Cheshire and Warrington LEP

Digital Infrastructure Plan
Interim Report

June 2020

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Contents

1. Introduction

1.1. Background

The Cheshire and Warrington (C&W) LEP has commissioned FarrPoint and its partner Hatch Regeneris to assist in the development of a Digital Infrastructure Plan to ensure that Cheshire and Warrington have the digital assets needed to underpin its economic growth aspirations set out within its Strategic Economic Plan (SEP) and Local Industrial Strategy (LIS).

A refreshed Cheshire and Warrington Strategic Economic Plan (SEP) was launched in July 2017 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. This built on a legacy of work undertaken by the 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 LEP to collaborate with partners where there are shared interests, including on digital matters.

The C&W LEP is also at an advanced stage in producing a Local Industrial Strategy (LIS) 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 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.

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. This is especially true given expectations that these trends may perpetuate in the long-term. The C&W LEP must consider how it facilitates the delivery of infrastructure in a way that can respond to these changes.

The Digital Infrastructure Plan will therefore act as an important facilitator of sustainable and inclusive economic growth, and as a driver of productivity and enhanced social equality. The 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 (i.e. Connecting Cheshire, Digital 2020), 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 and resilient, in a regional, national and global context.

1.2. Digital Infrastructure Plan Development

Important work has been done to date to inform and shape the C&W LEP Digital Infrastructure Plan. Evidence has been gathered to support the rationale for continued investment in fixed and mobile digital networks. This evidence base has been gathered via the following activities:

a) Review and map existing digital infrastructure assets and capability across the Cheshire and Warrington sub-region, to highlight the current strengths, gaps and opportunities

b) Identify potential synergies with existing or planned programmes in neighbouring subregions including north Wales

c) In tandem with the mapping work, identify future needs of the sub-region, aligned with the SEP and LIS, and detail and quantify potential use cases e.g. infrastructure needs to support connected and autonomous vehicles

d) Cross-reference against current / intended major government initiatives and funding opportunities, e.g. Digital Infrastructure Fund, Local Full Fibre Networks, 5G

e) Identify critical gaps in the evidence base or help commission requisite additional work as required (and as agreed by the C&W LEP)

f) Work in close partnership with the C&W LEP Officers and Growth Hub to determine digital infrastructure related business needs and opportunities

This Interim Report provides a summary of progress to date on the above tasks, with emphasis on the data and information that has been collated and outputs of the mapping exercise as a result of task a). Any gaps in the evidence base identified to date that may require further work to be commissioned as a result of task e) have also been captured to provide early notification to the C&W LEP.

2. Overview

2.1. National Context

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 to create 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 16-week competition window is currently still open for applications, with a closing date of 27th July 2020.

The UK Government workstreams can be summarised as follows:

- Superfast Broadband
- Local Full Fibre Networks (LFFN)
- Gigabit Voucher Scheme (GBVS)
- Rural Gigabit Connectivity (RGC)
- Universal Service Obligation (USO)
- Mobile - Improving 4G Coverage
- 5G Testbeds and Trials
- Outside In (in development)

2.2. C&W LEP in context

We understand that the main vehicle for encouraging Next Generation Access (NGA) connectivity and to leverage available funding is the Connecting Cheshire Partnership, made up of the three local authorities in the LEP area (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 Building Digital UK (BDUK), voucher-led grant programmes, European funding and work to stimulate commercial activity.

The first three 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, with additional 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. The partnership issued a public consultation in February 2020 to establish those areas that do not currently or planned (in the next three years) to achieve NGA broadband, with an intention to conduct a further open procurement in respect of the remaining areas without NGA broadband infrastructure (known as 'NGA White'). Public funding of up to £10 million may be committed via the forthcoming procurement for an intervention area comprising around 28,000 premises.

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 easy 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. We will continue to explore these opportunities further in developing the Digital Infrastructure Plan, whilst seeking to identify any additional collaboration opportunities. This 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.

We have gathered an evidence base through engagement with C&W LEP officers, the Growth Hub and key sector employers including Bentley Motors (Manufacturing), Encirc (Logistics and Distribution/Manufacturing), AstraZeneca (Life Sciences), United Utilities (Energy and Clean Growth) that showcases the broad spectrum of digital demand and the use cases that are driving adoption trends across the C&W LEP sub region. The overarching message is clear – digital infrastructure is integral to the future development and success of the C&W 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 provides a strong hook from which to link business need with further infrastructure investment. The Digital Infrastructure Plan will need to respond to this economic context, with a view to providing the capacity and quality of connectivity needed now, and in the future. The approach taken by the Digital Infrastructure Plan will need to reflect the nuanced needs of digital consumers, whilst acknowledging the presence of an established growth agenda and investment pipeline, which will build on areas of concentrated economic activity, including urban centres, the redevelopment of Crewe Station and the LEP's multi-site EZ. It will also need to consider interventions and investments that are already underway, acknowledging that work that is being done by the market and government to address connectivity issues. In some cases, this has been initiated by assumed business demand and the use cases underlying this.

The inherent importance of digital connectivity is reflected within a variety of strategies and policy, at a national, sub-regional and local level. Indeed, it is positioned as a 'golden thread' with a clear and consistent narrative built around the need for further investment to ensure infrastructure meets the needs of businesses and individuals, whilst also making sure that the UK maintains pace with international competitors. These strategies also set out the need to be future-focused and consider the nature of demand as technology continues to rapidly evolve, defined by a series of recurring and digitally-dependent use cases. With continued globalisation it becomes increasingly important not only to consider the competitiveness of the C&W LEP sub-region against other parts of the UK, but internationally as businesses increasingly seek to transact on a global scale.

We focus the remainder of this report to highlighting current digital provision in the C&W LEP sub region and any known plans/initiatives underway and planned, with initial conclusions drawn from our work to date and next steps.

3. Existing digital infrastructure assets and capability

3.1. 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. As a result, the fixed broadband coverage levels for Superfast, Ultrafast and Full Fibre (see Appendix A for definition) is available.

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 will form the basis for determining current coverage levels and to determine strengths, weaknesses and opportunities for consideration. The dataset captured to date will be complimented in due course with additional datasets to provide a strategic view of gap areas in recognition of the C&W LEP priorities when developing the Digital Infrastructure Plan. The plan is to provide authorised user access to the data via a secure mapping portal to engage the wider views of key stakeholders.
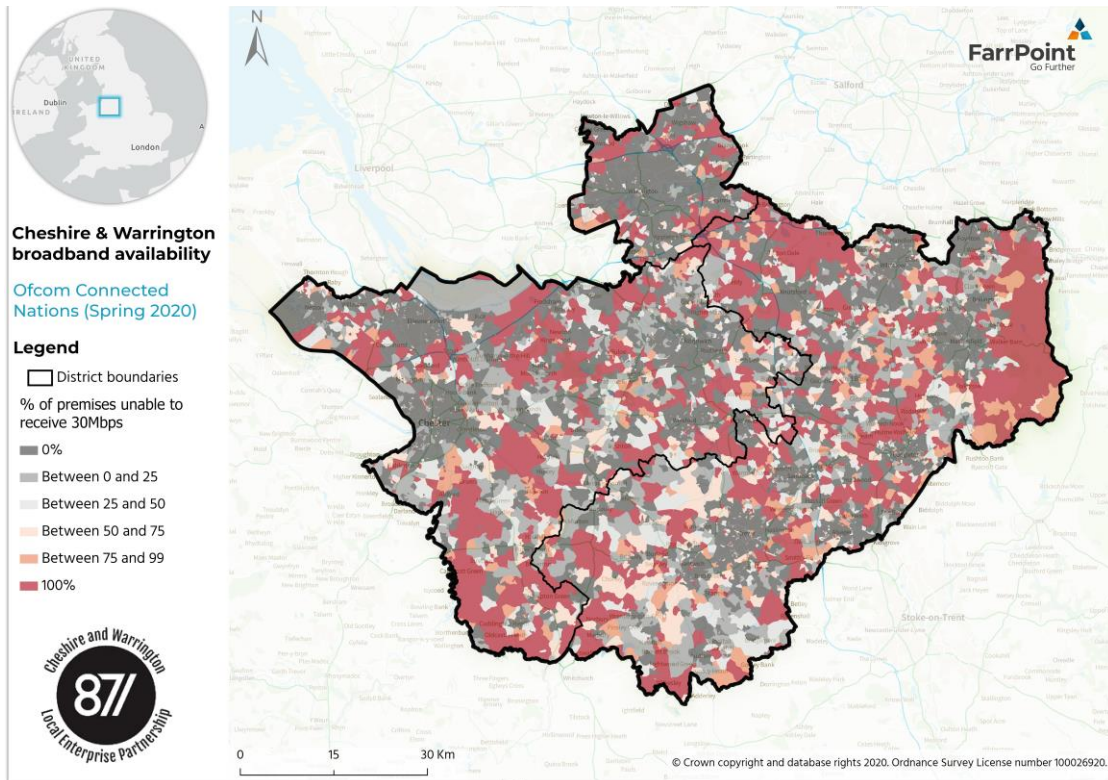
3.2. Initial Outputs

3.2.1. Superfast Broadband Coverage

Superfast Broadband Coverage is shown in Figure 1. 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 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 Cheshire and Warrington LEP area has an overall coverage figure of 96%.

Figure caption area / map titles:

Cheshire & Warrington broadband availability

Ofcom Connected Nations (Spring 2020)

Legend

☐ District boundaries

% of premises unable to receive 30Mbps

■ 0%
■ Between 0 and 25
■ Between 25 and 50
■ Between 50 and 75
■ Between 75 and 99
■ 100%

0   15   30 Km

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Area	% Superfast Availability	Number of Premises
Warrington	97.0%	95,781
Cheshire East	92.8%	175,278
Cheshire West and Chester	94.6%	160,504

Figure 1: C&W LEP Sub region Superfast Broadband Coverage

3.2.2. Ultrafast Broadband Coverage

Ultrafast Broadband Coverage is shown in Figure 2. 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.

Figure 2: C&W LEP Sub region Ultrafast Coverage
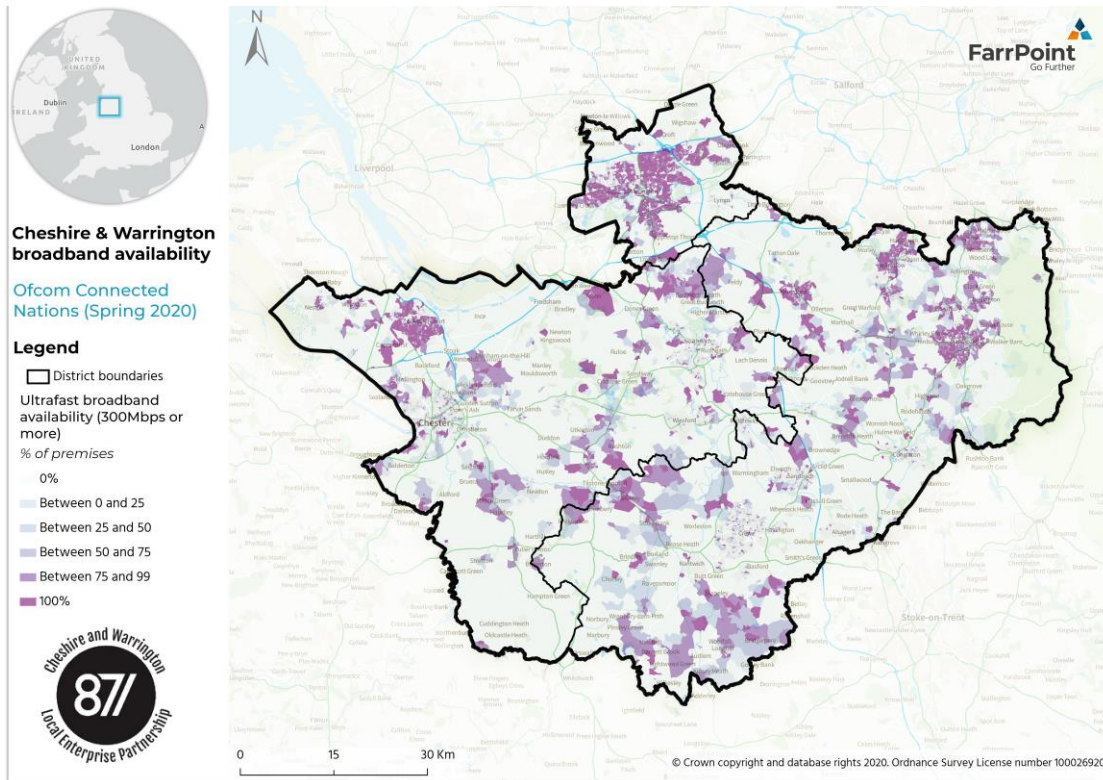
Area	% Ultrafast Availability	Number of Premises
Warrington	67.0%	66,168
Cheshire East	33.4%	63,087
Cheshire West and Chester	26.8%	45,414

3.2.3. Full Fibre Broadband Coverage

Coverage of full fibre broadband infrastructure varies significantly 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, post codes 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.
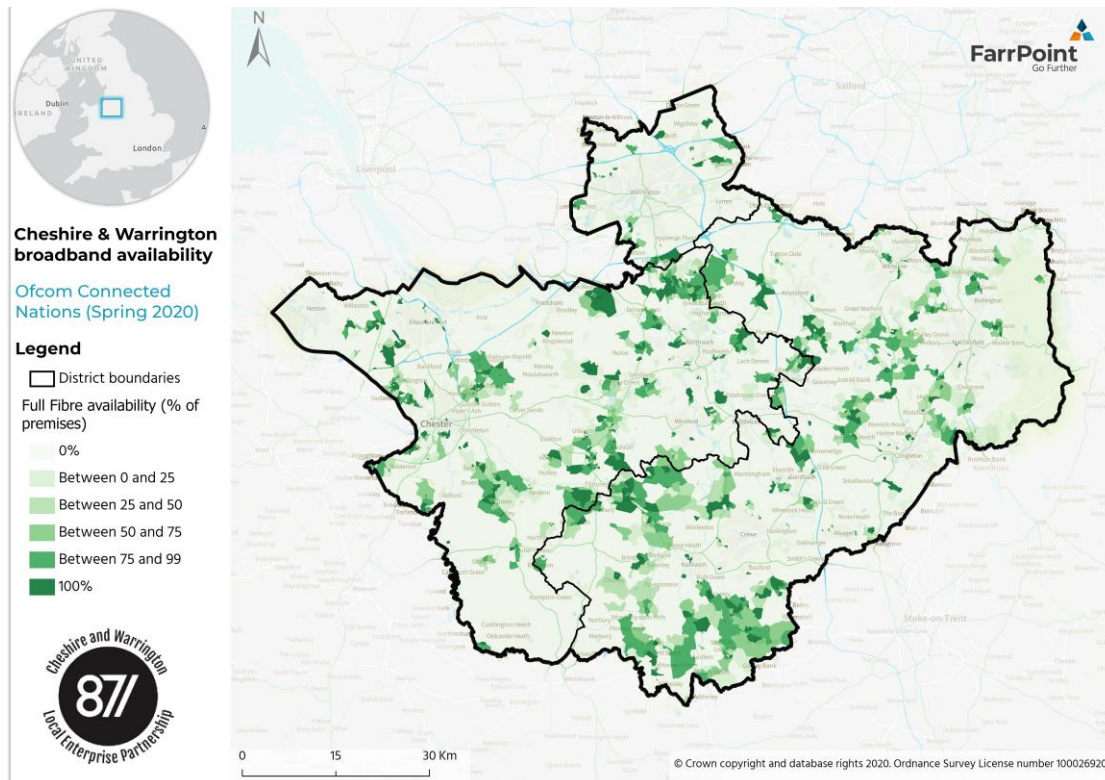
| Area	% Full Fibre Availability	Number of Premises
Warrington	1.2%	1,199
Cheshire East	4.2%	7,944
Cheshire West and Chester	8.4%	14,242

Figure 3: C&W Sub region Full Fibre coverage

3.2.4. Mobile (4G) Coverage

As shown in Figure 4, 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%.

Despite being well served by 4G coverage, to date only a single MNO (Vodafone) has deployed any active 5G infrastructure within the C&W LEP sub region, serving the area in and around Warrington. Ofcom do not currently publish a 5G coverage dataset and as such it is not possible to provide a map showing areas of 5G availability across the C&W LEP sub region.
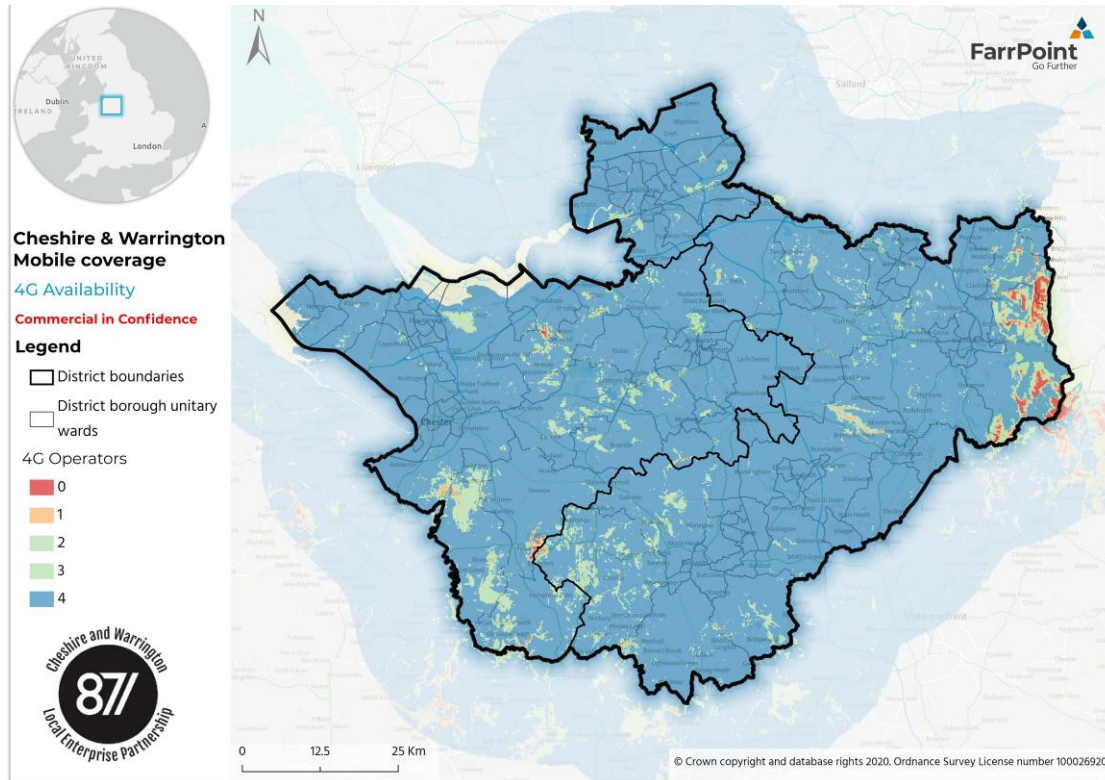
Area	% geography covered by all 4 MNOs	% geography not covered by any MNO	% premises covered indoors by all 4 MNO's	% premises not covered indoors by any MNO
Warrington	97.0%	0.0%	68.3%	0.1%
Cheshire East	91.1%	1.1%	83.2%	0.7%
Cheshire West and Chester	91.8%	0.2%	65.7%	0.5%

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

4. Gaps in Evidence Base

4.1. Initial Findings

The following highlights some gaps in the Evidence Base that we have identified to date:

- Additional spatial (GIS) data showing the boundaries of both existing and planned strategic development and employment sites would enable more detailed analysis of digital connectivity in these key strategic sites to be undertaken. This detailed analysis can then be used to ensure that these key strategic sites, which will be drivers for economic growth, sit at the heart of the Digital Infrastructure Plan for the sub-region. We are happy to work with the C&W LEP to consider how this information can be obtained to allow a more detailed spatial analysis should it not be available.

- The current Ofcom Mobile coverage dataset contains data in a 100x100m grid cell format and shows the number of operators in each cell providing 4G at a strength of -105dB. Whilst this is suitable to produce a high level overview of the area, it lacks detail to show where not-spots exist for specific operators, and as such does not necessarily reflect the 'on the ground' experience of users. This lack of detail also reduces the ability to identify opportunities to proactively approach the mobile network operators with recognised issues in order to improve coverage in the area, for example by offering public building rooftops or land to site mobile infrastructure in areas of poor coverage. We are happy to discuss how this more detailed mobile coverage data could be gathered if required.

- Lack of detail to date around the UK Government outside-in programme and definition of Gigabit capable broadband in this context to establish the position of the LEP sub region in terms of progress towards the UK Government targets.

5. Conclusion and Next Steps

5.1. Conclusion

The work undertaken to date has laid the groundwork for the development of the C&W LEP Digital Infrastructure Plan.

We understand that the C&W LEP sub-region has a strong economy which generates over £32bn in economic output per year, with both productivity growth and job creation outstripping both the regional and national averages. In addition to this whilst most UK regions have experienced a reduction in foreign direct investment in recent years the C&W LEP sub-region has successfully bucked this trend with a significant increase over the same period. The C&W LEP sub-region also has a highly skilled population with a higher proportion of residents holding Level 4+ qualifications than the regional and national averages.

There has been significant work done by the Connecting Cheshire Programme to have taken Superfast broadband (24Mbps) coverage 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 public consultation was launched February 2020 in advance of a potential procurement to extend NGA broadband to the remaining identified NGA White premises, with a view to emphasising Gigabit speeds in recognition of national targets for Gigabit capable broadband.

Our work to date has established an evidence base to support the rationale for continued investment in fixed and mobile digital networks in the C&W LEP sub region, with the C&W LEP employing a demand-led strategic approach. It is expected that these inputs will allow the C&W LEP to deliver connectivity improvements which will propel the sub-regional economy, drive productivity and grow key sectors. The Digital Infrastructure Plan will need to consider a changing landscape, while looking to influence, compliment, leverage and support the national initiatives/targets and funding available, with other regional and local funds to address connectivity requirements in the C&W LEP sub region. There is a particular need to encourage the market to deliver full fibre infrastructure as this provides the most future proofed and high performance infrastructure whilst also being a key enabler of 5G deployments and future innovation.

5.2. Next Steps / Timeframe

We will develop a detailed Cheshire and Warrington Digital Infrastructure Plan that fully encapsulates the findings and conclusions from progress to date and the ongoing work required to be undertaken. The considerations identified to date and further engagement planned with key local and external stakeholders will form a key element in the development of the draft and final Digital Infrastructure Plan scheduled for September 2020.

We will consider the feedback from our engagement with businesses within key sectors (including the Growth Hub) and further develop our spatial analysis to ensure the Digital Infrastructure Plan meets the current and future needs of the C&W LEP sub-region and is able to leverage any mutually beneficial collaboration opportunities with neighbouring regions where appropriate.

We will assess relevant funding sources, both through any existing contracts and through new sources, coupled with a review of technology options deemed most appropriate to address the gaps in digital connectivity that have been identified.

We will also consider the various models for public support for investment in digital infrastructure, including gap-funding, public sector owned, concession to Build Operate Transfer, Public / Private Partnership, voucher schemes, challenge funds and community schemes based on our practical experience of structuring, specifying, sourcing and evaluating solutions and will combine this with our understanding of the market in terms of technology trends, perceived barriers to investment, and latest thinking on approach to the challenge set by UK Government targets.

The format of the Plan and approach will be proposed and discussed with C&W LEP officers and other relevant stakeholders throughout its development to ensure that it meets requirements.

We will deliver a draft for review supported by a presentation and discussion of key findings, prior to a final report incorporating all feedback.

Regular checkpoint reports will continue to be provided throughout the development of the Digital Infrastructure Plan to show progress being made and to provide an opportunity to highlight any issues.

A summary of the remaining key deliverables and associated timeframes is outlined below.

Deliverable	Timeframe / Milestone
Provide access to online GIS mapping portal	w/c 22nd June 2020
Delivery of Draft Report	w/c 7th September 2020
Delivery of Final Report	w/c 28th September 2020

Appendix 1 – Connectivity Types

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). As such we have provided explanations of the most used broadband connectivity terminology below for reference.

Superfast Broadband

Superfast Broadband refers to any broadband connection which delivers speeds of 30Mbps of 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 Fiber-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 Fiber-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.

Version Control

Owner   Steve Smith

Classification   Client Confidential

Revision	Description	Author	Checked	Reviewed	Authorised	Date
1.0	Initial Version	SS	JM	JM	SS	19/06/20
1.1	Revised Version	SS	JM	JM	SS	30/06/20