, industry and academia to focus future hydrogen research and development, real-world testing and demonstrations. A hub masterplan has identified options in the Tees Valley, as well as providing a blueprint for the creation of hubs in other areas across the UK. The funding will kick-start activity across the region, supporting collaborative R&D pilot projects and pop-up trials that demonstrate hydrogen technology solutions across transport modes and forge new industry and academic partnerships. Confirmed technology trials include diesel buses retrofitted with hydrogen fuel cells, supermarket chains benefitting from hydrogen delivery vans and the police and NHS using hydrogen vehicles for rapid response services

Digital Energy Innovation

- Digital technologies will also be an essential tool in achieving government's target of reaching Net Zero by 2050, with technology enabling a better understanding of energy usage as well as increasing efficiencies. Local businesses require support to understand and utilise technologies that assist in the reduction of carbon emissions and help restore biodiversity, giving businesses the digital tools to reduce their own emissions as we drive forward a Green Industrial Revolution. Examples range from usage of smart meters in homes to AI-powered climate research and carbon capture facilities. In the Tees Valley, Net Zero Teesside is a Carbon Capture, Utilisation and Storage (CCUS) project that aims to decarbonise a cluster of carbon-intensive businesses by as early as 2030 and deliver the UK's first zero-carbon industrial cluster. Working in partnership with local industry and with committed, world-class partners, the project plans to capture up to 10million tonnes of carbon dioxide emissions, the equivalent to the annual energy use of more than three million UK homes

Digital Culture and Heritage Innovation

- £60million of devolved government funds has also been allocated by the Combined Authority to enhance culture and tourism in the Tees Valley, with £20million to support the development of Tees Valley-wide cultural delivery and £40million to develop maritime and heritage (Hartlepool Waterfront and Stockton and Darlington Railway Heritage). Digital technology is being used increasingly within culture and tourism to enhance culture and heritage experiences, with technology ranging from digital preservation to assist cultural heritage to augmented reality and immersive virtual reality to enhance the tourism experience. The Combined Authority needs to ensure that digital technology is being considered and included where appropriate in the development of culture and heritage projects across the Tees Valley, supported where possible by home grown digital businesses in the area

Digital Innovation Testbeds

- Digital testbeds and trials are an opportunity to determine the evolution of digital technology, the majority of which revolve around exploring the benefits and challenges of deploying 5G technologies. The 5G Testbeds and Trials Programme, launched by DCMS in 2020, looks to create testbeds in areas where the UK has a competitive advantage, such as scientific research, engineering and technology. In line with this, testbeds and trials in the Tees Valley are encouraged around priority industry sectors

5G Use Case Examples

CHEMICAL PROCESS

Remote access, maintenance and monitoring

Sensor technology – IoT enabled units

Augmented/virtual reality in engineering and design

ADVANCED MANUFACTURING

Seamless integration of wired and wireless components for motion control

Automated Quality Control

Predictive Maintenance

CLEAN ENERGY, LOW CARBON AND HYDROGEN

AI powered climate research

Smart metres/grids – ultra-low latency smart monitoring for energy consumption

Intelligent street lighting

BIOSCIENCE

Robotic imaging medical devices

Remote collection of medical clinical trial information

Automated supply chains for key medicines

DIGITAL

Virtual reality cloud gaming

Augmented and virtual reality goggles

Multiplayer augmented reality gaming

LOGISTICS

Autonomous vehicles/drone delivery

Digital twins/real time tracking

Augmented reality windshields/windows

CONSTRUCTION

Holographic building visualisation

Real time design display

Remote inspections

HEALTH & SOCIAL CARE

Remote patient monitoring – health wearables/home sensors

Connected ambulances

Augmented/virtual reality consultations

CULTURE & TOURISM

Augmented and virtual reality tourism

5G augmented events

Virtual reality cinemas

BUSINESS AND PROFESSIONAL SERVICES

5G cloud computing

Fintech 2.0

Blockchain and smart contracts

PUBLIC SECTOR 5G TESTBEDS: TO SUPPORT THE DEVELOPMENT OF A TEES VALLEY SMART REGION:

Traffic management systems and public transportation, smart lighting, waste management, environmental monitoring.

How we will achieve our ambition:

- Supporting our local business community to understand digital technologies and how they can be used to improve business, building on existing strengths such as Boho, DigitalCity, IDTC and Made Smarter

- Supporting the development of a Tees Valley Smart Region using smart technology and the IoT, including intelligent transportation systems, smart homes, and uptake of smart technology to support public services

- Supporting the uptake of technologies that reduce carbon emissions and help restore biodiversity, giving local businesses the digital tools to reduce their own emissions as we drive forward a Green Industrial Revolution

- Considering and including digital technology, where appropriate, in the development of culture and heritage projects across the Tees Valley, supported where possible by local digital businesses

- Raising the profile of the Tees Valley through digital events such as Animex, esports, Tees Valley Games and other digital festivals

- Promoting the Tees Valley's common regional digital identity

| Digital Inclusion and Skills

Our Ambition:

We will ensure the benefits of the internet and digital technologies are available to everyone, while ensuring the supply of Tees Valley residents with high-level digital skills meets employer demand.

Context

Digital inclusion is ensuring the benefits of the internet and digital technologies are available to everyone. Digitally excluded people can lack skills, confidence and motivation, along with having limited or no access to digital equipment and affordable connectivity. Research for the UK digital strategy suggests that there are a number of important barriers to digital inclusion, including:

- access to digital equipment

- access to digital connectivity – the ability to connect to the internet and go online

- basic digital skills – the ability to use digital technology

- confidence – some people fear online crime, lack trust or don't know where to start online

- motivation – not everyone sees why using the internet could be relevant and helpful

- design – not all digital services and products are accessible and easy to use

- awareness – not everyone is aware of digital services and products available to them

Alongside this, improving digital skills across all qualification levels is central to the levelling up agenda, with the difference in skill levels linked to differing outputs and wages across regions. Improving digital skills and training is also essential to the Covid-19 pandemic recovery, providing people with the digital skills they need to get back into work. In addition, 80% of the workforce of 2030 are already in work today[14], and we need to offer them the opportunity to upskill and reskill over their careers to progress and adapt to digital technology changes such as AI and automation.

State of play

Home schooling and home working during Covid-19 lockdowns highlighted issues with digital inclusion in local communities. The pandemic has demonstrated the vital role of digital technologies with a significant share of the population being confined at home during various periods of the pandemic, the need for good internet connectivity, appropriate digital tools and digital skills to use those tools has surfaced rapidly. A large number of activities related to work, education, healthcare, caring, shopping, socialising and other pastimes, moved from the physical to the virtual world and are expected to remain.

Although the proportion of internet non-users in the North East has declined between 2012 and 2018, the North East still has a higher rate of non-internet

users than all other English regions with 10.5% of Tees Valley residents aged 16+ having not used the internet in the last three months, compared to 7.8% nationally[15]. When the pandemic hit in March 2020 only 51% of households earning between £6,000 to £10,000 had home internet access, compared with 99% of households with an income over £40,000[16]. Even when poorer households had access to equipment and the internet, they were then less likely to have the skills to utilise it. Tees Valley residents have some of the lowest wages in the country with a gross annual full-time median wage of £28,080 compared to £31,460 nationally, and approximately 13% of Tees Valley residents earning less than £10,000 per annum in 2020[17].
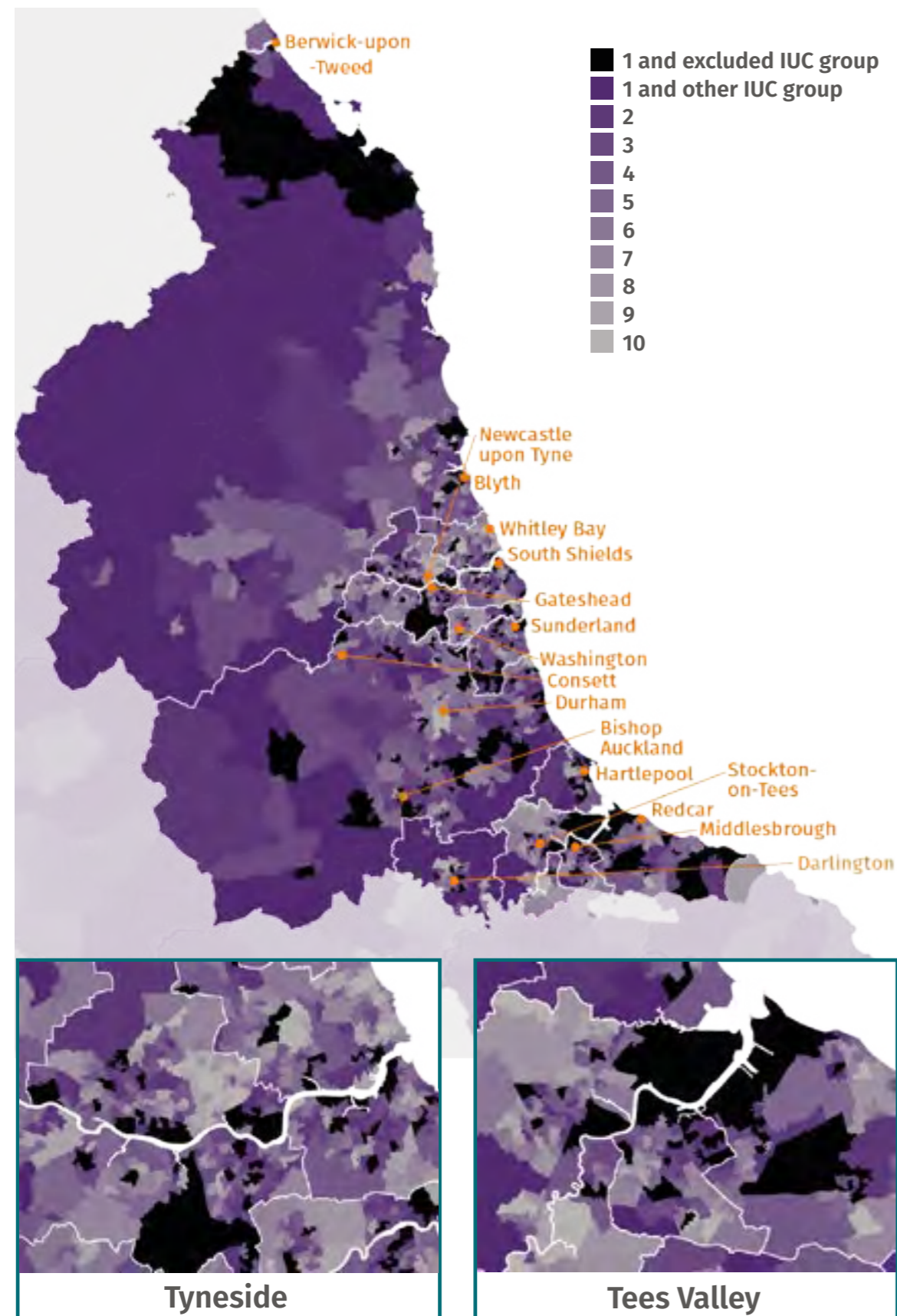
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[14] UK Skills Mismatch 2030 – Industrial Strategy Council
[15] ONS 2020
[16] State of the Nation 2020-21: Social Mobility in Great Britain July 2021
[17] ONS AHSE 2020

The below map illustrates areas at risk of digital exclusion within the North East, with concentrations seen in urban areas with high levels of deprivation, along with risk in some smaller towns[18].

Legend:
- 1 and excluded IUC group
- 1 and other IUC group
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

Map labels: Berwick-upon-Tweed, Newcastle upon Tyne, Blyth, Whitley Bay, South Shields, Gateshead, Sunderland, Washington, Consett, Durham, Bishop Auckland, Hartlepool, Stockton-on-Tees, Redcar, Middlesbrough, Darlington

Tyneside

Tees Valley

Source: Author's analysis of Alexiou and Singleton (2018), GMCA (2021), ONS (2011, 2020a, 2020b, 2021), Ofcom (2020), MHCLG (2019), and DWP (2021)

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[18] Taken from Roscoe E and Johns M (2021) Addressing digital exclusion in north east England, IPPR North.

Digital Kit and Affordable Connectivity

During the lockdowns, government brought in schemes to help education providers distribute laptops, tablets, 4G routers and free mobile data for vulnerable and disadvantaged children and young people who were home schooling due to Covid-19. However, in Great Britain, 8% of children still struggled to home school in February 2021 due to lack of devices[19]. The closure of schools during lockdowns has been linked to a negative impact on disadvantaged children, in particular those without the digital infrastructure and equipment in place to support home-schooling. The Tees Valley contains some of the most deprived areas in the country, ranking as the second most deprived LEP area in England with all five local authorities ranking in the most deprived 15% of local authorities nationally[20], with a large percentage of students on free school meals.

Internet service providers are beginning to tackle digital exclusion, for example Vodaphone's Everyone Connected initiative pledges for every Vodafone Together household they will donate a prepaid 20GB SIM to someone living in digital poverty for up to a year, as well as allowing customers to donate old devices to gift to young people in need together with six months of free data, unlimited calls and texts. The national databank launched by Virgin Media O2 and Good Things Foundation also aims to tackle data poverty by providing free mobile data to people in need.

Traditionally, in the Tees Valley, connectivity has been provided by either Openreach or Virgin Media, with the majority of internet service providers offering services through Openreach and minimum prices set for line rental and connectivity. However, over the past few years various alternative network providers have begun to operate in the Tees Valley, offering alternative networks to internet service providers and cheaper connection packages.

Digital Skills and Support

Within the UK, 53% of people believe they wouldn't have coped through the pandemic without online technology, with 8% of the North East still offline compared to 5% nationally[21]. Just 71% of the North East population is trained in basic digital skills, compared to a UK average of 79%, and the proportion of the population with zero basic digital skills is higher than that of all other English regions[22]. The UK Industrial Strategy Council predicts that, unless action is taken, in 2030 the most widespread under-skilling will be in basic digital skills.

Businesses have also highlighted a high number of skills shortage vacancies in digital roles, with access to high-level digital skills an issue both locally and nationally. This 'digital skills gap' existed prior to the pandemic, with demand for digitally skilled workers high across all levels of skills (basic, intermediate, and advanced skills). The pandemic has, however, heightened this demand for digital skills. In February 2020 there were 1,374 digital skills outlined as required across 2,720 job vacancies within Tees Valley. This figure rose to 2,002 across 3,683 in May 2021. The largest increases can be seen in demand for Microsoft Office skills followed by general computer literacy. Based on LinkedIn Learning, the top five skills UK companies need are cloud computing; artificial intelligence (AI); analytical reasoning; people management; and user experience design.

In January 2021, as part of the Lifetime Skills Guarantee, DfE announced a new wave of digital skills bootcamps, as an extension of a pilot programme they had been running in parts of the UK. The skills bootcamps are developed in partnership with employers, colleges, and local authorities, to help people develop the skills that are in-demand in their local area to get a better job. They include a range of digital courses and technical skills courses. They offer free, flexible courses of 12 to 16 weeks for adults aged 19 or over and who are either in work or recently unemployed (some skills bootcamps have additional eligibility criteria). They give people the opportunity to build up sector-specific skills and fast-track to an interview with a local employer. Digital bootcamps are being delivered in the Tees Valley by Teesside University's School of Computing.

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[19] ONS Feb 2021
[20] English Indices of Multiple Deprivation 2019
[21] Lloyds Consumer Digital Index 2021
[22] ONS Exploring the UK's Digital Divide March 2019

Digital Inclusion and Skills Strengths

As part of the devolution deal for the Tees Valley, the Combined Authority took responsibility for the Adult Education Budget (AEB), to deliver adult skills provision from August 2019 to new learners aged 19+ that live in the region. This allows the Combined Authority to direct adult education provision to target specific skills gaps in local businesses, including digital skills. Devolution of AEB funds includes support for the legal entitlements to full funding for eligible adult learners for "essential digital skills qualifications, up to and including level 1, for individuals aged 19 and over, who have digital skills assessed at below level 1". In 2020 the Combined Authority used these devolved adult education funds to enable adult education providers to use their Learner Support allocations to purchase digital equipment to support learners throughout the pandemic. Adult education providers in the Tees Valley could also use up to 2% of their allocations to provide support into the 2020/21 academic year, including CPD for staff to enhance digital skills to ensure delivery of high-quality online teaching.

Teesside University also provides its Teesside Advance Scheme, which gives all full-time undergraduates enrolling on year 0, 1 or 2 an iPad and £100 at the start of each academic year to spend on key course texts, mobile data and learning resources. Teesside University is also an Adobe Creative Campus, partnered with Adobe to promote digital literacy across all areas of study.

The North East region has launched 'Better ConNEcted', a campaign group dedicated to campaigning for digital inclusion in the North East of England. The group works with North East businesses to support innovative and practical solutions to getting people online, including supporting and training to improve digital disability accessibility. It also supports North East local authorities to make digital inclusion a priority and share best practice, encouraging local authority practices and policies to promote digital inclusion.

Within the Tees Valley there are also several local initiatives aimed at improving digital inclusion, including the South Tees Digital Development Partnership (STDDP) which provides the strategic coordination of activities across Middlesbrough and Redcar and Cleveland. The STDDP has launched Furbdit which works to reduce digital poverty by collecting unwanted digital devices and IT equipment, refurbishing, and donating back to the community.

In addition, charitable organisations such as Hartlepower have provided community broadband programmes to help combat digital exclusion, providing unlimited broadband through a free router and low-cost pay-as-you-go connections to disadvantaged residents. Hartlepower works collaboratively with voluntary sector partners, local authorities, and the Joseph Rowntree Foundation to deliver this programme.

Many of these local voluntary and community groups also provide digital skills training to support residents into employment.

Digital Inclusion and Skills Challenges & Opportunities

Although there are a number of digital inclusion activities taking place across the Tees Valley, access to digital devices and connectivity is still an issue for residents with some interventions being disparate and short-term. There is a need for strategic coordination of Tees Valley-wide activities, to support existing activities, with the possible provision of a digital inclusion framework for local authorities and the private sector.

Improving high-level digital skills is central to the levelling up agenda, with the difference in skill levels linked to differing outputs and wages across regions. Improving digital skills and training is also essential to the pandemic recovery, providing people with the digital skills they need to get back into work.

The challenge of finding experienced skilled people to fill jobs continues to be a key barrier to growth for the digital sector in the Tees Valley. Prior to COVID-19 36% of Tees Valley employers stated they found digital skills difficult to obtain compared to 32% nationally, with 42% of Tees Valley businesses anticipating digital skills will need developing in their workforce over the next 12 months[23].

Examining job adverts for digital occupations in the Tees Valley shows that Software Developers and IT Managers are the most frequently advertised posts, and the region has strong demand (relative to the national average) for Web Developers, IT Managers, IT Service Managers and IT Trainer roles. Popular skills that are in particularly high demand include skills related to IT management (e.g., hardware,

network security, configuration management, CompTIA A, Puppet), and web development (e.g. SEO, HTML5, accessibility). Less popular skills but which are in higher demand in the Tees Valley than elsewhere include skills related to animation and games sub-sectors (e.g., character animation, character design).

Digital upskilling is not a unique problem for the Tees Valley. As outlined within the UK's National Data Strategy Mission, the ONS has launched a Data Science Campus which has exceeded the NDS target of training 500 public sector workers to use data science skills. In 2021, the campus is scaling up existing training and continuing to develop new options to further improve data literacy and data science skills across the public sector.

We also have a diversity and inclusion challenge in the North-East. The under-representation of women in the technology workforce has been a chronic challenge – only 16% of digital occupations in England were held by females in 2018. There is no recent equivalent data for the Tees Valley, but we note that only 18% of higher education students in the region that qualified in digital courses in 2019/20 were female. In addition, 96% of respondents to a recent North East Digital Skills Audit[24] were of white ethnicity, 6% higher than the national average. This suggests there is a need to 'open up' the sector more and ensure we are acting to create wider opportunities to be a part of the industry.

How we will achieve our ambition:

- Increasing the number of Tees Valley residents with access to basic functional digital skills provision through relevant funding streams and programmes

- Identifying skills needs of local SMEs through business diagnostics and signposting to relevant digital skills training/provision

- Expanding existing digital inclusion activities across Tees Valley providing strategic coordination across the region to reflect local need

- Supporting Tees Valley residents to access low-cost connectivity options

- Encouraging and engaging in activities aimed at broadening digital diversity

- Ensuring the Tees Valley digital skills offer is better aligned to the needs of local employers

- Raising the profile of the Tees Valley as a digital hotspot for skills – retaining and attracting talent

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[23] DfE Employer Skills Survey 2019
[24] Digital Skills Audit – North East 2021 (Sunderland Software City)

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