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National Broadband Network
Request for Submissions on Regulatory Issues
regulatory@dbcde.gov.au

Regulatory Issues Associated with the National Broadband Network (NBN)

Google is grateful for the opportunity to submit comments regarding regulatory issues associated with the National Broadband Network.

As we discuss below, Australia has a tremendous opportunity to create untold benefits for Australian consumers and business by ensuring a proper regulatory, market, and technical framework for the NBN's development.

Executive summary

Google imagines an Australia in which broadband Internet is universally accessible, at world class speeds, at affordable prices. Faster broadband, in more places, delivered over a wider range of technologies, at prices that enable the services to be fully used as part of Australians' daily lives, will ensure that Australians can fully engage in the global digital economy and Australian businesses can more effectively compete on the world stage.

Australia is a vital country for Google and makes a substantial contribution to Google's worldwide operations. Google Australia, with offices in Sydney and Melbourne, provides Google Inc. with local support and representation in Australia. We're thrilled that over 9m Australians choose our search engine and over 3.5m watch videos on YouTube each month. Millions more use our other products. We're focused on working to continually improve our services in Australia.

Google is born of a highly competitive ecosystem – the open internet – in which alternative services are only ever a click away and in which the only way to succeed is to provide superior services, through constant technological improvement, innovation and focussing on earning users' trust. Google does not rely on proprietary lock-ins, bundling or regulatory fiat for our users' patronage. We earn our users in a competitive and open environment, one click at a time.

Google Maps was invented in Australia and has become an enormously successful product worldwide, revolutionising online mapping, access to geographic information, and user generated content. The Google Australia engineering centre, which launched in May 2005, contributes to the development of Google products and services in Australia and around the world. Recent examples include Mapplets and Traffic for Google Maps.

Google commends the Australian Government for acknowledging the critical importance of broadband to the future of Australia and for its proactive, consultative

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approach in developing a national broadband policy. Google agrees with the Government that Australia's future productivity, wealth competitiveness and wealth creation relies on world class infrastructure and that in this global economy, no infrastructure is more crucial than advanced communications networks.

The NBN represents an historic opportunity to develop a forward-looking regulatory environment to enable Australian consumers to fully participate in all of the benefits of the digital economy.

In many ways, the Australian communications and regulatory environment is unique and our submission takes these particular factors into account. In this submission Google suggests several key points that the Government should consider in both selecting the operator of the NBN and designing the best regulatory environment to achieve the Government's vision for broadbanding Australia:

- An open Internet is good for Australian consumers and businesses. To unlock the full potential of the NBN and the Internet access it will deliver, it is crucial to implement policies that maintain the Internet's fundamentally open, neutral, non-discriminatory nature.

- As important as the goal of universal access to fast broadband is, it will also be the affordability of broadband services that will ensure that Australians will be able to fully embrace the significant benefits of participation in the digital economy.

- Google submits that it is essential that if the winning bidder for the NBN also operates retail services of its own, it should offer such services on a wholesale basis to competitor independent providers on equivalent, non-discriminatory terms (from the perspective of both price and non-price terms and conditions). Google believes that some form of strong and independently enforced functional separation, or structural separation, is necessary in order to achieve this key objective. In choosing the appropriate regime, it is important that the Government focus on the paramount goal of ensuring that the mandate and incentive of the network operator align with promoting consumer choice, competition, and innovation

- In designing the regulatory environment for the NBN, the Government should consider the ways in which broadband providers' practices can threaten the fundamental openness of the Internet. Consideration should be given to promoting a regulatory environment that protects user choice, competition and innovation on the Internet.

- Google is concerned to ensure that the Government's well-intentioned investment in the NBN does not inadvertently lead to decreased competition and access to broadband services in the short term. For example, if exchanges with existing copper-based competitive infrastructure are converted to fibre-based technologies early in the NBN rollout period, Australia may in fact see a

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net *decrease* in broadband service availability and competition, with corresponding price impacts for consumers. Similar to the analog-digital television switchover strategy, it may be necessary to undertake a phased conversion of Australia's broadband infrastructure from copper wire to fibre optic cable. It is essential that existing ADSL 2+ and similar competitive copper wire based broadband services continue to co-exist with the NBN, at least during a defined transition period.

- Internet users are increasingly important producers, not simply consumers, of content and applications. As such, the Government should ensure the availability of high symmetrical broadband speeds (both download/upload) as a critical enabler of the social and economic benefits to be derived from the NBN.

- The rollout of a robust, open and non-discriminatory domestic fibre network has the potential to create vast social and economic benefits for all Australians. However, Google is concerned that without major developments in the international capacity market, Australia's investment may not translate into the kinds of cost reductions and speed improvements users deserve. Australia could end up with a superhighway to the node, but if we only have a few expensive roads with high tolls connecting Australia with the rest of the world, Australian users won't be traversing the *world*wide web at the promised superhighway speeds at reasonable prices.

- With Australian taxpayers investing billions of dollars into a new FTTN network backbone, designing the regulatory environment for the NBN represents a perfect opportunity for the Government and regulators to re-consider the challenges in Australia's peering market and set some basic conditions and standards to ensure fair and non-discriminatory peering arrangements in Australia.

This submission is divided into 4 parts:

Part I – an introduction to Google and Google's vision for broadband in Australia

Part II – ensuring the greatest accessibility to affordable broadband for all Australian by ensuring equality between all broadband providers

Part III - maintaining an open Internet on the NBN

Part IV – additional regulatory issues raised by the NBN (including consideration of existing investments in broadband networks and the importance of symmetrical Internet services in a Web 2.0 environment).

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Part I - Introduction

About Google

Google is a leading provider of Web-enabled software applications, content, and services. Google initially became familiar to most Internet users as the provider of the Google search engine, which enables hundreds of millions of users around the world to find information quickly at the click of a mouse.

Google now provides various well known specialist search and information services, including Google News, Google Earth and Google Maps. More recently Google acquired the well-known YouTube service. YouTube is a platform for people to watch and share original videos through a Web experience.

Google is also the provider of numerous other services that help Australians find, share and organise information. Some of the better known include:

- Google Docs, an online collaborative suite of office products including word processing, spreadsheets and presentation software, which helps families, schools and businesses create and share documents from any computer with a web connection.

- The innovative Gmail, Google Talk and Google Calendar programs, which enable users to email, instant message, communicate and organise their schedules with ease.

- Picasa, which allows users to manage, edit and share their photographs online

- Blogger, which allows users to set up their own websites (or blogs) where they can publish their materials and have a voice on the web.

The one feature that unifies most of Google's diverse services is that they are provided to users for free. This "free" model is supported by online advertising, an area in which Google has also taken a leading role. Through our AdWords service ("Sponsored Links"), we help businesses worldwide connect with customers and audiences, via highly relevant (largely text-based) advertising. And through our AdSense product, websites around the world can choose to run "Ads by Google" on their sites, which provides a steady revenue stream to many web publishers.

These services are providing enormous assistance to small and large businesses around the world. We are particularly proud of the number of businesses in Australia – from the largest publishers to thousands of local family businesses – who are using Google to both increase sales and earn advertising revenue.

The services that Google provides are connecting millions of individuals, groups and businesses worldwide, especially in a geographically isolated country like Australia. As our CEO Eric Schmidt recently told reporters in a visit to Sydney in March 2008:

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> "*Google is helping Australians overcome the tyranny of distance. We measure distances not in hundreds of kilometres, but in milliseconds.*"

This is not just true for Google. The same can be said of other companies borne of Web 2.0 – names such as Yahoo, eBay, Amazon, MySpace, Facebook, all of which are enormously popular in Australia, and which give Australians an ability to connect, to share, and to be informed.

Australia is a vital country for Google and makes a substantial contribution to Google's worldwide operations. Google Australia, with offices in Sydney and Melbourne, provides Google Inc. with local support and representation in Australia.. We do this through a number of means:

- Helping Australians to use and understand Google's products. We're thrilled that over 9 million Australians choose our search engine and over 3.5 million watch videos on YouTube each month. Millions more use our other products. We're focused on working to continually improve our services in Australia. Google is born of a highly competitive ecosystem – the open internet – in which alternative services are only ever a click away and in which the only way to succeed is to provide superior services, through constant technological improvement, innovation and focussing on earning users' trust. Google does not rely on proprietary lock-ins, bundling or regulatory fiat for our users' patronage. We earn our users in a competitive and open environment, one click at a time.

- Google Maps was invented in Australia and has become an enormously successful product worldwide, revolutionising online mapping, access to geographic information, and user generated content.

- The Google Australia engineering centre, which launched in May 2005, contributes to the development of Google products and services in Australia and around the world. Recent examples include Mapplets and Traffic for Google Maps.

- We partner with local businesses to provide highly useful and local services for Australians – some of the more publicised recent examples include:

    1. our work with Transperth to incorporate Perth public transport timetables and routes in Google Maps;
    2. working with political parties and other information providers to create the innovative Google election site for the 2007 federal election, including polling booth locations and electorate information;
    3. working with various Universities (eg Macquarie) and schools (eg NSW Department of Education) to roll our Gmail services to hundreds of thousands of University and school students

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- We help thousands of small and large Australian businesses take advantage of Adwords and AdSense to achieve their business objectives.

- We work closely with Australian Universities through scholarships, close consultation, prizes and events to help to encourage students to study IT and computer science, which will develop a more skilled and competitive Australian workforce for the new information age.

- Through our support for open source software, and our provision of free developer tools – such as numerous APIs, Gears, Open Social, Google App Engine and the Google Web Toolkit, Google helps thousands of Australian Web developers to develop websites and innovative online businesses that will power our economy and create a more digitised and web-enabled society.

Google's self-defined mission statement is straightforward, if not daunting: to organise all of the world's information and to make it universally accessible and useful.

There are three aspects of Google's mission. In many ways, fulfilling two aspects of this far-reaching corporate goal (organising the world's information, and ensuring it is easy to use) are largely within the purview of the employees of Google – in Australia and abroad, along with hundreds of thousands of small business partners, vendors, and of course our customers. The greater challenge is the central component of our mission: universal accessibility. Like other Internet-based companies, Google relies on the communications infrastructure provided by underlying carriers in order to reach our ultimate end users.

As such, Google has a strong interest in the regulatory environment that will apply to the NBN – both to advance its own mission and also to ensure that consumers have the best possible access to fast and affordable broadband services.

Google's vision for broadband in Australia

Google imagines an Australia in which broadband Internet is universally accessible, at world class speeds, and at affordable prices. Faster broadband, in more places, delivered over a wider range of technologies, at prices that enable the services to be fully used as part of Australians' daily lives, will ensure that Australians can fully engage in the global digital economy and Australian businesses can more effectively compete on the world stage.

Google commends the Australian Government for acknowledging the critical importance of broadband to the future of Australia and for its proactive, consultative approach in developing a national broadband policy. Google agrees with the Government that "Australia's future productivity, wealth competitiveness and wealth

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creation relies on world class infrastructure. In the global economy of the 21st century, no infrastructure is more crucial than advanced communications networks."[1] Indeed, the United Nations has recognised broadband as essential infrastructure: as a utility that is just as necessary as water and electricity.[2]

As the Government's Request for Proposals (RFP) to roll-out and operate a National Broadband Network for Australia recognises, advanced broadband infrastructure is essential to the "future prosperity" of Australia, creating both economic and social benefits. In particular, broadband Internet access is increasingly at the centre of Australians' daily lives, as citizens, creators, consumers, and producers.

The NBN will enable novel and transformative uses of the Internet, along with other sorts of network-based innovations and data transport services. Numerous countries have demonstrated that national broadband strategies and public sector leadership can be crucial to deployment[3], and Australia has wisely followed this course.

Google shares the Government's vision that the NBN will facilitate enormous technical advances for small business, innovative services in e-health and digital education, new communications opportunities (such as video conferencing and VOIP), better access to Government services and access to a wider range of entertainment options such as video on demand and Internet television.[4]

Google submits that there are additional benefits to be obtained by ensuring that Australians have access to faster and more affordable broadband services. These benefits flow from the positive value that the Internet can bring in and of itself, such as:

- Spurring creativity, such as the generation of user generated content facilitated by 'Web 2.0 applications such as YouTube, Facebook and MySpace
- Driving new forms of economic activity, such as people who enter advertising revenue sharing agreements with Google and earn an income through the popularity of their YouTube content
- Creating new forms of social engagement and interaction through Web-enabled means, such as social networking sites, or via citizen participation in democracy (see the 2007 Google Australian election initiative[5] or citizen participation via the Davos World Economic Forum channel on YouTube[6])
- Enabling Australian enterprises, government agencies and educational bodies to use Web-based applications to store documents in 'the cloud', where their

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[1] *ALP Policy Document New Directions for Communications. A Broadband Future for Australia – Building a National Broadband Network March 2007, www.alp.org.au,*

[2] *United Nations Conference on Trade and Development Information Economy Report UNCTAD/SDTE/ECB/2006/1, November 2006*

[3] *EDUCAUSE study:http://net.educause.edu/ir/library/pdf/EPO0801.pdf; see also OECD main findings 2008: http://www.oecd.org/dataoecd/32/58/40629032.pdf*

[4] *ALP Policy Document New Directions for Communications. A Broadband Future for Australia – Building a National Broadband Network March 2007, www.alp.org.au*

[5] *http://www.google.com.au/election2007/*

[6] *At the World Economic Forum, citizens were able to put questions directly to world leaders. See http://www.youtube.com/davos*

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documents will be available from any computer with an Internet connection, at greatly reduced storage and maintenance costs

- Enabling community groups to reach audiences in new and innovative ways, such as the BeatBullying YouTube channel aimed at addressing cyber bullying, or the Catholic Church's use of social networking for the upcoming World Youth Week in Sydney.

Available, fast, affordable

The NBN is an important step towards ensuring that more Australians have access to broadband at faster speeds. However, it is not just availability of broadband that is important. As critical as universal availability is – it will also be the *affordability* of broadband services that will ensure that Australians are able to fully embrace the digital economy. Google is pleased that the Government has recognised this key point and that the affordability of broadband services will be a critical element of the Government's consideration and an important policy focus.[7]

According to the OECD, broadband consumers pay more for less than their counterparts in many countries around the world. Australia ranks 23rd out of 30 countries in price per Mb/second, and the average speeds advertised by Japanese Internet providers are nearly 8 times those advertised in Australia.[8] Australians also face bandwidth caps (average of 14.75 GB) not present in many other countries, and face the highest costs for additional megabytes of data ($.011).[9] Some of these cost differences may stem from unique characteristics of the Australian market, most notably Australia's geographically diverse population and physical separation from other markets (although it should be noted that some studies have shown that population density does not fully explain broadband penetration across countries[10]).

Google submits that if appropriate safeguards are not built into the new regulatory environment, the NBN may simply replicate current problems within the existing market environment. Some current problems include broadband provider practices that threaten competition and innovation in the content and application markets and low speeds and capacities that frustrate consumer uses and innovation.

Regulatory settings required to achieve the broadband vision

Google submits that the Internet is too important to Australia's future to risk endangering the achievement of this critical national broadband vision by not fully embracing this historic opportunity to construct an appropriate regulatory environment that maximises the social and economic possibilities from the NBN in a

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[7] *Senator Stephen Conroy, Minister for Broadband, Communications and the Digital Economy, Speech to the Sydney Institute, Sydney, 6 May 2008.*
[8] *http://www.oecd.org/document/54/0,3323,en_2649_33703_38690102_1_1_1_1,00.html; http://www.zdnet.com.au/news/communications/soa/Australia-now-in-broadband-speed-top-ten/0,130061791,339283563,00.htm?omnRef=1337*
[9] *See OECD Broadband Portal: http://www.oecd.org/document/54/0,3343,en_2649_33703_38690102_1_1_1_1,00.html*
[10] *http://net.educasuse.edu/ir/library/pdf/EPO0801.pdf*

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manner that does not replicate known problems with the existing regulatory environment.

Paragraph 1.1.9 of the RFP states the Government's commitment to the promotion of both:

- the long-term interests of end- users
- the efficiency and international competitiveness of the Australian telecommunications industry.

These have been fundamental goals of Australian telecommunications regulatory policy in Australia since 1997. However, in the context of designing the optimal regulatory environment for NBN, and in assessing responses to the RFP and considering the NBN, Google submits that the long-term interests of end-users will be met by:

- ensuring greater accessibility of broadband services to all Australians
- guaranteeing fair and affordable prices for access seekers and consumers
- promoting efficient and innovative service delivery on the NBN.

This submission will expand on the regulatory conditions Google believes are necessary in order to meet these important goals. We will address seven key issues:

- Ensuring equal treatment for all broadband providers.
- Promoting an open Internet in Australia
- Preserving the benefits of existing investments in broadband services
- Acknowledging the importance of symmetrical Internet services
- Addressing known competitive issues, including international capacity constraints, and peering.

Part II – Accessibility of broadband services – ensuring equal treatment for all providers

In an optimal regulatory regime, the mandate and incentives of the NBN network operator would directly align with the public interest. In other words, the network operator would build its business model around and benefit from enabling competition, innovation, and consumer choice. The NBN network would then serve as a platform -- an input -- for myriad economic and social activities, by providing equal and non-discriminatory access to the network. The RFP correctly recognises the significance of "appropriate open access arrangements" (1.5) including "technical arrangements" (Schedule 2, 1.4) and "structural measures or models ... [that] prevent inappropriate self-preferential treatment" (1.5) in making sure that the network operator has the right incentives.

What if such incentives are not in place? The network operator's ability to abuse its gatekeeper status is a familiar problem, in Australia and around the globe. For decades, many economists believed that the communications market constituted a natural monopoly. While that thinking may no longer be applicable, significant

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barriers to entry suggest that the market should be seen as one featuring highly unnatural competition, and, in the absence of appropriate safeguards, the network operator will have an incentive to try to build its business model around extracting monopoly rents, leveraging its market power into other areas, and discriminating among uses and users of the network. Rather than creating a truly open platform for others, the network operator has as an incentive to privilege its own vertically-integrated or affiliated offerings. Once its business model is built in this way, a regulator's job becomes tougher, because the network operator will be likely to resist any action that would force it to alter its behaviour and threaten its supra-competitive profits.

Structural separation?

The RFP (at 1.10) requires proponents to submit arrangements for open access to their networks including:

- measures or models to ensure equivalence of access prices and non-price terms and conditions
- arrangements to allow access seekers to differentiate their service offerings to consumers.

Google understands that the Government is strongly considering adopting a structural or functional/operational regime separation of some sort to ensure open access on the NBN.[11] Google believes that this is critical from the perspectives of promoting open access to the NBN, plentiful and robust competition as well as preserving the Internet's openness.

Google submits that a fundamental goal of the NBN regulatory regime must be to separate the ownership of the NBN infrastructure from the provision of services over the new network. Structural separation commonly means that the owner of the network assets divests from other vertical markets, whereas functional separation requires varying levels of separation between functions, employees, and information within a company.

Recently, the OECD noted that "while [the costs of structural separation may outweigh the benefits] ... in the PSTN environment, it is not clear that it would still be valid in a fibre environment where high-entry costs may result in residents having access to only a single fibre network."[12] Many national governments have already mandated such policies, have been driving forces behind voluntary separation, or are supporting such policies in the future. For instance, we understand that the Government has taken note of regulatory developments in countries including:

- *The United Kingdom:* British Telecom has undergone a fundamental restructuring. Its new wholesale arm, Openreach, was launched in early 2006 to provide local communications infrastructure on an open and non-discriminatory basis to third parties. Under the watchful eye of OFCOM, the

[11] *http://www.itwire.com/content/view/18077/1095/*
[12] *http://www.oecd.org/dataoecd/32/57/40629067.pdf*

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British telecoms regulator, Openreach is designed to ensure that other communications providers face the same operational conditions as do BT's own retail arms. The key point is that BT's management has wholeheartedly accepted the wholesale/retail structural split, and point to improved profits and better services that have resulted.[13]

- *Singapore*: Last year, Singapore released an RFP for a "The Next Gen NBN [that] will offer pervasive and competitively priced ultra high-speed broadband connectivity to business users at the workplace as well as to Singaporeans at home, schools and learning institutions and other premises." In announcing the RFP, the Minister of Information stated: "As a policy, we have therefore decided to adopt separation between the different levels of the Next Gen NBN to achieve effective open access. The RFP to construct the network will therefore provide for structural separation of the passive network operator from the downstream operators." The passive network operator will then provide services to a separate wholesale entity, which will then offer broadband access to retail ISPs and will be operationally separated from any other such offerings.[14]

- *New Zealand*: On 31 March 2008, New Zealand approved an operational separation of Telecom NZ. Among other policies aimed at creating competitive, non-discriminatory access, this required "the establishment of at least three separate business units – a stand-alone, arms-length fixed network business network (referred to as the Access Network Services ... one or more arms-length wholesale units, and one or more arms-length business units that provide one or more other functions (for example, retail services)."[15]

- *The European Union:* EU Commissioner Viviane Reding explained in a speech last year why "Functional separation is in [her] view the right tool for the telecom sector" in order to create a barrier "between the access business and the services branch of the company, while non-discriminatory access is granted to service providers to the access network,"[16] and recently the European Regulators Group released a report that functional separation should be considered as an available remedy.[17] Meanwhile, *Sweden*[18], *Turkey*[19] and

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[13] *Statement issued by the Director General of Telecommunications, Effective Competition Review: Mobile. Released Sept. 26, 2001. Available at: http://www.ofcom.org.uk/static/archive/Oftel/publications/mobile/mmr0901.pdf. see also http://www.erg.eu.int/doc/publications/erg07_44_cp_on_functional_separation.pdf*

[14] *http://www.ida.gov.sg/News%20and%20Events/20071211184512.aspx?getPagetype=20*

[15] *http://www.med.govt.nz/templates/MultipageDocumentTOC____34436.aspx*

[16] *http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/07/624&format=HTML&aged=1&language=EN&guiLanguage=enif*

[17] *http://www.erg.eu.int/doc/publications/erg07_44_cp_on_functional_separation.pdf*

[18] *http://www.sweden.gov.se/sb/d/586/a/101046*

[19] *"Information Society Action Plan 2006-2010", State Planning Organisation, Turkey, July 2006 at: www.dpt.gov.tr/konj/DPT_Tanitim/pdf/Information_Society_Strategy.pdf*

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> *Ireland's* telecom Eircom[20] have all been weighing the possible benefits of different separation regimes.

In Australia, the ACCC has also recognised that:

> "a vertically separated ownership model could reduce incentives for the access provider to discriminate between downstream users of the access service and, therefore, facilitate strong and effective competition between access seekers in retail markets."[21]

In choosing the appropriate regime, it is important that the Government focus on the paramount goal of ensuring that the mandate and incentive of the network operator align with promoting consumer choice, competition, and innovation. In this regard, the benefits of full structural separation should be recognised. Because a structurally separated operator has no financial interest in any retail access provider whatsoever, or in any affiliated application or content services, it has no incentive to unreasonably discriminate among competing broadband access providers. Instead, its incentive is to build and maintain a network in a manner that ensures new innovations at higher layers of the network can thrive.

Google acknowledges that the possible benefits of structurally separating the winning bidder for the NBN (if necessary) should be considered carefully. It must be recognised that structural separation may eliminate the potential benefits of vertical integration such as reduced transaction costs. However, functional separation also provides less assurance that the network is truly operated in a non-discriminatory manner. As long as there is a benefit to providing self-preferential treatment, there will be an incentive to try to "game" the regulations. Functional separation aims to limit this behaviour, but it ultimately does not completely remove the underlying incentive to misbehave. The network operator need not eliminate competition, but rather can strive to simply impair or delay effective enforcement. Particularly as the network and technology evolves, it can become more difficult for regulators to monitor and evaluate the operator's changing behaviours. Accordingly, it is important to recognise that commentators and policymakers have raised concerns that functional separation may not go far enough to prevent anti-competitive conduct.[22]

For example, at the recent Fifteenth Online and Communications Council Communiqué on 21 May 2008, all State and Territory governments endorsed the following resolution:

> *"The state and territory Ministers expressed their strong preference for a solution [regarding the NBN] to be operated by a genuine wholesale provider that is separate from any retail service provider."*

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[20] *"Eircom break-up backed by FF", The Post – Ireland, 06 May 2007, at http://archives.tcm.ie/businesspost/2007/05/06/story23448.asp*

[21] *Graeme Samuel, ACCC, Regulatory Update for 2008, Speech to Australian Telecommunications Users Group Annual Conference, Sydney, March 13 2008*

[22] *See www.zdnet.com.au/news/communications/Telstra-must-split-if-it-wins-FTTN-bid-States/0,130061791,339289163,00.htm?feed=pt_national_broadband_network*

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This is also consistent with concerns expressed in 2004 by a Senate Committee enquiry into competition in broadband services in Australia. The Committee recognised the possible competitive harms that can flow from a sole provider offering both wholesale and retail services, and recommended:

> *"The Committee recommends that the Productivity Commission be tasked to undertake a full examination of all of the options for structural reform in Australian telecommunications, including but not restricted to, the structural separation of Telstra."*[23]

Google submits that it is essential that if the winning bidder for the NBN also operates retail services of its own, it should offer such services on a wholesale basis to competitor independent providers on equivalent, non-discriminatory terms (from the perspective of both price and non-price terms and conditions). Google believes that some form of strong and independently enforced functional separation, or structural separation, is necessary in order to achieve this key objective.

The RFP appropriately recognises that the design of the network and associated "technical aspects of open access" are also crucial. Some regulators and commentators have raised concerns that certain network designs may create challenges to providing non-discriminatory access to competing Internet access providers, including potential barriers to unbundling an FTTN network[24]. As such, Google submits that the Government should ensure that Proponents have clearly explained how network design will support open access. This should be demonstrated ahead of time, as design decisions meant to frustrate open access may be subtle, difficult to detect, and thus difficult to police. In this regard, Google submits that structural separation is more robust in ensuring that the network design truly facilitates competition; if the network operator's sole role is the innovative and profitable provision of wholesale services, then the NBN will be designed with that sole function in mind.

Google believes that the Government should also consider a range of other policies that will enable consumers to choose alternative providers with minimal "switching costs," particularly if the NBN network operator is allowed to have its own retail services. Even assuming the ability to choose another broadband provider in a particular area, providers can bind their customers with multi-year contracts, bolstered by substantial early termination penalties. The prevalence of bundling together different services also helps providers reduce "churn" (i.e., the use of competitive offerings). Such practices harm consumers and should be discouraged.

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[23] *Senate Environment, Communications, Information Technology and the Arts Committee, Report into Competition in Broadband Services, Recommendation 3, paragraph 4.77*

[24] *See statement of Commissioner Viviane Reding January 16 2008 http://www.egovmonitor.com/node/16700; Allen Consulting Study for Competitive Carriers Coalition companies (2006) http://www.allenconsult.com.au/publications/download.php?id=305&type=pdf&file=1*

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Part III – Ensuring the NBN delivers an open Internet in Australia

An open Internet promotes innovation, social discourse and economic growth

Google agrees with the Government that the NBN should "provide benefits to consumers by providing choice to run applications, use services and connect devices" (RFP 1.3.1.12). From its earliest days, the Internet has operated according to the principle that Internet access providers do not block, degrade, or discriminate among lawful content and applications. Instead, it is an environment of 'innovation without permission', where users are able to create and offer applications or content to others on the network, and users themselves are in control of what content and applications they access. This open, non-discriminatory architecture has given rise to fierce competition, constant innovation and unparalleled social benefits for the benefit of consumers, businesses and global economies.

The Internet's openness was not the result of mere whim or historical accident. It was deliberately designed to empower end-users in this manner. The Internet routes data equally, not favouring particular application or content providers over others and thus not inherently designed for any use in particular. Instead, it is a general purpose network to move data of all types, and end-users define its uses.

As Dr. Vint Cerf, Google's Chief Internet Evangelist and one of the architects of the Internet, has explained:

> "*The Internet was designed to allow the implementation of applications to reside largely with users at the "edges" of the network, rather than in the core of the network itself. This is precisely the opposite of the traditional telephony and cable networks, where applications and content are managed in the core (in headends and central offices), away from the users at the edge.*"[25]

As a result of this architecture, new applications and content, from the revolutionary to the merely useful, can be deployed and embraced by millions of individual users worldwide without the need for approval from gatekeepers and with minimal capital outlay (relative to many other networks). Applications and content succeed on their own merits – because users like them, not because particular intermediaries have picked them.

The power of open networks to inspire innovation is central to Google's story. When Google started as a project of two friends from Stanford University, they didn't have to ask anyone's permission to develop an Internet search engine. Rather, they were able to come up with a novel idea, implement it themselves, and let users access it. Google's co-founders, Larry Page and Sergey Brin, have noted on countless occasions that their tiny company likely would not have flourished had they needed to ask permission first in order to innovate.

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[25] *Prepared Statement of Vinton G. Cerf Vice President and Chief Internet Evangelist, Google Inc., U.S. Senate Committee on Commerce, Science, and Transportation Hearing on "Network Neutrality" (February 7, 2006)*

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Keeping the Internet open is about more than Google; it's about the next Google – and making sure that the Internet remains an open ecosystem, where new ideas can succeed, and new business models can flourish on their own merits. Indeed, Google's story is the story of myriad other companies that have become global brands in a matter of years or even months. Skype went from an Estonian start-up to being a major competitor in international calling. Facebook went from being a small college project to being a platform used by millions. Google recently held its second annual Developer Day in Sydney, where hundreds of web developers and entrepreneurs came to hear about the tools available to them to build web applications and programs. Google showcased Australian web businesses like Cleancruising.com and rememberthemilk.com, which use various Google developer tools as the basis of their services. They are reaching thousands and millions of users worldwide with innovative businesses and ideas. There are hundreds more, any one of which could be the next Google or Facebook.[26]

And it is the story not just of businesses, but also of other entities and individuals. Political and cultural groups as well as other communities of shared interest depend on the Internet to organise. Independent voices that typically could not afford access to traditional mass media platforms can now reach broad audiences. Today, "user-generated content" flourishes online, as individuals increasingly create and share content with one another. For instance, sites like YouTube allow individuals to share their creativity with local, national, and global audiences. With access to the most basic of computing tools, users can put a video online and develop an audience of millions.

The vibrant ecosystem of innovation that lies at the heart of the Internet has fueled unimagined economic, social, and personal growth. Given that an open, non-discriminatory Internet is the optimal outcome, the critical task is to determine the appropriate legal, regulatory, and/or market mechanisms to achieve that result. In developing the NBN, the Government should keep this goal firmly in mind.

Discriminatory network management practices threaten the open Internet

Google submits that in designing the regulatory environment for the NBN, the Government should consider the ways in which broadband providers' practices can threaten this openness. Consider, for example, conduct already present in the Australian market. A number of ISPs already engage in practices that privilege their own affiliated services over competitors by providing them to subscribers on an "unmetered" basis. Use of these services does not count against the subscriber's bandwidth cap.[27]

In a concentrated market for Internet access, this sort of behaviour can be troubling: threatening user choice, competition, and innovation on the Internet – ultimately to the detriment of Australian consumers. Rather than creating an environment in which

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[26] http://rossdawsonblog.com/weblog/archives/2008/06/official_launch.html
[27] *See for example: http://my.bigpond.com/whybigpond/#unmeteredentertainment*

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users are in control of what succeeds or fails, this type of discriminatory practice distorts the competitive playing field to suit the Internet provider's own interests. The unmetered services are provided with a significant advantage over all competitors. In an environment where the NBN would be the only equivalent network, this self-preferential treatment by a winning bidder would be particularly problematic.

The use of "unmetered services" is not the only way that broadband providers can undermine openness. In fact, it has become increasingly easy in recent years for access providers to technically limit and manage consumers' use of third-party Internet applications and content, by privileging, degrading, or discriminating among providers. Some access providers have begun degrading the performance of particular applications.[28] While such practices have been implemented in the name of handling congestion, broadband providers might also have an incentive to discriminate against Internet offerings that compete either with their own vertically-integrated Internet applications or content or non-Internet services such as voice telephony or video programming services. Whether carried out with benign or ill intent, such practices threaten to create a two-tiered Internet, where the access provider decides what innovations go in the "fast" and "slow" lanes and thus acts as a gatekeeper in the middle of the network.

What's more, broadband providers can abuse their bottleneck control over the last-mile and levy surcharges on users or third-party content providers in order to have their traffic delivered to end-users. Some ISPs have mooted the possibility of charging users (or content providers) extra for various services they claim are enjoying a "free ride" on Internet networks. Google submits that this analysis is simplistic, wrong and dangerous. Under the Internet's longstanding charging arrangements, each party pays for its own connection to the Internet and then is free to utilise that connection in whatever ways are desired. Content providers spend billions of dollars annually on R&D to create and deploy compelling content, applications, and services for Australian consumers, including news, data, video, music, gaming, and ecommerce services.

In order for the content and applications to be delivered into the Internet, so it then can be made available to consumers, content providers must arrange with network operators to: (1) carry the data traffic from company facilities to their Web servers over local telecom lines (the "last mile"); (2) carry the data traffic from the Web servers into the Internet over high-speed, high-capacity data lines ("special access"); and (3) carry the data traffic over the numerous interconnected networks that make up the Internet (the "Internet backbone"). To accomplish these important connectivity and transport functions in a fast and effective manner, content providers collectively pay billions of dollars per year to network operators, which fully compensates them

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[28] *For example, Comcast in the United States and Bell Canada have been interfering with certain Internet applications: see "In the Matter of the Petitions of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management": http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-08-91A1.doc; CAIP Part VII Application requesting certain orders directing Bell Canada to cease and desist from "throttling" its wholesale ADSL Access Services: http://www.crtc.gc.ca/PartVII/eng/2008/8622/c51_200805153.htm*

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for their network investment.

Broadband providers are permitted to collect charges from end users for providing broadband transmission and Internet access service that allow consumers to connect to the Internet. These charges can vary with the amount of bandwidth speed or capacity. However, allowing broadband providers to leverage their "situational monopoly" over terminating traffic would allow them to choose which content providers receive preferential treatment over others, which would distort the marketplace.

Google recognises that not all forms of differential treatment are necessarily problematic. Broadband providers have a legitimate need to manage network congestion, protect the security and integrity of their networks, and engage in a variety of other network management and business practices. However they must be required to do so in a manner that respects the fundamental architectural principles and values of the Internet.

Google submits that the Government should consider regulatory conditions that will preserve the fundamental open architecture of the Internet in designing the regulations to apply to the NBN. In this context, Google submits that structural or functional separation, as well as other pro-competitive policies, can be bulwarks against discriminatory practices. Absent robust competition in the Internet access market, broadband providers will have both the ability and incentive to leverage their market power and unreasonably discriminate among content and application providers. By contrast, robust competition in the access ISP market can check discriminatory behavior. If consumers have a multiplicity of truly competitive access provider options, then they can "vote with their dollar" and choose open networks over discriminatory ones.

Google submits that the Government should also consider crafting narrowly tailored non-discrimination rules that appropriately limit potential access provider misconduct, as competition may not be a panacea. There are many ways to express a non-discrimination requirement. In the United States, AT&T volunteered one definition as part of its merger with BellSouth, agreeing to protect four basic user freedoms[29] and committing "not to provide or to sell to Internet content, application, or service providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades or prioritises any packet transmitted over AT&T/BellSouth's wireline broadband Internet access service based on its source, ownership or destination."[30] While such a rule could be applied across all retail access ISPs, it is most important to be considered for the network operator's own retail services. The rule would work alongside the open access regime to check the ability of the network operator to leverage its market power into the Internet applications and content markets.

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[29] *These were outlined by the Federal Communications Commission: http://www.fcc.gov/broadband_network_management/#FCC-07-31*

[30] *Letter from Robert Quinn, AT&T to Marlene H. Dortch, Secretary, FCC, filed on Dec. 28, 2006, at 8-9 ("AT&T Letter").*

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Openness is consistent with the goals of the NBN

A central goal of the NBN is providing faster, more affordable broadband access. This goal is not in conflict with sustaining an open Internet.

There are both academic and real-world illustrations of how an open Internet actually creates enhanced incentives to invest in broadband facilities. For example, a recent econometric study at the University of Florida found that the cable and telephone companies providing broadband services are more likely to further develop their infrastructure, resulting in higher data speeds, if they do not charge Web-based content companies for preferential treatment.[31] As the authors concluded, based on detailed economic analysis, "the incentive for the broadband service provider to expand under net neutrality is unambiguously higher than under the no net neutrality regime." Obviously this outcome "goes against the assertion of the broadband service providers that under net neutrality, they have limited incentive to expand."

An excellent current example of an incumbent provider that embraces open on-ramps to the Internet is British Telecom (BT). As noted above, BT's management has wholeheartedly accepted its wholesale/retail structural split.[32] Further, in the United States, Verizon has made clear statements to the investor community that deploying fibre actually pays for itself.[33] Importantly, fibre deployment continues to reduce network costs and generate significant, ongoing savings in operating expenses. Verizon and analysts anticipate that FiOS will generate a positive operating income beginning in 2009, based on both growing revenues from FiOS services and the declining operational costs, resulting from fibre network efficiencies. Verizon's total fibre investment is expected to be EBITDA-positive in 2008. The costs to pass and connect homes have declined, and continue to decline, resulting in improved operational efficiency.[34] Analysts have observed FiOS will serve as a positive revenue source, where "it finally has reached the point where it will pay for itself in three-year payback."[35]

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[31] *Hsing Kenneth Cheng, Subhajyoti Bandyopadhyay, and Hong Guo, The Debate on Net Neutrality: A Policy Perspective, University of Florida (2007). Available at: http://www.hearusnow.org/fileadmin/sitecontent/TheDebateonNetNeutrality.pdf*

[32] *Statement issued by the Director General of Telecommunications, Effective Competition Review: Mobile, Sept. 26, 2001. Available at: http://www.ofcom.org.uk/static/archive/Oftel/publications/mobile/mmr0901.pdf; see also: European Regulators Group report, http://www.erg.eu.int/doc/publications/erg07_44_cp_on_functional_separation.pdf*

[33] *Verizon's Ivan Seidenberg claims that as Verizon builds FiOS networks over a period of four to five years, the company expects first to see positive cash flow, then to reach EBITDA positive, and finally to reach net income positive. Arshad Mohammed, Ivan G. Seidenberg Interview Excerpts, Washington Post, Jan. 31, 2006. Available at: http://www.washingtonpost.com/wp-dyn/content/article/2006/01/31/AR2006013101647_2.html*

[34] *Verizon Provides New Financial Data and Operational Details on its Fibre Network as Deployment Gains Momentum; Company Sees Positive Economic Returns; Customer Demand Proves Strong for FiOS Internet and TV Services, and Network Provides Platform for Innovation, PR Newswire, Sept. 27, 2006*

[35] *Sam Greenholtz and Mark Lutkowitz, Verizon's Clever Corrdiro Play, IT Business Edge, March, 21, 2006. Available at: http://www.itbusinessedge.com/item/?ci=13778. Fibre costs continue to decline,*

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An open Internet therefore can be seen to actually support the incentive to invest in capacity. Google submits that it is important to recognise that the policy considerations in the context of the NBN deployment are unique. In this situation the Government has decided to invest billions of dollars of public funds to create infrastructure to serve the public interest. The Government is itself already providing substantial incentives to invest, and it should not settle for a subpar network based on objections that it will not maximise the benefit to private entities. Instead, the government's focus should be on providing a sufficient return to the network operator in order to maximise the *public* benefit.

Part IV – Additional regulatory issues

Existing investments in broadband services

Google notes that under the current regulatory environment, it is the level of infrastructure competition (via ULLS) rather than resale competition that has led to the most benefits to Australian broadband consumers, through a wider range of differentiated services (from ADSL 2+ pricing plans through to "naked" DSL offerings) and reduced prices.

Two recent ACCC statutory reports tabled in Parliament have highlighted the importance of infrastructure competition to ensuring both increased differentiation of services and lower costs to consumers:

> *"2006-07 saw the highest level of investment in telecommunications in the 10 years since the introduction of open competition … The period was also significant in terms of take up of regulated unbundled services, with the number of unbundled lines increasing to over half a million by June 30 2007. Increased investment has enabled access seekers to differentiate their downstream product offerings to compete more vigorously for retail customers. As a result, end users are now able to access the internet using faster connections with increasing theoretical maximum speeds over ADSL2+ technology or upgrades to both Telstra's and Optus's HFC networks."*[36]

Google is concerned to ensure that the Government's well-intentioned investment in the NBN does not inadvertently lead to decreased competition and access to broadband services in the short term. For example, if exchanges with existing copper-based competitive infrastructure are converted to fibre-based technologies early in the NBN rollout period, Australia may in fact see a net *decrease* in broadband service availability and competition, with corresponding price impacts for consumers.

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and now are at $845 per household as of September 2006, which is already lower than the company's year end-target.

[36] ACCC telecommunications reports show continued investment and lower prices for consumers, ACCC news release 19 July, www.accc.gov.au/content/index.phtml/itemId/832319/fromItemId/142

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Google submits that the Government should consider the following in establishing an investment deployment strategy and time scale for the NBN:

1. The NBN should be rolled out in areas least served with broadband infrastructure first.

Google submits that an audit should be conducted of broadband availability by existing Telstra exchange area, and the Commonwealth portion of the funds required to build the NBN should be directed to serve the neediest parts of Australia first. It is simply not in the national interest for Commonwealth funds to be used in a way that enables the NBN operator to simplistically 'cherry pick' the most commercially viable areas first. Google submits that investment decisions and the NBN rollout schedule should be made in accordance with agreed public criteria that balance the technical realities of network build with ensuring that the NBN makes a real difference to areas that are currently unserved, or underserved by broadband services.

2. The NBN rollout should be phased to require the maintenance of existing competitive broadband during a specific rollout period

Google submits that, similarly to the analog – digital television switchover strategy, it is necessary to undertake a phased conversion of Australia's broadband infrastructure from copper wire to fibre optic cable. For example, in many metropolitan areas of Australia, competitive broadband services delivered by copper technologies are able to deliver broadband speeds in excess of the minimum 12 MB/second mandated for the NBN.

Careful consideration should be given to ensure that the NBN rollout does not adversely impact on the availability of existing broadband services. For example, mid-span injection technologies could be used to ensure that ADSL 2+ infrastructure could still be used during the construction and rollout of the NBN. Google submits that it would be counterproductive to the goal of ensuring better broadband for Australia if the rollout of the NBN in areas with existing high speed broadband services led to reduced competition, less differentiated service offerings and higher prices for consumers in these areas. It is essential that existing ADSL 2+ and similar competitive copper wire based broadband services continue to co-exist with the NBN, at least during an agreed transition period.

3. Consideration should be given to compensating infrastructure providers for broadband assets that may be stranded by the NBN rollout.

The importance of symmetrical Internet services in a Web 2.0 environment

One of the great evolutions in the Internet in recent years has been the popularity of so-called 'Web 2.0' services such as YouTube, MySpace, Facebook, Yahoo Answers, and Bebo. These services have become highly successful due to the immense popularity of user generated content – where Internet users are able to create their own content, share their thoughts and experiences on sites like Blogger, share home videos on YouTube or family photographs on photo sharing sites like Picasa or Flickr.

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Alongside the phenomenon of user-generated creativity, "cloud computing" describes an emerging set of tools that allow users to store data and run applications on third-party servers, rather than their own PC. For instance, users can back-up and store their documents on a third-party's server so that they can be accessed from anywhere, and they can use word-processing tools in order to create, edit, and collaborate (see e.g., GoogleDocs: http://docs.google.com). As well as the increased functionality delivered by "cloud computing", it creates significant cost savings for enterprises through reduced storage, support and maintenance costs. These sorts of tools are at the cutting edge of Internet innovation, which the NBN should help enable.

If there is a single impediment to Australians further embracing the benefits of Web 2.0 it is Australian broadband speeds, and in particular, the current speed and cap on user uploads.

The NBN RFP makes it clear that the Government recognises the important of "future proofing" (Schedule 2, 1.1.9) the NBN and, in this context, "the potential to use the proposed network as the platform for the eventual provision of fibre-to-the-premises (FTTP)."

Google submits that the Government should carefully consider the advantage of proposals that enable increasing symmetrical speeds and upload capacities. Today, low upstream speeds and restrictive bandwidth caps constrain innovation online and users' access to novel services.

Known competitive issues in the Australian telecommunications market

As previously mentioned, in 2004 a Senate Committee enquiry examined the state of competition in Australia's broadband market and identified a number of issues for reform. Google submits that two of the issues identified by the Committee in 2004 should relevantly be considered anew in the context of designing the regulatory settings for the NBN:

Recommendation 8:

> *"The Australian Competition and Consumer Commission should examine and report on the anti-competitive effects of the current peering arrangements which allow the exchange of traffic between Tier 1 providers on a settlement-free basis and which creates cost disadvantage for smaller ISPs"* (para 4.85)

Recommendation 9:

> *"The Australian Competition and Consumer Commission should examine the availability of access to, and cost of, backhaul services for carriers building or proposing to build broadband infrastructure. Consideration should also be given to the high costs of backhaul services in regional and remote areas in light of the fact that distance based charging is not a characteristic of the Internet"* (para 4.86)

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Indeed, Mr Graeme Samuel, Chairman of the ACCC, identified the costs of backhaul as a possible impediment to access seekers providing competitive DSL services in rural areas as recently as March 2008.[37]

Google believes that these two issues represent existing impediments to the delivery of cost effective broadband to Australian consumers and should be carefully considered in the context of developing the regulatory environment for the NBN.

International capacity constraints

As discussed above, the rollout of a robust, open and non-discriminatory domestic fibre network has the potential to create vast social and economic benefits for all Australians. However, Google is concerned that without major developments in the international capacity market, Australia's investment may not translate into the kinds of cost reductions and speed improvements users deserve. Australia could end up with a superhighway to the node (or subsequently premises), but if we only have a few expensive dirt roads with high tolls connecting Australia with the rest of the world, Australian users won't be traversing the *world*wide web at the promised superhighway speeds.

A 2007 TeleGeography Global Bandwidth Report suggests that roughly two-thirds of all Internet traffic in Australia is served from outside the country and the amount is growing each year.[38] The same report showed that trans-Pacific bandwidth demand grew 63.7 percent compounded annually from 2002 to 2007. Analysts predict that total demand for international capacity will continue to double roughly every two years. Against this background, it is imperative that policy developments in relation to the NBN also take into account the international capacity market and any barriers that may be posed to Australians realising the full benefits of the NBN.

Each and every piece of data served from outside Australia must travel across a small handful of undersea cables currently connecting Australia with the rest of the world. At present, the Australian continent is connected to the US and Asia by a small handful of cables. Each of these cable operators charges Australian ISPs for capacity. Australian ISPs in turn pass these costs on to consumers through higher service prices and download caps. In this way the true source of Australia's high broadband costs and slow speeds may have little to do with domestic broadband infrastructure and much more to do with the international capacity crunch.

Google submits that the best solution to Australia's international capacity cost and vulnerability challenges is robust competition in the market. With only four major cables running into the country, and the vast majority of the traffic transiting across just one cable (Southern Cross), this is a legitimate concern and worth exploring.

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[37] *Graeme Samuel, ACCC, Regulatory Update for 2008, Speech to Australian Telecommunications Users Group Annual Conference, Sydney, March 13 2008*

[38] *TeleGeography Reports are available from http://www.telegeography.com/products/gb/index.php.*

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One of the major reasons competition in the international capacity market may have stagnated is the high cost of building a new cable. Building a major undersea cable from Australia to Japan or the US typically has upfront costs in the hundreds of millions of AUD, not to mention often daunting regulatory burdens. With such high upfront costs, it can be difficult for any but market players with substantial balance sheets or downstream economic incentives to enter the undersea cable business.

The players with the greatest incentives are Australia's domestic ISPs and telcos, some of whom are already owners in full or in part of major undersea cables. Domestic ISPs have an incentive to improve international capacity to improve user experience and drive users to their networks. However, this may also lead to concerns about the integration of the undersea and domestic internet service markets. If Australia's major ISPs are also part owners of major undersea cables, they can pass on the international capacity costs to their customers while earning additional profits for their undersea cable businesses. Further, if domestic ISPs can control the limited number of cables leaving Australia, what is to stop them from charging excessive transit costs to the smaller players or blocking them out of the market entirely? As such, these ISPs have strange incentives to preserve a shortage of international capacity and continue earning additional profits from their undersea cable businesses.

Fortunately, competitors are beginning to enter the fray. Earlier this year Senator Conroy announced Pipe Networks' plans to build an AU$200 million cable between Guam and Sydney (called "Pipe Pacific cable-1" or PPC-1). Google is also playing its part, joining with SingTel and four other carriers to build a new cable between the US and Japan (called "Unity") which will increases trans-Pacific lit cable capacity by 20%.[39] Telstra has also announced plans to build a new cable between Australia and Hawaii with bandwidth for both retail and wholesale customers. These are important developments, but the Government and the ACCC should take steps to ensure real competition develops and that transit across these cables is priced fairly and equitably. The ACCC should investigate competitiveness in the undersea cable market and report back to the Government and public on the results. Meanwhile the Government should make a concerted effort to reduce the regulatory burdens new entrants face when deploying a new undersea cable.

The RFP is squarely focused on domestic broadband infrastructure, but international capacity will play a critical role in the success or failure of Australia's domestic fibre network. The RFP discusses international capacity in only one context. The Commonwealth's indicative risk allocation table includes a related category for evaluation, "Backhaul Capacity - Risk that domestic and international backhaul infrastructure cannot meet demand at required coverage and uplink / downlink speeds." Here the Government rightly notes the role of international backhaul capacity, but Google believes this will be significantly more important than the RFP implies.

Google urges the Government to take this risk seriously and to carefully evaluate each proposal's plans for international backhaul. Google believes that any credible

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[39] *See http://www.google.com/intl/en/press/pressrel/20080225_newcablesystem.html*

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domestic fibre network proposal should include an explicit plan for managing the international capacity crunch. The Government should assess these plans not only for their ability to guarantee access speeds, but also for their plans for managing the high costs of international transit. Will these costs be passed to consumers? Will the network have download or upload caps? Will it charge surcharges? With a domestic superhighway, how will the successful bidder manage to send two-thirds of that traffic across today's pricey, congested international toll roads? These are questions that are crucial to ensure that the full potential benefits of the NBN will be realised for Australian Internet users.

Peering

One of the cheapest ways to help solve the international capacity problem would be to encourage domestic peering and send less data overseas. With Australian taxpayers investing billions into a new national FTTN network backbone, Google submits that this is a perfect time for regulators to reevaluate the manner in which transit along that backbone is priced, managed, and regulated.

The Internet is made up of thousands of interconnected networks. Most of the participants in these interconnected networks have natural incentives to exchange traffic. Users want to be able to send emails, pictures and videos to users on other networks. Internet companies want to give users a fast and reliable connection to their online services. Internet service providers want to provide their users with the fastest connections to improve the value of their product offerings.

Because of the mutual benefits of sharing traffic across networks, in many cases content companies and ISPs will agree to share traffic for free, or "settlement-free" peer. However, not all stakeholders have the same incentives. It is much more important to a smaller ISP to be able to share data with a much larger ISP than it is for that much larger ISP to share traffic in return. As a result, the bigger players (Tier 1) can typically expect to charge the smaller players (Tier 2 and 3) for transit.

Peering arrangements, or the lack thereof, have a direct impact on end user speed and price. Enabling networks to share transit with one another speeds up the delivery of content to end users. When networks don't peer with one another, data often must travel across hundreds of miles of cable in the wrong direction, which lowers speeds for end users. This is an inefficient outcome and dramatically increases end user latency and costs.

Peering also has an important impact on the accessibility of internet services. High transit costs can discourage competing ISPs from expanding their service offerings into new areas. This is particularly true of rural areas in Australia, where transit fees are often prohibitive and Telstra generally operates the only backhaul services available. This has led even larger ISPs like iiNet to seek regulatory intervention.[40]

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[40] *As reported by ZDNet Australia, http://www.zdnet.com.au/news/communications/soa/Is-Telstra-a-backhaul-monopolist-/0,130061791,139205766,00.htm.*

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Given the ongoing challenges in Australian peering, the private sector has worked to find some solutions to Australia's peering challenges. Smaller ISPs are banding together at internet exchanges such as those operated by the Western Australian Internet Association (WAIA) and PIPE Networks to put themselves in stronger bargaining situations to secure better peering arrangements. Internet exchanges have proven to be effective in securing better transit agreements for their members, but they are not enough to address the problem completely, and Google submits that regulatory scrutiny is required.

There is a reason why two-thirds of all web traffic in Australia travels across costly undersea cables: content. Today Australian internet users find most of their content from companies that host data overseas like Google, Amazon, Facebook and Yahoo. As a result, there are two broad options for addressing this problem:

- encouraging the development of Australian content. With more compelling domestic content offerings, Australians would more frequently visit domestic Internet sites and in turn would need to send less data overseas.

- bringing the international content closer to home.

Internet companies like Google also have an interest to bring their data closer to users in Australia to improve speed and user experience. Generally Google and other internet companies improve user speed by locating servers closer to their end users. However in order for global content companies to operate facilities in Australia, they would need to secure cost-effective transit and peering arrangements with local Tier 1 and 2 internet service providers, just like Australia's smaller ISPs[41].

More locally hosted content is good for Australian users and businesses, and, as the economy becomes more digitally empowered and connected, will remove from the economy a significant cost being paid to international cable providers.

Unfortunately for Australian internet users, the peering environment in Australia is full of unique challenges. This has a direct impact on decision-making about whether or not to host content from Australia in order to improve end user speeds.

Australia's peering market is unique for two reasons.

- First, there are only a few Tier 1 players, who have historically been slow to enter peering arrangements. With an effective oligopoly over backbone transit, Tier 1 providers can charge monopoly rents on data transit and the smaller players and content companies have no choice but to pay them. If they do not, they will have to send their data through costlier, slower routes.
- Second, many major providers offer their own content services. This provides an incentive to discriminate against competing content services by degrading traffic speeds, or even by refusing to peer with content company offering a

[41] *Companies would also need to be convinced that the regulatory framework for the digital economy was in place to secure this investment.*

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competing service

Google submits that the fundamental principles governing the Internet as an end-to-end system of communication, are threatened not only by the potential for deliberate traffic degradation, but also by the closed peering market. The solution is to promote open peering in Australia to ensure robust competition at the backbone, ISP, and content layers of the network.

With the Government investing billions of dollars into the National Broadband Network, Google submits that it is imperative that the Government ensures that the network is used in a manner consistent with providing maximum value to end users. Given the long history of challenges in Australia's peering market, the Government should take this opportunity to set some basic conditions and standards to ensure fair and non-discriminatory peering arrangements in Australia.

The ACCC has in the past recognised the important role fair transit agreements play in creating a competitive market for internet services. In 1996 it brought action which opened the Tier 1 market and established the "Gang of Four" as the leading Tier 1 providers in Australia. However there has been increasing disquiet from smaller ISPs ever since. In 2001 Primus pursued action after growing its network to more than 230,000 users and yet still facing AU$15 million monthly transit bills from Telstra. In 2003 Pacific Internet claimed it could offer broadband for AU$40 per month if the larger ISPs agreed to fair peering arrangements. That year Pacific and other ISPs again called on the ACCC to take action and ensure fairness in the peering market.[42]

The Request for Proposals says little about the peering market, except perhaps in the context of Australia's international trade commitments and the need to "afford business enterprises and telecommunications suppliers of trading partners non-discriminatory access to a range of telecommunications services and facilities, prevent certain types of anti competitive conduct in the telecommunications sector and promote independent, transparent and technologically neutral regulation of the sector" (Section 1.5.28). Google submits that a key part of addressing these "certain types" of anti-competitive conduct should include a discussion of peering.

One possible solution to this problem would be to establish open criteria for domestic settlement-free peering with some minimum standards to ensure that Tier 2 and 3 ISPs and content companies that met minimum requirements could connect to the NBN on the same terms as Tier 1 providers. For example, such criteria could be based on:

- Operational requirements (for example, 24x7 NOC, Single ASN, consistent routing policy, no default routing)
- Minimum backbone capacity (for example, 10Gbits, with a minimum of 5

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[42] *Both the Primus and Pacific Internet cases were covered by ZDNet Australia. See: http://www.zdnet.com.au/news/soa/Telstra-Primus-not-our-peer/0,139023165,120108191,00.htm and http://www.zdnet.com.au/news/communications/soa/Cheaper-broadband-may-be-a-peering/0,130061791,120276641,00.htm*

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interconnects out of major sites in capital cities at a minimum 1GB each. Interconnection locations ideally should be in the largest population centres in Australia in a geographically dispersed manner)

- Minimum capacity utilisation (for example, a minimum of 25% utilisation of total capacity in either direction).

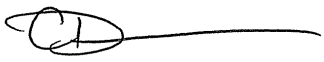
Google acknowledges that any open peering program would need to establish some basic minimum criteria to protect the integrity of the network. Such criteria might include metrics of upstream and downstream traffic, minimum pipe size, or minimum network size. Another option would be to establish a traffic-based credit system to make sure that smaller providers are compensated for the value they provide to bigger players. Australia could draw on the experiences of countries like Taiwan, Hong Kong, and Argentina, which have all tried bold regulatory solutions to peering market problems.

Australia now has a tremendous opportunity to set some clear and pro-competitive rules to ensure that peering arrangements are transparent and effective to maximise the benefits to all Australians from this historic infrastructure deployment. The FTTN network is the perfect opportunity for the Government to make sure transit costs in Australia are affordable and effective.

Conclusion

Google congratulates the Government for its vision in undertaking a significant investment in the future of Australia's digital economy. It is imperative that the network delivered as a result of this investment of public funds is supported by a robust and effective regulatory environment to ensure that Australians are able to access world class broadband services at the fastest possible speeds and the lowest possible prices. Google urges the Government to embrace the opportunity to set a regulatory framework that will enable Australia to harness the full benefits to Australian consumers and businesses of an open Internet.

Google would be pleased to discuss any of the issues raised in this submission and hopes that these comments will prove a helpful contribution to the debate.



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