

“Prediction is very difficult, especially if it's about the future.”

Nils Bohr, Nobel laureate in Physics

The following comments on the Digital Communications Infrastructure Strategy consultation document represent the personal views of the author, Michael Armitage, co-founder of Broadway Partners, and reflect his 30 years’ experience in the City and four years’ work developing broadband projects.

Introduction

Q1 Views are sought on:

a) Is this an appropriate role for Government?

The stated high-level observations about the proper role of Government are reasonable and non-contentious.

Government has a clear role to play in the creation of the optimal conditions for investment – a stable legal framework, including the consistent enforcement of competition law, together with forward-looking regulatory policies and suitable fiscal incentives.

Beyond that, and reflecting the undoubted strong positive externalities associated with network investment (as acknowledged *en passant* in 5.26), as well as its own interest as a provider of public services, the Government should think of itself first and foremost as a key stakeholder, and has an important role to perform as co-investor in a new national fibre infrastructure. We expand on this in our answer to Q24.

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

There are at least three principles to which Government should adhere.

1. Timing is (almost) everything.

As the ‘Objectives’ section of the Introduction itself says, “in the context of Government intervention in the development of future infrastructure timing is important”. Indeed so: in the writer’s opinion, the Government’s intervention from 2010 was justified on a somewhat false premise, the premature declaration of market failure in 2011, itself based on a cursory Market Review process, and before the market for superfast broadband had begun to develop.

In contrast, when the technical and economic limits of the copper network have become all too clear as BT pushes its upgrade programme to the final 20% of the population, and when long-term interest rates are at an all-time low and pension liabilities of an ageing population are at an all-time high, there has never been a better time than the present to launch a major long-term infrastructure programme, where the expected returns extend many decades into the future – to say nothing of the immediate and direct contribution of an extensive civils programme to employment, to the economy and to tax receipts.

2. The right kind of intervention.

Government would benefit from an expanded tool box of intervention measures: at present, it seems as if the only form of intervention available to it is the direct subsidy.

This is perhaps inevitable, given the dominance of the incumbent – “if all you have is a hammer, everything looks like a nail”. But it is certainly limiting, and damaging, from multiple perspectives: it risks introducing delay, by virtue of the need to achieve State aid clearance. It risks distorting the market, by substituting for, rather than stimulating, private sector-led investment. It is likely to be economically inefficient. And it provides little scope for scrutiny, oversight or accountability.

Moreover, given that one of the persistent problems in the communications sector is the very dominance of the incumbent, and the fragmented nature of potential alternative providers, it

seems counter-productive to intervene in such a way as to strengthen even further that incumbent's market dominance.

There are at least three areas where Government can usefully intervene to stimulate network investment.

First, as aggregator. As was highlighted in the Scottish referendum, there is a risk-taking and risk-averaging role that Government can take – whether in the provision of state-sponsored pensions, the guaranteeing of public debt, in its role as customer, or in the efficient aggregation of capital in the service of long-term investments such as communications infrastructure.

This role is particularly important given the very clear scale imperatives in communications network construction, and given the fragmented nature of the alternative network supply base. Government has a crucial role to play in facilitating access to finance, in acting as anchor customer, in coordinating between different utilities, and so on.

Second, as co-investor. As articulated more fully in the answer to Q24, and reflecting the significant positive externalities associated with efficient and ubiquitous digital communications infrastructure, Government should seek to act as co-investor in, rather than subsidiser, of new network investment. Self evidently, the participation of both local and central Government as co-investor represents a far better value-for-money proposition to the tax-payer than a direct subsidy, but also crucially sends an extremely positive signal to investors.

Third, as pro-competitive watchdog. Investment in next generation access technology is clearly discouraged where the incumbent monopolist continues to receive a regulated return on an obsolescent local loop infrastructure. Two obvious possible remedies present themselves: BT should be presented with a choice of either a forced legal separation of Openreach, as the most effective way to minimise anti-competitive cross-subsidies; or to have set a clear date for copper switch-off, timed to allow it to recover no more than the cost of its current FTTC deployment, say 2018. If neither of these prove acceptable to the incumbent, then the communications market should be subject to full CMA investigation.

3. The right kind of financing. Government has tended to turn to existing suppliers to deliver desired policy outcomes and, in the interest of risk minimisation, this has invariably been existing large suppliers, such as BT. While this is understandable, it is also regrettable, not least because it guarantees a solution based on corporate finance principles, rather than project finance principles. Given BT's fiduciary responsibility to allocate shareholders' capital to projects showing the highest return, ever larger quantities of public subsidy are required to 'move the dial' sufficiently to make a marginal project such as rural network upgrade into a project with a competitive return.

An approach based on project finance principles offers many significant advantages, not least the ability to start with a 'clean sheet' in respect of network design and technology optimisation, but also in its ability to attract the right kind of investor for each particular stage of the project – higher return private equity investors for the earlier and riskier stages, and longer term and more patient capital once the project has matured and been essentially de-risked.

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

There is a significant risk of 'mission creep' in both Government and regulator. There is also a sub-optimal fragmentation of responsibilities for this strategically important industry between multiple Ministries – DCMS, Defra, BIS and DCLG, as well as the Cabinet Office and HM Treasury and others. The plethora of consultation exercises, of which this is one, is testament to the risk of bureaucratic waste that exists in this arena.

In the writer's view, whichever department has responsibility for communications infrastructure policy should be required to work far more closely with DCLG and Treasury. There is also a clear case for investing in training in the area of finance, consistent with the co-investment role that Government should assume.

Section 1

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

There are two practical roles that Government can perform in this regard:

First, as coordinator: the consultation document listed the welter of independent and uncoordinated networks that have evolved almost randomly over time – the Highways Agency, Network Rail, the NHS, Planet, and so on. No mention is made of the existence of the most geographically ubiquitous network of all – the electricity network, which in many other countries plays an integral role in the development and support of Next Generation infrastructure. See, for example, the first national fibre network being constructed in Israel, with the Israeli Government and the electricity utility acting as strategic co-investors (www.abc.net.il). For all public bodies that are in receipt of public funding, the Government should mandate the proper coordination of network planning, with appropriate incentives and penalties to encourage infrastructure-sharing and avoid duplication. There is a clear proactive role for the UK Regulator's Network (UKRN) here.

Second, as 'anchor customer': Government is quite properly concerned to ensure the most effective delivery of public services and should therefore translate its vested interest in an efficient outcome into an invested interest, both as co-investor (see Q24 below) and as anchor customer.

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

No strong view.

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?

To the extent that different areas vary by both geographic and demographic factors, there is an inevitable disparity of investment outcomes if left purely to the market. This is beyond dispute.

Following the Scottish referendum, the UK faces a period of significant constitutional and institutional reform, with a centripetal shift in power to the regions and towards local autonomy. A commitment to provide a universally available communications infrastructure would represent a powerfully cohesive statement, as well as ensure fair distribution of resources and opportunity, equally to all regions, while serving also to reduce the London-centricity of the UK economy.

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?

No strong view: 20 years ago, in the era of dial-up access, 'always on' was not considered as essential, as internet use was generally only periodic. Ten years ago, in the era of first generation broadband, symmetric speeds were not considered essential, as social media had barely begun to impact on users' online behaviour. Now, the safest assumption is that current trends and trend rates of change will continue, and other trends will emerge, as yet unforeseen. In other words – nobody knows, and the attempt to micro-forecast demand by device type, by application or by medium is beyond the legitimate scope or competence of Government. The sensible and safe assumption is that current trends towards the increasing need for symmetric communications will continue.

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

Globalisation and the lowering of trade barriers encourages the free movement of human and financial capital and, with the increasing harmonisation of tax regimes, decisions on business location will increasingly be driven by the physical and societal attributes of a country or region. State-of-the-art infrastructure, the quality of housing stock, the robustness of institutions and the rule of law... these are all inherently non-fungible – they are all part of the physical stock of, and help define, the country's competitive resource.

The UK is blessed with many positive attributes, but a quality communications infrastructure is not one of them – clearly as a result of decades of under-investment.

The relevant benchmarks are those cities and countries that are, quite simply, the best, and that already compete with UK cities and regions: the Scandinavian countries and various Dutch, French and German municipalities. Given its strength in other areas, and assuming continuing improvement in educational attainment, if the UK adopts a coherent and committed approach to a fit-for-21st-century-purpose communications infrastructure, the country will become virtually unbeatable as a destination for inward investment, in the author's opinion.

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?

No strong views. The current benchmark is for easy and affordable access to Gigabit symmetric service, for both consumers and businesses – a standard to which the UK can only begin to aspire.

Section 3 - Scenarios

Scenario 1, 2 and 3

These comments apply to all three scenarios.

I have no strong view on the scenario approach, other than to suggest that it is at best a mildly interesting exercise. In my view, the time for this sort of analysis is surely past, and a few anecdotes illustrate the pitfalls of extrapolating from a base of current experience:

- Back in the early 1990s, when advising Millicom on its IPO, I recall a long and heated debate with the co-founder, Shelby Bryan, on whether mobile penetration in Brazil would reach 2% or 3%. We were both spectacularly wrong.
- The 3G licence auction in the UK was a monumental (short-term) success for the UK Treasury, and a monumental disaster for investors, for the mobile industry, for consumers... and for forecasters.
- Although long anticipated in concept as the basis for 'the remote-control for life', the iPhone's launch in 2007 had a quite unanticipated impact on the development of an apps-based ecosystem, and the consequent demand for data....
- ... which all goes to show, the truth of Bill Gates' dictum that 'the impact of technology is generally exaggerated in the short term, and under-estimated in the long term'.

The point is an obvious one, and almost too easy to make: as Nils Bohr, Nobel laureate in Physics, said "Prediction is very difficult, especially if it's about the future." Or as Lao Tzu, 6th Century BC Chinese poet, said: "Those who have knowledge, don't predict. Those who predict, don't have knowledge".

With those caveats about the hazards of forecasting, it must be asserted that the two studies cited in para 2.9 to justify the assertion that predicted download speeds are "well within the capability of existing network deployments..." are both self- and client-serving and are somewhat discredited studies that the author believes should play no meaningful role in the policy formulation process.

While scenario-based forecasting can be a useful tool for framing analysis, as presented, the scenario approach in the DCIS document contains a number of flaws in the author's view.

First, the base line for the scenario modeling exercise represents a statement of uncontroversial, 'motherhood-and-apple-pie' principles, verging on the platitudinous: to state that "mobility will increase", "technological change will remain rapid", "communications markets will change", and "consumers will change" does not advance the argument in any meaningful direction or way.

Second, there is insufficient differentiation between scenarios 1 and 2 to be useful – they are simply differentiated by 'degrees of more'. This is effectively acknowledged in 3.29 ("significant overlap with scenario 1").

Third, the overall approach focuses on consumer behavior and technological change, with little weight being attached to, and seemingly seen in isolation from, the role of the supplier and the overall regulatory and policy context. To illustrate: both scenario 1 and 2 are perfectly plausible, but only because they both represent 'policies of failure', characterised by 'more of the same', the preponderance of 'silos', etc. As such, they represent a vision of a de facto monopoly supplier-dominated universe.

More interesting, perhaps, would be to posit scenarios based on significant differences in the regulatory/competitive regime, translating into meaningful variations in both the supply side and demand side response. For example:

'More of the same': an incumbent supplier dominated market, where the incentives to invest are minimal, and the availability of capital is strictly rationed to near-term, quick-return marginal upgrades – analogous to Scenarios 1 and 2.... and the current situation.

'Thousand points of Light': a clear date is set for the copper switch-off, backed up the threat of monopolies investigation, resulting in a diversity of supply, a burst of innovation and a proliferation of services and business models.

This can perhaps best be illustrated via a simple two-by-two matrix:

	Single supplier	Multiple suppliers
High demand	<u>A) 'Monopoly heaven'</u> Supplier investment: Moderate Supplier returns: High Consumer benefit: Moderate Externality effects: Low	<u>B) 'Thousand points of light'</u> Supplier investment: High Supplier returns: Moderate Consumer benefit: High Externality effects: High
Moderate demand	<u>C) 'More of the same'</u> Supplier investment: Low Supplier returns: High Consumer benefit: Low Externality effects: Low	<u>D) 'The Best Worst Case'</u> Supplier investment: Moderate Supplier returns: Moderate Consumer benefit: Moderate Externality effects: Moderate

In this regard, Scenario 'B' represents a closer approximation to what policy makers should be aspiring to and striving for, where innovation and customer needs drive the investment agenda. Unfortunately, the risk is that current policy appears to be consigning the UK to a 'More of the Same' outcome, with monopoly power entrenched, and little incentive for the incumbent to replace its highly lucrative, cash-generative copper network.

Q8, 13 and 18 Do you agree with this scenario or elements within it? Where do you agree/disagree? If you disagree what alternative scenario do you envisage?

See above.

Q9, 14 and 19 What are your views on the technology commentary underpinning this scenario? To what extent might the infrastructure/technology discussed evolve irrespective of demand and how far will it be a direct consequence of the level of demand?

There is no dispute over the requirement for increased capillarity of fibre networks across the country and into rural areas. Digital isolation, whether in rural Surrey or the wilds of Scotland, is more about access to efficient and affordable backhaul than about the choice of access technology, be it FTTP or wireless, both fixed and mobile, over which the debate is modest. The issue is that there is not enough fibre backhaul, and what little there is, is not sufficiently available on a transparent, Open Access, dark fibre basis.

Q10, 15 and 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?

No strong views.

Q11, 16 and 21 Are there wider environmental issues not reflected in the scenario e.g. the price or availability of energy that will affect any of the scenarios and in what way?

There are clear environmental benefits associated with a wholesale shift to a fibre-only digital infrastructure – it has been suggested that BT's adoption of FTTC technology will require additional energy input equivalent to a complete gas-powered power station. The lower maintenance requirements of an all-fibre network will also generate lower traveling costs and fuel emissions. In respect of positive externalities, the ubiquitous availability of fibre networks will facilitate more systematic use of home-working, tele-medicine and the delivery of other public services, all of which will have significantly positive environmental benefits.

Q12, 17 and 22 How likely is any unforeseen disruption to this scenario and what area might it occur?

See above.

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?

In parallel with the market concentration that has taken place at the network operation level, with the incumbent BT remaining dominant in virtually all layers of the telecommunications value chain, is the concentration that has taken place in the supply chain. This has resulted in a potential shortage of civils capacity, and Government could usefully consider the creation of a National Fibre Taskforce, based on school-leaver apprenticeship schemes in a programme of direct job creation.

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?

This is the crux of the matter. It can be argued that Government intervention in the area of fixed and mobile broadband has been well-intentioned, but flawed. For a number of reasons: first, by declaring market failure in the area of superfast broadband for the 'final third' in 2011 as a result of a cursory Market Review process, and way too prematurely. Second, by deeming that direct subsidy was the best, or even only, way to effect change. Third, through a cumbersome and

ultimately top-heavy procurement framework. And fourth, a series of micro-interventions (MIP, Connected Cities etc.), which served only to confuse and distract the market. The consequence of all this intervention in the author's view has been an effective three-year paralysis in communications investment – a completely unanticipated outcome of a well-intentioned intervention.

Ideally, the market should be left to dictate the pace of technological change and product replacement. In practice, however, and reflecting the significant barriers to entry in telecommunications fixed networks, the market dominance of the incumbent supplier, and the lack of incentive to replace its own functioning network, 'natural monopolies' will tend to assert and defend themselves, particularly in lower density rural areas, and consumers will be left with a static, and therefore relatively deteriorating quality of service.

Direct intervention in the form of a grant subsidy to the incumbent has reached the limit of its effectiveness, and Government should adopt the principle of co-investing in the form of a Public/Private Partnership in communications infrastructure, just as it has embraced the concept in other strategic industries such as transport, power, healthcare and education, and as other countries have already embraced it in communications.

The West Oxfordshire example represents a beacon to the industry and to Government, with the local District Council making a ten-year loan to the infrastructure company, Cotswolds Broadband, alongside private investors, and with the passive infrastructure company having a clear mandate and requirement to provide NGA capability to 100% of the 'final 10%' of the West Oxfordshire area, using a mix of FTTP and Fixed Wireless technologies. The project is currently in the middle of the required Public Consultation (see <http://www.westoxon.gov.uk/news/sept/broadband-consultation/>), before going out to tender.

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

No strong view.

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

See above.

Section 4 Competition and regulation

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

One of the weaknesses of the current regulatory and policy regime is the extent to which regulators and policy-makers appear to have become in thrall to the incumbent provider. This is an almost inevitable consequence of policy, whereby the tendency towards market concentration and vertical integration discourages and even suppresses alternative provision.

As a minimum, Ofcom should ensure that there exists Open Access at all levels of the value-chain – not just the service provision and wholesale layer, and it should be beyond dispute that where network providers have been in receipt of public intervention subsidy, all layers should be open on a transparent, physical basis – including dark fibre, in both backhaul and local access. If necessary, this openness should be guaranteed through the legal separation of Openreach from the rest of BT.

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

Environmental, economic and other considerations should encourage as much passive network sharing as possible: indeed, in 'intervention'/white areas, it should be mandated.

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?

Absolutely, yes. As discussed above, there are compelling reasons from the point of view of economic welfare maximisation as well as social cohesion to drive towards universal access to future-proof communications infrastructure.

Cotswolds Broadband (CBB) is developing with West Oxfordshire District Council a coherent Universal Service Commitment, whereby CBB's commitment to '100% NGA' for the 'final 10%' of West Oxfordshire represents the primary source of its public legitimacy, and the justification for what amount to informal concessionary rights to the otherwise un-served areas of the district.

However, CBB's commitment to deliver superfast broadband to all premises within the agreed intervention area must balance the needs and expectations of users with the requirement to provide value to the public purse and to ensure a sustainable business. Thus, it is anticipated that NGA broadband will be delivered via fibre-to-the-premise (FTTP) technology where this is affordable, and via fixed wireless elsewhere in areas of low building density. Clear business rules will be established to manage 'exceptions': for example, businesses and consumers whose premises lies beyond the economic reach of FTTP will be given the choice of a standard-tariff wireless-based superfast connection, or the option to provide their own 'gap' funding to allow FTTP connection, based on transparent costing principles and with flexible repayment schedules. To manage the otherwise 'unmanageable' exceptions, a Review Committee, comprising representatives of the network owner, WODC and BDUK, will manage those instances where neither a FTTP or Wireless solution is practical.

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?

No strong view.

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

No strong view.

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

No strong view.

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

Keynes was reported to have said: "Markets can remain irrational a lot longer than you and I can remain solvent". While the process of technological change is inevitable, the timing of such change is uncertain, and it is within Government's power to accelerate that process, through the 'right' kind of policy intervention – such as signaling the intention to pursue a 'copper switch-off' policy. The less appealing alternative is to continue the incrementalist path that the Government has thus far pursued.

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

Existing competition law, if it were to be invoked, should be sufficient to police abuse of market dominance.

Ofcom should update its view on market definitions as a matter of urgency.

Universal 'open access' obligations should apply to all elements of an operator's network where any part of that network is in receipt of public subsidy – and not solely 'new duct and new pole infrastructure' (para 4.31).

The Government should mandate the UKRN to broaden its scope to include electricity, transport and communications networks, to ensure maximally effective coordination of investment across and between sectors, as is the case in many other jurisdictions.

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

One suggestion would be to encourage and facilitate the issuance of municipal bonds by local authorities.

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?

In principle, Government should resist the temptation to micro-manage the industry, as is implied in this question. The writer cannot envisage any benefits from such a focus.

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?

Copper access networks should evolve as much or as little and in whichever direction as the incumbent sees fit. What should not be happening is that the incumbent is rewarded through regulated pricing for maintaining an obsolescent network infrastructure.

The Government and Ofcom should signal their joint determination to drive towards full copper switch-off, preferably within the time-line implied by the accounting life of FTTC technology and by the current SEP framework – i.e. by 2018.

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;

The existence of significant 'not spots' in both fixed and mobile communications is an indictment of policy in this area, and represents a significant economic opportunity cost.

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?

Extending EIS benefits further and more permanently to investors in broadband 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

One of the very obvious, but barely addressed challenges of financing next generation networks is that the burden of network cost recovery falls almost entirely on the shoulders of the consumer and business user, in the form of a monthly bill – while the considerable externality effects and benefits are spread far more widely throughout society, which pays little if anything towards the cost of providing that utility. This quandary is exacerbated by the nature of broadband competition in the UK, where the value of broadband is not at all apparent in price packages, being subsumed within ‘bundles’.

To take a simple example: the current value of the UK’s housing stock is more than £5 trillion. Recent studies have shown that the impact of house values of even just superfast broadband is of the order of 3.8% (anecdotally, as reported by the Daily Telegraph, the ‘spot’ impact of a house for sale with no fast broadband can be as much as 20%). 3.8% of £5 trillion is £150bn, 10% of which (‘the final 10%’) is well more than the most pessimistic estimate of the cost of providing fibre to every village in the country.

Back-of-fag-packet calculations such as this demonstrate graphically the limited nature of the policy actions to date, and support the case that the immediate beneficiaries of superfast broadband – the house owner – should bear the bulk of the cost of improving the value of the housing stock.

Q39 Views are sought on:

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

First, the Government should resist the temptation to ‘pick winners’ – an area in which all Governments generally have a poor track record, and where the displacement effect of Government intervention can often inhibit more productive investment.

Second, the UK lost its ‘early mover advantage’ about 20 years ago. The country is barely even playing ‘catch up’ – for reasons that are clear.

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

No strong view.

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.

No strong view.

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?

No strong views, other than to reiterate the view that Government’s role should be in enabling the market to function effectively, and that the temptation to ‘pick winners’ should be resisted.

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

No strong views.

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

No strong views.

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

As part of the trend towards decentralisation, and reflecting the shift towards greater autonomy in local government financing, local authorities should be granted full control over the disposition of business rates as applied to fibre networks, and should be encouraged to pledge future Fibre Tax receipts to the servicing of infrastructure bonds, as a form of tax incremental financing. Given the legal and other advisory cost associated with municipal bond issuance, local authorities should be encouraged to combine their financing plans in the issuance of 'jumbo' bonds.

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

By following the excellent lead set by West Oxfordshire District Council, working with Cotswolds Broadband on a co-investment PPP arrangement.