



2020 Vision

Financing UK NGA

A snapshot of the 'State of the Art'

An independent view produced for INCA
by Brian Condon

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Foreword

Financing our future digital infrastructure is a difficult and important subject – and one that is crucial to us all. Online commerce is now worth £82bn to the UK economy¹, nearly 6% of GDP, and larger than the mining and utilities sectors combined. Public services are moving towards online delivery as a key part of the customer experience and for some it is becoming the preferred means of transaction - the latest example being universal credit. In the UK we rightly pride ourselves on the quality of our creative sector and digital industries and see these new industries as sources of growth. The problems that businesses in these sectors face transferring large quantities of data in a value chain dominated by smes is simply a fore-runner of what is to come as our data usage and transfer is estimated to increase by 37% year on year.²

Every £1 spent on Internet connectivity—mobile and fixed broadband networks—currently supports £5 in wider revenue for the U.K. economy³

The UK is at a crossroads in the development of what many of us regard as a critical infrastructure for the digital economy. How we go about replacing the old telecoms access network with new digital infrastructure is matter of investment and in an industry dominated by one (or two in the urban areas) major players, that depends on government policy and regulation. Our government has made pledges and set targets, formed new organisations such as BDUK and committed to targets for 2015 and a challenging vision for 2020 both in terms of the performance of our digital infrastructure and the levels of active use and inclusion for our people.

This report was commissioned by INCA to help advance the debate and as an important part of the growing online Knowledge Base at www.beyondbroadband.coop. We commissioned Brian Condon to produce the report because of his background in investment banking in the telecoms sector, but also his deep knowledge of the problems of broadband roll-out, particularly in rural areas.

As the report shows, many of those consulted; most of them members and supporters of INCA, are concerned at the strategic direction we are taking in the UK. So the report's conclusions are set within a difficult political and economic environment. The Government has set challenging targets for 2020 and we need to debate the options under the pressure to “deliver”.

Malcolm Corbett
CEO, INCA

¹ <http://www.atkearney.com/index.php/Publications/the-internet-economy-in-the-united-kingdom.html>

² Ditto

³ Ditto

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Key Issues: Solve ‘Demand Risk’; reinvigorate competition

Dealing with ‘demand risk’

Numerous times in the research work for this report it was said that “demand is not the issue” - everyone believes that we will eventually transition to a largely optical fibre-based digital infrastructure going all the way to the home or business, with (when we eventually get there) new generations of mobile technology delivering new services. And that the new services will go way beyond broadband. So while there is broad agreement on the destination, there is difficulty, confusion and conflict on strategy, timing and method. At the heart of this is what investors call ‘demand risk’.

Demand risk is a shorthand term for an investor’s unwillingness to invest in a project because he or she cannot understand how demand for a service will evolve and be unable to answer questions about what will be sold, when and how much customers will pay. Without credible answers to such questions a business plan is both difficult to invest in and deliver.

There are examples of dealing with demand risk. Broadband for the Rural North (“B4RN”) in Lancashire is seeking pledges and finance from potential customers, the Digital Region in South Yorkshire is being funded through public investment and BDUK is promoting the ‘gap funding model’ where public contributions ‘top-up’ a supplier’s investment in broadband infrastructure to make a project commercially viable.

To take these three examples - B4RN has pledges from over 70% of its potential market of 1,451 properties in a very rural area deep in the ‘Final Third’ and is raising money to build its network; the Digital Region has built out an extensive network covering 80% of homes in the region (representing 546,000 homes and 40,000 businesses) and the four BDUK pilots are in a tender process.

The cynics point to many previous sub-scale projects that have not paid back, the current issues with take-up in the Digital Region and the slowness and over-bureaucratic approach of BDUK. They have a case - which needs to be recognised in a balanced argument; B4RN risks not being able to raise the funds to deliver the plan; Digital Region risks not generating sufficient take-up to return the investment (and the local authorities criticised for ‘making losses’ may exit too early the private sector for £1 with the usual predictable consequences), and BDUK’s approach is seen to deny ‘localism’ and favour the incumbent.

It is easy to be critical, but at least these examples are all ways of exploring demand risk.

Reinvigorating Competition

Until we have full competition at all levels of the network for all services (including dark fibre and duct access) we can't make progress nor will we achieve the transformation we seek. Such competition does not exist in the UK nor do current policies or plans seem likely to produce it. This is a strategic and structural issue for the UK. It is the proper province of Government and the regulator and it needs to be debated openly.

Strategic questions

The strategic questions need to challenge our present approaches - asking if we can deliver the targets set by the Government for 2020; we need a credible plan to meet them and we need to help the industry out of the difficult place it is in:

- Can we develop innovative ways of supporting the financing of NGA that will encourage private investors to enter the market, leverage public funding and allow a variety of competing solutions? Is it strategically valid to put all our eggs in the gap-funding basket? Can we adopt some of the Project Bond structures being proposed by the European Commission and apply them to UK local and regional needs?
- How should Britain change the regulatory and industry structure to support a truly open set of networks? How do we open up such networks to allow the full force of competition?

We need to create the right environment for the debate on the next phase of the upgrade of our digital infrastructure that can form the platform for our future economy and society.

Executive Summary

The problem to solve in moving towards a truly next generation digital infrastructure is one of bringing the apparent emerging demand from local communities, especially those in rural areas, with the industry's ability to supply the new infrastructure required to support NGA services.

Service Providers see uncertainty in demand and also know that moving to NGA services drives massive increases in data use by households, placing strain on physical infrastructure and business models. The highly consolidated UK market is only able to compete on price as technology based on copper infrastructure has no guarantee of service quality or product differentiation. An industry that has 'painted itself into the corner' of the lowest price offer can't bring itself to believe in demand for NGA.

The environment is complex and it's clear that a way must be found to break the barrier between demand and supply. The industry feels it can't take a long term investment view, potential NGA customers behave passively assuming that the market will eventually get there or are actively trying to find solutions in areas the market can't serve (but are seen as sub-scale). New entrants spin their wheels seemingly unable to generate traction.

We need to find a way to define problems we can solve and new approaches. So in the report, we examine the 'State of the Art' in financing NGA through a process of structured interviews and discussions conducted under the Chatham House Rule and a review of some of the key issues facing the UK.

Dealing with 'Demand Risk'

Everyone agrees that there will be demand for NGA eventually – but understanding how demand builds and how 'take-up' develops is important to investors. Ways of reducing uncertainty for investors by using similar contract approaches to the mobile market. In the 'Final Third' without 'gap funding' or some kind of 'anchor tenant' from public services it's difficult to find viable business models.

The industry can't 'tune' itself to demand by offering differentiated products to target groups of users (say heavy Skype users or keen gamers). New entrants (such as Google, Facebook or Sony) may see the possibilities but the structure over-focus on the needs of the incumbents. The real users who demand NGA are likely to be the younger members of the household and not the bill-payers.

New ways of building networks on a modular basis mapped to local demand from specific sectors or geographical locations are being explored. The answers to 'what will they use it for and what will they pay' are easier to find using this approach and the risks are lower; this needs a new approach to network design, availability of 'dark fibre' and radically different 'price points'.

New ways of proving demand are needed and this is just as necessary in urban areas as it is in hard-to-serve rural locations.

Exploring new governance and ownership structures

The formation of geographically specific special purpose vehicles was cited as one way of breaking the demand barrier and offers scope for innovation.

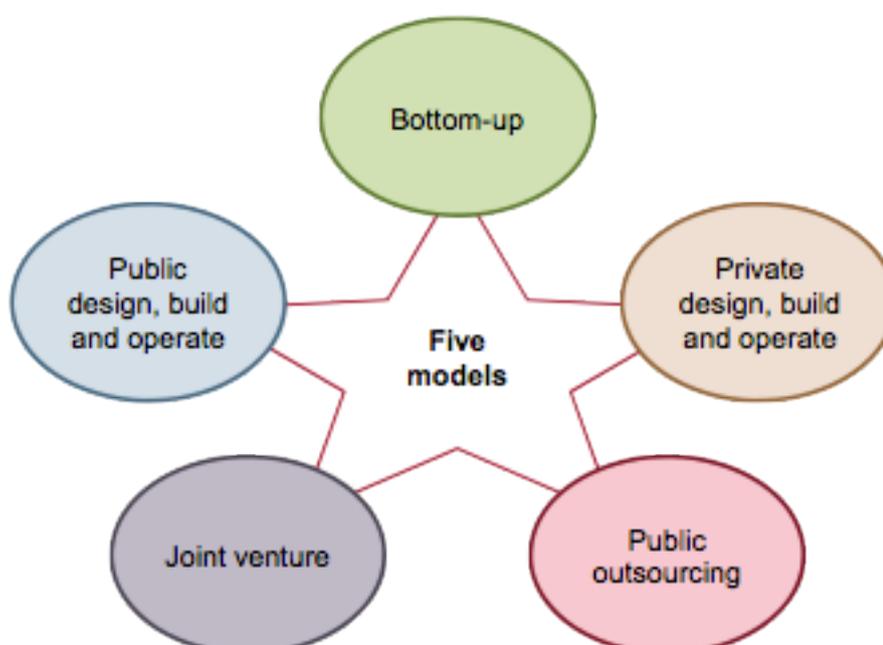
Emerging models for investment

The EU is attempting to drive change – the Digital Agenda for Europe aiming for all Europeans to have access above 30 Mbit/s and 50% or more of Europeans able to have access above 100 Mbit/s.

New allocations of funding with €9.2bn earmarked for digital networks and services infrastructure.

The EU has concluded that ‘lack of funding = slow deployment’ and is taking action, identifying the key issues.

A new EU guide identifies 5 models used around Europe for developing NGA investments which represent a range of options for combining public and private investments.



There are some UK examples of these models; the Bottom-up model is being pursued by Broadband for the Rural North (“B4RN”) in Lancashire and by Alston Cybermoor in Cumbria, the Private DBO model is being used for Superfast Cornwall and 3 of the 4 BDUK pilots (in Cumbria, Herefordshire/Gloucestershire Borders and the Highlands and Islands in Scotland), the Public outsourcing model is being used by the Digital Region project in South Yorkshire and the same model appears to be likely in North Yorkshire.

The direct promotion of a particular model by BDUK (the gap funded model) was criticised by a number of interviewees. County councils and others developing local broadband plans need to be aware that other models are possible.

BDUK's approach in the 'Final Third'

It is widely accepted that the market can tackle about two thirds of households. The remainder has become known as the Final Third. BDUK was allocated £530m of public money to subsidise spend on capital investment in the Final Third. BDUK announced four rural broadband pilots in the Highlands and Islands in Scotland, North Yorkshire, Cumbria and Herefordshire. BDUK announced funding allocations to 45 areas in England in August 2011, and further procurements are expected in 2012.

BDUK describes its "preferred commercial model" as the investment gap funding model. Three of the Pilots have adopted the gap funding model. Interviewees criticised BDUK's approach feeling that it favours the incumbents, is over-focused on FTTC and actively discourages new entrants.

The 'surprise' £100m for Cities

A somewhat surprising announcement as part of the Autumn Financial Statement was the provision of a new 'Urban Broadband Fund' of £100m targeted at the 4 National Capitals, the eight English Core Cities and other UK cities with 150,000 dwellings or more.

At the time of writing, it's not clear how issues such as State Aids are to be handled, given that the cities are not, for Broadband purposes conventionally regarded as areas of market failure. Though some argue that the market has failed to provide NGA in the UK at reasonable prices for structural reasons when in compared with similar European economies.

Co-investment models

New thinking on co-investment models offers the potential for progress:

- **"NetCo"** – proposed by Oxera, an independent economics consultancy, would be a structurally separate commercial network owned by its participant operators (service providers), including both independent access seekers and the incumbent.
- **"Free Trade Fibre"** The idea of 'horizontal' unbundling where owners of passive network infrastructure agree to trade together to enable the creation of a single passive network is being termed "Free Trade Fibre" by Dave Carter of the Manchester Digital Development Agency.
- **Community investment** Many local communities in poorly served areas are starting to develop their own plans for next generation

networks, encouraged by a £20m funding pot from DEFRA, the Rural Community Broadband Fund. More advanced projects have started to raise funding through community shares issues.

Broadly, those consulted feel that there is scope for innovation and progress in co-investment models but the industry is risk averse and the incumbents are unwilling to see communities as investors or partners.

Attitudes of UK Investors

It might be thought that the 'natural' investors for NGA, given the timescales and long-term cashflows would be utility investors; pension funds and specialists in, for example, PFI schemes. But, while the investment profiles may be similar the uncertainty of demand is a new risk to factor in. What is described as the 'take-up risk' is the barrier. The UK economic climate also makes investors wary of these long term investments.

The perception of risk is a driving factor; who intends to use the network and what they are prepared to pay for it are currently uncertain. "We need confidence of a level of take-up other wise we can't make the business plan stack up".

Service evolution

The transition to digitalisation of public services is well on the way, needing much more than a USC of 2 MB to offer credible, usable services especially in the areas such as Telehealth; the 'payback on telemedicine services can be in weeks not months', said one respondent. The idea that these services cannot form part of the underpinning or 'anchor tenancy' for NGA rollout is laughable - but that's what seems to be happening.

Multiple interviewees cited the coming demand for data services (both downloading from *and* uploading to the network "The failure to invest in the access network is what's causing the blockage." The argument here is that without new investment in the network close to users (whether these are homes or businesses) we can't deliver the new services.

Network duplication and public investment

The duplication of investment in multiple network infrastructures is also seen as a factor especially as contracts come up for renewal or new services (such as utility networks for Smart Metering) emerge. New entrants seem to be being told that they cannot carry these types of services over networks invested in by BDUK due to State Aid issues; "Yet BT is carrying exactly these types of services over its network". He adds "Networks which are funded by the taxpayer should be made available on a non-exclusive basis and this is allowable State Aid".

UK Government, Regulatory and Policy Issues

Everyone interviewed mentioned the confusion and difficulty surrounding the UK's approach to regulation and policy, increasing the uncertainty and perception of risk by all players in the market and public sector. Conflicting advice is being given (and received) at multiple levels. There seems to be no clear central point or source of information on policy from government.

State Aids

"State Aids" are often used as a reason for the public sector not to invest, as in 'State Aids = bad'. The threat of a State Aid referral is often used, and usually in a reasonably blunt manner. Interviewees cited examples of these and the author also has direct experience of such threats being used in an attempt to 'derail' projects. However, it is important to apply rational tests and to distinguish between State Aids which are allowable and those which are not.

Worth noting that the Commission is reviewing the State Aid Guidelines on Broadband Deployment; "In light of the public consultation that took place in mid-2011, the European Commission will evaluate whether and to what extent changes are necessary and, if appropriate, will come forward with new draft guidelines in early 2012".

Market failure

The EC makes a distinction between areas where no broadband infrastructure exists or is unlikely to be developed in the near term (white areas), areas where only one broadband network operator is present (grey areas) and areas where at least two or more broadband network providers are present (black areas).

The picture 'on the ground' is less clear - largely related to the quality of the available data and the scale at which such data are aggregated. One interviewee said "And when you drill down into the BDUK data in the cities, you find that there are huge 'white' swathes. Then BT comes in and says it will offer FTTC services at some unspecified point in the future blighting the market."

Independent service providers believe that BT's attitude and ability to use 'spoiling tactics' is inhibiting the development of the market and that Ofcom is unwilling to take any action. Other's feel that BT has difficulty interconnecting with other networks and that "We need to find some way to 'help them to help themselves' - but the regulator appears uninterested".

Passive Infrastructure Access

"PIA is not suitable at this stage - it's cheaper to build your own". Current plans seem to indicate that PIA won't be able to be used for business services or for backhaul. PIA seems likely to become a stumbling block.

Business rates on NGA

The issue of business rates applied to telecommunications networks has been the source of much contention and difficulty for more than a decade. The Valuation Office Agency is proposing changes especially in the light of the findings of the House of Commons Business Innovation and Skills Select Committee on Broadband held in early 2010 which held that BT's network was rated differently (classed as a utility operator) and on more favourable terms than the networks of other service providers (rated as ordinary businesses). The Committee said, "The current arrangements hinder the delivery of investment in NGA, which is being championed by Government".

Technology is not the barrier

Everybody with technical knowledge and competence spoken to for this report confirmed that, so far as FTTH is concerned, all the technology required to implement very high capacity networks exists and is in widespread use in businesses and homes worldwide.

Future service picture; what does it look like?

Everybody consulted believes that future services of value to the economy and to society can result from investment in NGA and that the UK needs to make progress toward to 2020 targets. As one interviewee said "It's not about Superfast Broadband; it's about the provision of products that allow new types of services and where the market price is determined by the actual costs. It's about transformation."

Statement of the problem

The problem to solve in moving towards a truly next generation digital infrastructure is one of bringing the apparent emerging demand from local communities, especially those in rural areas, with the industry's ability to supply the new infrastructure required to support NGA services. It's worth noting that the scale of infrastructure change is vast - especially in the local networks (where most of us live!); it's much more than an upgrade.

From the point of view of the Service Providers – not only do they not believe in the demand; they face two further problems - firstly, that the investment payback required is of a very long term nature by their standards (of the order of 15-20 years) and secondly, that their business models and operating cost structures are not designed to cope with the massive increase in data use (in both directions!) by households that generally ensues when NGA networks are implemented. The UK market for Internet Service Provision has consolidated and relatively undifferentiated competition on fixed price deals (given that existing services based on the copper network carry no guarantee of service quality) leads to the industry's belief that 'customers and content providers are unwilling to pay for what they use'.

The issue then is how to break the barrier between demand and supply. Who will invest in the infrastructure necessary to deliver future-proofed NGA in the UK? The industry is unwilling to and is behaving tactically rather than strategically (for example, cobbling together variations on existing technologies and calling them NGA), potential NGA customers are behaving passively (in areas the market may eventually serve) or thrashing around trying to find solutions (in areas the market struggles to reach). New entrants, such as Fujitsu Telecom have begun to look for viable projects; smaller alternative providers such as Gigaclear and IFNL are active; much of the activity in local areas is regarded as 'sub-scale'.

We need to find a way to generate the business models and investments to enable the UK to make progress towards the new, ubiquitous digital networks that our communities need. And we need to understand the 'State of the Art'.

We undertook a programme of focused interviews and discussions with key players, potential investors, government and public sector organisations and local projects based on a structured process. In assessing the responses, we will look for common themes, areas of agreement/difference, success criteria and 'what they are up for'. The work will be conducted under the Chatham House Rule. The results will be reported to INCA members and supporters and form part of the developing Knowledge Base in this important area.

Understanding attitudes to ‘demand’

In forming the business case, we need to understand the demand picture. A key driver for the business case is called the ‘take-up’ rate which is normally defined as the percentage of customers passed by the network who sign up for service. Opinions differ as to the ‘take-up’ rate needed to ensure that the network can be financially sustainable. “We need to model what we think the take up is after 3-5 years. It needs to be about 50% depending on the area, and factors such as geography and population density.” Some communities have expressed interest at the level of 70% or so - but will they actually sign a contract?

A way of ‘solidifying’ or qualifying demand might be a way to reduce the uncertainty for builders of these new networks. In the mobile phone market, for example, contract periods of 24 months are commonplace; and customers seem happy, on the whole, to sign up for long periods where they see the benefits.

In the Final Third it’s clear that some funding is required from government. A mixed funding model with, say, a 2 year contract to deliver public services to offset any revenue gap would be worth investigating. Also mentioned was the possibility of BDUK/Local authority funding to enable investment in the core network. Without gap funding or some kind of ‘anchor tenant’, “the business plan doesn’t stack”.

A more ‘segmented’ view of the market is needed

The industry can’t ‘tune’ itself to the demand; it needs a much more ‘segmented’ approach to the market; “There is demand from massive Skype users or gamers; they will pay £50 per month for access to 50 MB especially with good service quality, symmetry and low ping times”. It may be necessary to engage what one interviewee described as “new telcos” such as Google, Facebook and Sony who can grow on the back of NGA investment - there seems to be an over-focus on the positions of the ‘incumbents’. These new telcos see the value of multiple VLAN connections into the home in a way that conventional players don’t.

The situation calls for some very serious decisions - part of the problem is that we are in a ‘lag time’; where the real users who demand NGA are not yet the ‘bill payers’ (they’re generally the younger members of the household); there is therefore pent up demand but the industry can’t really quantify it.

Proving demand is the issue

Demand is easy to forecast, most independent observers can see that there will be demand for NGA services; but it’s difficult to quantify well enough to convince investors.

One interviewee drew a parallel between early investments in the UK's rail network in Victorian times arguing that we are seeing a similar scale of fundamental infrastructure change. "Everyone knew there was demand for rail links between places like Manchester and Liverpool - the investment was made by the people who might benefit and the merchants paid for the infrastructure to increase trade and reduce transaction costs. Rail was not paid for by government but by local communities who saw both the need and the potential benefits".

In looking to test demand, some projects, particularly in cities look to develop 'testbed' approaches; "We played the Living Labs card - it's Research & Development but it can provide real services". These approaches enable the testing of demand in close to real-life cases. "We can see demand from specific sectors - and communities - digital media, animation, film-making and test how the services can be used." Small scale networks can deliver benefits to these sectors; "You need a small enough network; dimension the plan so that you can accommodate 6-60 customers (not 6,000) and build on that".

The argument for modular network build to encourage demand is a way of introducing advanced services to those who will see value and spread the word. By beginning services to a key group of businesses identified as 'growth sector' (in this example companies in 'Digital Business') you take away some of the risks and answer the 'but what will they use it for and will they pay' objections often cited by the Telecoms industry. The network is designed to permit 'marginal extension' - get a few key businesses involved, get them using and excited about the potential and they will spread the word, more people will see the benefits, they will demand the service and you build out to them. "If you can't see demand - you're asking the wrong people! And you need a rock bottom price for dark fibre, a rock bottom price for active 'point-to-point'". This interviewee argues that there is both demand for dark fibre and certainly for 'cut rate' Ethernet - but not at the price points the industry expects.

"In terms of business demand, users will understand more as we move to Cloud Computing and this will need much more than FTTC to provide credible services."

"There is latent demand and we are gradually proving that. There are supply chain imperatives such as suppliers no longer being allowed to physically transport hard drives from place to place for security reasons.". An example was cited by one interviewee of the changes happening among communities of companies in the Digital and Creative sector in one major city. "Specialist ISPs are beginning to see demand for very large data transfer requirements among companies in sector clusters.

It's about infrastructure and how it's used to especially by media businesses in cities. It's a new type of 'medium density' market where 100 companies are

prepared to pay £100 per month for access to fibre infrastructure that can support very high capacity connections between them and their trading partners (this may not need the same high capacity connection to the Internet; at least not initially).”

Governance and ownership

The formation of geographically specific Special Purpose Vehicles, coordinated by local authorities and focused on actively generating applications and services for NGA is an interesting structure - these organisations will need to respond to local needs - but built right; groups of these SPVs can be aggregated to deliver services at greater scale.

“We’ve been round the houses on governance and ownership and have concluded that the best way for us is 100% ownership of the network by the City combined with the operation of the network by an industry partner under a concession.” In this model, the formation of a Special Purpose Vehicle has to be a medium term option; “All the SPV sells is dark fibre; nothing else.” This requires some flexibility of approach though, particularly in the short term; “Most Internet Service Providers want to start with active services and then [once their business has developed sufficiently] they might move to passive”. Point-to-point dark fibre is also an option - but not one currently available to most businesses. An important feature is to make sure that a Technology partner runs the passive network. As far as active services are concerned, a valid solution is to have either exclusive operation of active services (again under a concession) using the Open Access model or to have an ‘Operator of Last Resort’ ensuring that active services are available at ‘retail’ level (i.e. to specialist local ISPs or to businesses).

Emerging models for investment

EU developments as a driver of change

The EU has recognised that Member States will need to make significant investments in broadband infrastructure to meet the objectives set out in the Digital Agenda for Europe (DAE): by 2020, all Europeans should have access to the Internet at speeds above 30Mbit/s and 50% or more of European households should have subscriptions above 100Mbit/s.

As a part of the new EU budget proposal, the Commission announced a new fund - the Connecting Europe Facility (CEF) - with a proposed budget allocation of €50bn of which €9.2bn is earmarked for digital networks and services infrastructure. On 19 October 2011 the Commission adopted the CEF regulation that sets out the general rules for the implementation of this new facility, The focus of activity will be now on explaining the instrument to stakeholders and securing their support.

Lack of funding = slow deployment of broadband internet

The EC believes that the private sector is reluctant to invest in the deployment of broadband networks because of:

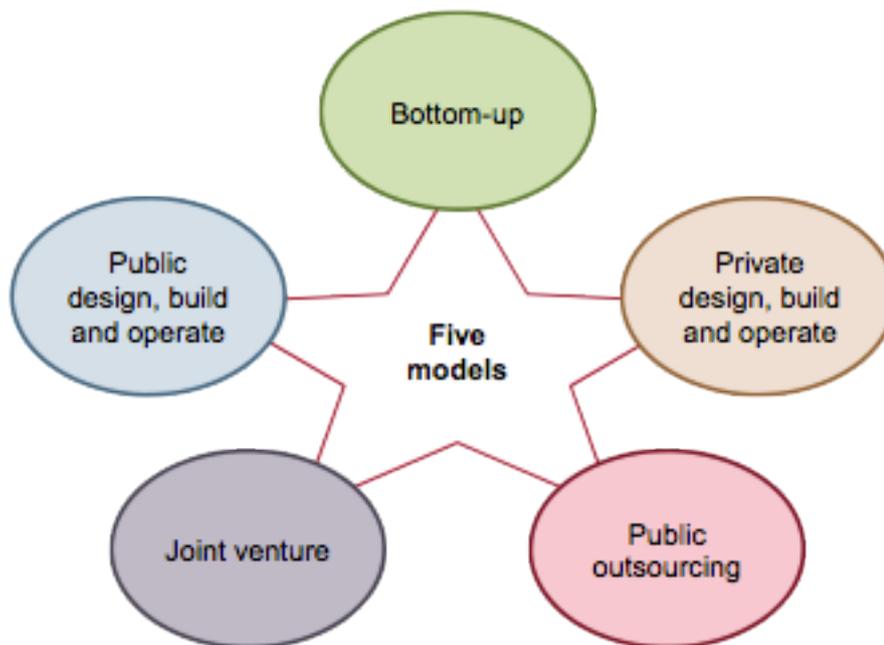
High risks: infrastructure sharing by private sector operators or resulting from public-private co-operation, are perceived as higher risk transactions,
Longer pay back periods,
Insufficient experience: promoters may be too small and inexperienced to attract the interest of large financial institutions.

The Commission is recommending that EU and European Investment Bank funds should be used alongside national funding instruments to compensate for the lack of private sector financing. "EU intervention is also necessary to ensure that areas outside urban conglomeration benefit from the deployment of ultra fast Internet."

EU guide to broadband investment - investment models

The investment models presented in the guide have been selected on the basis of public data on broadband projects from around Europe, and input from DG REGIO and eris@.

The models represent a range of options for combining public and private investment, and are presented in increasing order of involvement by the Managing Authority. Each model is applicable in different circumstances, depending on the scope of the required infrastructure, the specific aims of the Managing Authority, and the investment/risk appetite of potential private sector partners. The five investment models are shown and summarised below:



Bottom-up model

The bottom-up, or local community, model involves a group of end users organising themselves into a jointly owned and democratically controlled group (frequently a co-operative) capable of overseeing the contract to build and operate their own local network.

Private design, build and operate (DBO) model

The private design, build and operate (DBO) model involves the Managing Authority issuing funding (often in the form of a grant) to a private sector organisation to assist in its deployment of a new network. The public sector has no specific role in the ownership or running of the network, but may impose obligations in return for the funding.

Public outsourcing model

Under a public outsourcing model a single contract is awarded for all aspects of the construction and operation of the network. The major characteristic of this model is that the network is run by the private sector, but the public sector retains ownership and some control of the network.

Joint venture model A joint venture is an agreement under which ownership of the network is split between the public and private sector. Construction and operational functions are likely to be undertaken by the private sector.

Public design, build and operate model A public DBO model involves the public sector owning and operating a network without any private sector assistance. All aspects of network deployment are managed by the public sector. A public sector operating company may operate the entire network, or may operate the wholesale layer only (with private operators offering retail services).

There are some UK examples of these models; the Bottom-up model is being pursued by Broadband for the Rural North (“B4RN”) and by Alston Cybermoor in Cumbria, the Private DBO model is being used for Superfast Cornwall and 3 of the 4 BDUK pilots (in Cumbria, Herefordshire/Gloucestershire Borders and the Highlands and Islands in Scotland), the Public outsourcing model is being used by the Digital Region project in South Yorkshire and the same model appears to be likely in North Yorkshire.

The direct promotion of a particular model by BDUK (the gap funded model) was criticised by a number of interviewees, as one said “We are in a situation where the favoured model is gap funding based on the incumbent's business case. County councils developing local broadband plans and aiming to attract BDUK funding need to be made aware that other models can be successful and indeed offer a better return for public investment. It is not an easy case to make but worth the effort. Codifying the different approaches, albeit imperfectly is helpful “. In the next section, we look at BDUK’s approach to the ‘Final Third’.

BDUK’s approach in the ‘Final Third’

The coalition government announced in October 2010 that £530m of public money would be made available to subsidise spend on capital investment in rolling out superfast broadband targeted at areas the market cannot reach. It is widely accepted that the market can tackle about two thirds of households. The remainder has become known as the Final Third. In the Final Third, the target is to ensure that 90% of every County in the UK has access to superfast broadband services by 2015. These funds are being administered by Broadband Delivery UK (BDUK), an agency of DCMS, and the networks are being procured by the relevant local authorities.

BDUK announced four rural broadband pilots in the Highlands and Islands in Scotland, North Yorkshire, Cumbria and Herefordshire. BDUK announced

funding allocations to 45 areas in England in August 2011, and further procurements are expected in 2012.

BDUK describes its “preferred commercial model” as the investment gap funding model. Three of the Pilots have adopted the gap funding model, the fourth Pilot (North Yorkshire) has asked bidders to propose solutions under this model or a public sector owned supplier model and is in a tender process at the time of writing. County Councils allocated funding against their Local Broadband Plans are being strongly encouraged to adopt a gap funding model.

Under the investment gap funding model a local body procures broadband coverage outcomes from a private sector supplier through a contract. BDUK will provide funding to the local body as a contribution to the payments made by the local body to the supplier under the contract. The investment gap is the public contribution required to a supplier’s investment in broadband infrastructure to make a project commercially viable.

Interviewees’ experience of BDUK

“BDUK seem blinkered in their over-focus on FTTC and the ‘closed’ nature of their thinking is not helping to innovate or find solutions. The whole BDUK framework is hugely complicated and this is having the effect of discouraging new entrants.”

“BDUK is spending too much time courting the existing large ISPs such as Talk Talk - as a customer, why would I automatically want broadband from a large ISP; they don’t have a good reputation for customer services - I’d like a choice and I might prefer a local ISP.”

“The whole BDUK process is at a ‘bifurcation point’ - it will all either end in a mess with most people [private sector players] exiting the process having spent a lot of time and resource on fruitless bids or they will need to change their approach radically.”

“BDUK is utterly irrelevant to cities. A distraction. To us, it looks like ‘bungs’ to the incumbent to get rural areas up to some ‘lowest common denominator’ of basic minimum service.”

“There will not be a spade in the ground from BDUK intervention until 2014. And then there’ll be a panic before the next election!”

The ‘surprise’ £100m for Cities

A somewhat surprising announcement as part of the Autumn Financial Statement was the provision of a new ‘Urban Broadband Fund’ of £100m targeted at major cities.

The DCMS guidance indicates that public sector investment should be considered in the following areas:

- The stimulation of private sector investment, including exploring public sector partnering arrangements with the private sector;
- Broadband infill where commercial service providers do not deliver and have no plans to do so, building on the investment to be supported from the Government's £530 million funding for superfast broadband;
- New broadband networks to deliver ultrafast broadband where the market will not deliver, particularly targeting SMEs;
- Extending high-speed wireless connectivity, for instance by the provision of public wi-fi. A number of business models are being offered for this and cities should consider which would deliver best value for money for them;
- Assisting in the creation of new small and medium enterprises with good potential for growth using the enhanced broadband connectivity (for instance, by reducing administrative burdens and other barriers), including community enterprises and third-sector initiatives as well as private sector start-ups;

Proposals are invited from the City Authorities of the eight English Core Cities (Birmingham, Bristol, Leeds, Liverpool, Manchester, Newcastle, Nottingham, and Sheffield) and other UK cities with 150,000 dwellings or more (i.e. Glasgow and Bradford).

The national capitals (London, Edinburgh, Cardiff and Belfast) are not required to compete for approval for funding but must still submit proposals meeting the competition criteria. City authorities must lead proposals but should work closely with any other relevant local bodies, e.g. Counties, LEPs and lower tier authorities where appropriate.

At the time of writing, it's not clear how issues such as State Aids are to be handled, given that the cities are not, for Broadband purposes conventionally regarded as areas of market failure – although some argue that there is market failure of the provision of NGA at reasonable prices in comparison with other European countries (see the State Aids section below).

Co-investment models

“NetCo”

Oxera, an independent economics consultancy, has looked at the possibilities of a co-investment model as a way of overcoming financing and duplication of network investments in a report sponsored by Vodafone⁴, proposing the formation of an independent “NetCo”.

NetCo would be a structurally separate commercial network entity mainly supplying passive fibre access (unlit fibre loops) and primarily owned by its participant operators (service providers), including both independent access seekers and the incumbent. For the first five years it would supply these inputs only to its participant operators. Other alternative operators (OAOs) could purchase active services from any of the participant operators or, after the initial period of five years, fibre loops from NetCo on commercial terms.

Oxera considers that NetCo could address many of the market features that currently hinder investment in fibre-access networks in Europe, by:

Reducing the prospect of duplication of networks, and hence lowering the firm-level demand risk faced by investing operators;

Achieving long-term commitment from all stakeholders, including the regulator, which would be more likely to commit to an industry structure with several downstream operators and where the incentives for behaviour that distorts competition are reduced;

Achieving greater alignment of incentives and coordination among market participants in order to maximise network coverage.

Similar ideas have been considered in the community broadband movement for a number of years; it’s interesting that Vodafone would choose to sponsor the Oxera report and the implementation of the NetCo ideas would require radical restructuring of the telecommunications industry.

“Free Trade Fibre”

The idea of ‘horizontal’ unbundling where owners of passive network infrastructure agree to trade together to enable the creation of a single passive network is being termed “Free Trade Fibre” by Dave Carter of the Manchester Digital Development Agency. Described as a new collaborative marketplace, network owners would agree to share data on fibre location, lease costs and commit to a trading framework. Rather than the notion of one passive network owner and one operator with multiple service providers competing across an open network, “Free Trade Fibre” envisages a kind of virtual network creation with multiple passive network owners (which may include property companies or housing associations) collaborating together to share infrastructure.

⁴ Oxera - All go for NetCo? How a co-investment model could boost NGA roll-out <http://bit.ly/xbQcVO>

Community investment

Many local communities in poorly served areas are starting to develop their own plans for next generation networks, encouraged by a £20m funding pot from DEFRA, the Rural Community Broadband Fund. More advanced projects have started to raise funding through community shares issues, notably B4RN in Lancashire and Alston Cybermoor in Cumbria. A new consultancy firm, Broadway Partners has proposed creating a franchise model to encourage tax-efficient investment in schemes like these and INCA is working to develop a set of standards, a development template, in the Quality Marque project.

Involving users as investors and promoters

Work commissioned by INCA from the Plunkett Foundation supported by the Nominet Trust identified some potential modes of operation for community-driven networks. We cover the four main relationships that communities can adopt. These are:

DIY

Some communities have, literally, done it themselves. They have laid fibre by digging trenches, and then have created the infrastructure themselves. Such an approach doesn't just get the job done; it also lowers the cost of doing so.

Commissioning

Under this relationship, the community decides that it wants the service, but doesn't want to physically do it themselves. So it pays others to act on its behalf whilst retaining full control themselves. It should be noted that DIY and commissioning are not mutually exclusive, both in terms of the approach (which could vary on different parts of the project) and in member relations (some may dig ditches whilst others just buy the service.)

Partner

The third relationship recognises that a project is only viable with additional resources from the Private or Public Sectors and that this will be in a form which alters the ownership of the enterprise. This is considered in more detail.

Customer

The sit back and wait approach will leave many communities without service. Communities can however work together to demonstrate demand to make it economically viable for others to take on or even operate services across a privately owned network.

The potential for community investment vehicles

"Community investment is generally a good idea" but the key thing is to coordinate the involvement of communities and whether they can deliver the levels of investment needed.

"Semi-rural areas might get fibre to a central point supported by government funding such as BDUK or by local authorities it would then be necessary for

communities to 'build out' to meet this network. Community based investment would be a route to making that work."

"The biggest source of value in NGA investment is the ability to 'add value' to the capital value of the homes and businesses that have it - it's a standard question now when houses or country businesses are sold. The problem is one of bringing the resources together both at community level, and potentially with new players, as existing incumbents are unwilling to see communities as investors or partners; they see them as consumers to be sold to."

"Any networks built by communities need to be constructed according to ITU global standards." A preferable model would to sub-contract to specialist companies but where communities do it for themselves using public support, funders should mandate the construction be to recognised standards; this would also reassure investors.

Attitudes of UK Investors

The 'natural' investors for projects of this type are the long term utility investors; pension funds and specialists in, for example, PFI schemes. One project management organisation which has a sister company which acts as a 'portal' to investors in large scale projects argues that "Investments in NGA effectively need a new Telco company; unlike a PFI contract, there's no guaranteed revenue; our own internal finance company say it's too risky even with BDUK support". The issue is in 'take-up risk mitigation'; investors see that and can't deal with it.

One company has investigated the potential for overseas investors and has spoken with "a goodly number of investors" but the response is discouraging so far.

"No one lends £200-300m on a punt" and the idea that investors might be prepared to take the risk on these networks being used as part of a Public Services Network is not credible even if it's logical to use networks funded by BDUK and local authorities as part of a PSN."

"We've spoken to VCs, and other longer term infrastructure investors - the take-up risk is the barrier".

Methods of 'de-risking' business plans and engaging investors are actively being considered by promoters of projects and their advisers looking at:

- Methods for accelerating the generation of revenue (through agreements with service providers to transfer their business to these new networks)
- Finding 'anchor tenants' for the network; large customers prepared to agree long term contracts for use of the network (Public Service Networks are often cited)

- Understanding (and perhaps influencing) the way in which long term investors treat the “Asset Class” of investments offered by NGA

“It seems clear that the service picture is about the use of NGA as a new utility and it needs to be treated as such in investment terms; it’s not a 1-2 year payback.”

The UK climate makes investors very wary of these long-term investments. Reasons cited include the very high costs of producing an investment prospectus at affordable cost (inhibiting smaller projects), lack of fund-raising flexibility by Stock Market investors (this was a 20th century phenomenon). “What’s worse is that Ofcom won’t allow very long term contracts as a way of reducing risks; they say these are predatory.”

Attitudes to risk

New thinking is needed on how to reduce risks, especially as it appears that the private sector investors are expected to ‘shoulder the burden’ of risk. The biggest risk is the ‘risk of take-up’; meaning that providers will build the infrastructure with no certainty that that anyone will pay for the services. This is a particular factor affecting rural and the so-called ‘hard-to-reach areas’. One interviewee said, “No one is willing to think about it - whether it’s BDUK or local authorities. And the banks won’t fund the level of risk.”

The perception of risk is a driving factor; who intends to use the network and what they are prepared to pay for it are currently uncertain. “We need confidence of a level of take-up other wise we can’t make the business plan stack up”.

Service evolution

The transition to public services being digitised is well on the way - and it will need much more than a USC of 2 MB to offer credible, usable services especially in the areas such as Telehealth and services that enable people to live for longer in their own homes. One respondent believes that the ‘payback on telemedicine services can be in weeks not months’. The idea that these services cannot form part of the underpinning or ‘anchor tenancy’ for NGA rollout is laughable - but that’s what seems to be happening.

Another issue is the capacity of existing networks to cope with the demands from NGA and new offerings such as mobile services based on LTE (sometimes called 4G mobile); “You can invent and invest in all the apps and content you want - and pretty soon you’ll find that there’ll be a blockage; there’ll be problems in the Middle Mile [that part of the network between the local Exchange and the Core network] or in the Local Access Network [that part of the network between the premise and the local Exchange] and everyone will scream.”

Local people and businesses will generate Terabits of data and the backhaul can't cope with that. We need to invest in backhaul and be allowed to make money. "Providing 1 Gb to the home won't be any good if the backhaul can't cope."

"The failure to invest in the access network is what's causing the blockage." The argument here is that without new investment in the network close to users (whether these are homes or businesses) we can't deliver the new services.

Investment in other networks is being contemplated and this risks duplication and poor value:

- 'Smart grids' for electricity and other energy networks with investments estimated at £1.5 – 4bn
- Investment in PSN and N3 renewal (£3 – 5bn)
- MoD networks
- Highways Agency network and National Rail and other publicly funded infrastructure (such as tram networks in cities)
- JANET (the Joint Academic Network that connects up Higher Education Institutions)

One interviewee said that "BT is knocking them off one by one" as they come up for renewal and using this to help fund broadband rollout - and at the same time new entrants seem to be being told that they cannot carry these types of services over networks invested in by BDUK due to State Aid issues; "Yet BT is carrying exactly these types of services over its network". He adds "Networks which are funded by the taxpayer should be made available on a non-exclusive basis and this is allowable State Aid".

Smart Grids need decent latency, especially as users will want much more control over their home infrastructure than the utility companies expect - especially as the economy worsens and prices increase.

UK Government, Regulatory and Policy Issues

Everyone interviewed mentioned the confusion and difficulty surrounding the UK's approach to regulation and policy, increasing the uncertainty and perception of risk by all players in the market and public sector. Conflicting advice is being given (and received) at multiple levels. There seems to be no clear central point or source of information on policy from government.

Attitudes of local authorities

It seems to be difficult to engage local authorities and there's also a 'knowledge gap' in their understanding of the issues. There are bright spots though - "David Cullen and NYNET are a breath of fresh air; they 'get it' and consequently so do North Yorkshire County Council".

Some local and county authorities are aware of the issues and are saying, "We don't want a solution driven by FTTC - we know we'll be having the same conversations in 5 years' time...".

Another major barrier is the unwillingness of public actors to countenance 'adding in' Public Service Networks to overall procurements of NGA - it is not clear why this is not allowed.

One company active in Wales was specifically told that PSN-linkage was 'not allowed' despite the fact that it is known that many of these types of contract will soon be due for renewal. Indeed, while it may be the case that BDUK support cannot be used for some networks, there would be no reason why projects could not be broken into specific 'lots'. While informal discussions indicate that, once built, these networks might be able 'to play' in the PSN 'space'; "As an investor, it's not solid enough. A nice warm feeling doesn't tick the boxes!"

State Aids

"State Aids" are often used as a reason for the public sector not to invest, as in 'State Aids = bad'. The threat of a State Aid referral is often used, and usually in a reasonably blunt manner. Interviewees cited examples of these and the author also has direct experience of such threats being used in an attempt to 'derail' projects. However, it is important to apply rational tests and to distinguish between State Aids which are allowable and those which are not.

Article 107(1) of the Treaty on the Functioning of the European Union (the Treaty) provides that:

"Save as otherwise in the Treaties any aid granted by a Member State or through state resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall in so far as it affects trade between member States, be incompatible with the internal market"

Article 107(1) defines the concept of state aid by reference to its effects rather than its aims or objectives. A measure of public support is classified as state aid only if the conditions defined in that paragraph are all satisfied. This is because these conditions are cumulative.

The conditions that must ALL hold are the following:

Aid must be granted by the state or through state resources:

- The recipients must be undertakings (i.e. they must engage in economic activities)
- This aid must confer an advantage to the recipients;
- The advantage must favour certain (selected) undertakings or economic activities;
- The aid must affect trade between Member States; and,
- Aid must distort competition in the internal market.

Note that special guidelines apply to Broadband schemes; “Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks” and there is case law to consider. However, it is possible to structure projects in such a way that they can be compatible with State Aid rules, and many of these have been permitted using the provisions of Article 107 (3) which are worth considering:

‘The following may be considered to be compatible with the internal market:

(a) aid to promote the economic development of areas where the standard of living is abnormally low or where there is serious underemployment, and of the regions referred to in Article 349, in view of their structural, economic and social situation;

(b) aid to promote the execution of an important project of common European interest or to remedy a serious disturbance in the economy of a Member State;

(c) aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest;

(d) aid to promote culture and heritage conservation where such aid does not affect trading conditions and competition in the Union to an extent that is contrary to the common interest;

(e) such other categories of aid as may be specified by decision of the Council on a proposal from the Commission.’

Worth noting that the Commission is reviewing the State Aid Guidelines on Broadband Deployment “In light of the public consultation that took place in mid-2011, the Commission will evaluate whether and to what extent changes are necessary and, if appropriate, will come forward with new draft guidelines in early 2012”.

Market failure

The EC makes a distinction between areas where no broadband infrastructure exists or is unlikely to be developed in the near term (white areas), areas where only one broadband network operator is present (grey areas) and areas where at least two or more broadband network providers are present (black areas).

The contention is that in black areas cannot have market failure, that grey areas need further analysis to determine whether or not there is market failure and that white areas have market failure and intervention is possible. Largely, though not exclusively, white areas are in the underserved rural areas which are the focus of BDUK and also the Rural Broadband Development Fund.

The picture ‘on the ground’ is less clear - largely related to the quality of the available data and the scale at which such data are aggregated.

“And when you drill down into the BDUK data in the cities, you find that there are huge ‘white’ swathes. Then BT comes in and says it will offer FTTC services at some unspecified point in the future blighting the market. FTTC is not ‘halfway there’! It’s a halfway to nothing. Wherever the industry has done FTTC, they’re not going to come back and do FTTH. That’s market failure.”

“There is a market failure in the provision of wholesale services. That’s why there’s no innovation. If the market won’t deliver then, in the cities at least, there needs to be public intervention.”

“There seems to be a ‘golf club’ mentality about dark fibre - it’s traded a bit among Telco players; but not much.”

“We believe there is an EU single market issue in that very high speed services are available in many European countries at around £100 per month equivalent whereas the same services cost 1-2 orders of magnitude more in the UK.”

“The position of BT and their attitude and ability to use ‘spoiling tactics’ ahead of any local project action is a major risk for projects and their investors.” This brings in more uncertainty to the process and even large potential competitors must see this as a complicating factor.” “They have deliberately targeted BDUK areas; this makes it hard to establish a business case”.

BT is taking advantage of their ability 'to make a Statement' about investment in local exchanges. "They have 3 years to make it live and it enables them to 'muddy the waters' at no cost. One exchange statement can through the business model for an area I'm looking at 'out of the window'".

It seems that Ofcom is unwilling to take any action on this - there needs to be a much shorter timeframe from "Statement to build" (say 18 months) and there needs to be financial penalties should they fail to build - otherwise Statements just block the market.

"If BT is the 'last man standing' [in the BDUK process], they'll sell you what they want to sell you."

A problem for BT and therefore for everyone else is that "BT have a nightmare touching other peoples' networks - it's very difficult for them and expensive for us. We need to find some way to 'help them to help themselves' - but the regulator appears uninterested".

"The biggest constraint on Government policy is the need to protect BT and its pension fund" says one interviewee who argues that without this protection BT could not both pay its pensioners and satisfy its investors. "We need to look at the overall return to the UK in supporting NGA; both the potential 'tax take' and the economic advantage we can generate - this would change our policy to BT."

A way to produce changes in BT's behaviour is required to help them see the need to 'replace copper with fibre'; "BT's copper should be valued at the very least at scrap value. This would give BT the incentive to recycle it.

Passive Infrastructure Access

"PIA is not suitable at this stage - it's cheaper to build your own". Current plans seem to indicate that PIA won't be able to be used for business services or for backhaul. PIA is a big stumbling block to alternative investment in rural areas.

"There is ruthless negotiation between the big players and Ofcom is ineffectual". "Ofcom's cosy stitch-ups are because it's scared of being sued". One option would be for the Government to threaten the big players with a referral to the Monopolies and Mergers Commission - as a way of making progress on PIA.

"We need to make sure we have an open and competitive landscape - this is particularly the case for PIA - where we are concerned about 'the stuff BT will do' to make it difficult for us to establish a business case."

“Ofcom needs teeth and it needs to be prepared to use them; so far they have not done so.” One outcome would be to enforce proper functional separation; BT is not offering open access to the infrastructure.

Business rates on NGA

The issue of business rates applied to telecommunications networks has been the source of much contention and difficulty for more than a decade. Much lobbying by the industry and others has produced a review announced in January 2012, subject to further work and consultation.

For the purposes of this document, we provide a summary of the position based on the findings of the House of Commons Business Innovation and Skills Select Committee on Broadband held in early 2010 which very helpfully sets out the issues in clear language. (<http://bit.ly/HoCvoa>).

How business rates are applied

The Select Committee notes:

Business rates are a tax on the occupation of non-domestic properties. There are two methods by which business rates are calculated in the broadband industry; the Tone List method and the Receipt and Expenditure (R&E) method. BT's network is assessed on the R&E method, whereby it pays tax on what the Valuation Office Agency (VOA) assesses as the hypothetical rental value of BT's entire network, based on profits. By contrast, the Tone List method, which is applied to all other providers, requires them to pay a tax per kilometre, on the basis of the size of the network. The VOA sets the level on a five-year ratings cycle. The reason behind the distinction is that VOA considers BT to be a utility operator and smaller networks to be ordinary businesses.

The Select Committee concludes:

It is clear that the issue of business rates, in terms of both how they are applied to the industry, and the level at which they are set, remain contentious issues. If new investment, and new entrants to the NGA market are to be encouraged there needs to be a level playing field. **BT does not merit a method of taxation which differs from other providers, and one which appears to deliver to that company more favourable terms than its competitors. We conclude that the current arrangements hinder the delivery of investment in NGA, which is being championed by Government. We recommend that the Government review the application of business rates to fibre optic networks as a matter of urgency, and develop a uniform system for all providers.**

The VOA revised Guidance in January 2012

After consultation with the industry, including the Broadband Stakeholders Group, the VOA is proposing changes to the business rates applied to some

NGA networks. The rates will be applied in different 'bands' depending on the nature and location of the networks concerned. The VOA draws a distinction between what it describes as:

Urban and sub-urban, mainly residential, NGA networks – the first two thirds;

- Where rates of £20 per home per year or SME (where they form less than 14% of total connections) premises connected,

- Urban and sub-urban non-residential NGA networks – the first two thirds;
 - Where, at the time of writing, the VOA says “The VOA is investigating the costs of providing new urban and sub-urban NGA networks that are primarily designed to service business, commercial and public authorities with superfast broadband. These NGA networks do not provide connections to residential premises. More information is required on these types of NGA network before a valuation scale can be produced.”
- NGA in the final third
 - “A receipts and expenditure based valuation model has been developed by the BSG with input from the VOA and industry over the past 12 months. The valuation model has been run to produce a scale of rateable values per connection that will be applied to the NGA final third networks. The factual data of the individual NGA final third networks will inform the choice of the “Rateable Value (RV) per end user selected from the scale, with consideration being given to the high capital cost, low potential returns and pioneering nature of the developments.” The amounts due as rates are banded per end user: £2, £6.50, £10 or £30 per end user, and while the guidance on the VOA website indicates which counties are in each band it should be noted that “it is not possible to be definitive as to which of the above bands will apply to a particular NGA network.”

It's also important to note that the valuation applied is per connection irrespective of the fixed line technology. The VOA has come to this view, it says, due to the dynamic nature of the investment in the two main technologies FTTC and FTTH. “In the early years of deployment the FTTC network produces in most project areas a higher RV according to the R&E valuation model than the FTTH alternative, but this distinction is driven by differentials in the capital costs of extending the networks rather than in the intrinsic values of the two technologies after installation, when the relationship is reversed. While the networks are still being installed, and at least for the duration of the 2010 Rating Lists, the VOA will not distinguish between the rateable value of a FTTH or FTTC connection in the final third.”

The VOA provides some example scenarios covering three technologies typically employed; FTTC, FTTH-GPON (often used by incumbent operators) and FTTH Point-to-Point (normally used by new entrants). Example scenarios for Rural NGA (final third) networks have not been provided at the time of writing. The overall impression given at a joint BSG-VOA meeting on 8th

February 2012 was that the proposals are still riddled with uncertainties, with the most likely outcome being a series of challenges and individual negotiations between the VOA and network builders. It is doubtful that the amount of tax likely to be raised in the 'Final Third' makes the game worth the candle.

Technology is not the barrier; future services enabled

‘Technically, we know we can deliver; that’s not the problem’.

Everybody with technical knowledge and competence spoken to for this report confirmed that, so far as FTTH is concerned, all the technology required to implement very high capacity networks exists and is in widespread use in businesses and homes worldwide. There are many examples of successful and sustainable deployments in nearby European countries at all scales of population density and network size.

The technology case for networks where optical fibre is used to get close to the final user and then existing copper lines are used to reach the premises concerned is less compelling.

Future service picture; what does it look like?

The industry needs to change “Ofcom is regulating the wrong things”; we need to encourage investment further up the network and use ‘carrots and sticks’ re Quality of Service. Those who remove the bottlenecks should be allowed to make more money than those who don’t.”

The position of the multitude of national networks is worth examining says one contributor, drawing attention to what he describes as ‘cartel-like’ behaviour; “Why is fibre not switched on? We need to know who’s got what, what’s available especially where it’s tax-payer funded; we need to treat these networks as part of our critical national infrastructure.”

“As much decision-making as possible should be devolved regionally and more national networks need to be switched on. In this mode, the industry would evolve and BT would become more, not less, profitable.”

The UK’s role could be as the ‘entrepôt’ for global data. The need for resilience as public services increasingly transition to digital delivery will ensure that regional public sector players ‘dual source’ their communications.

“The fight is between those who are in Central Control and Planning mode and those pushing Decentralisation and Devolution. But we are in a ‘Command and Control’ Steam Age.” He argues that the Internet age is upon us and local government should lead the way. “Britain is the last of the Steam Age nations”.

“BIS doesn’t understand the importance of this issue for the development of our economy - nor do they seem to understand the difference between BT’s and Virgin’s plans and the transformative potential of NGA. It’s not about

Superfast Broadband; it's about the provision of products that allow new types of services and where the market price is determined by the actual costs. It's about transformation."

"You can expect to see the cities building their own dark fibre rings to connect key employment sites. Businesses buying point-to-point dark fibre is an option available in this scenario." The creation of a digital "Free Zone" (analogous to a Freeport) becomes possible where trading partners link together directly.

Future services need to be inclusive; and we need to find new ways of letting hard-to-let properties. Copper lines are increasingly not being used; especially in more deprived areas where people tend to use their mobile phones. "We need to involve property owners such as Housing Associations when estates are redeveloped."

The potential benefits of involving the NHS and other healthcare providers are not being costed in, yet it offers massive potential for benefit; "The NHS is dabbling" but somehow it needs to be done with the full involvement of all the organisations that might benefit.

"There are lots of opportunities; surely it's possible to go through the NHS budget and look for areas where new services and applications can be used to save costs and deliver better care." Examples cited include the care of dementia patients at home and enabling elderly people to live in their own homes for longer. "We need to think about funding for an application; and see these services as 'an anchor' for the business case".

Conclusions: Solve ‘Demand Risk’; reinvigorate competition

Dealing with ‘demand risk’

Numerous times in the research work for this report it was said that “demand is not the issue” - everyone believes that we will eventually transition to a largely optical fibre-based digital infrastructure going all the way to the home or business, with (when we eventually get there) new generations of mobile technology delivering new services. And that the new services will go way beyond broadband. So while there is broad agreement on the destination, there is difficulty, confusion and conflict on strategy, timing and method. At the heart of this is what investors call ‘demand risk’.

Demand risk is a shorthand term for an investor’s unwillingness to invest in a project because he or she cannot understand how demand for a service will evolve and be unable to answer questions about what will be sold, when and how much customers will pay. Without credible answers to such questions a business plan is both difficult to invest in and deliver.

There are examples of dealing with demand risk. Broadband for the Rural North (“B4RN”) in Lancashire is seeking pledges and finance from potential customers, the Digital Region in South Yorkshire is being funded through public investment and BDUK is promoting the ‘gap funding model’ where public contributions ‘top-up’ a supplier’s investment in broadband infrastructure to make a project commercially viable.

To take these three examples - B4RN has pledges from over 70% of its potential market of 1,451 properties in a very rural area deep in the ‘Final Third’ and is raising money to build its network; the Digital Region has built out an extensive network covering 80% of homes in the region (representing 546,000 homes and 40,000 businesses) and the four BDUK pilots are in a tender process.

The cynics point to many previous sub-scale projects that have not paid back, the current issues with take-up in the Digital Region and the slowness and over-bureaucratic approach of BDUK. They have a case - which needs to be recognised in a balanced argument; B4RN risks not being able to raise the funds to deliver the plan; Digital Region risks not generating sufficient take-up to return the investment (and the local authorities criticised for ‘making losses’ may exit too early the private sector for £1 with the usual predictable consequences), and BDUK’s approach is seen to deny ‘localism’ and favour the incumbent.

It is easy to be critical, but at least these examples are all ways of exploring demand risk.

Reinvigorating Competition

Until we have full competition at all levels of the network for all services (including dark fibre and duct access) we can't make progress nor will we achieve the transformation we seek. Such competition does not exist in the UK nor do current policies or plans seem likely to produce it. This is a strategic and structural issue for the UK. It is the proper province of Government and the regulator and it needs to be debated openly.

Strategic questions

The strategic questions need to challenge our present approaches - asking if we can deliver the targets set by the Government for 2020; we need a credible plan to meet them and we need to help the industry out of the difficult place it is in:

- Can we develop innovative ways of supporting the financing of NGA that will encourage private investors to enter the market, leverage public funding and allow a variety of competing solutions? Is it strategically valid to put all our eggs in the gap-funding basket? Can we adopt some of the Project Bond structures being proposed by the European Commission and apply them to UK local and regional needs?
- How should Britain change the regulatory and industry structure to support a truly open set of networks? How do we open up such networks to allow the full force of competition?

We need to create the right environment for the debate on the next phase of the upgrade of our digital infrastructure that can form the platform for our future economy and society.

Appendix A – Methodology and Process

This report comes about as a follow-up project to an NCA members and supporters workshop held in July 2011. Given the fast-moving nature and complexity of the issues, it was decided to investigate the current ‘State of the Art’ in financing NGA projects in the UK. The issue emerged as one of the barriers to successful widespread implementation of NGA in the UK. The outputs of the work were to help inform UK policy-making and form additional content and insight for the online Knowledge Base at www.beyondbroadband.coop.

Malcolm Corbett CEO of INCA defined and agreed the Terms of Reference with Brian Condon and the field work for the report commenced in October and continued through to December 2011. The report was written in January 2012 – with various announcements coming thick and fast.

A programme of focused interviews and discussions was undertaken with industry participants, potential investors, government and public sector organisations and local projects based on a structured process. In assessing the responses, common themes, areas of agreement/difference and project success criteria were identified. Other inputs were generated through attendance at meetings and events especially the INCA financing meeting in York and the NextGen Conference in November 2011. Additional research was conducted with primary sources.

All the interviews and discussions were conducted under the Chatham House rule, based on a list suggested by INCA and further developed during the process. A list of those consulted and/or their affiliations is not being released. All those interviewed are actively involved in the UK market for NGA.

About the Author

Brian Condon has worked in telecommunications for more than 20 years. In the early 1990s, based in Kiev, he advised the Ukrainian Minister of Posts and Telecommunications on restructuring and modernisation, bringing significant levels of foreign investment to Ukraine including implementing Ukraine’s first mobile operator.

Returning to the UK, he worked for PA Consulting’s Global Technology Group running technology strategy and product planning assignments for major operators, handset manufacturers and software vendors. Subsequently, he joined Close Brothers Corporate Finance to develop its technology practice advising on corporate strategy and mergers and acquisitions as Managing Director of Close’s Media, IT and Telecoms team.

Brian started his own business in 2003, co-founding Complexity Partners LLP the specialist consultancy working with Universities and other complex organisations on strategy, innovation and commercialisation. He is a board member of the Community Broadband Network, Aquafuel Research Limited a venture-backed technology

company and co-founder and Board member of the Centre for Creative Collaboration. He has a PhD in Physics from the University of St Andrews.