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techUK response to DCMS consultation:

Draft techUK response to DCMS consultation on the Digital Communications Infrastructure Strategy (DCIS)

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techUK | Representing the future

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Introduction

About techUK

techUK represents the companies and technologies that are defining today the world that we will live in tomorrow. In a very real sense techUK represents the future.

At the heart of tech in the UK is an ecosystem of 270,000 companies producing digital technologies, products and services. From east to west, north and south, from enterprise class organisations to established medium-sized businesses, growing small businesses and an exciting generation of tech start-ups: the UK is a hotbed of tech talent and techUK exists to represent the sector in its entirety.

Our role as techUK is to ensure that we seize the potential for good and address the disruptive new challenges that change and innovation always present. We work to understand the opportunities that technology provides; to support the companies and innovators that can realise those opportunities.

This underpins our simple vision to ensure that tech is good for the UK, the UK is good for tech and that tech is good for people.

Summary

techUK welcomes the Government consultation on the Digital Communications Infrastructure Strategy (DCIS) – in particular the initiative to consider, and take steps on, what Government needs to do to enable industry to facilitate a world class digital communications infrastructure in the UK for the 2020s.

We very much agree with the assertion that digital communications are an essential part of everyday social and business lives and yet its importance in underpinning economic and social activity is not fully recognised in policy making circles. The digital communications infrastructure is not only the set of platforms that brings us the traditional communication, broadcast, digital entertainment and emergency services but it increasingly plays a vital enabling role in a diverse range of applications from healthcare, transport, automation, defence / security and energy distribution as well as a plethora of new and innovative business models and services. Without it our daily lives will be severely affected.

Communications infrastructure is composed of a diverse range of networks and technologies. The fixed wired (fibre, cable, copper) and wireless (mobile, wifi) telecommunications networks are perhaps the most well known. However the communications networks that underpin our broadcast, (fixed and mobile) satellite, emergency and various utility services are also vital components of it. Increasing affordability of other airborne platforms serving as communication nodes will also increase in significance and availability by 2020.

As the consultation document recognises, digital communications is not only a major and growing sector in its own right but the infrastructure enables a growing multiplier effect across the whole economy. Also, the Government should not neglect the vital societal role the infrastructure plays in tackling the evolving challenges in public protection and disaster relief. This aspect should be an important component of the DCIS. If the UK is to remain a leading and competitive economy and enable its citizens

to tap into the widening opportunities to enhance their lives from 'digital' solutions, a world class communications infrastructure is a sine quo non. As such we strongly agree with the assertion that communications Infrastructure is indeed the latest 'essential utility' but we want to see wider Government policy and approach change to reflect this recognition.

Ultimately it is private industry, and the communications sector in particular, that will deliver a world class digital infrastructure and the associated technologies. In doing so, it will respond to the business, policy and regulatory environment and incentives that it faces. In turn it is Government (central and local) and regulators that hold the key levers to deliver the enabling environment that industry needs. Below are important themes for Government action:

- **Cross- Government prioritisation for 'digital'**: Communications infrastructure is increasingly critical to the delivery of a wide set of business and societal activities. As stated in techUK's digital manifesto, 'Securing our digital futures', we recommend that all Government Departments should have a Ministerial post that clearly has 'digital' within its portfolio, aimed at providing high level 'sponsorship' for harnessing and aggregating the power of digital solutions to deliver on the policy challenges

- **Incentivise long term infrastructure investment:** Given the competitive environment in the UK communications market, challenging margins, and the long term and costly nature of implementing and maintaining communications infrastructure, the Government has an important role in delivering an environment that incentivises industry to invest in the infrastructure. In the long term, it must remain firmly focussed on ensuring a stable and transparent policy and regulatory environment which gives certainly to industry and promotes investment. In the short term, it must leave no stone unturned at local and central level to reduce the (regulatory and bureaucratic) cost burden on operators in rolling out and maintaining new digital infrastructure.

- **Stimulate and aggregate demand:** Government (local and central) has a crucial role in promoting the delivery and consumption of public services through digital services. In addition to enabling enriched and personalised services more cost effectively than physical channels, this will also improve the business case for investing in communications infrastructure especially in sparsely populated areas where the business case is limited. Government needs to give this greater priority and to focus on scaling up such initiatives across UK.

- **Technology neutrality:** the digital communications infrastructure is composed of a range of technologies and transmission media with different strengths and characteristics. Successive Governments have rightly stated their belief in ensuring that their policies are technologically neutral. This must remain the case, ensuring that where necessary careful preparatory considerations are given to how this can be best achieved.

- **Co-ordinated (Government – Ofcom) approach to spectrum:** The increasingly competitive environment, together with the increase and diversity of demand for spectrum, means that spectrum decisions are increasingly complex. At the same time, spectrum policy and allocations have a strong regional (European) and

global dimension. International decisions are originated and 'matured' over long lead times and have a crucial impact on national markets. It is vital that Government and regulatory activities on spectrum are well co-ordinated to ensure a clear official strategy on spectrum.

- **Enabling UK to be 'home' for the development of key digital communications technologies and applications:** Government must provide proactive leadership to create a UK environment that both stimulates and supports home grown digital technology and communications companies and attracts multinationals in the field to undertake high value digital development and innovation activities here.

Detailed Responses

PLEASE NOTE THAT QUESTIONS WHERE WE DO NOT HAVE A RESPONSE AT THIS STAGE HAVE BEEN OMITTED BELOW.

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?

techUK agrees with the roles for Government identified in the document. In addition, we believe that government has a crucial role in the following aspects:

- **Cross- Government prioritisation for 'digital'**: As stated above, communications infrastructure is increasingly critical to the delivery of a wide set of business and societal activities. For Government, in an era of increasingly complex policy challenges (from stimulating growth to providing healthcare to an ageing population, sustainability and security of energy supply, and creating an integrated transport environment) and limited resources to deliver on these, digital solutions provided through a fit for purpose communications infrastructure often offer the way forward. Government does recognise this but to deliver on these effectively, resolute and joined up action from different parts of central and local Government is needed. In recognition of this, as stated in techUK's digital manifesto, 'Securing our digital futures', we recommend that Government should ensure continued Cabinet-level leadership for embedding digital solutions at the heart of its interventions by developing and executing a single strategy for public sector reform, the digital economy and digital inclusion. To support this, all Government Departments should have a Ministerial post that clearly has 'digital' within its portfolio, aimed at providing high level 'sponsorship' for harnessing and aggregating the power of digital solutions to deliver on the policy challenges.

- **Incentivise long term infrastructure investment:** creating and maintaining a world class communications infrastructure entails significant and long term investment. At the same time, UK enjoys one of the most competitive communications markets in the world and profit margins for operators are increasingly under pressure. This means that ensuring reasonable returns on current investments and sequencing future investments is an important factor for the industry. Government (local and central) Government can help create the necessary investment climate in 2 ways:

- In the long term, keep firmly focussed on ensuring a stable and transparent policy and regulatory environment which gives certainty to industry and promotes investment

- In the short term, leave no stone unturned at local and central level to reduce the (regulatory and bureaucratic) cost burden on operators in rolling out and maintaining new digital infrastructure by helping to lower network infrastructure / property costs, improving access to public sector land and street furniture and reforming planning law

Stimulate and aggregate demand: The arguments for promoting digital public services are well documented and accepted. The delivery of such services through digital channels not only provides a wide range of benefits for citizens (eg. better / personalised services and information, savings on retail offerings, increased employability) it also enables these services to be delivered more cost effectively. Stimulating demand for digital services in this way, also improves the commercial case for investing in communications infrastructure especially in sparsely populated areas where the business case (for commercial implementation of the infrastructure) is limited. Government (local and central) has a pivotal role in this:

- promoting digital skills and inclusion
- stimulating and aggregating demand by expanding digital public services, healthcare and education
- scaling up local digital demand and inclusion initiatives

- **Co-ordinated (Government – Ofcom) approach to spectrum:** In the UK, Government is responsible for Spectrum Policy and Ofcom is the independent regulator responsible for regulation and release of spectrum. In addition to their traditional communications applications, terrestrial wireless and satellite (and therefore spectrum) applications are at the heart of an increasing range of solutions for a wider set of sectors (eg. healthcare and transport). The increasingly competitive environment, together with the increase and diversity of demand for spectrum, means that spectrum decisions are ever more complex. At the same time, given the nature of radio propagation and need for multinational markets, spectrum policy and allocations have a strong regional (European) and global dimension. International decisions are originated and 'matured' over long lead times and have a crucial impact on national markets. It is vital that decisions on spectrum release are planned and implemented in a timely manner. Where this requires international decisions to be stimulated and / or influenced, this needs to be planned and co-ordinated in advance. Decisions not consistent with UK interests and delays in the release of spectrum could undermine UK economic, industrial and technology interests. For example, if fixed wireless access is seen to be a component technology for rural broadband, as responsible entities for making spectrum available, Government and Ofcom must come together to ensure relevant and sufficient spectrum is made available at the necessary time. It is therefore vital that Government and regulatory activities on spectrum are well co-ordinated to ensure a clear official strategy on spectrum that ensures that,

  - UK activities in international spectrum discussions are focussed on UK societal, economic, industrial and technology interests and

- the timescales and plans for spectrum release are in line with Government's policy priorities

- **Enabling UK to be 'home' for the development of key digital communications technologies and applications:** The UK has the most efficient and effective research base in the world[1]. It has a predictable policy and regulatory environment. UK consumers have a reputation for being enthusiastic adopters of (digital) technology and services. There is a thriving community of companies, both UK and multinationals, involved in the development of digital technology and applications and delivery of services. Government must provide proactive leadership to create an overall environment that both stimulates and supports home grown digital technology companies and attracts multinationals to undertake high value digital development and innovation activities here. See also answer to Q 38.

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

Government should certainly use its buying power to support policy objectives. For example there is still considerably more that could be done to co-ordinate communications service requirements (such as broadband) in public sector organisations to stimulate demand in areas where the commercial case for building next generation broadband infrastructure is weak. However Government should do more than just harness its combined buying power to support policy objectives. Digital communications and solutions hold the key to delivering many aspects of government policy from growth and productivity, high value jobs to education, healthcare, security and defence. In this respect, we welcome the introduction of a Ministerial Digital Task Force to co-ordinate Government action in enabling UK to capitalise on digital opportunities. We also welcome the appointment of a Minister for the digital economy with responsibility across DCMS and BIS. It is important however that these Government initiatives should focus on building long term UK capability rather than short term election objectives. In its recent technology manifesto, 'Securing our digital future', techUK has recommended that all Government Departments should have a Ministerial post that clearly has 'digital' within its portfolio driving consistent implementation of the three core strands of the single digital strategy within that department.

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

To assist migration requires that IPv4 and IPv6 compliant infrastructure is utilised to ensure backward compatibility. The digital infrastructure is a communications highway that interconnects to many autonomous networks (ground and space based). Greater promotion of standards will help to ensure future proofing.

[1] HEFCE (2014) 'UK Universities lead the world in research' Retrieved from http://www.hefce.ac.uk/news/newsarchive/2014/news87377.html

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?

It is important to differentiate between access to services and access to competition. Variations in population density will inevitably result in disparity in the level of competition in broadband services across UK. However all households and businesses should have access to good quality superfast broadband services that they need. The momentum towards coverage / availability of mobile and fixed superfast broadband must be maintained. Where necessary, in areas where the commercial business case for implementing (and operating) next generation infrastructure, the Government should continue to subsidise the implementation of networks and work with industry to reduce the ongoing operational costs. In doing so, Government should remain fully neutral to the underlying technology.

Ultimately it is industry which will deliver the next generation networks and services in question and continuing private sector commitment to invest in fibre, cable, wireless as well as satellite networks will be a major contributor to this. As pointed out in the consultation document, investment by BT and Virgin in particular has already helped to bring access to the major portion of the expected 76 % of UK households. The roll out of 4 G networks by mobile operators, including the 98 % (2 MBps) coverage obligation placed on one of the 4 G licensees, will bring next generation mobile services to a substantial part of the population.

Government too has an important role. It has made available not insignificant public funds to augment industry investment in areas where the business case for private sector investment is weak. Thus, together with the above private sector investment, this should enable access to superfast broadband to at least 95 % of UK households.

Government should also take into consideration the use of satellite alternatives in order to maximise the full range of technology solutions in the future digital communications infrastructure.

Finally, Government should maintain the momentum towards improved availability of the next generation infrastructure by doing everything it can to reduce the associated bureaucratic cost burden: In seeking to extend coverage to the final few percent of the country (especially sparsely populated areas), the cost of implementing and operating communications infrastructure is a major factor for industry. As stated in our answer to Q 27, there is much that can be done here in terms of creating a pro investment environment and reducing red tape relating to permissions for implementing infrastructure and ease of access to it for ongoing operational activities. Also there is need to support R&D initiatives to the next level of delivery to ensure innovations are fully utilised.

i. supporting the diverse range of technologies / platforms for tackling the final few percent: fixed wireless and satellite solutions play an increasingly important role in providing coverage in the final 5 % (95 to 100 %). Government has made a start by providing £ 10 M funding for the investigation of innovative solutions for providing superfast coverage to the final 5 %. Following the completion of these pilot exercises, Government should soon develop a fully -costed plan for facilitating the full range of communications platforms from fixed, line, to wireless and satellites for delivering innovative solutions. Incentives are needed to enable Industry to commit to a delivery time table for the 5%

ii. The internet will be increasingly used by Government to deliver lower-cost services for citizens. 'Smarter Government' asserts that it can be four times cheaper to deliver services over the internet than by post. The satellite industry is playing its part in delivering a fast solution to the Universal Service Commitment (USC) for broadband. As part of a technology neutral approach, the Government should take into account the role of next-generation superfast broadband from satellites with optimised delivery of broadband internet services, as part of a national approach.

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?

This is a difficult question to predict. The Broadband Stakeholders Group's (BSG) Report on the domestic demand for bandwidth[2] suggests that, while the demand for speed in both directions will shift upwards, the difference will remain. The shape of communications networks will always evolve to suit shifting demand patterns. The challenge for Government policy towards UK's communications infrastructure is to concentrate on the big picture and ensure a flexible policy and regulatory environment that promotes investment, adoption, innovation and technology leadership. Video and real-time operations will be the primary demand, whilst applications will be based on low-data rate communications (eg. M2M) that have little margin. Hence, the network and strategy needs to be divided into service types with a strategy for each.

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

The UK should continue to measure itself against major European countries, as it does through the European Broadband Scorecard, as well as looking to those countries which are traditionally seen as digital pioneers such as Japan, South Korea and Sweden.

While benchmarks are useful indicators of areas of success and perhaps more importantly where action is needed, a key role for Government is to ensure that the UK's own market operates as efficiently as possible.

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?

At the market level, techUK believes that the measures (coverage, take up, speed and market concentration) set out in Ofcom's EU Broadband Scorecard are reasonable. In terms of take up of broadband services, in addition to that by households, take up by SME's would be a useful measure in helping to drive up productivity. Furthermore, given the need now to drive utilisation of the digital infrastructure and its applications, we

[2] BSG and Communications Chambers Report, Domestic demand for bandwidth

should consider the metrics in the EU Digital Agenda relating SME and consumer take up of services such as e-government, e-commerce and e-invoicing.

Q10, 15, 20 Are there technologies not identified here that you think will have a major impact on the performance of existing infrastructure or the deployment of additional infrastructure in the next 10-15 years?

In addition to the technologies such as 5G and Internet of Things already identified, potential airborne networks with ad-hoc capability and photonics are technologies to be also considered.

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?

UK communications industry has shown itself consistently to be willing to invest in the provision of communications infrastructure in all its forms – from fibre and cable to wireless and satellites. However as stated elsewhere, in a competitive market with increasing challenges on margins, there will be areas (such as the more sparsely populated ones) where the commercial case for investment in infrastructure is weak. In these specific cases, there will be an ongoing need for public intervention. As the Government has recognised in the consultation document, returns in terms of economic and social regeneration from such public intervention is very significant.

Also, provision for public protection and disaster relief (emergency services) is an important component of digital communications infrastructure. While commercial providers will deliver the infrastructure services, the vital societal benefit means that Government has an important role in ensuring that it is properly resourced.

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

It is impossible to precisely forecast the most likely scenarios. However current trends and the spread of the use of communications technology, services and applications in almost every aspect of our lives and business sectors, together with the momentum on the development of broadband technology, especially in the wireless arena, means that a mixture of Scenarios 2 and 3 is not an unreasonable working assumption. Aside from the increasing demand, the impact and importance of digital communications infrastructure to society and commerce makes it of strategic importance and justifies the description of it being the latest essential utility. Thus the Government's Digital Communications Infrastructure Strategy should not only have the flexibility to cater for the different future demand scenarios but be given the same strategic priority as other utilities across Government.

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

At a time of reducing margins for communications service providers, the Government at local and central level should do everything possible to help improve industry incentives to invest in new and improved networks. In particular, it should,

- help lower network infrastructure / property costs and improving access through Electronic Communications Code reform - under the current regime, there is a huge disparity between the rental cost to site electricity pylons and that for mobile base stations.

- Enable better access to public sector land, roof tops and street furniture - will help to improve coverage and capacity across the UK. Public bodies should have a presumption in favour of enabling access to their buildings, land and street furniture for use for network infrastructure

- reform to planning law to move to a system which makes it easier to implement new sites and infrastructure - given that 85 % of the cost of building transmission line infrastructure is in civil engineering work, enabling innovative infrastructure deployment techniques such as narrow trenching and overhead deployment is a priority in delivering extended and improved broadband coverage; furthermore a consistent and pro-industry application of the Permit Scheme by local authorities is now more than ever essential

- seek out scope for additional flexibility on State Aid Rules to better support rural broadband roll out and to reinforce the principles of technology neutrality

- look more seriously at airborne alternatives (such as High Altitude Platforms -HAPS, etc).

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

See answer to Q 27

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?

techUK is not averse to the idea of a revised USC at some point in the future to accommodate evolution in technology and usage. However, we believe that a more important priority is to focus on e-inclusion – encouraging sections of the community unwilling or unable to use broadband. Industry has a strong incentive to promote and support take-up of their services but Government also should do more to co-ordinate and enable scale up for the e-inclusion related initiatives across the country.

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

Given the nature of the industry, multinational frameworks are often preferable to national frameworks. However these frameworks should reflect the competitive and pragmatic scenarios often taken in the UK. Government should engage proactively and constructively in EU and wider negotiations to promote these principles and ensure a level playing field for companies in the UK.

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

Clearly competition is an important driver for innovation. However there needs to be a balance between competition and the incentives for investment. Competition is a good thing and the UK enjoys one of the most competitive environments for communications services and our consumers have benefited greatly from this. Competition should be at the core due to the wide market being addressed and network infrastructure needs to be extendible. However, the communications industry has been experiencing ongoing pressures on its margins which undermine the incentives on companies to invest in new, up to date infrastructure and innovation. The balance may well be shifting to mitigate against investment and Government should ensure that policy and regulation takes account of the need to ensure a long term environment for investment.

Government also has an important role in driving technological change:

- harnessing its significant buying power to promote change
- being proactive and devoting sufficient resources in the creation of a well connected world class research and innovation ecosystem which prioritises digital technologies and services, and
- embracing long term policy decisions which impact on technology change with early engagement with industry through trade associations and industry – Government fora.

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

Government and regulators need to work closer with industry. An ideal way to do this is to engage with trade associations and initiatives facilitated by them such as the UK Spectrum Policy Forum, Broadband Stakeholder Group and the techUK – Ofcom Forum.

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

See answer to Q27. A crucial way for Government to provision of communications infrastructure is to incentivise investment and reduce the regulatory and bureaucratic cost burden for implementing and operating communications infrastructure.

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?

See answer to Q27.

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

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?

The digital communications industry, in common with many other sectors, is increasingly international in nature. Companies and investors often look to a range of candidate countries where they could invest for their technology and service innovations. In doing so, they look to a range of 'investment-friendly' factors in these countries- and the Government has a crucial role in ensuring that these are in place in UK. In the case of digital communications technologies and services, these will include the questions:

- Is the policy and regulatory landscape stable, transparent, joined up and pro industry (ie. does it incentivise investment) ?
- Does the Government (and its agencies) value digital technology? ie. does it have the digital economy and the adoption of digital solutions at the heart of its policies ?
- Is the Government proactive in taking policy decisions (such as 'switch overs' and roadmaps) to enable innovation and take up of new technologies
- Is the research and innovation base well supported and joined up? Is there a common intellectual property framework for efficient industry – academia collaboration?

Q39 Views are sought on:

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

If UK wishes to retain its position as a leading (economic) nation, ensuring the UK is home for the development of strategic new technologies and services is a must. These are technologies and services that will have a world-wide impact and markets. There are a number of examples offered in the answer to Q39 b below. In the case of satellite communications technologies, where harnessing seed funding from Government and research & innovation agencies, followed through by industry investment, helped to establish UK as a 'go-to' place on satellite communications in subsequent years. This also opens the door for export opportunities in a global market for (in this case) 'Internet from Satellites' that is estimated to be worth £29 billion per annum by 2030. In addition to the subsequent commercial rewards, the benefits of such 'early mover' seed investment from Government have also been in the creation of UK careers in high value and high technology fields for our young people as well as attracting the best of international talent.

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

The pace of innovation in digital technology and applications continue to accelerate and in the next 5 years we expect to see very significant growth in a number of new

technologies. In considering interventions to stimulate early mover advantage, the Government should particularly focus on technologies and applications that will become an everyday reality in the coming years. In the context of digital communications infrastructure, these include:

- Internet of Things (expected to reach ($ 7.3 tn by 2017)
- 5G and new wireless technologies (expecting a 40-fold increase by 2018): to support new and high capacity operational and usage scenarios
- Next generation satellites technology and services: new approaches to high capacity satellites delivering step changes in throughput and enabling uses across wider sectors.
- Wearable technology (expected to reach $ 70 bn by 2024)
- Big data and data analystics (expected to reach $ 32.4 bn by 2017)

UK also has valuable expertise in RF and optical technologies and in the integration of complex systems. A useful approach for Government is to promote collaborative demonstrator projects on these areas, perhaps combining multiple platforms.

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?

As often noted, UK has an excellent reputation for science, research and innovation. The UK's R&D and innovation landscape is a mature and well developed one. However despite our world class research and our reputation for innovation, a well recognised weakness has been the pipeline from research and innovation through to commercialisation. The establishment of the Technology Strategy Board, TSB, (now called Innovate UK) and the Catapults are steps in the right direction but more needs to be done particularly with bridging the gap to the private sector where these projects are still seen as too long term and high risk. The Government could underwrite some of this risk or provide loans to companies directly. In terms of maximising opportunities from UK's R&D and innovation landscape techUK believes that attention should be given to the following areas:

- While there is recognition of it, much more needs to be done to increase co-ordination and collaboration between the various innovation initiatives in the science and research areas, and the technology innovation activities of Innovate UK (and the catapults). In doing this a key output should be the identification and mapping of the capability base across UK of the digital communications related research and innovation. More also needs to be done in going from proof-of-concept to commercialised services where investment requirements are much greater.
- Given the increasingly central role that communications infrastructure plays in a wide range of commercial and societal activities, together with the associated global commercial opportunities, greater priority should be given, in the innovation programmes of the Research Councils and InnovateUK, to the development communications technology, applications and services.

- Government also need to look to other nations experience and where possible benefit from other R&D, for example the US, Canadian and Australian broadband approaches and the technology applied.

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

See answer to Q 39b

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

Need to secure an environment where SMEs will survive and flourish. The size of this market leads SMEs often to play limited roles and so more needs to be done to enable a more substantial role where they can fully contribute their innovative and technological areas of expertise.

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

Local bodies can play a crucial role in driving demand and promoting adoption and use of broadband. Many examples of good practice exist. Government should provide greater leadership in enabling the scaling up of these local initiatives to create national impact. There should be no barriers on location and incentives should be in place for investment supporting communications across every local region. This creates jobs across the UK rather than in focused areas. Local bodies can also help improving coverage of communications infrastructure by enabling economic access to land, rooftops and road furniture to communications service providers and thus help to reduce the cost of implementing and running the infrastructure. See answer to Q 27.

end