Sheffield City Council

Author/Lead Officer of Report: David Oliver, Business Partner

Tel: 07792 846021

Report of: Eugene Walker, Executive Director Resources

Report to: Cabinet

Date of Decision: 18th September 2019

Subject: The Sheffield City Council Digital Connectivity Strategy

Is this a Key Decision? If Yes, reason Key Decision:-	Yes [X]	No [ ]
- Expenditure and/or savings over £500,000		[ ]
- Affects 2 or more Wards		[X]

Which Cabinet Member Portfolio does this relate to?   Finance, Resources and Governance (Deputy Leader)

Which Scrutiny and Policy Development Committee does this relate to? Economic and Environmental Wellbeing Scrutiny and Policy Development Committee

Has an Equality Impact Assessment (EIA) been undertaken?	Yes [X]	No [ ]
If YES, what EIA reference number has it been given? 588		

Does the report contain confidential or exempt information?	Yes [ ]	No [X]

Purpose of Report:

The purpose of this report is to seek approval of the Digital Connectivity Strategy and, in principle, the programme of activities and projects proposed within it. These activities and projects will improve digital connectivity in Sheffield, so that coverage, choice and speed of communication stays ahead of demand; and so that connectivity enables residents and businesses to use digital solutions to improve their lives and to sustain, grow and create new business.

Recommendations:

It is recommended that Cabinet:

1) approves the Digital Connectivity Strategy and the 'direction of travel' set out therein.

2) notes that the Director of Business Change and Information Solutions will seek any additional formal approvals required to implement the activities and projects described in the Digital Connectivity Strategy and summarised in this report such as the procurement of contracts for 5G, Wi-Fi and Internet of Things Networks.

Background Papers:

None

Lead Officer to complete:-		
1	I have consulted the relevant departments in respect of any relevant implications indicated on the Statutory and Council Policy Checklist, and comments have been incorporated / additional forms completed / EIA completed, where required.	Finance: Paul Schofield
		Legal:
		Equalities: Michelle Hawley
	Legal, financial/commercial and equalities implications must be included within the report and the name of the officer consulted must be included above.	
2	**EMT member who approved submission:**	Eugene Walker, Executive Director Resources
3	**Cabinet Member consulted:**	Cllr Terry Fox, Cabinet Member for Finance, Resources and Governance and Deputy Leader
4	I confirm that all necessary approval has been obtained in respect of the implications indicated on the Statutory and Council Policy Checklist and that the report has been approved for submission to the Decision Maker by the EMT member indicated at 2. In addition, any additional forms have been completed and signed off as required at 1.	
	Lead Officer Name: David Oliver	**Job Title:** Business Partner
	Date: 28th August 2019	

1   PROPOSAL

1.1   Sheffield's Current Digital Connectivity Landscape

1.1.1   Sheffield is well served by the current generation digital connectivity technology. For example, coverage of Superfast Broadband (fixed line broadband that is capable of download speeds of 30Mbps) is at 96.5% of the City and coverage of 4G (cellular broadband with average download speeds from 16 to 33Mbps) ranges from 72.1 to 96.2% of the City depending on network operator.

1.1.2   However, both Superfast Broadband and 4G technologies are incapable of meeting future demands for speed, capacity, reliability, and responsiveness; and are fast approaching end of life. Indeed, Openreach and the Government have both announced plans to phase out copper based Superfast Broadband infrastructure.

1.1.3   The next generation of digital connectivity technology is full fibre networks and 5G cellular networks.

1.1.4   Full fibre networks dispense with copper wire and traditional street cabinets. They provide a direct connection from a property to an exchange using glass fibre and are capable of download speeds in excess of 1,000Mbps.

1.1.5   5G uses a new radio interface that along with other new technologies, enable much higher radio frequencies to be used. This enables significantly more data to be carried over the air for faster speeds, reduced congestion and lower latency. At launch, 5G download speeds are expected to start at 150Mbps, eventually becoming as fast as 1,000Mbps plus.

1.1.6   Only these new technologies are capable of meeting the future demands for speed, capacity, reliability, and responsiveness required by residents, businesses and the public sector in order to use modern digital services. With copper and early generation cellular networks soon being phased out, we are at risk of becoming 'cut off' - unable to use the applications, products and services that communicate on modern networks. This will increase the digital divide, with more people unable to benefit from the social, health, educational and financial benefits of being online.

1.1.7   Unfortunately, Sheffield is not well served by this next generation of digital connectivity technology and has not generally compared well with other UK cities on connectivity. The most recent Smart City Index published by Huawei in 2017 placed Sheffield 16th of 20 cities assessed. At time of writing, full fibre network coverage in Sheffield is only 1.66%. This is the lowest coverage of the 10 Core Cities. Nationally, the figure is 8% coverage.

1.1.8 Openreach, the largest of all of the full fibre network infrastructure providers in the UK, has announced plans to deploy full fibre networks in over 70 UK towns and cities through its 'Fibre First' programme.

1.1.9 Sheffield was added to the Fibre First programme in July 2019. Officers believe that the Council's early stage development of a barrier busting approach to wayleaves, planning and highways (as described in the Digital Connectivity Strategy) was a key factor in determining the city's inclusion.

1.1.10 Two Mobile Network Operators, EE and Three, have announced that Sheffield will be included in their initial 5G roll out plans, with work to commence in Summer 2019.

1.1.11 The announcements by EE and Three are positive. However, they mark just the beginning of 5G in Sheffield. It will take several years and several iterations of the technology before 5G technology is fully deployed. The announcements to date largely describe upgrades to existing macro cell network infrastructure. It is expected that additional macro cells will need to be constructed across the city along with potentially hundreds of small cell radios in denser indoor and outdoor areas.

1.2. How the Council Could Improve Digital Connectivity in Sheffield

1.2.1 Following almost a decade of austerity and year on year reductions in central government funding, combined with rising pressures for both children's and adult's social care; the Council's ability to fund digital connectivity from its core budget is limited.

1.2.2 However, we believe improvements can still be achieved by leveraging our position as an anchor institution with significant assets and influence on city policy and strategy. The Digital Connectivity Strategy, set out in the Appendix, sets out a vision for digital connectivity in Sheffield, achievements to date and plans for building on these over the next 3 years utilising:

1.2.3
- Arrangements such as concession contracts or alternative forms of agreement that will offer use of council owned assets in exchange for a rental income and some form of digital connectivity service;
- Applications for funding from Government, Sheffield City Region and other external sources;
- Publicising and promoting our strengths and achievements because an enhanced profile and reputation based on world class digital connectivity will help attract business and inward investment to the City - one of the reasons why this Digital Connectivity Strategy is important is that it makes a clear statement of our intent to the market which will increase our chances of attracting those companies who want to make investments in relation to fibre, 5G

and other digital connectivity;

- Establishing and maintaining closer working relationships with the private sector, sharing information, helping each other, innovating, ensuring that public sector interventions complement those of the private sector;
- Adopting a pro investment, barrier busting approach to wayleaves, planning and highways to provide the conditions required by network operators to install full fibre, 5G and other telecommunications infrastructure quickly, efficiently and effectively in the City.
    - o Full fibre network infrastructure providers need help from Local Authorities to remove barriers to deployment. Pragmatic approaches to highways, planning and wayleaves will increase speed and coverage of full fibre network deployment.
    - o There is much for the Council to do to ensure that Sheffield continues to benefit from each improvement in the speed and coverage of 5G. Equally, there is a real opportunity for Sheffield to become a leading 5G City, if it is able to quickly, efficiently and effectively deploy an open access small cell network across the City.

1.2.4 Most of our achievements to date have been delivered in partnership with our Local Authority Partners through the Superfast South Yorkshire programme. We will continue to collaborate in this way where this helps to deliver our strategic objectives.

1.2.5 We will also collaborate with our City partners in Academia, Health, Police, Commerce and other sectors in order to implement the aims and objectives of the strategy, to enable further downstream benefits to be delivered, and to ensure that Sheffield moves towards being recognised as one of the country's best connected cities.

1.3. Activities and Projects

1.3.1 The Digital Connectivity Strategy includes a number of proposals for improving digital connectivity in Sheffield that will be pursued over the next 3 years including:

- Seek further investment in the Superfast South Yorkshire programme;
- Promote Government connection voucher schemes;
- Produce a transport network digital connectivity plan;
- Seek further investment in business support programmes;
- Ensure Council enabled networks can be used as accessible innovation test beds;
- Establish a city wide register of public assets that can be used to improve digital connectivity;
- Establish a single point of contact responsible for enabling the private sector to reuse these assets;

- Maintain and extend public owned infrastructure such as duct;
- Arrangements such as a concession contract or alternative form of agreement for an open access 5G infrastructure;
- Seek to introduce a policy that will require developers to provide full fibre access at new sites (superfast only if they can demonstrate that full fibre is not feasible). The new policy will be tested through the Sheffield Local Plan public examination process, recognising that this goes further than current national planning policy;
- Publish a digital connectivity charter describing how the Council will adopt a pro-investment, barrier busting approach to wayleaves, planning and highways;
- Arrangements such as a concession contract or alternative form of agreement for an Internet of Things (IoT) infrastructure;
- Fund IoT demonstrators that illustrate the art of the possible in different sectors;
- Arrangements such as a concession contract or alternative form of agreement for free of charge public access wi-fi outside the city centre;
- Try to find a way of providing free of charge/reduced cost basic internet access in social housing.

1.3.2   Where further decisions are required to implement these proposals these will be taken in accordance with the Leader's Scheme of Delegations.

2.   HOW DOES THIS DECISION CONTRIBUTE?

2.1   The Digital Connectivity Strategy has an ambitious vision; that by 2021 Sheffield will be recognised as one of the best connected cities in the country: where coverage, choice and speed of communication stays ahead of demand; and where connectivity enables residents and businesses to use digital solutions to improve their lives and to sustain, grow and create new business.

2.2   The Digital Connectivity Strategy has 9 Strategic Objectives, these are:

- To deliver access to superfast broadband for 100% of Sheffield;
- To deliver access to full fibre at every major business location;
- To deliver digitally connected public and private transport networks;
- To stimulate demand and encourage innovation;
- To exploit publicly owned assets and infrastructure;
- To establish Sheffield as a 5G-ready city;
- To become an industry recognised, pro-investment, barrier busting city;
- To establish a city-wide internet of things network;
- To provide free internet access in council owned social housing, outdoor spaces and potentially other council owned buildings.

2.3   It is anticipated that these strategic objectives will deliver the following benefits:

- To ensure that no one is excluded from the digital age and the socio-economic benefits of being online;
- To meet the demands from an increasing resident population, ensuring sufficient network capacity;
- To enable businesses to be more productive and more competitive;
- To sustain and grow the digital sector, in new and emerging technologies;
- To provide ubiquitous coverage, so that residents, workers and visitors are always connected;
- To facilitate rapid adoption of smart services such as 5G, Internet of Things (IoT), Connected Vehicles;
- To enable public services to be delivered more efficiently, more effectively, and to be accessible online;
- To create jobs, to learn and apply the skills needed for the infrastructure, products and services;
- For smart city solutions that improve energy use, public safety, traffic management and air quality;
- To establish Sheffield's reputation as a 'go to' place for innovators, researchers and investors;
- To gain a competitive advantage from ensuring supply is available ahead of demand; and,
- To meet consumer demand for higher bandwidth for video streaming, gaming, home working.

3.   HAS THERE BEEN ANY CONSULTATION?

3.1   The Digital Connectivity Strategy is the product of over 12 months' worth of consultation and collaboration with the fixed line infrastructure providers, mobile network operators, shared infrastructure providers, government departments, specialist consultancies, public sector partners throughout the city region, academia and the private sector.

4.   RISK ANALYSIS AND IMPLICATIONS OF THE DECISION

4.1   <u>Equality of Opportunity Implications</u>

4.1.1   An Equalities Impact Assessment has been completed for this project, Reference: 588. This describes the positive impact that the Digital Connectivity Strategy, and the provision of free of charge internet access in particular, will have on Health, Age, Disability, Poverty and Financial Inclusion. These consist of:

- Improved health and well-being through remote health monitoring, better communications and access to health services;
- Reduced isolation as access to the Internet can help improve

communication and social engagement;

- Improved education outcomes through the use of web-based learning materials;
- Better employability through more effective job hunting and the ability to work remotely;
- The ability to access public services which are increasingly available online (such as applying for Universal Credit);
- Access to savings and discounts offered through online shopping (estimated at over £500 per year).

4.2 Financial and Commercial Implications

4.2.1 The Digital Connectivity Strategy will be implemented using: existing Council resources and commitments; in partnership with City, sub regional and regional partnerships; and, through innovative relationships with the private sector. This will require the use of the revenues generated from concession contracts (or alternative forms of agreement such as contracts, leases or wayleaves).

4.2.2 This report seeks approval for the strategy to implement digital connectivity and does not commit the Council to additional net expenditure. The intention is that any costs that might be incurred, in any of the Council's departments, will be defrayed by the income generated from the various concessions, leases and wayleaves agreements that may be negotiated with partners. The choice of the most appropriate agreement will be made in accordance with the Council's decision making processes at the time.

4.2.3 The final gross cost of implementing this strategy will not be known until detailed plans are developed; however, it is likely to involve a commitment of not less than £150k which will be funded from the agreements referred to in Section 4.2.2 above. In committing to this strategy, Cabinet should note the scale of this commitment, the inherent risk in IT projects (especially on increased costs) and balance this against the potential benefits to the city outlined in this report.

4.3 Property Implications

4.3.1 The following proposals may affect Council property/assets:

- Establish a city wide register of public assets that can be used to improve digital connectivity;
- Establish a single point of contact responsible for enabling the private sector to reuse these assets;
- Maintain and extend public owned infrastructure such as duct;
- Procure a concession contract (or alternative form of agreement) for an open access 5G infrastructure;
- Publish a digital connectivity charter describing how the Council will adopt a pro-investment, barrier busting approach to wayleaves, planning and highways;

- Procure a concession contract (or alternative form of agreement) for an Internet of Things (IoT) infrastructure;
- Procure a concession contract (or alternative form of agreement) for free of charge public access wi-fi outside the city centre.

4.3.2　Activities and projects that affect Council property will be developed in greater detail by officers from BCIS in collaboration and agreement with officers from the Portfolios/Services concerned. Reports seeking further decisions regarding the implementation of the Digital Connectivity Strategy will address any specific implications, including property implications of those subsequent decisions.

4.3.3　The implications for Housing and Neighbourhood Services are described separately in Section 4.6 below.

4.3.4　The Director of City Growth has been consulted in the development of the Digital Connectivity Strategy. Officers from City Growth will be key stakeholders in the development and delivery of the activities and projects described above.

4.4　Legal Implications

4.4.1　The Council does not have specific powers or duties concerning digital connectivity. However, it does have the general power of competence within the Localism Act that permits the Council to do anything that an individual may do, subject to certain limitations such as specific restrictions on its powers in other legislation.

4.4.2　Many of the proposals within the Digital Connectivity Strategy will require further, more specific, decisions before they can be fully implemented. These decisions will be taken in accordance with the Leader's Scheme of Delegations following consideration by the relevant decision makers of all of the relevant implications, including legal implications, of those further decisions.

4.5　City Growth Implications

4.5.1　There are implications arising from the following activities and projects for the City Growth Department, including Planning and Transport. These activities and projects will be developed in greater detail by officers from BCIS in collaboration and agreement with officers from the Portfolios/Services concerned.

4.5.2
- Produce a transport network digital connectivity plan;
- Seek further investment in business support programmes;
- Seek to introduce a policy that will require developers to provide full fibre access at new sites (superfast only if they can demonstrate that full fibre is not feasible). The new policy will be tested through the Sheffield Local Plan public examination process, recognising that this goes further than current national planning policy; and,

- Publish a digital connectivity charter describing how the Council will adopt a pro-investment, barrier busting approach to wayleaves, planning and highways.

4.5.3 The Director of City Growth has been consulted in the development of the Digital Connectivity Strategy. Officers from City Growth will be key stakeholders in the development and delivery of the activities and projects described above.

4.6 Housing and Neighbourhood Services Implications

4.6.1 There are implications for Housing and Neighbourhood Services arising from the activity/project that will try to find a way of providing free of charge/reduced cost basic internet access in social housing. These could include: entering into wayleaves with broadband providers for the provision of free of charge and paid for internet services; reviewing and processing deployment plans; and, providing access for installation.

4.6.2 For the purpose of clarity, social housing tenants will never be forced to use a free of charge/reduced cost internet service. The use of any free of charge/reduced cost or paid for internet service will always be at the discretion of the tenant.

4.6.3 The Director of Housing and Neighbourhood Services has been consulted in the development of the Digital Connectivity Strategy and will be a key stakeholder in the delivery of the activities and projects listed above.

4.7 Public Health Implications

4.7.1 The citizens of Sheffield may be wary of the public health implications arising from the deployment of 5G in Sheffield.

4.7.2 The 5G networks deployed by any Mobile Network Operator in Sheffield will need to comply with government technical standards and health and safety legislation.

4.7.3 Public Health England is responsible for advising the UK Government. Its guidance note entitled "Mobile phone base stations: radio waves and health" was updated in May 2019. This guidance note explains that Public Health England, along with the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the European Commission's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), and the World Health Organisation all share the view that the results of current scientific research show that there are no evident adverse health effects if exposure remains below the levels set by current standards.

5. **ALTERNATIVE OPTIONS CONSIDERED**

5.1 Do Nothing

5.1.1 The Council could choose not to adopt and implement the Digital Connectivity Strategy and to allow the market to determine the speed and coverage of next generation digital connectivity; it could choose not to work with the market to reduce barriers to investment; and it could choose not to directly intervene through, for example, concession contracts (or alternative forms of agreement).

5.1.2 However, history has shown that without public sector intervention, the market is slow to deploy infrastructure, particularly in less affluent areas of the City.

5.1.3 Public Sector Interventions since 2014 have achieved the following:

- Coverage of superfast broadband has increased from 80% to over 95% and will reach 99% of premises by 2021;
- Take-up of superfast broadband has increased from 18% to over 45%;
- Sheffield business parks were amongst the first in the country to access full fibre, gigabit, broadband;
- Business support programmes have helped SMEs use digital to sustain and grow their business;
- SMEs have received vouchers for half price connection and for half price innovation projects;
- The city centre has one of the best public access wi-fi networks in the country.

5.1.4 The do nothing option is not recommended because, were the Council to choose not to intervene, it is likely that coverage of full fibre and 5G in Sheffield would continue to lag significantly behind the rest of the country, with many other cities competing to attract the limited resources of the market to their own areas.

6. **REASONS FOR RECOMMENDATIONS**

6.1 It is recommended that Cabinet approves the adoption of the Digital Connectivity Strategy in order to improve digital connectivity in Sheffield, so that coverage, choice and speed of communication stays ahead of demand; and so that connectivity enables residents and businesses to use digital solutions to improve their lives and to sustain, grow and create new business.

APPENDIX

THE SHEFFIELD CITY COUNCIL DIGITAL CONNECTIVITY STRATEGY

Sheffield City Council

Digital Connectivity Strategy: 2019 to 2021
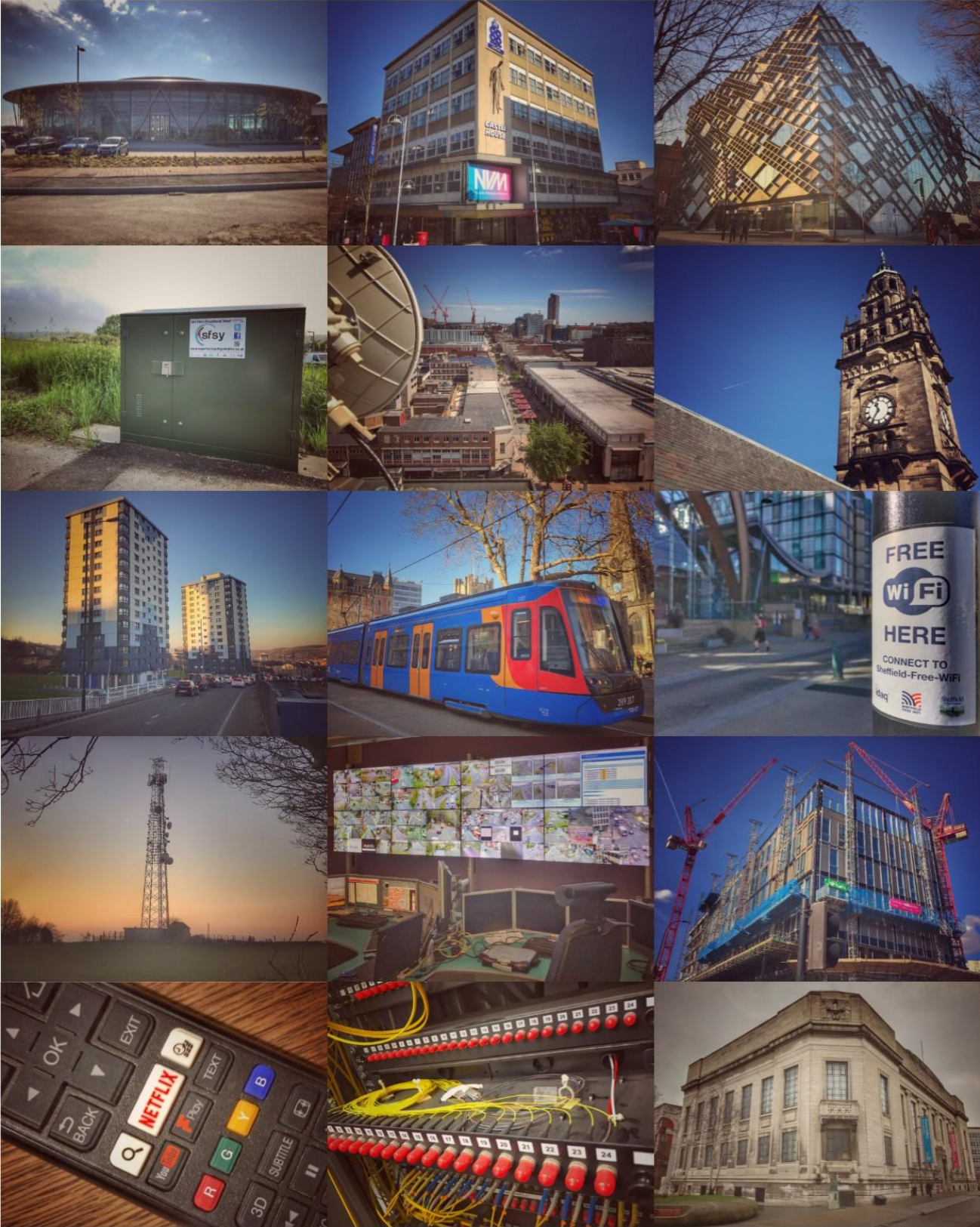
Executive Summary

Digital Connectivity

Digital Connectivity is the means by which electronic devices and 'things' communicate with each other, with private networks and with the internet. There are 14 billion electronic devices and 'things' connected to the internet today including computers, smart phones, tablets, TVs, smart speakers, wearables, vehicles, traffic signals, smart meters, buildings, data centres, medical equipment, sensors, industrial equipment etc. Digital Connectivity consists of fixed line networks (legacy copper networks and modern full fibre), mobile networks (legacy 4G and modern 5G) and wireless networks (Wi-Fi, Internet of Things Networks).

Our Vision

By 2021 Sheffield will be recognised as one of the best connected cities in the country: where coverage, choice and speed of communication stays ahead of demand; and where connectivity enables residents and businesses to use digital solutions to improve their lives and to sustain, grow and create new business.

Why We Need This Strategy

During the last five years, Sheffield City Council has played a key role in ensuring that businesses and residents are able to access the best digital connectivity services available:

- Coverage of superfast broadband has increased from 80% to over 95% and will reach c99% by 2021;
- The take-up of superfast broadband has increased from 18% to over 45%;
- Business parks in Sheffield were amongst the first in the country to access gigabit full fibre broadband;
- Business development programmes have helped businesses use digital to sustain and grow;
- Vouchers have covered 50% of many local businesses' digital connection and innovation costs; and,
- The city centre now benefits from arguably the best public access wi-fi network in the country.

However, the Council cannot afford to stand still. As Sheffield develops and grows, there will become an increased demand on high speed, ubiquitous connectivity. The Council must document and share its Vision for Digital Connectivity in order to give residents and businesses confidence that their future connectivity needs will be met. It will help to demonstrate that Sheffield is a pro-investment city that is open for business and encourage the market to invest here ahead of other less ambitious cities. This strategy will ensure that Sheffield has the infrastructure in place to meet the following connectivity requirements:

- To enable businesses to be more productive and more competitive;
- To sustain and grow the digital sector, in new and emerging technologies;
- To provide ubiquitous coverage, so that residents, workers and visitors are always connected;
- To facilitate rapid adoption of smart services such as 5G, Internet of Things (IoT), Connected Vehicles;
- To enable public services to be delivered more efficiently, more effectively, and to be accessible online;
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1. The Vision

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Our Strategic Themes

Access for All
Increase coverage and take-up across the whole of the city

Economic Growth
Business connectivity and support for competitive advantage

Innovation
Adopt the latest technology innovations at an early stage

Exploit Public Assets
Reuse City infrastructure to deliver quickly and economically

Enables Wider Benefits
Support and enable digital inclusion, public service transformation and 'smart city' Initiatives

2. The Benefits of Digital Connectivity

2.1 Being Economically Competitive

The 2018 Digital Economy and Society Index (DESI) found that, overall, the UK is ranked 7th in the European Union for digital connectivity. However, this assessment is based largely on the use of current generation technology that is fast reaching end of life such as Fibre to the Cabinet (FTTC), Cable Broadband and 4G. The UK is not so well placed where the next generation of digital connectivity is concerned. For example, it is currently ranked 26th for Fibre to the Premise (FTTP). According to broadband comparison website, Think Broadband, coverage of Superfast Broadband in Sheffield is 96.5% but coverage of Full Fibre is only 1.6%.

Analysis commissioned by Ofcom from Dr Pantelis Koutroumpis of Oxford University has proven that investment in broadband has had a positive impact on economic growth, increasing UK GDP by 0.37% pa from 2002 to 2016 (a cumulative increase of 5.3% over the period). Investments in coverage, speed and take-up are each proven to increase economic growth. The Ofcom report establishes an empirical basis for how broadband has impacted on the UK economy and supports a strategy of continuing to encourage broadband investment, improving coverage and speed, and increasing take-up.

Business benefits enabled by digital connectivity include:

- Access to, and use of, products, services and resources that are increasingly digitally enabled;
- Increased efficiency and effectiveness, increasing productivity and reducing costs;
- Growth of existing markets and entry to new global markets;
- Innovation and the creation of new products and services; and,
- Workstyles that attract skilled employees.

Sheffield has a thriving and growing creative, digital and tech sector, including: WANdisco, Sumo Digital, Jaywing and Pimoroni. There are over 60 successful digital and cross-sector collaborative communities, meetups and digital skills initiatives, including: dotSHF, Smart Sheffield and Sheffield Digital.

Digital industry is growing faster in Sheffield than any other sector, creating new jobs and new wealth for the city. The 2018 Tech Nation Report described the growth in digital industry and jobs in Sheffield. Sheffield's tech industry turnover grew by £82m in 2016-17 to £745m, an increase of more 12% - the largest increase of all major UK cities.

For this to continue, the supply of full fibre, 5G and other forms of digital connectivity must remain ahead of demand. A city that is responsive to advances in digital connectivity technology will retain and grow its digital sector and the other sectors of its economy that are increasingly dependent on connectivity and technology for their competitive advantage.

Digital connectivity also drives growth through innovation and the development of new products and services, many of which are inconceivable at the time that the next advance in technology is first deployed. A connected city can support testbeds, trials and collaborations between public, private and academic partners to further drive innovation and growth. It enables Sheffield to become a more digitally enabled and interactable city to drive new kinds of business and relationships with consumers.

The Government's Future Telecoms Infrastructure Review supports this, stating that "it is important that network supply stays ahead of demand, otherwise it risks becoming a constraint on the potential for future innovation, productivity and growth."

Analysis commissioned by the National Infrastructure Commission (NIC) from Frontier Economics has estimated that the benefits of full fibre to consumers from being able to access new innovative services (Premium Audio Visual, Virtual and Augmented Reality and Smart Home) and from cost savings in the delivery of public services (Telehealthcare, Online Classrooms and 5G) could reach £33.3Bn by 2050. This analysis makes no allowance for wider economic benefits associated with productivity improvements, greater scope for innovation, enhanced labour force participation, or 'externality' impacts related to improved health, wellbeing, inclusion or environmental benefits.

Analysis commissioned by City Fibre based on a wide range of national and international research and evidence does account for these wider impacts and has predicted that the total economic impact of deploying full fibre broadband networks in Sheffield, when combined with investment in smart city technologies, IoT, 5G mobile networks and new telehealth technologies, could be as high as £1.364Bn over 15 years. These potential benefits are summarised in the following table.

Economic Benefit	(£m)
Direct Impacts	60
Up to 150 jobs created in construction, civil engineering & the professional services associated with network construction.	
Productivity	38
Business processes based on faster upload & download speeds, uncontended services, ultra-low latency, superior resilience & reliability.	
Innovation	40
Develop new & richer products & services, access new markets across the globe, innovate in collaboration with international online communities.	
Business Start-Ups	43
Starting a business is easier & less expensive, powerful cloud based solutions are accessible on subscription, businesses are leaner & more productive, flexibility supports their sustainability.	
Worker Flexibility	38
New working practices, access to a wider labour pool, lower premises overheads, work-life balance improves motivation/productivity, reduced barriers to work for carers, single parents etc.	
Housing Wealth	162
Digital connectivity is a priority feature for an increasing number of home buyers, gigabit connectivity has increased house prices by 4% in the United States.	
Health	31
New forms of outreach, person centred care, remote diagnosis, prevention & patient monitoring through e-patient records, apps, wearable devices, telehealth & assistive living technologies.	
5G	616
The features of 5G mobile communication will create new business models, products & services that increase growth in transport & logistics, finance, health & social care, manufacturing & retail.	
Smart Cities	113
Enable the roll-out of connected & interactive technologies & data to make a wide range of services & urban infrastructures better adapted to user needs & more efficient.	
Industry 4.0 / IoT	223
Industry 4.0 & IoT (industrial robots, networked machinery, data simulation, 3D printing, big data & analytics, augmented reality etc.) will revolutionise manufacturing & drive economic growth.	
Total	**1,364**

2.2 Enjoying a Better Quality of Life

Digital connectivity improves our quality of life. If the people of Sheffield understand the benefits of the internet for them personally and if they have the skills and the means to get online; then they will be happier, healthier and better off financially. The socio-economic benefits of being online include:

- The ability to access public services which are increasingly available online;
- Improved education outcomes through the use of web-based learning materials;
- Better employability through more effective job hunting and the ability to work remotely;
- Improved health and well-being through remote health monitoring, better communications and access to health services;
- Reduced isolation as access to the internet can help improve communication and social engagement;
- Access to streaming services which are increasingly replacing physical methods of distributing recreational content such as TV, movies and music;
- Access to savings and discounts offered through online shopping; and,
- More opportunities to interact with new digital services and experiences in the environment, both urban and rural.

Sheffield has an ambition to be recognised as a leading digitally inclusive city where everyone who wants to be online is able to benefit from the advantages of the digital world. The Council will continue to work with its partners to reduce digital exclusion in the city; and will help to establish a Local Digital Skills Partnership to focus on helping people with basic digital skills centred on addressing access, skills, motivation and trust.

The potential socio-economic impact of improved digital skills and digital connectivity in Sheffield is huge. Sheffield is the 60th most deprived of the 326 Local Authority geographies according to the 2015 English Index of Multiple Deprivation. The following table shows how the city ranks across a range of measures.

Sheffield City Council Area: Rank of Average Score (1 is Most Deprived, 326 is Least Deprived)

Index of Multiple Deprivation	Income	Employment	Education, Skills, Training	Health Deprivation & Disability	Crime	Barriers To Housing & Services	Living Environment	Income Deprivation Affecting Children Index	Income Deprivation Affecting Older People
60	68	79	41	73	80	107	135	68	53

Those who would benefit the most from being online are precisely those who are digitally excluded. The following table, based on the 2017 Good Things Foundation Digital Nation Report, compares characteristics of the digitally excluded to corresponding quality of life benefits experienced by regular internet users.

Characteristics of Non Users	Benefits Experienced by Regular Users
90% are disadvantaged in some way	74% use public service web sites
39% are older than 75	66% feel happier & 51% less isolated due to more social contact
78% left school before the age of 16	90% progress to further learning
50% are in social class DE	52% are more confident managing money
48% are chronically ill or disabled	67% feel more confident managing their health
45% earn less than £11.5k	£516 to £744 saved each year
19% are unemployed	64% find paid or voluntary work, or look for work

The impact of improved digital skills and connectivity in Sheffield will be felt most by Sheffield's 'digitally excluded'. For example:

Financial Impact

Universal Credit is a single monthly payment for people on a low income or who are out of work that replaces six 'legacy' benefits and tax credits. In most cases, Universal Credit should be applied for online, so new claimants will need digital skills and connectivity. However, in a 2019 survey, 50% of organisations involved in delivering Universal Credit in Sheffield reported that the supply of online access is not enough to meet current and/or future demand. This places up to 8,400 people in Sheffield currently claiming the out of work benefits covered by Universal Credit at financial risk (Nomis Jan 2019).

Health Impact

In Sheffield in 2014-15 almost 100,000 days were lost to work-related stress, depression or anxiety. Currently 1 in 3 people of working age have a long-term health condition. By 2030, on current trends, 40% of working age people will be affected by poor health. The distribution of this barrier is not equal, with the poorest populations of the city having a 60% higher level of long term conditions. Digital skills and connectivity can help those affected by physical or mental health conditions to access health and social care services and to manage their own conditions, to keep socially active with friends and relatives, to feel better faster and to return to work sooner.

The impact of improved connectivity in Sheffield will also be felt by those who have long since embraced the benefits of internet access. Full fibre and 5G networks offer far faster, far more reliable, far more responsive connectivity than superfast fibre to the cabinet networks. This technology is required to meet the demands of greater bandwidth for consumer services. For example:

Video on Demand

Video on Demand is a massive growth area in the US and the UK. High Definition content streams at 8Mbps and 4k Ultra High Definition content streams at 32 Mbps which exceeds the UK definition of Superfast Broadband. Also where 4G connections tend to offer download speeds of around 20Mbps (which is fast enough to download a HD movie in 30 minutes), 5G is expected to surpass that by orders or magnitude: 500 to 1,500 Mbps (fast enough to download the same film in 25 seconds).

Traffic Growth and Future Proofing

Domestic internet traffic will continue to grow in the future as multiple family members use increasing numbers of internet services in their daily lives. For example, on line gaming in high definition; streaming of music, video and catch up TV; voice calling, video calling, wearables, smart speakers and other connected devices combine to create ever increasing demands on bandwidth.

In a 2018 study for Ofcom, WIK Consult assessed the applications that require ultrafast broadband and how demand for bandwidth might evolve in the years to 2025. WIK found that high definition video, consumer cloud traffic, gaming, 'tactile internet' (e.g. remote diagnostics and autonomous driving) and 'immersive media' (e.g. virtual and augmented reality) would drive the demand for greater bandwidth. WIK found that up to 40% of UK households could demand at least 1Gbps download speeds and 600Mbps upload speeds by 2025. Under a less aggressive scenario, WIK estimated that 8% of households would require Gigabit bandwidth by 2025, and that more than 50% would require download speeds of at least 300Mbps.

2.3 Delivering Better Public Services

Digital Connectivity enables public services to be delivered in ways that are increasingly more innovative, more effective and more efficient. It enables public services to be targeted and to be tailored to the needs of individuals. Digital Connectivity also enables these new personalised public services to be accessed electronically, rather than in person or through a telephone contact centre.

The benefits of electronic public service delivery are described below:

- Enables the public sector to deliver services electronically to the public who are then able to access them 'any time, any place, anywhere';
- Delivering access to public sector services electronically online is often more efficient than delivering them through face-to-face or telephone contact centre channels. The 2016 LGA 'Engaging Citizens Online' report estimated the initial costs per transaction of face-to-face contact at £8.21, £2.59 for a telephone contact and £0.09 for an online transaction;
- Enables the public sector to improve its business processes, to take advantage of digital products and services to improve efficiency and effectiveness, to innovate and be responsive to changes in demand;
- Enables the public sector to reduce costs by using lower cost cloud based services rather than more expensive on premise alternatives;
- Enables the public sector to share information, to deliver joined up services, and to implement alternative organisational models such as shared services; and
- Enables the delivery of other organisational strategies. For example: public service transformation; education and skills; and, economic development.

Local Authority Transformation

The Sheffield City Council Customer Experience Programme, together with other initiatives, will equip Council Departments with the technology, skills and tools required to deliver consistent, flexible and responsive public services.

Sheffield City Council will put customers at the centre of service design; it will make it easier for customers to contact, access and receive services whenever and however they prefer to.

The Council wants to ensure that when customers make contact, they can get what they need in that first point of contact, or in as few as possible, and that the Council keeps them regularly updated along the way. The Council also wants to support customers to do more general tasks online.

The Customer Experience Programme will support projects to develop modern, flexible, responsive and digitally enabled services based on the needs of customers. Using service and customer insight it will identify new and exciting ways of working and deliver the tools needed to be a more modern and customer focussed organisation.

Access Method	How Do Customers Access Services Now?	How Do They Want To Access Services In The Future?
On Line	22%	58%
eMail	25%	15%
'Phone	43%	20%
Face To Face	1%	5%
Paper Forms & Post	20%	2%

A Long Term Plan for the National Health Service

The NHS Long Term Plan, published in January 2019, describes how the NHS will become fit for the future and how it will get the most value for patients from its limited funding. The plan describes how technology will play a central role in realising the Long Term Plan, helping clinicians use the full range of their skills, reducing bureaucracy, stimulating research and enabling service transformation.

The NHS will establish a wide-ranging and funded programme to upgrade technology and digitally enabled care across the NHS. Over the next 10 years, this programme will result in an NHS:

- Where digital access to services is widespread;
- Where patients and their carers can better manage their health and condition;
- Where clinicians can access and interact with patient records and care plans wherever they are, with ready access to decision support and AI, and without the administrative hassle of today;
- Where predictive techniques support local Integrated Care Systems to plan and optimise care for their populations; and,
- Where secure linked clinical, genomic and other data support new medical breakthroughs and consistent quality of care.

The Emergency Services Network

The Emergency Services Network (ESN) is a critical communications system that will replace the current Airwave service used by the emergency services.

The ESN will be used by the police, fire and rescue, and ambulance services as well as a range of other users stretching from local authorities and utility services to first responders like inshore rescue. There are potentially around 300,000 individuals who will depend on ESN, using handheld devices or operating equipment in 50,000 vehicles, 115 aircraft and 200 control rooms.

The ESN software is being provided by Motorola Solutions and the infrastructure is being built by EE; who will upgrade and extend its existing 4G network. Around 500 new sites will be built, 300 in the most rural areas of the country. The new sites can be shared with other mobile network operators in order to maximise coverage for both the emergency services and to bring much commercial coverage to unserved areas.

3. Strategic Objectives

3.1 Deliver Access to Superfast Broadband for 100% of Sheffield

Superfast Broadband is a broadband connection able to download data at speeds of 30Mbps or above. Superfast Broadband can be provided using a range of different technologies including Fibre to the Cabinet, Fibre to the Premise, Cable and Wireless. A single superfast connection can support multiple computers, tablets, games consoles, and phones, meaning more people can be online at the same time. By 2021, we want every business and every resident in Sheffield to be able to access broadband services that offer speeds of 30Mbps and above.

<u>The Current Position</u>

In 2014 Superfast Broadband (30Mbps) reached only 80% of premises in Sheffield. The broadband providers in the UK had no plans to extend their networks, so the Barnsley, Doncaster, Rotherham and Sheffield Local Authorities formed the Superfast South Yorkshire Programme. Collectively, the South Yorkshire Authorities applied for funding to Central Government and to Sheffield City Region. They secured £15m and established a project to extend connectivity to c100,000 residential and commercial premises across the region through an almost entirely Fibre to the Cabinet (FTTC) infrastructure.

The Superfast South Yorkshire Programme has long recognised that Fibre to the Cabinet infrastructure has limited capacity and is incapable of meeting future demands for speed, bandwidth and reliability. Therefore, it has targeted public sector investment at Fibre to the Premise infrastructure (FTTP) since 2016. Fibre to the Premise is the gold standard for residential and business telecommunications; therefore our longer term ambition is for 100% of the region to have access to Fibre to the Premise Gigabit Broadband.

In 2018, The South Yorkshire Local Authorities will invest a further £4m to connect up to 10,000 premises that are currently unable to access superfast broadband with an almost entirely Fibre To The Premise infrastructure. This will extend coverage of Superfast, Ultrafast or Gigabit broadband to almost 99% of South Yorkshire by 2021.

<u>How We Will Do It</u>

01: Further Investment in the Superfast South Yorkshire Programme [Medium Term]

Sheffield City Council, along with its South Yorkshire Local Authority Partners, will continue to seek further investment in the Superfast South Yorkshire Programme. Additional public funding, together with further commercial investment, will extend coverage from 99% to 100% of the region.

3.2 Deliver Access to Full Fibre at Every Major Business Location

Full Fibre Broadband connections provide the fastest and the most reliable speeds available, capable of transferring data at 1,000Mbps and above. Full Fibre Broadband is delivered by Fibre to the Premise technology – a glass fibre connection directly from the exchange to the home or business, an infrastructure that has a lifetime of many decades. Sheffield has very little coverage of full fibre at the moment. However, a number of infrastructure providers have recently announced plans to increase coverage and in 2018 the Government set a target for national coverage by 2033. We believe that access to full fibre is essential for our future economic success. Therefore, our second objective is that by 2021 it is possible to access gigabit fibre broadband at every Major Growth Area, Major Business Park and Business District in the city including the city centre.

The Current Position

In March 2016, £5m of Central Government and Sheffield City Region funding was invested to bring speeds of 100Mbps and above to South Yorkshire Enterprise Zones and key Business Parks through Fibre to the Premise infrastructure.

In March 2018 the Government launched a Gigabit Voucher scheme to help businesses (or clusters of businesses) to buy gigabit-capable connectivity. It is anticipated that this demand will encourage operators to invest in new infrastructure to extend their coverage in the region. By March 2019, 177 Gigabit Vouchers had been issued in South Yorkshire with a further 80 in the pipeline, attracting a total of £577k government funding into the region.

How We Will Do It

02: Connection Vouchers [Short Term]

Sheffield City Council, along with its South Yorkshire Local Authority Partners, will promote Government Voucher Schemes that subsidise the costs of full fibre connectivity. We will aggregate and communicate demand from businesses to digital infrastructure providers who will extend their coverage to meet this need.

3.3 Digitally Connected Public and Private Transport Networks

A digitally connected transport network offers many benefits. It enables commuters to access personal and business networks on their commute to and from work, and during their working day as they move around the city. It enables commuters to access up-to-date information about the performance of the public transport system and the travel choices that they have in the city - regardless of whether they are at home planning a journey or at a bus stop, tram stop or train station. It ensures that public transport is a safe place to be, that it has the connectivity needed for lighting, CCTV monitoring and for calling the emergency services. It enables Connected and Autonomous Vehicles to traverse the city's roads. It enables the highway network to be managed more efficiently and effectively; improving road safety, managing traffic flows, minimising congestion, reducing pollution and improving air quality.

The Current Position

A range of improvements to the city's transport network are planned for the next three years, many of which are dependent upon 5G, wireless or full fibre connectivity. Projects include the Clean Air Zone (a c£50m system that charges owners of the most polluting vehicles to enter Sheffield City Centre) and an Internet of Things Programme to be implemented by Amey LG. Initially this will see sensors installed in litter bins, grit bins and drainage gullies. The Programme also has the potential to improve the maintenance of: roads; pavements; street lights; street signs; traffic signals; street furniture; grass verges; bridges and highway structures; waste collection; and, the gritting of roads and pavements.

Sheffield City Council, along with its Sheffield City Region Partners, must also now plan for the introduction of electrical vehicle charging; for connected and autonomous vehicles; and for the implementation of the Sheffield City Region Transport Strategy 2018-2040.

How We Will Do It

03: The Transport Network Digital Connectivity Plan [Medium Term]

Sheffield City Council will define the digital connectivity requirements of all of its major transport initiatives in order to ensure that these needs are met in the most efficient and effective manner, and that opportunities to add value, reduce cost, disruption and environmental impact are seized.

3.4 Stimulate Demand and Encourage Innovation

Extending coverage of digital connectivity will not in itself achieve the economic and social benefits that we want to realise. We must be proactive in stimulating demand and in encouraging citizens and businesses to use superfast, ultrafast and gigabit broadband as well as 5G and wireless networks such as Wi-Fi and IoT. Our fourth objective is to stimulate demand and encourage innovation amongst residential and business users.

The Current Position

In 2015, the Superfast South Yorkshire Programme developed a Demand Stimulation Strategy and obtained £1m funding from the South Yorkshire Local Authorities and from the European Regional Development Fund (ERDF) for its implementation.

In 2017 The Digital Growth Programme was launched which supported businesses to adopt new technology enabled by superfast broadband. It provided inspirational presentations from companies such as Rolls Royce, it raised awareness of the 'art of the possible', and it provided practical sessions to help local businesses put in place plans to implement what they had seen. 66 Sheffield based SMEs each received over 12 hours of support from the Digital Growth Programme.

In 2015 the South Yorkshire Local Authorities joined the government funded Connection Voucher Scheme. This 6 month programme offered grants of up to £3,000 to cover the installation costs of connecting to superfast or ultrafast broadband. 415 Sheffield businesses took advantage of the scheme, attracting over £500k government funding into the city, with many of the superfast or ultrafast broadband connections being provided by local suppliers.

In 2017 the Superfast South Yorkshire Programme established its own ERDF funded Connection and Innovation Voucher Scheme. The vouchers covered 50% of a business's connection costs up to £2,500 and 50% of a business's ICT enabled innovation costs up to £12,500. 108 Sheffield businesses took advantage of the scheme, attracting £665k government funding into the city.

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In March 2018, DDCMS launched a national Gigabit Broadband Voucher Scheme. This offers vouchers worth up to £2,500 to support the capital costs of new gigabit capable connections for businesses in the region. By March 2019, 177 Gigabit Vouchers had been issued in South Yorkshire with a further 80 in the pipeline, attracting a total of £577k government funding into the region.

Take-up of Superfast Broadband was 18% in 2015. In January 2018 take-up in the Intervention Area (the coverage funded by the SFSY Programme) had reached 26%, by March 2019 it had reached 42%, and by 2021 it is expected to reach 50%.

How We Will Do It

04: Business Support Programme [Short Term]

Sheffield City Council, along with its South Yorkshire Local Authority Partners, will continue to stimulate demand and encourage innovation through the Superfast South Yorkshire Programme, and to bid for additional funding for business support. Sheffield City Council's City Growth Department will continue to provide targeted support to start-ups and SMEs with growth potential. This will include explaining how technology and connectivity can improve productivity - regardless of the size, nature or IT maturity of the business. Business Support is also available from the Sheffield City Region Growth Hub.

05: An Accessible Innovation Test Bed [Medium Term]

The digital connectivity infrastructure to be established through this strategy represents an 'innovation platform' that can act as a testbed for research and development and for the development of new products and services; accessible by the universities, technology start-up incubators, and the city's broader digital eco-system. The Council has a proven track record here, the Sheffield City Centre Wi-Fi Service can be used as such a test bed, and it will adopt the same approach with future concessions/agreements for 5G, IoT and further Wi-Fi connectivity. The 'innovation platform' could potentially be used by Regional and National Partners such as the Connected Places Catapult and the DCMS 5G Test Beds and Trial Programme.

3.5 Exploit Publicly Owned Assets and Infrastructure

Sheffield City Council owns thousands of assets including street light columns, CCTV columns, underground duct, administrative buildings and social housing. Our fifth objective is to exploit publicly owned assets and infrastructure in order to improve the supply of full fibre and 5G telecommunications services and to foster innovation and growth.

The Current Position

In November 2017, Sheffield City Council entered into a concession contract that offered exclusive use of its city centre assets to a telecommunications company in exchange for a rental income, profit share and the provision of a free of charge public access Wi-Fi network. The rental income and profit share helps the Council to fund its digital activities. The free of charge public access Wi-Fi network makes the city centre a more vibrant and attractive places for citizens, visitors, businesses and shoppers. This will increase footfall and help local businesses thrive and grow.

The Council will make its assets available for reuse to help deliver the aims and objectives described in this Digital Connectivity Strategy. Potential applications include the use of council owned duct to extend full fibre networks, the use of council owned street assets to mount small cell radios for 5G, and the use of council rooftops to host Radio Gateways for IoT networks. Council assets could also be used by tech and digital industry to innovate, develop new products and services, and to get to market quickly.

<u>How We Will Do It</u>

06: Asset Register [Medium Term]

Sheffield City Council will establish a city wide inventory of publicly owned assets, ensuring that data such as location and condition is accurate and well maintained. The asset register will be used to support the delivery of the Digital Connectivity Strategy, and to stimulate further innovation through the reuse of public sector assets.

07: Single Point of Contact [Short Term]

Sheffield City Council will make it easier for digital infrastructure providers and the technology and digital industries to reuse public sector assets where this delivers the Digital Connectivity Strategy or stimulates further innovation. This will include the Home Office funded Sheffield-Wide Imaging and Switching System Network. We will establish a single point of contact and joined-up and efficient processes that make it easier for partners and the private sector to extend and improve digital connectivity in the city.

08: Maintain and Extend the Infrastructure [Long Term]

Sheffield City Council will adopt a 'dig once' approach so that publicly owned duct is laid under highways whenever there is a major development in the city. This approach has recently been adopted for the heart of the city programme. The duct can then be used by the Council to provide connectivity for traffic signals, ANPR cameras, CCTV etc. The new duct increases the assets available for reuse by partners and the private sector to extend and improve digital connectivity in the city. Private sector partners will also be invited to lay their own duct during these developments.

3.6 A 5G-Ready City

This objective is to stimulate market development and deployment of 5G technology and infrastructure in the city. This will create new opportunities for businesses, developing capability and skills, and encouraging inward investment; and it will ensure that Sheffield secures an 'early mover advantage' in the investment and development of capability and skills as future 5G products, services and applications evolve.

<u>The Current Position</u>

It is understood that the Mobile Network Operators plan to upgrade their existing 4G cellular infrastructure to meet the short to medium term demands of 5G, but do not plan to invest in the infrastructure required for longer term, higher levels of demand, known as 'densification'.

Sheffield City Council owns thousands of assets including street light columns, CCTV columns, underground duct, administrative buildings and social housing. These assets could be used by a telecommunications company to provide, ahead of demand, a wholesale 5G network ready for densification.

A densified 5G infrastructure (assumed to be based on a fibre to the street light, fibre to the small cell solution) is most appropriately provided on a shared basis, thus enabling choice and completion of 5G services to the customer, and minimising the amount of civil construction, disruption and environmental impact of each MNO implementing its own competing small cell network in the city.

09: 5G Ready Sheffield [Medium Term]

Sheffield City Council will procure a concession contract (or other appropriate form of agreement) that will offer use of Council owned assets throughout Sheffield for small cell networks in exchange for a rental income and the creation of an open access fully managed densified 5G infrastructure. By ensuring that the 5G network supply stays ahead of demand, the city will be well placed to respond quickly to the opportunities it will present for future innovation, productivity and growth. Furthermore, the income generated from the concession/agreement will help fund the Council's future digital activities.

3.7 An Industry Recognised, Pro-Investment, Barrier Busting City

This objective is to ensure that Sheffield is recognised by the telecommunications industry as an attractive place to invest, where the local authority proactively supports operators and removes barriers to the deployment of infrastructure.

The Current Position

Sheffield City Council has long recognised that digital communications infrastructure is vitally important for the social and economic well-being of the city. The current levels of fixed line, mobile and wireless coverage could not have been achieved without the support of council services such as planning, highways and property. Some of our processes are recognised as industry best practice and are quoted in government publications. For example, The Yorkshire & Humber Common Permit Scheme (YHCPS) which minimises delay and reduces disruption to road users from street works. However, we do not receive the recognition that we deserve; that would enhance the city's reputation, attract suppliers to the city, and ensure that collectively we gain competitive advantage from being an early adopter of new technology.

How We Will Do It

10: Planning Policy [Short Term]

Sheffield City Council will seek to introduce a policy that will require developers to provide full fibre access at new sites (superfast only if they can demonstrate that full fibre is not feasible). The new policy will be tested through the Sheffield Local Plan public examination process, recognising that this goes further than current national planning policy. This will mean that the gaps in commercial coverage do not grow in size, and that additional public funding is not required to help fill those gaps. Developers will be asked to consider installing multiple full fibre suppliers in order to provide choice and competition.

11: Barrier Busting [Short Term]

Sheffield City Council will publish a Digital Connectivity Charter. This will describe how the Council will adopt a pro-investment, barrier busting approach to wayleaves, planning and highways to provide the conditions required by network operators to install full fibre, 5G and other telecommunications infrastructure efficiently and effectively in the city. It will describe how the city council will establish and maintain relationships with the market, and how it will manage and govern digital connectivity internally.

3.8 A City-Wide Internet of Things Network

Our eighth objective is to establish a city-wide, open access IoT network that supports all major long range wireless communication protocols. Sheffield City Council owns administrative buildings and social housing that are ideal locations for IoT radio gateways.

<u>The Current Position</u>

By 2020 it is estimated that there will be 13 billion things in the home, 3.5 billion things in vehicles, 411 million wearable things, 646 million things in the hospital and 9.7 million other things in the city connected to the internet. A city-wide, technology agnostic and open access IoT communications network is required to provide connectivity and backhaul for Sheffield.

This is not just about meeting current and future demand, it is also about gaining competitive advantage for the city, its businesses and its citizens as 66% of early movers in manufacturing say IoT is critical to competitive advantage, 88% report a return in investment, and 77% of leaders say that IoT will transform business as we know it.

<u>How We Will Do It</u>

12: A City Wide IoT Network [Medium Term]

Sheffield City Council will procure a concession contract (or other appropriate form of agreement) that will offer use of council owned buildings throughout Sheffield for IoT radio gateways in exchange for a rental income and the creation of an open access fully managed IoT infrastructure. By ensuring that IoT networks are in place ahead of demand, the city will be well placed to respond quickly to the opportunities that IoT presents for future innovation, productivity and growth. Furthermore, the income generated from the concession/agreement will help fund the Council's future digital activities.

13: IoT Demonstrators [Long Term]

Sheffield City Council will use some of the revenue generated by the connectivity concessions/agreements to fund IoT demonstrators and proof of concept projects that illustrate the art of the possible and that can then be deployed further by the private sector to improve productivity, and by the public sector to improve efficiency and effectiveness.

3.9 Free Internet Access

We live in an increasingly digital world where many people are already benefitting from the internet, digital TV and mobile communications. Cities are some of the most digitally advanced, digitally driven places on the planet. This creates a huge range of business and social opportunities with rapidly changing products, services and ideas. It also offers further opportunities to learn, save money and keep in touch. When individuals are digitally active it can improve the accessibility of services and support to people who find themselves physically and emotionally isolated, whilst also providing employment opportunities both in digital careers and other industries that make use of digital technology.

Sheffield's City Council is committed to tackling inequalities by supporting those with the greatest needs and helping and enabling people to achieve their full potential. Through Sheffield's 'Tackling Poverty Strategy', we have identified that 'affordable safe access to the internet and the ability to use it can save people money and increase their ability to search for and apply for work, develop skills and access the services they need.'

Therefore this objective is to regard access to the internet as a human right, and to provide free of charge internet access wherever we can – in our public buildings, in our open spaces and in our social housing, so that those who wish to access the internet are able to do so (we recognise, and respect, that some people choose not to be digitally connected).

The Current Position

In 1856 Sheffield Public Library opened its doors for the first time, offering the public free of charge access to a selection of newspapers and books. 163 years later and the citizens of Sheffield are still visiting their local libraries in order to access information and services that they would otherwise not be able to, not just through printed media, but increasingly electronically.

Sheffield City Council currently provides free of charge access to computing devices and to the internet at libraries, first point buildings, and in the outdoor spaces and public buildings of the city centre.

However, we want to go beyond this and to provide free of charge internet access in public buildings and outdoor areas beyond the city centre and in the homes of our social housing tenants. This will help to bring the internet closer to the 20% of the overall population, and 40% of social housing tenants, that are digitally excluded.

How We Will Do It

14: Sheffield Free Wi-Fi Service - Phase 2 [Medium Term]

Sheffield City Council will procure a concession contract (or other appropriate form of agreement) that will offer use of council owned street lights, CCTV columns and buildings for the provision of residential and commercial Wi-Fi services in exchange for a rental income and a free of charge public access Wi-Fi service. Phase 2 is expected to cover outdoor spaces and non-residential public buildings in densely populated areas of Sheffield outside the city centre. This will provide free of charge internet access to more areas of the city, and generate further funding for the Council's future digital activities.

15: Free of Charge Basic Internet Access in Social Housing [Medium Term]

Sheffield City Council will attempt to find a way of providing social housing tenants with basic internet access that is free of charge to the tenant and free of charge to the Council. The Council will investigate whether it is possible for a digital infrastructure provider to offset the costs of providing a basic free of charge service through the profit generated by sales of paid for services to those tenants able to afford a commercial service. If it is not possible to find a way of providing basic internet access that is free of charge, then we will try to find a way of providing internet access at a reduced cost.

4. Digital Connectivity Strategy: Summary of Activity

Strategic Objective and Activity	Phasing (Months)	Lead Organisation
1. Deliver Access to Superfast Broadband for 100% of Sheffield		
01: Further Investment in the Superfast South Yorkshire Programme	*M: 10-18*	*SFSY*
2. Deliver Access to Full Fibre at Every Major Business Location		
02: Connection Vouchers	*S: 6-10*	*SFSY*
3. Digitally Connected Public and Private Transport Networks		
03: The Transport Network Digital Connectivity Plan	*M: 10-18*	*SCC*
4. Stimulate Demand and Encourage Innovation		
04: Business Support Programme	*S: 6-10*	*SFSY, SCR, SCC*
05: An Accessible Innovation Test Bed [Medium Term]	*M: 10-18*	*SCC*
5. Exploit Publicly Owned Assets and Infrastructure		
06: Asset Register	*M: 10-18*	*SCC*
07: Single Point of Contact	*S: 6-10*	*SCC*
08: Maintain and Extend the Infrastructure	*L: 18 Plus*	*SCC*
6. A 5G-Ready City		
09: 5G Ready Sheffield	*M: 10-18*	*SCC*
7. An Industry Recognised, Pro-Investment, Barrier Busting City		
10: Planning Policy	*S: 6-10*	*SCC*
11: Barrier Busting	*S: 6-10*	*SCC*
8. A City-Wide Internet of Things Network		
12: A City Wide IoT Network	*M: 10-18*	*SCC*
13: IoT Demonstrators	*L: 18 Plus*	*SCC*
9. Free Internet Access		
14: Sheffield Free Wi-Fi Service - Phase 2	*M: 10-18*	*SCC*
15: Free of Charge Basic Internet Access in Social Housing	*M: 10-18*	*SCC*

This strategy describes a range of activities and projects that Sheffield City Council plans to implement in order to deliver its objectives for digital connectivity. These activities and projects will be developed in greater detail in the months ahead. We will take account of developments in technology and changes in market conditions as we progress.

5. Our Strategic Approach

5.1 Our Strategic Approach To Funding

Following almost a decade of austerity and year on year reductions in central government funding, combined with rising pressures for both children's and adult's social care; the Council's ability to fund digital connectivity from its core budget is limited at best. Therefore, we will find alternative sources of funding to deliver our objectives. This includes:

- Concession contracts (or other appropriate forms of agreement) that will offer use of council owned assets in exchange for a rental income and some form of digital connectivity service;
- Applications for funding from Government, Sheffield City Region and other external sources; and,
- Publicising and promoting our strengths and achievements because an enhanced profile and reputation based on world class digital connectivity will help attract business and inward investment to the city.

5.2 Our Strategic Approach To Working With The Private Sector

Sheffield City Council, along with its South Yorkshire Local Authority Partners, will work with digital infrastructure providers, and residential/commercial developers, to establish and maintain a shared understanding of one another's plans, ensuring that public sector interventions complement those of the private sector.

In addition, we will adopt a pro investment, barrier busting approach to wayleaves, planning and highways to provide the conditions required by network operators to install full fibre, 5G and other telecommunications infrastructure efficiently and effectively in the city.

5.3 Our Strategic Approach To Working With Partners

The majority of our achievements to date have been delivered in partnership with our Local Authority Partners through the Superfast South Yorkshire programme. We will continue to collaborate in this way where this helps to deliver our strategic objectives.

We will also collaborate with our city partners in Academia, Health, Police, Commerce and other sectors in order to implement the aims and objectives of this strategy, to enable further downstream benefits to be delivered, and to ensure that Sheffield is recognised as one of the country's best connected cities by 2021.

5.4 Our Strategic Approach To Standards

5G networks will need to comply with government technical standards and health and safety legislation. Public Health England is responsible for advising the UK Government on 5G. Its guidance note entitled "Mobile phone base stations: radio waves and health" was updated in May 2019. This guidance note explains that Public Health England, along with the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the European Commission's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR), and the World Health Organisation all share the view that the results of current scientific research show that there are no evident adverse health effects if exposure remains below the levels set by current standards.