

TO BROADBAND OR NOT TO BROADBAND

MARTIN STEWART-WEEKS

Director, Internet Business Solutions Group
Cisco Systems¹

1: Introduction

For a question to which the answer is very simple, we seem to be making heavy weather of the broadband debate in Australia.

We can't seem to agree on how much broadband we need or what kinds of speeds it should be capable of delivering. The policy debate is constantly distracted by the furious claims and counter claims of the dominant incumbent and the regulator. Smaller service providers cry foul and struggle for a sustainable place in the sun and consumers fume at comparatively poor price and performance deals. And now the whole discussion has been colonised by a political contest to determine who can more credibly claim to be in command of the future.

At one level, this is all good. For some time, the broadband debate was a largely confined to a few engineers and academics. Countries like Japan and South Korea invested in massive upgrades to their broadband infrastructure, which only served to reinforce their outlier status. For the most part, they were not seen as models that were either relevant or replicable.²

Now, and with something of a rush, broadband has moved from the technology edge to the policy centre. In the process, it is being reframed (correctly) as a debate about services and capabilities, not about the underlying technologies. It has new political currency and is assuming its rightful place as the defining infrastructure of a connected world.

But the risk we face is that, as we define our broadband ambitions, we can forget why we are having the debate in the first place. More importantly, for all the progress that has seen the broadband issue accorded a new political and popular currency, the mainstream policy processes in this country remain ambivalent. This is being fuelled by a strange mismatch between continuing scepticism, and sometimes plain ignorance, about the evidence of broadband's transformative potential and the steadily accumulating evidence of the social and economic impact of new models of service, collaboration and innovation which it is accelerating. I will return to this "policy lag" a little later.

This paper revisits three fundamental propositions:

- The first is that there are **some underlying principles** that should increasingly inform the structural and policy framework for broadband investment that delivers access, quality and innovation

¹ The views in this paper are personal and should not be taken as necessarily the views of Cisco Systems

² We are reduced to watching, with a mixture of envy and feigned disinterest, while these leaders continue to stretch their lead. A recent story on PoliticsOnline noted that while America might have invented the Internet, "the Japanese are running away with it. Broadband service here is eight to 30 times as fast as in the United States -- and considerably cheaper. Japan has the world's fastest Internet connections, delivering more data at a lower cost than anywhere else..."

- The second is that there is a **growing body of credible evidence** that illustrates why broadband is the necessary condition to realise the ambitions for communication and collaboration that increasingly characterise the way individuals, organisations and communities live, work, learn and play
- And the third is that the increasingly robust analysis of the **social and economic benefits** of broadband ought to be making a more significant impact that it appears to be on the policy calculus that drives both public and private investment.

It closes with a few modest predictions about the way in which the Australian broadband debate might unfold in the next period.

2: Setting the context

If we are going to secure the kinds of policy outcomes we have set for ourselves as a nation and as a community – new investment in industries that will deliver jobs and sustainable prosperity, smarter, more efficient and more accessible public services, access to a

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proliferating world of entertainment and new levels of social inclusion and engagement in stronger communities – we need to be able to connect, communicate and collaborate like never before. The flow of knowledge, information and ideas is central to that challenge. And that flow is now more and more a function of the robust and secure networks that link us to each other, to our communities and to networks of information and

services anywhere, anytime.

Three features of this remarkable shift in the broadband debate stand out:

- One is that the debate is less concerned with technology – a simplistic focus on building ‘fatter pipes’ – and more concerned with the services it enables.
- The second is that we have well and truly left behind the assumption that the only real value of broadband is faster Internet connections and quicker email. Nothing wrong with those, of course. But we are now confronted with growing evidence that “real broadband” creates the conditions in which to think of completely new ways to connect people, communities and services. We are irrevocably launched on a “tipping point” journey of innovation and invention fuelled by the astonishing possibilities of connectedness that the new broadband capabilities promise and are already delivering.
- And thirdly, this new phase of broadband policy is being driven by a combination of competitive and consumer pressures which themselves demand urgent answers to big policy and investment decisions at the national, regional and local level. The early evidence is that these new broadband capabilities are already delivering new services and new consumer and policy options that are dramatically raising the bar. Broadband is an integral part of the new arena in which the global pressures for innovation and a competitive edge are being played out.

Despite its recent and dramatic arrival at the heart of mainstream political and policy discussions, the debate about broadband in Australia is characterised by a confused and confusing tangle of perceptions, claims and counter-claims. For example:

- People already have access to as much broadband capacity as they need or are prepared to pay for and, in any event, for the most part 1.5 Mbps (or even 8Mbps for some) is perfectly adequate for what most people need to do. Businesses and universities can already access specialist networks that offer faster ‘industrial strength’ broadband.
- Telstra is acting like a rational if intransigent incumbent as it wrestles with the transition from a communication and data transport company to a company based on services. Its investment decisions are being coloured by a complex mix of politics, regulatory complexity and an internal contest between its role as a private profit-maximising company and the role, bestowed by historical accident, as owner of critical national infrastructure.
- The unpredictable and unreasonable actions of the regulator, aided and abetted by inconsistent and unhelpful policy settings, is placing unconscionable burdens on Telstra, expecting it to risk shareholder wealth and potential long term value by investing in new infrastructure from which it won’t be allowed to extract an appropriate return.
- The examples of broadband leadership often held up to shame Australia into faster and more concerted action– Korea, Singapore, Japan, Holland, Sweden – are not relevant because they either represent inappropriate models of public investment or are driven largely by what we like to dismiss as frivolous activities like online entertainment and gaming. As a business commentator put it recently, why should we be investing all this public money in faster broadband just so a few teenagers can swap music files faster?
- Australia should construe public investment in real broadband infrastructure as the digital equivalent of the Snowy Mountains scheme or the rollout of a proper interstate highway system. This is what contemporary nation-building looks like. It will ensure we have the core infrastructure that will nurture wave after productivity-enhancing wave of Internet-enabled applications and services on which our national and individual success in the 21st century networked information economy depends.
- Major public investment in broadband is both risky and unnecessary, in danger of creating a rolled-gold information superhighway that gets too far ahead of the competitive services and applications whose demand for bandwidth would make it worthwhile. When people are ready to pay for the broadband services they feel they can use and create value from – private, commercial or public – the market will find a solution and give it to them. Getting ahead ourselves in that process is bad policy and worse economics.

There are others, but these kinds of assertions and arguments, floating in an impenetrable soup of arcane regulatory contest and inconclusive analysis (just how do you work out how fast is fast enough?) offer a daunting prospect to the ordinary citizen trying to make some sense of it all. It is all sound and fury, signifying if not nothing then certainly not very much that connects with their more practical considerations. Unable to fight through this technical and political thicket, they revert to a much more basic test. Why is it, they wonder, that for the most part they still can’t do the kinds of things online, at a reasonable price, that citizens in other countries are increasingly taking for granted?

3: Some underlying principles

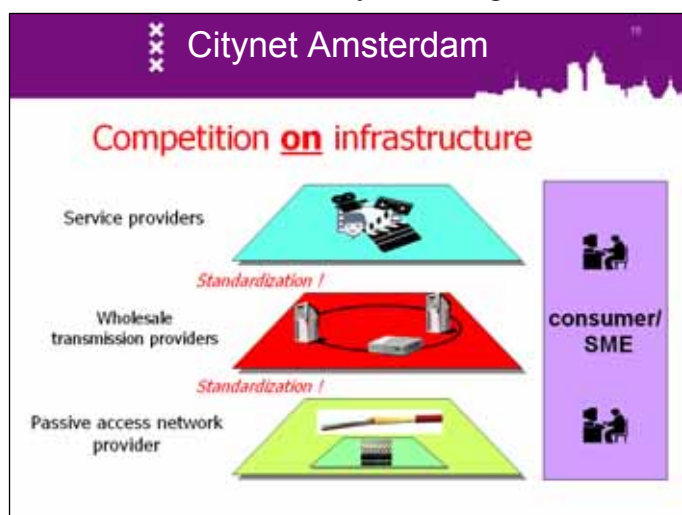
Although there are plenty of variations that account for local nuances of policy, funding and regulation, there is growing agreement about the elements in a basic business model for effective broadband deployment.

At the heart of the model is a **three-layer framework** that clearly distinguishes between:

- The network itself, an essentially passive layer of physical infrastructure (civil infrastructure such as ducts as well as dark fibre, etc) that can be either owned and rolled out by the public sector (local and/or regional governments generally) either directly or through a government-owned utility, or co-owned by public and private investors (in this last case investors are housing corporations, real estate companies or banks).

In recent years, the role of government has moved from being a sole investor in this layer to being an “orchestrator” of private investment stakeholders.³

- The transmission layer which provides the various access networks that will carry the content and services (this is usually called the “active layer” where an operator will “light the fibre”)
- The access, services and content layer, which typically sees a competitive regime of service and content providers bringing a range of content and value-added services to residential, business customers and public administration organizations.



³ The focus increasingly is on providing fibre networks as the core of the new broadband capabilities being rolled out to business, citizens and communities. A recent industry report (Heavy Reading: FTTH Worldwide Market & Technology Forecast, 2006-2011) put the focus on fibre into stark relief: “It’s been almost three decades in the making, but fibre to the home (FTTH) is finally emerging into the mainstream and is set to transform the telecom environment worldwide over the next decade. *FTTH represents the first major upgrade to the access network since the deployment of cellular infrastructure in the 80s and 90s, and like cellular, it is likely to have a deep impact on the entire supply chain, including technology vendors and network operators.* Over the next 15 to 20 years, copper access networks worldwide will be largely replaced by a fibre access network, creating massive opportunities for vendors, network builders, and service providers. The most important catalyst for this change is a growing perception that copper access networks will soon no longer be able to meet the ever-growing consumer demand for bandwidth, driven mainly by the Internet, IP, and the many services running over it. At the same time, competition to move customers onto complex service packages that include video is leading some to conclude that they must be first to deploy fibre, pre-empting or frustrating future competition. This environment has led to the beginnings of a mass migration to fibre in several countries, notably Japan, Sweden, and the U.S. They will be joined in the next year or two by China, France, South Korea, and the Netherlands, among others, and ultimately every city in which consumers are ready to pay for higher performance and richer services.

The point about the three-layer model is that, broadly speaking, the policy objective is to avoid a situation in which a single organisation plays roles at more than one layer.

The best example I know is the Alberta SuperNet project in which network provider Axia took on a self-denying ordinance that meant it could not compete in the services space on top of the network that it was constructing. The policy outcome is obvious – to avoid giving Axia an incentive to restrict access to the network from services that might be competitive with its own offerings. In the Alberta model, Axia's network access and provision role depends on robust competition at the services layer. It does better when more competitors in the services space do well. In that sense, the policy and economic incentives are aligned to the overall policy outcome – cheaper, faster broadband access for more people and businesses, regardless of their location.

Beyond this simple model, experience around the world also suggests that broadband policy ought increasingly to be motivated by some other fundamental considerations. For example:

- 1 **People don't access infrastructure, they access services.** The focus now should be less on technology and more on the services and capabilities that citizens, businesses and communities need to connect, communicate and collaborate.
- 2 Successful broadband projects should **start by understanding people and communities** and the services and capabilities they want to access or invent. Broadband capability should enable and accelerate the ambition for new services that is already developing and rapidly remove the connectivity blocks and barriers to innovation and new service development.
- 3 **The debate is not about provisioning broadband, but about provisioning connectedness.** People want access to technology that helps them save time, have fun, learn something, make money, stay or get healthy, stay in touch or be creative. It's what broadband does that matters, not what it is.
- 4 The broadband debate in Australia is being driven by a **powerful coincidence of policy ambition and technology potential.** It should increasingly be animated by three ideas - a sense of urgency, a boldness of vision and a practical commitment to action.
- 5 To achieve maximum service flexibility, product offerings and minimum service costs for subscribers, it is vital that multiple communications service providers can use the **common access infrastructure** to compete in the provision of telecommunications services.
- 6 The broadband debate only ever makes sense in the context of the lives of people and communities in which it can make a difference. When real broadband capability is in place, secure, accessible and reliable, people and communities will confront the new technologies of networked interaction with a powerful mix of **imagination and pragmatism.**

4: Growing body of evidence

The defining characteristic of the knowledge society is the ability to create, share and use knowledge as a social and economic resource in ever more complex combinations and across wider communities of interest and practice. 'Next generation' broadband is rapidly becoming the core technology which enables and often accelerates the capacity to realise that ambition.

Even though it has become a cliché, it's true that our ability to live and grow in this kind of world is a function of our capacity to connect, to communicate and to collaborate across the street, across town or across the world.

Think about a remote region like regional Western Australia where a new broadband IP network is creating opportunities for doctors and health care providers to connect to each other and with their patients to save time, improve diagnoses and treatments and offer better care and support for people and communities, including remote Aboriginal communities.

The same basic principles of connection and communication, using integrated IP networks, are being applied in the first fully 'medical grade' national health information network in New Zealand.

In Queensland, the technical and further education system is experimenting with the evolution of 'vocational learning zones', connecting together a widely distributed network of places and spaces in which learners and teachers can interact and learn. The intention is to use networked information and communication technologies to slip the constraints of time and place and create an "anywhere, anytime" learning system. Libraries, shopping centres, students' homes and offices, a campus – it ought not to matter where you are when you need to access knowledge, courses, guidance and advice to progress your learning priorities.

More recently, Queensland has nailed its economic development colours firmly to the

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broadband mast with the announcement of "the development of an options paper to outline strategies and options to ensure that Queensland maximised the benefits out of the Federal Government

broadband activity to examine the options for delivering the best broadband services and connectivity to Queensland businesses and communities". Announcing the plan, the then Minister for State Development noted that "broadband is critical infrastructure and is essential to Queensland's economic development...broadband [is] one of the most urgent areas needing attention in the Smart State."

In Western Sydney, videoconferencing and networked communities for teachers' professional development is offering curriculum choices for students in schools that wouldn't otherwise have them. The project is fuelling a real buzz of excitement as teachers, including those who lacked the confidence to engage with technology, grasp the chance to teach differently and to offer students new and more effective ways to engage with their learning. In the recent election campaign, the NSW Government took up the results of the Connected Classes pilot and committed \$168 million to roll out the solution across the State.

Cities and regions around the world are taking up the challenge too. Hundreds of leading European cities have come together to pursue a "broadband manifesto", anxious to roll out the next generation of fibre-based broadband services on which they will run an evolving mix of commercial and public services that will fuel a new round of innovation and growth.

Economic resilience, especially for the small and medium enterprise sector that is so often home to innovation and new employment growth, and social inclusion are the twin and interdependent pillars around which these new capabilities are being fashioned.

Political parties, governments, corporations and community organisations are feeling their way into a new world of powerful connection to their citizens, customers and members, with whom new broadband technologies enable them to interact in much richer, more complex ways than ever before. The new technologies of connection and communication create fresh opportunities for 'agency', that sense of empowerment and self-reliance that means people

can do things for themselves – search out information, do business easily, quickly, conveniently and securely and stay in touch with their families and friends using video, pictures, text and the phone, all delivered on faster, more intelligent and more secure networks.

Think too of the daunting challenges of social care into the new century as the proportion of the population that is aged and will need varying levels of care and support keeps rising. The policy objectives are clear – providing choice and quality in service provision, ensuring financial viability for aged care services, helping people to remain independently in their homes and connected to their communities, offering them responsive care and support packages that suit their lives and their circumstances.

And older people, anxious to retain their independence, want to talk with their family and friends and keep in touch with their doctor or their health care worker. They want to access entertainment, they want cheap and flexible phone services, and they want to live in homes that are connected and safe.

They want to be able to connect to their carers and doctors on simple technology that would allow, for example, a community nurse to check they have taken their medication without having to travel to their home twice a day.

Too often, these practical and innovative ideas founder on the rock of inadequate connectivity. The fact is none of this is going to be possible or affordable without pervasive communication and the ability quickly and securely to connect people and the services they rely on.

Once you have very high speeds, I guarantee that people will figure out things to do with it that they haven't done before

Videoconferencing and video phone calls, sending X-rays or other health information easily between members of a care and support team and perhaps other family members, getting automated reminders about medication or check ups – this is a rapidly evolving bundle of services and capabilities that will place heavy demands on the network.

In a small rural community in the Netherlands, a community of about 9,000 people has created a co-operatively-owned broadband network over which predominantly video-based services allow older residents to stay in touch with each other and with their GPs or health providers.

The network also allows them to run a virtual ‘neighbourhood watch’, using video camera surveillance to create a sense of security and confidence in their own communities. Internet access and web surfing are not really the ‘killer application’ in this context, but the same underlying broadband capability is being adapted to suit the needs of this particular community.

There are plenty more stories of this sort that can now be told to illustrate the pace and scope of broadband’s pervasive impact. But the point of these stories in this context is twofold. One is the way in which they reinforce the human dimension. The broadband debate, next generation or otherwise, only ever makes sense in the context of the lives of people and communities in which it can make a difference.

The other point is to at least raise the question about whether or not these stories, and the solid evidence of the practical impact of broadband they offer, are being noticed. Have we arrived at the point where the policy process is both not hearing these stories and, if it does, failing to translate them into new insights that ought to be driving the next phase of broadband investment in Australia?

5: Social and economic benefits

Information technology is shifting from a focus on moving information and data around between people and organisations to a focus on creating new ways for people, knowledge and services to interact.

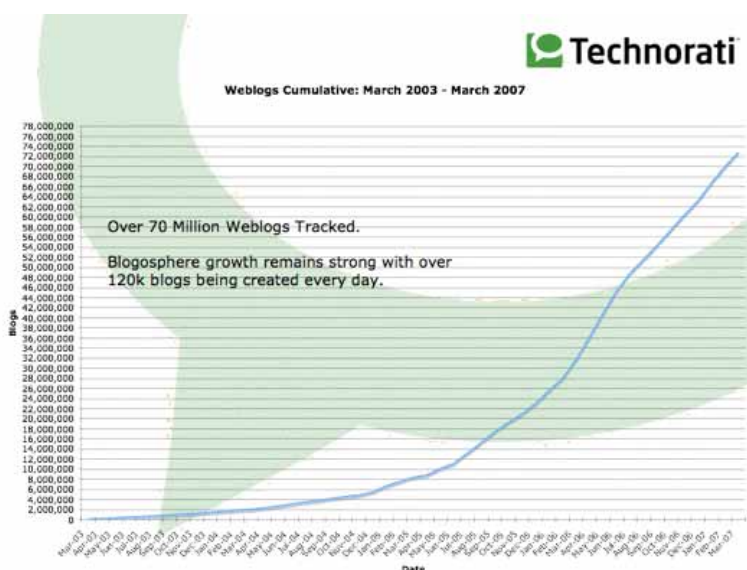
Think about the astonishing rise of social networking and its irresistible intrusion into our lives. In its most recent report (August 2007), [Nielsen/NetRatings](#) has released online traffic data for social networking, blogs, and video sites for the past 12 months. The report indicated a 117%, 19 million unique users, traffic growth for [Facebook](#) and a lagging, albeit still strong, MySpace growth of a 23% pace of 60 million.

Separately, a report from Ipsos Insight Research in France released a new study that shows that social networking sites like MySpace, Facebook, Mixi and Cyworld have emerged as major factors in the culture of communication for adults around the world. One analyst commented that even in lesser-developed markets, video sharing and on-line capability is affecting consumer's disposable time. No longer are people trying out these sites, but they are driving their behavior.

Reinforcing these new data is another study from search engine marketing firm iProspect which has published the first iProspect Social Networking User Behavior Study.

The study reveals that approximately 1 in 4 adult Internet users regularly visited the most popular social networking sites in the past year, including MySpace, YouTube, and Amazon.com. In addition, the study also revealed that 1 in 3 Internet users report that their purchase decisions are influenced by sites that contain social content, with Amazon.com being the most influential of all⁴.

Finally, the blog analysts at Technorati are now tracking over 70 million blogs, noting that blogs are growing at the rate of about 120,000 new weblogs being created worldwide each day. That's about 1.4 blogs created every second of every day. They now refer to a phenomenon they've christened the "live web" – blogs, photo sharing, podcasting, tagging, posting on other people's blogs - the "seething activity" of people finding new ways to connect and communicate.⁵



They also report an intriguing league table of most popular blogging languages:

- Japanese the #1 blogging language at 37%
- English second at 33%
- Chinese third at 8%
- Italian fourth at 3%
- Farsi a newcomer in the top 10 at 1%

The social network's defining characteristic is collaboration. With the rise of cheap, ubiquitous and increasingly powerful tools like blogs, wikis, YouTube, MySpace, Facebook,

⁴ <http://www.promotionworld.com/news/news/070410iProspect.html>

⁵ <http://technorati.com/weblog/2007/04/328.html>

the social networking model is inviting us to create and share ideas and knowledge differently. Computer networks have given way to the human network. Technology has found a new and much more satisfying purpose, turning new and simpler ways to share and to communicate into an engine of economic value and potent innovation.

One powerful and provocative analysis of the “wealth of networks” describes this change as a shift in the “material conditions of production” which have increased “the relative salience of social sharing and exchange” in driving economic production. It points out that the rise of networked information and communication has made these familiar patterns of social behaviour effective beyond their normal role in building social relations and fulfilling individual psychological needs. They have come to play “a substantial role as modes of motivating, informing and organising productive behaviour at the very core of the information economy.”

The analysis takes the insight much further, arguing that the feasibility of using social, rather than market or proprietary mode of production (ie relying more on cooperative peer production and coordinated individual action) “creates opportunities for greater autonomous action, a more critical culture, a more discursively engaged and better informed republic and perhaps a more equitable community.”⁶ Benkler’s analysis, along with many others, reminds us that in many ways the focus on broadband and the Internet is too narrow. While clearly there are some astonishing technology changes being wrought in and on the web, their real significance lies in the new social and economic models they herald and enable.

This new social networking model, of course, lives and thrives on the network. The point is not just the ability to create and post something cheaply, easily and quickly. The whole point is to get a response, to keep or find friends and, in the process, to spark a community of interest. The whole point IS the network or at least the rich, sustained collaboration that network delivers. Connectedness is the dominant currency of the networked age.

This is a world increasingly defined by three ideas:

- The **network as a platform** for collaboration and creativity
- A new-found ability to **empower the edge**, to drain power and authority away from the centre or the top and out to the edges where people find new freedom to create and interact
- The growing importance of the **“power of us”**, a phrase coined by BusinessWeek to describe a new ethic of distributed, voluntary collaboration in which self-organising communities of interest and practice can harness their collective wisdom, and their undisputed collective power, to lay claim to new levels of authority and influence as citizens, as workers and as consumers and customers.

The early evidence about the economic benefits and social outcomes of this new world of pervasive connectedness is compelling, if not conclusive. There is an accumulating body of evidence that suggests significant benefits are available from the services and connectedness that broadband infrastructure provides.

The Allen Consulting Group in Australia concluded in a 2003 study of the economic impacts of “true” broadband that “...there are substantial net economic gains available to the region in the analysis and probably many other major urban areas in Australia from the development

⁶ Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom*, Yale, 2006:92

and use of a true broadband network.” The report went on to suggest that “these gains far exceed the initial investment costs required to finance the network.” (*True Broadband: Exploring the Economic Impacts*, September 2003).

More recently, a Carnegie Mellon study of broadband’s economic impact claimed that:

Even after controlling for community-level factors known to influence broadband availability and economic activity, we find that between 1998 and 2002, communities in which mass-market broadband was available by December 1999 experienced more rapid growth in (1) employment, (2) the number of businesses overall, and (3) businesses in IT-intensive sectors. [*Measuring Broadband’s Economic Impact*, MIT and Carnegie Mellon, January 2006]

The study concludes by admitting that its analysis was necessarily preliminary and drew attention to the need for additional data and experience with broadband investments. It finishes though with the observation that “...the early results presented here suggest that the assumed (and oft-touted) economic impacts of broadband are both real and measurable.”

The feasibility of using social, rather than market or proprietary modes of production (ie relying more on cooperative peer production and coordinated individual action) creates opportunities for greater autonomous action, a more critical culture, a more discursively engaged and better informed republic and perhaps a more equitable community

In the United States, a major study of the potential economic benefits of

accelerated broadband deployment to older Americans and Americans with disabilities [*Great Expectations*, Robert E Litan, New Millennium Research Council, December 2005) looked at three types of benefits from broadband deployment and use. They included lower medical costs, lower costs of institutionalized living and the additional output generated by more seniors and individuals with disabilities in the labor force.

Considered together, the study estimates the three benefits to accumulate to at least \$927 billion in cost savings and output gains in 2005 dollars over the 25 year period, 2005 to 2030. This amount is equivalent to half of what the United States currently spends annually for medical care for all its citizens (\$1.8 trillion).

The search for hard and ‘soft’ evidence of the social and economic benefits of broadband investment, and the applications and services that broadband delivers, will continue. At the same time as jurisdictions search for the strongest evidence to justify what are often very large investments of both public and private money in these new technologies, it is also clear that leading governments recognize that these investments are basic “table stakes” to successful engagement in global economic competition and national development. It’s not so much a question of finding the economic and social payback for these investments. It’s more a question of worrying about the economic and social costs of failing to make these investments in the first place.

In the area of economic development, the cities of Amsterdam and Almere (at the heart of The Netherlands’ creative arts, media & gaming district) have recently announced the development of a broadband infrastructure (fibre-to-the-home and to the offices with wireless as future development) covering the entire population and small and medium enterprises. This strategy is aimed at providing SMEs in the software development and creative arts sectors with the necessary telecommunication flexible infrastructure.

A recent report suggested that an increasing number of Dutch towns have opted for municipal fibre networks to create a computer-grid system. The idea is to combine municipal FttH with the combined computing power of business and residential subscribers for research calculations, and taking advantage of the computers’ free hard disk space. The scheme was

touted as developing a supercomputer city. Several distributed computing grids exist worldwide, but the geographic concentration at Almere helps combat latency, while the participating computers are linked to a 100Mb/s network to optimise data sharing. Indeed, Almere is one of 18 projects of the EC's BEinGrid research program to assess the possibilities of grid computing.

The report goes on to suggest that some practical applications have emerged to take advantage of the collective power of multi-computer processing. These range from complex 3D designs, image searching and retrieval, weather predictions, and crunching medical research data. This last area illustrates the booming business in online medical applications and advice, whether from established cottage hospitals and surgeries, or even clairvoyants.

Many councils and hospital trusts are saving money by relying on online medical care, achieved through web cams and interactive units managed by people at home. The grid network is allowing research to be undertaken using the resources of PCs and thus saving the high cost of data storage and specialist computers. Rotterdam's Erasmus Medical Centre is just such an example: a study on bone aging requires scans of up to five gigabytes each. These are done by computers on Almere's grid, and are then uploaded to the hospital.

Transferring data on this scale requires fibre networks, and the fact that it can be done in conjunction with computer grids opens the door for innumerable commercial applications. The report concludes that The Netherlands' experience strengthens the argument that in coming years jobs, prosperity and a range of social benefits in Europe will follow where broadband infrastructure is strongest.

Presumably the point of that story in particular is to illustrate what happens when broadband becomes part of the groundwork for innovation and growth. New ideas emerge for value-adding services, impossible without the connectedness of real broadband, which speak directly to big policy priorities, in this case in health. The policy insight here is the central part broadband plays in a policy mix that creates an environment for innovation. As Internet pioneer Vint Cerf commented in the context of lamenting America's failure to match the experience of Japan especially in driving new levels of broadband performance, "Once you have very high speeds, I guarantee that people will figure out things to do with it that they haven't done before".⁷

The development of broadband programs also allows small and medium businesses to leverage on a number of internet business solutions implemented on top of the network, such as e-commerce, e-supply chain, e-logistics or e-procurement. Tackling social and digital exclusion is another area of focus for governments investing in broadband. The availability of a broadband network is the main prerequisite in the development of social inclusion programs around cities in Europe. Inclusion initiatives aimed at enabling disadvantaged citizens to gain access to ICT and online services, backed up by training and community-based support services, cannot be implemented without the presence of a flexible, low cost access infrastructure.

In the area of efficiency of the public administration, the Italian Province of Brescia has focused in the past 3 years at developing a number of provincial services across its intranet. The launch of an internal communication and collaboration initiative is providing the local government with the opportunity to save about 8,2 Million Euros within the initial 5 years of operation, leveraging on traditional intranet self service tools (employee directory, online expense reporting, shared calendaring, etc) as well as on mobile communication solutions.

⁷ http://www.washingtonpost.com/wp-dyn/content/article/2007/08/28/AR2007082801990_pf.html

Politicians, high level civil servants and field workers use mobile devices to streamline communication.

The Province is now making those internal services available to municipal organizations within its territory, developing a large shared services regional center. This initiative is linked with the launch of the regional broadband access infrastructure.

Traffic and transport management is another important area in which local government is developing broadband solutions. Traffic monitoring and parking management systems, RFID-enabled applications for intelligent transport management are some of the examples available. Cisco's own work with the Clinton Global Initiative, part of our larger Connected Urban Development program, is working with Seoul, Amsterdam and San Francisco to push the practical application of broadband-enabled ICT to sustainability and other urban management challenges. The work in those three cities is generating a solutions inventory, technical architectures and models of value case and impact analysis that we can then take into other cities as the program grows and scales.

These are a few more outcomes from recent studies:

- The Australian Government's own Broadband Advisory Group in 2003 cited a study (Accenture 2001) as estimating that next generation of broadband could produce **economic benefits of AUD\$12 billion to \$30 billion per annum to Australia**
- A 2004 report prepared for Multimedia Victoria by economic consulting firm ACIL Tasman found that the annual contribution of broadband to the Victorian GSP (Gross State Product) was expected to peak in 2008 at just over \$2.5 billion. It estimated aggregate benefits to the Victorian economy from 2004 to 2015 of between \$12.7 billion and \$22.6bn. When scaled up for the Australian economy as a whole, this represents a **boost the GDP of around \$12 billion in the peak year 2008, and benefits between \$55 billion and \$96 billion over 2004 to 2015.**
- A 2003 study by the UK Centre for Economic and Business Research found that that due to the growth in the number of broadband connections, by 2015, **annual UK GDP could be up to £21.9 billion (AUD\$52.1 billion) higher than it would otherwise have been.**
- Similarly a 2005 study by IDC and the Economist Intelligence Unit found that **if broadband diffusion in New Zealand was accelerated**, by whatever means, to a level of 50 broadband subscribers per 100 of population within 10 years, **nominal GDP would increase by NZ\$314 million (AUD\$283 million) by 2010, NZ\$2,740 million (AUD\$2,468 million) by 2020 and NZ\$7,215 million (AUD\$6,500 million) by 2030.**

A broader and more recent study of the deep and increasingly pervasive economic impact of technology came to this conclusion⁸:

The reality is that while the benefits of new technologies are often exaggerated at first, they often turn out to exceed initial expectations in the moderate-to-long term. This is exactly what has happened with the digital revolution.

The digital economy is more than fulfilling its original promise, with digital adoption rates exceeding even the most optimistic forecasts of the late 1990s. The integration of IT into

⁸ *Understanding the economic benefits of the information technology revolution*, Robert D Atkinson and Andrew S McKay, The Information Technology and Innovation Foundation, March 2007

virtually all aspects of the economy and society is creating a digitally-enabled economy that is responsible for generating the lion's share of economic growth and prosperity.

Atkinson's study is a compelling review of the increasingly ubiquitous role that information technology plays in fuelling innovation and economic growth. The analysis is crafted around a model of economic impact which shows the implied linkages – the policy logic, if you like – between investing in technology and the economic benefits that result (measured as higher per capita income and rising GDP). His logic model is included as [Attachment 1](#) to this paper.

Atkinson uses his analysis to argue a very important point which I think plays more deeply than we sometimes allow in the Australian context.

He argues that mainstream economic and public policy makers have got to pay more attention to IT. I think he's right about that. And I would add the need to conceive the significance of broadband as much more pertinent to big contemporary policy debates and decisions.

My experience is that, despite the best efforts of many and the inexorable advance of the technology revolution, mainstream policy makers don't understand its significance and often heavily discount its impact. I think we are all worse off as a consequence and it is certainly impeding faster and more purposeful progress on the broadband front.

I wonder if we aren't in danger in Australia of falling into a "policy lag" trap. This is a function of the gap that opens up between reflexive perceptions about the lack of value delivered by some large investments in IT in the past and the increasingly opposite real-life experience of more and more people as they enjoy the indisputable benefits of effective, reliable and often transformative technology.

In conversations with senior bureaucrats or politicians with little or no direct involvement or interest in technology, you can sometimes be struck by their perception that IT is costly, confusing and too often ends up creating political and financial problems. Large projects make claims about cost reduction and other benefits that don't get delivered either at all or within the expected, and usually politically driven timeframes. Implementation becomes more complicated than was anticipated and proponents come back looking for more money to bail them out.

In that frame, IT investment looms as an unforgiving black hole, a place to be avoided but where, if you do have to go, you end up sacrificing good money on the altar of good intentions and from which you return invariably disappointed.

But these same sceptics will often be surprised by the evidence, whenever you get a chance to bring it to them, of successful IT projects delivering real value to, for example, doctors and patients in the health system or teachers and students in the school system. They can be surprised when you draw the policy implications of the kind of densely networked, multi-channel lives their teenagers live, happily devouring the benefits of broadband-enabled communication without a second thought. The policy ambivalence that often cripples the rational discussion about necessary investment in technology stands in stark contrast to the experience of those who, at the very same time, are busy enjoying the benefits of powerful technologies delivering better service, greater productivity and more convenience.

In Australia at least, we confront an increasingly urgent challenge to close these perception-reality gaps and to take mainstream policy makers beyond their own ignorance (which is unforgivable) and scepticism (which is understandable) to look more closely at the shifting evidence that is often accumulating right under their noses. We still suffer to some extent from a policy debate on broadband and related technology issues in which many of the key

influencers and decision-makers are motivated by experiences and perceptions at least 5 years old.

It remains a critical policy challenge to not only update our collective knowledge and experience about technology but to combine that with a deliberate strategy to mainstream the broadband and wider technology debate.

6: To conclude: some modest predictions

To return to this paper's original question – to broadband or not to broadband?

Let me attempt a few answers and, in the process, offer up a few modest predictions:

- It is, of course, far too late to even be asking the question. Australia is going to broadband, is already broadbanding but will need to significantly up the ante in terms of pace, access and impact.
- The broadband capacity which many people endure in Australia is inadequate. If we are going to make the most of the new capabilities of collaboration and communication, especially using video, to fuel a whole new cycle of innovation and services (both private and public), then the benchmarks set by countries like Japan, Korea and Holland will have to rapidly move from aspirational to foundational. Our continuing dismissal of these examples as culturally, politically and economically inappropriate benchmarks for Australia could appear to be glib and increasingly misconceived.
- The big drivers for broadband demand will be, as in other countries, personal entertainment, the astonishing rise of social networking and the design and delivery of whole new services in critical areas like health and education.

Already, education systems in Australia are straining the current network capacity they can provide to learners and teachers to support massively collaborative approaches to creating content, evolving curriculum and discovering new learning models. In the health care system, we want to use new video based tools to create rich, simple and immediate virtual connectivity between older people able to live longer at home and their families and carers. We know it makes sense and we know it works. We know it will save money and create happier, more confident independent living. But too often the solutions and the motivation to put them into practice are becalmed by the lack of bandwidth.

- Compared to our near neighbours especially, Australia is already beginning to look fairly ordinary when it comes to broadband policy and performance. As countries like Singapore, Japan and Korea, as well as places like China and India grapple the broadband infrastructure challenge right into the heart of their ambitions for national social and economic transformation, we are, at least by comparison, at risk of falling further and further behind.
- And finally, let me predict the bleeding obvious – broadband will simply grow more and more important to Australia's future. And that is because it IS as transformative for individuals, business and communities as the hype suggests. You'd expect someone who works for Cisco to say that, of course and I make the claim with some trepidation given the distractions of the last hype cycle we all lived through about the Internet itself. Mind you, we shouldn't forget that although some aspects of the irrational exuberance with which the first round of Internet hype became infected were unhelpful, many of the core claims on which it grew have turned out to be true, not

perhaps in their original pumped up form but in much deeper and more important ways.

But the reason I think the broadband claims are true is not because I necessarily endorse (or even share) the wilder claims of the technology obsessed but because I see, and increasingly witness in my own life, the human opportunities which are at stake.

The reality is that while the benefits of new technologies are often exaggerated at first, they often turn out to exceed initial expectations in the moderate-to-long term. This is exactly what has happened with the digital revolution.

When I stack up what we've already seen in areas like health and education, and in the wonderful potential of the rise and rise of social networking, and when you consider that what we've seen so far is the merest scratching of the surface, I know that this prediction is neither fanciful nor risky.

The question remains, though, whether we will continue to make heavy weather of it all. I hope not. There's too much at stake.

Consider where we find ourselves, in policy terms. We're looking for ways to spend less and do more, to lift the quality, reach and impact of public services with fewer people to run them and more people demanding them. We want to slow the unsustainable increase in strained public budgets, lower the tax burden on a shrinking working population and still provide a steadily improving level of amenity in communities that are socially inclusive, economically resilient and environmentally sustainable.

How do we expect to pull off that three-card trick without completely rethinking the way people interact with each other, with the information and knowledge they create and use and with the social, economic and environmental conditions they create and on which they rely? None of this is possible without the kind of rich, complex and secure connectedness that real broadband offers.

This is one of those classic insights where you realise that technology is fuelling a set of policy and human challenges to which it is also a central part of the solution. Broadband, and the human network it enables, ought to be right at the heart of our policy process. Because pretty much none of the big, hairy, audacious policy ambitions to which we are now hostage is achievable without it.

If this is right, then the policy debate should be driven by an approach in which three common features stand out:

- One is the way in which **broadband drives choice**. As broadband capacity grows to allow virtually any type of service to be relatively easily and cheaply bundled with other services and delivered to different segments of the market, the ability for people to choose the mix of services that best reflects their changing needs and circumstances is empowering.
- A second feature is the **changing nature of the communication experience** once people have access to the kind of broadband capacity that delivers a much richer and more immersive experience.

Sending people emails is one thing. The experience gets better when you can access traditional phone and video conferencing. But when the technology allows a level of real-time video-based communication, where the quality of the sound and pictures is

much richer and more sophisticated than before, the experience moves to a new level. This argument isn't that technology replaces real human connection. The argument is that there are now other modes of communication which enhance and extend those human networks by adding flexibility, efficiency and convenience into the mix.

- And the third feature of the stories is the absence of any specific focus on the Internet, computers or the technical questions of broadband speeds and capacity. The focus for many people is on **new ways to communicate and create communities of interest and engagement**. It is not a question of how fast you can do email or how quickly you can surf the net. And the real answer to the question "how fast is fast enough?" can only ever be definitely determined by reference to what it is that people and organisations and communities actually want to do. In other words, the answer is not a technical one, but one driven by human aspiration.

Broadband has become the inescapable infrastructure platform for success in the digital, networked society. The growing evidence from around the world is that the real significance of next generation broadband capabilities is the impact on three interrelated outcomes:

- The first is **economic resilience** and the capacity for cities, regions and countries to compete successfully in the global knowledge economy; real broadband is rapidly becoming a core utility for the networked age, providing a platform without which large companies and small and medium enterprises will not be able to create and access the investment, skills and services they need to deliver sustained economic growth and development.
- The second is **strengthening social networks and inclusion**, creating new opportunities for people to become engaged and connected not only with each other in the communities in which they live and work but also with key resources and expertise in the wider world. In that sense, broadband becomes an enabling technology for a human network that invests in both 'bonding' and 'bridging' social capital, dramatically lifting the quality and reach of connection and collaboration on which strong and resilient communities rely.
- And the third outcome is a sense of **personal "agency" or empowerment**, the ability for people to be confident about their ability to manage their own lives and do things for themselves, everything from shopping on line, dealing with government, staying in touch with family and carers so they can stay active and independent into their older years or perhaps managing the effects of a chronic illness.

To twist William Gibson's famous aphorism a little, when it comes to broadband, the future has already arrived. It's just that it's not very evenly distributed. Fixing that will be the policy work of the next few years in Australia.

