



Broadband in Rural Areas

Broadband Stakeholder Group Submission to EFRA Committee

2003

I. Introduction

1. Approximately 67% of the UK population has access to a mass-market broadband solution – that is one that is targeted at residential or small business users. Broadband availability is highest in urban and suburban areas (where 75% of the UK population live). However, broadband availability falls significantly in market towns, rural villages and remote areas.
2. Significant barriers exist to the extension of mass-market broadband coverage to rural areas. The high costs involved in deploying new networks in areas of low population density make it difficult for operators to build sustainable business models to justify investment, particularly given the challenging commercial conditions faced by the ICT sector. Even wireless networks, which are cheaper and easier to deploy than fixed networks, have only so far been deployed on a relatively small scale. These problems are exacerbated by uncertainty about the level of demand. Broadband remains a relatively nascent market and only about 10% of users have so far taken up broadband services where they are currently available. Promoting broadband take-up remains a key priority for the Broadband Stakeholder Group.
3. Nevertheless, in some of the most remote parts of the country, the economics are so challenging that it is clear that the market will not deliver without some form of intervention. However, it would be premature to suggest that market failure exists in all areas where broadband has not yet reached. With concerted action on the part of industry, community groups, local, regional and national government, regulators and other stakeholders the BSG believes that it will be possible to extend the reach of broadband services to new areas. This is essential for both regional economic development and social inclusion. However, in some areas of the UK public sector funding may be required to ensure coverage and regional authorities will have a pivotal role to play in harnessing private sector investment, regional funding and public sector demand.

II. The Broadband Stakeholder Group

4. The Broadband Stakeholder Group (BSG) was established in April 2001 to advise the government on the development and implementation of a strategy to enable the UK to meet the government's target to have the most extensive and competitive broadband market in the G7 by 2005. Membership of the BSG is open and voluntary and includes stakeholders from across the whole broadband value chain, including: service providers; equipment suppliers; the content industry; central and local Government; RDAs; local community groups; consumers and consumer representatives; trade unions and trade associations etc.
5. The BSG published its first report November 2001 with a set of 15 strategic recommendations to meet the government's broadband objective¹. Most of these recommendations were accepted and integrated into the Government's UK Online

¹ <http://www.broadbanduk.org/reports/reports.htm>

Broadband Strategy². A follow-up BSG report was published in November 2002, providing an update on progress and further recommendations.

III. What is Broadband?

6. The BSG defines broadband as 'Always on access, at work, at home or on the move provided by a range of fixed line, wireless and satellite technologies to progressively higher bandwidths capable of supporting genuinely new and innovative interactive content, applications and services and the delivery of enhanced public services.'³ This definition deliberately avoids defining broadband in terms of specific data rates, as these are likely to change over time as the technology and the market develop.
7. Broadband connectivity is not new – large organizations have been using very capacity leased lines for many years, however, developments in technology now mean that similar services can be offered to residential users, small businesses and public services – offering the prospect of pervasive high speed connectivity.

IV. Why is broadband important?

8. The deployment of mass-market broadband services is still a relatively recent phenomenon and the impact of broadband on economic growth has still to be assessed. Nevertheless, many economists continue to predict significant macroeconomic benefits from the proliferation of broadband networks. These predictions have driven a number of governments around the world to act and to prioritise broadband deployment as a matter of government policy. South Korea put broadband at the heart of its strategy for transformation towards a knowledge-based economy, and as the world leader in broadband it is now starting to derive real economic and social benefits, from its success including the rapid development of e-commerce, e-learning, e-government and e-growth⁴.
9. The BSG believes that Broadband has real potential to accelerate the five key drivers of economic growth: enterprise; innovation; competition; investment and skills⁵. A view supported by a recent US Department of Commerce report⁶ predicting that the specific regional economic development benefits resulting from greater broadband deployment and use would include:
 - Job creation and retention
 - Reduced traffic congestion
 - More successful industrial growth, recruitment and retention
 - Improved education and health systems

² [http://www.e-envoy.gov.uk/oeo/oeo.nsf/sections/reports-broadband/\\$file/index.htm](http://www.e-envoy.gov.uk/oeo/oeo.nsf/sections/reports-broadband/$file/index.htm)

³ As a starting point this would include higher bandwidth services (defined as >256 Kbit/s by the OECD - the BSG recommends using OECD's definition in order to allow international comparability) but anticipates progressive development through to next generations of Broadband.

⁴ Source: Investigating Broadband Technology Deployment in South Korea, Brunel/ DTI July 2002

⁵ See BSG Report and Strategic Recommendations November 2001

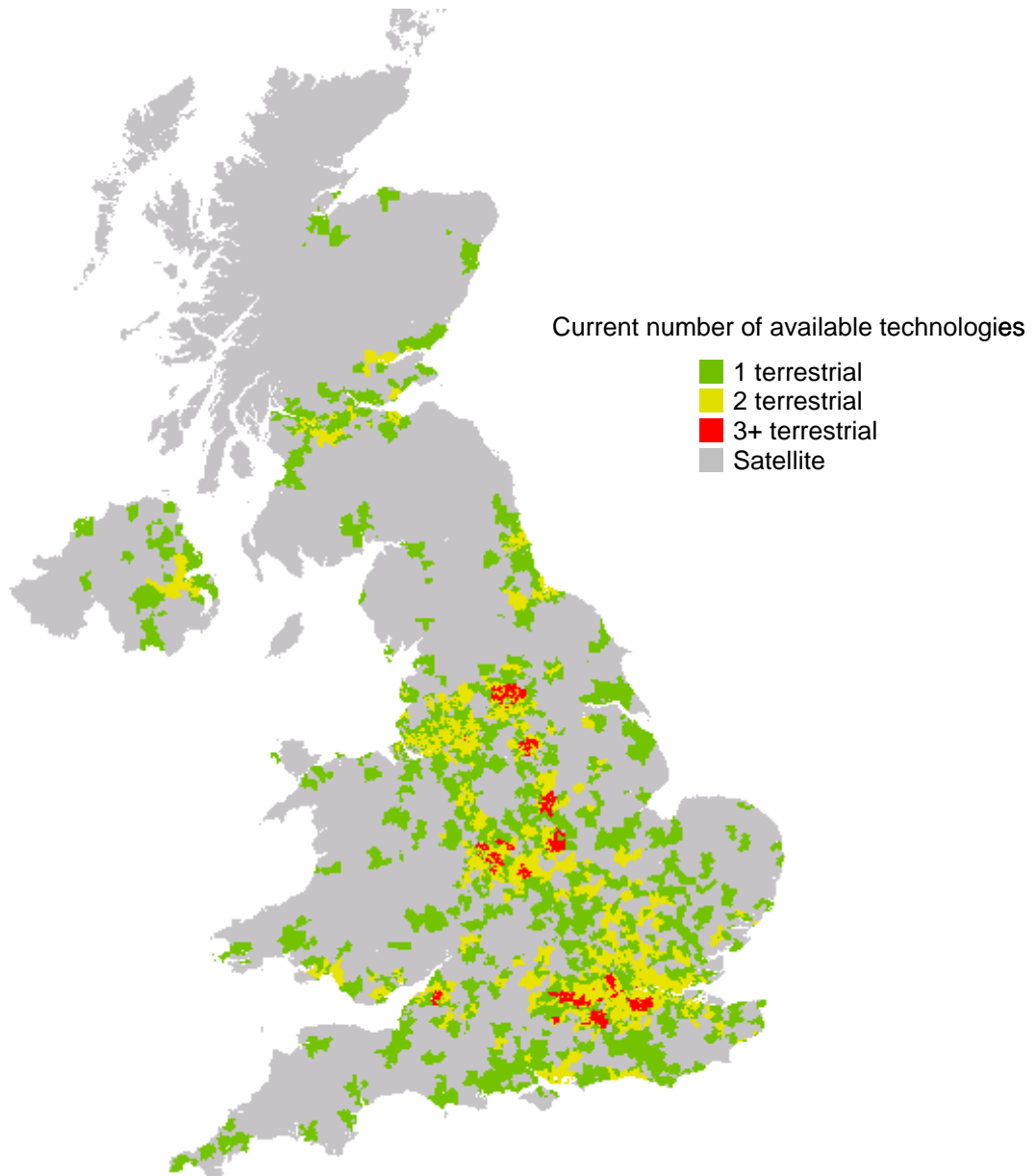
⁶ Understanding Broadband Demand, Office of Technology Policy, US Department of Commerce, September 2002

- More productive research and development
 - Increased start up and entrepreneurial activities
 - Urban core revitalization
 - Improved government efficiencies and service delivery
10. As globalisation continues, countries and regions will compete with each other on the quality and pervasiveness of their high-speed communications networks. The BSG believes that the successful rollout and take-up of Broadband is of central importance to the health and future prosperity of the United Kingdom.
11. Broadband should be particularly beneficial for rural areas as it allows people to communicate and share information regardless of their physical location. Broadband can help to strengthen rural communities by making community services more easily accessible and can also help in rural regeneration. By enabling companies and organisations located in rural areas to engage with clients and suppliers anywhere in the world broadband provides new opportunities for growth and job creation. There is already evidence of some SMEs moving out of urban areas to broadband enabled rural locations to take advantage of cost savings and other benefits associated with rural life. Broadband also facilitates more flexible working patterns. Home working is proving to be a major driver of demand, reducing the need to commute to urban areas.

V. Current Broadband Coverage

12. Approximately 67% of the UK has access to a mass-market broadband solution – that is one that is targeted at residential or small business users. Two-way satellite are available across the UK however, these are currently priced at a premium to terrestrial services. Broadband availability is highest in urban and suburban areas (where 75% of the UK population live), where economies of density make the deployment of broadband relatively cost effective. However, broadband availability falls significantly in market towns, rural villages and remote areas (home to 25% of the UK population).
13. As figures 1 and 2 illustrate, broadband remains a relatively ‘urban’ phenomenon. The high costs associated with the roll-out of new broadband networks and uncertainty about the level of demand are major barriers to market-led broadband deployment in less densely populated areas. The map below shows the coverage of mass-market broadband technologies in the UK as at the end of August 2002.

Figure 1: Broadband coverage in the UK, Q3 2002 [Source: Analysys]



	<i>DSL</i>	<i>Cable</i>	<i>FWA</i>	<i>Total</i>
Urban centres (50% UK population)	89%	60%	22%	95%
Suburban centres (25% UK population)	52%	33%	3%	58%
Market towns (15% UK population)	21%	11%	1%	26%
Rural villages (7% UK population)	6%	1%	0%	7%
Remote rural (3% UK population)	1%	0%	0%	1%
Overall	61%	40%	12%	67%

Figure 2: Population (household) coverage by mass-market broadband by area type⁷, Q3 2002
[Source: Analysys]

VI. Extending broadband coverage

The challenge of building sustainable business models for rural broadband

13. There are currently a number of constraints to the commercial deployment of broadband in rural areas. These include: low economies of density; high equipment and civil infrastructure costs; demand uncertainty; the current risk averse financial climate and the scarcity of appropriate radio spectrum.
14. Firstly, there is a close correlation between broadband coverage and population density as the average cost per user of deploying new technology in less densely populated areas is significantly higher than in urban areas. Economies of density are a primary factor in determining the cost effectiveness and therefore commercial viability of providing new or upgrading existing local access networks⁸ in any given area. High economies of density have usually been a key success factor in countries where there has been very rapid deployment of broadband such as South Korea⁹. Unfortunately, almost a third of the UK population lives in areas of relatively low population, making the commercially sustainable provision of broadband access more difficult.
15. Secondly, population densities are significant due to the high cost of equipment and civil infrastructure. In the case of fixed networks, 65-70% of the cost associated with the deployment of new fixed local access networks is related to civil infrastructure (trenches,

⁷ Note: The definitions of area type are based on the population density of the postal sector. This means that low population density postal sectors may be classed as rural, even if they are close to high population density areas

⁸ During the late 90s there was heavy investment in backbone infrastructures leading to the oversupply of capacity in trunk networks. However, this investment was not matched by investment in the local access network and it is this part of the network that is currently the bottleneck for pervasive mass-market broadband access.

⁹ Source: Investigating Broadband Technology Deployment in South Korea, Brunel/ DTI July 2002

- ducts, poles, masts and buildings). Meanwhile, although, equipment costs have fallen (particularly for products that can be manufactured on a large scale for global markets), they remain a significant cost and a major barrier to the rollout or upgrade of new networks. By encouraging/ allowing operators to share infrastructure it may be possible to reduce investment costs and improve the business case for new network investment.
16. Thirdly, although take-up is accelerating (1.5 million users in January 2003) the UK broadband market is still at a relatively nascent stage and is characterised by considerable uncertainty. Questions remain about business models, price elasticities, and the future availability of compelling content, services and applications market. Operators are therefore currently concentrating their efforts in building the market in the more accessible urban areas. The further development of a dynamic, competitive sustainable market is a prerequisite for releasing new investment for wider deployment.
 17. Fourthly, the high costs of extending coverage are exacerbated by the challenging financial conditions currently facing the ICT sector. The current funding problems experienced by many telecoms operators are obviously slowing the growth of broadband. Market conditions will stabilise, but it appears that this could be a slow process and so access to capital will continue to be a major constraint on the development of Broadband in the UK as operators are required to have very robust business models to justify investment in the current financial climate. This is a factor that must be recognised by both policy makers and regulators alike.
 18. Finally, given that wireless networks are significantly less expensive to deploy than fixed networks, they should be ideally suited to addressing the issue of broadband coverage. However, the ability to deliver low cost mass-market wireless solutions to complement equivalent fixed line services such as ADSL and Cable depends upon the availability of appropriate spectrum. Not all spectrum is equal, some frequencies have the right combination of physical properties such as range achievable and data capability (for a given service) which results in that band being very much more suitable than other bands for the provision of commercially viable mass-market wireless broadband services. So far, very few services targeted towards residential users have been launched using the frequencies currently available in the UK, to a large extent this is because the frequency properties do not allow for commercially sustainable low cost products in areas of low population density. (To reiterate the point made above, given the current financial constraints facing the sector as a whole, operators need to have very robust business models in order to secure investment funding for new networks).

VII. Current market developments

19. Despite these difficulties the private sector is putting considerable effort into extending broadband coverage

ADSL

20. Having broadband enabled more than 1100 exchanges (covering more than 60% of households) BT stated that further upgrades of exchanges would only be carried out where clear demand indicated commercial viability. To this end, the company announced

trigger levels for demand necessary to implement upgrades and established an online registration scheme for consumers. This initiative has been particularly successful, all over the country, local community groups have actively campaigned to encourage local residents and businesses to sign up for broadband. More than 175 BT exchanges have now hit their broadband trigger levels and have been or are in the process of being DSL enabled and another 700 are still on the registration list.

21. At the same time, BT is trialling new ADSL technology including the use of new, smaller ADSL exchange equipment - 'mini DSLAMs' – designed for deployment in smaller exchanges, which would not otherwise be commercially viable to enable. BT is also trialling an extended reach ADSL product which could increase ADSL coverage in broadband enabled areas to about 97%. Currently ADSL services have a maximum range of 5.5kms, which means that about 5% of households that are currently connected to an ADSL enabled exchange are too far from the exchange to receive broadband. An extended reach ADSL product would help to overcome this problem.
22. Through the combination of demand registration schemes and the potential use of new technology, BT believes that ultimately it should be possible to reach 80% of UK population with ADSL technology.

Cable

23. Due to the high costs associated with deploying new cable networks, they are not particularly suitable for deploying broadband to low population density areas and cable is not expected to play a significant role in delivering broadband to rural areas. Rather, it is anticipated that NTL and Telewest will focus on consolidating their businesses in competition with BT where they already have a presence.

Satellite

24. Several operators are now offering 2-way satellite services, which are available across the whole of the UK. However, these services are priced at a premium to other terrestrial consumer broadband products (mainly due to the cost of the consumer premises equipment) and are primarily targeted towards the SME market.
25. However, considerable effort is being put into the development of a consumer satellite proposition. So called '1-way hybrid' systems are currently being trialled using a combination of a satellite downlink with a terrestrial return path (56kbps modem, ISDN line or GPRS as the return path.) Whilst these services will not share the same performance characteristics as other broadband solutions they should provide a valuable alternative to narrowband, where other broadband services are not available.

Wireless

26. The BSG believes that wireless broadband technologies have the potential to make the biggest impact on extending broadband coverage. The key advantages that wireless access systems offer include relatively cost effective system deployment suitable for less densely populated areas, fast installation and rollout and nomadicity and full mobility.

27. A number of frequency bands have been made available for wireless broadband services in the UK, however, only a limited number of commercial services targeted at residential users have actually been launched, mainly because the frequency properties of the bands made available or the allocation processes used have not allowed for commercially sustainable low cost products¹⁰. For instance, many industry players remain sceptical as to whether it will be possible to deploy viable wireless broadband propositions using the 3.4 GHz band due to the fact that the licences are being allocated on a regional rather than national basis.
28. The BSG has called upon the Radiocommunications Agency to review its spectrum allocation for wireless broadband and to develop a new strategic plan for wireless broadband. Recognising that the commercial viability of a proposal is dramatically affected by the operating frequency, it is crucial that more suitable frequency bands are made available for wireless broadband.

Mobile

29. GSM services are widely available across the UK and GPRS (so-called 2.5G) services, which offer new mobile data services will also be accessible across the UK. However, the roll out of 3G services is likely to be more limited due to the high infrastructure investment costs involved. One route to address this problem would be to allow mobile operators to share network infrastructure in rural areas.

VIII. Routes for successful public sector intervention

30. Despite the difficulties associated with extending broadband coverage to rural areas the BSG does not believe that it would be either appropriate or desirable to impose any form universal service obligation on the provision of broadband services. Although a tempting panacea, such a regulatory intervention would be extremely premature given the nascent stage of the market and would inevitably stifle competition, innovation and growth in an important and dynamic sector of the economy.
31. However, judicious intervention by the public sector can help to support broadband rollout in rural areas. In the English regions, the RDAs have access to significant funds for economic development and regeneration, and it is clear that European Structural funds can also be used to support broadband projects. Where necessary appropriate use should be made of these funds to encourage wider broadband deployment.

Public Private Partnerships

32. Public/ private partnerships have a major role to play in extending coverage and stimulating demand and there are a large number of diverse projects being trialed and implemented across the regions and devolved administrations to explore options for encouraging the wider deployment of broadband. Many of these have been funded through the DTI's £30m broadband fund. Whilst not all of these projects will be successful, some are already starting to have a real impact. The UK Broadband Task

¹⁰ See Annex 1 for a detailed overview of the wireless situation, together with a summary of the range of terrestrial and satellite wireless access systems that could be deployed and the measures necessary to remove impediments to their rapid exploitation.

force has a key role to play in leveraging the experience of the most successful schemes so that the lessons are learnt and disseminated between regions, devolved administrations and other stakeholders.

33. A very good example of the power of broadband to stimulate community development is in the pioneering project in Cornwall under the ActNow banner. This is a groundbreaking partnership between BT, the South West England RDA, Cornwall County Council, local business organisations and colleges. Crucially this initiative has focused on action to stimulate demand from day one of the project and has not simply concentrated on the supply side infrastructure issues. As a result the first 1000 customers were signed up within four months of the project's launch, which in turn led to more BT exchanges being ADSL enabled. Cornwall is now one of the fastest growing broadband markets outside London.
34. The Cornwall project, and others in the UK, demonstrate some key principles that lead to successful project implementation:
 1. Working in Partnership: with the private sector, local authorities, development agencies, the education sector, business support organisations and, crucially, local communities themselves all engaged in the creation and implementation of a broadband development plan;
 2. Investment: with shared investment, shared risks and staged roll-out;
 3. Focus on the People: the real determining factor in the creation of a healthy broadband market is people, the users. Successful projects focus on motivating people, not just manipulating pipes;
 4. Purpose: ensuring that there are a range of compelling applications that mean something to local communities, businesses and individuals;
 5. Support: providing high levels of support, training and other help, including financial incentives.

Public Sector Aggregation

35. The aggregation of public sector demand for broadband can also play a role in helping to extend broadband coverage to new areas. By aggregating public sector demand (i.e. combining procurement from different public services and bringing it to the market in a coordinated manner) government can act as an 'anchor tenant' for operators and improve the commercial case for rolling out networks in new areas. A number of significant developments have been undertaken by government in the last 12 months to take this forward. However, there is some way to go to deliver on the aggregation vision and government will need to actively encourage, enable and support pragmatic aggregation projects at the regional level.

Infrastructure Sharing

36. As mentioned above, significant capital is required to achieve wider scale broadband roll out. A substantial part of the capital requirement, particularly at the local access network level, is for civil infrastructure, i.e., the trenches, ducts, poles, masts and buildings needed to accommodate the transmission networks. However, if this civil infrastructure

- were shared, the overall investment costs could be significantly reduced and the barriers to new network deployment lowered.
37. The BSG has therefore proposed that the establishment of third party Civil Infrastructure Utilities should be encouraged to provide civil infrastructure that can be used and shared by network operators (both wireless, mobile and fixed) to deploy new networks.
 38. As the civil infrastructure utility would be available for use by competing access operators, it would encourage multi-operator, multi-technology competition in the local network in areas where competing access infrastructures would not be commercially viable. The 'third parties' could include RDAs, local authorities, community groups, construction companies or financial institutions coming together in an attempt to facilitate the provision of broadband access in their areas. The concept could develop as follows:
 - The local or regional authorities would decide to ensure the creation of civil infrastructure suitable for telecommunications networks (ducts, manholes, masts, co-location sites etc.) in their area and look for commercial partners.
 - The partnership would finance and construct the infrastructure.
 - The infrastructure would be leased to operators of both wireless and fixed networks at non-discriminatory prices.
 39. For some areas of the UK, the commercial viability of broadband provision may be questionable even after the deployment of third party civil infrastructure. In such cases, local authorities may decide to create financial incentives to attract operators to provide services to the general public, possibly in combination with demand aggregation schemes.

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