

Cheshire and Warrington LEP

Digital Infrastructure Plan

October 2020



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1. Executive Summary

The C&W LEP Digital Infrastructure Plan sets out a vision to play an integral role in enabling the objectives of the Local Industrial Strategy to be delivered and to leverage infrastructure assets and investments made to date, facilitating a step-change towards the next generation of fixed and mobile connectivity. In doing so, Cheshire and Warrington will be able to service the industries of the future, provide best in-class connectivity to its business and citizens and remain competitive, resilient and adaptable to change, in a regional, national, and global context.

The case for digital and the need to invest in infrastructure capable of delivering sustained growth and competitive advantages is seen within a variety of sub-regional policies. This is a demonstration of LEP and local partner alignment with the government's digital agenda, but also helps to reaffirm a consistent recognition of the value of digital connectivity.

In July 2017 Cheshire and Warrington launched its refreshed Strategic Economic Plan (SEP) which sets out the sub-region's growth ambitions to 2040. The refreshed SEP sets out the high-level vision to double the size of the Cheshire and Warrington economy by 2040, founded on a series of spatial and thematic priorities including digital. The LEP is also at an advanced stage in producing a Local Industrial Strategy for Cheshire and Warrington which includes reference to the importance of digital skills and infrastructure in boosting productivity, economic resilience, and social and economic inclusion.

The LEP, in conjunction with its local authority partners, is keen to ensure that it has a clear, developed, and deliverable Digital Infrastructure Plan needed to support its long term economic growth ambitions and the changing nature of how people and business use digital technologies in their homes, workplaces and for leisure. This is particularly true of the development of key sectors and priority growth locations, which will rely on access to high speed, secure and resilient digital infrastructure as they consume greater quantities of data and harness technologies to support research and innovation.

Whilst the sub-region has prospered from a sustained period of positive overall economic growth, equating to increased employment and productivity, the LEP has a retained focus on the importance of resilience, reflected within its emerging LIS. With the seismic and far-reaching impacts of COVID-19 becoming more apparent, these considerations are placed into even sharper focus, as the need for a rapid recovery is born out in data, sentiment and opportunity to insulate businesses from future economic shocks paramount.

Policy has traditionally orientated around urban centres, market towns and key employment sites being the focus for growth, underpinned by the planning system. There are trends that suggest this model of economic activity may be changing. Quality of life measures, the desire to work flexibly and improve work-life balance are all key factors driving a pattern of more distributed working, alongside the commercial imperative – many of which have been facilitated as a result of improved digital connectivity. Whilst Cheshire and Warrington have made great strides in improving fixed and mobile connectivity, rural areas are still challenged by the quality and extensiveness of provision. In the context of flexible and dispersed working, innovative SMEs operating from rural locations and the wider digital reliance on other infrastructure, there is a need to ensure balance and provide increasingly equitable connectivity versus urban counterparts.

The overarching message is clear – digital infrastructure is integral to the future development and success of the Cheshire and Warrington economy and is an engine for growth that is helping the area to overcome challenges and exploit new economic opportunities. Whilst uses cases vary, digital dependency is a common trait – one that is fundamental to the sub-region's prospects and future economic resilience.

This Digital Infrastructure Plan covers a five-year period to 2025, which is appropriate both in the context of technological and policy change. The Plan supports four strategic objectives and priorities, which drive the measures to be delivered within the timeframe.

Objective 1: Enable Gigabit Capable infrastructure across the C&W LEP sub-region, with particular focus on delivery to priority/gap areas, through leveraging commercial and

government investment programmes that promote services delivered at a fair price and through an open network infrastructure that attracts a wide variety of retail service providers.

Objective 2: Address areas of coverage inconsistencies and speed/service inequalities in recognition of changing work patterns, a mobile workforce, reliance on connectivity and the convergence of fixed/mobile technologies.

Objective 3: Adopt/strengthen a consistent barrier busting approach to digital policy.

Objective 4: Drive adoption of digital connectivity by increasing participation/skills and take-up of services.

The Plan captures the existing digital infrastructure assets and capability across the Cheshire and Warrington sub-region, cross-referenced against current / intended major government initiatives and explores potential synergies with existing or planned programmes in neighbouring subregions. The C&W LEP is committed to sourcing and securing the right level of funding to deliver the plan and expects to work in partnership with industry.

There is a significant ongoing coordinating role for the C&W LEP in delivering the vision, objectives and actions of the Digital Infrastructure Plan, leveraging their unique built-up knowledge of existing and planned infrastructure within the C&W LEP sub-region and building on the successful work done thus far to improve digital connectivity.

In order to help deliver the Digital Infrastructure Plan, there is a need to encompass a more holistic view of digital infrastructure, including 4G, 5G and IoT in addition to the governments drive towards gigabit-capable connectivity, and sufficient resources allocated to provide this coordination. This is vital in order to ensure alignment and proactive engagement with DCMS, to ensure the C&W LEP sub-region is able to leverage and gain early benefits from national programmes such as Outside-in and the Shared Rural Network (SRN) in addition to helping shape future programmes and policy. Only by taking a more holistic view of digital infrastructure, helping to remove barriers to deployment, stimulating the market to deliver more and identifying areas where intervention is required across a range of connectivity types can the economic ambitions of the LIS and SEP be fully realised.

2. Strategic Context

2.1. Introduction

The Cheshire and Warrington Strategic Economic Plan (SEP) sets out the sub-region's growth ambitions to 2040 that encompasses the high-level vision to double the size of the Cheshire and Warrington economy by 2040, founded on a series of spatial and thematic priorities including digital. This is built on a legacy of work undertaken by the Cheshire and Warrington Local Enterprise Partnership (C&W LEP) and its partners, which has sought to grow, specialise, and increase the competitiveness of the Cheshire and Warrington economy. The SEP has also helped Cheshire and Warrington to anchor itself within larger economic development constructs, such as the Constellation Partnership and the Northern Powerhouse, which provide opportunities for the C&W LEP to collaborate with partners where there are shared interests, including on digital matters.

C&W LEP is currently developing its Local Industrial Strategy (LIS), underpinned by a robust evidence base (including that which informed the Strategic Economic Plan). This strategy will identify the distinctive strengths of the sub-region, whilst highlighting potential issues that may hinder growth aspirations. The LIS includes reference to the importance of digital skills and infrastructure in boosting productivity, securing economic resilience, and delivering social and economic inclusion.

The C&W LEP, in conjunction with its local authority partners, is keen to ensure that it has a clear, developed and deliverable plan for the digital infrastructure needed to support its long term economic growth ambitions and the changing nature of how people and business use digital technologies in their homes, workplaces and for leisure. As C&W LEP and partners continue to invest in the sub-region's economic future, so does the importance of projects and programmes being digitally connected. The investment pipeline is significant, with many of the projects well-placed to exploit digital technology and unlock the benefits of high quality fixed and mobile connectivity. This includes investments to strengthen C&W's innovation ecosystem, the provision of digital skills, development of more integrated and responsive transport networks and also the benefits associated with place-making and regeneration, shaped by IoT, 'smart' technologies and the ability for digital to inform design and community engagement.

The Digital Infrastructure Plan (DIP) covers a five-year period to 2025, which is appropriate both in the context of technological and policy change. The plan will be reviewed and updated where required to reflect relevant changes in local progress and national directives.

2.2. Approach

An evidence base has been gathered in support of this Digital Infrastructure Plan that has included the following activities:

- Reviewing and mapping of existing digital infrastructure assets and capability across the Cheshire and Warrington sub-region, to highlight the current strengths, gaps, and opportunities
- Identification of future needs of the sub-region, aligned with the SEP and LIS, and to identify potential use cases
- Determination of digital infrastructure related business needs and opportunities working in partnership with C&W LEP Officers and Growth Hub
- Identification of potential synergies with existing or planned programmes in neighbouring subregions
- Cross-referencing against current / intended major government initiatives and funding opportunities

2.3. Digital Opportunity

Recognition of the far-reaching value of digital technologies is crystallised within the following eight dimensions:

1) Strategic Drivers: a broad spectrum of policy acknowledges the importance of cyber and digital businesses and the scope they have to support national economic growth, as evidenced within the **UK Industrial Strategy, C&W Digital Strategy** and C&W LEP's emerging **Local Industrial Strategy (LIS)**.

2) Economic Impact: the 2018 Tech Nation report estimated the value of the UK's Digital Tech economy to be nearly **£185 billion**, growing at a rate nearly **3 times faster** than the rest of the UK economy, with strong prospects envisaged.

3) Global Competitiveness: the 2019 Tech Nation report highlighted the **global race to be digital** and the pace of growth internationally, with the **UK in close competition** with the likes of the United States, Japan, South Korea, China and Germany.

4) Online Security: cyber threats are very real and have proven to be disruptive and challenging to economies globally, reinforcing the need for cyber resilience to be in place and **digital technologies to be driving the next wave of safeguards**.

5) Environmental Sustainability: digital technology **is propelling a new phase of innovation and research**, helping to develop solutions for the world's most prominent environmental challenges in an integrated, smart, and sustainable way.

6) A Societal Leveller: digital technologies have helped to increase the democratisation of societies, **providing new and interactive ways for citizens to learn, influence and contribute**, irrespective of locational and geographic limitations.

7) A Cross-Cutting Enabler: increasingly identified as an economic enabler, **digital technology is embedded within an increasingly broad cross-section of industries**, and so-called development of the fourth industrial revolution (Industry 4.0).

8) Efficient Public Services: governments, central and local, are **undergoing a continued programme of digital transformation**, aimed at service delivery improvement, greater efficiency, responsiveness, and improved transparency.

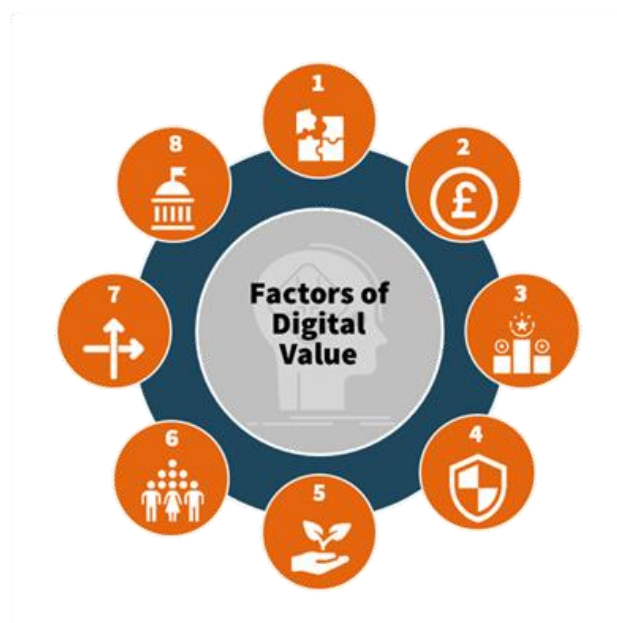
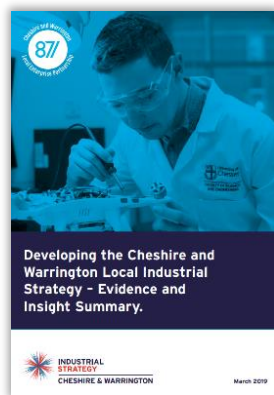


Figure 1: Reach and Value of Cyber/Digital Technologies

The continued prospects for digitally-led growth appear to be exceptionally strong, but fast, robust, and upgradable infrastructure must be in place for the impacts to be maximised. Investment in digital networks to date has played a key role in the competitiveness, specialisation, and increased productivity of the C&W economy, providing a basis from which to build, servicing sectors that are at the forefront of technology. These ambitions have been shared by C&W LEP and supported in the Local Strategic Narrative (see Table 1) that sets out the case for digital and the need to invest in infrastructure capable of delivering sustained growth. Competitive advantage is seen within a variety of sub-regional policies. This is a demonstration of C&W LEP and local partner alignment with the government’s digital agenda and further ambition, reaffirming a consistent recognition of the value of digital connectivity.

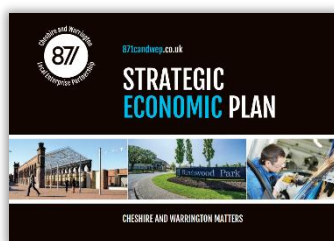
Strategy	Digital Positioning
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C&W LIS Evidence and Insight Summary
(2019)



- Notes the importance of digital technologies in delivering productivity gains and unlocking innovation, as well as tackling the Grand Challenges identified in the UK Industrial Strategy.
- Makes the case for further digital infrastructure investment because of coverage inconsistencies and speed/service inequalities.
- Outlines the need to support the rural economy and digital technology’s role as a leveller in terms of physical barriers.
- Articulates the need for the workforce to be digitally skilled and prepared to work in sectors that are increasingly shaped by technology, with new ways of learning underpinned by digital networks.

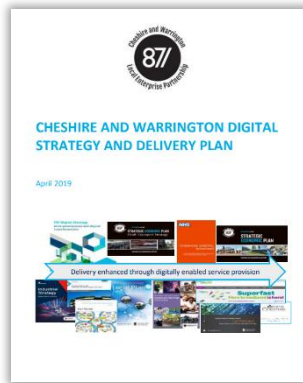
C&W SEP
(2017)



- Sets out support for the digital sector and wider base of industries that have become digitally dependent, as an area of significant growth and specialisation potential.
- Makes clear the need to invest in best-in-class fixed and mobile infrastructure, positioning the C&W LEP sub-region as one of the best-connected places in the UK.
- Reasserts the need to drive adoption and ensure people have the skills necessary to exploit digital opportunities and access productive employment.

C&W Digital Strategy
(2019)

- Sets out a framework to realising the potential opportunity digital technology presents for the sub-region.
- Orientated around a vision which seeks to “create digitally-empowered, connected communities to support, grow and future-proof the vibrant local economy through a digital revolution”.
- Acknowledges the importance of digital transformation to the public sector and



service delivery as well as triggering a variety of employment, education, and quality of life improvements.

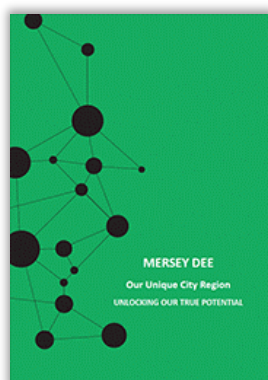
- The strategy provides a roadmap to delivery, built around three strategic priorities (Digital People and Digital Services, Digital Industrial Revolution, Strategic Planning, Collaboration).

C&W Transport Strategy (2017)



- The strategy acknowledges the important role digital connectivity has in enabling people to make better informed travel decisions and in doing so make more efficient use of the available transport networks.
- Recognises the potential that changes to more flexible working practices could have in relieving pressure on the transport networks, particularly during peak times.
- Articulates the need for continued investment in digital connectivity to ensure people are able to benefit from these changes.
- Makes clear the importance of providing the underpinning digital technologies to support future transport developments such as autonomous vehicles, smart ticketing, smart motorways, etc as they emerge.

Mersey Dee Alliance Growth Prospectus (2017)



- Recognises the regions reputation as a breeding ground for advanced expertise in manufacturing, science, engineering and energy industries, which are increasingly digitally dependant.
- Notes that investment in both transport and digital infrastructure has not kept pace with demand and puts forward a package of investments needed.
- Reasserts the need for skills to match the future requirements of the economy by highlighting the need to upskill the workforce.
- Sets out a number of digital schemes for investment between 2016-2024 with the aim of achieving 100% coverage of Ultrafast broadband.

Constellation Partnership HS2 Growth Strategy

- The Strategy makes the case for HS2 to be the centrepiece for the partnership's growth agenda, unlocking transformative opportunity through connectivity.

(2018)



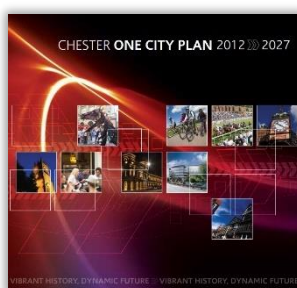
- The railway is positioned to support a good and sustainable growth agenda, as well as being the key to unlocking regeneration and new development.
- Looks at other factors that are likely to drive growth, including the need for digital infrastructure to drive smart technologies, overcome physical connectivity challenges and drive new employment opportunity.
- Sets out how the delivery of HS2 can provide complementary digital infrastructure that can service locations along the line.

Cheshire East Economic Strategy
(2019)



- Draft text within the strategy notes the importance of digital businesses and their economic potential, in an urban and rural context, with a focus on Creative/Digital but also its cross-cutting impact.
- Makes clear that digital infrastructure improvements are a necessity for the area's economic vitality to be maximised.
- Also notes the wider value of digital connectivity linked to its value as an enabler of skills, social mobility, and life-work balance.
- Calls for action and a continuation of working with government and the private sector to address connectivity issues.

Chester One City Plan
(2012)



- Whilst somewhat dated in terms of when it was first published, the Plan is a 15-year strategy to guide the future economic regeneration of Chester.
- The document notes the need for the city to be future facing and support the growth of new and emerging sectors, especially those with a digital focus.
- Calls for investment in the city's infrastructure to attract investment and enhance competitiveness including broadband connectivity.

Table 1: Strategic Narrative

2.4. Digital Landscape

2.4.1. National Position

Currently, according to Ofcom's Connected Nations Spring 2020 update, 95% of premises in the UK have access to Superfast broadband speeds (30Mbps or greater), with 54% able to access Ultrafast broadband (300Mbps or greater) and 12% of premises connected to Full Fibre infrastructure. Furthermore, 91% of the UK's geography is now covered by a 4G signal by one or more mobile networks, with 99% of premises able to receive signal indoors from at least one operator whilst 95% of the UK's road network has coverage.

The UK Government has set out its ambitions to ensure world class digital connectivity that is gigabit-capable, reliable, long-lasting, and widely available across the UK – and to do so at pace. As part of this a £1.1 billion digital connectivity package was launched, including the £400 million Digital Infrastructure Investment Fund to help investment in new fixed and mobile networks; the Local Full Fibre Network (LFFN) programme; and the 5G Testbeds and Trials programme. The UK Government also introduced legislation to exempt new full fibre infrastructure investment from business rates and the Barrier Busting Task Force was created, whose remit it is to identify barriers to fixed and mobile network deployment, and to work with industry, local authorities, and others to overcome them. Legislation has also been put in place creating a new Universal Service Obligation (USO) giving every household and business the right to request a broadband connection of at least 10 Mbps.

The UK Government set an ambitious target for 15 million premises to be connected to full fibre by 2025, with nationwide coverage by 2033. The UK Government also wants to be a world leader in the next generation of mobile technology, 5G, with deployment to the majority of the country by 2027 so that UK consumers and businesses can take early advantage of the benefits. The election of a new Prime Minister in the summer 2019 triggered a renewed commitment to accelerating the digital agenda, including further digital infrastructure investment with a desire to see the UK full fibred by 2025. Subsequent announcements have the Government pledging £5 billion to support the rollout of gigabit capable broadband in the hardest to reach 20 per cent of the country.

The Future Telecoms Infrastructure Review (FTIR) highlighted that despite over 97% coverage of superfast broadband, largely based on copper user connections, the UK is in danger of falling behind on rolling out fibre and 5G connections. As a result, the UK Government propose a more proactive approach than has been taken historically in the UK. The Building Digital UK (BDUK) Superfast Broadband programme acted on failure of the market to deliver in hard to reach areas, providing subsidy to stimulate the market. The challenge of building a full fibre network is much greater and the opportunity cost of the delay in connecting non-commercial areas is also much greater. Recognising this, the FTIR proposed, as part of a wider range of measures, an outside in approach to ensure that intervention for gigabit capable connections take place in the expected non-commercial areas, and to build in from these to meet the commercial infrastructure to ensure that no areas are systematically left behind. Further detail on the approach and supporting UK Government initiatives is expected to materialise in due course.

In addition to fixed connectivity, the Government announced in October 2019 a new £1bn deal with Three UK, Vodafone, O2 and EE (BT) to establish a new Shared Rural Network (SRN), which will see the mobile operators working cooperatively together in order to extend the geographic coverage of 4G (mobile broadband) services to 95% of the UK by 2025. Ofcom see improving 4G coverage as a top priority and have identified a number of initiatives to improve coverage for 4G, and to help develop 5G including release of more spectrum to operators; proposals to enable shared access to spectrum; and improving coverage in building and vehicles through legalising some types of mobile phone repeaters.

5G continues in its development and the launches to date are a hybrid using the existing 4G core network and new 5G radio sites which allows the support of enhanced broadband and elements of massive machine communications. This will be further enhanced with future release of the standards and implementation of a 5G core to give the full benefits of 5G capabilities. The challenge for operators is how 5G can be rolled out in the fastest, smoothest, and most efficient way possible, while meeting the key objectives of successful coexistence with 4G and continuous growth. The capacity demands of 5G will also drive the need for deeper fibre penetration for

connecting mast sites. 5G covers a wide spread of use cases and technology but initial deployments will be for enhanced mobile broadband, primarily in cities and large towns to provide existing mobile services but with a better experience. The wider benefits of 5G's capability to support IoT at scale, lower latency specialist solutions and multiple private networks over the same infrastructure, will take time to develop and become available, driven by a business case.

The Department for Digital, Culture, Media and Sport (DCMS) in August 2019 challenged rural areas across the UK to compete for a slice of a £30 million fund to research and develop apps that take advantage of 5G technology. The Rural Connected Communities (RCC) competition will see up to ten rural areas selected to run 5G trials that will emphasise innovative use cases and technical solutions to build the business case for investment in rural connectivity and demonstrate the capabilities of 5G to benefit rural communities. RCC applications deadline was 25th October 2019. At the same time, the UK Government launched a consultation on plans to simplify planning rules to make it easier to build mobile infrastructure and boost network coverage in hard-to-reach parts of the country. The consultation on planning reform closed on 4th November 2019. A further open competition within the 5G Testbeds and Trials Programme, 5G Create has made available up to £30 million of government funding, aiming to explore and develop new use-cases and 5G technical capabilities, as well as demonstrate sustainability after government funding finishes.

The current UK Government workstreams can be summarised as follows:

- Superfast Broadband
- LFFN
- Gigabit Voucher Scheme (GBVS)
- Rural Gigabit Connectivity (RGC)
- USO
- Mobile - Improving 4G Coverage
- 5G Testbeds and Trials
- Outside In / Final 20% (in development as of the date of this plan)

Appendix A provides further context to the telecoms sector, including legislative framework, State Aid scheme, Investment Models, Public Bodies Role, Community Role, market drivers and barriers and technology trends.

2.4.2. Cheshire and Warrington LEP Position

2.4.2.1. Information/Data Sources

Coverage information at a postcode level (derived from Ordnance Survey Codepoint polygon dataset) was determined using the Ofcom Connected nations report 2020 (Spring release) dataset. This database contains the coverage levels for each area based on data collected from all operators and processed at a postcode level.

Mobile coverage was also mapped using Ofcom Mobile data, which is issued in a 100x100m grid cell format, covering the C&W LEP sub-region. This list contains the number of operators in each cell providing 4G at a strength of -105dB.

The mapping exercise formed the basis in determining current coverage levels and to determine strengths, weaknesses, and opportunities for consideration. The dataset captured to date has been complemented with additional datasets to provide a strategic view of gap areas in recognition of C&W LEP priorities when developing the Digital Infrastructure Plan.

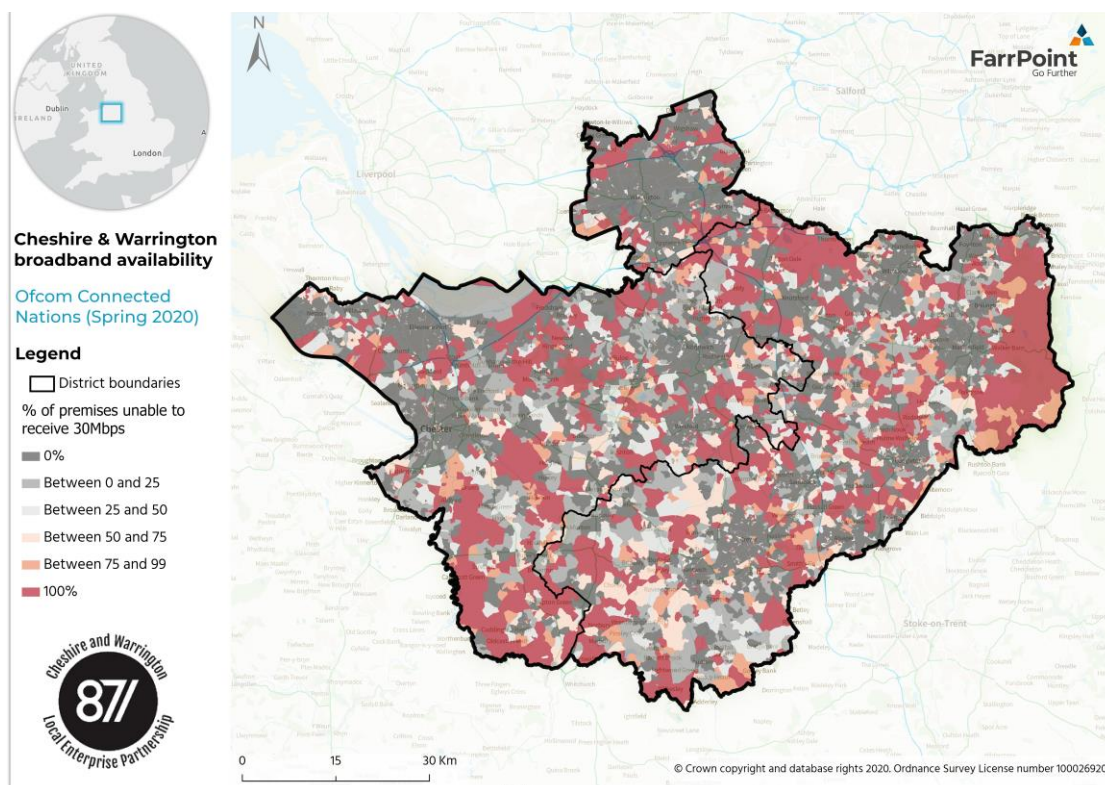
2.4.2.2. Outputs

2.4.2.2.1. Superfast Broadband Coverage

Superfast Broadband Coverage is shown in Figure 2. The Cheshire and Warrington LEP sub-region has an overall coverage figure of 94% which is comparable with the overall UK coverage of 95%.

Cheshire East has the lowest coverage of Superfast broadband at 92.8%, closely followed by Cheshire West and Chester with 94.6% coverage. The largely rural nature of these areas will play a factor, which historically present more challenges and are less commercially attractive to suppliers for deployment of broadband infrastructure. Conversely in Warrington, which is predominantly urban in its geography, coverage of Superfast broadband is above the overall UK average at 97%. The widespread coverage of Superfast broadband across the C&W LEP sub-region means that most of the business and industrial parks are well served.

It should be noted that the figures are based on the more recent 30Mbps Superfast definition relating to Next Generation Access (NGA) broadband used by Ofcom and the EU rather than the previous 24Mbps definition used by Government's BDUK programme, which had a target of reaching 95% coverage of UK premises by the end of 2017. When using the previous 24Mbps definition, the C&W LEP sub-region has an overall coverage figure of 96%.

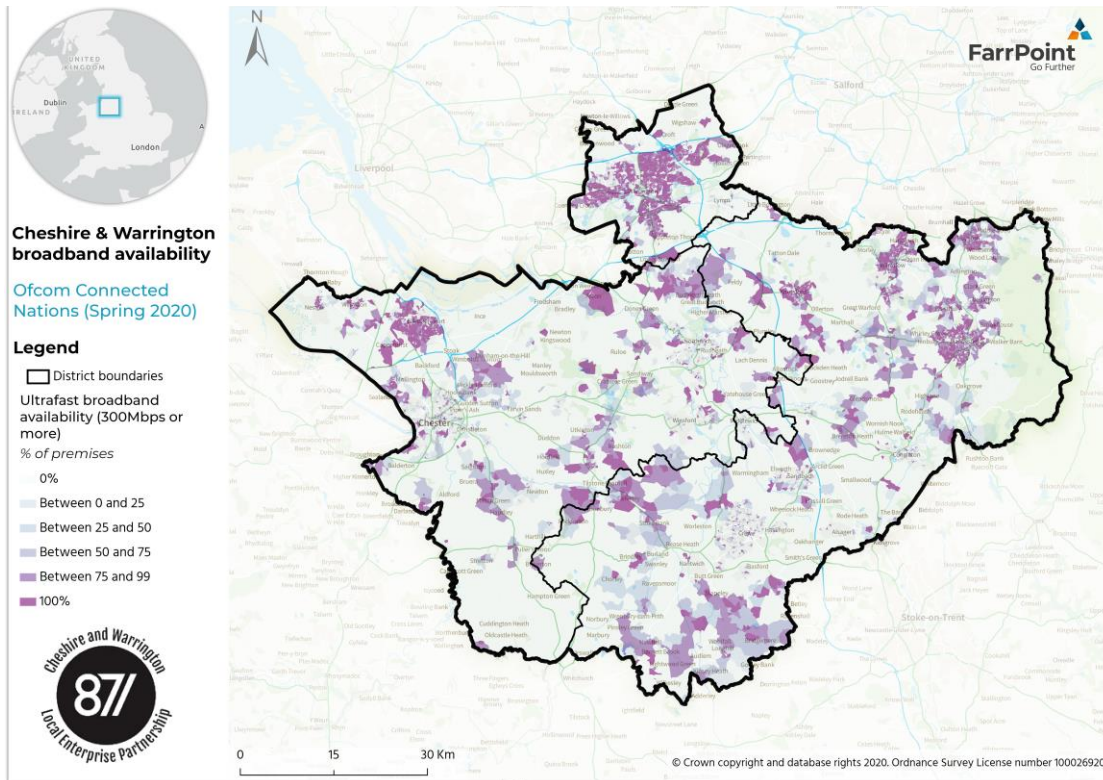


Area	% Superfast Availability	Number of Premises with Superfast	Number of premises without Superfast
Warrington	97.0%	95,781	2,913
Cheshire East	92.8%	175,278	13,619
Cheshire West and Chester	94.6%	160,504	9,083

Figure 2: C&W LEP Sub-region Superfast Broadband Coverage

2.4.2.2.2. Ultrafast Broadband Coverage

Ultrafast Broadband Coverage is shown in Figure 3. Overall, 67% of premises in Warrington have access to Ultrafast broadband, which is above the overall UK average of 54%. Both Cheshire East and Cheshire West and Chester are poorly served by Ultrafast broadband when compared to Warrington and the overall UK, with only 33.4% and 26.8% coverage, respectively.



Area	% Ultrafast Availability	Number of Premises with Ultrafast	Number of premises without Ultrafast
Warrington	67.0%	66,168	32,526
Cheshire East	33.4%	63,087	125,810
Cheshire West and Chester	26.8%	45,414	124,173

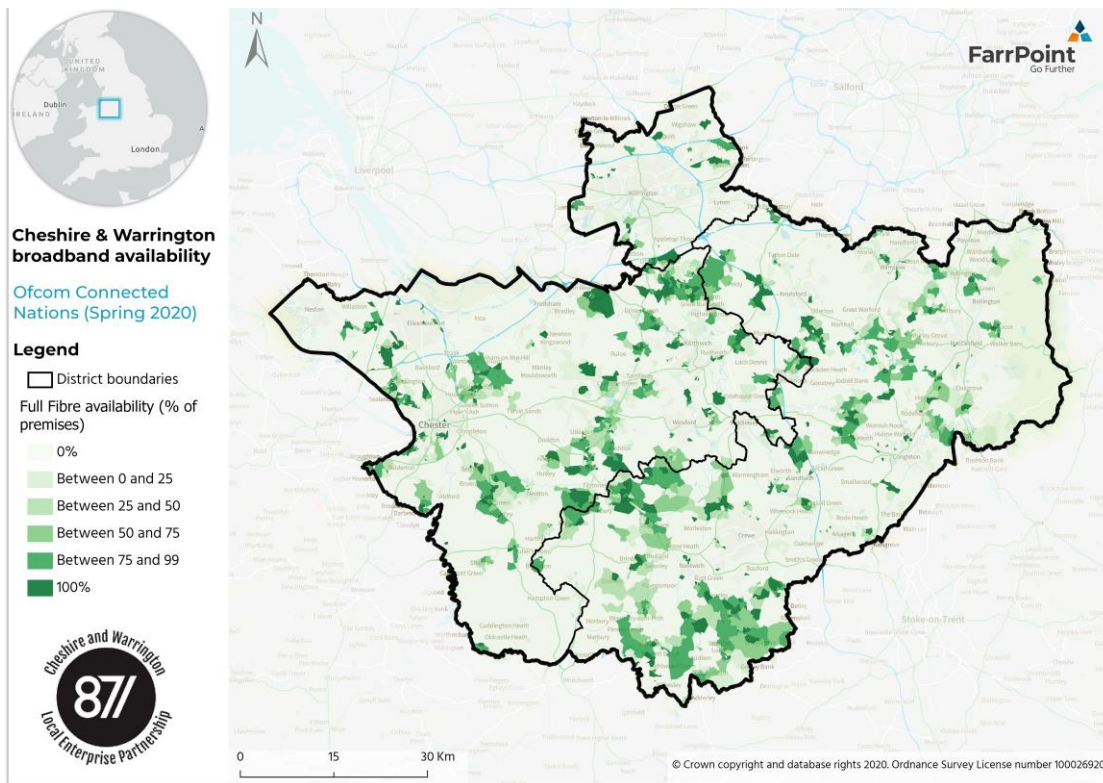
Figure 3: C&W LEP Sub-region Ultrafast Coverage

2.4.2.2.3. Full Fibre Broadband Coverage

Coverage of full fibre broadband infrastructure is shown in Figure 4 and varies across the C&W LEP sub-region, with Cheshire West and Chester having the best coverage at 8.4%, whilst Warrington has the least coverage at 1.2%. All areas are below the UK average figure of 12% coverage, with much of the coverage in less densely populated areas, possibly as a result of the existing Connecting Cheshire programme where full fibre connectivity was the only viable option to deliver the contracted speeds. As with Ultrafast coverage, business and industrial parks are typically poorly served by full fibre coverage. Full fibre coverage offers the most future proofed and scalable technology for delivering the UK Government's target of Gigabit capable broadband across the UK. The definition of 'gigabit' in this context is not yet formally agreed and as such it is impossible to identify with any certainty which premises, postcodes or areas are able to receive such a service yet, with this unlikely to be clear until later in the year when BDUK

publish their guidance, based on a new State Aid notification needed to allow public subsidy in areas of market failure. The Ofcom Connected Nations data does not report on availability of gigabit download speeds.

Note: businesses may have a dedicated private telecommunications circuit (known as a 'private circuit') between two or more locations, or a Direct Internet Access (DIA) circuit delivered via a fibre connection according to a commercial contract with an operator that offers such business grade services. Such services are widely available throughout the UK, although come at a cost premium compared with a fibre broadband connection. Unfortunately, due to the 'private' nature of these connections it not possible to provide an accurate map of which premises have such a connection, however it would be reasonable to assume that in business / industrial parks and areas with large retail stores this type of connection will be commonplace, in part due to the lack of suitable alternatives.



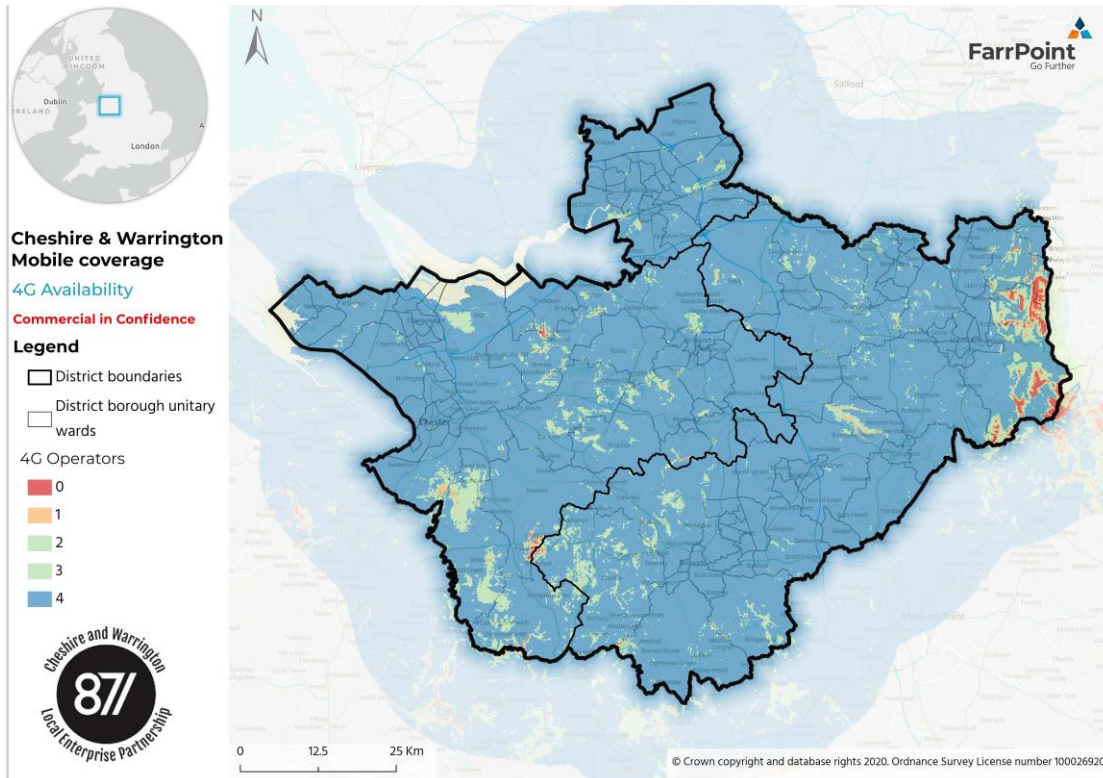
Area	% Full Fibre Availability	Number of Premises with Full Fibre	Number of Premises without Full Fibre
Warrington	1.2%	1,199	97,495
Cheshire East	4.2%	7,944	180,953
Cheshire West and Chester	8.4%	14,242	155,345

Figure 4: C&W Sub-region Full Fibre coverage

2.4.2.2.4. Mobile (4G) Coverage

As shown in Figure 5, 4G coverage across the C&W LEP sub-region is good, with over 90% of the geographic area able to receive a 4G signal from all four Mobile Network Operator Networks (MNO's) outdoors, leaving less than 1.1% unable to receive an outdoor mobile 4G signal. This compares favourably against the UK average figures of 67% and 9% respectively.

Indoor 4G coverage however is not as good, with only Cheshire East able to receive a 4G signal in 83.2% of its premises from all four MNO's, against a UK national average of 81%, whilst both Warrington and Cheshire West and Chester have less than 70% of premises able to receive indoor 4G signal from all four MNO's. However, less than 0.7% of premises across the C&W LEP sub-region are not able to receive an indoor signal from any MNO, compared to the UK national average of 1%.



Area	% geography covered by all 4 MNOs	% geography not covered by any MNO	% premises covered indoors by all 4 MNO's	% premises not covered indoors by any MNO
Warrington	97.0%	0.0%	68.3%	0.1%
Cheshire East	91.1%	1.1%	83.2%	0.7%
Cheshire West and Chester	91.8%	0.2%	65.7%	0.5%

Figure 5: C&W LEP Sub-region 4G Mobile Coverage

2.4.2.3. Adoption

Adoption figures are available for take-up of Superfast broadband that has been deployed via the Connecting Cheshire programme which can be used as a proxy to gauge demand for digital connectivity more generally within the C&W LEP sub-region.

In the most recent published figures by BDUK (March 2020¹) this showed that 68.31% of premises able to access Superfast broadband as part of the initial phase-1 contract, and 58.31% of premises delivered as part of the more recent phase-2 contract had taken up a Superfast broadband service from an operator. These compare favourably to the average take-up across

¹ Source - <https://docs.google.com/spreadsheets/d/1Hs00bNsyRV1WoOt-fow3rsNXzpcKg26AsOWvk1bvJrk/edit#gid=7>

all BDUK Superfast programmes in the UK which for the same period was 62.66% and 48.54% respectively, providing clear evidence that strong demand exists for digital connectivity within the C&W LEP sub-region.

Again, whilst regional mobile take-up figures are unavailable, a recent survey by Deloitte² looking at UK wide found that 88% of UK adults have access to a smartphone, and 95% of these smartphones are used every day. The report further indicates that adoption remains strongest within the 18-24 and 25-34 age groups, among whom mobile ownership is almost universal at 93% and 94% respectively whilst within the previously resistant 45+ age groups, adoption has leapt from 60% to 90% for the 45-54 age group, and up to 80% for those aged 55-75.

2.4.2.4. Future rollout

Digital infrastructure continues to be rolled out across the C&W LEP sub-region as part of supplier's commercial deployment in addition to the ongoing work of the Connecting Cheshire programme to bring Superfast broadband connectivity to those areas excluded from commercial deployments and UK Government initiatives, with much of the focus now on delivery of full fibre / gigabit-capable infrastructure in support of the government target of providing gigabit-capable connectivity to the majority of premises by 2025. The investment and competition that alternative suppliers have introduced has influenced incumbent behaviour, expediting deployment of new networks and services by a variety of operators in both urban and rural areas.

In addition to this there has been some initial deployment of 5G infrastructure within the C&W LEP sub-region, however this is currently limited to parts of Warrington only, limiting the opportunities for citizens or businesses to harness the benefits it could bring.

2.4.2.4.1. Connecting Cheshire Programme

The first two phases of the Connecting Cheshire roll-out were delivered in partnership with Openreach using a gap funded model to invest local and the UK Government's Building Digital UK (BDUK) agency funds. This was completed in June 2019, with £39m of funding from the partnership between the four Cheshire councils, BT and BDUK, including funding from the European Regional Development Fund, invested to reach an additional 106,000 premises; of which over 90,000 are now able to access superfast, or above speeds. The overarching aspiration of Connecting Cheshire Local Broadband Plan was to deliver 'NGA for all', now defined as download speeds of 30Mbps and above.

As part of its ongoing work to bring Superfast broadband connectivity to premises across Cheshire East, Cheshire West and Chester, Halton and Warrington the Connecting Cheshire Programme is currently undertaking a procurement exercise for a third phase of deployment following completion of an Open Market Review (OMR) in Aug 2019 and subsequent Public Consultation which closed on the 6th Apr 2020.

The Invitation to Tender (ITT) for this third phase of the programme was launched on 29th Jun 2020 with a submission deadline for bidders of 21st Sept 2020 with contract award anticipated in Nov / Dec 2020. Of the 540,490 premises within the Overall Geographic Area (OGA) this third phase is focussed on the 21,920 remaining NGA White premises, of which the programme is seeking to specifically target 2,197 SMEs, located in 1,256 unique business premises.

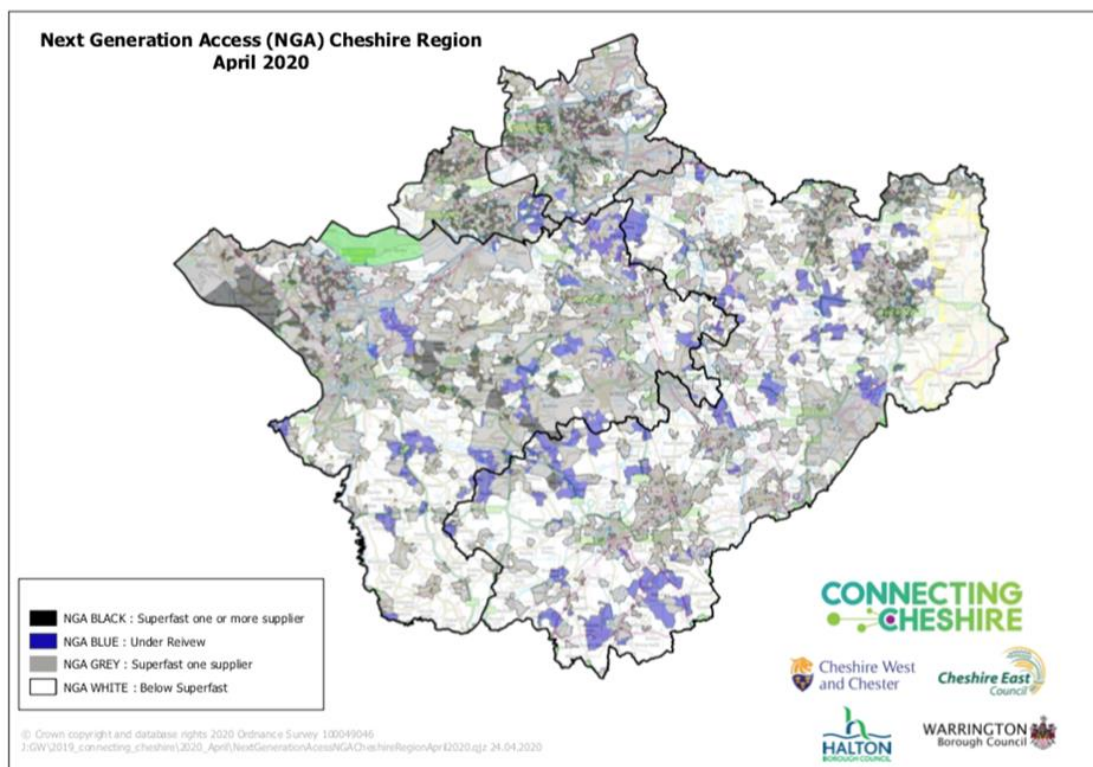
The procurement is seeking a solution that can deliver gigabit download speeds (1000Mbps) to end users to as many premises as possible within the geographical areas by the end of 31 March 2023. However, where it is not economically viable to provide a solution that delivers gigabit capability, suppliers can propose a solution at lower speeds, provided that such a solution meets the requirements of NGA Qualifying technology for State aid purposes.

² Source - <https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/technology-media-telecommunications/deloitte-uk-plateauing-at-the-peak-the-state-of-the-smartphone.pdf>

The procurement is also designed to target as many premises on the slowest broadband speeds (<15 Mbps) as possible within the target area. The procurement has £4.5m of funding allocated with an upper contract limit of £10m, subject to approval of a further £5.45m of funding being secured from the Local Authority partners. The programme is funded by a combination of local authority monies and European funding from the European Regional Development Fund (ERDF). This means that to ensure compliance with the ERDF grant funding regulations, each structure deployed as part of the programme must enable NGA connectivity to at least one eligible SME within the target area. ERDF funding of £4.25m is required to be utilised on eligible businesses by 31 March 2023.

Figure 6 shows the geographic locations of the premises to be targeted within the procurement and provides a summary of the number of premises within each category as determined by OMR/State Aid Public Consultation (SAPC).

This shows that some premises within the OGA already have NGA broadband services available, or there is a commitment to make NGA available in the next three years by a commercial operator, meaning these premises are Out of Scope Premises and are mapped as NGA grey or black. The remaining premises are classified as NGA white and as such In Scope for the procurement, with a further proportion classified as 'under review'. Whilst these under review premises are not targeted for the purposes of the procurement, Connecting Cheshire will continue to review the relevant operator's plans regularly and where it is determined that delivery is not taking place can through a Contract Change Control Procedure include these 'under review' premises for further NGA deployment.



Lot Name	A) Total Premises in Overall Geographic Area	B) Target NGA White Business Premises (in scope of this ITT)	C) Total NGA White premises	D) Under Review NGA White Premises (potentially in scope of the contract at a future date)	F) Out of Scope Premises in Overall Geographic Area (not in scope of ITT)
Geographic area	540,490	1,256	21,920	2,093	516,477

Figure 6: Connecting Cheshire phase-3 intervention area

2.4.2.4.2. Commercial broadband rollout

Openreach

Openreach committed a £12 billion investment to connect over 20 million premises over the coming years to a new full-fibre digital infrastructure via its “Fibre First” programme, which initially aims to connect 4.5 million premises by the end of March 2021³ with a further 3.2 million homes and businesses in rural areas of the UK by the mid-2020’s⁴.

Figure 7 illustrates Openreach’s current plans for their Fibre First Towns, Cities and Boroughs and Rural Market Towns and Villages Build Programme within the C&W LEP sub-region and shows a number of areas are included within these plans with the communities of Congleton and Winsford already able to access full fibre services⁵. This does not show any full fibre deployment related to other programmes such as the work on the Connected Cheshire / BDUK programme, new sites / retro new-sites, or other smaller scale programmes or infill work undertaken by Openreach.

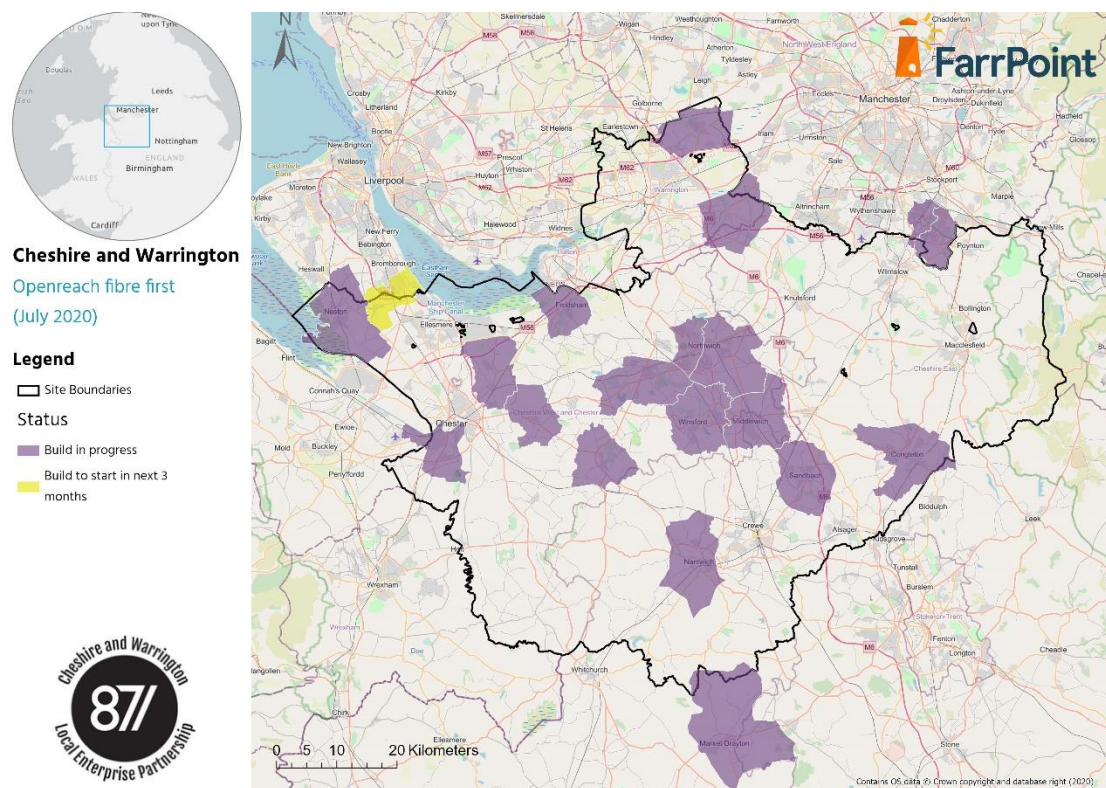


Figure 7: C&W LEP Sub-region Openreach Fibre First deployment

It should be noted that to deliver these plans Openreach are planning to hire more than 1,000 new engineers in 2020 across the UK, which could provide employment opportunities for residents within the C&W LEP sub-region.

Virgin Media

Virgin Media are in the process of upgrading their infrastructure across the UK to gigabit-capable speeds via their “Gig1” service which offers an average peak-time download speed of 1,104Mbps. To date the upgrades have been completed in major city areas including Liverpool

³ Source - <https://www.openreach.com/fibre-broadband/fibre-first#ourfibrefirstprogramme>

⁴ Source - <https://www.openreach.com/news-and-opinion/articles/over-three-million-more-rural-homes-and-businesses-to-get-full-f>

⁵ Source - <https://www.openreach.com/news/openreach-pledge-to-upgrade-harder-to-reach-areas-brings-a-broadband-boost-to-congleton-and-winsford/>

and Manchester, resulting in Virgin Media customers in Warrington and Knutsford now being able to access gigabit-capable broadband⁶.

This is likely to extend to other Virgin Media coverage areas such as Macclesfield, Wilmslow, Poynton and Bollington in the east, and Ellesmere Port, Neston and parts of Chester in the west as part of their nationwide plans to bring gigabit speeds to nearly 15 million homes by the end of 2021.

CityFibre

CityFibre is currently the UK's largest alternative provider of wholesale fibre network infrastructure and has announced network build projects in over 60 out of an anticipated total of 100 towns and cities to reach up to 8 million homes as part of their £4bn Gigabit City Investment Programme, with construction already underway in a number of areas.

Within the C&W LEP sub-region, Chester has already been announced⁷ for inclusion within this programme, with early discussions ongoing in Warrington.

Similarly to Openreach's recruitment plans above, CityFibre are running a UK-wide recruitment and training programme to fill up to 10,000 network construction jobs to help build their networks including both experienced construction workers as well as those seeking career changes and training opportunities with a specific focus on attracting more women and individuals from Black, Asian and Minority Ethnic (BAME) backgrounds, both of which are significantly under-represented in the construction industry.

These jobs will be created within CityFibre's growing pool of network construction partners, each of whom is responsible for delivering against contracts that will run for up to 7 years providing long term opportunities for those who successfully complete the selection and training process.

B4RN Cheshire (Broadband for the Rural North)

B4RN was originally created in rural Lancashire in 2011 as an FCA-registered community benefit society which is owned by the communities it serves and cannot be sold to, or taken over by, any commercial company. Since then it has enabled over 5,000 homes and businesses to connect to a 1 gigabit (1000Mbps) symmetrical, full-fibre service at extremely competitive pricing through its community-led approach, with any profits returned to the local community.

However, unlike typical commercial rollouts communities that want the B4RN service must build their own segment of the B4RN network. This means raising funds by encouraging investment in B4RN shares, identifying potential subscribers, persuading landowners to allow the network to cross their land and recruiting volunteers to do the build. B4RN is registered as a supplier under the Government's GBVS, meaning residents and businesses in eligible postcodes could get assistance towards the installation cost of the B4RN service to their home or business.

Unfortunately, as B4RN relies on volunteers and landowner co-operation to keep build costs to a minimum the pace of deployment varies significantly making it difficult to give a firm timeframe as to when properties will be connected.

The service is currently live in the area from Capenhurst to Shotwick, with plans underway to extend this infrastructure into the surrounding areas of Ledsham, Woodbank, Puddington, Burton and Ness in future⁸.

2.4.2.4.1. Improved 4G Coverage

The Shared Rural Network (SRN) is tasked with increasing geographic coverage of 4G from mobile operators across the UK by tackling total and partial coverage not-spots. By 2026 this

⁶ Source - <https://www.virginmedia.com/shop/broadband/gig1-gigabit-broadband>

⁷ Source - <https://www.cityfibre.com/news/cityfibre-reveals-36-towns-cities-benefit-full-fibre-rollout-accelerates/>

⁸ Source - <https://b4rn-cheshire.org.uk/>

programme will see 4G coverage from all four operators rise to a minimum of 90%, up from 81% in 2020, and coverage from at least one MNO increase to 98%.

2.4.2.4.2. 5G rollout

Mobile operators are still in the early stages of 5G deployment in the UK, with an initial focus on high footfall urban areas. As a result of this, Ofcom do not currently publish coverage data, preventing a detailed coverage map from being produced at this stage.

Mobile operators do however regularly announce details of where they have deployed 5G, and by looking at these announcements we can see that across the C&W LEP sub-region 5G coverage is currently limited to areas within Warrington thus far from both Vodafone and O2. EE and Three are yet to deploy and 5G infrastructure within the sub region, as shown in Figure 8.

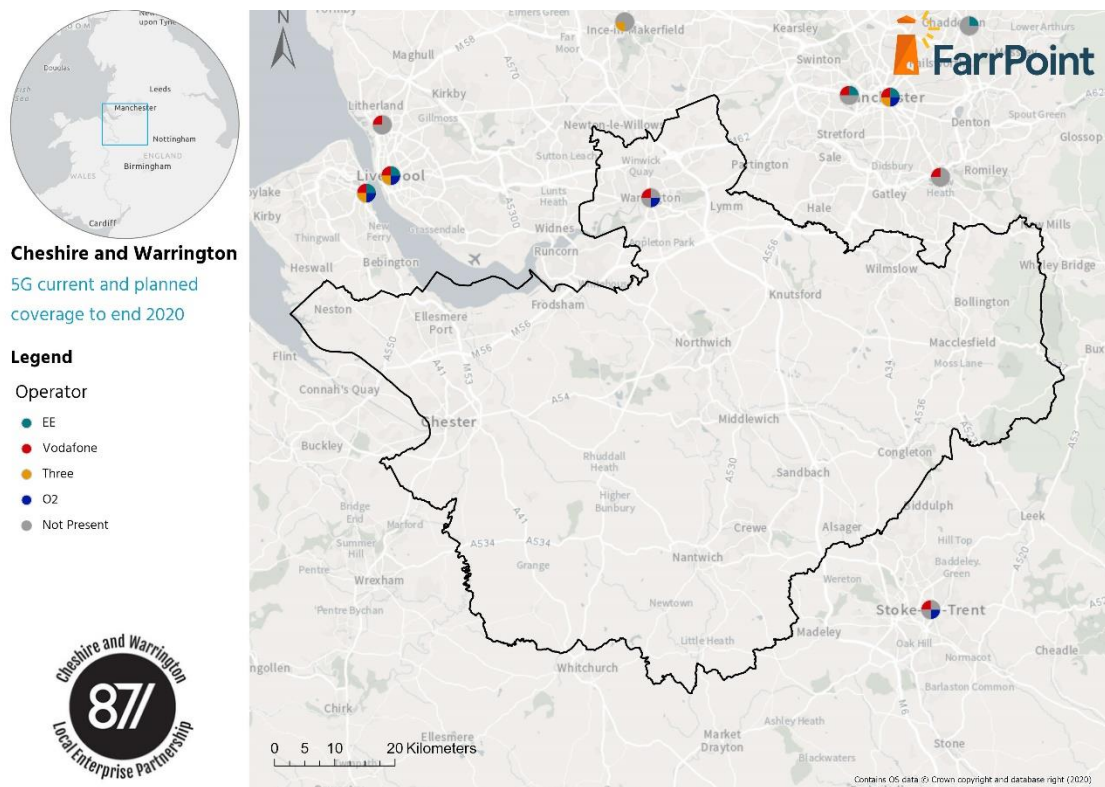


Figure 8: C&W LEP Sub-region current 5G deployment

Feedback from the industry suggests that 5G rollout will initially begin with Mobile operators upgrading existing macro sites in dense urban areas before spreading outwards to other less dense urban areas, areas of high footfall (retail parks, business parks) and major transport routes. Feedback also suggests that it is unlikely that 5G coverage will reach more rural areas in near future unless there is a specific requirement or business case to drive this.

2.4.3. Other initiatives

Collaboration on the development of a Connected Corridor for world-class supply chain management

The North Wales Economic Ambition Board has described a Growth Vision for North Wales which aims to accelerate the growth of the North Wales economy significantly by 2035. The Growth Vision focusses on transport infrastructure, housing, skills and employment support for existing business and digital infrastructure. To develop the digital infrastructure element of the growth ambition, a North Wales Digital Connectivity Strategy was developed, identifying a range of initiatives which would significantly enhance digital infrastructure provision within the region.

One of these initiatives is the development of a 'Connected Corridor' of 5G and LPWAN gateways to enable world-class supply chain management along the entire length of the A55 (European Route E22) and A483 to allow enhanced tracking capability of goods and vehicles, particularly those accessing the region's ports and industrial zones.

Key sectors and businesses operate through extended (often global) supply chains, with the efficient operation of these supply chains, and major transport operations (such as ports) ideally requiring tracking of goods, vehicles, etc over extended distances.

The importance of high capacity 5G and LPWAN wireless connectivity for management of goods, components, vehicles, and transport containers was determined in discussion with lead companies in the manufacturing, energy, and transport sectors. The research identified the importance of tracking items well beyond the boundaries of individual manufacturing or transport facilities. Improvements to supply chain management require tracking of items over many miles to improve manufacturing and transport schedules.

As an example of how this initiative might be used, the Port of Holyhead could track commercial transport vehicles and containers as they approach the site with any necessary online documentation verified before vehicles and containers reach the port and appropriate loading schedules produced. Where necessary, vehicles could be held at locations away from the port – helping to maximise the use of space at the port for efficient loading and un-loading of ships. These developments are considered particularly important for the management of the transport of goods through the port post Brexit.

Similar use by advanced manufacturing companies for tracking the delivery of key components can enable more efficient production schedules. As advanced manufacturing approaches are increasingly applied to major construction projects, similar productivity improvements will also apply during the construction of key sites and facilities – taking advantage of the connected corridor and regional campus LPWAN and 5G deployments.

As the use of high capacity 5G and LPWAN becomes established, it is expected that widespread commercial deployment will be undertaken, potentially under concessions along road and rail routes. The intention of this initiative is to provide an initial strategic uplift to the North Wales region through the early implementation of a connected corridor along the key commercial route in the region. The A55 and A483 routes provide a clear strategic commercial corridor through the region.

The A55 and A483 route is 156 km in length, and as the route already has fibre connectivity along its length there is no expectation that additional fibre deployment will be required. It is proposed that 5G and LPWAN infrastructure will be installed along the full length of the A55 – with a combined 5G and LPWAN transceiver installation every 2km.

Commercial models being considered by the North Wales Economic Ambition Board for very high bandwidth network deployment include:

- Interest bearing repayable loan;
- Grant funding;
- Equity investment; or
- A combination thereof

The proposed network will also include extensive coverage of the network rail route across the region and both passenger connectivity and rail signalling applications are considered likely commercial opportunities in the short term with further exploitation in the medium to long term (10-15 years) including connected and autonomous vehicles.

The proposal for the Connected Corridor route does not end at the border with England and consideration for extending the scope of the network will follow in the project business case.

The North Wales Economic Ambition Board has already expressed an interest in collaborating with both C&W LEP and Highways England, which will be investigated further during business case development for the initiative. A proposal to extend the Connected Corridor across the M56 to the M6 is seen as a logical step, meeting potential investment from the private sector in the foreseeable future where existing strong 4G coverage is upgraded in areas of intensive

transport activity. Figure 9 below shows two alternative potential routes have been modelled for such an extension, ranging from 61km to 76km. The longer of these two routes is likely to be preferred as it passes not only the Airbus UK East facility but also passes a number of business, industrial and retail parks along the proposed route before ultimately reaching the junction between the M56 and M6 where there is a significant cluster of logistics and distribution businesses located (identified as a key sector by C&W LEP).

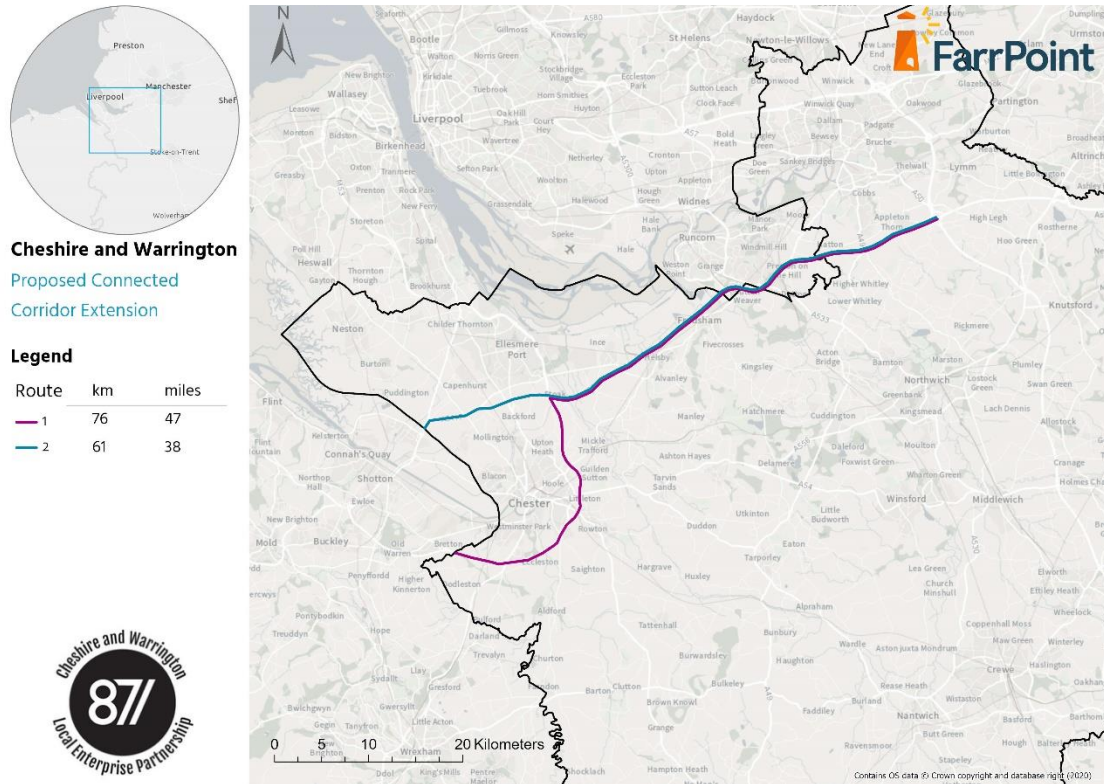


Figure 9: C&W LEP Sub-region Proposed NWEAB Connected Corridor Extension

Dig Once / Backhaul Network

The Liverpool City Region Combined Authority (LCRCA) has an ambition to connect key digital assets in the Liverpool City Region (LCR) which include the super-computer at SciTech Daresbury and the several trans-Atlantic cables which reach the UK mainland around Southport. SciTech Daresbury has a high-performance computing capability that is the most powerful supercomputer in the UK dedicated to industrial R&D and is involved in a unique, global collaboration with IBM Research. The trans-Atlantic cables carry internet traffic between the UK, North America and the rest of the world and offer reduced latency which is a source of competitive advantage for hyperscalers and other large data users in the LCR.

At the time of starting the project less than 2% of premises in the LCR had access to full fibre, lower than neighbouring areas of Greater Manchester and Leeds City Region and significantly lagging the best performing digitally connected cities internationally. The cities that have done this well, such as Dublin, Amsterdam and Stockholm, use fibre led connectivity as an inward investment point of difference. LCR seeks to do the same, driving both economic growth and public service delivery improvements.

The LCR Backhaul Network will interconnect all six constituent Local Authority areas within the LCR. An indicative route has been considered and in-principle agreements have been reached with representatives from the six Local Authorities in terms of network routing, however this proposed route remains subject to optimisation by the Joint Venture, including carrying out detailed surveys and obtaining all necessary approvals. LCRCA's purpose in delivering the infrastructure is both to generate a financial return and to secure and stimulate enhanced economic growth across LCR underpinned by this digital infrastructure, with a "no borough left behind" approach.

Any commercial arrangement that is entered into by LCRCA will be expected to deliver and manage a fibre backhaul network across the entire LCR. The LCR Backhaul Network is expected to both stimulate the development of local-loop fibre networks, but also maintain the ability to connect across and through, creating a unified architecture across the LCR.

The aim to develop a commercial partnership will allow LCRCA to retain part ownership of the infrastructure assets, sharing the risk, and in return benefiting from the financial opportunities that could be achieved. The ambition for the network:

- A commercially viable and technically secure venture
- A futureproofed and resilient backhaul network
- Operates at the wholesale passive layer with open access infrastructure
- Enables future expansion by either the Joint Venture or by other third parties / altnets
- Support at least one major economic cluster in each Local Authority area
- A technical solution which provides superior performance, confidence, and capacity.

Approximately 220km+ of digital infrastructure will be installed in carriageways, footpaths, and cycle ways over the next three years, connecting all six-boroughs to the Hartree supercomputer in Halton, one of the most powerful supercomputers in the country.

£6.4m from LCR's Strategic Investment Fund will be invested in Halton, Knowsley, Liverpool, Sefton, St Helens and Wirral to lay ducts while existing roadworks take place in an innovative approach known as 'dig once'. It is anticipated that c.30% of the overall digital network will be installed via this system, minimising disruption to road and public transport users.

Procurement of a joint venture partner to act as co-investor, commercialisation partner and network manager of the future network has already begun.

There is scope for C&W LEP to work with the Liverpool City Region Combined Authority to further develop plans and the business case to secure funding to extend their 'Dig Once' duct and backhaul network into the Ellesmere Port area of the C&W LEP sub-region initially, whilst looking at other opportunities to extend this infrastructure into other parts of the C&W LEP sub-region (see Figure 10):

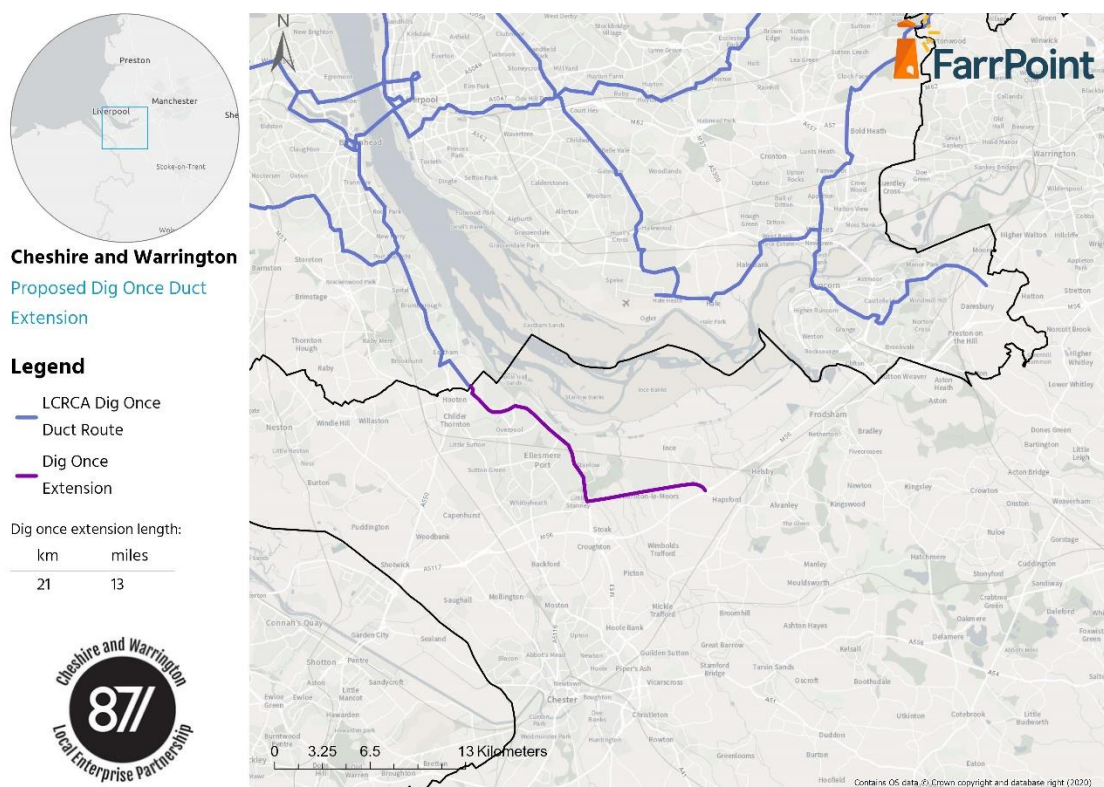


Figure 10: C&W LEP Sub-region Proposed LCR Dig Once Duct Extension

2.4.4. Current Strengths and Gaps

There has been significant work done by the Connecting Cheshire programme to ensure both residential and business premises across the C&W LEP sub-region have access to digital connectivity, taking Superfast broadband (24Mbps) coverage from 67% that was predicted to be delivered by the market alone to the current figure of 96%, and in doing so contributing to the UK Government target of 95% overall UK coverage by the end of 2017. A procurement is ongoing with an intervention area consisting of 21,920 remaining NGA White premises, that includes:

- 2,197 SMEs
- 12,275 premises in areas of deprivation across the C&W LEP sub-region. Figure 11 shows the most deprived areas, those areas with an Index of Multiple Deprivation (IMD) score of 1-5 (1 being the most deprived and 10 the least within the index), that are within scope for the next phase of the Connecting Cheshire programme's deployment.

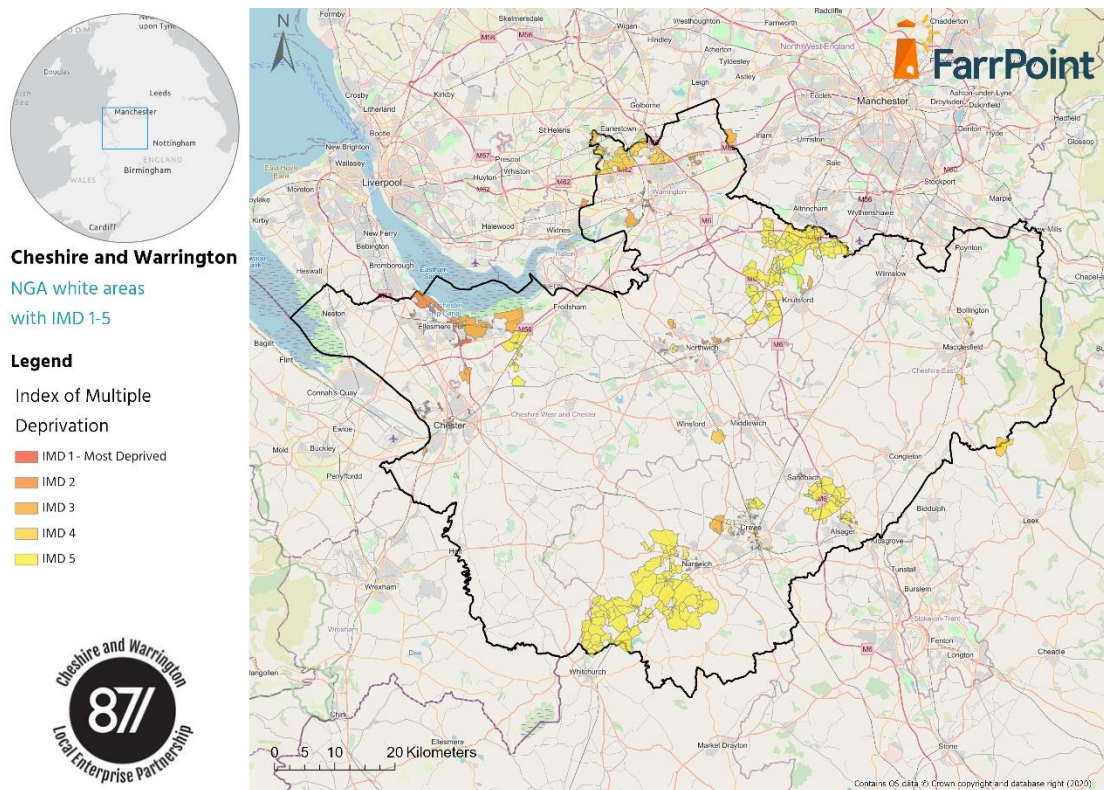


Figure 11: C&W LEP Sub-region NGA white areas vs. deprivation

- Premises in total or partial not spot areas – those where premises are unable to access either Superfast broadband or 4G connectivity or offer very limited coverage. Figure 12 highlights these not-spot areas within the C&W LEP sub-region with analysis indicating that 1,146 premises are in areas without access to Superfast broadband and 4G services, with an additional 1,772 premises in areas without access to Superfast broadband and coverage from only a single 4G operator.

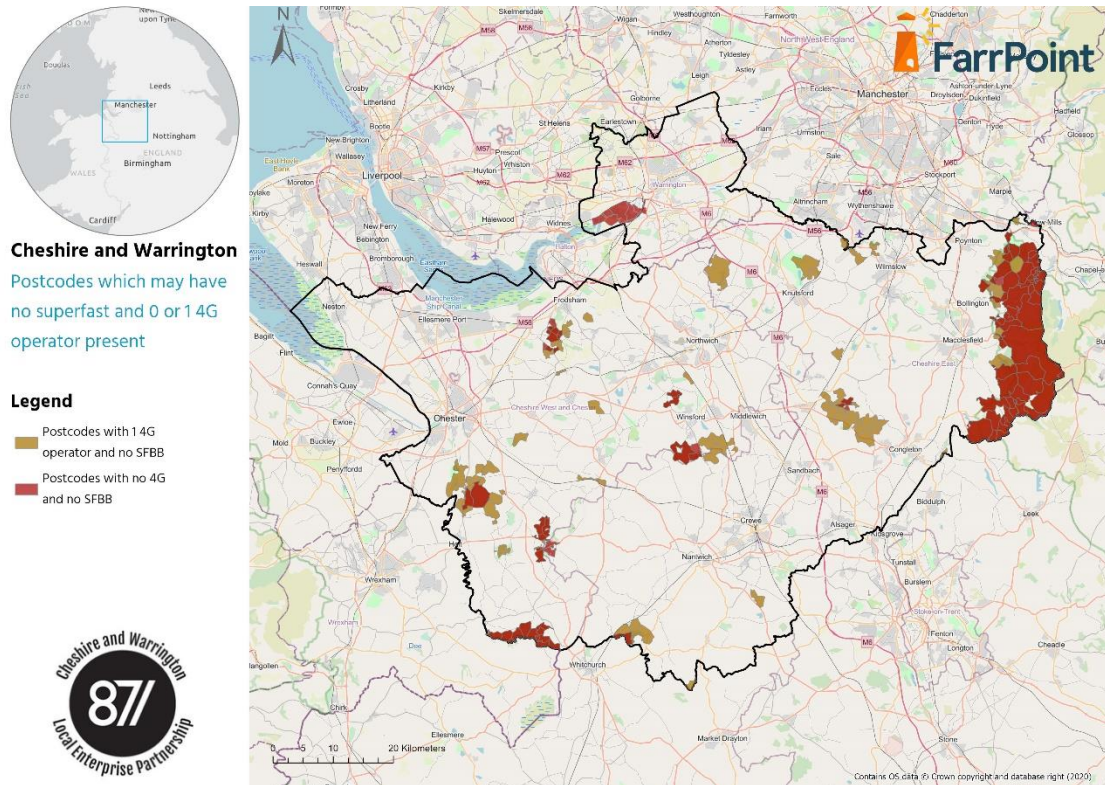


Figure 12: C&W LEP Sub-region areas with limited or no superfast / 4G coverage

The Connecting Cheshire interventions have enabled some Gigabit Capable/ Full Fibre connections, with the current procurement prioritising Gigabit capable speeds. There is also ongoing commercial deployment of both ultrafast and Gigabit Capable / full fibre infrastructure from a range of suppliers within the C&W sub-region. However, deployment does not extend to cover the entire C&W LEP sub-region, risking a second connectivity divide emerging between those on Gigabit-capable connections (>1000Mbps) and those on NGA (>30Mbps).

A similar position is emerging with mobile connectivity, with the majority of premises already able to access 4G signal but with not-spots/areas of poor coverage still remaining, whilst emphasis is being placed on the emergence of 5G, with early commercial deployment limited at present to parts of Warrington only and unlikely to extend to cover the whole sub-region in the short to medium term without incentive.

There are currently low levels of full fibre infrastructure considered the most future proof solution to offering Gigabit capable connections and long term digital connectivity requirements, including being a key enabler of 5G rollout. At present Cheshire West and Chester has the best coverage at 8.4%, whilst Warrington has the least coverage at 1.2% with all areas of the C&W LEP sub-region significantly below the UK average figure of 12% coverage. If the C&W LEP sub-region is to fully realise the economic and societal benefits that future proof digital connectivity can enable it is vital that coverage of both fixed and mobile connectivity is ubiquitous across the entire C&W LEP sub-region so that everyone has an equal opportunity to participate and nobody is left behind.

The UK Government recognise the need for continued public sector intervention to meet their Gigabit Capable objectives, with the DCMS Outside-In programme the main vehicle for delivering Gigabit capable solutions in the final 20% of the UK where the commercial market is not expected to deliver. This programme is currently in development with the details as they emerge likely to play an important influencer in the shaping of the measures included in this Digital Infrastructure Plan, in terms of establishing a recognised baseline for the extent of premises deemed to have access to defined Gigabit capable connectivity and those areas in the C&W LEP sub-region that will be eligible for intervention to deliver Gigabit capable connectivity. It is anticipated that there will be an ongoing requirement for a regional coordinating body to work with DCMS in order to help deliver this programme and address current and future digital connectivity challenges faced in the C&W LEP sub-region by influencing, complimenting,

leveraging and supporting these national initiatives/targets and funding available, combined with any other regional and local funds whilst also working proactively with the market to drive additional commercial deployment.

2.4.5. Key Considerations

The evidence base, that in some cases echoes national trends/patterns and has also been tested for locally specific use cases and demand through consultation, has highlighted the following key considerations that have informed and shaped the Digital Infrastructure Plan:

There is significant consistency in uses cases and digital dependency across all business types – digital adoption and the use of technology is driving demand for connectivity across all sectors and business sizes, meaning the case for ubiquitous coverage is strong. The use of advanced technologies, such as AI, automation, analytics and IoT is increasingly commonplace, yet the digitalisation of workplaces, including software and cloud-based IT is also a key driver of demand. The dependency on digital technologies for C&W Priority and Key Sectors are demonstrated through the Digital Use Case examples in Appendix B.

Businesses view connectivity through the lens of service quality rather than a focus on specific technologies – businesses remain motivated by gaining a commercial edge and finding solutions to problems, driving a need for seamless digital connectivity that is not defined by the technologies employed, but rather the quality of service. This should be an overarching target for the Digital Infrastructure Plan, with a technology agnostic approach taken where appropriate, recognising the convergence of fixed and mobile networks. The cross-cutting nature of digital technologies is recognised by C&W LEP. In this vein, the Infrastructure pillar of the LIS identifies a consistent digital offer as a priority to retain C&W LEP’s status as an attractive location to work and live.

Larger businesses are focused on the need for resilience and security in particular – major employers are often deploying digital technologies at greater scale, meaning their connectivity requirements are more significant and complex. This translates into a focus on connectivity that is resilient and secure, such that these businesses can function continuously and with cyber threats squarely in mind. In many instances, these employers will be focused on the importance of secure and multi-site connections, that are beyond the scope of consumer level technologies and more bespoke in nature.

SMEs are equally active digital consumers but with different priorities – C&W’s smaller businesses are actively exploiting the benefits of digitalisation, yet their needs are somewhat nuanced compared to larger employers. SMEs are more likely to seek digital connectivity which offers affordable access, offers competition and choice and the opportunity for speed and capacity to be scaled up as necessary, over time.

Some locations will require prioritisation due to their role as economic hubs – C&W’s key urban centres and EZ are hubs of economic activity, will be subject to future growth and, largely, are the location for many of C&W LEP’s most important economic assets. Their competitiveness and attractiveness as investment locations will depend on the quality and capability of digital infrastructure provision.

The digital divide and rural inequalities must be bridged too – whilst C&W has made great strides in improving fixed and mobile connectivity, rural areas are still challenged by the quality and extensiveness of provision. In the context of flexible and dispersed working, innovative SMEs operating from rural locations and the wider digital reliance on other infrastructure, there is a need to ensure balance and provide increasingly equitable connectivity versus urban counterparts. Ensuring rural communities’ benefit at a similar pace as urban areas will unlock

economic growth and create more and better jobs, deliver digital inclusion and transform access to services for rural areas through the effective use and adoption of ICT.

C&W LEP's economic resilience will be spearheaded by digital connectivity - whilst the sub-region has prospered from a sustained period of positive overall economic growth, equating to increased employment and productivity, C&W LEP has a retained focus on the importance of resilience, reflected within its emerging LIS. With the seismic and far-reaching impacts of COVID-19 becoming more apparent, these considerations are placed into even sharper focus, as the need for a rapid recovery is born out in data, sentiment, and opportunity to insulate businesses from future economic shocks paramount.

Connecting anchor assets and institutions will be integral to C&W's future resilience – there is a clear need to ensure that the sub-region's most prominent economic assets are connected at the highest level, as they will play a key role in C&W's economic resilience, particularly post COVID-19. Public sector sites, utilities companies and education and skills establishments are all key to this objective and are increasingly geared around the deployment of advanced digital technologies.

Digital infrastructure will support a more flexible and inclusive economic future - the COVID-19 pandemic has demonstrated the exceptional demand and reliance on digital infrastructure and services, and the accelerated patterns of home-working that have occurred as a result. The dependence on digital infrastructure covers all aspects of life and presents a need for a ubiquitous high speed connection to enable access and use of digital services for ongoing daily work, education, and social/entertainment, and to ensure ongoing support and access to health services and amenities from residents across the C&W LEP sub-region. This is especially true given expectations that these trends may perpetuate in the long-term. Encompassed within this is the need for digital connectivity to transform public sector service delivery, allowing staff to work more effectively, increasing opportunities for remote working, and transforming how services are accessed / delivered to citizens. C&W LEP must consider how it facilitates the delivery of infrastructure in a way that can respond to these drivers and which takes into consideration a changing landscape.

Demand is not static and likely to increase – the pace of change within C&W's business base is rapid and constantly evolving, with digitalisation playing a pivotal role in the perpetuation of these trends. This is unlikely to slow down, as digital disruption and innovation unlocks new use cases, such that the Digital Infrastructure Plan should carefully consider the need for infrastructure investments to respond and be suitably future-proofed.

Digitalisation is not occurring in isolation - C&W will need to remain competitive and create the conditions for a flourishing digital economy. With this too, are opportunities to work collaboratively and address common challenges on a larger scale. Collaboration with neighbouring sub-regions and in a national context, recognising the interventions and investments underway and planned, harnessing synergies, and leveraging the work that is being done by the market and public sector to address connectivity issues, reducing any barriers to adoption and deployment where possible.

Securing a digital future requires a rounded approach to intervention - the UK telecoms market often states that existing policies and processes both nationally and within Local Authorities hamper deployment of digital connectivity across the UK, in addition to difficulties in securing new/additional sites for infrastructure deployment (4G and 5G). Seeking ways to reduce or remove these barriers to reduce the cost and complexity of deployment would have a positive impact on the rollout of digital infrastructure. By taking a more proactive and collaborative approach to understanding and reducing these barriers, working with the national Barrier Busting Task Force who have produced a range of guidance on working collaboratively

and adopting best practice within the current legal framework, deployment could be accelerated and extended within the C&W LEP sub-region.

Driving demand will make C&W a natural location for investment - the Connecting Cheshire programme already has higher than average levels of take-up of digital connectivity deployed via the programme however by further driving promotion of the services available and driving additional take-up of both commercial and publicly subsidised services additional investment could be unlocked. By demonstrating demand to the market the C&W LEP sub-region will be seen as an attractive place for further investment and deployment of both fixed and mobile connectivity, whilst also potentially releasing additional claw-back (gainshare) funding from existing contracts within the Connecting Cheshire programme which can be reinvested in delivering additional coverage.

Appendix B provides digital use case examples from businesses in priority and key sectors within the C&W LEP sub-region.

3. Vision, Strategic Objectives and Priorities

3.1. The Vision

The Digital Infrastructure Plan will play an integral role in enabling the objectives of the LIS to be delivered and leverage infrastructure assets and investments made to date, facilitating a step-change towards the next generation of fixed and mobile connectivity. In doing so, Cheshire and Warrington will be able to service the industries of the future, provide best in-class connectivity to its business and citizens and remain competitive, resilient and adaptable to change, in a regional, national, and global context

3.2. Strategic Objectives and Priorities

The following sets out the four strategic objectives and priorities that this Digital Infrastructure Plan shall support, which drive the measures deliverable within the timeframe of the Plan as detailed in Section 5.

Objective 1 - *Beyond developing its priority sectors and key economic assets, C&W LEP is committed to establishing C&W as a world-class digitally connected sub-region, to the benefit of all industries, including SME's, start-ups, and entrepreneurs*

Priorities

- The industries prioritised by C&W LEP and in particular those identified in the LIS as super strength specialisms⁹ which make the C&W LEP sub-region distinct in a national context, and those identified in the SEP based on their contribution to the sub-regions economic distinctiveness and productivity agenda, shall maximise the benefits from digitisation by having access to the required connectivity:
 - Figure 13 illustrates where the top companies within each sector are currently trading across the C&W economy⁹ and demonstrates the broad spatial distribution of active firms, with clear clusters observed.

⁹ Source - Metro Dynamics, 2019

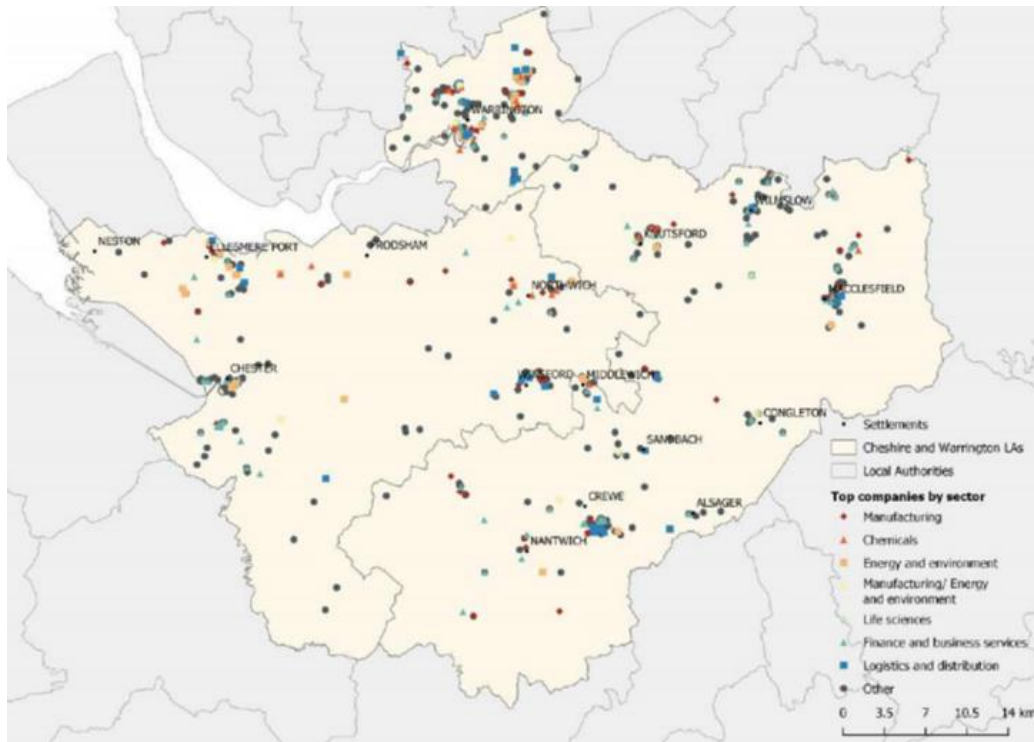


Figure 13: Top companies by sector within the C&W LEP Sub-region

- Reading directly from the sector summary and broader base of evidence, C&W LEP has developed and honed its view on the industries that should be prioritised, based on their contribution to the sub-region’s economic distinctiveness and the productivity agenda. These are set out below and form the basis for associated economic development policy and investments. Critically, these are also the sectors that will stand to benefit from digitalisation and continue to become more digitally dependent as technology evolves.

Priority Sectors

Manufacturing: drawing on C&W’s strengths in chemicals and automotive manufacture and assembly, the Manufacturing sector represents over **2,000 businesses** and supports over **40,000 jobs**, accounts for **25%** of C&W LEP’s GVA, and has shown strong employment and business base growth. Despite this, a relative lack of specialism within this key sector compared to the national average, provides the impetus for the sector to develop expertise in light weighting manufacture moving forward.

Life Sciences: a nationally important location for manufacturing pharmaceutical products and preparations, C&W boasts an end-to-end value chain of medicine discovery, formulation, and manufacturing. An LQ of **1.81** is a signal of C&W’s highly specialised Life Sciences sector, as reflected by the presence of globally recognisable companies including AstraZeneca and Sanofi. Some **175** life sciences businesses support over **7,000 jobs**, and the sector has experienced business growth of **25%** over the past 5 years, albeit structural changes at AstraZeneca have led to a small loss of employment.

Energy and Clean Growth: a highly specialised sector with an LQ of **1.77**, Energy and Clean Growth industries are a strong mix of traditional carbon economy and clean, green energy sources including wind and biomass. C&W is also home to the UK’s largest nuclear engineering services cluster, offering end-to-end nuclear supply chains from design through to decommissioning. The business base has increased by almost **50%** since 2014, with employment growth of **14%** for the period 2013-2018. Within the sector, over **3,200 businesses** supporting some **30,000 jobs**.

Key Sectors

Finance and Business Services: underpinned by a strong base of Financial Service Activities, this sector accounts for over 5,000 businesses and 43,000 jobs. Nationally recognisable companies with a focus on banking and credit provision have a strong presence in the area, including Assurant, Barclays, Lloyds Bank, M&S Bank and Royal London. Moreover, the sector has experienced strong business growth (+42%) since 2014, but employment has contracted significantly (-28%) between 2013-2018.

Logistics and Distribution: excellent transport links and proximity to both Liverpool and Manchester are primary drivers of C&W's success as a major logistics hub. Almost **1,500** logistics and distribution companies support over **26,000 jobs**, including companies such as Hermes, ASDA and Eddie Stobart. Strong business and employment growth over the past 5 years has in part been facilitated by the development of the 575-acre OMEGA mixed-use development.

- Built around the physical presence of businesses and the clustering of key sectors, aligned to the pattern of urban settlements and focal points for activity, C&W LEP and local authorities have a well-developed view of its economic hubs. These are reflected within the planning system, spatial constructs, and the LIS/SEP, and are a strong indication of where demand for digital connectivity will be most pronounced and dense. The spatial focus for growth should therefore influence the rollout strategy for digital connectivity, to ensure areas of greatest demand are serviced with the best possible technology and speeds. That said, it should not be at the expense of evolving working patterns and the trend of companies moving towards more distributed models, in favour of reduced operating expenses and an enhanced work-life balance (particularly in a post COVID-19 environment).
- The use of technology is also inherent to the flexibility sought by small businesses, allowing many tasks and processes to be undertaken regardless of location. This is consistent with the concept of distributed firms which reflect the opportunities that digital technologies unlock, with employees dispersed across a wide geographical area. It is also important to reflect on the role that digital capability plays in the realm of innovation and entrepreneurship, with technology increasingly at the core of new businesses ideas and development of IP. This is seen within C&W's base of start-ups, scaling companies and those that have managed to attract significant investment.
- C&W LEP's base of economic assets are an added dimension to the spatial requirement for best-in-class connectivity, as institutions that will be digitally dependent and demand scalable future capacity. These span higher end further education institutions, locations which are the emphasis for R&D and innovation and pilot projects and trials, specific examples include University of Chester, Reaseheath College, Warrington & Vale Royal College, Macclesfield College, Thornton Science Park, Birchwood Park, Cheshire and Warrington Health Matters, Cheshire Energy Hub
- Key strategic investments - Key investments by C&W LEP focus on addressing key barriers to economic growth, many of which would benefit from harnessing stronger digital capabilities and as new technologies are adopted, digital infrastructure and connectivity in addition to the enhancement of digital skills within the current and future workforce will be key factors in the ability for the C&W to meet the needs of existing businesses and new investors.
- C&W LEP forms part of the Northern Powerhouse, Mersey Dee Alliance and Constellation Partnership, recognising its role in a wider context and the value of working in collaboration rather than in competition on key infrastructure projects thus strengthening the case for investment by all partners, enabling additional opportunities and economic benefits to be achieved across the wider region, with businesses and citizens living and working across

administrative boundaries. C&W LEP is keen to explore synergies within neighbouring sub regions through collaborative/partnership working, e.g. North Wales, Liverpool City Region to deliver additional economic benefits within the region.

Objective 2 - Address areas of coverage inconsistencies and speed/service inequalities in recognition of changing work patterns, a mobile workforce, reliance on connectivity and the convergence of fixed/mobile technologies

Priorities

- Ensure that those areas that are not yet able to access NGA services, particularly those in rural areas who have historically suffered from the lowest connection speeds and areas of deprivation across the C&W LEP sub-region are delivered, in order to unlock the increased opportunities that digital connectivity can enable such as increased social inclusion, employment and education opportunities in addition to providing access to increasingly 'digital first' public services such as local council services, benefits claims, passport and driving license applications.
- Elimination of partial and total mobile coverage not-spots within the C&W LEP sub-region to ensure that citizens, businesses, and visitors are able access good mobile connectivity no matter where they live, work or visit.
- Drive additional commercial deployment of digital connectivity whilst also increasing community resilience by actively identifying sites to act as digitally enabled Community Hubs across the C&W LEP sub-region.
- Accelerate commercial deployment and reduce potential cost barriers of digital connectivity to residents and businesses where there is demonstrable demand and bring the C&W LEP sub-region into line with other areas who already offer additional incentives e.g. Gigabit voucher top-ups etc.
- Adopt an outside-in approach to ensure that further intervention takes place in the expected non-commercial areas, and to build in from these to meet the commercial infrastructure to ensure that no areas are systematically left behind.

Objective 3 – *Adopt/strengthen a consistent barrier busting approach to digital policy*

Priorities

- Ensure a coordinated, proactive approach is adopted across the C&W LEP sub-region, providing a stable and consistent policy environment for commercial deployment of digital infrastructure across the three Local Authority areas - Planning, wayleaves etc to be reviewed to ensure alignment in support of local planning objectives, national planning policy framework, etc.
- Ensure digital infrastructure can be deployed as cost effectively as possible within the C&W LEP sub-region, including leveraging existing public assets and ensuring new developments are connected to the highest specification digital infrastructure to avoid future rework or capacity constraints.

- Ensure existing policies are reviewed to reduce or remove any barriers to deployment and consider digital infrastructure requirements in any future policies or local plans.
- Ensure future infrastructure projects such as new developments, highways improvements, etc consider digital connectivity as standard during the planning stage and throughout delivery, for example by building in additional duct capacity during construction that can be utilised for deployment to avoid subsequent retro-fit of digital infrastructure at greater expense.
- Actively encourage innovation and be a willing partner for technology trials/pilots, showcasing the C&W area as a testbed for leading edge technologies and offering the ecosystem for commercialisation/further deployment of tried and tested solutions.

Objective 4 – Drive adoption of digital connectivity by increasing participation/skills and take-up of services

Priorities

- Build on the work of the C&W Digital Skills Partnership (ref) to increase digital inclusion activities for citizens, ensuring those outside the workforce have the digital skills necessary to actively participate in an increasingly digital world. Recent estimates show that 16% of the UK population cannot undertake Foundation digital activities such as turning on a device, connecting to Wi-Fi or opening an app by themselves, with the most vulnerable and disadvantaged the most likely to be digitally excluded¹⁰.
- Continue to facilitate and support businesses to understand how digital connectivity can help transform their organisation and make it more resilient, from reaching new markets to facilitating homeworking for their staff or developing new innovative products and services.
- Facilitate and support citizens in harnessing opportunities provided by digital connectivity by ensuring they have the essential digital skills needed for work and at home, with particular focus on those who are most vulnerable/disadvantaged who are most likely to be digitally excluded.
- Increase competition, consumer choice, with a range of services offered at varying price points to consumers and businesses, to help drive take-up and adoption of digital connectivity and services (including accessing e-learning and online resources that would help to develop skills more generally).

¹⁰ https://www.lloydsbank.com/assets/media/pdfs/banking_with_us/whats-happening/lb-consumer-digital-index-2020-report.pdf

4. The Plan

4.1. Target Measures

Enable Gigabit Capable infrastructure across the C&W LEP sub-region, with particular focus on delivery to priority/gap areas, through leveraging commercial and government investment programmes that promote services delivered at a fair price and through an open network infrastructure that attracts a wide variety of retail service providers

- Successful appointment of a Supplier for the current Connecting Cheshire Programme procurement and leverage clawback (gainshare) funds from current contracts for reinvestment in additional NGA coverage, with emphasis on Gigabit capable and to address the following priorities:
 - Premises in areas of high deprivation to ensure areas with the most vulnerable and disadvantaged citizens are not left behind and can fully participate in digitally enabled society
 - Premises in total or partial not spot areas
 - Premises that are businesses/rural SME's
- Leverage funding via the £200m BDUK Rural Gigabit Connectivity (RGC) programme (ending in 2021, encompassing the Hub approach and Voucher Scheme) and £5bn Outside-in programme to deliver gigabit-capable solutions to premises within the C&W LEP sub-region and contribute to the UK Government targets by 2025. Whilst these programmes are funded and managed within BDUK, adequately resourced local programmes, with established local knowledge and participation is vital to ensure these national programmes are successfully delivered:
 - Actively engage with local communities and suppliers to identify potential hub sites and voucher scheme opportunities, and to support the BDUK Outside-in programme in delivering the UK Government gigabit-capable objective, encouraging both the commercial market and UK Government to prioritise delivery in the C&W LEP sub-region taking into account C&W LEP objectives/priorities
 - Potential for Voucher Top-up Scheme for eligible residents and businesses within the C&W LEP sub-region to provide additional capital funding, over and above the standard value of the Rural Gigabit Connectivity Voucher Scheme, for the installation of gigabit-capable connectivity to their premises, further reducing the barriers to getting connected to gigabit-capable connectivity in areas where previous schemes have been unable to meet the full cost of installation. This should aim to reduce cost barriers for residents and businesses in rural parts of the C&W LEP sub-region by both increasing the value of connection vouchers available to eligible residents and businesses to fund the capital installation cost of gigabit-capable connectivity and promoting a more consumer-led approach by communities
 - Work with BDUK to prioritise the C&W LEP sub-region to be added to the new consumer-led 'Broadband Upgrade Fund' voucher scheme, subject to successful outcome from the pilot of the scheme
 - Identify public/community sites which are suitable for the creation of drop-in spaces to provide connected hotspots (public WiFi) and act as Community hubs, whilst also acting

as an anchor for potential future commercial deployment of gigabit-capable connectivity to surrounding premises

- Work with the Liverpool City Region Combined Authority to further develop plans and the business case to secure funding to extend their 'Dig Once' duct and backhaul network into the Ellesmere Port area of the C&W LEP sub-region initially, whilst looking at other opportunities to extend this infrastructure into other parts of the C&W LEP sub-region
- Encourage commercial deployment of Gigabit capable / full-fibre infrastructure within the C&W LEP sub-region by proactively highlighting priority areas/areas of demand to help ensure the market delivers the predicted 80% coverage needed to support governments ambition for gigabit-capable connectivity to the majority of premises by 2025 as part of their 'Outside-in/Final 20%' programme. Without commercial deployment reaching the 80% coverage level predicted a gap will remain between this and the Outside-in programme which is targeting the hardest to reach premises in the 'final 20%' of the UK meaning some premises will be left behind. Full fibre deployment should be encouraged as it offers future proofed connectivity to premises and is also a key enabler of future 5G roll-out for high capacity backhaul provision to mast sites
- Increase C&W LEP readiness for strategic projects to take advantage of any applications for funding and develop compelling narrative to attract continued investment in both fixed and mobile connectivity across the C&W LEP sub-region:
 - Develop a pipeline of 'shovel-ready' projects within the C&W LEP sub-region to improve digital connectivity for residents and businesses
 - Develop and promote a narrative setting out the opportunities for digital innovation and testbed facility within C&W LEP sub-region, highlighting key sector and regional strengths - manufacturing, life sciences, energy & clean growth, finance & business services, and logistics & distribution.

Influence extended 4G rollout and encourage and promote the role of next generation mobile technology within the C&W LEP sub-region. Provide support to 5G testbeds and trials, investigate innovative solutions and use cases, through partnership working (e.g. North Wales Connected Corridor, 5G and IoT), and proactive engagement with operators to fill gaps in coverage and upgrade existing sites; hence taking timely advantage of the benefits and early access to the quickest and most durable technologies

- Target locations identified as having poor mobile coverage:
 - Consider not-spot areas where premises are unable to access either Superfast or 4G connectivity, as a superfast connection offers options for WiFi calling where mobile coverage is currently poor, and mobile broadband offers an interim option for data connectivity where fixed line speeds are currently poor
 - Consider the needs of priority businesses and locations, whilst seeking ubiquitous coverage across the entire C&W LEP sub-region to help facilitate remote/mobile working, tourism, etc.
 - Work with BDUK to identify candidate sites for the SRN programme
- Work with North Wales Economic Ambition Board to further develop plans and the business case to secure funding for a 'Connected Corridor' to extend 5G and IoT connectivity across the major A55 / M56 transport route to the M6

- Explore opportunities for technology trials/pilots, showcasing the C&W area as a testbed for leading edge technologies and offering the ecosystem for commercialisation/further deployment of tried and tested solutions

Adopt/strengthen a consistent barrier busting approach to digital policy

- Form a Digital Infrastructure Steering Group to ensure alignment and coordination of policies and procedures related to deployment of digital connectivity across the three Local Authority areas – Warrington, Cheshire West and Chester and Cheshire East:
 - Ensure a Digital Champion and Digital Coordinator is established within each of the three Local Authorities in support of UK government objectives to reduce barriers to digital infrastructure deployment
 - Establish Digital Infrastructure Steering Group, with appropriate representation from C&W LEP, Local Authorities and the national Barrier Busting Task Force
 - Identify key policies relating to deployment of digital infrastructure within each organisation and consider how these align or any changes that may be required to improve alignment and consistency across the C&W LEP sub-region
 - Work with the market to understand current challenges and pinch-points within existing policies and processes to identify areas for improvement
- Identify, develop and publish a list of public sector assets available within the C&W LEP sub-region that can be offered to the market in order to reduce any barriers for investment by commercial operators, accelerate rollout and increase coverage of digital infrastructure:
 - Identify suitable land, building, street furniture and other assets which could be offered to the market (on commercial terms) to reduce barriers to deployment
 - Develop process to publish and maintain a list of assets identified, and proactively engage with the market to promote these assets for use, considering best practice where appropriate (i.e. WM5G, Connected Places Catapult etc)
- Proactive optimisation of existing assets and investment in assets/digital coordination of infrastructure projects where feasible, to provide digital capabilities, capacity, and linkages in line with C&W LEP priorities and opportunities (e.g. Dig Once, Smart City, IoT, new developments/infrastructure schemes etc)
 - Assess where existing assets could be replaced, optimised/consolidated, or coordinated to meet desired outcomes – reduced street clutter, smart city initiatives (IoT, CCTV, streetlighting, public WiFi etc)
 - Assessment of digital infrastructure impact on upcoming development/infrastructure schemes and opportunity to leverage these to increase capacity and coverage of digital infrastructure – for example by installing additional ducting during planned road/cycle path/footpath construction/maintenance
 - Consider opportunities to further extend collaborations with the North Wales Economic Ambition Board and Liverpool City Region Combined Authority using existing or new assets within the C&W LEP sub-region

Encourage deployment through demand stimulation. Drive adoption of digital connectivity by increasing participation/skills and take-up of services making sure people (citizens and businesses) have the right skills required to realise the benefits and opportunities of enhanced digital connectivity.

Potential long term employment opportunities to help drive / accelerate additional deployment of infrastructure in the region by providing engineering skills - aerial fibre operatives, underground cabling operatives, fibre engineers and civils operatives

- Expand the work of the C&W Digital Skills Partnership to include activities demonstrating how digital connectivity can be used to increase productivity, innovation and resilience within priority and key sectors in addition to the wider SME businesses across the C&W LEP sub-region
 - Develop opportunities for businesses to showcase best practice and share innovative ways of working utilising digital connectivity both within priority and key sectors and across sectors
 - Work with digital connectivity suppliers to showcase innovation and new/emerging opportunities to businesses within the C&W LEP sub-region
- Expand the work of the C&W Digital Skills Partnership to include activities aimed at increasing citizens digital skills and reducing digital exclusion:
 - Develop measures to increase citizens essential digital skills and reduce digital exclusion, focussing on those who are most vulnerable/disadvantaged within communities
 - Identify partner agencies from the public, private and 3rd sectors who are able to deliver digital skills training to citizens and explore the opportunities to form a regional partnership of organisations who can increase digital skill levels and reduce digital exclusion – education, banks, companies, charity groups, community organisations, etc
- Continue and expand demand stimulation work to increase take-up of digital connectivity within the C&W LEP sub-region, with focus on the requirements and opportunities for homeworking because of the current pandemic:
 - Identify appropriate delivery mechanisms for additional demand stimulation activities across the C&W LEP sub-region, considering the different drivers and demands of both residential and business users – direct mailshot, advertising, signage, business/community engagement
 - Identify relevant funding sources for demand stimulation activities

4.2. Milestones and Funding Considerations

Milestone	C&W LEP Role	Funding Sources	What does success look like	Measuring Success
Outcome of the Connecting Cheshire extended NGA Broadband and Gigabit access procurement (Dec 2020)	Driven by Connecting Cheshire	BDUK/DCMS Local Authorities Private Sector	Successful appointment of Bidder(s) submitting the most economically advantageous (MEAT) tender to deliver a Speed and Coverage outcome within funding levels	Contract Award/Implementation Plan agreed NGA connections (premises/%) Gigabit capable connections (premises/%) Reduction in total and partial not-spots (premises) SME connections
Outside In programme, the Rural Gigabit Connectivity programme (2021) and any additional funding announcements leveraged in line with targets within the period of this Digital Infrastructure Plan (2025)	Potential for additional funding to be made available by the LEP, with local initiatives and encouraging both the commercial market and UK Government to prioritise delivery in the C&W LEP sub-region, taking into account C&W LEP objectives/priorities	BDUK/DCMS Local Authorities Private Sector C&W LEP	Funding leveraged Accelerated delivery of Gigabit/full fibre	Gigabit capable connections (premises) Full fibre coverage (%) Hub sites created (sites) Vouchers for Gigabit capable connectivity issued/claimed (vouchers/£) Level of funds leveraged (£)
SRN Programme (2026)	None expected other than local co-ordination/advisory	BDUK/DCMS Private Sector	Funding leveraged Extended coverage of 4G	Increased coverage of 4G networks (%) Reduction in total and partial not-spots (premises) Level of funds leveraged (£)

Alignment and coordination of policies and processes related to deployment of digital infrastructure across the C&W LEP sub-region (2021)	Co-ordination and advisory role	C&W LEP Local Authorities	Policies and processes aligned across three Local Authorities within the C&W sub-region Improved engagement with market Accelerated delivery of Gigabit/full fibre/5G Extended coverage of 4G	Policies and processes reviewed/aligned (number) Gigabit capable connections (premises) Full fibre coverage (%) Increased coverage of 4G networks (%) Increased coverage of 5G networks (%)
Comprehensive list of assets and strategic case (2022)	Co-ordination and advisory role	C&W LEP Local Authorities	Comprehensive mapping of assets captured Asset list published Leverage assets to reduce barriers to commercial deployment Strategic Case delivered	Assets used for deployment (type/number) Gigabit capable connections (premises) Full fibre coverage (%) Increased coverage of 4G networks (%) Increased coverage of 5G networks (%)
Collaboration with neighbouring regions on digital infrastructure projects (2020/21)	Lead role working with neighbouring sub-regions to develop the strategic case and delivery, with potential for additional investment by the LEP	C&W LEP Local Authorities <i>(Neighbouring Sub-Regions)</i>	Funding leveraged Accelerated delivery of Gigabit/full fibre Extended coverage of 5G/IoT	Gigabit capable connections (premises/%) Increased coverage of 5G networks (%) Open access duct infrastructure created (km) Level of funds leveraged (£)
Increased digital skills and participation (2025)	Co-ordination and advisory role	C&W LEP BDUK/DCMS Private Sector	Increased digital skills Reduced digital exclusion Regional partnership in place to deliver	Increased number of digital/digitally enabled businesses within the C&W LEP sub-region (number)

			digital skills/inclusion activities to citizens	<p>Participation in digital skills training events (participants)</p> <p>Case studies showing benefits of enhanced digital skills (citizen/business)</p> <p>Increased use of digitally enabled council service (%)</p>
Increased adoption of digital connectivity services (2023)	Driven by a coordinated demand stimulation programme	C&W LEP Local Authorities	<p>Increased take-up of NGA services deployed via Connecting Cheshire programme</p> <p>Accelerated delivery of Gigabit/full fibre</p> <p>Commercial deployment of Gigabit capable connectivity at 80% or greater by 2025</p>	<p>Connected Cheshire NGA take-up (%)</p> <p>Gigabit capable connections (premises)</p> <p>Full fibre coverage (%)</p>
Pipeline of digital infrastructure projects (2021)	Lead role to develop the strategic case and delivery, with potential for additional investment by the LEP	C&W LEP Local Authorities	<p>Pipeline of 'shovel ready' digital infrastructure projects developed in readiness for future funding opportunities</p> <p>Published narrative setting out opportunities for digital innovation within the C&W LEP sub-region</p>	<p>Strategic Outline Business Cases created (number)</p> <p>Increase in number of digital innovation projects in the C&W LEP sub-region (projects)</p> <p>Level of funds leveraged (£)</p>

4.3. Delivery considerations

The main vehicle thus far for encouraging NGA connectivity and to leverage available funding has been the Connecting Cheshire Partnership, made up of the three local authorities in the C&W LEP sub-region (Cheshire East, Cheshire West and Chester and Warrington Borough Council) plus Halton. This partnership was established to deliver faster broadband to areas where it had not been commercially viable to invest previously, with emphasis on outlying and rural communities. The partnership has played a progressive and active role in securing investment to extend NGA coverage, through co-investment with BDUK, voucher-led grant programmes, European funding, and work to stimulate commercial activity.

There is a coordinating role for the C&W LEP in delivering the vision, objectives and actions of the Digital Infrastructure Plan, leveraging built-up knowledge of existing and planned infrastructure within the C&W LEP sub-region and building on the successful work done thus far to improve digital connectivity. However in order to help deliver the Digital Infrastructure Plan, a more holistic view of digital infrastructure, including 4G, 5G and IoT in addition to the governments drive towards gigabit-capable connectivity would need to be adopted, and sufficient resources allocated to provide this coordination. This is vital in order to ensure alignment and proactive engagement with BDUK, to ensure the C&W LEP sub-region is able to leverage and gain early benefits from national programmes such as Outside-in and the SRN in addition to helping shape future programmes and policy. Only by taking a more holistic view of digital infrastructure, helping to remove barriers to deployment, stimulating the market to deliver more and identifying areas where intervention is required across a range of connectivity types can the economic ambitions of the LIS and SEP be fully realised.

Our work to date has involved engagement with existing or planned programmes in neighbouring subregions including north Wales. Through these discussions we believe that there are opportunities to collaborate with both the North Wales Economic Ambition Board and the Liverpool City Region Combined Authority on their digital connectivity projects. The North Wales Economic Ambition Board are keen to explore how their work to create a contiguous 5G corridor up to Cheshire border (80-mile stretch) could be extended and taken to the M56 / M6. This will encompass passenger connectivity, rail signalling, road, and residential uses and have indicated that logistics suppliers are very interested in this and would seem an excellent fit with the sub-regions buoyant and significant logistics and distribution sector of almost 1,500 companies supporting over 26,000 jobs. The Liverpool City Region Combined Authority's (LCRCA) 'Dig Once' initiative currently stops at the borders of the C&W LEP sub-region, however it would be relatively straight forward and cost effective to extend elements of this into areas such as Ellesmere Port and Warrington, both of which are geographically close to the planned infrastructure route. Whilst the LCRCA's focus is on delivery of the infrastructure within their own area, they indicated a willingness to explore how the infrastructure could potentially be extended, and in doing so draw additional investment into the project. This collaboration not only provides an opportunity to make rapid progress on improving digital connectivity, but also demonstrates to potential suppliers that the region is actively working to seek opportunities and is 'open for business', which can help further stimulate commercial investment in digital infrastructure in the C&W LEP sub-region.

C&W LEP should help drive the vision through placing an emphasis on Digital infrastructure in ongoing strategic investments, with the objectives set out in this Digital Infrastructure Plan in mind.

Appendix A

The legislative Framework

The Electronic Communications Code 2017 (the “Code”) underpins all agreements between site providers and Code operators, dealing with rights to use land for digital communications purposes. Code operators are individuals or bodies who have applied for, and been granted, operator status by Ofcom. This status recognises that the provision of digital communications networks forms an important public service. Consequently, agreements between site providers and Code operators are subject to special statutory rights and protections, as set out in the Electronic Communications Code. The Code was recently reformed as part of the Digital Economy Act 2017. These reforms were intended to reduce the cost of providing communications infrastructure and make it easier for operators to deploy such infrastructure. The new Code came into force on 28 December 2017.

State Aid Scheme

Local authorities must take account of the European Commission’s State aid and competition regulations. On 26 May 2016, the European Commission approved the 2016 National Broadband Scheme (NBS), which is an umbrella scheme for broadband projects in the UK. Local bodies can apply to BDUK directly for confirmation that their local broadband projects comply with the terms of the umbrella scheme and are therefore state aid compliant. BDUK has provided guidance on this process. The 2016 NBS is set to expire at the end of 2020. A new state aid NBS is not likely to be up and running at scale until 2022/2023.

Investment Models

There are various models for public support for investment in broadband, including gap-funded procurements, voucher schemes broadband, challenge funds and community schemes. The 2016 NBS Decision allows for implementing bodies to choose the most appropriate funding model to their broadband project, specifically referencing the following models as examples:

- Public Sector Owned (or municipally owned);
- Concession to Build-Operate-Transfer;
- Public Private Partnership;
- Gap Funding model.

In the broadband sector, demand-side measures may complement supply-side measures aimed at infrastructure roll-out by supporting the take-up of broadband services over the deployed infrastructure. Voucher schemes may be used to support subscriptions of broadband services by reducing the cost for end-users. Such voucher schemes typically have an eligibility criteria, for example the Better Broadband Voucher Scheme was launched in December 2015 to provide an affordable, basic broadband installation to homes and businesses that are unable to access a broadband service with a download speed of at least 2Mbps and will not benefit from the Superfast broadband roll out within the next 12 months. The scheme has boosted the broadband speeds of more than 20,000 homes and businesses in some of the hardest to reach areas of the UK. The Scheme is due to end on 31 December 2019. The subsidy can be used to fund a variety of technological solutions including satellite, 4G and fixed wireless. As part of the Rural Gigabit Connectivity (RGC) programme, BDUK adapted the existing Gigabit Broadband Voucher Scheme to support the delivery of full fibre connectivity in rural areas. Businesses and homes in the hardest to reach areas of the UK may be eligible for funding towards the cost of installing full fibre broadband to their premises when part of a group project. Gigabit broadband vouchers can be used by small businesses and the local communities around them to contribute to the installation cost of faster connections using gigabit-capable infrastructure. Vouchers are issued to the supplier and can only be used to offset the cost of installing a gigabit-capable broadband connection to premises. Voucher schemes can have an option to aggregate vouchers under a group application. A local lead is often needed to tap the potential of aggregating vouchers to secure enough leverage to attract extension of a network operator’s network to deliver the required connectivity.

Public Bodies Role

The Digital Connectivity Portal was launched to provide an online resource for local authorities and communications network providers with guidance to support investment in broadband and mobile networks. The Portal provides practical guidance on subjects such as digital infrastructure strategy and leadership, access to and use of public sector assets, a guidance on access agreements, and matters relating to planning and use of the highways. The Portal sets out the importance of a focused strategy for encouraging and facilitating the deployment of full fibre and mobile networks to help boost economic growth, digital inclusion and deliver a range of societal benefits including the more effective provision of local public services. The approach should:

- Consider how the local authority will facilitate the rollout of digital infrastructure that could include developing planning policies that support the roll out of new digital infrastructure in line with policies in the National Planning Policy Framework (NPPF);
- Stress the importance to the local authority of working in partnership with infrastructure providers and network operators;
- Highlight the importance of taking future digital infrastructure requirements into account when conducting council business;
- Promote long-term investment;
- Identify and aggregate public sector demand for connectivity services;
- Provide transparent contact information of key local authority stakeholders.

A digital champion in a local authority can help to minimise barriers to the rollout of broadband and mobile networks and support effective engagement between local authority and network operators. This could be a senior cabinet member, councillor, or senior local authority official.

Community Role

Over the past few years, some communities have successfully improved broadband access in their local area. To build on their successes, DCMS has provided guidance to help other community groups to access and benefit from potential models, case studies, guidance and funding options relevant to local broadband projects.

Market Drivers and Barriers

Delivering the digital infrastructure will only fulfil part of the ambition. There is a need to ensure that residents, businesses, and visitors understand the benefits and applications that access to superfast broadband can enable, now and into the future. This should encourage the take up of superfast services and ensure that the benefits and opportunities this brings are maximised, particularly for business growth and innovation. The capturing of demand in an area is also an important influencer for an operator to consider commercial build, which is often demand driven.

A demand stimulation strategy should help people have the skills and awareness about how the internet can be used and managing their digital life in a way which suits their needs and delivers better outcomes. There is significant scope to stimulate business start-ups through both enhanced opportunity for home working and reducing initial start-up costs, to new business opportunities resulting from emerging technologies. Harnessing the internet can help existing businesses to grow through innovative new marketing and communications techniques (such as social media and website optimisation), to increase their customer base, opening new markets and increasing exports.

Critical to the success of a demand stimulation strategy is partnership working, including liaising with district and borough councils, business bodies, educational and healthcare institutions, BDUK and other partners involved in delivering the activities outlined in the strategy.

Technology Trends

There are a range of digital connectivity types available, however it should be noted that there is inconsistency in how digital connectivity is described, both in policy and by the market, with some terminology describing the speed delivered (such as Superfast and Ultrafast), whilst others describe the infrastructure that underpins the service(s) delivered (such as FTTC, FTTP, 4G/5G, IoT). As such we have provided explanations of the most used connectivity terminology below for reference.

Superfast Broadband

Superfast Broadband refers to any broadband connection which delivers speeds of 30Mbps or greater (note: upon initiation of the BDUK Superfast Broadband programme, superfast broadband connections were defined as 24Mbit/s and above). This is often delivered using a mix of fibre and copper telephone lines, typically referred to as Fibre to the Cabinet (FTTC), however it is also available via other Next Generation Access (NGA) technologies such as Fixed Wireless Access (FWA). Such delivery mechanisms not involving a fibre connection to the premise typically suffer from a reduction in performance over distance from the access node (e.g. cabinet or mast location), meaning those properties furthest from the cabinet or mast site often receive reduced speeds.

Ultrafast Broadband

Ultrafast broadband describes broadband speeds between 300Mbps and 1Gbps and can be delivered using higher bandwidth technologies such as Hybrid Fibre-Coaxial (HFC) infrastructure typically used by Virgin Media, or Fibre to the Premise (FTTP) connectivity. Whilst this offers significantly higher download speeds than Superfast broadband, upload speeds may still be restrictive for business users who produce large amounts of data.

Gigabit Broadband

Gigabit broadband as the name suggests is capable of delivering speeds of 1Gbps (1 Gigabit / 1000Mbps) or greater and is typically delivered via high bandwidth technologies such as Hybrid Fibre-Coaxial (HFC) infrastructure used by Virgin Media, or Fibre to the Premise (FTTP) connectivity, or potentially in future 5G. Upload speeds are also typically higher than Superfast or Ultrafast services, with synchronous packages also available which provide the same upload and download speeds and which are often considered more desirable for business users.

Full Fibre Broadband

Full Fibre broadband, often described as Fibre to the Premise (FTTP), offers a full fibre connection from the exchange into the premise and is the fastest and most futureproof form of digital connectivity currently available. Full Fibre can reach multi-gigabit speeds and is not subject to any reduction in speeds delivered over distance. Typical packages currently provide 1Gbps speeds, however it can also be deployed at slower incremental speeds to compete commercially with Ultrafast Broadband. FTTP is considered the most future-proof solution and is seen as a key enabler for future technologies such as 5G.

Mobile (4G/5G)

4G is the fourth generation of mobile phone technology and follows on from 3G and 2G technology. Standard 4G (or 4G LTE) is around five to seven times faster than 3G, offering theoretical speeds of up to around 150Mbps, which equates to maximum potential speeds of around 80Mbps in the real world. A faster version of 4G is also available in many parts of the UK, called 4G LTE-Advanced (also known as LTE-A, 4.5G or 4G+) which offers theoretical speeds of up to 1.5Gbps, however the current LTE-A networks have a maximum potential speed of 300Mbps with real world speeds falling a lot lower.

5G is designed to deliver peak data rates up to 20Gbps. In addition to higher peak data rates, 5G is designed to provide much more network capacity by expanding into new spectrum, such as mmWave. 5G can also deliver much lower latency for a more immediate response and can provide an overall more uniform user experience.

5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices, enabling next-generation user experiences, empowering new deployment/business models, and delivering new services.

Internet of Things (IoT)

The Internet of Things IoT refers to a system whereby embedded devices/sensors are able to collect and transfer data over a network enabling the information collected to be presented in a readable form such as a dashboard, or for the information to interface to another application that would, for example, create an alert, or trigger some other response. As such, the term "IoT" can be very broad and could include everyday devices such as mobile phones and Bluetooth connected devices. Some of these technologies have existed for some time. However, the recent surge in the adoption of IoT, along with increased enthusiasm for the technology, is generally based around radio connected devices that have a very low power consumption and so can be battery powered. The battery life can typically be years before replacement or recharging is required. These devices also typically have relatively long-range transmission capabilities due to their ability to receive extremely low-level radio signals. Sometimes these devices can be used in situations where a permanent power source exists and so in these cases, messages could be transmitted more frequently for example, but essentially the infrastructure will remain the same and is based on low bandwidth data transfer for monitoring and control applications. IoT is rapidly being adopted in many industries around the world. The UK government predicts an average of 15 devices per household by 2020, which would amount to more than 420 million devices in the UK alone (DCMS, 2018).

Appendix B

Digital Use Case Examples

Bentley Motors (Manufacturing)

Bentley Motors is a world-renowned and established luxury car manufacturer, operating from a state-of-the-art facility in Crewe. At the forefront of automobile design, engineering and manufacturing, Bentley now forms part of the Volkswagen Group, having been acquired in 1998. The firm is both a major employer (4,000+ jobs on site) but also a vanguard of innovation, research and development and the adoption of digital technologies. This has translated into a business where technology intersects along all stages of the car production process, as well as defining its office-based functions.

Bentley's digital dependency is characterised by the sheer breadth of employment and roles within the firm and the need for a pipeline of digital talent to fulfil these jobs. These straddle a wide variety of operations and include the need for technical and non-technical skills which will unlock the full capability of digital technologies at the heart of the company's ongoing transformation. Some of the most prominent drivers of digital dependency and reliance on technology are summarised below, many of which interface with wider Industry 4.0 trends:

- ▶ **Software and app development, driven by complex coding**
- ▶ **Data capture, science and analytics, particularly 'big' and complex data**
- ▶ **AI and machine learning to support the advanced use of robotics and automation**
- ▶ **Virtual and augmented reality to support design, testing and sales operations**
- ▶ **Large-scale deployment of IoT and sensors to achieve 'smarter' production**
- ▶ **Cyber security and the need to proactively combat cyber threats**
- ▶ **Robotics and co-bots driving the automation of manufacturing processes**
- ▶ **Blockchain and the effective management of complex and real-time information**

As with other manufacturing firms, Bentley continues to adapt and harness the rapid evolution of digital technologies to leverage benefits and maximise competitive advantage. It will therefore be a sustained digital connectivity consumer with a significant reliance on high quality and resilient digital infrastructure, powering innovation, its production line, distribution and sales functions.

Encirc (Logistics and Distribution/Manufacturing)

Encirc is an innovative a rapidly growing business, with a significant footprint and strong roots within the sub-region. It operates across a number of sectors, encompassing the manufacturing of container glass, modern filling facilities and warehousing & logistics. As such, the company is unique in offering an end-to-end supply chain service, including high security storage and advanced logistics and distribution, serving customers worldwide. Encirc's profile has been further raised through media coverage showcasing its capabilities and deployment of advanced technologies.

The firm is an active consumer of digital applications and processes, which has led to an increasingly strong dependence on connectivity, both at its primary site in Chester, but also at the location of its widely dispersed workforce. It is an excellent example of Industry 4.0 in practice, with digitalisation shaping and disrupting many areas of the business, in both pronounced and more discrete ways. This has been at the core of the firm's growth strategy and cumulative effect of investment in digital technologies has led to a number of commercial benefits, including profitability and the ability to scale. It has also enabled a variety of wider benefits, including an enhanced skills and training offer, as well as improved work-life balance.

The key areas where Encirc's digital dependency is most evident are:

- ▶ **Glass production lines (such as Line 14) which are increasingly automated**
- ▶ **The use of robotics and co-bots within manufacturing and distribution**
- ▶ **Innovative use of data to inform decisions and continuous improvement**
- ▶ **Software and machinery driving warehousing and storage operations**
- ▶ **The widespread use of software in an office setting, driven by cloud-based servers**

The business is increasingly orientating its recruitment and staff development functions around the need for people with a strong base of digital skills, in recognition of expected trends and demand for digital acumen. This is likely to translate into a greater need for secure and scalable digital connectivity, allowing for planned growth in Chester and more flexible patterns of working.

AstraZeneca (Life Sciences)

AstraZeneca is a global pharmaceutical company with a major UK presence, anchored in their R&D base at Alderley Park, its second largest manufacturing facility in Macclesfield and a biologics team in Speke. The company's purpose is to push the boundaries of science to deliver life-changing medicines, in a robust and safe manner, working with government, academics and healthcare professionals to develop medicines and vaccines tackling some of the most prominent wellbeing challenges. AstraZeneca employs more than 4,500 people across the sub-region and supports a large and diverse supply chain.

The firm's identity and commercial success is defined by its continued innovation and exceptional research and development reputation, driven by the Alderley Park campus. Here the focus is on the discovery and development of new medicines and cancer research, including the Advanced Lead Centre and associated innovation facilities, all of which are at the absolute forefront of medicine development.

The importance of digital technology to the firm is a storied one with the business harnessing the power of digital to drive innovation and research. Indeed, the pivotal nature of digital technologies is now seen at the core of company's growth strategy (coined AZ2025), suggesting a further push into advanced technologies to drive new discoveries and competitive advantages. Notable aspects of this strategy include:

- ▶ **A vision for a truly digital factory with 'smart' technologies front and centre**
- ▶ **Robotics and automation embedded within all manufacturing**
- ▶ **Improved use of data analytics within clinical trials and medicine production**
- ▶ **More developed applications of machine learning and AI**
- ▶ **The widespread use of image recognition and electronic records**
- ▶ **Software and machinery driving warehousing and storage operations**
- ▶ **Leveraging innovation from 'digital twinning' to support simulation**

AstraZeneca is a rapidly evolving company, which will target growth as a result of its digital dependency at key locations across C&W. It's digital connectivity requirements are likely to reflect the dynamics of its research and production activity, with an emphasis on secure, seamless and high capacity infrastructure.

United Utilities (Energy and Clean Growth)

United Utilities is the United Kingdom's largest listed water company, founded in 1995 and headquartered in Warrington. With more than 5,000 employees the company is a major employer and manages the regulated water and waste water network in North West of England, which including Cumbria, Cheshire, Greater Manchester, Lancashire and Merseyside.

United Utilities is responsible for water supply management which relies on a complex and large-scale operation, involving hundreds of reservoirs, treatment works and pumping stations and thousands of miles of water pipes. Within this are a vast array of systems and processes which are deployed to support the efficient and timely flow of water to homes and businesses, whilst meeting the necessary legislation and statutory requirements mandated by government. At the core of this, is an absolute focus on the quality of water supplied.

Digital technologies are playing a fundamental role across the business, with a particular emphasis on driving efficiency, reducing waste, maximising quality and improving the company's environmental and ecological footprint. The impact and disruptive effects of digital technologies are visible across the business, aided by progressive strategy and industrial relationships. Examples of this include:

- ▶ **Becoming the first UK water company to use AI on a operational large-scale**
- ▶ **The creation of an Innovation Lab as a platform for digital research**
- ▶ **The introduction of robots to support network performance monitoring**
- ▶ **Rolling out a digitally-based workforce management and sales platform**
- ▶ **Harnessing the power of data to generate real-time digital evidence packs**
- ▶ **The extensive use of IoT and software to support information exchange**

The influence of digital adoption is also seen across the business in office and management-based settings, with staff increasingly able to work flexibly as a consequence. The sheer scale and dispersion of United Utilities' assets means that the geographical dependency of the firm is equally large, with digital connectivity critical across a huge number of C&W locations beyond its Warrington offices. The seamlessness of infrastructure coverage is and will be a key consideration.


Version Control

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0.2	Updated template	JM	SS	SS		
0.3	Initial Draft	SS	JM			
0.4	Updated Draft	JM	SS			
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