



Select Committee on Communications

INQUIRY INTO SUPERFAST BROADBAND

Written evidence

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1. The House of Lords Select Committee on Communications is seeking evidence on the question of whether superfast broadband will meet the needs of a “bandwidth hungry” United Kingdom. This submission addresses the need to understand what a “bandwidth hungry” United Kingdom actually requires in terms of broadband connectivity, and notes the importance of developing a clear understanding of broadband as infrastructure.
2. The UK Government’s broadband strategy “Britain’s Superfast Broadband Future”¹⁷¹ does not offer a clear definition of broadband, it simply notes a target download speed for broadband services in the UK. The same is true of the Call for Evidence. The first point of business for an inquiry into the government’s broadband strategy must be to develop a full understanding of the characteristics of next generation¹⁷² broadband connectivity, and to develop a specific definition of the type(s) of broadband connectivity needed to achieve the government’s strategic objectives in encouraging the rollout and take-up of broadband across the UK. Consideration of network attributes in addition to download speed is essential.
3. In developing an understanding of the characteristics of broadband networks, the difference between today’s commercial Internet services and broadband networks developed as communications *infrastructure* must be understood. This point is explained below.
4. Consumers understand broadband networks as Internet connections. They acquire fixed or wireless broadband access through Internet service providers (ISPs), and the services they use operate “on top of” the commercial Internet. To use the Internet, consumers must have an access device and a connection to an Internet service. The most common access devices are computers, tablets, or smartphones but newer model television sets and game consoles can also function as Internet access devices. Consumers do not generally have access to broadband services delivered outside the current ISP business model.¹⁷³

¹⁷¹ Department for Business Innovation & Skills, & Department for Culture Media and Sport (2010). *Britain’s Superfast Broadband Future*. London: Department for Business, Innovation and Skills. <http://www.culture.gov.uk/publications/7829.aspx>. Referred to throughout this submission as the broadband strategy.

¹⁷² Although the term ‘superfast’ may resonate with citizens and policy makers to describe broadband networks, it has no generally agreed upon meaning. The term ‘next generation’ broadband is used in this submission to refer to the networks that will provide broadband connectivity in the future. Next generation networks are replacing the copper and hybrid-fibre coax (HFC) cable networks that were first used in the late 1990s to deliver broadband services. Detailed discussion of next generation broadband networks is provided in OECD (2011). *Next Generation Access Networks and Market Structures*. Paris: OECD Directorate for Science, Technology and Industry.

¹⁷³ Internet protocol television (IPTV) or voice over IP telephony are exceptions to this statement, if IPTV and/or VoIP services are delivered over a managed broadband network independent of an Internet service. However, such services are not considered broadband services in the same way as Internet services, and a household that only had a VoIP telephone or only used IPTV would not be counted as a household that had a broadband connection (nor would it likely consider itself to have a broadband connection). As such the common definition and understanding of what a broadband service is is tightly bound to the delivery of Internet access. Broadband can be used in other ways, but this is not well understood by the general public, nor is it a common practice as yet.

5. It is possible to deliver services over broadband networks outside the current ISP business model. In simple terms, what this means is that rather than using the commercial Internet, services can be provided over what are often called “managed networks.” Managed networks are designed to offer a higher, more reliable quality of service than the commercial Internet which operates on a “best effort” basis.¹⁷⁴
6. Broadband networks can be designed to allow for the delivery of best-effort commercial Internet services as well as offering managed services with different quality characteristics. For instance, Australia’s National Broadband Network (NBN) is designed to offer multiple classes of service, each with different performance characteristics, supporting voice, video streaming, premium data, gaming and business services, and internet access.¹⁷⁵ The Alberta SuperNet is another example of a next generation broadband network that supports delivery of managed services, in this instance enabling telemedicine, video conferencing, and delivery of other government services within the Canadian province of Alberta.¹⁷⁶
7. Australia’s NBN is designed to be “a significant piece of Australian critical infrastructure that will underpin the provision of a range of essential services to the Australian community.”¹⁷⁷ Likewise, the Alberta SuperNet is public communications infrastructure. These next generation broadband networks were designed to offer much more than commercial Internet access, and offer much potential to enable the delivery of a wide range of services over broadband networks.
8. Both the Alberta SuperNet and the Australian NBN operate on an “open access” basis, meaning that any qualified service provider can use the network (for a fee) to provide a service to any user connected to the network.¹⁷⁸ These networks offer uniform service quality across the network,¹⁷⁹ meaning that a service provide can develop a service with the confidence that it will work for all network users.

¹⁷⁴ This distinction is explained in Middleton, C. A. (2010). Delivering Services over Next Generation Broadband Networks: Exploring Devices, Applications and Networks. *Telecommunications Journal of Australia*, 60(4), 59.01 - 59.13.

¹⁷⁵ Voice and internet access services are currently available, with plans to roll out the other service classes in the next 2 years. See NBN Co Limited (2011). NBN Co Fibre Access Service Traffic Class Performance Discussion Paper. <http://www.nbnco.com.au/assets/documents/traffic-performance-whitepaper-dec-2011.pdf>, and NBN Co Limited (2010). *Corporate Plan 2011 – 2013*. <http://www.nbnco.com.au/assets/documents/nbn-co-3-year-gbe-corporate-plan-final-17-dec-10.pdf>.

¹⁷⁶ <http://www.servicealberta.gov.ab.ca/AlbertaSuperNet.cfm>. An overview of the Alberta SuperNet is provided in Middleton, C. A., & Given, J. (2010). Open Access Broadband Networks in Australia, Canada, New Zealand and Singapore. *Telecommunications Policy Research Conference*. Arlington, VA.

¹⁷⁷ Wong, P., & Conroy, S. (2010). *Statement of Expectations*. Canberra: Government of Australia. http://www.dbcde.gov.au/__data/assets/pdf_file/0003/132069/Statement_of_Expectations.pdf.

¹⁷⁸ The Next Generation Nationwide Broadband Network in Singapore operates along similar lines. <http://www.ida.gov.sg/Infrastructure/20090731125844.aspx>

¹⁷⁹ 93% of Australian premises will be served with a fibre connection, the remaining 7% will be connected by satellite or fixed wireless service. A minimum speed configuration of 12 Mbps download, and 1 Mbps upload will be available to all premises in the country, with those in the fibre footprint having access to the much higher speeds that fibre can offer (a 100 Mbps download/40 Mbps upload service is currently available). The differentiated classes of service will be available across all connection types. Information on the NBN’s offerings is available at <http://www.nbnco.com.au/getting-connected/service-providers/product-components/product-and-pricing-overview.html>.

9. The underlying business models for next generation broadband infrastructure¹⁸⁰ like the Alberta SuperNet and Australia's National Broadband Network are fundamentally different than the one for commercial Internet service provision. Broadband designed as infrastructure and operated on an open access basis offers more options for the delivery of high quality broadband services than broadband networks developed by commercial Internet service providers.
10. The use of managed broadband networks for service delivery rather than the commercial Internet has the potential to make services more widely available and easier to use, especially for those who are not very digitally literate. Services can be delivered to a variety of devices (e.g. television set, custom designed health equipment) and do not require the service recipient to have computer skills or be "on the Internet" as we understand it today. An individual must be connected to a broadband connection to receive a broadband service, but many services can be delivered without the recipient having an Internet service.¹⁸¹
11. The call for evidence claims that "Superfast broadband enables high-bandwidth content to be delivered quickly across the network, enabling users to access a range of services such as telemedicine, improved video conferencing and the streaming of HD or 3D video content." It is accurate that broadband networks *can* be used to provide telemedicine, video conferencing and video streaming services, but in order to enable high speed broadband networks to deliver these services in an effective way, the network must be designed to support such services. The managed service approach to network design adopted in Australia and Alberta offers examples of how broadband networks can be used to deliver services outside the existing commercial ISP model.
12. Commercial Internet services can be provided over any broadband network, but to date, there is not a clear model that would allow independent service providers to deliver managed services (e.g. telemedicine, video conferencing) on a commercial ISP's broadband network. The experience of using a commercial Internet service provider's network may be quite different than that of using a managed network, even if the networks operate at similar speeds. For instance, any customer accessing a 12 Mbps download/1 Mbps upload service on Australia's National Broadband Network is guaranteed these speeds. A customer accessing a digital subscriber line (DSL) service from a commercial ISP might be offered download speeds of "up to" 24 Mbps, but the network is not designed to guarantee these speeds to all customers.
13. An assessment of the government's broadband strategy must recognise and take into account the differences between commercial Internet service provision and the development of next generation broadband networks as infrastructure available for use by all interested service providers. It is not the intent of this submission to make a recommendation as to the characteristics of broadband connectivity to be made

¹⁸⁰ For further discussion of broadband as infrastructure, see Middleton, C. A. (2008). *Information and Communication Technology (ICT) Infrastructure as Public Infrastructure: Final Report of the Community Wireless Infrastructure Research Project*. Toronto: Ryerson University. http://www.cwirp.ca/files/CWIRP_Final_report.pdf.

¹⁸¹ For an excellent description of how managed services can offer accessibility to a wider range of service recipients, see Internet Society of Australia, & Australian Communications Consumer Action Network (2011). *National Broadband Network: A Guide for Consumers*. Sydney: ISOC (AU) and ACCAN.

available to the citizens of the UK, but to establish that there is an important difference between commercial Internet service provision and the development of next generation broadband as infrastructure. The inquiry should recognise this difference and address it in its consideration of the type of communications infrastructure required in the UK over the next 20 years.

14. The call for evidence asks “Will the Government’s targets be met and are they ambitious enough? What speed of broadband do we need and what drives demand for superfast broadband?” The discussion above explains why simply setting a target speed for broadband is not sufficient to ensure that broadband networks can deliver a wide range of high quality services. The government needs to develop a clear understanding of what broadband capacity is needed to meet the needs of UK citizens and the businesses, NGOs, and government agencies that provide services to them. The targets should address more than network speed, also considering the need for quality of service options, and for network access for qualified service providers.¹⁸²
15. The broadband strategy states that “Superfast broadband will provide the foundations from which the UK economy will grow and recover from the recession. It will change the way we do business, how we interact with people and how we access entertainment. It will offer better and more efficient channels for delivering public services, making them more accessible. It will reduce costs for consumers and enhance the capability of businesses to communicate and exchange information with their customers and suppliers. This is fundamental to our future prosperity” (p. 7). In order to realise these benefits, it is necessary to develop a clear understanding of the specific mechanisms by which access to broadband connectivity will enable these goals. For instance, what are the models for service delivery? What services could be delivered over the commercial Internet? What services are better suited for delivery using managed networks? What assumptions are in place regarding service delivery location? Is it assumed that to receive the benefits of next generation broadband, individuals will access broadband services in their homes? What equipment is needed for individuals to receive services? Are there services that should be available free of charge, or on a subsidised basis? What services are considered essential and what are the minimum network specifications required to deliver these essential services? These are just some of the questions that must be considered when determining whether the broadband strategy will be effective in enabling UK citizens to benefit from access to next generation broadband connectivity.
16. The call for evidence asks “What communications infrastructure does the UK ultimately need to remain competitive and meet consumer demand over the next 20 years?” Reiterating the comments above, a clear vision of the purpose of this communications infrastructure is required. Questions to be considered should include: What does this infrastructure need to enable? Should it be a uniform, ubiquitous infrastructure that is open to all potential service providers? Answers to these questions will help determine whether the current strategy, which focuses on

¹⁸² See Middleton, C. A. (forthcoming). Beyond Broadband Access: What Do We Need to Measure, and How Do We Measure It? In P. Napoli (Ed.), *Beyond Broadband: Developing Data-Based Information Policy Strategies*. Bronx, NY: Fordham University Press.

encouraging the private sector to build faster Internet services, will deliver the communications infrastructure the UK needs.

17. The question of location of use of next generation broadband networks is a critical one in developing broadband infrastructure that will serve the needs of citizens and service providers. Policy makers have taken a technologically neutral stance in encouraging the development of next generation broadband networks, suggesting that connectivity provided by fixed or mobile technologies can meet users' needs. Although speeds may be the same, the functionality and usefulness of a fixed next generation connection (providing service in a single location, e.g. at home) is very different from a mobile broadband connection (providing service anywhere a subscriber chooses). If services are to be delivered over next generation broadband networks, should such services be available in any location? Should a government broadband strategy ensure that whatever broadband characteristics are deemed important are available on a mobile basis as well as to fixed locations?¹⁸³
18. To summarise, this submission makes the case that the design of next generation broadband infrastructure matters. In developing the UK's broadband strategy, policy makers must articulate a clear vision of how broadband connectivity can provide benefits to citizens, and then ensure that the strategy delivers the broadband infrastructure that allows such benefits to be realized.

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¹⁸³ These points are addressed in Middleton, C. A., & Bryne, A. (2011). An Exploration of User-Generated Wireless Broadband Infrastructures in Digital Cities. *Telematics & Informatics*, 28(3), 163-175, and Middleton, C., & Given, J. (2011). The Next Broadband Challenge: Wireless. *Journal of Information Policy*, 1(1), 36-56.