

Appendix C8: Digital Infrastructure Topic Paper

Introduction

The explosive growth of connectivity over the last decade has resulted in digital technologies increasingly touching on almost every aspect of modern living, meaning that demand for ever faster global connectivity is only expected to increase. There is an opportunity to create ambitious plans for connectivity for North East Cambridge that will not only support good Internet access for residents and businesses, but which will also provide a platform for some of the “smart” technologies, including environmental monitoring and management, energy efficiency and future transport solutions that are being considered as part of the area action plan. This includes both fibre to the premise (FTTP) for all properties as a minimum and provision for infrastructure to support mobile services including 5G and subsequent generations of mobile technology. The provision of low-power wide-area network (LPWAN) networks are also likely to play a key role in the rollout of low-cost sensors that will enhance monitoring of the environment, in line with the Environmental Health Topic Paper.

This will:

- Support ambitions for the NEC to become an innovation district, i.e. a centre for knowledge-based industries cluster together, primarily in small areas
- Help unlock economic opportunities particularly in industry 4.0, i.e. new digital industrial technology to gather and analyse data across machines, enabling faster, more flexible, and more efficient processes to produce higher-quality goods at reduced costs. This could include advanced manufacturing, support 3D printing etc.
- Enable new mobility solutions and facilitate ease of transition when changing between transport modes, which supports the aims to minimise the need travel, reduce the impact of the private car and encourage a switch to more sustainable modes.
- Provide effective solutions to servicing requirements, including the operation of ‘last green mile’ deliveries
- Enable the delivery of future facing intelligent infrastructure including energy, waste, water, transport etc. allowing the Area Action Plan to better manage these aspects of the development
- Support environmental monitoring
- Support the transition to zero carbon by enabling new technologies

- Enable residential properties to be future proofed as homes become more connected and entertainment within the home demands greater bandwidth support things like Augmented Reality (AR) and Virtual Reality (VR)
- Enable connectivity to support health care and the development of community.

The availability of high-quality communications is vital to modern day business operations from payments to supply chain management and research projects. It also provides essential access to residents for online services, education and the ability to stay in contact with family & friends. Digital connectivity is now considered by many to be an additional utility and is therefore expected to be included in any new development both residential and business. Ensuring a future facing digital Infrastructure which can adapt to emerging technology is included in the development design provides multiple benefits to developers, service providers, local councils, highway authorities, businesses and residents:

- It ensures the design and equipment locations for communication infrastructure are integrated into the overall design of the development.
- There is a significantly lower cost both financially and environmentally to install communications ducts, chambers, power cables and cabinets at a time when footways/carriageways are being constructed and other utilities installed.
- Disruption to residents and commuters is minimised by ensuring a majority of the construction work takes place at the same time as the general development and primarily before first occupation.
- The quality of finish for new surfaces, in particular footways and carriageways, is maintained by avoiding the need to retrofit underground apparatus.
- Digital Connectivity is becoming an increasingly important factor for home owners and businesses on where they choose to live, work and invest.
- The availability of high quality digital connectivity is a pre-requisite for many future facing technologies.
- The availability of a fibre duct system means that fibre networks can be replaced, extended to new areas and upgraded with minimum cost and disruption to the existing fibre and highway networks. Fibre optic cables are currently considered the best and fastest option for providing fixed connectivity that have a long lifespan expected to last several decades.

Failure to include “open access” Digital Infrastructure, that allows any telecoms provider access to the infrastructure to supply a service through an agreement with the asset owner, as part of the development design and site construction is likely to lead to significant delays

in the provision of high quality gigabit capable communications to the development. This is due to the higher costs and inherent additional difficulties in retrofitting infrastructure meaning commercial suppliers are more likely to prioritise investment in other locations where there is likely to be a lower cost and a quicker return on investment.

Key Evidence Documents

Evidence that we already have:

- Future Telecoms Infrastructure Review (FTIR) - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/732496/Future_Telecoms_Infrastructure_Review.pdf
- Cambridgeshire and Peterborough Digital Infrastructure Review 2019 - <https://www.connectingcambridgeshire.co.uk/wp-content/uploads/2019/07/Connecting-Cambridgeshire-Digital-Connectivity-Review-2018-2019-with-map.pdf>
- Delivering a Digital Connectivity Strategy for Cambridgeshire and Peterborough 2018 -2022 - <https://www.connectingcambridgeshire.co.uk/wp-content/uploads/2018/07/Connecting-Cambridgeshire-Digital-Connectivity-Strategy-2018-2022.pdf>

Topic Papers:

- Environmental Monitoring
- Future mobility
- Health & wellbeing
- Environmental Health
- Climate Change
- Community safety
- Anti poverty
- Internalisation

National Planning Policy Framework and other relevant national legislation

National Planning Policy Framework

Section 10 of the **National Planning Policy Framework (NPPF 2018)** – Supporting high quality communications – describes how the rollout of high quality communications should be supported with paragraph 9 stating - “*Advanced, high quality and reliable communications infrastructure is essential for economic growth and social well-being. Planning policies and decisions should support the expansion of electronic communications networks, including*

next generation mobile technology (such as 5G) and full fibre broadband connections. Policies should set out how high quality digital infrastructure, providing access to services from a range of providers, is expected to be delivered and upgraded over time; and should prioritise full fibre connections to existing and new developments (as these connections will, in almost all cases, provide the optimum solution)”.

Electronic Communications Code

The **Electronic Communications Code** that came in to force on 28 December 2017 is set out in schedule 3A of the Communication Act (2003). The Code is designed to facilitate the installation and maintenance of electronic communications networks as well as including certain “immunities” from the Town and Country Planning Legislation. The Bill includes a Code of Practice designed to make the rights of operators to install and maintain equipment on both public and private land clearer, give greater flexibility to use the rights and encourage the sharing of network apparatus.

Telecommunications Infrastructure Bill

Telecommunications Infrastructure Bill 2019-20 – passed the second reading in the House of Commons on 22 January 2020. The Bill once approved will amend the Electronics Communications Act to reduce barriers to telecommunication operators to install services to multi-dwelling buildings where a landlord has not responded to their request. This is part of the Government’s approach to reduce barriers preventing the nationwide rollout of gigabit-capable broadband.

Background/Context/Relevant Data/Corporate Council Objectives and Strategies

Future Telecoms Infrastructure Review

The importance of high quality gigabit capable digital connectivity has recently been highlighted by the **Government** setting a target in the Review of having full fibre coverage across the UK by 2033 and announcing their investment alongside Mobile Network Operators (MNOs) in a Shared Rural Network (SRN) to significantly reduce rural ‘not-spots’ where mobile coverage is unavailable across the UK. There also have been/and are a number of Bills being introduced designed to facilitate the rollout of the required infrastructure. The Government has also invested in a number of 5G testbed and trial projects across the UK as part of their plans to improve mobile connectivity.

Digital Connectivity Strategy for Cambridgeshire

Cambridgeshire County Council and Cambridge and Peterborough Combined

Authority (CPCA) are both supporting the Connecting Cambridgeshire Programme in the development of the Digital Connectivity Strategy for Cambridgeshire. Targets have been agreed by the County Council's Economy and Environment Committee for more than 30% of properties in Cambridgeshire having full fibre to the premise by 2022. An Enabling Digital Delivery team was created in 2018 to support and facilitate the rollout of improved digital connectivity by working with telecommunications suppliers and all other stakeholders offering advice and support on any matter relating to digital connectivity. The County Council and the Cambridgeshire and Peterborough Combined Authority have also adopted a policy to include fibre ducting in all transport and other infrastructure schemes which also includes schemes commissioned by the Greater Cambridge Partnership (GCP) to help reduce the barriers and speed up the rollout of full fibre across Cambridgeshire.

Cambridge City Council Local Plan

Cambridge Local Plan (2018) includes Policy 42 - Connecting new developments to digital infrastructure - which States:-

“Provision for high capacity broadband (such as ducting for cables) should be designed and installed as an integral part of development, to minimise visual impact and future disturbance during maintenance. All telecommunications infrastructure should be capable of responding to changes in technological requirements over the period of the development.

5.22 Early provision of high-quality broadband to new homes and offices in Cambridge can avoid future disruption and harm to the street scene, and ensure that all new development is fully integrated into modern communications technology. This will:

- help communication for business and residents;*
- allow for increased home working (impacting on demand for business land);*
- reduce the need to dig up pavements; and*
- help address isolation.”*

South Cambridgeshire District Council Local Plan

South Cambridgeshire Local Plan (2018) includes Policy TI/10 – Broadband – which states:-

“New development (residential, employment and commercial) will be expected to contribute towards the provision of infrastructure suitable to enable the delivery of high speed broadband services across the district. As a minimum, suitable ducting to industry standards

should be provided to the public highway that can accept fibre optic cabling or other emerging technology. Other forms of infrastructure, such as facilities supporting mobile broadband and Wi-Fi, should be included where possible and viable.

10.60 Broadband is a key infrastructure element for the district. Increasing broadband coverage in rural areas will encourage local enterprise, give more people the flexibility to work from home, save transport costs and reduce congestion. Wider access to broadband will also bring opportunities to provide health, education and public services in better ways. This includes supporting elderly and vulnerable people so they can live independently, and helping young people and adult learners to develop the skills they need to succeed. It will support implementation of the South Cambridgeshire Economic Development Strategy and the Cambridgeshire and Peterborough Broadband Plan, prepared by the Connecting Cambridgeshire partnership.”

There is already significant alignment between Central Government, Cambridgeshire County Council, Cambridge City Council and South Cambridgeshire District Council on policy regarding digital connectivity and the recognition of the important role it plays in modern society. The development of North East Cambridge provides an excellent opportunity to build on this to ensure that the highest standard of future proofed digital connectivity is included from the outset of the design of the development and that best practice is incorporated to ensure that ubiquitous gigabit capable connectivity is available to facilitate day to day living, business operations, transport, education, environmental monitoring and future facing technology.

Digital Infrastructure Opportunities and Key Issues

Embed infrastructure in the development design and built environment

Opportunity

- Reduces time & cost to install infrastructure as part of the overall development build increasing the likelihood of commercial investment
- Lessens the visual impact of digital infrastructure such as cabinets, poles and masts
- Appropriate infrastructure will enable future communications technology to be rolled out at minimal disruption and cost

Risk

- Lack of digital infrastructure design knowledge could mean the network is not designed appropriately to meet the requirements of multiple suppliers
- The availability of locations to install communications equipment may be compromised by embedding in the planned built environment
- The input of experienced digital infrastructure designers may not be utilised or readily available leading to poor infrastructure design

Open Access infrastructure/Neutral Host model

Opportunity

- Reduces the requirement for physical infrastructure therefore reducing impact on residents, business and the environment both for the installation and the impact on the street scene
- Maximises the number of suppliers who can readily access the market ensuring competition and a wider range of service providers for residents/businesses

Risk

- Some telecoms suppliers have a preference to own the infrastructure on/in which they install their equipment and may therefore choose not to invest in the area
- Developers may want to exclusively own the digital infrastructure as a source of revenue if a multiple supplier open access element is not included in planning conditions

Low-power wide-area network (LPWAN)

Opportunity

- Put in place connectivity to support deployment of sensors and support the environmental monitoring topic paper
- Support business to develop new ideas
- Unlock innovation by allowing new sensors to be created utilising the low cost communication network
- Support the operation of infrastructure by allowing large scale monitoring via low cost devices

Risk

- This is a relatively new market with a number of emerging technologies/use cases, it may therefore be difficult to ensure the correct technology providing longevity is deployed

Better plan and manage existing and future communications

Opportunity

- Development of a digital twin, a digital replication of the physical assets of North East Cambridge, to understand the communication landscape in the area
- Support innovation through providing a variety of appropriate communication methods to new devices and technologies that require it to operate
- Support the rollout of new technologies such as 5G by understanding the interactions of the existing networks and required supporting infrastructure

Risk

- It may not be possible to plan for some new technologies as the preferred design of these new networks is still being developed
- Some suppliers have historically been sensitive about making their network design publicly available that could impact on the ability to map their networks

Support economic growth and innovation

Opportunity

- Connectivity will support innovation across the site
- Support Industry 4.0 and economic growth
- Support alternative models for mobility, including 'Mobility as a Service'.

Risk

- Poor connectivity will put business/industry off using the site.
- Grid capacity to support the additional power demands

Preferred Approach

High quality provision with choice of providers

- Ensure that all new developments (housing, offices, retail, industrial, leisure, community and transport) have access to high quality communications via the latest generation of high speed gigabit-capable broadband from a choice of providers and that mobile coverage will be suitable for a growing population.

Open access broadband

- Broadband infrastructure should be “open access” infrastructure and provided by at least 2 suppliers, where possible, across the development to ensure that residents & businesses have a selection of suppliers and that service quality & pricing should be competitive.

Assessment of existing conditions

- Developers should assess the likely impact of developments on the existing mobile networks in the area and take appropriate action. Development proposals should include where appropriate pre-designated locations for future mobile mast installations that include suitable design of the land or building to accommodate the equipment as well as the provision of power and backhaul connectivity to the mast location.

Fibre connectivity in street furniture

- Rollout of 5G should be facilitated by ensuring that fibre connectivity is designed in a way that it will be easily accessible for connection to street furniture such as street lighting columns. Street furniture specifications should be designed in such a way that the installation of telecoms equipment and other sensors can be included.

Consider wireless connectivity within building as part of design

- The design of buildings within the development should consider the impact of the design on wireless connectivity within the building. In-building solutions should be provided if the building design is expected to impact on the quality of wireless signals.

Submit a digital infrastructure strategy with planning application

- A digital infrastructure strategy should be submitted as part of the planning application outlining how digital connectivity will be included to meet the current and future anticipated requirements of the development in terms of residential, business, public building/space and transport connectivity as well as environmental monitoring.

Contribute to digital twin with 3-D models

- Developments should support the creation of a Digital Twin, by providing 3D models of their schemes to be assessed by the Greater Cambridge Shared Planning Authority.

Reasons for preferred approach

A) Embedding innovation in NEC

The open data approach outlined above enables the development of services and amenities by private, public, and third sector organisations. This is further supported by ensuring that development provides high quality infrastructure, and contributes to the development of a digital twin, draft policies will contribute to the innovation by default.

B) Carbon reduction

Increasing the quality of digital infrastructure can help with monitoring of environmental performance, as described in the environmental monitoring topic paper, and support a transition in behaviours that supports the climate emergencies declared by the councils.

C) Support industry and economic activity

High quality digital infrastructure will help the growth economic activities by ensuring that tenants – both residential and employers – and visitors will have access to the best quality connections to support their activities.

D) Support sustainable infrastructure, mobility, energy, water and waste

Digital infrastructure provision is an enabler of other services, and the high quality approach outlined above in the preferred approach can accelerate the development of smart and fourth industry services.

E) Support community cohesion

Ensuring that Wi-Fi is publicly available, and digital infrastructure is equitably distributed can help community cohesion. The proposals for open data will also provide opportunities for start ups and new services to emerge.

F) Create attractive residential properties and business premises

Digital living, as made clear by the Covid-19 pandemic, is now a key part of home life. The preferred approach outlines how the draft policies can ensure that all residents at North East Cambridge will be able to be connected to the highest quality infrastructure regardless of tenure.