CityFibre

Digital Communications Infrastructure Strategy

Response to the Consultation
Submitted by: CityFibre Holdings Limited

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CityFibre's Response to the Consultation

Digital Communication Infrastructure Strategy

Published 6th August 2014

I. Introduction

1. CityFibre welcomes this opportunity to respond to the consultation document titled Digital Communications Infrastructure Strategy, published by DCMS and HM Treasury on 6th August 2014 ("DCIS Consultation").

2. CityFibre is an operator of all-fibre networks in major UK towns and cities. We design, build, operate and own passive fibre infrastructure that is deployed on a city-wide basis. Our networks are used by ISPs, integrators and MNOs in a shared infrastructure wholesale model, providing fibre optic connectivity to public services, businesses and homes. CityFibre is a dedicated wholesale fibre infrastructure provider preferring not to offer retail services in downstream markets.

3 CityFibre is the UK's largest independent provider of fibre infrastructure with networks deployed in 57 towns and cities. We are leading the rollout of Gigabit Cities throughout the UK, with projects deploying city-wide FTTP infrastructure now underway in York, Peterborough, Coventry and Aberdeen.

4 CityFibre is a member of a joint venture with Sky and TalkTalk bringing Gigabit FTTH to residents in the City of York utilising a pure fibre network that is independent of BT Openreach. The parties have announced their intention to expand the venture to a further two cities. Furthermore, CityFibre owns one of the UK's largest current FTTH networks in Bournemouth.

5. In January 2014 CityFibre listed on the AiM market of the London Stock Exchange. We are supported by top tier institutional investors, providing capital to deliver Gigabit City projects in up to 25 cities. Furthermore, CityFIbre is pre-qualified for infrastructure debt guarantees from HM Treasury's UK Guarantees Scheme administered by Infrastructure UK.

6. CityFibre's response to this consultation is divided in to three parts. Part II provides context to our submission Part III includes CityFibre's response to the questions posed in the DCIS Consultation. No claim for confidentiality or business secrets is being made in respect of this submission.

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II. Context for CityFibre's Comments

1. **CityFibre is an Infrastructure Builder**. The comments that CityFibre makes in this submission are in the context of our role as fibre infrastructure builder – hence our views expressed herein are biased towards fixed infrastructure. We have not provided in-depth commentary in relation to either wireless or broadcast segments, however, we believe strongly that both wireless and broadcast will have an ever increasing dependency on fixed fibre networks as data traffic grows and linear and on-demand content is internet delivered.

2. **A Focus on Infrastructure.** In recent history the development of communications (and its regulation) has focused on services and service competition – with little attention paid to the underlying infrastructure. Going forward, it is vital that debate and policy shifts towards the physical foundations of our digital communications – to the infrastructure itself. Government must collaborate with industry to establish outcomes not only focused on a 10 to 15 year horizon but also further ahead.

3. **Fit-For-Purpose.** Communication is now digital and the infrastructure underpinning digital communications must be built specifically for this purpose. As such, we believe that legacy copper and cable networks should be retired in the mid-term, being replaced with newly built end-to-end fibre networks with sufficient deployment of dark fibre to future-proof for any scenario of data growth. All mobile and wireless transmitters must be connected to fibre to ensure no bottlenecks in mobile data transmission.

4. **Shared Infrastructure**. We believe that digital infrastructures should be shared, supporting all segments of the communications market. CityFibre's approach delivers infrastructure (dark fibre) to service providers in all market verticals, enabling them to shift towards consuming infrastructure rather than consuming bandwidth. As such, our shared passive infrastructure model is underpinned by strong economics, having low operating costs and stable long-term revenues from multiple infrastructure consumers.

5. **Build Now, Build New & Build Once.** Delivering fit-for-purpose digital infrastructure will take time. In the context of exponential growth in data, the UK does not have the luxury of lengthy debate or procrastination – construction of new fibre infrastructures must happen now. Capital invested should be directed to end-to-end fibre infrastructure with capacity for all scenarios of future growth. The use of interim technologies (FTTC, FTTdp, etc) that preserve the life of copper and cable should be discouraged.

6. **Working Towards Structural Separation of Infrastructure and Services**. Whilst we do not advocate mandated structural separation of BT, we do suggest the industry evolves toward the provision of infrastructure in efficient structurally separated investment vehicles. Infrastructure builders such as CityFibre will focus on layer 1 passive infrastructure (duct & fibre) only, making it available to MNOs, service providers and wholesalers. By adopting this approach, passive infrastructure can be constructed by multiple parties in different geographic areas making investment efficient and aiding faster deployment. Layer 2 access and layer 3 services (including BT's capabilities) can continue in the current structure, evolving to span infrastructure from multiple providers.

7. **Gigabit Cities.** CityFibre is deploying fit-for-purpose, shared dark fibre infrastructures in towns and cities across the UK. Supported by service providers in all market verticals (public sector, business, consumer and mobile), our fibre infrastructures provide unrestricted bandwidth and are deployed with substantial fibre capacity for all future connectivity needs. We believe our Gigabit Cities provide a template for digital infrastructure that is applicable and replicable nationwide.

8. **Embracing the New Generation of Fibre Infrastructure Builders.** It is clear that BT is unable to undertake the task of upgrading the UK digital infrastructure alone – recent history has demonstrated the firm's increasing dependency on state assistance. BT's ability to invest significantly in content, fund dividends, service pension obligations and operate inefficient legacy networks will limit its appetite to invest in new infrastructure. Therefore, for the UK to transition to the digital infrastructure needed to remain globally competitive, Government must embrace the new generation of fibre infrastructure builders. By doing so, investment will be more efficient, outcomes achieved sooner and with less dependency on state funding.

CityFibre is proud to be investing in a brighter digital future for the UK. We welcome engagement with policy makers and industry in reshaping the foundations of our digital economy.

Part III

Comments and Observations on the DCIS Consultation

Our comments to the DCIS Consultation are provided below. For ease of reading, the questions posed in the DCIS Consultation are included in *green italicised text,* followed by CityFibre's response in black text.

Introduction

Q1 Views are sought on:

a) Is this an appropriate role for Government?

b) What other high level principles the Government might adopt?

c) What resources do you consider the Government should aim to deploy to effectively manage its role?

Digital infrastructure is critical to the UK's economic prosperity; therefore, it should be a priority for Government to clearly communicate desired outcomes and to collaborate closely with industry – both established players and new or emerging private sector initiatives.

CityFibre is broadly in agreement with Government's role as outlined in the introductory section of the DCIS Consultation. Policy should ensure the necessary deployment and supply of fit-for-purpose digital communications, and emphasis should shift to 'Infrastructure' with the physical methods of connectivity being a more significant component of the National Infrastructure Plan or other infrastructure policies of future governments.

In setting and communicating the ambition for our digital infrastructure Government should:

i) Strive to be World Class – It has become clear that current policy and programmes have resulted in the UK's digital infrastructure, when compared to international benchmarks, being mediocre. Whilst manipulated Ofcom scorecards can paint a rosy picture, the reality is that the UK is falling behind many other countries. Going forward the UK must aim to be truly world-class in infrastructure terms. With many countries deploying FTTP and embracing Gigabit communities, supporting a strategy of hybrid copper-fibre networks will leave the UK near the bottom of international league tables. Government should set the bar high and avoid compromises offered by legacy incumbent operators.

ii) Adopt simple, clear and concise outcome statements – For example; *"All fixed line access networks must be capable of 1 Gbps symmetrical connectivity by 2020", "Copper and cable access networks will be switched off by 2030"* etc.. Ambiguous terms such as 'Superfast' are open to interpretation so should be avoided. Scottish Government's World Class Digital Infrastructure policy and Labour's recent Number One in Digital are notable for documenting clear ambitions.

iii) Support the new generation of fibre infrastructure builders – Recent developments in the industry have seen the emergence of new fibre infrastructure builders (CityFibre in urban areas and Gigaclear in rural areas are two examples). Government should adopt a principle that incumbents will not deliver 'fit for purpose' digital infrastructure alone, and that these new privately funded initiatives will play a significant role is achieving desired outcomes. Policy should seek to aid their deployments and collaboration should be encouraged.

iv) Embrace infrastructure competition – Before copper and networks can be retired, the fibre infrastructures that will replace them must be built. Operators of copper and cable networks have weak business cases (they will not obtain increased wholesale revenue relative to the Capex needed) so they will adopt an approach of slow incremental

upgrades that prolong the life of outdated technology. In contrast, new generation fibre infrastructure builders have no legacy infrastructures to maintain so capital is effeciently invested in fit-for-purpose fibre infrastructure. A policy that encourages infrastructure competition will lead to investment in modern infrastructure supported by industry confidence to use alternative wholesale networks. CityFibre's shared infrastructure model is demonstrating the benefits of this approach today.

v) Stimulate and facilitate private investment – State intervention through the provision of financial resources (State Aid) should be avoided wherever possible. Government's role should be to encourage private investment by fostering a competitive infrastructure market driven by clear policy ambition. Care should be taken to ensure the regulatory environment encourages infrastructure investment – the desire to constantly drive down consumer prices should be moderated.

vi) Ensure that State intervention does not strengthen monopolists – State intervention should only be considered in areas of proven market failure. However, if intervention is necessary then Government should embrace a more collaborative approach to industry as a whole rather than a bias to incumbents. Intervention should seek to support private sector investment (loan guarantees for example) as opposed to substitution with state aid. If intervention measures are employed, the new generation of fibre infrastructure builders should be major beneficiaries, as this will drive desired outcomes quicker in a fairer, potentially less regulated environment.

Section 1

Q2 What potential opportunities are there for Government to leverage its combined buying power to support policy objectives?

The Government is a major user of digital communications. Therefore, Government spending on ICT services and connectivity can play a major role in supporting the transition to modern fit for purpose digital infrastructure. CityFibre's Gigabit City projects all demonstrate how local government use of our fibre networks play a role in supporting private sector investment.

However, combined buying power has its pitfalls, so Government policy (both central government and local government) must be adopted to avoid the following common issues:

i) Combined buying power to drive "lowest cost" outcomes – Whilst larger buying power is a useful tool to drive efficiency, it can lead to a focus on lowest cost, often resulting in substandard technical outcomes. For example, we have witnessed in PSN projects that a drive for lowest cost has resulted in connectivity standards being downgraded rather than upgraded. This is clearly an undesirable outcome.

ii) Misalignment of local procurements to infrastructure policy objectives – as stated earlier public procurement frameworks for ICT services can be misaligned to infrastructure objectives. For example, Scottish Government has a policy objective that all fixed line connectivity should be gigabit speeds (1000 Mbps) by 2020. However, local government procurements under the SWAN contract are specifying connections to many schools as 10 Mbps delivered via DSL – a misalignment of local ICT procurement with Government policy objectives for World Class Infrastructure.

iii) Bigger contracts may bias outcomes toward incumbent operators – There is a risk that combining Government spending on ICT into a small number of large procurements will favour outcomes to incumbent infrastructure providers and limit the involvement or success of more appropriate infrastructure providers. This should not be a desirable outcome.

In considering the above, CityFibre, therefore proposes that Government spending on ICT should re-enforce policy objectives for world class infrastructure in an environment where new generation fibre infrastructure builders such as CityFibre are provided with equal opportunity.

In specific reference to PSN, we suggest that the current supplier framework is expanded to involve a greater number of SME providers, and policies established to encourage that no less that 25% of digital connectivity (at an infrastructure level) is awarded to SMEs – this will encourage substantial private investment in new fibre infrastructure.

Q3 If migration to IPV6 is required, are there any barriers to that migration and if so how might these be addressed?

As a builder of passive fibre infrastructure we do not have a strong voice on the transition to IPV6. However, our Gigabit City vision is supportive of the smart city agenda, machine-to-machine communications and the IoT, so an appropriate supply of internet addresses is critical for the longer term growth and development of the internet.

Section 2 - What might future demand look like?

Q4 Is an ongoing disparity of provision of broadband services inevitable? If so should this be addressed and how might this be done most effectively?

According to statistics published by DEFRA 18% of the UK population live in rural areas and 82% live in urban areas. It follows that the vast majority of the UK's GVA and GDP is derived from urban areas. Whilst a longer-term objective should be to remove the disparity between urban and rural areas, from a policy perspective the transition to fit for purpose digital infrastructure in urban areas should be the priority.

CityFibre views a full migration to end-to-end pure fibre infrastructure in urban areas as the only suitable future proof digital infrastructure. CityFibre's Gigabit City model demonstrates that city-wide shared fibre infrastructure can be deployed efficiently to all businesses, homes and public services. Such networks also provide dark fibre connectivity to mobile operators and wireless providers, ensuring an appropriate fixed infrastructure to underpin 4G and 5G wireless services.

Therefore, Government policy should support and encourage private investment in end-to-end fibre infrastructure in UK towns and cities.

Connectivity in rural areas is also important and current Government intervention is seeking to bring superfast broadband to rural areas through BDUK. Looking forward, consideration should be given to fibre backhaul to support better mobile and wireless connectivity and initiatives for rural FTTP (Gigaclear and B4RN for example) should be encouraged. Over time, with a full deployment of FTTP and wireless technologies, the disparity will disappear.

Q5 How symmetrical will digital communications networks have to be in the future? Will this differ across user types? What implications does this have for fixed and wireless broadband provision?

In addition to the statements in paragraphs 2.12 to 2.14 of the DCIS Consultation consideration should be given to further trends in digital communications; in particular the transition to cloud computing and that end users are increasingly 'publishers' of content.

The rapid adoption of cloud computing, driven by simplified access to applications and data from multiple devices and access platforms (fixed and mobile) via the internet, is empowering process efficiencies in business, improved delivery of public services and driving the use of OTT applications in the home. Consumer and business use of social media, HD content sharing and video communications such as FaceTime and Skype means users are now large producers and publishers of data.

Therefore, as digital communication is increasingly symmetric, our digital connectivity must

quickly evolve towards symmetrical connectivity. Any definition of 'fit-for-purpose' must ensure adequate upload performance as well as download performance – we believe the target should be symmetric connectivity for all fixed networks.

Asymmetric connections are an inherent limitation of copper based technologies such as xDSL. The deployment of pure fibre infrastructure removes such limitations allowing symmetrical connectivity – we believe that policy should promote the deployment of FTTP networks, including fibre connectivity to mobile base stations.

Q6 Which countries should be our benchmarks on communications infrastructure to ensure that businesses remain in the UK and continue to invest?

Q7 What metrics do you think should or will become relevant in comparing network performance in different countries? What metrics should most appropriately be used as the basis to set objectives for government policy?

Taking Q6 and Q7 together, we believe that Government should move away from the current 'European Scorecard' approach as this can be manipulated to make the UK rank favourably in the short-term but breeds complacency in terms of our underlying infrastructure. In infrastructure terms we are far behind the Netherlands, Scandinavia and much of Asia. Southern Europe also has a significant number of FTTP deployments underway.

The USA drive for Gigabit Cities, spearheaded by Google, is also evidence of a major shift towards FTTP and gigabit speed connectivity. In January 2013: US FCC Chairman Julius Genachowski announced a plan to have at least one ultrafast gigabit city in every state in the US by 2015. He commented, *"American economic history teaches a clear lesson about infrastructure. If we build it, innovation will come. The U.S. needs a critical mass of gigabit communities nationwide so that innovators can develop next-generation applications and services that will drive economic growth and global competitiveness."*

Businesses will increasingly seek to locate in areas offering best connectivity. Better digital connectivity will foster new business models and encourage the formation of new companies, some of which will become market leaders. For example, Spotify and Skype were both born in Stockholm, assisted by fibre-optic connectivity provided by Stokab.

The FTTH Council publishes it's annual ranking of countries through a measure of fibre connected buildings. This is a good measure for digital infrastructure, however, the UK does not even rank as we have less than the 1% of buildings fibred.

Therefore, Government should work with industry to develop a sensible set of infrastructure measures, such as % of homes with FTTH connections, % of businesses with FTTP connections, % of mobile base station connected to dark fibre etc. International benchmarks should be with countries known to be advanced (or advancing) with fibre deployments.

Caution should be given to the liberal use of the word "fibre". BT claims that it has rollout out fibre to 19 million homes, but in infrastructure terms these homes are still connected via copper. The FTTC wholesale model has encouraged the marketing of Fibre Optic Broadband - we must not be fooled into believing the marketing hype and buzzwords.

Section 3 - Scenarios

Question 8 through to Question 22

Section 2, paragraph 2.2 of the DCIS Consultation, states that "Looking ahead 10-15 years in the communications space is challenging if not near impossible". We have sympathy with this statement, and we believe that attempts to predict long-term bandwidth needs are both futile and unnecessary.

We can predict more accurately the continued evolution of processing power and data storage – both of which will continue to track the principles of Moore's law, doubling in capability every 24 months, and continuing the exponential growth in data produced and transmitted. Transporting the ever-increasing volume of data between computers, apps and users will demand digital infrastructure that is both fit-for-purpose and future proof.

Trends indicate that wireless technologies will continue to proliferate at pace, and mobile data bandwidth will also rise exponentially. MNOs will transition through 4G, 5G and beyond resulting an increasing number of smaller cells to bring mobile data 'down to earth' – all requiring connectivity capable of gigabit speed transmission.

In digital infrastructure terms, pure fibre optic networks provide the solution. Whilst the industry often refers to fibre as Gigabit capable, the unlit dark fibre has no known limitations and is proven to support data speeds measured in terabits (1000 gigabits).

Therefore, policy makers should worry less about role-playing scenarios and focus simply on ensuring the UK's digital infrastructure is world-class, fibre based and capable of all future bandwidth demands.

General

Q23 Are there factors, for example technical or unrelated to the regulatory framework, that could create bottlenecks and delay future infrastructure deployment in the UK in this timeframe, that would result in demand not being met or the UK not being seen as a leading digital nation?

From CityFibre's perspective, as a builder of new fibre infrastructure, we believe that attention must be paid to several aspects of civil engineering and construction, notably:

i) Efficient planning and wayleaves – Government should seek to simplify process for gaining wayleaves ensuring communications infrastructure is treated as a utility. Payment principles should be standardised, and timeframes for landlords to agree wayleaves should be shortened.

ii) Support for construction techniques – Efficient construction techniques, such as micro-trenches / narrow-trenches should be adopted as approved methodologies and supported by the Highways Agency and other applicable public bodies.

iii) Availability of skilled civil engineering staff – Construction of new infrastructure will need a sufficient supply of construction and engineering resource. An undersupply will drive inefficient investment. As infrastructure build creates employment, Government should consider appropriate training schemes and apprenticeship initiatives to ensure the UK has the skilled workforce needed.

iv) Availability of fibre (or other technologies) – deployments and upgrades of digital infrastructure are underway worldwide putting demands on the technology supply chain. Government must ensure clear policy and investment stability to give confidence to manufactures thus underpinning supply. Where possible, manufacturing of passive components (duct, fibre etc.) should be undertaken in the UK.

Q24 Do you expect commercial providers to deliver future infrastructure and meet demand on a purely commercial basis, or is some form of public intervention likely? If public intervention is likely how might that work with the commercial provision of infrastructure? What form might that intervention take?

The new generation fibre infrastructure builders (CityFibre, Gigaclear and others) are between them deploying end-to-end fibre optic networks in urban and rural areas on a commercial basis. Most models are based on a principle of aggregated demand and/or

industry support to trigger private investment.

We believe that Government should embrace and support these rollouts to encourage the deployment of fit for purpose fibre infrastructure on a nationwide basis – in many cities, towns and villages.

Consideration should be given on how to accelerate such deployments, and the role that Government can play. As stated earlier, where possible we believe that Government policy must encourage and facilitate private investment through:

i) Clear, concise outcome statements – such that policy ambition is not misinterpreted.

ii) A stable regulatory environment that encourages investment – to achieve this, the ever-present desire to drive down consumer pricing must be reigned in to enable wholesale pricing to be maintained at levels to underpin investor returns. A concept of a 'pricing floor' should be considered.

iii) Government being a customer of the new infrastructures – in particular local government and other public sector agencies as this signals confidence to investors.

iv) The principle of infrastructure competition – which Government must adopt as the new fibre networks will overbuild incumbent networks. Anti-competitive behaviour of BT must be stopped.

To further underpin confidence to investors, as well as signal the critical nature of digital infrastructure to the UK economy, the provision of Government loan guarantees should be considered to support capital funding from commercial lenders. HM Treasury's UK Guarantees Scheme, administered by Infrastructure UK is one example, for which CityFibre is pre-qualified. Loan guarantee schemes should be structured to:

i) Encourage commercial lending – from banks and infrastructure investors supporting the rollout of fibre infrastructure builds.

ii) Balance the risk reward profile for stakeholders – for example, in commercial models based on demand aggregation, projects could be accelerated by lowering aggregated demand thresholds with the loan guarantee used to counterbalance risks perceived by commercial lenders.

ii) Not trigger State Aid regulation – loan guarantees should be priced on an arms-length basis in accordance with assessed lending risks. New generation fibre infrastructure builders will 'buy' loan guarantees from Government generating an income for HM Treasury.

There may be limited cases where State funding is necessary – these should continue to be restricted to areas of genuine market failure. In such cases intervention must encourage and support participation from the new generation fibre instrastucture builders. Furthermore:

i) State funding should not further the lifespan of copper networks. Beyond BDUK Phase 1 and Phase 2, aid should be direct only to end-to-end fibre infrastructure and high capacity wireless/mobile networks. This will create a more level playing field for wider industry participation.

ii) Game playing NGA vs. Business Connectivity must be stamped out – New fibre infrastructures support connectivity for all uses, and this should be encouraged as it promotes investment efficiency. To uphold a position that State funded infrastructure is for NGA only is shortsighted and will ultimately lead to unsatisfactory outcomes dominated by BT.

iii) Government should introduce policy that no less than 50% of any aid must be granted new generation fibre infrastructure builders – to limit dependency on BT and to prevent strengthening of an infrastructure monopoly based on out-dated technology.

iv) Co-investment models may be more appropriate that grants – this support the policy of infrastructure competition better, whereas grants to one provider distort the competitive market potentially harming opportunity for future private investment.

Q25 Which current or draft legislation might prevent or facilitate the emergence of any of the scenarios?

Current BDUK Phase 1 and Phase 2 projects are supporting hybrid copper-fibre upgrades and strengthening the monopoly position of BT. We believe this is not in the interests of longer-term infrastructure aims. Beyond BDUK Phase 2, policy must shift with Government taking a inclusive approach to FTTP deployment that engages the new generation fibre infrastructure builders.

Intervention in urban areas through Super Connected Cities has been extremely problematic, a fact that DCMS will surely admit. In our view, this has held back digital infrastructure in our cities putting some of them two years further behind in infrastructure terms. Government should embrace CityFibre's Gigabit Cities approach and work closely with us to realise open shared end-to-end fibre infrastructures in both Core and Key cities.

Q26 Do you have views on which scenario (or combination of scenarios) is most likely and should influence the development of future strategy?

See response to Q8 above.

Section 4 Competition and regulation

Q27 How might efficient investment in communications infrastructure be supported, for example by changes in the regulatory framework?

See response to Q24 above.

Q28 Are there any further measures necessary to incentivise the rollout of future mobile infrastructure in currently underserved areas?

In infrastructure terms, mobile operators require access to two critical resources; fibre optic backhaul transmission and physical locations (masts, buildings, street furniture) to install transmitters. Higher capacity mobile technologies (4G, 5G and beyond) will demand a greater number of smaller cells, in turn putting pressure on the supply of connectivity and locations.

Without access to these resources, underserved areas will proliferate (even in urban areas) and mobile data coverage will suffer. Therefore, policy must consider the availability and supply of fibre infrastructure (most likely dark fibre) to an increased number of cell site locations.

Encouraging a model of 'shared infrastructure' whereby passive fibre is made available to all market verticals (public sector, business, residential and mobile) will give mobile operators access to cost effective dark fibre. CityFibre approach offers this today.

Q29 Is there a role for a revised USO or USC to ensure that minimum consumer demand requirements are met and to reduce the potential for a new digital divide? What might this look like?

It is clear that current USO and USC must be updated to be relevant for the time horizon of

this DCIS Consultation.

USO: In relation to the Universal Service Obligation placed on current incumbents, BT in particular, we believe it is right for Government to amend the USO taking into account the high level of State subsidy provided by through BDUK Phase 1 and Phase 2. In that regard broadband at speeds of 30 Mbps should be added into the USO with effect from 2018.

USC: The above suggestion for USO would make the current Universal Service Commitment (2 Mbps) redundant. Therefore, a new form of USC should be considered taking into account the policy aspiration for digital infrastructure. We suggest the following:

i) Emphasis should shift to infrastructure – USC should be replaced with a 'Universal Infrastructure Commitment (UIC)' this will set the digital infrastructure commitment that Government is making to UK citizens. A timeframe, say 2025, should be set by which time the UIC deliverables should be achieved.

ii) UIC based on shared and open fibre networks – The UIC should underpin policy objectives to deliver layer 1 shared fibre to all premises mobile/wireless cell sites nationwide in a timeframe set out in the UIC. The UIC commitment will allow all service providers to migrate to the superior infrastructure affecting a controlled copper to fibre switchover.

iii) Collaboration with industry to deliver the UIC – in keeping with the themes of CityFibre's comments in the response, Government should engage the support of the new generation fibre infrastructure builders and incumbents to deliver the UIC objective, underpinned by a policy and regulatory environment that is adapted where necessary to aid successful outcomes.

Q30 In terms of supporting future innovation and long-term investment in infrastructure, what areas of broadcasting regulation may have served its purpose by 2025 -2030 (or indeed earlier). What future technical developments may also have longer term implications for regulation and wider public policy?

CityFibre has no comment to make in response to Q30.

Q31 Are there changes to the EU Framework that the UK might seek to encourage more competition in UK markets?

Government should play an active role in Europe's digital policy units to ensure that regulation frameworks contemplated in Brussels aid UK digital infrastructure goals. A 'one-size-fits-all' approach will prove limiting.

Historically, the EU Framework and Ofcom's regulation has biased outcomes toward service competition and delivery of lower pricing and better services for consumers. This has lead to a healthy competitive ISP landscape in the UK and supported the success of major ISPs such as Sky, TalkTalk and others. However, the fact remains that BT is largely an infrastructure monopoly and the vast majority of service providers have to buy access connectivity from BT. The deployment of FTTC aided by £billions of State subsidy have strengthened its grip over infrastructure – this situation is unhealthy for the UK's digital ambitions longer term.

In our view, the EU Framework and resultant regulatory models must evolve to bring more focus on infrastructure deployment in a competitive market environment, taking into account the long lifespan utility nature of the fibre infrastructure assets.

Directives that reduce civil engineering costs may bring benefits to UK infrastructure builders. However, use of other utility duct as shared physical infrastructure must be fit-for-purpose and available in a timeframe that aids fibre infrastructure deployments. We do not believe that

such measures should be mandated, as attempts to use infrastructure of other utilities is likely to hamper progress in the short-term as conditions for access are likely to be complex.

The EU's State Aid Guidelines currently favour outcomes biased to incumbents. These should be revisited to ensure they are equally supportive of new generation fibre infrastructure builders such as CityFibre. In particular:

i) The degree of pseudo SMP-type regulation imposed by the State Aid rules should be reduced and simplified;

ii) Passive open access remedies should be satisfied by the provision of dark fibre only;

iii) The separation of NGA and Business Connectivity markets should be abolished, and replaced with a simpler approach to common shared infrastructure; and

iv) The process of mapping of white, grey and black areas should be overhauled as these can be game-played by incumbents to their advantage, especially when considering NGA and Business Connectivity and separate markets.

Q32 Should Government seek changes to the European Framework which put more reliance on competition law and how might this be done?

Further to the response to Q31 above, in striving to an environment of infrastructure competition in the UK, then competition law should play a greater role. A competitive, industry supported infrastructure market will result in a greater degree of self-regulation over time, with less SMP style regulatory controls.

BT will, for the foreseeable future, maintain a dominant position, and competition law must ensure that this it does not abuse its position and engage in anti-competitive behaviour.

Q33 In what ways can you see competition driving technological change in the UK in the future?

See our response to Q40 to Q42.

Q34 How can the regulatory framework keep up to date with new business models and changes in technology?

Government and Ofcom must meet regularly with industry to keep a finger on the pulse of emerging business models and technologies.

The UK must look more closely at digital infrastructure developments in countries significantly more advanced than the UK in infrastructure terms, notably Scandinavia, Eastern Europe, Asia and USA.

Q35 Are there any changes to legislation other than the Communications Act that would incentivise the provision of communications infrastructure?

We propose that the current structure of 'fibre tax' must be simplified. Whilst business rates on infrastructure assets generate tax income for Government, we believe that the system should be overhauled by VOA to be more conducive to fibre investment. Specifically:

i) We propose a fibre tax rebate incentive during the period while infrastructure is being deployed.

ii) The rates for point-to-point fibre in access networks is treated the same as NGA.

iii) Public sector connectivity, e.g, schools, libraries etc, are excluded – to encourage better infrastructure for learning and other public services.

iv) Dispensation is given to certain tech-clusters, R&D and innovation uses to aid fibre deployment for innovation and economic development.

v) That the rating system in applied on a non-discriminatory basis across all infrastructures.

To repeat part of our response to Q23, in relation to planning and construction:

i) Efficient planning and wayleaves – Government should seek to simplify process for gaining wayleaves ensuring communications infrastructure is treated as a utility. Payment principles should be standardised, and timeframes for landlords to agree wayleaves should be shortened.

ii) Support for construction techniques – Efficient construction techniques, such as micro-trenches / narrow-trenches should be adopted as approved methodologies and supported by the Highways Agency and other applicable public bodies.

Q36 Would there be benefits to investment from a focus on broadband only services? Are there any barriers to the emergence and adoption of broadband only services, whilst still providing necessary access to emergency services?

From an infrastructure perspective, the question is irrelevant. A modern fibre based infrastructure supports all forms of connectivity and application. Services delivered across infrastructure should be at the discretion of service providers. Mobile networks have near ubiquitous coverage.

Policy should ensure fit-for-purpose digital infrastructure is efficiently deployed, and industry should be free to determine service models and propositions to users.

We need to stop thinking in terms of voice, broadband and broadcast; going forward we need to think more simply about connectivity, ensuring best IP connectivity in the home, at work, in our public spaces and on the move. Communication is increasingly device and app led. For example, my eighty year old parents now use an iPad for the majority of their communications with friends and family via Skype and FaceTime; using WiFi connectivity in the home and mobile connectivity outside of the home.

Historical provision of separate networks for voice, TV and business connectivity have established charging models routed in old world voice telecoms – line rental is an example of this, as it the limitations of number portability to VoiP. The notion that twisted-pair copper wire is needed for emergency services is also routed in the past. The DCIS Consultation states that 15% of households are mobile only, meaning that traditional voice has been abandoned. This trend is likely to rise as consumers continue to 'cut the cord' from historical networks and service packages. Policy and regulation must not pander to the structure of BT's legacy networks and wholesale services.

Section 5 – Facilitating and Encouraging Investment

Q37 How might copper access networks evolve over time alongside other access technologies? Is there a role for policymakers in helping manage any transition from copper to other access networks?

The future of copper networks should left to the discretion of their owners; in that regard it is BT (and to a lesser extend Virgin Media and KCOM) that should determine their evolution and

lifespan.

Whilst technologies such as VDSL and G-Fast exist to squeeze more data through copper wires they should not be considered fit-for-purpose in infrastructure terms – hybrid copper-fibre networks have significant operational problems in both performance and reliability.

As stated elsewhere in this response, policy should support the deployment of end-to-end dark fibre to all premises, mobile/wireless cell and other connectivity points nationwide. The networks should be open and shared (including access to the retail units of BT, KCOM and Virgin Media) and service providers should be able to migrate customers, connections and services to from the legacy networks to the new fibre network as they see fit.

Government should prevent further state funding (beyond BDUK Phase 1 and Phase 2) to extend the lifespan of copper. Proposals from BT to invest further state funds in FTTC or G.Fast should be rejected.

Government should not get too concerned about LLU investment from ISPs, as the fact remains that DSL technology will ultimately be made redundant in any scenario. However, a key benefit of LLU must not be forgotten – it provided ISPs with access to passive connections, allowing ISPs to engineer services to their own specification. This was seen as a key benefit to ISPs. Evolution to VDSL (VULA, GEA) has meant that ISPs must now consume active services from BT, so the ability to differentiate in infrastructure terms has been eliminated – this is seen as a backwards step by the ISPs and it is a factor in the slow take up of VULA. Policy should seek to ensure an LLU structure in a fibre environment, with ISPs having access to passive dark fibre in the access network. This will allow for LLU DSL investments to be refreshed overtime with fibre OLT/ONT investments made by ISPs.

In encouraging the deployment of fibre infrastructure, Government should engage with the new generation of fibre infrastructure builders in accordance with our recommendations outlined in this DCIS Consultation response.

Q38 Views are sought on whether there are any additional actions the Government should consider to ensure:

a) That the provision of all areas of the UK's digital communications infrastructure remains competitive in order to ensure that the UK can take full advantage of growth opportunities in the Digital Age;

b) Aside from legislation and adapting the regulatory framework in the broad sense which other actions should the Government take to encourage investment in communications infrastructure?

c) That potential investment in the provision of digital communications infrastructure offers a suitable risk and reward profile to ensure that they can be financed by the private sector

We have stated our reasons why end-to-end shared fibre infrastructure is the right platform for growth opportunities and actions that Government to encourage delivery elsewhere in this response. In answer to this Q38 we elaborate more on investment issues.

Consideration must be given to how an efficient investment vehicle will deliver appropriate returns for investors. CityFibre has undertaken extensive modelling to determine the optimum financing structure that maximises private investment – some of this thought is outlined in the independent report by Oxera published in February 2013 titled *A Shared Fibre Access Model for UK Towns and Cities: Feasibility and Implications.* [1] In balancing the risk reward profile for private investment Government should note the following:

[1] http://www.oxera.com/Latest-Thinking/Publications/Reports/2013/A-shared-fibre-access-model-in-UK-towns-and-

i) Investors seek a clear focus on infrastructure – Institutions, infrastructure funds and some pension funds are seeking yield generating infrastructure assets. A focus solely on layer 1 passive infrastructure creates "Digital Real Estate" models that are attractive to investors.

ii) Shared infrastructure optimises long-term yield – The passive infrastructure investment 'vehicle' will generate best yield when serving all market verticals; public sector, business, residential and mobile. An infrastructure for NGA (FTTH) alone will be sub-optimal.

iii) Efficient investment needs a clean investment vehicle – infrastructure deployment must be cost effective, and operating costs must be efficient. Incumbents and integrated providers are in-efficient investment vehicles (high costs of operating legacy networks, compromised solutions, excessive staffing, pension obligations, etc.), therefore, investors will seek clean investment vehicles that ensure efficient investment and optimum yield. A clean vehicle will have no legacy infrastructure overheads and low staffing costs.

Wholesale access revenues generated in the industry are sufficient to support private sector fund a deployment of fibre infrastructure nationwide. However, to ensure delivery it is clear that the flow of these revenues (or a proportion of such revenues) must shift from an inefficient vehicle (BT) to efficient investment vehicles (new generation fibre infrastructure builders). This is starting to happen through natural market competition (CityFibre's Gigabit Cities proves this), and many of the points we make in this response outline principles that can be adopted by Government to accelerate this.

CityFibre Infrastructure Holdings PLC was established specifically as an effecient investment vehicle to achieve the above outcomes.

Q39 Views are sought on:

a) The case for the UK to invest to gain 'early mover advantage';

b) What areas in particular the UK should aim to see investment;

c) Are there any actions not covered elsewhere in this report that the government should consider to ensure digital communications infrastructure is in place before it is needed and such that it helps generate need.

In infrastructure terms, the UK is very much playing 'catch-up'. Government has a choice to either:

a) Continue along the current path of incumbent dominated, state subsidised slow incremental infrastructure upgrades underpinned with a regulatory system focused on best value to consumers; or

b) Set a new strategy, with policies and broader industry engagement, to deliver open shared fibre networks to all premises in the UK – accelerating Gigabit communities with a regulatory system that supports infrastructure competition and private investment.

Option b) is achievable and is starting to take place in cities such as York, Peterborough, Coventry and Aberdeen. Government should engage with CityFibre and other new generation fibre infrastructure builders to shape a blueprint for our digital infrastructure that accelerates deployments.

Whilst it's too late to have 'early mover advantage', the UK can attempt to leapfrog back into a leading position through action and collaboration with industry.

Q40 How can we maximise the current R&D and innovation UK landscape to help take advantage of the opportunities provided by future technologies? What needs to be done by Government and its agencies, and industry to tackle any gaps?

Q41 In which future communications technologies do you consider the UK has, or could achieve, an international leadership position?

Q42 What more might government and industry do to exploit future technologies, associated new applications and emerging business models?

Taking Q40, Q41 and Q42 together, we should consider infrastructure as a foundation. Innovation will come from the uses of digital infrastructure and the service opportunities that flow from it.

Shared dark fibre networks deployed at scale provide the optimum platform for digital innovation. To repeat the quote in Q7 regarding America's plans for Gigabit fibre, *"The U.S. needs a critical mass of gigabit communities nationwide so that innovators can develop next-generation applications and services that will drive economic growth and global competitiveness."* We believe the UK could benefit in the same way. We suggest:

i) Government embraces CityFibre's vision and rollout of Gigabit Cities – establishing citywide fibre infrastructure in many towns and cities across the UK, and delivering gigabit speed connectivity to all market verticals; public sector, business, consumer and mobile.

ii) Establish innovation hubs in each Gigabit City – providing innovators and start-ups with access to low cost gigabit connectivity, supported by initiatives to drive technology innovation.

iii) Foster relationships with Universities in each Gigabit City – enabling R&D initiatives using Gigabit connectivity to innovate in the subject mater specialism of the university, e.g. cyber security, 3d-design and printing, life-sciences, digital arts etc..

Ubiquitous dark fibre will spark disruptive business models, pioneer uses of 'Big Data' and lead to new ways of collaboration. Government agencies such as the Technology Strategy Board (TSB) should support projects underpinned by digital infrastructure. Smart city initiatives should be aligned to Gigabit Cities where digital infrastructure is the key enabler.

Local authorities should be empowered to spearhead local R&D and innovation initiatives.

Q43 What role might local bodies have in facilitating the future delivery of digital communications infrastructure?

Q44 How can council's maximise the digital communications infrastructure in their local area to support their work on economic regeneration?

Taking Q43 and Q44 together, local authorities are major beneficiaries of modern fibre infrastructure. From CityFibre experience, below are a few viewpoints:

- *"The Gigabit City project is the most important development for Peterborough since the railways." – Marco Cereste, Leader of Peterborough City Council*
- *"CityFibre's decision to make Aberdeen a Gigabit City helps us to realise our ambitions of being at the leading edge of the digital revolution with the world-class connectivity essential for continued growth" – Jenny Laing, Leader of Aberdeen City Council*
- *"We want to be a top 5 UK economy and to do so, we need the physical infrastructure to support that. Turning York into a Gigabit City is hugely important for businesses, residents and visitors" – James Alexander, Leader of City of York Council*

Local bodies (LEPs, chamber of commerce, local authorities, universities etc.) are passionate about their city, towns and villages. Universally, the importance of broadband and better

connectivity is top of their agendas. CityFibre has a track record on engaging with local bodies and councils, developing rewarding partnerships that encourage investment in their local areas. In this regard we note the following:

i) Supportive of infrastructure competition – progressive city leaders understand the intrinsic value of supporting infrastructure competition; inward investment, better choice for service providers and superior connectivity delivered sooner – these factors bring opportunity for the local areas to be digital leaders, attracting business that underpin economic growth.

ii) Become a user of new fibre infrastructure – Being a user of new gigabit fibre infrastructure can transform delivery of public services, empower education and enable efficiencies. In turn, the local authority contract provides confidence to investors and the revenues flowing from the contracts support the business case for shared fibre infrastructure. In certain circumstances, local authorities can act as anchor tenant to secure new infrastructure investment.

iii) Collaborative partnership approach – In making a substantial private investment in a town or city, its important to know that the infrastructure investment is supporting economic and regeneration objectives of the council. We propose long-term strategic partnerships that facilitate collaboration and an alignment if interests.

iv) Aid planning and construction – Building new infrastructure brings some disruption, so civil engineering should be co-ordinated and local authorities should support efficient construction methodologies.

v) Enthuse and engage communities – City leaders and local bodies should play a facilitation role with local business and residents to galvanise support for new digital infrastructure and making them aware of benefits to the broader community.

vi) Make use of infrastructure assets – Local authorities have access to a number of assets that can facilitate infrastructure deployments; for example, street furniture, utility ducts and dark fibre infrastructure. Opportunities to exploit these assets should be explored.

vii) Support innovation and business growth – LEPs, local chamber of commerce and economic development functions should be proactive in exploiting new infrastructure to attract business growth and further inward investment. Universities should support digital R&D and innovation.

viii) Don't tolerate intimidation – Finally, local bodies and councils should stand up to the intimidation tactics of BT. It is natural that a monopolist wants to preserve it's monopoly position, so introduction of competition will spark anti-competitive behaviour. As stated elsewhere in the response, this behaviour should not be tolerated.

--- END OF RESPONSE ---