Department for
Digital, Culture
Media & Sport

Extending Local Full Fibre Networks

Call for Evidence Summary of Responses

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Department for Digital, Culture, Media and Sport

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Ministerial Foreword

Our economy depends on our digital infrastructure delivering the necessary connectivity for everyone, both now and in the future. Fast and reliable broadband connections across all areas of the UK will enable businesses to grow and develop as well as opening up the possibilities of new services for individuals. We are determined to maintain a world-class digital economy that works for everyone and drive productivity through our modern industrial strategy.

We have made great progress with superfast, but do not want to risk falling behind in technology terms. Our Local Full Fibre Networks Programme is focused on the future, which means full fibre Full fibre connections will deliver the speeds consumers and businesses will need in the next decade and beyond. Full fibre connections are secure and reliable. Full fibre connections are also vital for the development of 5G - the next generation of mobile technology.

This Programme is supported by £200m worth of investment. This Call for Evidence has informed how we will invest that funding to accelerate the market's delivery of full fibre connections and ensure that we create the best possible communications networks for our future. I am very grateful to all of those who responded.

Minister of State for Digital

Executive Summary

The Call for Evidence sought to understand how, through the use of public funding, the Government could take further action to stimulate greater and faster commercial deployment and extension of full fibre network infrastructure. The objective is to deliver futureproof full fibre connectivity, helping businesses to grow, and, in time, enabling the roll out of 5G and other wireless services across the UK. We received 125 responses, which displayed an impressive level of detail and engagement with this issue from public and private sector stakeholders. We were also informed by an industry forum co-ordinated by techUK and INCA. We are very grateful to all those that responded and a full list of respondents is provided at Annex A.

We summarise here the evidence that we have received and this document is structured around the four questions that were asked in the Call for Evidence. Case studies have also been used, with permission, when respondents provided examples of an approach being discussed.

Summary of Responses

We sought evidence across three areas:

1. Existing activity and approaches

- What local approaches have been taken to date or are planned - either in the UK or internationally - to stimulate the market delivery of full fibre networks, in both urban and rural areas, and what results have they achieved? Where appropriate please provide evidence and any other additional information.

Responses outlined a range of approaches that have been used to date and the impact these have had. Many of the examples of successful activity related to collaboration between local bodies and providers as well as local organisations or businesses. Aggregation of demand for fibre connectivity was a common theme and a variety of methods for this were evidenced, including those led by local bodies, suppliers and consumers. Another key theme here was the importance of local bodies having a clear digital strategy and supporting the development of full fibre networks in their area.

2. Consideration of different approaches

- What evidence is there to demonstrate the effectiveness and potential of approaches A to F [below], specifically in the context of stimulating the rollout of local full fibre networks in urban and rural areas?

    a. Public sector demand aggregation, where a local body combines the broadband requirements of a number of sites to make a compelling investment case for providers.
    b. Voucher schemes for businesses, to encourage demand for full fibre connections and help SMEs to combine their demand in order to encourage providers to invest.
    c. Making public sector assets, such as ducts, available to providers to reduce the investment required for full fibre roll out.
    d. Shared access to location data on existing infrastructure assets for providers so that new networks can be planned more easily.
    e. Directly funding fibre routes in uneconomic areas.
    f. Potential pilots, suggested by respondents.

We sought evidence for the effectiveness of each of the above methods in extending full fibre networks.

a. Many local bodies shared their experiences of **aggregating public sector demand** highlighting successful projects and potential challenges.
b. The vast majority of responses regarding a new **voucher scheme** were positive, with a range of suggestions to ensure that a scheme would be as effective as possible for both providers and consumers.
c. A number of responses described experiences where **public sector assets,** such as ducts had been made available for providers to enable full fibre roll out. There was enthusiasm for this among respondents as a “win-win” for local bodies and providers.
d. There was significant interest in **sharing information on infrastructure assets** from local bodies and providers, with government seen mainly as a facilitator of this approach.
e. **Directly funding fibre routes** in uneconomic areas was seen to be useful in specific circumstances where the commercial case was particularly weak.
f. A number of other **potential pilots** were suggested, focused on the specific needs of different areas, including ‘copper switch-off’ with a date set to switch off an area’s copper network to encourage the use of fibre connections.

Almost all responses were supportive of government intervention to support the development of new fibre networks, and agreed that there was a need to improve the UK’s current fibre infrastructure. All of the approaches found support among respondents with public sector demand aggregation, alongside making public sector assets available, and a voucher scheme most positively received.

3. Opportunities to improve local approaches

- What is the most effective and efficient delivery model Government can use to stimulate future delivery of full fibre networks across the UK in both urban and rural areas, building on and integrating approaches that have been taken to date?

- What other changes, locally and/or nationally, are needed to reduce the cost of full fibre rollout, such as opening access to publicly and privately owned facilities, or changes to wayleaves, streetworks and other areas? What evidence is there to demonstrate the effectiveness of such changes?

Responses in this area reinforced the calls for public sector demand aggregation and a new voucher scheme, and highlighted that these could be even more effective when combined. Many respondents felt that local bodies had an important role to play in understanding the connectivity requirements of their area and identifying the correct approach to extend full fibre networks.

There were some differences in views on the level of intervention that is necessary, with most interested in government funding for specific projects and approaches, while others favoured a focus on regulatory changes to create a supportive environment for the industry with lower costs for extending full fibre, in particular for wayleaves and street works.

Other Themes

Across the responses a number of other key themes were raised. Primary among these was the provision of full fibre broadband to new builds, while the importance of ensuring good connections for those in rural areas was also a focus. Some other technologies, such as fixed wireless, were mentioned, as was the importance of educating consumers, local bodies and businesses about the benefits of high speed and high quality connectivity.

Next Steps

The responses to the Call for Evidence have informed our approach and in the Spring 2017 Budget, Government announced further details around the £1.1 billion of new funding to boost the UK's digital infrastructure. This includes £200 million to fund locally-led projects across the UK to leverage local and commercial investment in full fibre infrastructure, through harnessing public sector internet demand, upgrading school connections and new full fibre connection vouchers to increase business take-up. We will work with providers and local bodies over the summer to develop our approaches, incorporating them into the first wave of projects later this year. The evidence that we have received will also inform our approach to wider activity relating to full fibre connections, including developing and sharing best practice between local authorities.

Introduction

In the 2016 Autumn Statement, the Government announced £1.1 billion of new funding to boost the UK's digital infrastructure, including stimulating the market deployment of full fibre networks. Full fibre networks are the "gold standard" of broadband with fibre-optic cables all the way to the consumer's premises offering a very reliable and secure internet connection with download and upload speeds in excess of 1 Gigabit per second and very low latency (fast reaction times).

The UK is a world leader in superfast broadband coverage (>93%) and we are on track to extend coverage to 95% of UK premises by December 2017. However, just 2% of premises currently have access to the full fibre connections that we expect to be an important part of our future digital infrastructure mix.[1] Widespread full fibre connections will support a significant enhancement in fixed and mobile broadband quality, helping to develop and deploy 5G - the next wave of mobile technology.

Following the Autumn Statement announcement, we launched a Call for Evidence, seeking to explore a set of questions and assumptions around government interventions to support the further commercial roll out of full fibre networks. The extension of full fibre networks is key to our recently published Digital Strategy, which aims to create a world-leading digital economy that works for everyone. [2]

The evidence received has informed the development of the plans that the Government announced in the 2017 Spring Budget. Starting in 2017, we will invest £200 million to fund locally-led projects across the UK to leverage local and commercial investment in full fibre. By harnessing public sector internet demand, upgrading connections to schools and other public sector buildings, and offering new full fibre connection vouchers to increase business take-up, we will make it more attractive for the private sector to build full fibre networks. This will incentivise substantial new commercial investment to connect homes and businesses and help extend the reach and accelerate the roll-out of the next generation of mobile services.

We are very grateful to all those who responded and will continue to engage with local bodies and providers over the summer.

[1] Ofcom, (2016), *Connected Nations 2016*, p. 16.
[2] Department for Culture, Media and Sport, 'UK Digital Strategy', (1 March 2017) https://www.gov.uk/government/publications/uk-digital-strategy/uk-digital-strategy

Section 1: Existing activity and approaches

Question 1

What local approaches have been taken to date or are planned - either in the UK or internationally - to stimulate the market delivery of full fibre networks, in both urban and rural areas, and what results have they achieved? Where appropriate please provide evidence.

A range of different approaches were explained in responses to this question. Suppliers mentioned involvement in schemes to aggregate demand. Community partnerships to fund fibre roll out to more remote areas was mentioned as one approach, while on-demand fibre installations allow for aggregation among local customers with the first customer's high connection costs discounted, based on the potential future take-up of fibre services by their neighbours. One provider described their work with the landlord of a multi-occupancy building with many SMEs, when a small group of SMEs requested a faster connection. The provider agreed to underwrite the infrastructure costs for a full fibre connection to the building in return for a preferred supplier agreement as other tenants seek to upgrade.

Experiences of providers and local bodies working together were also common, including accessing public sector assets such as rooftops, ducts and street furniture to build infrastructure. Experience of working with social housing providers and developers was also highlighted and some local bodies described positive working relationships with providers, including relaxing planning conditions where appropriate.

> The University of Cambridge has 56km of fibre network around the city, which also supplies some customers from Anglia Ruskin University, Cambridgeshire County Council and research sites. The University/Connecting Cambridgeshire partnership has also supplied a fibre link along the Cambridgeshire Guided Busway using existing ducting.

[3]

Public sector demand aggregation has also seen positive results, such as one example where 4,500 public sites, across over 100 different organisations, including schools and GP surgeries have been provided with fast, reliable and secure networks through Public Sector Broadband Aggregation. The potential to use public sector sites in more rural areas was also explored in some responses.

> In some rural areas, NYnet have used schools to overcome the difficulties of a distributed population: 'The solution to the problem was to extend the availability of PoPs to schools that were geographically proximate to the areas of greatest need, and offer a backhaul service ... from these.'

[4]

[3] Connecting Cambridgeshire's response to the Call for Evidence on Extending Local Full Fibre Networks, p. 1-2.
[4] North Yorkshire County Council and NYnet's response to the Call for Evidence on Extending Local Full Fibre Networks, p. 14.

Community projects were described as an effective approach, particularly in more rural areas, with residents independently aggregating their demand in order to work with a provider. This was aided by community buy-in, strong local leadership and landlords being willing to grant wayleaves quickly and easily.

Some businesses have also identified approaches to improve their access to full fibre networks, such as a digital exchange offering a shared data centre and digital services to its members and aggregating demand for new networks. Similarly, local bodies have been involved in helping to aggregate local demand to create an anchor customer for wider roll out, with some positive results.

Section 2: Consideration of different approaches

Question 2

What evidence is there to demonstrate the effectiveness and potential of approaches A to F above, specifically in the context of stimulating the roll out of local full fibre networks in urban and rural areas?

Responses to this question gave very helpful insight into a range of approaches that have been used to support the deployment of full fibre infrastructure across the UK. Six specific options were examined and a substantial amount of evidence for the potential effectiveness and limitations of these was received.

a. *Public sector demand aggregation*

There was considerable support for this approach and a number of local bodies suggested that they saw potential for this in their area. It was noted that the spread of public buildings across an area can provide for an extensive network spine, though some suggested that this may be more viable in urban areas where there is a greater concentration of such buildings. Council buildings, schools, colleges, doctors' surgeries, hospitals and social housing were all suggested as potential demand which could be aggregated. The success of the JANET network for higher education institutions was highlighted by some respondents to demonstrate the benefits of aggregating demand including lower costs and greater connectivity. The wider impacts on economic development were also highlighted as a potential benefit of public sector demand aggregation when used in the right areas.

> 'The Scottish Wide Area Network (SWAN) was created in order to aggregate demand across the public sector in Scotland...it is envisaged that it should generate significant savings… [and] indirectly stimulate new commercial infrastructure investment'.
>
> [5]

It was noted by some that aggregation will require careful coordination of needs and agreement of shared risk as public bodies may have different requirements and currently procure their networks independently. An open access model was suggested along with the creation of a national dark fibre Crown Commercial Service framework. The risk of overbuilding of infrastructure was raised, as well as the need to ensure competition in procurement. Overall support for the aggregation of public sector demand was strong, with confidence in its potential benefits so long as these concerns are mitigated.

[5] Scottish Government and Scottish Futures Trust's response to the Call for Evidence on Extending Local Full Fibre Networks, p.4.

> Coventry City Council have developed a 140km state of the art fibre network. Working with their partner CityFibre it is being updated and extended through the Coventry Core initiative to reach more businesses. The network currently connects over 300 key sites throughout the city, including government buildings, schools and hospitals. To make it ready for Coventry's business community it's been upgraded and extended to reach more businesses.

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b. Voucher schemes for private sector demand aggregation

A substantial number of respondents gave evidence regarding the potential of a voucher scheme and their past experience with other schemes. A voucher scheme received considerable support, with many expressing enthusiasm for the idea and some local bodies highlighting that such a scheme was already part of their plans for the area. The benefits for both providers and businesses in enabling new networks were noted.

Voucher schemes have been used successfully to support demand for superfast broadband roll out and a number of respondents highlighted their positive experience of the previous, business-connectivity focused, voucher scheme. In 2014/15 the Broadband Connection Voucher Scheme helped more than 40,000 SMEs access faster broadband. However, the previous schemes were generally focused on connecting businesses to existing infrastructure, rather than specifically aiming to stimulate investment in new infrastructure and so cannot simply be replicated.

Some providers suggested specific considerations for the development of the voucher scheme, which tended to draw on their experience of the previous schemes. These focused around ensuring that vouchers can be aggregated among SMEs and that their use is aligned to how providers deliver fibre, both in terms of the products available and their billing systems. The importance of competition while ensuring that vouchers are only redeemable with providers that are members of provider and regulatory bodies was also highlighted. Examples from previous schemes offered useful experience but in some cases the specific nature of a full fibre connectivity scheme was not addressed.

However, a number of local bodies expressed interest in developing a voucher scheme for full fibre networks in their area. The importance of awareness-raising and thorough, targeted marketing were emphasised. There were also helpful examples of planned and existing local programmes using vouchers to successfully encourage the aggregation of demand for connections. Suggestions regarding the design of such a scheme included the potential for enabling residential consumers and those who currently have technology such as fixed wireless to access fibre connections to use vouchers. Others highlighted that they felt vouchers would be most effective where there is already an existing fibre spine to extend.

[6] Coventry & Warwickshire Local Enterprise Partnership's response to the Call for Evidence on Extending Local Full Fibre Networks, p. 3. [amended]

Those who had concerns about the voucher scheme raised issues surrounding the complexity and timescale of new fibre build and ownership issues when aggregating demand. Some also highlighted the potential difficulties a provider may face in aggregating enough demand to facilitate building new networks, as customers may all look to different suppliers, including to those with existing networks. In this scenario, vouchers may cannibalise demand, rather than benefit those providers planning to invest in new networks which may not be available to new customers for at least 12 months. The issue of ensuring that vouchers target symmetric gigabit capable connections while remaining technology neutral was also raised, as well as a desire to focus on open access networks. Some also expressed the need to follow State Aid rules and to ensure that vouchers are not used to subsidise networks that are already planned or fund increased wayleave charges. These were specific concerns that can be tested and respondents' overall view of the potential of a voucher scheme was very encouraging.

c. Making public sector assets available

Government has already made public sector assets available in a number of locations. We are keen to maximise the potential of public sector infrastructure and sought to understand the evidence for this approach. Overall, feedback was very positive with a number of respondents referring to case studies where they have begun to work in this way to good effect. The potential to mitigate the large capital costs of building new networks was very positively received. The suggestion was seen as mutually beneficial for local bodies and providers, to bring underused assets into use and enhance local services.

> [In addition to over 20km of ducting and fibre already in place or being worked on,] Tameside Metropolitan Borough Council are developing a project with Manchester City Council to use ducts laid alongside new tramways to central Manchester, providing 10km of fibre connection.

[7]

The need for long-term agreements on ownership and terms of use as well as specific arrangements for 24-hour access and maintenance were noted. It was suggested that making assets available may be best suited to the development of a mutual collaboration vehicle to coordinate infrastructure. Concerns raised included issues around State Aid and commercial constraints, as well as the need to mitigate any data protection concerns and the risk of public bodies relocating away from the asset. There was a suggestion that this option may be more suited to urban areas, where assets are located in closer proximity. Overall, the issues raised were points to consider in individual cases while the principle received strong support.

d. Access to location data on infrastructure assets

Information on existing infrastructure is essential to planning new networks. There was considerable support for making information available where the current lack of reliable and accessible information causes difficulties for both local bodies and providers. Openreach has

[7] Tameside Metropolitan borough council's response to the Call for Evidence on Extending Local Full Fibre Networks, p. 3.

recently developed an online database to share information about their duct and pole infrastructure. Some providers stated that they were willing to provide information about their networks to share on a combined database. It was also suggested that government departments and agencies should share information regarding their assets. A range of information that may be helpful to share was identified, including:

- The location of fibre-enabled cabinets
- The location of all ducts, nodes and poles, including those used for other utilities
- Local mapping, including publicly-owned technology and infrastructure
- Individual property-level information, including to which cabinet that property connects
- Take-up figures

A number of benefits of sharing data on infrastructure assets were suggested, including planning networks in currently underserved areas, enabling coordination of works to minimise disruption, and organising the connection of new builds. The sharing of information was felt to encourage debate and competition in expanding the infrastructure, though commercial sensitivities should be considered. The importance of ensuring the accuracy and maintenance of these maps (and their cost) was noted, as was the fact that other information and surveys may still be required. Support for the sharing of information was clear alongside willingness to contribute from a range of respondents.

e. Directly funding fibre routes in uneconomic areas

Direct funding of fibre routes was seen as a solution only in very specific locations and circumstances. These tended to focus on remote rural areas where the commercial case for investment was weak and specific enterprise zones where the benefit to the local economy could be substantial. Community partnership models and other forms of funding were suggested as alternatives but respondents did note that there may be a small number of locations where these would not be possible. Some areas described situations which they felt may benefit from direct funding to overcome congestion in ducts being used to prevent upgrades and to resolve backhaul issues. The use of this funding to stimulate commercial investment was also highlighted.

> In rural Sweden, 'intervention focused on ensuring that dark fibre backhaul reached to within a few kilometres of all homes and businesses, but residents had to fund the final connection...There are over 1000 local municipal fibre networks in Sweden.'

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f. Potential pilots

Respondents outlined a variety of options that have been or could be the subject of pilot projects to establish further evidence of their effectiveness. These included "copper

[8] INCA response to the Call for Evidence on Extending Local Full Fibre Networks, p. 5. And N. Babaali, 'Sweden: A showcase for rural FTTH', (26 June 2013), http://www.ftthcouncil.eu/documents/Opinions/2013/Rural_FTTH_Nordics_Final.pdf

switch-off" in which all existing connections would migrate to fibre, although copper is currently required for other services and the reliability of fibre for all services would have to be assured. It was suggested that there are areas currently with poor copper connections which may be suitable for a pilot to replace the network across the area.

Funding for connections to social housing or Digital Exchanges near enterprise zones were also suggested as pilot ideas. Specific assistance to SMEs and farm businesses for fibre installation were also mentioned. Other pilot suggestions included assessing local bodies' connectivity and rating their success in order to share best practice, as well as developing an online platform to help users to identify potential suppliers and compare their options.

'The GLA and some London boroughs are considering exploring a Digital Exchange model [where businesses could share data centres and fibre access]… to address the structural obstacles in delivering full fibre while providing neutral aggregation points for new networks.'

[9]

[9] GLA response to the Call for Evidence on Extending Local Full Fibre Networks, p. 6.

Section 3: Opportunities to improve Government's approach

Question 3

What is the most effective and efficient delivery model government can use to stimulate future delivery of full fibre networks across the UK in both urban and rural areas, building on and integrating approaches that have been taken to date?

A range of delivery models and evidence were supplied, with particular support for a model based on improving the viability of full fibre investments for providers. The benefits of using public sector connectivity requirements to bring full fibre networks to an area were noted by a number of respondents, including facilitating investment and reducing the risk for infrastructure providers. A voucher scheme to draw providers further into these areas and encourage businesses to invest in new technology was mainly well-received too and the two schemes were seen to complement one another. Areas which have an existing fibre spine are considered most suitable for a voucher scheme and public sector requirements could provide this initial core network.

Other delivery models were also suggested, which tended to focus on direct assistance to overcome issues such as backhaul availability. These included the use of fixed wireless, particularly in more rural areas, the use of spare bandwidth on public sector connections to share with local businesses and homes, and a digital village pump to bring connectivity to an area. The use of railway or tramway tracks for ducting was also mentioned, as was sharing ducts with other utilities.

A small number of respondents suggested that since the market for full fibre connections is strong, government intervention should be limited and subsidies are not required. These respondents favoured a government approach focused on opening opportunities for investment, encouraging competition and enabling providers to build more easily. There were references to sharing data on current infrastructure and services and how government could facilitate this. Other suggestions to aid suppliers focused on regulation, planning, and business rates and are outlined further below in Question 4. Some respondents also suggested that other technologies, including cable and G.fast, would provide cost effective and rapid improvements in connectivity and that investment in these should also be encouraged.

Overall, a number of respondents highlighted the importance of combining delivery approaches for best effect and using the right model in the right area. It was also clear that respondents felt that local bodies were best placed to understand the current infrastructure and the future needs of their local areas. Suggestions for concentrating on local bodies with a clear digital strategy, and ensuring that all local bodies can see the benefits of investment in digital infrastructure were also received. Local community groups and parish councils were mentioned as organisations that could be engaged and empowered to find a solution that works best for them. Across the various options, responses were positive about locally-led projects and the combination of both public sector and private sector demand aggregation.

Question 4

What other changes, locally and/or nationally, are needed to reduce the cost of full fibre roll out, such as opening access to publicly and privately owned facilities, or changes to wayleaves, street works and other areas? What evidence is there to demonstrate the effectiveness of such changes?

A number of wider changes that could help to develop the best possible environment for investment in full fibre were identified by respondents, where it was suggested that government could act and encourage local bodies through sharing of best practice. Primary among these was the issue of wayleaves which were mentioned repeatedly as a frustration for both internet service providers and local bodies, with over a fifth of respondents mentioning difficulties with wayleaves in their response. Wayleave costs could be a significant barrier, and assistance with obtaining wayleaves and reducing the cost was mentioned by a number of respondents.

There was a clear desire for a standardised approach with simplified regulatory requirements. It was suggested that local wayleave panels could be beneficial as could better communication between providers and local bodies. A nationwide approach to major landowners and working with organisations such as the National Farmers' Union and the Country Land and Business Association were also recommended by some respondents to simplify the process. Working to develop positive relationships between local bodies and providers was also seen as beneficial to gain access to public buildings and infrastructure more easily. More generally, emphasising the benefits of full fibre broadband to landlords and the potential increase in the value of their property was recommended to aid in gaining their co-operation.

Another key area raised by respondents that could reduce costs was around planning and street works. The costs and administrative requirements of gaining permission for works were highlighted as barriers by a number of providers and discussed by local bodies. A number suggested alterations to regulations, for instance allowing works on newly-adopted roads for the purposes of installing fibre, and not classifying works on roads that are not traffic-sensitive as 'major'. Simplifying the processes for applications was key for many respondents and building strong relationships between local bodies and providers was seen as essential to resolving these issues.

Coordinating with other utilities was also raised as a potential method of cost-reduction, with other utility providers laying ducts for fibre as part of their street works which would then be mapped and available on an open access basis to all providers. It was also felt that sharing existing infrastructure would help to reduce the costs associated with full fibre roll out.

> Greater Manchester Road Activities Permit Scheme (GMRAPS), operated by Transport for Greater Manchester, 'is the first joint [local authority] permitting regime [in England] for all road works… work is better coordinated and communicated…[allowing] fibre infrastructure providers to take advantage of works being undertaken by other utilities'.

[10]

The business rates relief for new full fibre infrastructure announced in the 2016 Autumn Statement was mentioned by some respondents as helpful in reducing costs, though some suggested further tax reductions, or that providers who light existing dark fibre should also qualify for relief.

[10] Greater Manchester Combined Authority's response to the Call for Evidence on Extending Local Full Fibre Networks, p. 4.

Other Themes

Property development

The installation of fibre connections in new properties was raised by a number of respondents, including suggestions that all new build properties within 1km of existing fibre infrastructure should be connected to a fibre network and that property developers should be required to register communications infrastructure needs at the same time as other utilities. The agreement between the Home Builders Federation and Openreach was cited as an example of good progress in this area. [11] Increasing competition for new build infrastructure was also raised as a way to help to improve coverage. The role of local bodies in determining the requirements for developments in their area was highlighted and examples were given of local authority actions in this area.

Regulatory changes

Responses suggested a range of regulatory changes that could reduce the cost and timescales required for the construction of new fibre infrastructure. Those impacting upon costs have been outlined in Question 4, but others included limiting pre-noticing of poles to sensitive areas, standards to encourage local bodies to build new street furniture to be ready for fibre deployment, giving fibre providers the same rights as other utility providers and standardising regulations so that providers have certainty for planning roll out. Narrow trenching and other techniques were also mentioned by providers for the deployment of full fibre connections and it was felt that greater support for these from planning bodies would be beneficial to wider deployment. Some respondents recommended that neighbouring local bodies should work together to facilitate planning across administrative boundaries and it was suggested that this could help to aggregate demand across regions.

Some of these issues have been addressed through recent regulatory changes that are already in place or soon will be, to facilitate new fibre infrastructure. These include the implementation of the EU's Access to Infrastructure regulation giving the right of access to existing infrastructure on fair and reasonable terms, and a right to coordinate street works where a public funding element is involved. We are also proposing to make permanent an existing temporary relaxation in the rules for deploying fixed broadband infrastructure, first introduced in 2013.

Rural areas and the Universal Service Obligation

Some respondents raised the concern that the focus ought to be on more remote rural areas and the final hard to reach areas who are not expected to have superfast connections through commercial delivery or under the Broadband Delivery UK programme. There was a concern that full fibre roll out may increase the digital divide as certain areas would benefit from improved connections while others do not. It was suggested that Fibre-to-the-Premise (FTTP), with its low operating costs, can be a sustainable solution for deeply rural areas while delivering greater social benefits and so these areas should be prioritised through the roll out of faster broadband.

[11] Department of Culture, Media and Sport & Ed Vaizey MP, (5 February 2016), 'New build homes to have superfast broadband connectivity', https://www.gov.uk/government/news/new-build-homes-to-have-superfast-broadband-connectivity

Technologies

Some respondents suggested that full fibre would not be the solution for all areas at this time and recommended other technologies which they felt may be worthwhile. These included hybrid fibre and copper solutions such as G.fast and coaxial cables, as well as digital village pump solutions with fibre running to a central location and distribution to premises through wireless technology. Solutions such as fixed wireless masts were suggested by some respondents, mainly for rural locations where full FTTP connections may be difficult to achieve and Fibre-to-the-Mast may be most appropriate.

We did receive some responses referring to studies on the impact of microwave and wireless technology on the environment and human health. These responses were, however, supportive of full FTTP solutions.

Consumer education and demand

A key aspect in facilitating full fibre roll out was identified as educating consumers, businesses, landlords and local bodies about the benefits of improved connectivity. It was felt that until consumers understand the impact that increased speed and reliability of fibre could have for their business or the value of their property, there will not be active support and interest in full fibre. For both local bodies and private consumers, the cost of a full fibre network will need to be justified by its benefits.

Some respondents suggested a role for government in this education, while others felt that providers were key to educating consumers. A specific issue was mentioned regarding the difference between Fibre-to-the-Cabinet and Fibre-to-the-Premise which many consumers may be unaware of when buying “fibre” broadband. Communicating the benefits of full fibre to local bodies was seen to be essential to developing fibre infrastructure in their area and holding positive planning discussions.

Some also highlighted that the market currently offers only a limited number of gigabit service packages and this limits take-up of full FTTP. It was felt by some respondents that this was because the need for full fibre was currently limited, particularly among those who already have superfast connections. The development of greater demand and supply of gigabit services will be central to the wider roll out of full fibre.

Regulatory issues and State aid

A small number of respondents felt that government intervention was unnecessary for full fibre roll out as the investment case already exists for commercial providers. These respondents suggested that the focus of government action should be on removing regulatory barriers and enabling connections for those areas that are beyond commercial reach.

Respondents were also aware of the State Aid restrictions and areas in which government cannot intervene. Some raised concerns that government funding for new connections may distort the market and felt that this risk would need to be mitigated with clear guidelines to ensure that all projects are designed with this in mind.

Other Contributions

We held a workshop with TechUK, representatives of the Broadband Stakeholders Group and INCA and we are very grateful to all of the participants for their input. Various delivery approaches were discussed as well as wider issues relating to the roll out of full fibre networks. The key evidence from the workshop was as follows:

- Participants were positive regarding the potential of a gigabit voucher scheme as well as providing suggestions to ensure their effectiveness, including facilitating aggregation and allowing time for network build to take place.
- Some suggested that vouchers would be focused on current business requirements rather than investment for the future and others were concerned that vouchers may subsidise planned networks but not encourage the growth of new networks.
- Good examples of public sector demand aggregation were supplied, though some suggested this approach would be less effective in rural areas.
- There was broad agreement that extending full fibre networks relies on sharing data on both infrastructure nodes and capacity.
- There was support for direct funding of connections to remote rural locations where necessary.
- Providers were positive about the business rates relief for new full fibre networks and highlighted regulatory changes that could support full fibre roll out.

We also held a number of meetings with both providers and local bodies to discuss options and experiences with different approaches to extending full fibre networks.

Next Steps

The very helpful responses that we received have contributed to our plans. As announced at the Spring 2017 Budget, DCMS will now engage further with providers and local bodies to develop delivery approaches and incorporate these into the first wave of projects in 2017.

We will work with local bodies to identify the right combination of approaches for their area, focusing on some of those discussed in the Call for Evidence, including:

- Bringing public sector broadband demand together to create an anchor customer, providing enough revenue to reduce the risk of building a new network for providers. This will also bring fibre closer to more homes and businesses, helping them to be connected too.
- Increasing full fibre business connections through the a voucher scheme, and enabling businesses to work together to aggregate their demand.
- Making public sector assets available to providers will help to build new networks more cheaply and make the best use of existing infrastructure.

In parallel, we will be developing a competitive funding process for local areas to bid for projects to stimulate large-scale commercial investment in full fibre networks. These projects would combine these different delivery approaches with their own digital planning strategy and their efforts to create an attractive regulatory and planning environment. Full fibre broadband will deliver a step-change in speed, service quality, security and reliability. It will be for local areas, working in partnership with the Government, to make a case for how best to meet their needs for better broadband, including in rural areas. More details will be published in due course.

We are also investing £400m into the Digital Infrastructure Investment Fund, which will be at least matched by private investors on the same basis. The fund will be managed by private sector fund managers on a commercial basis, in line with an agreed investment mandate. The aim is to provide greater access to commercial finance for alternative developers of full fibre networks, and act as a catalyst for further private investment in the sector.

Annex A: Respondents

Telecommunications Providers and Industry Bodies

- Broadband Stakeholder Group
- BT
- Call Flow Solutions
- CityFibre
- Community Fibre
- Cybermoor Services
- FairFibre
- Federation of Communication Services
- Gigaclear
- Groupe Intellex
- Huawei
- Hyperoptic
- ibub Networks
- Independent Networks Cooperative Association (INCA)
- Internet Services Providers' Association (ISPA UK)
- Internexus Networks
- ITS technology Group Limited
- KCOM
- Mason Infotech
- Metronet UK
- MS3
- Optimity
- Passive Access Group (Vodafone, Sky, Colt, Three and TalkTalk)
- Portel AV Limited
- Sky
- SSE
- TalkTalk
- techUK
- UK Competitive Telecommunications Association (UKCTA)
- Virgin Media
- Vodafone
- Wessex Internet
- Xi Communications
- York Data Services
- 4th-utility
- 802 Works

Local Bodies

- Aberdeenshire County Council
- Adur and Worthing Councils
- Bath and North East Somerset Council
- Belfast City Council
- Black Country Local Enterprise Partnership
- Bristol City Council
- Buckinghamshire Thames Valley LEP
- Cambridgeshire County Council
- Central Bedfordshire Council
- City of Edinburgh Council
- Colchester borough council
- Connecting Cheshire Partnership
- Cornwall Council and the Cornwall & Isles of Scilly Local Enterprise Partnership
- Coventry & Warwickshire Local Enterprise Partnership
- Cumbria County Council
- Digital Cardiff
- Digital Tameside
- Dorset County Council
- Epping Forest District Council
- Greater Manchester Combined Authority
- Hampshire County Council
- Herefordshire County Council
- Hertfordshire County Council

- Irish Central Border Area Network (ICBAN)
- Leeds City Region Enterprise Partnership
- Leicester and Leicestershire Enterprise Partnership (LLEP)
- London authorities including Mayor of London, Southwark Council, Camden Council, Royal Borough of Kingston upon Thames, City of London, Westminster City Council and Digital Greenwich (alongside London First, Tech UK, and Tech London Advocates)
- Kent County Council
- Manchester Digital
- Mid Ulster District Council
- Middlesbrough Council
- Milton Keynes Council
- National Association of Local Councils
- Norfolk County Council
- Northumberland County Council
- North Yorkshire County Council and NYnet
- Portsmouth City Council
- Rural West Sussex Partnership
- Rutland County Council
- Scottish Government and Scottish Futures Trust
- Somerset County Council
- Suffolk County Council
- Superfast South Yorkshire
- Superfast Staffordshire
- Surrey County Council
- Tay Cities Deal (for Angus, Dundee, Fife and Perth and Kinross Councils)
- Welsh Government
- West Sussex County Council
- Wiltshire County Council
- Wired Sussex
- Worcestershire County Council
- Worcestershire Local Enterprise Partnership

<u>Other Organisations and Individuals</u>

- British Chamber of Commerce
- Campaigns:
    - Broadband for Rural Devon and Somerset (B4RDS)
    - Shropshire and Marches Campaign for Better Broadband in Rural Areas
- Communications Consumer Panel
- Consultants:
    - Data Network Consultants Limited
    - FarrPoint
    - GreySky Consulting Ltd
    - Hatoforoi (HFL)
    - MHP Communications
    - Spirit Public Sector Ltd
    - Wansdyke
- Country Land and Business Association (CLA)
- EEF, the manufacturers' organisation
- ElectroSensitivity UK (ES-UK)
- EM Radiation Research Trust
- Federation of Small Businesses
- Historic Houses Association
- Individuals - 16
- National Farmers Union
- NEN - The Education Network
- Ordnance Survey
- South West Grid for Learning Trust