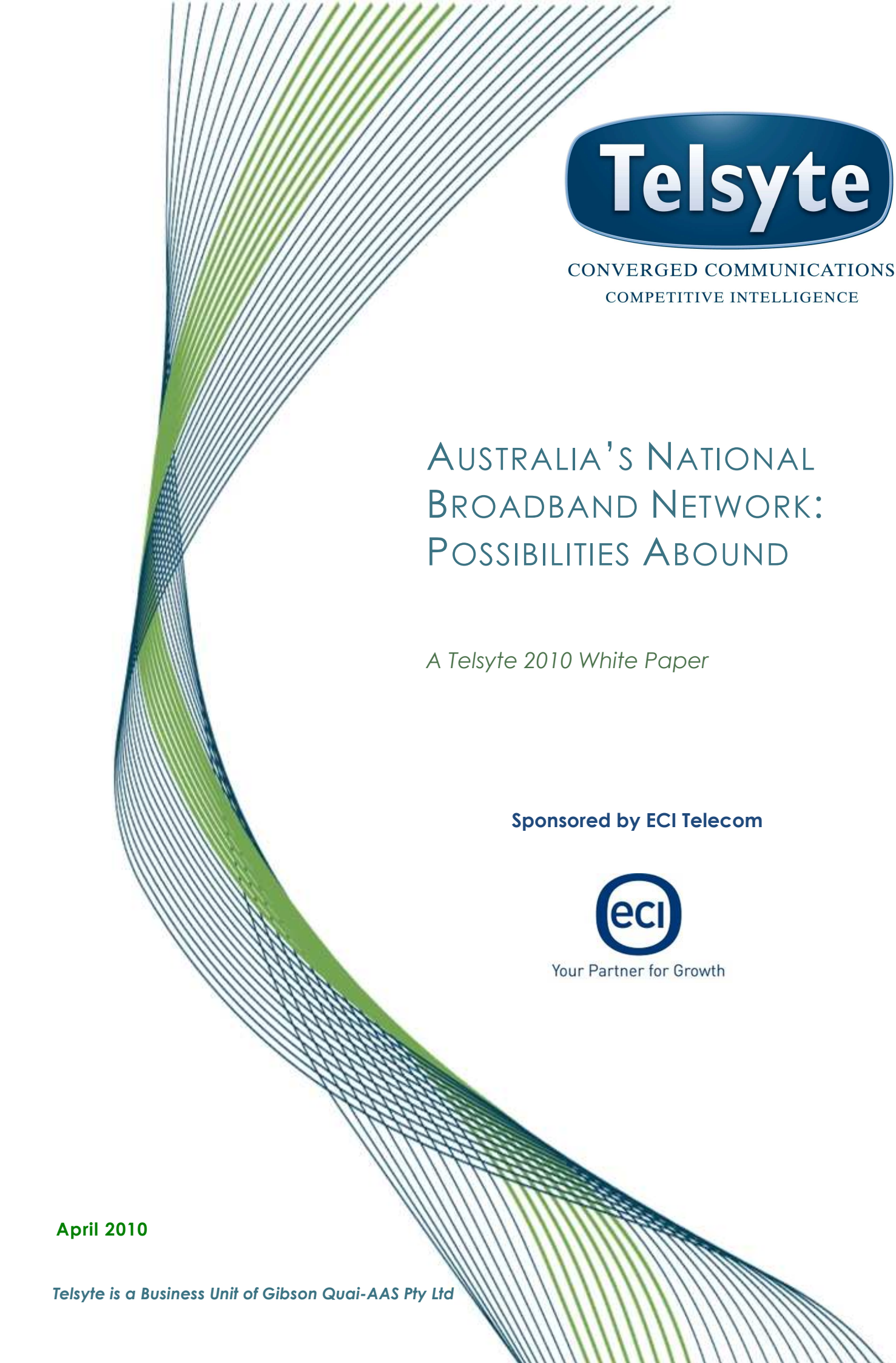

Telsyte

CONVERGED COMMUNICATIONS
COMPETITIVE INTELLIGENCE

AUSTRALIA'S NATIONAL BROADBAND NETWORK: POSSIBILITIES ABOUND

A Telsyte 2010 White Paper

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Table of Contents

Building A Ubiquitous High-speed Australia 4
Australia's National Broadband Network 4
What can Australians do with 100 Mbps? 5
The economics of the NBN 5
NBN Possibilities for Australian Consumers 6
Entertainment and multi-play services 6
Health services 7
Education and government services 7
The connected home 8
NBN Possibilities for Australian Businesses 8
Cloud computing and virtualisation 8
Remote working and mobile workforce 8
Video conferencing and virtual meeting 9
Conclusion 9
Related Thought Leadership Papers 10

BUILDING A UBIQUITOUS HIGH-SPEED AUSTRALIA

Australia has embarked on the largest-ever infrastructure project in the country's history. Billed as nation-building and one of the largest ever attempted globally, it has been likened in significance by some to the construction of the railways, roads and electricity networks in the past centuries. High-speed networks have been identified as a crucial element in the Australian government's strategy to ensure the country's international competitiveness and to drive national productivity into the future.

For the telecommunications industry, the National Broadband Network (NBN) represents a major structural shift, as it will change the types of service offerings, the types of service providers operating in the market, and what users can do with their broadband connections. The NBN will lower market entry barriers for many potential and existing industry players, particularly content and applications providers currently bottlenecked by their dependency on connectivity partners. It will change the business models service providers are able to deploy to deliver innovative offerings. For some industry participants, it will fundamentally change all aspects of their operations and will spawn new markets. The NBN will also open the door for delivery of new communications, entertainment and utilities services, enable new mechanisms to delivering social services, and change the way we interact with technology within our homes.

Technology history has shown that user behaviour can shift in unexpected ways and opportunities that arise are often unimaginable at inception. For instance, consider the unintended stellar rise of SMS and the Internet itself and the unexpected use and derived value of Web 2.0 and social networking. Experience shows that value can be identified in the unexpected and new opportunities for service providers are realised through a complex interaction between service provider offerings, vendor capabilities and changing user behaviours, which drive demands.

Australia's National Broadband Network

In April 2009, the Australian government announced a plan to invest $43 billion on building a high-speed, open-access broadband network that would serve the whole of Australia. The planned NBN network will deliver broadband services with speeds up to 100 Mbps to 90% of the Australian population via fibre-to-the-home technology. Those not covered by the fibre network will be served via complementary wireless and satellite networks delivering speeds of at least 12 Mbps.

NBN Co was formed to plan, build and operate the network. NBN Co, the government and its consultant advisors, along with a number of key industry organisations, have been working to define the operational design of the network, build the operational business case and demonstrate the economic viability of the project.

From an operational perspective, the NBN will:

- **Be an open-access network offering wholesale-only services.** The chief principle of the NBN is an open-access, wholesale network that enables an equal footing for all retail service provisioning, and

- **Provide Layer 2 wholesale services.** NBN Co will build Layer 1 (passive layer) and Layer 2 (Ethernet) networks, then wholesale Layer 2 services to retail service providers, which will be responsible for their own Layer 3 infrastructure, where service delivery and competition take place.

NBN Co has been given the mandate of completing the project in eight years, starting from 2009. The NBN is being built in stages, with Tasmania being the country's "test bed",

thanks to the island state's most advanced progress. NBN Co has recently announced plans to trial five mainland sites in 2010.

The nature and degree of involvement by Telstra, the country's incumbent telco, in the NBN remains uncertain, and will be critical to the project's economic viability and would lead to drastically different commercial outcomes for Telstra itself. Additional to the issue of Telstra's role, NBN Co has not yet fully articulated how the existing network owners other than Telstra would vend their stranded assets. In any case, the government's establishment of NBN Co is promising to eliminate the industry's long-standing stranglehold, fostering competition and innovations, and opening up a new world of digital economy. Telsyte believes lying at the heart of the NBN are future services and applications that we cannot even imagine today, that will be key to innovations and competition.

However, it appears the NBN is likely to break up one monopoly and create another that is regulated. Telsyte believes the current proposition is likely to solve part of the problem. In essence, above the Layer 2 services to be provided by NBN Co, there will still be a void of services that traditional wholesalers currently provide, under existing regulation. This will create opportunities for larger providers with access to a strong balance sheet to become aggregators or Layer 3 wholesale providers, thereby simply shifting the bottleneck. In effect, the large industry participants are expected to form an oligopoly market.

To ensure the government's vision is realised, the NBN must be a truly open, intelligent, and future-proof network capable of supporting delivery of multi-sector services. The key to its success and contribution to economic growth will be the establishment of a sustainable trans-sectorial ecosystem through aggregation efficiencies.

What can Australians do with 100 Mbps?

There are endless sets of statistics demonstrating how much faster 100 Mbps can complete certain tasks than the ADSL2+ broadband services currently available in Australia. For example, 100 Mbps can download a whole music album in a mere 5 seconds, and an hour-long TV show in just 30 seconds. While 100 Mbps services will undoubtedly enable us to do the things we already do in a much faster fashion, it is the way the NBN will change how we do things that is the most interesting and will lead to the most impact in terms of service provisioning, user experience and demand for new personalised services. For instance, Telsyte foresees significant growth opportunities for the business intelligence and data mining sector, where growth has traditionally been stifled by access to large bandwidths and their prohibitive costs.

Essentially, ubiquitous 100 Mbps will enable two things to change. Firstly, applications that are particularly time-sensitive, such as video and voice, will be greatly enhanced, while others will be deliverable at variable service qualities as required. The other major impact relates to productivity gains as it will enable users to do a variety of different things at the same time. This ability to conduct a number of bandwidth-hungry activities simultaneously is the particularly important factor in driving change in the way broadband is used by Australian households and businesses. This, in turn, will open new opportunities for players from non-telecom industries to leverage the network, giving rise to new business and operational models for retail service providers.

The economics of the NBN

Apart from technology and industry model discussions, one major debate has been the economic viability of the NBN, given current market conditions, including the cost disparity faced by households in metro and regional areas, current competition levels, expected take-up rates following deployment, and consumers' current willingness to pay for broadband services above current prices.

Telsyte research reveals that the average household ARPU for broadband services in Australia stands at $48 a month. Although that ARPU is trending upwards as subscribers move to higher value and bandwidth packages, operators currently providing very high-speed services, such as Canberra's TransACT, have found that their subscribers, more often than not, opt for lower-speed packages than the full 100 Mbps that is available. This suggests that Australian consumers do not value higher speed broadband services and do not fully understand their usage potential, a finding confirmed by our recent consumer study which reveals that the vast majority of Australian consumers are unaware of the NBN project and have no clues what the NBN can do.

A government-commissioned consultancy report is understood to have suggested a monthly wholesale price of $75 per household based on a 90% take-up, which would lead to a retail price of at least $120 per month. At face value, monthly spending of $120 for broadband services seems out of reach for the typical Australian household. However, Telsyte believes there is a gap between the current understood value of broadband services and the value that the NBN will bring in the near term following its deployment. The NBN has the potential to be the infrastructure upon which all communications services are provided. As a starting point, this could include broadband, voice and pay-television services. Telsyte data shows that the average combined spending for these three services by Australian households today is just approaching the $120 mark, therefore additional value will have to be created to bridge this gap between the willingness to pay and value delivered.

Telsyte believes the availability of ubiquitous high speed broadband services will dramatically change the way we use broadband at home, enabling service providers to create new value-added offerings and spawning new services that will not be limited to telecommunications. The NBN will provide the basic "pipes" upon which retail service providers of all types will be able to overlay basic connectivity and a host of value added services. This, over time, will shift market power to the emerging retail service providers. The potential opportunity that the NBN will bring is vast, with many future services unimaginable today. We have set out below some of the opportunities we expect will be targeted by service providers in the consumer and business markets, following NBN deployment and where ubiquitous high speed networking brings particular value.

NBN Possibilities for Australian Consumers

Entertainment and multi-play services

Bundled quadruple-play offerings (fixed voice, mobile, broadband, and subscription-based television) have been part of the core strategy for telecommunications operators looking to increase revenue streams and the "stickiness" of their subscriber base for some time. In Australia, true IPTV offerings are just starting to develop, but internationally in countries where fibre-to-the-home is more readily available, IPTV has become an established service. Examples of where IPTV has firmly taken root include Japan, Korea, and parts of the United States.

Entertainment services including interactive television, on-demand movies, and on-demand games will be one of the first cherries picked by operators looking to increase consumer spending following deployment of the NBN. The growing popularity of the still-nascent 3D technology and future interactive, e-commerce activities will depend on high-speed broadband capabilities. Australia's third-largest ISP iiNet has already moved to enter the IPTV market with its FetchTV offering that will be available soon. Further moves to provide IP-based interactive entertainment from other providers are expected to follow as NBN deployment approaches. Telsyte also expects that through media-rich, social applications and other forms of interaction, personalised services will be commonplace as retail service providers seek to improve customer stickiness and become relevant in the eye of the consumer.

Health services

With an ageing population, countries around the globe, especially developed ones, are faced with spiraling costs of healthcare. The potential of high-speed broadband in healthcare is significant in managing the vast quantities of information more efficiently, spreading scant resources more cost-effectively and enabling delivery of remote health care without hospitalisation, where possible. Internationally, a number of major initiatives have already been established to bring the value of technologies into the healthcare system, with the United Kingdom being a shining case in point. The NBN will enable access by remote patients and health practitioners to specialist medical resources located in city areas, allowing them to have specialist consultations without the need to travel long distances.

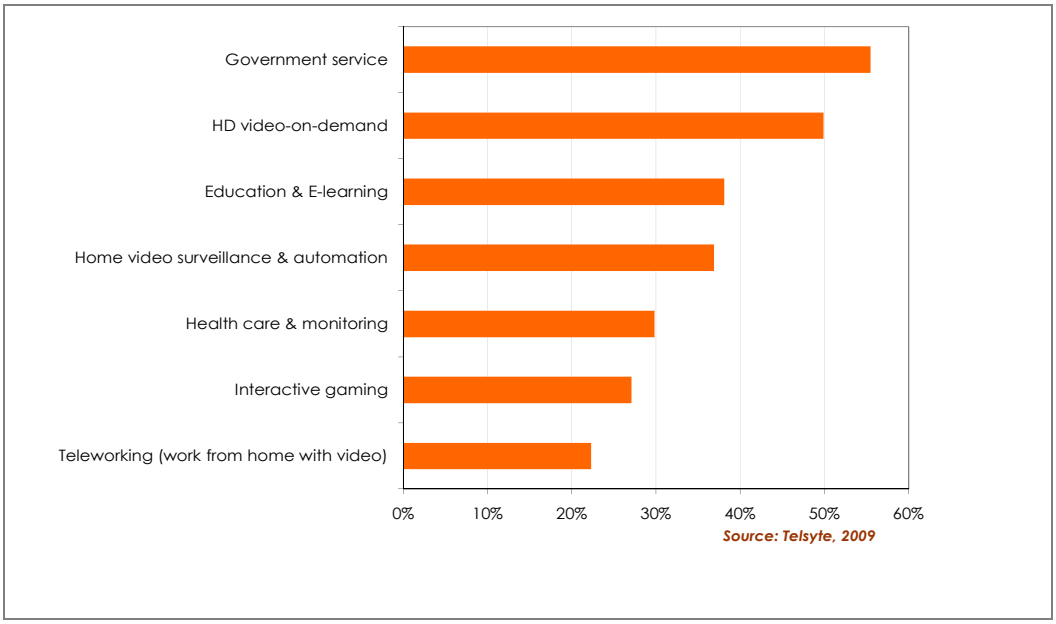
Ubiquitous high-speed broadband will also make possible self-managed aged care, through such solutions as telemetry, remote video cameras, movement sensors and vital sign monitoring, which can be used to affect change in the way healthcare is delivered. The healthcare system of the future will manage a vast amount of information, including patient and medical records, and images such as x-rays and ultrasounds, in a seamless manner. The NBN will provide the basic infrastructure that would allow such a system to be undertaken here. Broadband has already allowed the UK Department of Health to migrate the National Health Service to a single, centrally-mandated electronic care record for patients and connect 30,000 general practitioners to 300 hospitals, providing secure and audited access to these records by authorised health professionals.

Education and government services

As in healthcare, education stands to benefit significantly from the availability of ubiquitous high-speed broadband. Future learning will be collaborative and synchronous, allowing teachers and students to fully interact in real-time with the use of multimedia teaching aids. In addition to the actual delivery of educational content in virtual classrooms, broadband will also facilitate important administrative tasks, including student enrolment, tracking and class administration, and communication between learner and instructor.

Government and social services are another prime area that will benefit from the NBN. In fact, recent Telsyte research reveals that Australian consumers have expressed the highest level of interest in government services in an NBN world, as shown below.

Australians' Interest in NBN Applications



The potential of e-learning is not limited to schools and universities, as it also applies to companies. Employee training, skill upgrades and customer communications that can be done remotely will greatly benefit businesses, particularly those with branches throughout the country.

The connected home

The NBN will enable a whole new suite of services in the home, ranging from smart utilities metering, real-time and remote monitoring of home surveillance and security, and automated management of appliances. The first movement in this area is already afoot, with Australian electricity companies starting to roll out smart electricity meters across the nation. Smart meters, coupled with a smart network, enable continuous two-way conversations between consumers and the utilities company, which allow utilities to supply the right amount of energy, consumers to save money and, in the future, permit users to sell energy back into the network. Water and gas companies are following suit.

In the future, these smart meters which form elements of a smart grid, may also double as a hub for home and local area networks, allowing utilities companies to provide other services, such as home automation, surveillance or even entertainment content, to Australian households. In the context of the NBN, Australian utilities companies are the most active non-telco participants engaging in the dialogue with NBN Co, as the prospects of network infrastructure sharing and of them becoming Layer 3 retail service providers are very palpable.

NBN Possibilities for Australian Businesses

Cloud computing and virtualisation

The concept of cloud computing is not new as it was introduced a decade ago under the moniker ASP. Unfortunately, the ASP model did not materialise, partly because of the dot-com bust but also because there were no high-speed networks to fulfill its promises. For large corporate and government users, NBN Co has provisioned speeds of up to one Gpbs. This time, ubiquitous high-speed networks will certainly accelerate adoption of cloud services by Australian businesses. In fact, we expect that, with the NBN, cloud computing will not only take hold but become the dominant way to run a company's IT systems.

The NBN will also enable businesses to run time-sensitive, mission-critical applications and infrastructure, such as remote storage, efficiently. The adoption of cloud services will provide businesses with both capital and operational cost savings. Capital savings will be based on negating the need for hardware replacement on a cyclical basis, whereas operational savings will be derived from vastly reduced project implementation, support and maintenance costs.

Remote working and mobile workforce

A shift in Australia's population age, household structure and technology are leading to a shift in our working patterns. A growing preference towards part-time employment has been a characteristic of the Australian workforce over the past three decades, with more Australians working from home. In addition, increasing numbers of workers are becoming mobile. The proportion of Australian mobile employees, currently at 30%, is projected to grow significantly in the next decade.

Remote and mobile workers will clearly benefit from the NBN through such applications as multimedia collaboration and remote access to bandwidth-hungry corporate applications. Moreover, cloud computing means there is no need for remote and mobile workers to store data locally, resulting in up-to-date and accurate information for all involved. Apart from the ability to work efficiently from anywhere, the fact that employees

do not have to commute to the office can translate into substantial time and money savings – "soft" benefits that Telsyte believes are not well understood by consumers and thus not taken into account when it comes to their perception of and willingness to pay for NBN services.

Video conferencing and virtual meeting

Video conferencing is now beginning to make real inroads in Australia. Video conferencing is a powerful offering for organisations looking to increase the efficiency of teamwork and reduce travel costs. While the technology can be made to work with the broadband networks currently available in Australia, ubiquitous high-speed broadband really enables the technology to provide high-quality and high-resolution services that make the experience akin to meeting in the same room.

A large number of branch offices in regional and rural Australia do not have access to the same quality or speeds that capital city offices do. Consequently, interoffice conferencing has not been used effectively, hampering business productivity. The NBN promises to change that by enabling businesses to conduct conferencing and virtual meetings independent of physical location constraints. Outside of the corporate environment, it is envisioned that the NBN would enable consumers to enjoy high-quality video conferencing facilities in the household, allowing them to virtually meet colleagues, friends and relatives anywhere in the world.

CONCLUSION

Australia has taken a bold step to build one of the world's first and largest ubiquitous, open-access, high-speed broadband networks. Although it may be difficult to imagine the full possibilities the NBN will bring in eight years' time, one thing is certain: it promises to fundamentally change industry dynamics, the way service providers deliver their offerings, and the way we consume services and interact with technology.

The NBN will create new industry players, many from non-telecom sectors, bring about opportunities for suppliers, and benefit both consumer and business users alike. Consumers will enjoy an enhanced experience what is available today, but more importantly a raft of new services – entertainment, education, healthcare, utilities – that will be introduced. For businesses, benefits will come from top line growth opportunities created by new personalised offerings as well as from operational efficiencies, productivity gains and cost savings through such as technologies as cloud computing and teleworking.

While the economics of the NBN may seem difficult to understand, the new services that will be enabled many years from now and the "soft" benefits which may not be easily quantifiable will be key to realising its full potential. It is likely that long-term viability will come from what Telsyte defines as "aggregation efficiencies" or the multi-sector services that can be provided over the single "pipe" by ecosystem players within the telecom industry and trans-sectoral partners.

Technology history has shown that user behaviour can shift in unexpected ways and opportunities that arise are often unimaginable at inception. Lying at the heart of the NBN are future services and applications that we cannot even envision today, that will be key to innovations and competition. The NBN must be a truly open, intelligent, and future-proof network capable of supporting delivery of multi-sector services.

Telsyte foresees vast opportunities for innovative industry players who will become Layer 3 retail service providers of this open-access network and for those players who can extract customer value in the new ecosystem. Opportunities equally lie for solution providers able to bring together ecosystem partners and provide end-to-end customer solutions, and also for suppliers who can assist these players in service provisioning and delivery, policy and control, and customer management.

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