

Mobile Planning Presentation

Slide 1 – Introduction

The presentation is focussed on Mobile network design and how this relates to the current coverage and connectivity in Northstowe.

Slide 2 – Connecting Cambs

The Connecting Cambridgeshire programme supports the rollout of improved digital infrastructure across Cambridgeshire and Peterborough. Hosted by Cambridgeshire County Council but funded by the CPCA it operates across 3 workstreams:

Infrastructure – focused on improving connectivity levels for residents and businesses covering both fixed and wireless technologies. Working with commercial operators to support the deployment of the infrastructure and undertake targeted interventions to drive further investment in the region.

Innovation – Focuses on the technology that digital connectivity enables and how this can be used to improve services and create new opportunities.

Inclusion – Focuses on making digital connectivity accessible for all residents from access to devices, developing digital skills and ensuring people are confident in their use of digitally enabled technology.

Slide 3 – Mobile Infrastructure 1

The infographic on this slide demonstrates the different mobile infrastructure required to deliver a ubiquitous mobile network across an area. It utilises taller lattice towers in rural locations, monopoles and rooftop sites in urban locations as well as the relatively recent innovation of small cells that are often located on street lighting columns or other street furniture. These transmission points allow devices whether it be a phone, a car or home device to connect to the mobile network.

Enabling this connectivity is a fibre cable at each of the antenna locations to take the information being sent and received by each radio to the mobile exchange servers and across the world.

Slide 4 – Mobile Infrastructure 2

Infrastructure will look similar to the examples on this slide. The networks are designed to overlap coverage areas of the different masts however coverage is impacted by a number of key features:

- How tall the mast is: generally the higher (within reason) an antenna is installed the further it can transmit a signal.
- The Surrounding topography: the flatter the terrain in any direction the less disruption a signal will encounter and therefore the further it can travel. Disruptive factors include hills, trees, buildings etc.
- The wavelength of the radio signal to be used: the longer the wavelength the further it can generally travel. In general, a 5G signal cannot travel as far a 2G/3G or 4G signal.

interlinked to the coverage of a site is the data Capacity:

Every site can handle a finite volume of connections and data traffic so this is a consideration when designing a network and impacts on the density of masts needed to provide appropriate coverage/capacity.

When designing a network these coverage and capacity considerations will define where equipment would ideally be located but the physical location must also take into account:

- Availability of private or public land that can be built on including the granting of planning permission.
- There needs to be nearby power & fibre.

Why do coverage gaps appear:

There are 2 key changes taking place in the mobile data landscape:

- 1) The physical landscape is changing. New buildings and developments are changing where mobile coverage is required. The 2 images of Northstowe on the right are taken over a decade apart and illustrate these changes.

Slide 5 – Data Usage & what are MNOs doing to improve the network

- 2) Ofcom data shows that data usage per user is increasing year on year in the UK. There are also more devices connecting to the mobile network. Therefore, capacity requirements are increasing.

With the changing demands and the government target of 5G coverage in all populated areas by 2030 all 4 Main MNOs – EE, Three, Virgin Media O2 & Vodafone – are making significant investments into new mobile infrastructure that will increase the capacity of 4G networks as well as developing their 5G networks.

5G networks provide significantly higher data capacity than 4G along with faster data speeds and lower latency which is essential for safety critical applications. There is also a side benefit to deploying 5G in that as people start to take up 5G connectivity it will free up space on the 4G network.

MNOs are also deploying Small cells, a relatively new tool for improving mobile networks that are designed to boost data capacity in hotspot locations such as shopping centres, train stations etc. They usually have a limited range of 100-150m and from a MNO perspective they are relatively simple to install as they can be deployed on existing street lighting columns as shown in the bottom left and centre picture.

Slide 6 – Northstowe Coverage issues

These set of map focuses the current coverage in Northstowe.

- The coverage maps on the left have been taken from the Ofcom website and show anticipated indoor mobile coverage in Northstowe. Coverage varies between operators and it is worth noting that the outdoor coverage will be better but there are still issues.
- The coverage maps on the right have been taken from our independent coverage survey that largely reflect the modelled data from Ofcom. This has the guided busway coverage skirting up the right. The red/black squares represent poor coverage from multiple operators.

In order to try and resolve this particular issue there are several things that are being worked on both nationally and locally:

- Connecting Cambridgeshire have commissioned drive test surveys to benchmark data connectivity allowing us to identify areas of poor connectivity and encourage improvements.
- Connecting Cambridgeshire are engaged with each of the 4 MNOs and are working with them to better understand their plans for the region – meetings are being planned with each

of them in the near future. Additional engagement is taking place with neutral mast providers – these are companies that build masts to host equipment for some or all of the MNOs.

- Connecting Cambridgeshire fund a planning officer to be a single point of contact for mobile planning applications who can advise them on their plans, pre-empt potential issues and guide them on preferable locations for installations.
- Connecting Cambridgeshire also support a number of technology pilots including small cell technology working alongside our Street Lighting team and PFI contractor to overcome restrictions currently in place for telecoms equipment.