



## Getting up to speed: making super-fast broadband a reality

**Decisive action is needed to attack the developing economic recession. While short-term intervention is needed to cope with its immediate impact, government should also use this opportunity to address the fundamental challenges we face in the next few years. This will enable the UK to emerge from the recession in a far stronger position.**

**Next-generation, super-fast broadband will be a vital part of the emerging digital economy's infrastructure, enabling dramatic improvements in connectivity and offering new possibilities for businesses, public services and local communities.**

**NESTA estimates that the provision of universal super-fast broadband could directly create 600,000 new jobs, with £18 billion added to GDP. The indirect effects could be far larger. California is an economy approximately the size of the UK – it has been estimated that ultra-fast broadband installation there could add \$366 billion to economic output and create two million new jobs.**

**But this fibre-optic infrastructure is expensive, with a baseline cost of widespread provision running to £5 billion. NESTA is recommending a radical new deal with the telecommunications industry that will deliver super-fast broadband rapidly and at minimal immediate cost to consumers or government. Ofcom, the communications regulator, should use its powers to provide radio spectrum access rights to communications companies in return for installing a fibre-optic broadband network: a 'spectrum for speed' swap. In addition, with intelligent government procurement, this will rapidly deliver the universal super-fast broadband network the UK will need to compete in a digital world. As part of this deal, broadband providers will be required to deliver free, basic broadband services to the most deprived households in the UK.**

### Attacking the networked recession

#### The first true networked recession

This is the first true 'networked recession': the first where our ultra-connected world, linking billions of us together as never before in history, faces a global economic challenge. NESTA has argued that the UK needs a strategy not just to cope with the recession, but to attack it: the downturn is an opportunity for the UK to emerge as more innovative and more competitive than its trading partners.<sup>1</sup>

An effective attack on the recession will mean developing and reinforcing those networks that create value. By massively expanding the UK's internet capacities, we can both provide a short-term stimulus to the economy and deliver

a vital piece of network infrastructure that will drive economic growth for decades to come.

### Next-generation internet access is vital for future economic growth

#### The internet is the crucial infrastructure for future innovation and growth

The internet is a strong driver of economic growth.<sup>2</sup> Web applications, services and platforms improve productivity and make it easier for businesses to collaborate and access new markets via digital distribution and online retail.<sup>3</sup> Internet access increases consumer choice and strengthens competition. It also enables the development of innovative, more efficient and inclusive ways to deliver public services.

1. Leadbeater, C. and Meadway, J. (2008) 'Attacking the Recession: how innovation can fight the downturn.' London: NESTA.

2. An analysis of the impact of broadband on economic growth in 120 countries between 1980 and 2006 has shown that an extra ten percentage points in broadband penetration by 2006 accounted for a 1.21 percentage point increase in per capita Gross Domestic Product (GDP). See D'Costa and Kelly (2008) 'Broadband as a platform for economic, social and cultural development: Lessons from Asia.' Paris: OECD.

3. Broadband Stakeholder Group (2004) 'The Impact of Broadband-enabled ICT, Content, Application and Services on the UK Society and Economy to 2010.' Available at: [http://www.broadbanduk.org/component/option,com\\_docman/task,doc\\_view/gid,111/](http://www.broadbanduk.org/component/option,com_docman/task,doc_view/gid,111/)

## Super-fast, next-generation broadband offers dramatic new possibilities

As online applications, services and networks become more powerful, so do the potential benefits from pervasive high-bandwidth internet access. Cloud computing, for example, will enable businesses to store their data and applications in online servers, reducing substantially their hardware and software costs.<sup>4</sup> Online doctor consultations will increase the efficiency and convenience of health provision, particularly for older people.<sup>5</sup> Improvements in the digital distribution of high-quality content will open up new creative and commercial opportunities for content owners, while innovative social media and platforms will enable people to collaborate with each other more easily regardless of the distance.<sup>6</sup>

In order to harness these benefits, it is however necessary to improve data transmission speeds through an upgrade of the existing network infrastructure. This requires replacing its copper backbone with fibre-optic.<sup>7</sup>

## But the UK is lagging behind in the deployment of super-fast broadband

### Other nations have taken a lead in super-fast provision

While consumers and businesses in South Korea and Japan<sup>8</sup> have access to connection speeds of up to 100 megabits per second (Mbps) at affordable prices, the average UK broadband speed is 3.6Mbps.<sup>9</sup> As demand for digital content and business applications grows, so will pressure on the current infrastructure, reducing connection speeds even further.

The US and China, and other European countries including Sweden, Denmark, the Netherlands and Italy are already laying down super-fast 'fibre to the home' (FTTH) networks. Similar developments in the UK, however, have been more sluggish.<sup>10</sup> Recent announcements by major broadband providers of significant investments in new infrastructure are helping to close the gap. But decisive government intervention can accelerate the delivery and act as a short-term economic stimulus. It is time to move beyond the recommendations of the Caio Report.<sup>11</sup>

## The 'digital divide' between those with internet access and those without remains wide, and may grow wider

Even access to normal-speed broadband internet in the UK is uneven, with 56 per cent of households now having basic access, compared to 68 per cent in Japan, 67 per cent in Sweden and 74 per cent in the Netherlands.<sup>12</sup> Low-density rural areas are particularly badly served, while households in the lowest income groups are most unlikely to have broadband access. Twenty-eight per cent of UK citizens have never been online.<sup>13</sup> Public concern has been growing about a new 'digital divide' between those with access to the digital economy, and those excluded.

### Upgrading to universal super-fast broadband can add billions to UK GDP

The direct economic benefits of super-fast broadband will be substantial. Based on the South Korean super-fast upgrade, 600,000 new UK ICT jobs can be created in four years, adding £18 billion to GDP.<sup>14</sup> The indirect benefits will be larger still. It has been estimated that the deployment of a one-gigabit per second network in California, an economy the size of the UK, would create two million new jobs and contribute \$366 billion to Gross State Product in seven years.<sup>15</sup>

The experience in South Korea and Japan shows that fast broadband is a driver of innovation with real economic impacts. By creating strong demand for online goods and services, it has supported the growth of innovative digital content providers, such as online games developers, which are now global leaders.<sup>16</sup>

But internet access not only allows people to do things more efficiently, it also allows them to achieve completely new and unexpected things. The wave of ICT-based innovation that we have witnessed in the last two decades will intensify as bandwidth constraints are removed through improvements in infrastructure. These impacts are, by definition, impossible to fully anticipate but can be hugely significant for society.

### However, the costs are substantial

The Broadband Stakeholder Group (BSG) is an independent advisory body to the government on broadband issues. It has carried out a comprehensive analysis of the likely costs of widespread super-fast broadband coverage in the UK. Providing the fibre-optic cable infrastructure across the country that will deliver street-level access to super-fast

4. Plum Consulting (2008) 'A Framework For Evaluating the Value of Next-Generation Broadband.' London: Plum Consulting.

5. OECD (2008) 'Broadband Growth and Policy in OECD Countries.' Paris: OECD.

6. Benkler, Y. (2007) 'The Wealth of Networks.' New York: Yale University Press.

7. Plum Consulting (2008) 'A Framework For Evaluating the Value of Next-Generation Broadband.' London: Plum Consulting.

8. DTI (2005) 'Exploring the Broadband Opportunity: Lessons from South Korea and Japan.' London: DTI.

9. Ofcom (8 January 2009) 'Average speed.' Available at: <http://www.ofcom.org.uk/media/features/b speeds>

10. Heavy Reading (2005) 'FTTH in Europe: Forecast and Prognosis 2006-2011.' London: Heavy Reading.

11. Caio, F. (2008) 'The Next Phase of Broadband UK: Action now for long term competitiveness. Review of Barriers to Investment in Next Generation Access. Final Report.' London: HMSO.

12. OECD (2008) 'OECD Information Technology Outlook.' Paris: OECD.

13. Dutton, W.H. and Helsper, H.J. (2008) 'The Internet in Britain 2007.' Oxford: Oxford Internet Institute.

14. Based on South Korean Ministry of Information and Communication figures cited in Lee, H., Oh, S. and Shim, Y. (2005) Do we need broadband? Impacts of broadband in Korea. 'Info: the journal of policy, regulation and strategy for telecommunications.' 7:4, pp.47-56(10).

15. Gartner, Inc. (2003) 'One Gigabit or Bust Initiative: a broadband vision for California.' Stamford, CT: Gartner, Inc.

16. DTI (2005) 'Exploring the Broadband Opportunity: Lessons from South Korea and Japan.' London: DTI.

broadband (50-100Mbps) will cost £5 billion.<sup>17</sup> This will provide access to broadband services to households, businesses and public services across the country, which are up to 33 times faster than the current average speed. Some of the UK's super-fast broadband will need alternative delivery options, such as super-fast wi-fi access.

This is a significant expense at a time of increased pressure on budgets, public and private. Long-term investments by private companies can be viewed as an unnecessary expense by shareholders in straitened times. However, government finances are also facing a substantial squeeze from both increased public expenditure and falling tax receipts, reducing the ability of public funding to make good a private deficit.

### **Slowing the delivery of super-fast broadband will hurt the UK's chances of recovery from recession**

#### **Future competitive advantage will depend on fast connection speeds**

But slowing delivery of super-fast broadband now, as a result of recession, will prevent the UK from making a speedy economic recovery. As broadband-intensive applications and services become widespread, UK businesses will become less able to compete with companies in countries that have upgraded their network infrastructure. Slow broadband connection speeds that reduce the uptake of these technologies will make UK companies less cost-efficient, competitive and able to collaborate with partners in faraway locations.

The provision of next-generation broadband is therefore currently uncertain. It has been estimated that, without intervention, the private sector will deliver super-fast broadband coverage across two-thirds of the UK. However, in the current economic climate, investment in infrastructure is at risk of slowing down. Access to the rest of the UK is very challenging. The public sector needs to intervene, supporting the private sector in providing national coverage.

### **The government must use all the levers at its disposal to improve nationwide broadband access**

#### **Regulation can release enormous value**

Ofcom is the national communications regulator for the UK. It has a substantial range of powers, covering communication by both radio and wire. This provides Ofcom with the potential to create enormous amounts of value for businesses looking to provide broadcast or communications services in the UK. The auction of some 3G mobile spectrum licences, for example, giving telecoms companies the ability to provide next-generation phone services, raised £22 billion for the UK government.

#### **Communications services are becoming more integrated**

In the eight years since that auction, we have seen a growing integration of communications providers across different technologies. Digital media convergence means that integrated telecoms companies now have interests in providing services through a variety of distribution methods – broadcasting, internet and fixed and mobile phone services.

#### **And access to radio spectrum remains very valuable**

New entrants to the broadcast media markets are looking to expand their existing audiences through the provision of new channels and services through new technologies such as super-fast wireless internet. Demand for spectrum is growing. Last year's US spectrum auction, selling radio frequencies released by the switch to digital broadcasting, raised \$18 billion. Newly-released UK spectrum will also be very valuable.

#### **Ofcom should swap spectrum for infrastructure delivery**

Ofcom is in a position to allocate highly sought-after licences for radio spectrum in exchange for the delivery of super-fast broadband infrastructure. It should make full use of these powers to incentivise the delivery of vital national infrastructure.

Once the relatively high cost of infrastructure is in place, new services are relatively cheap to launch and deliver. Consumers will benefit from more services – from broadcast media to local community applications. Premium paid-for services will give consumers ultra-fast access at up to 2,500Mbps.

17. This is the cost of 'fibre to the cabinet' (FTTC) provision. Providing fibre-optic cabling directly into individual households, replacing existing copper wires, is estimated to cost at least £25 billion. This is prohibitively expensive and in any case the FTTC system allows for future fibre-optic expansion into households and businesses, should they want it. See Analysys Mason (2008) 'The costs of deploying fibre-based next-generation broadband infrastructure: final report for the Broadband Stakeholders Group.' London: Broadband Stakeholders Group.

## Using public procurement to deliver rapid broadband roll-out

### Public investment to provide super-fast broadband access to schools, hospitals and other public buildings can act as a lever for the private sector

The success of the North Yorkshire's Net (NYnet) initiative<sup>18</sup> is an example of how the public sector can take the lead with innovative procurement policies that connect public buildings to super-fast broadband infrastructures, attracting subsequent investments from the private sector.

The North Yorkshire County Council, with support from Yorkshire Forward and Government Office Yorkshire and Humber has invested £2.2 million on the deployment of fibre-optic broadband network connecting schools, hospitals and other public sector buildings across the county. Their pooled resources support a sustainable, open-access network that private operators can then extend to connect up households and businesses. North Yorkshire, a region where broadband deployment was considered commercially unviable in many areas, now boasts a 100 per cent rate of broadband access.<sup>19</sup> The delivery of next-generation broadband services is in the pipeline.

Replicating this model for other rural areas would enable the very rapid delivery of broadband access across the country. The Department for Innovation, Universities and Skills should work with the Regional Development Agencies and local public sector bodies to create regional coalitions able to deliver broadband through public procurement, using Yorkshire as an example.

### Extending the network and looking ahead

To accelerate the move to super-fast broadband, NESTA recommends that planning guidance and building regulations make allowance for the provision of broadband services alongside conventional utilities like gas, electricity and water.

Utility companies should be encouraged to help provide the necessary upgrades to cables and fibre-optic when they maintain their own infrastructures. This will dramatically reduce the costs of laying fibre into homes.

## Free broadband for the most deprived

### Overcoming the 'digital divide'

But simply providing the technical infrastructure for super-fast broadband across the UK will not be enough to deliver a fully-connected Britain. Concerns have been raised about a growing 'digital divide' in the UK. Forty-two per cent of households currently have no broadband service, and these are often the most deprived or socially excluded.<sup>20</sup> We are in danger of creating a new 'digital underclass', unable to participate fully in the digital economy, excluding them still further from society.

NESTA estimates that the lump-sum cost to service providers of granting five years' free, basic broadband access to those claiming Income Support at £1.175 billion.<sup>21</sup> Ofcom should use its licensing powers to grant spectrum licences in return for free conventional broadband access for those households. The Department for Work and Pensions should work with broadband service providers to ensure the correct households are targeted.

### Using public broadcasters to drive broadband adoption

Providing access to the service alone will not guarantee adoption. There is a major role for content publishers to help drive demand for broadband. Public service online content provided by the BBC, Channel 4 and others is high quality, trusted by consumers and dedicated to creating public value. Initiatives such as the BBC's iPlayer and the recent launch of Channel 4iP demonstrate that public service broadcasters can make a positive difference in encouraging take-up. This contribution must be recognised by policymakers when considering the challenges to broadband adoption.

18. See <https://www.nynet.co.uk>

19. ZDNet (3 January 2006) 'Yorkshire hits 100 per cent broadband coverage.' Available at: <http://tinyurl.com/9bqmco>

20. British Telecommunications plc (1 April 2005) 'Broadband Deprivation Analysis: potential targets with low deprivation and low broadband access.' Available at: [www.btwholesale.com/pages/downloads/broadband\\_extra/marketing/mrc/2005/may/targetsbasedondeprivationfinal3.ppt](http://www.btwholesale.com/pages/downloads/broadband_extra/marketing/mrc/2005/may/targetsbasedondeprivationfinal3.ppt)

21. Estimate based on 75 per cent take-up over five years for those on Income Support, and 25 per cent take-up amongst pensioners.