

21st Century Broadband

The Rudd Government has announced it will establish a new company that will invest up to \$43 billion over 8 years to build and operate a National Broadband Network delivering superfast broadband to Australian homes and workplaces.

This historic nation-building investment will help transform the Australian economy and create the jobs and businesses of the 21st century.

THE NEED FOR ACTION

NEEDS ARE GROWING

More and more Australians are using the internet, and many are consuming more and more data. Consumers and businesses are clamouring for faster, more affordable, more widely available broadband. Statistics show that where high speed broadband services are available, they are used.

Telstra's networks have experienced a 90-fold increase in traffic in just seven years. It is estimated that the total bandwidth consumed in the United States in 2010 will exceed that consumed by the whole world in 1995.

New applications and greater internet use will increase demand for broadband in coming years. New applications can increase business productivity and efficiency. Online studying offers students greater learning opportunities. Online health opens up opportunities for remote patient monitoring. Regional towns can benefit from greater connectedness to other areas.

Existing telecommunications networks will not be able to support this increase in traffic for much longer. It is not surprising that these old networks cannot cope as they have evolved from a telephone

network that was first rolled out in the late 1890s. And since the growth in traffic shows no sign of slowing down, we need to invest in new networks that have as long a life-span as possible.

To get the best out of the new opportunities offered by the internet, people need to be able to upload and download information. Next generation broadband networks are designed with this two way process in mind. We now need to invest in the infrastructure for the 21st Century.

AUSTRALIA IS FALLING BEHIND – INTERNATIONAL COMPARISONS

Currently, Australia is trailing its international peers on a range of telecommunications indicators. The most recent OECD statistics indicate that Australia is:

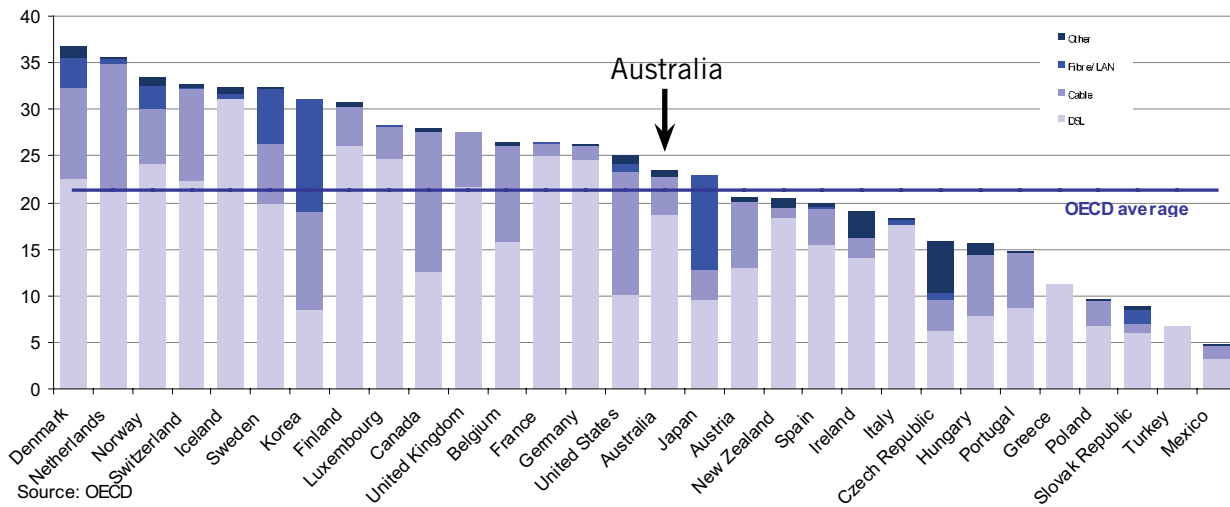
- in the bottom half of OECD countries in terms of broadband take-up (16th out of 30 countries);
- paying more for broadband than most OECD countries (20th out of 29 countries); and
- 3rd most expensive for fixed line services for small and medium enterprises.

The World Economic Forum has reported that Australia is:

- 25th for accessibility of digital content; and
- 35th for quality of competition in the Internet Service Provider sector.

Australia needs to do better than this.

OECD Broadband subscribers per 100 inhabitants, by technology, June 2008



Closing the gap on world leading countries will not happen instantly, so we need to start now.

NOT ENOUGH COMPETITION OR INVESTMENT

Competition has driven investment in next-generation, superfast broadband networks overseas. For example, in the United States, pay TV cable network operators and telephone network operators have each fought for broadband subscribers by upgrading their networks to offer faster, and cheaper, services.

This level of competition between networks does not exist in Australia partly because Telstra is one of the most integrated telecommunications carriers in the world.

Telecommunications policy has stifled competition and investment for over a decade. While the former government privatised a telecommunications infrastructure monopoly, it did not set up an adequate competition regime and it did not invest in next generation broadband infrastructure. While governments in other countries have reformed and invested in their telecommunications markets, Australia has been held back.

NATIONWIDE ACCESS

Nationwide access to next generation networks is vital for Australia's future economic prosperity. Any network that does not deliver enhanced broadband across the nation will divide Australia into a nation of digital winners and digital losers.

If businesses are going to get the benefits of superfast broadband, it needs to be available, and affordable, at each and every one of their locations across the country.

THE RUDD GOVERNMENT'S PLAN FOR ACTION

BETTER TECHNOLOGY AND INCREASED COMPETITION

We went to the 2007 election with a clear commitment to build a National Broadband Network. We are now following through and exceeding that commitment.

We are fixing two real and pressing problems:

- the need for better, faster broadband services through building a better network; and
- the structural problems that plague the sector and prevent genuine competition.

The Australian Government will establish a company to invest up to \$43 billion to deliver superfast broadband to Australian homes and workplaces. At the same time we are committed to reforming the existing telecommunications regime.

The Rudd Government's policy is designed to ensure that Australians can gain access to superfast broadband services at affordable prices, from a thriving competitive industry.

A NEW NETWORK

The Government will build and operate a new network to deliver superfast broadband.

The network will:

- be built on fibre; supplemented by next generation wireless and satellite technology; and
- provide future-proofed technology for decades to come.

By investing in a new network, the Government will overcome the problem currently faced in Australia where broadband to homes and workplaces is delivered over an aging copper-based network. When the new network is complete all Australians will be able to access fast broadband.

The Government's objective is to connect 90% of homes and workplaces to the fibre network within the company's investment of up to \$43 billion.

In other parts of Australia, next generation wireless and satellite technologies will ensure all Australians will get access to broadband speeds that will

support new, two-way, interactive video services and applications.

Connecting fibre optic cables directly to people's homes will allow speeds of 100Mbps and beyond. This is 100 times faster than speeds many Australians currently use.

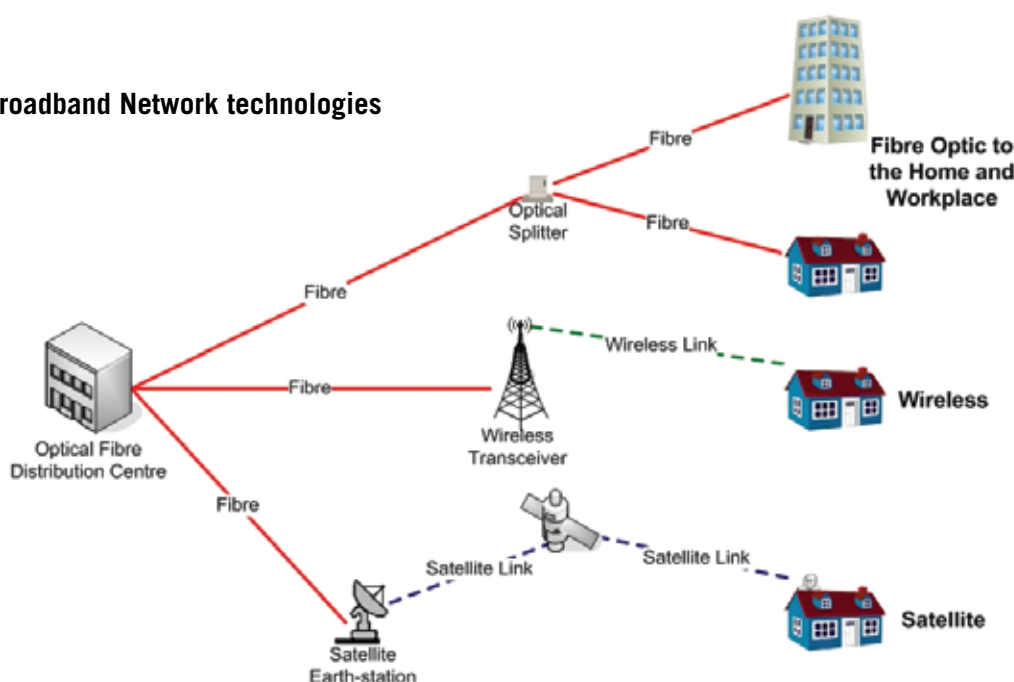
A NEW COMPANY

Unlike other companies in the telecommunications sector, the new company will only be allowed to offer wholesale services. This means it will not offer retail services to consumers and businesses. As a result, the company will not favour one retailer over another; it will treat all of its customers equally. Competition amongst retailers will thrive and consumers will benefit from greater choice, more attractive services and, importantly, lower prices.

The Government will encourage private investment in the company from the time that building of the network starts. We will sell the company within five years of the network being built. Until full privatisation, the Government will be the majority shareholder in the company.

We will introduce legislation to ensure that the new network company always operates as the Government intends. The legislation will give the ACCC a strong, independent oversight role in ensuring the access terms offered by the company are fair, and that the company treats all of its customers equally. As well, the legislation will make sure that at no stage can a customer of the network control the new network company.

National Broadband Network technologies



THE NETWORK TECHNOLOGY

There are two basic ways of delivering broadband and telephone services:

1. through metal wires or optic fibres; or
2. wirelessly either by satellite or using a mobile phone style of network.

Each has its strengths, and the new network will use both. Using a combination of technologies, all Australians will get access to faster, more reliable broadband services which support the latest two-way applications.

Fibre optic to the home and workplace

Fibre optic to the home and workplace technology (or FTTP) is the state of the art 'future proof' fixed broadband technology and is capable of providing customers with download speeds of 100 Mbps and upload speeds of 50 Mbps. Broadband speeds available over fibre optic technology are expected to reach 1 Gbps and beyond in the coming years.

Fibre to the home is the "end-game." – **Hugh Bradlow, Chief Technology Officer, Telstra**

"Of all the technologies available, fibre to the premises delivers the highest dedicated speed to the end user." – **CSIRO**

"Fibre to the Premises is the most future proof technology." – **NICTA**

"[FTTP] technology is the most future proof, with no other technology competing with the expected continuing advances in optical fibre transmission and the future potential of optical switching systems. It is the only technology expected to meet the user demands of 2020 and beyond in urban and suburban environments." – **Defence Science and Technology Organisation**

Next generation wireless broadband

Experts also agree that wireless broadband technologies have an important role to play in delivering broadband services to parts of Australia, and for delivering connectivity while people are on the move.

The next generation wireless technologies (such as 'Long Term Evolution') will be able to deliver consistent broadband speeds of 12 Mbps (bursting to 100 Mbps or more) to individual customers, well above the speeds available on existing infrastructure in regional and remote areas.

"In general terrestrial wireless is well suited to providing services in areas of low teledensity or difficult terrain where the economics of deploying wired infrastructure is prohibitive." – **Australian Communications and Media Authority.**

Next generation satellite broadband

Next generation satellite broadband is an important part of the National Broadband Network. The satellite technology used for the National Broadband Network will be capable of providing 12 megabits per second or more. The National Broadband Network satellite system will ensure that broadband services are available to 100% of Australia's landmass, including remote and black spot areas that are unable to receive terrestrial broadband services.

"Satellite delivery of broadband services is possibly the only technically viable solution in remote areas of Australia because it does not require that distribution plant is pre-provided in the locations where the service is to be accessed." – **Australian Communications and Media Authority.**

URGENT ACTION IS REQUIRED

The Australian Government is committed to achieving outcomes that will benefit the community as quickly as possible. Some parts of the National Broadband Network initiative will take time to deliver – rolling out a new network across the country is a major and complex engineering task. However, there are practical steps that can be taken quickly, which will deliver real benefits to Australian communities in the short to medium term.

TASMANIA FIRST

Tasmania has the lowest level of broadband penetration of any state in Australia at 32% of households.

The Tasmanian Government submitted a proposal as part of the National Broadband Network tender process. While this process did not deliver a national solution, the Tasmanian Government's proposal fitted well with the Rudd Government's new approach. Tasmania is well advanced in its planning and is ready to start work.

This is why the Australian Government is fast-tracking negotiations with the Tasmanian Government to commence, this year, the roll-out of the new network in Tasmania.



BACKHAUL

Backhaul networks consist of high capacity optical fibre transmission links that connect telephone exchanges located in cities, major regional centres and rural towns across Australia. These transmission links are the backbone of any telecommunications network – they carry the emails and mobile phone calls from Broome to friends and relatives in Brisbane, Bangkok and Birmingham.

In regional areas where competing backhaul networks do not exist there is little pressure on providers to offer lower prices, which means that companies cannot make new services available to consumers in these areas at prices they can afford.

The Government will invest up to \$250 million to immediately address backhaul blackspots throughout regional Australia. This will:

- deliver an immediate economic stimulus;
- reduce the cost of broadband services;
- put in place key infrastructure for the roll-out of the National Broadband Network; and
- allow existing providers to consider extending mobile networks to smaller towns.

GREENFIELDS – NEW ESTATE DEVELOPMENTS

Given people need faster broadband, it just does not make sense to build new homes that use all the latest approaches to save energy and water but then connect them to copper wires instead of 21st Century fibre optic connections.

Forward looking local governments, such as the Whittlesea Council in Victoria, are using their planning powers to encourage developers and telecommunications carriers to build fibre optic networks in new estates.

The Rudd Government wants to support these initiatives and make sure this best practice approach is taken up nationwide. This is why we will require from 1 July 2010 all new estate developments to install fibre optic networks to homes and workplaces.

REGULATION IN THE TRANSITION PERIOD

The roll-out of the National Broadband Network as a wholesale-only, open access network will fundamentally transform the competitive dynamics of the Australian telecommunications sector.

The Government is committed to reforming the current telecommunications regulatory regime in the lead up to the roll-out of the new network to fix up the obvious problems that exist. The current regime has been in place since 1997. Even without the Australian Government's National Broadband Network initiative, the competition regime was due for review in 2009.

The Government is seeking public comments on a range of options to improve the regime.

The Government will consider key options for reform, including:

- streamlining access regulation processes, by allowing the ACCC to set up-front access terms for companies wanting access to Telstra and other networks;
- strengthening the powers of the ACCC to tackle anti-competitive conduct by allowing it to impose binding rule of conduct when issuing competition notices;
- promoting greater competition across the industry, including measures to better address Telstra's vertical integration, such as functional separation;
- addressing competition and investment issues arising from horizontal integration of fixed-line and cable networks, and telecommunications and media assets;
- improving universal access arrangements for telephony and payphones; and
- introducing more effective rules requiring telephone companies to make connections and repairs within set time frames.

The discussion paper is available at www.dbcde.gov.au/nationalbroadbandnetwork. Submissions are due at 5pm, 3 June 2009.

WHY BROADBAND IS ESSENTIAL

The new network will improve Australia's productivity and economic prosperity, assist the nation's fight against climate change, improve service delivery in the critical areas of education and health and ensure the connectedness of our regions.

Superfast broadband networks are purpose built for the digital age of the 21st century.

They:

- deliver faster download and upload data speeds;
- transform the online world into a visual medium, enable real-time collaboration; and importantly
- enable everyone in the house or workplace to use a range of high speed services simultaneously.

ECONOMIC BENEFITS

The Government's investment will deliver an immediate stimulus to the economy by creating employment opportunities. The roll-out of the new network will create jobs in the short-to-medium term – the network must be designed, routes surveyed, trenches dug, cable laid, and software developed.

Australian businesses have been held back by slow and expensive broadband.

With fast and affordable broadband, a company's location will no longer matter.

- Firms can be in contact with customers and suppliers all around the world.
- Businesses from can be run from home.
- Small businesses can compete no matter where they are located.
- Head offices can provide world-class training and development to staff in remote locations.

A recent study conducted for the European Commission found that broadband:

- led to improvements in labour productivity of 5% on average in the manufacturing sector and 10% on average in the services sector; and
- led to the creation of 105,000 net new jobs in Europe in 2006.

Superfast broadband is good for business. It saves time, saves money and increases productivity.

REGIONAL BENEFITS

The new network will dramatically improve broadband for all Australians, including those living in regional and rural Australia. We have consulted widely and experts agree that for rural and remote areas wireless and satellite are more practical than fibre.

For the regions fast, reliable broadband networks help overcome the challenges of distance – it will become less important where you live.

People living away from major cities will have:

- less need to travel to get specialist services, saving people time and money;
- convenient access to city services; and
- opportunities for communities to connect with one another using real time, high-definition video conferencing.



People living in the bush will have better access to specialist services, information sources and tools that are typically located in major urban centres. The Government is making sure broadband services are improved for every Australian.

ENVIRONMENT, HEALTH AND EDUCATION BENEFITS

ENVIRONMENT

The roll-out of a next generation National Broadband Network will enable new technologies to assist Australians to combat the impact of climate change and reduce greenhouse gas emissions.

A study undertaken in 2007 found that broadband could help reduce Australia's annual emissions of greenhouse gas by 5% and save around \$6.6 billion a year in energy and travel costs for both businesses and households.

HEALTH

The availability of high-definition video conferencing, which will be supported by the National Broadband Network, will enable Australians that live away from the major state hospitals to benefit from consultations with medical experts, improving timely access to highly specialised services.

A high speed broadband network will also support access to specialist advice and second opinions through the secure electronic transfer of diagnostic information and test results, such as x-rays, enabling early diagnosis of diseases and treatment and potentially reducing hospital stay times. It can reduce the need for patient travel outside of rural and regional centres.

High speed broadband can make a positive impact on health outcomes by improving the efficiency of the systems and processes used, allowing more dollars to be spent directly on patient care. The implementation of electronic health records, which can be transferred quickly, securely and reliably between GPs and specialists, is a good example.

The National E-Health Strategy developed in December 2008 and endorsed by the Australian Health Ministers' Conference states E-health should be viewed as both the essential infrastructure underpinning information exchange between all

participants in the Australian health care system and as a key enabler and driver of improved health outcomes for all Australians.

EDUCATION

High speed broadband will enable teachers to work with a range of online curriculum materials to help lift the education outcomes nationwide and also to improve their skills through access to high quality professional development material.

The Australian Government's Digital Education Revolution is allowing students and teachers to have access to online curriculum tools and resources to support the national curriculum, as well as conferencing facilities for specialist subjects such as languages.

Fast broadband will enable teachers and students of all ages to have better access to online curriculum content, from both their workplaces and homes. It will support the use of interactive content and enhance remote learning opportunities. In turn this will deliver better educational outcomes and better employment opportunities.



CONSUMER BENEFITS

The Government's initiative will ensure all Australians will have access to a digital lifestyle and be able to enjoy all the benefits of superfast broadband.

The National Broadband Network will enable truly high speed carrier grade video, data and voice services.

Children will be able to use the internet to download study documents at the same time that their parents are doing business online.

Families and friends will be able to communicate via high-definition video conferencing and to share their video files and digital photos across the country in real time.

People will have access to high-definition movies and TV shows from around the world no matter where they live and they will be able to fully interact with the content.

The community will benefit from better emergency service and disaster relief systems, which allow people to communicate in critical situations where immediate access to information is vital.

Everyone will have faster access to websites to conduct searches and undertake online transactions.

Continuous download speed	Time to download an average compressed movie (1 GB of data)
100 Mbps	1m20s
30 Mbps	4m27s
12 Mbps	11m7s
256 kbps	8h41m
56 kbps	1d16h

Australians will be able to make better use of the range of digital devices in their homes now and into the future – digital video recorders, digital cameras, high-definition monitors, PDAs, MP3 players, laptops and other smart appliances.

A truly high speed network will save Australian families time and money by allowing access to an increasing range of sophisticated online services.

The new network, together with the competition reforms the Government is considering, will make internet service providers compete harder to win your business – keeping prices low and the quality of their service high.