

Future Telecoms Infrastructure Review: Call for Evidence Response

1: What is the existing UK telecoms market structure and policy framework able to deliver?

- **When will it deliver, and how certain can we be that it will fulfil the Government's ambitions for full fibre networks and 5G deployment?**
- **What will this mean for roll-out of these technologies and for competitive models in different geographic locations?**

In our view the current policy framework is adequate to enable the delivery of full fibre optic infrastructures to most parts of the UK by 2030.

We fully support the UK Government's policy to encourage Infrastructure competition. We believe this approach will maximise competition, reduce prices and increase service choice available to consumers.

5G deployment will be highly dependent on the ability of the thousands of small cell units to access full fibre-optic backhaul and so policy initiatives should focus on ways to accelerate the build of full fibre-optic networks.

2: What barriers exist to long term investment in the UK telecoms market (beyond work underway by the Local Full Fibre Networks programme to stimulate demand, and by the Barrier Busting Taskforce to reduce build costs)?

- **What effect do existing revenue streams have on investment plans?**
- **What effect do visibility and predictability of returns have on investment plans?**
- **What is the effect of current infrastructure deployment models?**
- **What impact do current infrastructure sharing arrangements have on investment?**
- **What is the impact of the existing relationship between wholesale and retail markets?**
- **What changes to spectrum licensing and sharing could foster greater innovation and investment in 5G?**

Investors seem comfortable with the assumption that ARPU for Internet services will remain consistent at today's level with some small annual increases due to inflation and a general drift to higher speed and higher priced service packages. Increased infrastructure competition should reduce ARPU in the longer term.

Investors see greater opportunities in reducing deployment costs. Deployment costs fall into three key categories:

- 1) **Material and equipment costs** - In general we have seen these costs reduce during the five years we have been building our full fibre-optic network. We assume this is due to economies of scale in component manufacturing created as the roll-out of global full-fibre networks accelerates. There is a risk that costs will increase if global roll-out accelerates beyond the capacity of manufacturers to supply materials and equipment.
- 2) **Labour costs** - There is a risk that a skills gap in specialist fibre-optic skills (e.g. fibre splicing) may push up deployment costs, this may be exacerbated by a reduction in imported skilled labour following Brexit. Policy should consider how training in fibre cabling skills can be funded and fast-tracked over the next few years.
- 3) **Access to Infrastructure** - We believe this is the area where policy can have the largest impact on deployment cost reduction. There are two key types of infrastructure access required:
 - a) **Access to Property** - The Electronic Communications Code provides network builders with rights to access land and properties in which to install apparatus and full fibre cabling. However we believe that educating landowners in:
 - i) the Government's desire to roll-out full fibre and landowners critical role in achieving this;
 - ii) the benefits of having full-fibre installed onto their buildings (both to the value of their building and the benefits available to their tenants);
 - iii) the enablement of IoT and 5G technologies that full fibre installation brings.

If the Government wants to invest in demand stimulation then this should be focused on incentivising landowners to provide access to their property.

- b) Access to Ducts - DCMS and OFCOM should be congratulated on their efforts to improve the process through which full fibre operators can access Openreach's duct network. We believe success in this area will accelerate full fibre deployment significantly in the next two to three years. Policy should now focus on how other public and private sector duct networks can be made available to full fibre network builders. To encourage infrastructure competition the Government may want to consider public sector funding for installing ducts, that all network builders can use, to more remote properties.

Innovation and Investment in 5G

The roll-out of 5G network provides an innovative opportunity to include landowners in the mobile service value chain thereby removing the issue of obtaining wayleaves for the deployment of 1,000s of small-cells.

Landowners would be able to purchase their own small-cell technology that they could install on their own property. These small-cells would use cognitive radio techniques to eliminate interference from other cells deployed on nearby properties.

Mobile Network Operators (MNOs) would pay landlord small-cell owners an interconnect fee for data transceived by their small-cell(s). Landowners in high utilisations areas would receive a higher payment from MNOs based on the higher data processed by their small cell(s). This would incentivise neighbouring landowners to install their own small-cell(s) increasing network resilience and capacity. Cognitive radio technology would dynamically manage the power and frequency allocation of surrounding small-cells to avoid interference.

Effectively the 5G spectrum would be available for any landowner to use with perhaps just a light license regime to prohibit hacking the cognitive radio algorithms.

Although radical such an approach brings a number of benefits:

- Landowners would be incentivised through interconnect payments to deploy small-cell technologies on their land replacing the current inefficient wayleave system.
- Landowners will be incentivised to have full fibre deployed at their property so that their small-cells can transceive data quickly to maximise the interconnect payments they earn.
- Landowners would become responsible for resolving their own not-spot zones by deploying more small-cells on their land.
- MNOs can control the speed at which 5G roll-out occurs by setting the interconnect they are willing to pay to incentivise landowners to deploy small-cells.
- Competition in the MNO market is increased as barriers of entry into the MNO market is reduced because MNOs only have to operate their central office systems (cloud based MNOs) - their distributed network is supplied by landowners and fibre providers.

3: What can the UK learn from the widespread deployment of fibre networks in other countries?

- **What factors have led to higher full fibre investment in other countries and how applicable are these to the UK?**
- **What have been the impacts of fibre roll-out models in other countries on competition dynamics, consumer bills, and risk allocation?**
- **To what extent can the fibre that has been rolled out internationally be used for mobile backhaul, and what lessons can the UK learn?**

No Comment

4: The Government wants to consider all market models that will facilitate the next generation of technologies.

a. What different market models* might work in the UK in the longer term, and what risks and opportunities do they present?

- **What consequences could different market structures, including ones which support longer pay-back periods, have on the investment environment, competition and outcomes for consumers?**
- **How might these vary in different geographic areas of the UK, including urban and rural areas?**
- **Over what timescale could market models be changed, and what policy conditions would be necessary to enable this?**
- **Are the current arrangements for BT legal separation working effectively?**

*** Market models which you may wish to consider in responding could include:**

- **Infrastructure competition between different network providers wherever possible**
- **Collaborative models at an infrastructure level**
- **Regulatory asset bases, franchise models, cap and floor regimes, a diversified model to account for geographic variation, and/or gainshare models for infrastructure provision**
- **Risk sharing models between infrastructure providers and retail providers**

The policy objective should remain to create a competitive market for telecommunication services so that ultimately regulation and price controls can be removed.

The Openreach PIA service has demonstrated that collaboration at the duct level is possible with multiple operators sharing the same sub-highway duct utilising a system of subducting. In London we can start to see some emergence of competition between duct owners and we anticipate this will occur in other urban centres.

In more remote rural areas competition will be less and it maybe necessary to fund duct installation publicly. In many cases it maybe actually be more cost effective for communal ducts to be installed by the highways authority as it can be done at a marginal cost whilst other highways work is taking place.

Sharing duct space reduces the disruption, and damage to the highway, that would be caused if each network operator had to install their own ducts.

A national duct network to every property will enable effective infrastructure competition to occur. The cost difference of serving a rural property as opposed to an urban property becomes the cost of a few kilometers of fibre cable and subducting which is insignificant when compared to the cost of installing new ducting over that distance.

We would anticipate that each property would be able to choose between four or possibly five different vertically integrated network operators with each sustaining a market share of between 20% - 25% to provide a reasonable return to their investors. Some network

operators may choose to partner with popular consumer brand organisations who could provide a virtual network operator as has happened in the mobile industry.

b. What should Government consider when assessing the potential for migration from copper to full fibre networks?

- **Over what time period could migration occur?**
- **What phases might migration be required to go through?**
- **What would be the pros and cons for markets and competition?**
- **What would the implications be for different groups of consumers?**

Under the infrastructure competition model described above the consumer market would dictate the the speed of migration. The old “copper to the home” networks would continue to operate in parallel to the new full-fibre networks providing at least one of the infrastructure choices open to consumers.

As the new fibre network options become available to consumers the regulation on the copper network providers can be reduced as they will no longer have an infrastructure monopoly.

5: The Government wants to achieve its digital infrastructure goals at the least additional cost. How should new digital infrastructure be paid for?

- **Are consumers (residential and business) willing and able to pay for new digital infrastructure, given its expected benefits?**
- **What could incentivise investors and shareholders to make long-term investment decisions in telecoms infrastructure?**
- **What is the potential role of government in stimulating demand or otherwise de-risking new infrastructure investment?**

Our belief is that full fibre-optic infrastructure competition will become available to most properties within the UK by 2030 without public sector subsidy.

The public sector may want to take the opportunity to invest in full fibre-optic deployment itself so that it can enjoy some of the future returns available and the Digital Infrastructure Fund (DIF) is a good example of how that can be achieved.

If the Government wants to accelerate full fibre-optic infrastructure competition it should focus its expenditure on stimulating demand within the landowner / property industry to educate landowners to the benefits of full fibre and where necessary provide incentives to them for allowing multiple fibre network operators to install cables and 5G infrastructure onto their buildings. Public bodies should set an example by quickly granting wayleaves to full fibre network builders.

In the above scenario it is still likely that infrastructure competition will emerge first in cities and more affluent rural areas. If the Government wants to attract new network build in underserved areas it should consider investing in duct networks to serve those area that full fibre network builders can then use. If Highways authorities can install these duct network at marginal cost when other works are undertaken then there is a possibility they can obtain a return on their investment from usage fees paid by network builders for the use of the ducts.