# The Allen Consulting Group dandolopartners

# A Competitive Model for National Broadband Upgrade

An alternative to Telstra's fibre-to-the-node proposal that is in the national interest

# 10 July 2006

Report to AAPT, iiNet, Internode, Macquarie Telecom, Optus, Powertel, Primus, Soul and TransACT

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# Glossary

ACCC	Australian Competition and Consumer Commission
ACIF	Australian Communications Industry Forum
ADSL, VDSL, HDSL	Asymmetrical (video/high) digital subscriber line
AMPS	Analogue Mobile Phone System
CAN	Customer access network
САРМ	Capital Asset Pricing model
DSLAM	Digital Subscriber Line Access Multiplexer
ECTA	European Competitive Telecommunications Association
FAN	FTTN access network
FANOC	FTTN access network ownership company
FTTH	Fibre to the home
FTTN	Fibre to the node
GSM	Global Systems for Mobiles
HFC	Hybrid fibre coaxial cable
ISDN	Integrated services digital network
LLU	Local loop unbundling
LSS	Line sharing service
NGN	Next Generation Networks
PSTN	Public switched telephone network
SMP	Significant market power
TSLRIC	Total service long-run incremental cost
ULLS	Unconditioned Local Loop Service
USTR	Office of the US Trade Representative
VoIP	Voice over internet
WACC	Weighted Average Cost of Capital

# Executive summary

# This report

This report sets out a proposed path forward for Australia to upgrade its broadband infrastructure to FTTN, while protecting and strengthening competition.

Australia's broadband position is poor — the average Australian customer receives low bandwidth services at high prices, and a lack of variety in broadband service offerings. We point out that Australia needs to do better — and suggest that our national objectives should be strong effective competition in the provision of that bandwidth to deliver high average bandwidth and better broadband services.

The picture is set to improve markedly, with the Government's sustained commitment to ULLS and LSS now delivering benefits to consumers.

Telstra has offered another 'solution': an FTTN network offering 12Mbps to four million homes and businesses in the five major capital cities. We argue that Telstra's proposal must be rejected because it has a number of fundamental problems:

- By reaching only 4 million homes and businesses, it would create a two-tier Australia, with less than half the country able to receive high speed broadband, and the remainder stuck with low speed broadband.
- It would establish Telstra as the monopoly provider of FTTN because there is no way for competitors to use 'unbundled' elements of the FTTN.
- It would seriously damage ULLS-based broadband competition indeed this appears to be a significant motivation for FTTN.
- It would enhance Telstra's capacity to sabotage its competitors.

We observe that the Government faces a choice. Should it give Telstra the generous regulatory concessions sought in exchange for building an FTTN network? Or should it refuse to do so — and potentially delay the arrival of higher bandwidth services?

This report sets out an alternative model that avoids the problems associated with Telstra's FTTN proposal. We conclude that the benefits of this model are compelling, delivering:

- an FTTN network with substantially greater reach than the 4 million homes and businesses proposed by Telstra;
- an FTTN network operating under the discipline of competition thus ensuring more innovation, lower prices, better service and greater penetration than Telstra's model;
- the necessary certainty of outcome to allow an investment in the FTTN network to be justified;
- joint control of key aspects of decision making over the FTTN network, thus significantly improving on the features of Telstra's FTTN model which would be so damaging to competition;

- the agreement of all Telstra's major fixed line competitors, hence allowing rapid industry wide agreement on the arrangements for FTTN rollout instead of a protracted and uncertain legal process; and
- a managed transition from ULLS, not the sudden destruction of it.

# Australia lags behind on broadband and needs to do better

Australia needs high speed, widely available, low cost broadband services. Our national economic performance depends on it. Government policy aims to achieve this outcome. In 2004, the Federal Government released Australia's National Broadband Strategy, which includes the vision:<sup>1</sup>

Australia will be a world leader in the availability and effective use of broadband, to deliver enhanced outcomes in health, education, community, and government to capture the economic and social benefits of broadband connectivity.

Many other countries are aiming for similar outcomes.<sup>2</sup>

However, in contrast to other developed countries, Australia's performance has been poor (although it is now improving). On most key measures, we lag behind other countries.

First, broadband take–up or penetration is low, with Australia comparing unfavourably when benchmarked against advanced Western economies. Australia is ranked only 17<sup>th</sup> amongst 30 OECD countries. Australia's ranking would be towards the bottom end of the benchmarking, if it were not for the inclusion of emerging Eastern European economies in the OECD group.

Secondly, broadband price levels have been too high. This has been the main reason why take up has been low.

Thirdly, the bandwidth available is very low. Telstra has positioned 256Kbps as the entry level broadband service. In many other countries, broadband means speeds of 10Mbps or more — 40 times as fast as Telstra's entry level service. In leading nations like South Korea and Japan, broadband speeds of up to 100Mbps are available.<sup>3</sup>

Fourthly — and the root cause of the three problems identified so far — competition has been poor. Telstra is the dominant network owner, with almost 80 per cent of broadband services provided via the traditional copper loop.<sup>4</sup> Hence price competition is limited as most operators are constrained by the wholesale price charged by Telstra. Even more seriously, competition in features and benefits is very limited. If Telstra chooses (as it does) to set the highest available speed on its DSL network to 1500Kbps, this is also the highest available speed that resale-based competitors can offer.

It is uncontroversial that Australia needs to do better on broadband.

See www.dcita.gov.au/ie

For example, the UK Government target for broadband was for the UK to have the most extensive and competitive broadband market in the G7 by 2005.

Assessing competition within the Australian market – a neutral view, Spectrum Strategy Consultants, 22 March 2006.

Telco regulation 'necessary' to development: ACCC, ACCC media release 1 June 2006.

What, then, should our national objective be? Wider availability of high speed services? Today's services, but at lower prices? Or some combination?

We suggest that the right way to think about this policy problem is set out in the matrix below. One dimension shows average bandwidth or speed. This recognises that, other things being equal, we want access to the highest available bandwidth for the largest possible number of people (Note that if half a million Australians receive 100Mbps, but the remaining 19.5 million get 256Kbps, then the *average* bandwidth will not be particularly high.)

The other dimension shows the degree of competition in the marketplace. This recognises that, other things being equal, more competition will drive lower prices, better service, more innovation, and faster take up. It is not much use having a high bandwidth service widely available if only one operator controls it, and sets prices so high that it is barely used.



Figure ES.1 SUMMARY OF BROADBAND POLICY CHOICES

Today, Australia has limited competition and relatively low bandwidth. We are in the bottom left hand box in the matrix. Our national objective should be to move into the top right hand box. But how best can we get there?

# **ULLS/LSS** are bringing substantial improvements

The Government and the ACCC are following a plan to drive Australia to a world where the average bandwidth available to customers is higher, and the level of competition is higher, than today.

The core of that plan is to stimulate competition through the 'unbundling' of Telstra's copper local loop network — under which Telstra's competitors can use either the 'unbundled local loop service' (ULLS) or the 'line sharing service' (LSS).

The merit of unbundling is that competitors to Telstra build their own networks. The competitor uses only one element of Telstra's network — the 'dumb copper' from the Telstra exchange to the customer's premises. When the competitor does this, it can offer very different features and services to Telstra. For example, both iiNet and Optus are delivering DSL services of up to 20Mbps — much faster than Telstra's limit of 1.5Mbps.

ULLS/LLS based competition is still in its early days. iiNet has over 100 000 customers that it serves using LSS, and combined with PowerTel has 262 exchanges in service today. TransACT has also offered ULLS–based services for over two years, experiencing strong customer take–up. Optus commenced ULLS–based services for consumer customers in December 2005, and already has over 10 000 customers (which are served using ULLS), a number that it expects to grow rapidly over the next three years. It has also committed to build its own ULLS equipment in 340 Telstra exchanges.<sup>5</sup> Primus has plans underway to build 200 DSLAMs in Telstra exchanges.

ULLS and LSS competition have been held back by lengthy regulatory skirmishes over the price that competitors must pay for the two services. However, Telstra's delay game on these issues is nearing its end.

Over the next three years, unless the ACCC and the Government change the rules on LSS and ULLS, the use of these services is likely to grow strongly — and in turn cause a step change improvement in the Australian broadband market. We can expect:

- strong growth in the number of customers taking broadband;
- continued improvements in pricing driven by competition; and
- steady improvements in the average bandwidth provided to customers, as more and more companies deliver speeds well in advance of Telstra's current limit of 1.5Mbps.

These gains will be substantial and tangible. If the benefits of an FTTN network are to exceed its costs, it will have to do even better.

# Telstra's proposed FTTN network as the solution

In November 2005, Telstra proposed a radical change to the Australian broadband market. It would build a 'fibre to the node network' which would provide a guaranteed minimum speed of 12 megabits per second to customers in the addressable market. This would be four million 'service addresses' — which we interpret to mean customer premises, both homes and businesses — in the five major capital cities.<sup>6</sup>

Optus steps up competition with broadband network, Optus media release 30 March 2006 Telstra technology briefing, Telstra's ASX statement, 16 Nov 2005.

In exchange for its commitment to build this network, Telstra has sought substantial concessions from the laws which would normally apply. Initially, Telstra wanted legislation to exempt this network from the 'access regime'.<sup>7</sup> The 'access regime' is the requirement, under the Trade Practices Act, that Telstra must provide 'access' to its networks, at prices ultimately determined by the ACCC, to competitors. (Similar provisions apply to the operators of other networks in Australia, including gas, electricity, water and rail networks.)

Subsequently, Telstra has proposed that it be given various exemptions by the ACCC — rather than this being done by Parliament through legislation.<sup>8</sup> The key principle remains, however — in exchange for building this network, Telstra wants to be freed of many elements of the law that would normally apply.

# Telstra's FTTN model has such grave problems that it cannot be accepted

When Telstra's model for an FTTN network is assessed against the policy criteria that govern access arrangements, it is clear that the proposal is gravely flawed. That is, it does not deliver sufficient national benefits to justify Telstra being freed from the access regime as it has asked.

There are four fundamental problems with Telstra's proposal:

- By reaching only 4 million homes and businesses, it would create a two-tier Australia, with less than half the country able to receive high speed broadband, and the remainder stuck with low speed broadband.
- It would establish Telstra as the monopoly provider of FTTN because there is no way for competitors to use 'unbundled' elements of the FTTN.
- It would seriously damage ULLS-based broadband competition indeed this appears to be a significant motivation for FTTN.
- It would enhance Telstra's capacity to sabotage its competitors a capacity which history shows that resale models are particularly vulnerable to.

# It would create a two-tier Australia

Telstra is proposing to invest \$3.1 billion to build its FTTN network to potentially serve four million customers in the five major capital cities.<sup>9</sup>

Telstra technology briefing, Telstra's ASX statement, 16 Nov 2005, pages 6-8.

ACCC News Release, 12 April 2006.

There has been some confusion around the amount that Telstra is proposing to spend. The figure of \$3.1 billion comes from Telstra's "National Broadband Plan", 11 August 2005, attached to ASX release 9 September 2005. This plan spoke of the delivery of 6Mbps in the FTTN network. Telstra's Technology Briefing of 16 November spoke of a network that could deliver 12 Mbps, but did not give any updated cost figures. Subsequent media reports (e.g. in the Australian, June 11, 2006) have said that Telstra's FTTN network will cost \$3.4 billion, but this figure may be confused with the amount that Telstra will pay Alcatel to upgrade its networks generally (not just FTTN). Other media reports (e.g. Herald Sun, 23 May 2006) have the cost of the FTTN network at \$3 billion.

According to Telstra, it has approximately 8.6 million customer premises nationally.<sup>10</sup> Hence, Telstra's proposal would serve less than half of all Australians. It would exclude all rural areas. It would exclude all regional centres including 15 cities with a population of over 50,000 — Albury Wodonga, Ballarat, Bendigo, Cairns, Canberra,<sup>11</sup> Darwin, Geelong, Gold Coast, Hobart, Launceston, Newcastle, Rockhampton, Toowoomba, Townsville and Wollongong.

Telstra is proposing to include the most lucrative and easy to serve, densely populated areas in the FTTN network. That is, it is 'cherry picking' the most attractive markets. Once it is established in these lucrative markets, the prospect of competitors establishing themselves in other markets that are less population dense is extremely low. In turn, Telstra will feel under no pressure to extend its FTTN network throughout the rest of Australia.

This will create a two-tier Australia. A minority of Australians will enjoy high bandwidth services. The majority will receive only lower speed, lower quality services. Given the importance of broadband as an economic enabler, Australians in the communities unserved by FTTN will likely see a steady decline in the relative standing of their local economies.

# It would establish Telstra as the monopoly provider of FTTN

FTTN is an ideal technology for an incumbent with anti-competitive ambitions. Firstly, unlike the existing copper network, it cannot be unbundled. This means that if Telstra is able to build the FTTN network on the terms it proposes, it will be protected against competitive entry. Telstra will be the monopoly supplier — allowing it to keep prices high and capture monopoly rents.

Secondly, this means that the only competition will be from resellers — but with the speed, grade of service and other features all determined by Telstra, it will be impossible for resellers to differentiate or to offer truly effective competition.

# FTTN cannot be unbundled

The ACCC, like competition regulators around the world, has mandated 'unbundling' because it wants to facilitate competitive entry into telecommunications. In its current architecture, Telstra's network can be 'unbundled'. That is, a competitor is able to purchase a single element from Telstra — the copper line linking the exchange to the customer's premises. The competitor can purchase this without having to purchase the remaining elements of the 'bundle', which are required to provide an end-to-end service to the customer.

FTTN cannot be 'unbundled'. There are both technical and economic reasons why not.

The first technical reason is that the 'node' — the cabinet which sits in the street and serves about 200 homes — is too small for competitors to install their own electronic equipment. By contrast, under today's network structure, the competitor is able to install its equipment in the exchange, which has plenty of room.

Telstra, The Digital Compact & National Broadband Plan, Canberra, 11 August 2005, slide 9 of pack entitled 'National Broadband Plan: Equitable Access to High Speed Internet for Families and Businesses Across Australia'. This presentation was released to the Stock Exchange on 9 September. It states that there are 8.6 million 'premises' nationally, of which 6.8 million are urban. We believe that 'premises' means the same thing as 'service addresses'.

While Canberra will not be included in Telstra's proposed FTTN network, Canberra enjoys high bandwidth services provided by the TransACT network.

The second technical reason is that it would be pointless for competitors to build their own nodes next to Telstra's nodes – as there will be no way for the competitor to interconnect with the copper wires which will run from the node to customers' homes. We expect that Telstra will build each of its 20,000 nodes next to a pillar – the existing device in the street from which the copper wires running to around 200 homes fan out.<sup>12</sup>

Once the FTTN network is set up, all of the copper wires which come into the pillar from the 200 homes will now be, in turn, directly connected into the node. There will be no available spare copper wires which could connect to a competitor's node.

The economic reason why an FTTN network cannot be unbundled is directly related to the small number of households served from a node — only around two hundred, as compared to the ten thousand or more served from an exchange. It is economically viable for a competitor to invest in putting its electronic equipment into a Telstra exchange. The competitor has a reasonable chance of securing enough customers — out of the ten thousand available — to cover the cost of installing the equipment. But when there are only two hundred customers available — the calculation changes dramatically.

# Therefore Australia will revert to resale competition - which is much more inferior

With unbundling of an FTTN network not a viable option, what are the prospects for resale competition under an FTTN network? In short, they are poor. Australia has had considerable experience of resale competition in fixed line voice telephony. This experience shows that competitors operate on very low margins, so they are unable to put the incumbent under much price pressure.<sup>13</sup>

Equally as important, resellers are unable to differentiate their product from Telstra's. Under an FTTN network, if competitors are reselling Telstra's product, they will have to accept Telstra's decisions regarding bandwidth, grade of service, and other key factors such as the contention ratio.<sup>14</sup> This is because all these decisions are made by configuring the node in one way or another — and Telstra will control the node.

# It would seriously damage ULLS competition

As discussed, FTTN is an ideal technology for Telstra because of the market structure it produces. Once the FTTN network is in place, Telstra will have regained its monopoly. But it is an ideal technology for Telstra in another way — it will largely head off the competitive threat which Telstra faces from ULLS and LSS.

<sup>&</sup>lt;sup>12</sup> There are pillars sitting on most street corners in Australia. They are a 'junction point' between the Telstra exchange — serving around 10,000 homes — and the home. Each pillar serves around 200 homes. Copper comes in from one side of the pillar — the home side — and connects to a termination point. Copper comes in from the other side of the pillar — the exchange side — and connects to another termination point. Another short copper wire runs, inside the pillar, from the termination point on one side to the termination point on the other. This makes it easy to reconfigure services, by moving the short wires around.

<sup>&</sup>lt;sup>15</sup> Indeed, currently, Telstra sets the GST-inclusive wholesale price of line rental at \$30.36 – which is more than the retail price of line rental under its two most popular plans, Homeline Complete at \$26.95 and Homeline Plus at \$29.95. It is unsurprising that resale competition produces anaemic results when competitors face negative margins on line rental.

This is the ratio of the sum of the maximum bandwidths promised to the 200 customers taking service from the node, to the aggregate bandwidth made available on the fibre, which comes into the node. Therefore, the less bandwidth Telstra reserves on the incoming fibre, the lower will be the quality of service experienced by the customer.

Again, this is so for a combination of technical and economic reasons.

The technical problem is that, once Telstra converts services from a particular exchange to FTTN, it will be very difficult for Telstra's competitors to continue to serve customers (who are more than 1.5 kilometres from an exchange from that exchange) with ULLS-based services.

The reason for this is because of interference or 'cross talk'. This will affect about two-thirds of access seekers' addressable market. The ULLS service will be of unacceptable quality because of interference from the stronger signal on the copper wire carrying the last leg of the FTTN service.

Now consider the economic problems. There are two. The first is the impact on the competitor's service once Telstra commences FTTN. The competitor will be in the same position as an airline offering propeller aircraft in the 1950s when a competitor introduced jets. If competitors are restricted to lower bandwidth services, and Telstra has a monopoly on high bandwidth services, there will be little competitive pressure on Telstra.

The second economic problem is the impact on ULLS competition even before FTTN commences. If competitors expect that Telstra will deploy an FTTN network, this will have a serious chilling effect on ULLS investment. The chilling effect will be compounded if there is insufficient clarity (as there presently is) about how much notice Telstra needs to give to competitors before converting an exchange to FTTN — even if competitors are using that exchange for ULLS–based services.

So even before it commences an FTTN–based service, FTTN is an ideal technology for Telstra. Unless the Government and ACCC act decisively, Telstra will succeed in chilling competition from ULLS.

#### Enhance Telstra's capacity to sabotage competitors

An incumbent monopolist has the ability to degrade the quality of service offered by its competitors who gain access to its infrastructure. This is a particular problem with resale, and one of the reasons why ULLS is attractive to competitors. However, even with ULLS, competitors are vulnerable to sabotage by the incumbent, which creates effective barriers to take–up of the service.

Because FTTN cannot be unbundled, and under Telstra's proposed network it will control the end-to-end service, the problem of potential sabotage will be profound. Given the degree of control that the FTTN model offers, the issue of who controls the network becomes fundamental, and it is desirable that this control be removed from the network owner.

# Government and ACCC must choose what to do

The Government and ACCC face a choice. Their options are to:

- give Telstra the generous regulatory concessions which it has sought in exchange for building an FTTN network (Option 1); or
- refuse to accept Telstra's proposal (Option 2 essentially the *status quo* of competition through ULLS); or

pursue a model which allows an FTTN network to proceed while sustaining competition (Option 3).

This report sets out the elements of Option 3.

In exercising this choice, the Government and the ACCC must weigh up multiple considerations:

- It is in Australia's interest to increase the average bandwidth available to consumers and businesses.
- It is in Australia's interest to protect and increase competition in telecommunications.
- It is not in Australia's interest to lock in a monopoly structure for the new generation of broadband services.
- It is not in Australia's interest to lock in a two-tier broadband market, where less than half of all Australians enjoy high speed broadband, and the majority of Australians are locked indefinitely into slower speed services.
- Telstra has private property rights over its network and its shareholders are entitled to see those protected.
- Telstra is subject to the law of the land including the access regimes which apply to its networks, and this has been fully disclosed to its shareholders from the time of the first float in 1997.

The Government and the ACCC should also recognise that other countries have faced this same public policy problem and have been notably reluctant to give their incumbents the kind of deal that Telstra is seeking. This has been particularly evident in nations which, like Australia, do not enjoy an alternative source of broadband competition coming from independently owned cable television companies.

The British communications sector regulator, Ofcom, has stated that the appropriate means for regulators to encourage investment and innovation is by minimising the regulatory risk for both incumbents and their competitors.<sup>15</sup> Ofcom also points out that telecomms competitors require the continuation of efficient access and interconnection arrangements, so they can compete with services provided by the incumbent over its next generation network.

# This report proposes a better model

This report proposes a better model for the development of an FTTN network in Australia than the one proposed by Telstra.

This model has been developed in consultation with the nine leading telecommunications companies which have come together in a consortium to commission this report.<sup>16</sup>

<sup>&</sup>lt;sup>15</sup> "This is not achieved through regulatory holidays". Next Generation Network based competition: an Ofcom perspective, presentation to Centre for European Policy Studies, Tom Kiedrowski Ofcom, May 2006.

AAPT, iiNet, Internode, Macquarie Telecom, Optus, Powertel, Primus, Soul and TransACT.

The key features of the proposed model are as follows:

- governance arrangements for key decisions regarding the FTTN network through joint stakeholder participation in a special purpose company called 'SpeedReach';
- a process to secure more extensive capital investment in the FTTN access network ('FAN') thus delivering high bandwidth broadband to millions more Australians than under Telstra's proposal;
- a recommended approach to the pricing of access to the FTTN network;
- an integrated process to move forward, including a managed process for transition from ULLS to FTTN, and a process for all significant stakeholders to agree on the proposal.

# SpeedReach

Our core recommendation is that the FTTN access network (FAN) must not be under Telstra's exclusive control. This is a consequence of the fact that the FAN is a bottleneck asset. Instead, key network design and operational decisions must be made by a separate body which considers the interests of all users of the FAN. Under such a model, we believe that Telstra can upgrade its network to FTTN, with competition preserved.

Therefore, we recommend that control issues should be handled separately from ownership issues. Specifically, we propose the creation of a special purpose company — to be named SpeedReach<sup>17</sup> — to make key decisions in relation to the FAN.

SpeedReach will take a central role in the regulatory and commercial scheme under which the FAN will be built. It will take the key operational decisions on such matters as the bandwidth between the exchange and the node; the cards which are installed in the node, thus determining the characteristics of the services which can be offered from the node (bandwidth, symmetrical or asymmetrical etc); which equipment suppliers will use; and so on.

SpeedReach will not interfere with the ownership rights of the owner of the FTTN Access Network. However, by contract with SpeedReach and with the members of SpeedReach, the network owner will agree that certain key operational decisions will be made by SpeedReach.

SpeedReach will be a company governed by company law. Its members will be all telcos which use the FAN. It will have a board of respected independent directors and a small high–quality executive staff.

SpeedReach will charge a management fee to the owner of the FAN. This will be set to cover costs. (In turn, the access fees charged by the FAN owner to all users of the FAN will be set to allow recovery of this management fee.)

<sup>&</sup>lt;sup>17</sup> We suggest the name SpeedReach for three reasons. This company's actions will determine: the speed with which decisions will be made; the speed with which the network will reach customers; and the speed of the services that will be provided over the network.

SpeedReach will be charged with maximising the utilisation of the network, so that its management has the incentive to take decisions which maximise traffic on the network. However, the prices that are charged for access to the FAN will be determined through a regulatory process.

SpeedReach will contract with Telstra (or another specialist operator if it chooses) to carry out such physical and operational services on the FAN on a day-to-day basis as are necessary to give effect to SpeedReach's decisions.

These arrangements will allow rapid decision making, in contrast to the slow and legalistic ACCC processes which apply today. However, they will ensure that key decisions are made in the interests of all users of the FAN, rather than solely in the interests of Telstra.

Figure ES.2 shows the reach of the FAN; it is the network elements specified in this diagram which SpeedReach will have the power to make decisions about.



In the body of the report, we go into more detail regarding the operation of SpeedReach.

# Ownership, funding and network reach

The control of the FTTN access network is one issue; ownership is another.

Telstra's model is that it would own 100 per cent of the FAN. However, there is a range of alternative ownership structures, where the FAN could be owned by:

- a consortium of telcos including Telstra; or
- a range of financial investors, in addition to, or excluding, Telstra.

We believe that a model in which the FAN is not totally owned by Telstra, but instead is owned wholly or partly by players other than Telstra, offers clear public policy benefits; as well as offering potential private benefits for Telstra and its shareholders.

We set out below the schematic of a model under which the FTTN access network would be owned by a party other than Telstra. We have used the generic term FTTN access network ownership company, or 'FANOC', to describe the entity which would own the FTTN access network. There is a range of possibilities about who would own FANOC, and in what proportions. The three likely classes of owner would be Telstra; other telecommunications companies; and financial investors.

As we have indicated, the ownership of the network would not give the owner control of all key decisions. FANOC would own the network, but key decisions would be made by SpeedReach.



It is important to be clear that Telstra would continue to own all of its other assets. In particular, it would continue to own the local exchange. Also, Telstra would continue to own the 'last mile' of copper between the nodes and the customers' premises.

The diagram below illustrates the key parties, and the relationships between them, under a model where the FTTN access network is not 100 per cent owned by Telstra, but instead the FTTN access network is owned by FANOC.



We believe that investment in the FANOC would be considered by investors as an alternative to investment in other utility infrastructure investments such as gas and rail networks. Such investments today attract substantial support from a range of private investors, such as retail investors, superannuation funds, and specialist infrastructure investors. Both equity and debt instruments are issued, and widely taken up, to fund such infrastructure investments.

A clear public policy benefit of a model in which other parties can co-invest with Telstra in the FTTN network is that, with additional capital available, the network will serve a larger number of Australians, compared to Telstra's model. To assess this benefit, it is necessary to estimate the number of additional services which could be provided, and the location of those services, for given levels of additional investment.

Accordingly, we have conducted a directional cost modelling exercise to determine the cost of expanding the FTTN network beyond the four million services proposed by Telstra. Based upon this work, we estimate that the reach of the network could be expanded by approximately 25 per cent, or almost one million additional services, for additional capital expenditure of approximately \$1 billion.

Regional centres such as Townsville and Newcastle would be included in the expanded network.

Under the pro-competitive model for FTTN which we propose, retail competition will be significantly more vigorous than a model in which Telstra is the monopoly provider of broadband services over the FTTN. In turn, this will cause more customers to take up high bandwidth services on the FTTN network, more quickly, than under the base case scenario in which Telstra is the sole operator.

The reason is that, firstly, in a competitive environment, prices will be lower and hence take–up higher than in a monopoly environment. Secondly, with multiple operators competing to attract new customers to the high bandwidth category, there will be vigorous advertising and other initiatives to attract customers.

The shared ownership model we have proposed would avoid the wasteful duplication of investment that has cost the Australian telecommunications industry (and, in turn, the nation) so much in the past. The best known example is the duplication of the Telstra and Optus HFC networks.

FANOC would enable a co-ordinated approach to investment so as to maximise the availability of high speed broadband while avoiding the inefficiency of duplication. While co-ordination of investment by competitors is not normally recommended in market economies, network industries such as telecommunications are an exception. The infrastructure — including the fibre and the contents of the nodes — is a natural monopoly.

# A pricing model for access to the FAN

We believe it will be relatively straightforward to develop access prices which will be paid by parties (including Telstra) for access to the FAN.

FANOC will submit a special access undertaking to the ACCC which will be used to determine access prices. The key underlying principle, in accordance with Part X1C of the Trade Practices Act, will be that access prices will be in the Long Term Interest of End Users (LTIE). That is, the access pricing regime will be consistent with the primary regulatory objectives of the ACCC, which are:

- promoting competition in a market for listed services; in this instance, the market for broadband services;
- achieving any-to-any connectivity in relation to carriage services that involve communications between end-users; and
- encouraging economically efficient use of, and the economically efficient investment in, the infrastructure by which telecommunications services are supplied.

Access prices should reflect cost and be set on the basis of the Total Service Long Run Incremental Cost (TSLRIC) of providing access to the FAN. Access pricing is discussed in more detail in the body of the report.

# An integrated process to move forward

A fundamental problem with Telstra's proposal to upgrade its network to FTTN has been a lack of consultation with other interested parties, and in turn the failure to design a process and a model which will best advance Australia's national interest. This lack of consultation has led to suspicion that Telstra's primary motive is to stifle existing competition.

In this report, we present an alternative model for FTTN which will address the anti competitive problems with Telstra's model. But there are a number of issues which will require further consultation, further design work and market testing.

We recommend an integrated process to move towards finalisation and implementation of an acceptable FTTN model.

This process will involve the following steps:

- Scope investment appetite and required terms.
- Finalise network design.
- Finalise and implement governance arrangements including SpeedReach.
- Determine access pricing.
- Agree network upgrade timetable and ULLS lifetime by exchange.
- Obtain final stakeholder sign off.
- Raise additional capital.
- Commence construction and ULLS to FTTN transition period.
- Complete transition period.

We believe that following these steps in a logical sequence is the best way to deliver an FTTN network as rapidly as possible, and deliver the national benefits of high bandwidth services which the network promises.

Our recommended process involves negotiation between, and working amongst, all interested parties. We believe it will take less time, and deliver more certainty to all parties including Telstra, than the aggressive winner take all model which Telstra has been pursuing.

# Conclusion

The model we propose establishes a sensible public policy process to protect competition as we move to a higher bandwidth Australia. It will enable the Government and the ACCC to say to Telstra: "here are the conditions you would need to meet in order to satisfy competition concerns and be granted a special access undertaking to proceed with an FTTN rollout". It would also allow alternative investment models to be tested, potentially allowing the benefits of an FTTN network to reach more widely than under Telstra's plans.

If, however, Telstra maintains its insistence that it will only build an FTTN network on terms which suit its interests exclusively, the Government and the ACCC should decisively reject that proposal. FTTN is not an absolute good. If it comes at the cost of destroying competition, it is not worth having. High speed, high bandwidth, high quality broadband can and will be obtained through ULLS, provided the regulatory settings promote competition. FTTN may be a useful way of enhancing Australia's broadband capability, but certainly not at the cost of allowing Telstra to remonopolise the telecommunications sector.

# *Chapter 1* **Broadband in Australia**

This chapter considers the state of the broadband market in Australia, focusing on the extent of take–up and penetration of broadband in Australia relative to its OECD partners, and its overall performance against other developed countries. The consequences from slow broadband take-up caused by lack of competition are serious, and include risks to realising economic benefits, benefits to the community at large and specific sectors.

Also considered in this chapter are the advantages of the delivery of broadband and other services from a competitive broadband network, including the consumer welfare benefits from such a network.

The chapter concludes with relevant policy considerations.

# 1.1 Introduction

With the forthcoming full privatisation of Telstra, Australia has reached a cross roads as far as one of the most important technological advances of our age is concerned — broadband.

The structure of the telecommunications industry in Australia, with Telstra the dominant player, together with difficulties associated with effective management of the regulatory regime, has meant that broadband take-up in Australia has been slow by world standards. This has had negative consequences for businesses, which are deprived of the productivity benefits that broadband can bring, and consumers who are denied a range of social, health and education benefits. The negative consequences are particularly acute outside the major metropolitan centres.

Competition in broadband has, to date, largely consisted of Telstra's rivals reselling DSL services over the customer access network (CAN) owned by Telstra. Because Telstra owns the only ubiquitous wired telecommunications network in the country (the historical legacy of Telstra once being the wholly government–owned monopolist), Telstra is uniquely positioned to dominate the broadband market for years to come, unless its competitors can provide competition based on their own facilities.

That competition is now beginning to emerge as other companies install their own equipment (principally, DSLAMs) in Telstra's exchanges and access the unbundled local loop (ULLS — essentially the unconditioned pair of copper wires which run from a customer's premises to the local exchange). While there is much to resolve in the ULLS access regime (including, critically, the regulated price of access) there is no question that ULLS access provides Telstra with a serious competitive threat, perhaps for the first time since the telecommunications market was liberalised. ULLS access provides Telstra's competitors with the ability to provide broadband services which are not merely carbon copies of Telstra's BigPond services, as well as voice services.

Telstra's reaction to the emerging ULLS threat has been two fold. First, it submitted an undertaking which proposed a flat monthly ULLS<sup>18</sup> access of \$30, rather than access prices which are cost-based. This would have prevented Telstra's competitors from offering retail pricing for ULLS-based services in metropolitan areas which was competitive with Telstra. However, on 15 June 2006, the ACCC issued a draft decision rejecting to reject this undertaking, because:

"...Telstra's proposed average price is unlikely to promote competition on its merits and likely to heavily distort the use of an investment in telecommunications infrastructure"<sup>19</sup>

Second, Telstra has proposed to rollout a fibre-to-the-node (FTTN) network to four million premises. Under the terms apparently proposed by Telstra for the FTTN network, Telstra would be able to deny its competitors the access necessary to provide competition and stimulate further innovation. Competitors would be left with little more than the ability to re–sell Telstra's product, representing a significant and likely irreversible step backwards. The near inevitable result would be a broadband market captured by a single player.

Customer reach had begun to grow significantly before Telstra's FTTN announcement, which, by creating an atmosphere of anti-competitive uncertainty, has had a chilling effect on competitors' investments. Unsure of whether Telstra will succeed in its campaign, some competitors have put their ULLS investments on hold until the situation is resolved.

Telstra's strategy was aptly summarised by Morgan Stanley Equity Research:<sup>20</sup>

If Telstra's latest ULL undertaking is accepted by the ACCC, and it convinces the Australian Government to grant it safe harbour on its fibre roll-out, Telstra will have effectively reentrenched its fixed line monopoly position ... once it rolls out fibre ... that [will] leave a lot of stranded DSLAM investment from competitors ... FTTN deployment is one way to undermine the competitive DSLAM threat ... Telstra is not satisfied with making life tougher for competitors, it appears to want to keep them out of the market altogether [emphasis in the original].

Citigroup, in a report on 15 May, 2006, writes:<sup>21</sup>

"...we struggle to identify the commercial benefits associated with investing in fibre networks other than for customer and revenue protection on Telstra's behalf ...The construction overseas of fibre networks has been driven by customer retention strategies (eg: Verizon) or through massive tax incentives (eg: Japan). We struggle to identify any offshore markets where the ROIC on this type of investment is accretive in any way".

The ACCC notes that:

It is interesting that Telstra's [FTTN] announcement was only made after a number of broadband competitors publicly indicated their intention to deploy this new ADSL technology from Telstra's exchanges — another example of the importance of competition in providing innovative products and services to customers.<sup>22</sup>

<sup>&</sup>lt;sup>18</sup> Unconditioned Local Loop Service. A related concept is Line Sharing Service (LSS). Under LSS, competitors access Telstra's unconditioned copper lines for the purpose of delivering data, but not voice, services. This report argues extensively about the benefits of ULLS access for broadband competition, but the same principles apply to LSS.

<sup>&</sup>lt;sup>19</sup> ACCC News release, 15 June 2006.

<sup>&</sup>lt;sup>20</sup> Morgan Stanley Equity Research 2006, *Will Telstra Be Allowed to Re-entrench its Fixed-line Monopoly?*, January 24.

Citigroup, Telstra Corporation Ltd: Any takers for a 40 year payback on FTTN? 15 May 2006, p.2

Ed Willett, Commissioner, SPAN: Promoting Effective Competition Within the Telecommunications Sector, 1 April 2005, p.8

It is not unusual to observe incumbents protecting their turf with anti-competitive strategies. In the United States, commentator Charles Ferguson has written:

...through a combination of inefficiency, cartelistic conduct, and rational monopoly behaviour given their current incentives, both the ILEC [Incumbent Local Exchange Carriers] and CATV (cable television) industries particularly the former are deploying broadband technology slowly and in ways designed to protect their established, increasingly obsolete, business ... As a result, broadband service has become a major impediment to U.S. and even world economic growth.

While there are genuine concerns about the anti-competitive conduct of the ILECs and CATV companies in the United States, there is some comfort in the fact that these companies genuinely compete in the delivery of broadband services, at least in the consumer markets. Unfortunately for Australian consumers, this scenario will not play out in Australia due to the fact that the dominant telephony company, Telstra, owns 50 per cent of the dominant pay television company, Foxtel (and all of the HFC over which Foxtel is terrestrially delivered). Under its current ownership structure, there is no chance of Foxtel competing with Telstra for the delivery of broadband services to Australian households and businesses. Indeed, Telstra offers its customers bundles of telephony, broadband and Foxtel.

Consequently, the only feasible alternatives to Telstra, in the delivery of broadband services, will come from other telecommunications companies, but this can only be achieved if they are not locked out of the market. While an FTTN network offers the *potential* of superior broadband services in the short term, that potential can only be realised in a sustainable fashion if the market for the delivery of those services is *competitive*. A re-monopolisation of the network — which Telstra's FTTN proposal represents — will not only prevent Australian businesses and consumers from benefiting in the future. It will strand existing investment, monopolise currently competitive markets and strip choice for customers where it once existed.

# 1.2 The Australian context

The ACCC Chairman has observed that competition in the broadband space is particularly vulnerable and made more so by uncertainty arising from Telstra's FTTN proposal:

... early signs are that Telstra's telephony dominance could extend to broadband services. There is also a question mark as to how sustainable the retail competition offered by other key players is, given the considerable uncertainty around the implications of Telstra's network modernisation plans for those competitors currently putting their own DSLAM infrastructure into Telstra's exchanges.

Access to ULLS has been one of the most important regulatory reforms of the last decade in Australia. It is significant that as the benefits are on the cusp of being realised on a significant scale, Telstra has chosen to make its FTTN proposal.

 <sup>&</sup>lt;sup>23</sup> Charles H. Ferguson, *The Broadband Problem: Anatomy of a Market Failure and a Policy Dilemma*, Brookings Institution, Washington D.C., 2004, p5.

Graeme Samuel, Chairman, ACCC, Australian Telecommunications Users Group, 2006 Annual Conference, 7 March 2006

Telstra's competitors have embarked on investments based on access to ULLS. Optus has announced and is currently in the process of rolling out a broadband network that will reach 340 exchanges in metropolitan Australia. It will enable Optus' network to reach to an additional 2.9 million households and businesses, in addition to those addressed by Optus' HFC network. As at March 2006, approximately 10 000 Optus customers had migrated to ULLS.<sup>25</sup>

iiNet has 100 000 customers that it serves using the line sharing service (LSS), a form of unbundling, and combined with PowerTel has 262 exchanges in service today. iiNet has found that it can deliver broadband speeds to its customers well in excess of what Telstra claims it will deliver on its FTTN network.<sup>26</sup> According to iiNet:

For most customers in metropolitan areas to achieve 6000kbps, it is simply a matter of utilizing the existing copper CAN. Whatever other purposes may be served by building a multi-billion dollar fibre network, the provision of high performance ADSL (6000kbps or more) is not amongst them.

Internode likewise offers its customers high speed broadband, though it notes that some lines cannot be migrated to high speeds due to technical restrictions imposed by Telstra. Notwithstanding these difficulties, its high speed services are active in 41 exchanges, and are planned or are being built in 65 more.<sup>28</sup>

TransACT has offered ULLS-based services for over two years, experiencing strong customer take-up.

While these developments are promising, and point to the potential of ULLS-based broadband competition, the roll out of competitive infrastructure would be much higher were it not for anti-competitive maneouvres by Telstra, including:

- the inability of competitors to obtain commercially acceptable access pricing from Telstra;
- the difficulty faced by competitors in building customer bases of sufficient scale due to the existing LCS and wholesale line rental pricing arrangements; and
- price squeezing by Telstra in the DSL market which has undermined the economics of resale in voice and broadband services.

<sup>&</sup>lt;sup>25</sup> Optus submission to the ACCC, "A Strategic review of the regulation of fixed network services", February 2006, and Singtel Telecommunications Limited And Subsidiary Companies, *Management Discussion and Analysis of Financial Condition, Results of Operations, and Cash Flows for the Fourth Quarter ended 31 March 2006*, p49.

Greg Bader and Steve Dalby, *The Myth of Fibre, Notes on the performance of consumer ADSL services connected to the iiNet DSLAM network,* May 2006.

Ibid, page 15.

http://cgi.internode.on.net/cgi-bin/dsl-coverage-table?carrier=Agile

Telstra has sought to challenge the ACCC's jurisdiction to deal with some of these matters on the basis that they fall outside the service description for ULLS. Amongst other things, Telstra has sought to use a very narrow definition of ULLS to frustrate access to the service. Implicit in migrating a resale customer to ULLS is the need to port the customer's number which currently requires a call diversion service to be put on the customer's line during transfer. Telstra argues that call diversion falls outside the scope of the declared service and has set the price for call diversion at an excessive level. Clearly this service is fundamental to the supply of ULLS and should fall within the scope of the declared service.

Despite these impediments, Telstra's competitors have invested in ULLS, as illustrated above. However, there is a long way to go.

Telstra has responded to this competitive pressure with its FTTN proposal. The proposal would establish Telstra as the monopoly supplier of broadband over the FTTN network, with its competitors reduced to being merely resellers of Telstra's service. The effect of the current proposal by Telstra has been to chill ULLS investment as competitors face the prospect of stranded assets.

Thus, the highest impact, most immediate action that could be taken to increase broadband penetration in Australia is unfreezing ULLS investment through a decisive government response to Telstra's FTTN proposal.

# 1.3 What is at stake?

At stake in today's regulatory decisions about the broadband market are two very different futures for telecommunications in Australia. In one future, sustainable competitive pressure reduces prices over the long term, choice is enhanced, innovation flourishes and the local industry grows and continues to attract investment. The other, more bleak, future will be a natural consequence of Telstra successfully re–monopolising Australia's access network.

Explicitly at stake is a range of economic and community benefits that is worth reflecting on in some detail. The achievement of these benefits, and the speed at which they flow to Australia, are at risk in an environment devoid of genuine, large-scale, infrastructure–based competition. In this section we summarise some of the major benefits of broadband that can be delivered by the vibrant marketplace that the Australian Government has pledged to create.

# Economic benefits

Three key benefits arise from the widespread adoption of quality broadband services: productivity, innovation, and growth.

#### Productivity

The importance of broadband to economic growth is universally accepted by governments and international economic bodies, among them the OECD, ITU and EU. When estimated in financial terms, the economic benefits are significant. In 2003, for example, Crandall, Jackson and Singer<sup>29</sup> estimated that the total annual consumer benefit from broadband in the US would be between US\$64 billion and US\$97 billion per year if 50 per cent of US households adopted broadband. If broadband achieved universal penetration, the benefit could be more than US\$300 billion. The authors found that ubiquitous broadband would increase total US GDP by US\$180 billion per year and create 61,000 new jobs.

In the UK, a 2003 study by the Centre for Economics and Business Research (CEBR) found that, based on forecast growth in the number of broadband connections, by 2015 annual UK GDP could be up to 21.9 billion pounds higher than it would otherwise have been. In addition, CEBR found that annual UK fixed investment would be approximately 8 billion pounds per annum higher and annual government borrowing around 13 billion pounds per annum lower than it would have been without broadband connection. These estimates are illustrated in Figure 1.1.

To put the estimates into perspective, the forecast productivity gains of between 0.5 and 2.5 per cent from broadband by 2015 equate to an extra hour of work per week for all workers in the UK and compare well with other general purpose technology impacts, such as railways and electricity, whose impacts were 2-17 per cent 'social saving' after 35 years and 3.3 per cent after 65 years respectively.<sup>30</sup>



# Figure 1.1 ECONOMIC IMPACT OF BROADBAND (UK POUNDS MILLION IN 2000 CHAINED PRICES)

Source: The economic impact of a competitive market for broadband, Centre for economic and business research, UK, 2003  $\,$ 

<sup>&</sup>lt;sup>29</sup> Crandall and Jackson, Dot Econ & Criterion Economics Study, "Competition in broadband provision and its implications for regulatory policy", 2003, p.10

Broadband, fulfilling our potential, Broadband Industry Group UK, November 2003

Two further studies at state level reinforce these country-based findings. In a recent study commissioned by the US state of Michigan an increase of US\$440 billion in the gross state product (GSP) and almost 500,000 new jobs over a decade was estimated.<sup>31</sup> A separate analysis of broadband's impact on the state of California conducted for the Corporation for Education Network Initiatives in California (CENIC) in 2003 estimates an increase of US\$376 billion in incremental GSP and nearly two million new jobs over a 10-year period.<sup>32</sup>

In Australia, work by Accenture in 2001 estimated that next generation broadband could produce economic benefits in Australia of between AUD\$12-30 billion.<sup>33</sup>

# Innovation

ICT generally, and broadband specifically, have contributed significantly to innovation across a range of industry sectors. In manufacturing, for example, broadband has enabled step-change reforms to supply chain management by enabling real-time sourcing and supply of commodities. In financial services, broadband has generated innovative applications to enable companies to exchange information with each other in real time, and for those companies to do the same with their customers.

# Growth

In general terms, broadband technologies will "stimulate Australia's economic growth by revolutionising the way services are delivered and business is conducted."<sup>34</sup> This is particularly true in service sectors such as health and education, as well as research, national security and general government. A recent US study concluded that:

"broadband has a significant positive effect on the growth in the number of business establishments, increasing growth, by almost one-half of one percent"

# 1.4 Australia's lagging performance

The optimistic vision for broadband in Australia is of a healthy market that balances supply side competition with demand side choice, and extends affordable access to high quality broadband services to all Australians. As a result, Australia will grow in terms of its economic performance and international competitiveness, and Australians will benefit from a range of broadband-enabled opportunities in ebusiness, telecommuting, e-health, e-learning, e-government, media and entertainment.

<sup>&</sup>lt;sup>31</sup> Michigan Economic Development Corporation releases study detailing benefits of accelerating statewide broadband deployment, MEDC Press Release, December 3, 2001 (//medc.michigan.org/news)

<sup>&</sup>quot;One gigabit or bust initiative: a broadband vision for California", CENIC and Gartner Consulting, May 2003

Innovation delivered – Broadband for Australia, An economic stimulus package, Accenture, 2001, p.8.

Broadband advisory group, 2003

<sup>&</sup>quot;Measuring broadband's economic impact", Lehr, Osorio, Gillet, MIT, January, 2006

If this vision for broadband is achieved, Australia will require markedly improved broadband penetration, price, choice, speed, availability, and take-up. Competition — at a significant scale — is essential to bridging the gap between the vision and the reality. In general terms, Australia would be more likely to keep pace with other industrial nations, Australians could choose from a wider range of more affordable, high quality broadband services, and rural Australians in particular would have better access to broadband services (and all the economic and social benefits that they deliver), than is currently the case.

As of June 2005, Australia's broadband penetration rate, measured by subscribers per 100 inhabitants, ranked 17<sup>th</sup> amongst 30 OECD countries. A more competitive environment is likely to increase penetration rates. As noted in the 2005 Broadband Market Report:

"competition is pushing broadband penetration as countries with more competitive markets (measured by market share of new entrants) tend to have a higher broadband penetration as well as a faster growth".<sup>36</sup>

#### Figure 1.2

# OECD BROADBAND SUBSCRIBERS PER 100 INHABITANTS, BY TECHNOLOGY, JUNE 2005



A recent report by Ovum, commissioned by the UK Department of Trade and Industry, demonstrates the extent to which the Australian broadband market lags behind 10 other developed countries. The study was based on comparisons across several success indices, measuring price, choice, availability and take-up. The results of the Ovum report are shown in Figure 1.3 and 1.4, where a higher score represents good performance. As illustrated, there is room for significant improvement in Australia's performance on each metric relative to other developed countries.

<sup>&</sup>lt;sup>36</sup> Broadband market competition report, May 2005, http://erg.eu.int/doc/publications/ erg\_05\_23\_broadbd\_mrkt \_comp\_report\_p.pdf

It is noteworthy that the least competitive markets globally are those with the strongest incumbents. Deutsche Telecom (Germany), Telecom Italia (Italy), Telstra and Eircom (Ireland) all continue to dominate the telecommunications markets in their respective countries and are considered to wield considerable market power. Ovum notes developments that have encouraged ULLS take–up in France, and that large price cuts have improved competition in that country.



Source: Ovum International broadband market comparisons, update, June 2005



Source: Ovum International broadband market comparisons, update, June 2005

Throughout the world and in Australia the evidence is clear: more competition brings lower prices, higher penetration and greater innovation — for example, the much vaunted `triple play' in broadband. The chart below shows that higher incumbent market share does not lead to increased broadband penetration — indeed, lower market share is correlated with higher penetration.

Figure 1.5



Source: ECTA Broadband Scorecard March 2005

Further, prices reduce as the market share of any one player is reduced.



Figure 1.6 IMPACT OF COMPETITION ON PRICES

In referring to the 'dynamic effects on the wider economy', a report by ECTA notes that the potential for productivity gains in the UK arising from higher competition have been sized at twenty billion pounds.<sup>3</sup>

In Australia, non-Telstra carriers note that their investment plans are dependent on their ability to gain access, on reasonable terms and prices, to the natural monopoly access network owned by Telstra.

<sup>37</sup> ECTA (European Competitive Telecommunications Association), 'Promoting Investment through Competition', Goals for 2010. Note the productivity point in this case is made with specific reference to spectrum. The previous two charts are from the same source.

Thus, encouraging more competition encourages more investment, increasing the speed and extent of achieving better, faster and cheaper broadband services to more Australians. Indications of greater broadband availability in Britain, following Ofcom's aggressive agenda to drive competition, are demonstrated in the chart below.<sup>38</sup>



# Figure 1.7 CHANGE SINCE OFCOM FORMED HAS BEEN RAPID

Ofcom also observes that without sustainable and effective competition by infrastructure-based operations, consumer benefits and choice would not be realised. Tellingly, Ofcom refers to the `imbalanced competitive playing field' as one of three drivers of a market structure that would not deliver such benefits.<sup>39</sup>

# 1.5 The role of competition

# Supply side competition and innovation

Competition between suppliers has long been an acknowledged driver of innovation in price and service delivery. In 2000, the National Bandwidth Enquiry noted that:

"the Australian bandwidth market has not to date seen the same levels of innovation in the type and range of infrastructure service provision as is seen in the most competitive North American and European markets".<sup>40</sup>

<sup>&</sup>lt;sup>38</sup> Sean Williams, Board Director, OfCom, Keynote presentation, CMA conference 2006, February 2006 <sup>39</sup>

Ibid 40

National Bandwidth Enquiry report, April, 2000

According to the National Bandwidth Enquiry, the level of competitive pressure in the market, and underlying cost structures, exert a major influence on price trends.<sup>41</sup> Currently, Telstra has the dominant share of the broadband market in Australia and its broadband prices and service levels, despite improvement over time, are still relatively poor when compared with that of incumbents in other countries. This is illustrated in Figure 1.8.<sup>42</sup> Increased broadband competition has the potential to act as a key driver of price reductions and service improvements by the incumbent and thus to deliver real consumer benefits.

#### Figure 1.8

# TOP ACCESS SPEED OF INCUMBENT'S RESIDENTIAL BROADBAND AND MONTHLY SUBSCRIPTON FEE





In terms of service, broadband innovation involves, in particular, upgrades to networks and increases in speed. In the Netherlands, a "tough but innovative" environment, competition has led to availability of cable access speeds of 20Mbps, capacity increases of 60 per cent per annum, and the potential for high speed capabilities of up to 100 Mbps by 2008.<sup>43</sup>

<sup>41</sup> 42 ibid

<sup>&</sup>quot;Assessing competition within the Australian market – a neutral view", 22 March, 2006, Spectrum Strategy Consultants

<sup>&</sup>quot; "Cable in the Netherlands: full blown competition", March 2006, http://www.vecai.nl/downloads/ docs/budapest270306.pdf

#### Demand side choice and flexibility

Demand side choice and flexibility gives consumers greater capacity to select between service providers, and to find and customise solutions to meet specific demands. Telstra's dominance of Australia's broadband marketplace has had the effect of reducing choice and flexibility for consumers. In markets which are less concentrated, such as Japan, Belgium and Korea, consumers can derive real benefits from competition. Japan provides a good case study. In 2000, the Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) established rules for local-loop unbundling and co-location in order to encourage deployment of DSL. These rules made it much easier for new ADSL operators to interconnect with the local networks of the incumbent, NTT, and led to more vigorous competition. The entry of Yahoo!BB energised competition amongst ADSL providers and set a price benchmark. Providers' monthly charges rapidly fell to around JPY 3000 (US\$25), at the same time that quality of service rapidly increased from 1.5 to 8 to 12 to 26 Mbps.<sup>44</sup>

# Protecting competition

Economic regulation is an essential driver of competition and therefore investment. This recognition is shared around the world and is central to ACCC's approach to regulation. ECTA (European Competitive Telecommunications Association) notes that:

Regulation will promote competition as well as efficient investment and innovation so long as:

- Returns on investment are sufficient for shareholders; and
- Regulation is clear and predictable (i.e. low risk).

They note that even in the less challenging European environment, there is 'no rationale for [a] 'moratorium' on economic regulation'. In the proposal outlined in this report, ECTA's two tests of ROI and predictable legislation are met.

ECTA notes that investment growth depends on *effective competition* [their emphasis].<sup>46</sup> They note that a clear link between regulatory effectiveness and total telecommunications investment is evident in a cross-country comparison of 10 European countries.

<sup>&</sup>quot;The impact of new technologies such as broadband and VOIP on telecommunication markets", Robert Shaw, ITU Internet Strategy & Policy Advisor, September, 2003: http://www.itu.int/ITU-D/finance/

ECTA (European Competitive Telecommunications Association), 'Promoting Investment through Competition', Goals for 2010

<sup>&</sup>lt;sup>o</sup> ECTA (European Competitive Telecommunications Association), 'Promoting Investment through Competition', Goals for 2010

# Figure 1.9 RELATIONSHIP BETWEEN REGULATORY SCORECARD AND INVESTMENT AS PERCENTAGE OF GROSS FIXED CAPITAL FORMATION (GFCF)



Significantly, competition stimulates both incumbent and new investment: competition has not deterred investment by incumbents in broadband and NGNs.



Figure 1.10 REGULATORY EFFECTIVENESS IMPACT ON INCUMBENT INVESTMENT

Thus, competition leads to higher investment, including by the dominant firm. By contrast, investment will be reduced in a market dominated by an incumbent.

# 1.6 Consumer welfare

We estimate a *competitive* high speed broadband network could deliver estimated consumer benefits of between \$17 billion and \$23 billion, which would double the benefits currently enjoyed by consumers.

In economic analysis, a standard measure of consumer welfare is consumer surplus, defined as the difference between what consumers would be willing to pay for a service, and what they actually pay. In Figure 1.11 below consumer surplus is the area below the demand curve, but above the price, P1.



Precise estimation of consumer surplus for broadband in Australia requires detailed knowledge about the broadband demand curve, which is not available. However, following, Crandall, Hahn and Tardiff,<sup>47</sup> a reasonable estimate of consumer surplus can be made by making parametric assumptions about demand; specifically:

- that the elasticity of demand (the responsiveness of demand to changes in price) is constant along the demand curve; and
- that there exists a "choke price" i.e. a maximum price beyond which demand will be zero. Figure 1.12 shows the demand curve based on these assumptions.

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Robert W. Crandall, Robert W. Hahn and Timothy J. Tardiff, "The Benefits of Broadband and the Effects of Regulation", in Robert W. Crandall and James H. Alleman (eds), *Broadband: Should We Regulate High-Speed Internet Access?* AEI-Brookings Joint Center for Regulatory Studies, Washington D.C., 2002.



Assuming that the choke price, p\_max, is a constant multiple c of the actual price, then consumer surplus (CS) is given by

$$CS = pq(1 - c^{-(e-1)})/(e-1)$$

where e is the elasticity of demand.

When e=1, then

$$CS = pq \ln(c)$$

As at December 2005, there were around 2.8 million broadband subscribers in Australia.<sup>48</sup> Significant growth in broadband subscription has occurred in recent years as a result of emerging competition. While there is a range of broadband plans and consequently many prices, a reasonable benchmark price for a broadband service is \$50 per month, or \$600 per year. Assuming that p\_max is \$100 (i.e. c=2) then annual consumer surplus from broadband use in Australia is shown in Table 1.1 below, for two elasticity assumptions, e=1 and e=2. When e=1, consumers adjust their demand to changes in price so as to spend the same amount as before the price change. When e=2, consumers adjust their demand to twice the percentage of the price change so, for example, a five per cent reduction in price leads to a 10 per cent increase in demand.

#### Table 1.1

#### **BROADBAND CONSUMER SURPLUS IN AUSTRALIA**

e = 1	e = 2
\$1164 m	\$840 m

Source: ACCC, Snapshot of Broadband Deployment as at 31 December 2005
The consumer surplus values in Table 1.1 are annual values. Assuming they recur in perpetuity, the present discounted values of Consumer Surplus (with a 5 per cent discount rate) are \$23 billion for e=1, and \$17 billion for e=2.

Thus, notwithstanding the fact that by world standards broadband in Australia is of low quality and highly priced, it still delivers very significant consumer benefits to Australians.

Under a competitive high speed broadband network, the potential consumer benefits will be even larger, due mainly to the greater bandwidth that such a network will bring. High speed broadband networks increase the speed of service, enabling a range of new services to be delivered. The key broadband services are often referred to as the 'Triple Play': fast Internet access, voice over internet (VoIP) and video over internet. A 2005 European Commission paper considered these applications in more detail, identifying five broad categories of broadband applications:<sup>49</sup>

- Simple messaging services, including e-mail, instant text messaging, remote log in and simple web and internet access. These services require relatively low bandwidth.
- Large file transfer services, which are simular to messaging service but involve richer files. Examples might include rich content Internet surfing, teleworking functions, downloading of games and other software, and virtual private networks. These types of services typically require 1–2 Mbps or higher for efficient internet use.
- Unidirectional real time data (including images and video) services, which generally take the form of broadcast services such as audio and video streaming, and radio and television broadcasting. These services often require high or very high bandwidth. In broadcasting, recent technological developments have enabled more efficient sharing of underlying files (the content itself) between multiple users.
- Interactive real time messaging where participants communicate in real time with each other, such as video messaging, gaming etc. These types of services require at least 1–2mbs, and the underlying technology needs to support symmetric services with extremely low latency (delay).
- Bi-directional real time services, includes video conferencing, interactive gaming, integrated business communication services and wide area business networks. These services cannot be delivered efficiently if latency exists, and the technology must support symmetrical functionality and high bandwidths.

The promise of the benefits of these and other services will shift the demand curve for broadband to the right, as shown in Figure 1.13 below, and the level of consumer surplus will rise.

Commission of the European Communities, "Digital Divide Forum Report: Broadband Access and Public Support un Under-Served Areas", Brussels, 15.07.2006

Figure 1.13





Because broadband penetration in Australia is still low, and services are generally highly priced and relatively low quality (i.e. low bandwidth), the potential for a large rightward shift of the demand curve must be considered high. This potential can be gauged by the growth of broadband over the past four years or so, especially since the end of the March quarter of 2004, which was when DSL resale took off seriously, triggered by Optus entering the market on February 15 2004. In the 18 months to March 2004, total broadband subscribers increased by 16 per cent per quarter.<sup>50</sup> In the following 18 months, total broadband subscribers increased by 20 per cent per quarter, despite coming off a much larger base.<sup>51</sup> Thus, the entry of competitive providers, even though they essentially only resold Telstra's low quality DSL broadband products, triggered a surge of demand, with associated high levels of consumer welfare benefits.

High speed broadband offers the potential for significantly larger consumer benefits. Whether these benefits are obtained, however, will depend critically on whether broadband services are delivered in a competitive market. If Telstra is able to monopolise the broadband market, then a familiar scenario will play out. That is, prices will increase over time, service levels will be reduced over time and consumer choice will be compromised. As prices approach the maximum that consumers are willing to pay, the consumer welfare benefits will decline rapidly. Effectively, the increase in consumer surplus brought about by a rightward shift of the demand curve will be undone by higher Telstra prices (Figure 1.14).

<sup>50</sup> ACCC, Snapshot of Broadband Deployment as at December 2005 51

There were 815,500 broadband subscribers at March 31 2004, compared with 332.200 subscribers 18 months earlier



Figure 1.14
REDUCED CONSUMER SURPLUS WITH TELSTRA MONOPOLY

Consumer welfare will suffer in other dimensions as well: if there is only one supplier, there will be less innovation in service delivery and Telstra will be able to leverage its market power into content markets as well.

For example, by controlling the technical features of the node, Telstra will be able to foreclose competitive, infrastructure-based, video services — effectively permitting only resale of Telstra products.

Alternatively, if the broadband market is competitive, consumer benefits from a high speed network will be much higher than they are now. Assuming that the price does not change following a rightward shift of the demand curve (i.e. in a competitive market, broadband suppliers offer high speed broadband at the same price that exists currently), then it can be shown that the percentage increase in consumer surplus will be equal to the percentage increase in the number of services sold.<sup>52</sup>

Thus, if under a competitive high speed network the number of broadband subscribers doubles (so that Australia reaches the same broadband penetration as Canada — see Figure 1.4), there will be an *additional* \$17 billion to \$23 billion in consumer surplus.

# 1.7 Policy priorities

Consumer surplus, translated into government policy terms, can be interpreted as 'national interest' or public good. The Australian Government has established a policy framework that is strongly supportive of competition, and has backed unbundling of the local loop as a key policy tool, through declaration (regulation) of the Unconditioned Local Loop Service (ULLS) by the ACCC.

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However, the Government, regulators and the Australian public have been presented with a false dilemma by Telstra. Telstra has suggested that its FTTN proposal, which it says is the only way to achieve high speed broadband, cannot be achieved unless it alone can use the FTTN infrastructure. That is, improving Australia's broadband capacity to levels approaching other jurisdictions globally can only occur if the new infrastructure is controlled by a monopoly provider. The choices facing Australia are set out in the diagram below.





The diagram conceptualises the alternatives open to Australia and highlights that while it may be in Telstra's interest to be the monopoly provider of a high bandwidth network, it is certainly not in Australia's interest. Rather, the national interest would be best served by:

- encouraging the rollout of broadband to as many people as possible in a way that stimulates and does not stifle competition;
- encouraging the ULLS rollout as the most effective present mechanism to drive competition and deliver benefits to end users; and
- rolling out FTTN in a way which preserves and strengthens competition in the delivery of broadband services.

The national interest is served by the Government's stated policy objectives of preserving and strengthening competition, expanding the footprint of high–speed broadband to as many people as possible and encouraging continuing investment in the ULLS rollout. The objectives represent the most effective way to deliver benefits to end–users, and are the policy objectives that underpin the conclusions and recommendations in this report.

# *Chapter 2* Telstra's FTTN proposal

This chapter describes what is known about Telstra's FTTN proposal, the detrimental effects on competition across a range of telecommunications markets and the flow-on effects on the market more generally from Telstra's proposal.

# 2.1 Introduction

Telstra's planned \$3.1 billion<sup>53</sup> FTTN rollout represents one of the most significant changes to the Australian telecommunications network in Australia's history, yet, at this stage there is a real lack of clarity about Telstra's proposed new FTTN deployment. Specific details about the planned network are limited, and description of technical and regulatory features of the network are sparse. This was noted by the ACCC.<sup>54</sup>

In summary, Telstra has moved to re-establish its original dominance.

Telstra's original dominance was based on its ownership of infrastructure and customers, providing access to competitors only on a resale basis — the weakest form of competition, as pictured below.



Resale competition is a weak form of competition because:

• the features and benefits of the service sold by the reseller are virtually identical to those of the Telstra service, making it very difficult for competitors to differentiate their services;

<sup>&</sup>lt;sup>53</sup> There has been some confusion around the amount that Telstra is proposing to spend. The figure of \$3.1 billion comes from Telstra's "National Broadband Plan", 11 August 2005, attached to ASX release 9 September 2005. This plan spoke of the delivery of 6Mbps in the FTTN network. Telstra's Technology Briefing of 16 November spoke of a network that could deliver 12 Mbps, but did not give any updated cost figures. Subsequent media reports (e.g. in the Australian, June 11, 2006) have said that Telstra's FTTN network will cost \$3.4 billion, but this figure may be confused with the amount that Telstra will pay Alcatel to upgrade its networks generally (not just FTTN). Other media reports (e.g. Herald Sun, 23 May 2006) have the cost of the FTTN network at \$3 billion.

<sup>&</sup>quot;It is not clear to the Commission whether [specified concerns] are justified. Until further details are made available from Telstra, it would be difficult to form any definitive view on the precise implications of the FTTN deployment.", ACCC Discussion Paper, A Strategic Review of the Regulation of Fixed Network Services, p. 55, December 2005

- the margins earned by resellers are very low (and frequently negative), meaning that the resellers are kept financially weak and are unable to put much pricing pressure on the incumbent; and
- because the reseller has very high variable costs and low fixed costs, there is little incentive for the reseller to increase its scale as it will not enjoy unit cost savings by doing so.

As discussed in Chapter 1, the most significant regulatory reform to date has been the unbundling of the local loop, through requiring Telstra to offer its competitors one of two different services: ULLS or LSS. The reform has enabled competitors to invest in their own DSLAMS. It has allowed competitors two critical advantages they had not previously enjoyed. First, they can differentiate services from Telstra, thus providing more choice to customers and a basis on which to market and capture more customers. Second it allows competitors to achieve returns to scale from investments in their own infrastructure — a far more effective form of competition and one that lays the foundations for ongoing investment and therefore more sustainable competition.

There were three possible responses open to Telstra once ULLS– and LSS–based competition began to gain momentum. The first was to compete in the retail marketplace using the same technology as its competitors. For example, in response to competitors such as Optus and iiNet offering speeds of up to 20 Mbps using ADSL2+, Telstra could have introduced ADSL2+ by upgrading its DSLAMS.

The second option for Telstra was to invest in fibre-to-the-home (FTTH). However, from Telstra's point of view this was sub-optimal, because:

- it would have involved even higher capital expenditure than an FTTN rollout; and
- unlike FTTN, it did not make unbundling impossible. Rather, it would have left crucial infrastructure in the exchange, which would have allowed competitors to also put their own infrastructure into the exchange, as pictured below.



The third option, embodied in Telstra's FTTN proposal, represents the ideal solution for the objective of damaging competition and returning to monopoly provision. In the absence of an effective regulatory response, Telstra's proposal would likely have the result — because the DSLAMs sit in the nodes, and because Telstra is proposing no competitive access to the nodes — that Telstra can reimpose a resale model and block the provision of ULLS to two thirds of the market

# 2.2 What is known about Telstra's FTTN roll-out<sup>55</sup>

The following points are known about Telstra's proposed FTTN network deployment:

- Telstra's planned footprint for the roll-out will cover four million Australian 'service addresses' in the five major capital cities.
- Of the four million addresses, one third will continue to receive service via a copper wire from the exchange, and two thirds will receive service via fibre and copper
- The roll-out will cost \$3.1 billion, and involves running optic fibre cabling to approximately 20,000 nodes across Australia.
- Each node, a cabinet which will sit on a street corner, will service approximately 200 households.
- Minimum speeds of 12 Mbps will be provided to all households and businesses within the FTTN footprint.
- The roll-out footprint will be contained to major Australian capital cities: Sydney, Melbourne, Brisbane, Adelaide and Perth.
- DSLAMs will be installed in nodes. This effectively moves the capacity to set data rates from the local exchange to a level deeper in the network.
- Optical fibre will replace copper wire between the nodes and the local exchanges (rather than duplicating it).
- 116 of the 250 network switches housed in capital cities within the FTTN footprint will be decommissioned by Telstra as part of the roll-out.

# 2.3 What is presumed about the FTTN roll-out

- It is not feasible for competitors to install their own nodes alongside Telstra's, because there are not enough spare copper wires (beyond the ones that Telstra will use) to run from the competitor's node to the customer premises.
- Competitors' access to the network will be limited to the core infrastructure layer only, therefore significantly reducing service differentiation.
- Customers will effectively have service levels (including data speeds) capped, with Telstra being solely responsible for setting maximum data rates for each customer served by the FTTN network.

Source: Telstra briefings, 15 and 16 November, 2005

# 2.4 What is unknown

Many things are unknown about Telstra's plans:

- The exact nature of technologies and services being considered as part of the roll-out, including the specific characteristics and limitations of services such as Bitstream.
- The exact nature of Telstra's proposed access regime, including the extent to which competitors will be able to retain end to end physical control of the infrastructure which serves their customers. It is not known whether Telstra intends to provide competitors with rights to set and change contention ratios, and to provision the network between the node and the local exchange in response to changes to those ratios. However, it must be considered more likely than not that Telstra intends to keep control of the infrastructure, since this would compel its competitors to be just resellers of Telstra's broadband services.
- The basis on which Telstra has justified its business case, particularly the market share assumptions that have been factored into the development of this case. Given that the FTTN network footprint duplicates much of the network which was declared under the ULLS, it is reasonable to conclude that the business case is partly predicated on protecting Telstra's revenues by damaging competition in the metropolitan Australian broadband market.

It also appears that there are inconsistencies in Telstra's claims about the number of customers that will be served from this network.

Telstra claims that it will provide high bandwidth services from this network to four million service addresses in the five largest cities. It further claims that today these service addresses are supplied by 5.4 million PSTN and ISDN services; and that these service addresses represent all service addresses in the five largest cities.<sup>56</sup>

We believe that Telstra has sought to position its new network as providing service to *all* customers in the five largest cities. Our analysis, however — which draws amongst other things on data provided by Telstra on other occasions — suggests that four million service addresses represents considerably less than all service addresses in the five largest cities.

Firstly, Telstra provided a detailed presentation to the Federal Government in August 2005 in which it described its first plan to upgrade its network to broadband. This presentation was released to the stock exchange on 9 September.<sup>57</sup> It states that there are 8.6 million 'premises' nationally, of which 6.8 million are urban.<sup>58</sup> This means that the four million premises which will receive the upgraded service represents 46.5 per cent of all premises nationally.

<sup>&</sup>lt;sup>56</sup> Telstra technology briefing, 16 November 2005.

<sup>&</sup>lt;sup>57</sup> Telstra, The Digital Compact & National Broadband Plan, Canberra, 11 August 2005.

We believe that 'premises' means the same thing as 'service addresses.' (Another term which is widely used in the telecommunications industry is 'customer premises.' All mean the same thing: namely the location to which the operator provides a service. The majority of premises will have only one service; but some will have two or more, and a single business premises may have a large number of services.)

Secondly, Telstra's annual report states that it has 11.4 million PSTN and ISDN lines nationally.<sup>59</sup> This means that the services which will be replaced in the five largest cities are 47.4 per cent of all of its services nationally. These two figures are quite close and suggest that something less than half of all of Telstra's customer premises, or service addresses, nationally, will be upgraded to be able to receive the 12 Mbps service.

However, ABS data on population distribution shows that Australia's population is 20.1 million, and the five largest cities have a total population of 12.2 million — or 61 per cent of Australia's total population.<sup>60</sup> This is considerably higher than the 46.5 per cent to 47.8 per cent of national customer premises which will be upgraded by Telstra.

It appears that many people who are defined by the ABS to live in the five major capital cities will not in fact be served by the new FTTN network.

This discrepancy is particularly important when it comes to estimating the likely cost of expanding the FTTN network beyond Telstra's proposed reach. This is discussed further in Chapter 4 of this report.

# 2.5 Problems with Telstra's Proposal

There are four fundamental problems with Telstra's proposal:

- By reaching only 4 million homes and businesses, it would create a two tier Australia, with less than half the country able to receive high speed broadband, and the remainder stuck with low speed broadband.
- It would establish Telstra as the monopoly provider of FTTN because there is no way for competitors to use 'unbundled' elements of the FTTN.
- It would seriously damage ULLS-based broadband competition indeed this appears to be a significant motivation for FTTN.
- It would enhance Telstra's capacity to sabotage its competitors a capacity which history shows that resale models are particularly vulnerable to.

It is not surprising that other countries, facing similar policy challenges, have not agreed to give incumbent telcos the kind of deal that Telstra is trying to get for itself.

# It would create a two-tier Australia

Telstra is proposing to invest \$3.1 billion to build its FTTN network to potentially reach four million service addresses in the five major capital cities.

ABS 1301.0, Year Book Australia, 2006

Telstra Annual Report 2005 states that Telstra has 10.12 million total access lines (p78) and 1.3 million ISDN lines (p88)

As discussed above, according to Telstra, services approximately 8.6 million customer premises nationally. Hence, Telstra's proposal would serve less than half of its customers. It would exclude all rural areas. It would exclude all regional centres including fifteen cities with a population of over 50,000 — Albury–Wodonga, Ballarat, Bendigo, Cairns, Canberra,<sup>61</sup> Darwin, Geelong, Gold Coast, Hobart, Launceston, Newcastle, Rockhampton, Toowoomba, Townsville and Wollongong.

Telstra appears to have proposed a limited build due to capital constraints. But this raises the question: could a more expansive network be built with more investment?

Telstra is proposing to include all of the most lucrative and easy to serve, densely populated areas in the FTTN network. That is, it is 'cherry picking' the most attractive markets. Once it is established in these markets, the prospect of competitors establishing themselves in other, lower population density markets is extremely low. In turn, Telstra will feel under no pressure to invest in FTTN in the rest of Australia.

This will create a two-tier Australia. A minority of Australians will enjoy high bandwidth services. The majority will receive only lower speeds, lower quality services. Given the importance of broadband as an economic enabler, Australians in the communities unserved by FTTN will likely see a steady decline in the relative standing of their local economies.

# It would establish Telstra as the monopoly provider of FTTN

FTTN is an ideal technology for an incumbent with anti-competitive ambitions. Firstly, unlike the existing copper network, it cannot be unbundled. This means that if Telstra is able to build the FTTN network on the terms it proposes, it will be protected against competitive entry. Telstra will be the monopoly supplier — allowing it to keep prices high and capture monopoly rents.

Secondly, this means that the only competition will be from resellers — but with the speed, grade of service and other features all determined by Telstra, it will be impossible for resellers to differentiate or to offer truly effective competition.

# The importance of unbundling

In its current architecture, Telstra's network can be 'unbundled.' That is, a competitor is able to purchase a single element from Telstra — the copper line linking the exchange to the customer's premises. The competitor can purchase this without having to purchase the remaining elements of the 'bundle', which are required to provide an end-to-end service to the customer. Instead, the competitor puts the unbundled element (the copper line from the exchange to the home) together with the other elements which it provides itself — the electronic equipment that the competitor installs in the exchange (the DSL Access Multiplexer or 'DSLAM'); the fibre running from the exchange back into the competitor's network; and the core of the network including switching equipment. The manner in which the ULLS is provided to Telstra's competitors is illustrated in Figure 2.3.

<sup>&</sup>lt;sup>61</sup> While Canberra will not be included in Telstra's proposed FTTN network, Canberra enjoys high bandwidth services provided by the TransACT network.



The reason that competition regulators around the world have mandated unbundling is that they want to facilitate competitive entry into telecommunications. An incumbent's telecommunications network is a massive enterprise, built up over many years. Telstra has an access network with over 10 million lines. If other carriers were required to duplicate the whole of Telstra's network before they could offer a service, then Telstra would be protected by a massive barrier to entry — in turn allowing it to keep its prices high. That is why the Government and ACCC require that Telstra must rent the unbundled copper line to competitors. That allows a competitor to combine that line with the elements that it has built (using its own funds) — in turn allowing it to compete with Telstra. This means more competition and therefore greater choice and better service offerings for customers.

As discussed at section 4 above, unbundling of the local loop is gathering pace in Australia. This holds the promise of real benefits for all Australians using telecommunications services – both voice telephony and broadband.

# FTTN cannot be unbundled

FTTN cannot be 'unbundled'. There are both technical and economic reasons why not.

The first technical reason is that the 'node' — the cabinet which sits in the street and serves about 200 homes — is too small for competitors to install their own electronic equipment. By contrast, under today's network structure, the competitor is able to install its equipment in the exchange, which has plenty of room.

The second technical reason is that it would be pointless for competitors to build their own nodes next to Telstra's nodes – as there will be no way for the competitor to interconnect with the copper wires which will run from the node to customers' homes. We expect that Telstra will build each of its 20,000 nodes next to a pillar – the existing device in the street from which the copper wires running to around 200 homes fan out.<sup>62</sup> Today the pillar is connected to another set of copper wires running back to the exchange; tomorrow it will be connected directly to the node, which in turn will connect to a fibre running back to the exchange.

<sup>&</sup>lt;sup>62</sup> There are pillars sitting on most street corners in Australia. They are a 'junction point' between the Telstra exchange — serving around 10,000 homes — and the home. Each pillar serves around 200 homes. Copper comes in from one side of the pillar — the home side — and connects to a termination point. Copper comes in from the other side of the pillar — the exchange side — and connects to another termination point. Another short copper wire runs, inside the pillar, from the termination point on one side to the termination point on the other. This makes it easy to reconfigure services, by moving the short wires around.

This means that, once the FTTN network is set up, all of the copper wires which come into the pillar from the 200 homes will now be, in turn, directly connected into the node. There will be no available, spare copper wires which could connect to a competitor's node. (It is almost as if the pillar is like an extension powerboard with four sockets in it. When Telstra connects the pillar to the node, it is as if Telstra has plugged an extension cord into each of the four sockets; there will be no spare sockets for a competitor to plug its cord into).

The economic reason why an FTTN network cannot be unbundled is directly related to the small number of households served from a node — only around two hundred, as compared to the ten thousand or more served from an exchange. It is economically viable for a competitor to invest in putting its electronic equipment into a Telstra exchange. The competitor has a reasonable chance of securing enough customers — out of the ten thousand available — to cover the cost of installing the equipment. But when there are only two hundred customers available — the calculation changes dramatically.

# Therefore Australia will revert to resale competition – which is much more inferior

With unbundling of an FTTN network not a viable option, what are the prospects for resale competition under an FTTN network? In short, they are poor. Australia has had considerable experience of resale competition in fixed line voice telephony. This experience shows that competitors operate on very low margins, so they are unable to put the incumbent under much price pressure.<sup>63</sup>

Equally as important, resellers are unable to differentiate their product from Telstra's. Under an FTTN network, if competitors are reselling Telstra's product, they will have to accept Telstra's decisions regarding bandwidth, grade of service, and other key factors such as the contention ratio.<sup>64</sup> This is because all these decisions are made by configuring the node in one way or another — and Telstra will control the node.

Table 2.1 summarises the barriers which prevent a competitor getting meaningful access to the FTTN access network — and which, in short, mean that the FTTN network cannot be "unbundled". It demonstrates how the progress that has been made with ULLS is halted by Telstra's FTTN proposal.

Indeed, currently, Telstra sets the GST-inclusive wholesale price of line rental at \$30.36 — which is more than the retail price of line rental under its two most popular plans, Homeline Complete at \$26.95 and Homeline Plus at \$29.95. It is unsurprising that resale competition produces anaemic results when competitors face negative margins on line rental.

<sup>&</sup>lt;sup>54</sup> This is the ratio of the sum of the maximum bandwidths promised to the 200 customers taking service from the node, to the aggregate bandwidth made available on the fibre, which comes into the node. Therefore, the less bandwidth Telstra reserves on the incoming fibre, the lower will be the quality of service experienced by the customer.

Table 2.1

Access required for genuine competition	Technical barriers to achieving appropriate levels of access
Can a competitor install its electronics (DSLAM) in the node?	Physical limitations within the node prevent installation of more than one DSLAM Challenges associated with disconnecting and re-connecting copper pairs into separate DSLAMS
Can a competitor build a second node next to Telstra's node?	Technical limitations on duplicate access to the copper pairs — no `double adaptor' possible at the level of the node Physical `street furniture' limitations at local council level
	Even if the above were overcome, the economics of installing a duplicate node are not justified
Can a competitor maintain physical control over the network from the customer back to its core network?	Technical/physical space restrictions at the node prevent the installation of multiple DSLAMS, which in turn presents the following issues:
	<ol> <li>Inability of providers that do not control node DSLAM settings to set contention ratios or change cards to support different levels of services (e.g. ADSL vs symmetric DSL vs video DSL vs analogue television)</li> </ol>
	<ol> <li>Lack of control over backhaul provisioning, which drastically reduces the capacity of a provider to guarantee levels of service</li> </ol>
	3. Inability to deliver a reasonable service over copper (to the node) due to interference
Can a competitor provide differentiated levels of service to customers, including corporates?	Telstra control of the DSLAM at the node enables it to set a cap on the maximum permissible service level, preventing competitors from providing business grade services from the node
	Telstra control of the DSLAM at the node restricts the capacity of competitors to make technical changes to the network (contention ratios and backhaul provisioning) in real time
	Limitations on the provisioning of nodes (including DSLAM capacity) enforces a natural cap on total quality service that can be delivered from a given node, effectively reducing the service levels possible if the node is not properly provisioned in the first instance

#### PHYSICAL ACCESS TO AN FTTN NETWORK: WHAT IS REQUIRED AND WHAT THE BARRIERS ARE

Source: ACG and Dandolo Partners discussions with industry

An example of how Telstra could monopolise the provision of innovative services such as IPTV under its proposed FTTN network is discussed in Box 2.1. IPTV is the delivery of television content provided via Internet Protocol direct to the home. It runs on a Multicast network for live streaming video (e.g. CNN/Live Sport etc). Transmissions are multi-cast.<sup>65</sup> IPTV provides a genuine alternative to free-to-air arrangements, with increased consumer choice, a new market for content producers, and potential to attract new investment — and increased competition — from industry. However, the potential benefits from IPTV are at risk if Telstra is allowed to monopolise the provision of this service under FTTN.

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That is, a single piece of content is duplicated at a point in the network and distributed to multiple receivers (rather than the same content having to be sent to each receiver individually from the start of the network to the end.

Box 2.1

#### HOW TELSTRA COULD MONOPOLISE IPTV

#### How IPTV could be provided under a competitive regime

Under ULLS, competitors can deliver IPTV using bandwidth of 2.4Mbps. This offers exciting possibilities for video services. With access to the ULL, each DSLAM/last-mile infrastructure provider in Australia could potentially provide IPTV to the majority customers over existing equipment as they have complete control over their network in terms of backhaul, port configuration and protocols. This means an infrastructure provider can have the benefit of running multicast, configuring DSLAM ports to provide QoS (high priority to video) and making decisions about where they place content playout servers. (Play out servers are the servers that inject the video content (both live and on-demand/prerecorded) into the network.)

#### Under Telstra's FTTN proposal

By contrast, the current FTTN proposal for 'bitstream' from Telstra follows the current Telstra wholesale model for ADSL ports. This model effectively removes any ability for an access seeker to compete with the infrastructure owner. It would make it impossible for a competitor to deliver its own IPTV service.

'BitStream' is a term which is used to confuse the nature of the product being offered. It appears to be providing a service in which the port to the user is completely logically connected to the access seeker. However, the reality is the access seeker has no control over:

- Port configuration eg. Speed or Reliability
- Port protocols Telstra Wholesale enforces a layer 2 tunnelling protocol (L2TP) service which is unsuitable for live streaming video as it prevents multicast access to the exchange/node etc as it enforces a stream-per-user delivery.
- Quality of service critical for Video delivery.
- Backhaul delivery the access seeker is required by Telstra to pay for backhaul to a central point ("aggregation").

Most important for providing live video services is having access to multicast to allow efficient delivery of bandwidth. Multicast allows the operator to deliver one video stream to a node and then have the node send a copy to each customer. However, in Telstra's FTTN proposal, competitive providers would not have access to multicast. With high aggregation costs, it would be uneconomic for a provider to provide IPTV. Telstra would have this market all to itself.

Even if Telstra's FTTN proposal allows access to the nodes at an exchange level, a lack of ability to control the port at the node and do Multicast would still prevent IPTV being delivered.

Potentially Telstra may acquiesce and allow access to injecting multicast streams by providers. However, Telstra may limit the content delivery by charging in a way that would still render it uneconomic for providers (especially smaller ones) to offer content. Additionally, the platform may limit the number of competitive channels because of:

- technical limitations on bandwidth that Telstra may provision to the node (out of control of the access seeker in the FTTN model);
- · Telstra pre-purchasing all or almost all channels available; and
- charges to deliver the channels or configure the ports to allow video to an access seeker's port.

#### It would seriously damage ULLS competition

As discussed, FTTN is an ideal technology for Telstra because of the market structure it produces. Once the FTTN network is in place, Telstra will have regained its monopoly. But it is an ideal technology for Telstra in another way — it will largely head off the competitive threat which Telstra faces from ULLS and LSS.

Again, this is so for a combination of technical and economic reasons.

Telstra has made it clear that, of the four million households who will be served by its FTTN network, around one third are within 1.5 kilometres of the exchange and hence can receive 12Mbps using existing DSL technology. These customers will continue to be served by that technology; and hence competitors will continue to be able to serve these customers using the existing ULLS and LSS. Therefore the discussion in this section concerns customers who are more than 1.5 kilometres from the exchange.

The technical problem is that, once Telstra converts services from a particular exchange to FTTN, it will be difficult for Telstra's competitors to continue to serve customers (who are more than 1.5 kilometres from an exchange from that exchange) with ULLS-based services.

The reason for this is because of interference or 'cross talk'. This will affect about two thirds of access seekers' addressable market. Consider two homes which are next to each other. Assume they are three kilometres from the exchange. The first is served by Telstra's FTTN network; the second is served by a competitor using ULLS. The first home receives a service which runs over fibre from the exchange to the node; there, it transfers across to copper for the final part of the journey. The signal on the copper will thus have last been 'amplified' by the electronic device in the node, some 1.5 kilometres upstream. The second home, by contrast, will receive a signal which has travelled over copper all the way from the exchange; a signal which was last amplified 3 kilometres upstream.

The problem is that for the last 1.5 kilometres, the two signals will travel along two copper wires which are very close to each other (given that they are part of a large bundle which ultimately runs down one street). One will be carrying a more powerful signal than the other, having been amplified more recently, and this will cause interference with the signal on the second copper wire. This will render the quality of the second service unsatisfactory.

Now consider the economic problems. There are two. The first is the impact on the competitor's service once Telstra commences FTTN. The competitor will be in the same position as an airline offering propeller aircraft in the 1950s when a competitor introduced jets. If competitors are restricted to lower bandwidth services, and Telstra has a monopoly on high bandwidth services, there will be little competitive pressure on Telstra.

The second economic problem is the impact on ULLS competition even before FTTN commences. If competitors expect that Telstra will deploy an FTTN network, this will have a serious chilling effect on ULLS investment. The chilling effect will be compounded if there is insufficient clarity (as there presently is) about how much notice Telstra needs to give to competitors before converting an exchange to FTTN – even if competitors are using that exchange for ULLS–based services.

So even before it commences an FTTN-based service, FTTN is an ideal technology for Telstra. Unless the Government and ACCC act decisively, Telstra will succeed in chilling competition from ULLS.

It is important to recognise that unbundled services support not just greater competition, they also facilitate greater investment. ECTA notes that "progress in Japan, the UK, and France can be associated with action on unbundling and bitstream access", as demonstrated in the charts below.<sup>66</sup>





Source: OECD, ECTA, Point



Figure 2.5
UNBUNDLED SERVICES LEAD TO GREATER INVESTMENT

<sup>&</sup>lt;sup>66</sup> ECTA (European Competitive Telecommunications Association), 'Promoting Investment through Competition', Goals for 2010

The investment bank Citigroup has issued a report expressing doubt that FTTN will generate significant new revenues.<sup>67</sup> Indeed, many observers suggest the real benefit to Telstra from FTTN is not the new revenue streams it will generate from this investment; but as the investment bank Morgan Stanley points out, Telstra's FTTN proposal will undermine the competitive threat of ULLS, and thereby protect Telstra's existing revenue streams.<sup>68</sup>

Others have suggested that in proposing its FTTN network — and particularly the location of the 450 exchanges, which are principally the exchanges where Telstra expects competitors to roll out ULLS — Telstra is simply replicating the strategy it used in the mid-nineties to head off the threat from Optus building a cable network. At that time, Telstra responded with the 'telephony defence strategy' — build out a new cable network which duplicated the Optus network, expressly justified on the basis of protecting its existing revenues from erosion.

# Enhance Telstra's capacity to sabotage competitors

An incumbent monopolist has the ability to degrade the quality of service offered by its competitors who manage to gain access to its infrastructure. This is a particular problem with resale, and one of the reasons why ULLS is attractive to competitors. However, even with ULLS, competitors are vulnerable to sabotage by the incumbent, which creates effective barriers to take-up of the service.

The recent experience of competitive carriers with ULLS provides a number of specific examples of operational processes and non-price terms and conditions of supply where Telstra has created such barriers. For example, the ability of access seekers to migrate existing resale customer base to ULLS is compromised by a number of onerous or inefficient operational processes. Examples include:

- Onerous forecasting arrangements which create environment where all the risk is placed on access seekers. Telstra's terms and conditions stipulate that access seekers cannot exceed submitted forecasts but they may be penalised if actual orders fall below the forecast. These terms dictate that access seekers have to operate cautiously and do not have the flexibility to pursue aggressive ULLS migration strategies.
- Telstra sets arbitrary and blanket limits on daily migration rates. These act as a brake on the rate of migrations and again provide access seekers with little flexibility to pursue aggressive migration strategies.
- There are significant inefficiencies in the migration process because Telstra continues to run key components of the end to end process, such as ULLS cutover and the associated number porting, as distinct processes. This lengthens the period of service outage customers can face during the migration process. This presents a significant impediment to customer take-up, especially within the business market where any service outage is considered unacceptable.

Telstra Corporation Ltd, Any takers for a 40 year payback on FTTN? Tim Smeallie, Citigroup, 15 May 2006
 See Telstra Corporation, Will Telstra be allowed to re-entrench its fixed-line monopoly? Andrew Hines, Morgan Stanley, 24 January 2006

• Telstra refuses to provide meaningful service levels on migrations and only commits to operate within soft guidelines set by industry codes. This typically means that it will only commit to complete a task within a "clear business day", when in reality it ought to be completed within minutes or hours. Again this acts as a barrier to customer take-up because access seekers provide basic assurances about the migration process (such as timeframes for completion).

Telstra's ability to sabotage its commentators has been noted by several commentators, and the need to guard against it has been noted by the ACCC, which has said:

...important that we recognise that as long as one carrier overwhelmingly dominates the telecommunications sector, to the extent that all its competitors are beholden to it for access to the very infrastructure they need to compete, then regulation will be required to ensure that, as far as possible, competition is promoted and protected.

Because FTTN cannot be unbundled, and under Telstra's proposed network it will control the end-to-end service, the problem of potential sabotage will be profound. Given the degree of control that the FTTN model offers, the issue of who controls the network becomes fundamental, and it is desirable that this control be removed from the network owner. This issue is dealt with in greater detail in chapter 4 as part of the rationale for an independent company to make key network decisions.

# 2.6 Market consequences of reduced competition

Competition, though crucial, is not an end in itself. It is a fundamental precondition for an efficient market because it generally attracts more investment, creates downward pressure on price and stimulates innovation and service levels. A less efficient market tends disproportionately to disadvantage users at the margins of that market. In this case, Australians living in regional and rural areas — already significantly disadvantaged by inefficiencies in the market — will be even worse off under FTTN as the divide between the haves and have-nots widens.

The other key consequence of an inefficient market is the negative impact it has on commercial and industrial productivity. Given the fundamental importance of broadband infrastructure, the downstream impacts (i.e. those in retail telecommunications markets) from inefficient performance affect the wider economy and society. In this section we consider the consequences of a market subject to greater incumbent dominance and reduced competition. The consequences include:

- reduced investment;
- reduced benefits to regional and rural Australia; and
- higher prices and reduced choice.

<sup>&</sup>lt;sup>69</sup> Ed Willett, Commissioner, SPAN: Promoting Effective Competition Within the Telecommunications Sector, 1 April 2005, p.8

# Creates uncertainty for investment in existing and planned ULLS based networks, increasing the risks of infrastructure-based competition

Liberalisation of the Australian telecommunications market has had significant positive impacts and has helped create the conditions in which competitive carriers can earn a return on their infrastructure investments. One of the most fundamental regulatory decisions of recent years was the granting of access rights to local exchanges, effectively ending the Telstra monopoly on the rights to determine service levels for end customers. It also had the effect giving Telstra's competitors the opportunity to achieve economies of scale.<sup>70</sup>

Competitors to Telstra operate on the basis that regulatory 'fairness' will prevail in developing business cases for infrastructure investments. Non-incumbent investment decisions are higher risk, and deliver lower returns, than those of incumbents, as described in a 2004 ACCC report assessing telecommunications infrastructure in Australia. The study found that while carriers other than Telstra held only 7.06 per cent of the local network subscriber base, these companies invested around 20 per cent of the \$872.1 million spent on local network infrastructure expansion.<sup>7</sup> An earlier ACCC report conducted in 2002 found that of the \$1.8 billion invested in local access network infrastructure, around 33 per cent was invested by carriers other than Telstra. Despite this, carriers other than Telstra held only 15 per cent of the subscriber base (14 per cent SingTel Optus, one per cent all other carriers).<sup>2</sup> In other words, Telstra achieves higher market share as a result of its infrastructure investments than do its competitors. Lacking the advantages of dominance that Telstra enjoys, competitors find that the infrastructure investments are high-risk and vulnerable not just to normal commercial pressures but anti-competitive action by Telstra as well.

Telstra's FTTN proposal threatens to strand infrastructure that has already been deployed. Up to two thirds of the investments in local network infrastructure expansion could be by-passed, representing several hundred million dollars of stranded infrastructure. Given that non-incumbents are more willing to invest than the incumbent — demonstrated by their lower investment returns — an environment which discourages their investment will have a negative impact on the entire industry and therefore a broad section of consumers.

Apart from preventing future investment, Telstra's FTTN proposal threatens to strand investments that have already been made by alternative carriers. Some carriers have to date heavily invested in ULLS–based networks which depend on continued regulated access to the ULLS. The current FTTN proposal effectively short-circuits competitors' infrastructure by migrating customers to a new access network. After unsuccessfully resisting granting its competitors access to the ULLS, Telstra has simply proposed to create a new bottleneck, after its competitors have invested to create an alternative to Telstra's existing bottleneck infrastructure. Telstra's competitors will need fair access on equal terms to the bottleneck aspects of the FTTN network, as well as continued access to the ULLS.

<sup>&</sup>lt;sup>70</sup> However Telstra has been less than fully co-operative with its competitors when they have attempted to implement their access rights.

<sup>&</sup>lt;sup>11</sup> Australian Competition and Consumer Commission "Telecommunications Infrastructure in Australia 2004". http://www.accc.gov.au/content/item.phtml?itemId=690365&nodeId=file4368544568257&fn=Telecommunica tions%20infrastructure%20in%20Australia%202004%20(released%20Jun%2005).pdf

<sup>&</sup>lt;sup>2</sup> Australian Competition and Consumer Commission. "Telecommunications Infrastructure in Australia 2002" http://www.accc.gov.au/content/item.phtml?itemId=690303&nodeId=file42ae28b001a58&fn=Telecommunica tions%20infrastructure%20in%20Australia%202002.pdf

To a great extent, a more table environment could be promoted through regulated access to essential points on the FTTN network on reasonable price and non-price terms and conditions. This is discussed further in Chapter 4.

# Reduces benefits to regional and rural Australians

Telstra's current FTTN proposal is an example of 'cherry picking' — deploying an infrastructure that serves only the most profitable customers in the major capital cities. For all telecommunications providers, investment decisions are driven by the capacity to receive a reasonable return on investment. Rather than calculating this return on investment on a site-by-site basis (i.e. by DSLAM) most carriers try to establish the ROI across an entire network. It is accepted that a small proportion of the market will generate a large proportion of the return — for comparatively little capital cost. When taken on a whole network basis, households or businesses that may not be profitable to service when considered on a one–off basis may justify investment because the economics across the wider network permit it.

Telstra's plans have potentially very serious implications for long-term infrastructure investment. Telstra's FTTN footprint cherry-picks the most profitable segment of the Australian telecommunications market. Though the scale of investment required by Telstra to service four million service addresses is substantial, servicing the remaining customers will be a much more significant challenge. If Telstra's proposal means that its competitors are locked out of investing in metropolitan infrastructure, then the only option will be to invest in infrastructure for the least profitable segments of the population only. This is likely to be an uncommercial proposition for them, given that regional and rural investments are generally anchored by profits achieved in higher-density markets, but these markets will have become monopolised by Telstra.

Under Telstra's FTTN plans, it is therefore likely that there will be no investment in high speed broadband in rural and regional Australia, either by Telstra (because it will be satisfied by cherry picking the most profitable market segments) or by its competitors, because, having been locked out of the major metropolitan markets, they won't be able to make the business case to do so.

# Leads to higher prices and reduced choice

The level of competition in the supply side of the market has a direct relationship to the extent of choice available to the demand side of the market. The `any colour you want as long as it's black' consequence of a monopoly is true for consumers in general, not just those living outside urban areas. Whilst extensive evidence of this has been provided throughout this report, it appears particularly starkly in the exhibit below, which shows that of the benchmarked countries Australia shares two unwelcome honours: its broadband is the highest priced, and nearly the slowest!<sup>73</sup>

M.Kende, Analysys, National and International advances in telecommunications; see www.analysys.com/USdownload/ National\_International\_Telecoms.pps



This situation has arisen for a range of reasons: the strength of incumbent advantage, Telstra's willingness to aggressively defend that advantage at all costs, the difficulties that regulators have faced in protecting competitors and Australia's challenging topography. It is clear that it has been in the incumbent's interests to arbitrarily limit broadband speed and availability. Providing a 'mediocre' service has enabled expectations to be kept artificially low, while at the same time it has reduced the costs to Telstra of providing a reasonable level of services. The current proposal would give Telstra even greater capacity to keep Australia's broadband in its control.

# Chapter 3

# The policy choices faced by the Government

This chapter describes the key choices for Government and the policy issues that are likely to influence the choice for Government. This chapter reasons that accepting Telstra's FTTN proposal would not be in the interests of Australians. Lessons from overseas jurisdictions facing the same public policy challenges as the Australian Government are described to illustrate that these countries have erred on the side of achieving better competitive outcomes as a matter of good policy.

# 3.1 Introduction

Government can play a fundamental role to ensure that the benefits from broadband are available to all Australians, by putting in place good policy that promotes broadband competition and therefore the growth of broadband penetration. This means providing mechanisms for *competitive processes* to flourish to encourage the emergence of new players offering a variety of innovative broadband and other telecommunications services to all Australians. This should be the ongoing objective of good telecommunications policy.

At this point in the development of the telecommunications market, the Government is faced with choices that will significantly impact on the future of broadband competition. This will, in turn, affect the extent to which benefits of increased broadband take-up will be realised by all Australians. Therefore, decisions made by the Government and regulator must be considered carefully.

Importantly, the Government must keep in mind that a competitive telecommunications industry is in the interests of all Australians and the effort in regulating this industry should be directed towards these ends.

In considering its policy options, the Government should realise that what Telstra is proposing is essentially a rear-guard action aimed at foreclosing competition. This has been recognised by a number of observers, including the US Trade Representative. In commenting on Australian conditions in its 2006 Review of Telecommunications Trade Agreements, the US Trade Representative states the following:

Telstra has been aggressive in attempting to undermine the authority of the ACCC — mainly through direct appeals.

Telstra has worked actively to minimize the scope of safeguards designed to ensure that Telstra offers competitors access to key parts of its networks on terms equivalent to those Telstra offers itself (operational separation) and to curb reforms concerning the structure and level of pricing for unbundled local loops.

The US Trade Representative will also encourage Australia to adopt reforms concerning the structure and level of pricing for unbundled local loops that do not foreclose competitive entry into the Australian market.

Experiences of international jurisdictions are reviewed later in this chapter, and provide lessons for the Australian government and ACCC as to how these jurisdictions have dealt with some of the challenges of introducing a new high bandwidth network.

# 3.2 Key choices for the Government and the ACCC

The Government and ACCC face a choice. Their options are to:

- give Telstra the generous regulatory concessions which it has sought in exchange for building an FTTN network (Option 1); or
- refuse to accept Telstra's proposal (Option 2 essentially the *status quo* of competition through ULLS); or
- pursue a model which allows an FTTN network to proceed while sustaining competition (Option 3).

In chapter 4 of this report, we lay out a model which we believe would be an appropriate option 3. Its key feature from a regulatory perspective is a model for independent control of key aspects of network configuration and operation.

# Policy issues for consideration by government

In exercising this choice, the Government must weigh up multiple considerations:

- It is in Australia's interest to increase the average bandwidth available to consumers and businesses.
- It is in Australia's interest to protect and increase competition in telecommunications.
- It is not in Australia's interest to lock in a monopoly structure for the new generation of broadband services.
- It is not in Australia's interest to lock in a two-tier broadband market, where less than half of all Australians enjoy high speed broadband, and the majority of Australians are locked indefinitely into slower speed services.
- Telstra has private property rights over its network and its shareholders are entitled to see those protected.
- Telstra is subject to the law of the land including the access regimes which apply to its networks, and this has been fully disclosed to its shareholders from the time of the first float in 1997.

#### Satisfying Government policy objectives

Given these considerations, and the discussion earlier in this report, it is clear that Option 1 should be rejected by government. This option will lock in a monopoly structure for high speed broadband services; and will create a two-tier broadband market. This is not in the national interest.

High speed broadband services could be delivered by either Option 2 *or* Option3, and are beginning to be delivered by Telstra's competitors. Option 2 is consistent with satisfactory resolution of all the above policy issues; it involves continuation of ULLS-based access.

Option 3 offers a managed transition from ULLS to a jointly owned FTTN network, rather than the significant diminution of ULLS and many of its existing and potential benefits, which is the implication of Option 1.

The key point is that it is by no means clear that FTTN is either necessary to deliver high speed broadband services, nor that it is commercially viable on its own terms, (except as a monopolisation strategy for Telstra). If it is not, then Option 2 will satisfy the Government's policy objectives. If FTTN, *with competitive access and control removed from the asset owner*, is judged as technically and economically superior to ULLS-based broadband, then Option 3 will best satisfy the Government's policy objectives.

In short, government policy considerations will best be satisfied by policy and regulatory settings which

- continue to facilitate pro-competitive ULLS investment (Option 2 and in the transition to Option 3); and
- facilitate broadband competition in an FTTN setting under Option 3.

# Benefits of continued access to the ULLS as a means of delivering broadband services

As discussed in the previous chapter, under Telstra's proposal (Option 1), ULLS– based competition will be severely diminished. This is undesirable for several reasons. ULLS–based competition is beginning to erode Telstra's monopoly power; it will stimulate efficient investment; and it will deliver numerous benefits to consumers including more choice, better services and lower prices.

#### Continued access via ULLS will promote broadband competition

ULLS uptake, while growing, is not yet extensive. As at June 2005, less than 50 000 ULLS services had been taken up by access seekers, most of those in the business market and inner metro areas.<sup>74</sup> There are a number of reasons for this slow take–up including:<sup>75</sup>

- the substantial infrastructure investment required;
- the considerable risk associated with this form of quasi infrastructure-based competition; and
- the need for competitors to firstly build a sustainable critical mass of customers through the resale of Telstra's services prior to committing to ULLS rollout.

Despite these obstacles, facilities-based competition via ULLS is delivering promising results. Several carriers have signalled their intention to take-up large numbers of ULLS as part of plans to roll out their own DSLAMs for the provision of xDSL products. Some of these roll outs commenced in the first half of 2005.

A number of benefits have already arisen from access to ULLS. The quasi facilities-based competition offered by ULLS enables competitors to provide customers with a much more diverse range of broadband services, rather than simply reselling voice and data services.

ACCC 2005, A strategic review of the regulation of fixed network services — an ACCC Discussion Paper, December, p. 42.

ACCC 2005, A strategic review of the regulation of fixed network services — an ACCC Discussion Paper, December, p.42.

However, the full potential of ULLS access has yet to be fully realised. The ACCC notes that:  $^{76}$ 

ULLS uptake to this date has been disappointing. ACCC figures suggest that, as at December 2004, only around 30 000 ULL services had been taken up by access seekers, and that these are mostly in the business market. The ACCC believes that this number will increase in the coming financial year.

The ULLS bottleneck will likely continue for some time, and it will be important for the ACCC and Government to combine to provide vigorous regulatory support for ULLS-based competition. Other technologies with broadband capabilities such as wireless and satellite technologies are not well suited to offering voice and some data services to the same extent as ULLS-based networks. These technologies, therefore, do not have the same potential for providing a competitive offering to customers as a ULLS-based network does. Appendix A provides further discussion about lack of substitutability between other technologies and FTTN in delivering comparable broadband services.

# Continued access via the ULLS will promote efficient investment in infrastructure

ULLS is an effective means to build a competitive network relatively quickly. It does not involve inefficient duplication of another access network: rather, it allows competitors to take advantage of the existing local loop infrastructure. For instance, an access seeker can deploy a network with national reach by installing its own DSLAMS into Telstra exchanges and building fibre from the exchange back to the centre of its network.

Continued declaration of the ULLS is likely to promote efficient investment in competing infrastructure by access seekers. Infrastructure investment includes the deployment of DSLAMs, cabling and transmission services to provide a full range of services to customers via the ULLS. A winding back of regulatory access to ULLS is likely to deter existing and planned investment in a competing ULLS–based network. In particular, the regulatory uncertainty would reduce access seekers' incentives to invest in their own networks given the risks to the return on their investment, including any contractual commitments.

ULLS/LLS based competition is still in its early days. iiNet has over 100 000 customers that it serves using LSS, and combined with PowerTel has 262 exchanges in service today. TransACT has also offered ULLS-based services for over two years, experiencing strong customer take-up. Optus commenced ULLS based services for consumer customers in December 2005, and it already has over 10 000 customers (who are served using ULLS), a number that it expects to grow rapidly over the next three years. It has also committed to build its own ULLS equipment in 340 Telstra exchanges. Primus has plans underway to build 200 DSLAMs in Telstra exchanges.

# 3.3 Why should Telstra receive regulatory relief?

All of Telstra's networks, including the FTTN network if it proceeds, are subject to the access regime under Part XIC of the Trade Practices Act. However, Telstra has proposed that it be given various regulatory exemptions by the ACCC.

ACCC 2005, ACCC telecommunications report 2003-04, March, p.17.

Telstra's public arguments and those of its proponents seem to be that it needs the FTTN network to improve its financial performance and, in turn, make the forthcoming float of Telstra shares a success. This is a wholly irrelevant consideration for the ACCC and the Government.

There is no good policy reason to corrupt Australia's telecommunications regulatory regime as it is to apply to FTTN simply to provide sweeteners to existing or prospective Telstra shareholders. Giving exemptions to Telstra would undermine the certainty of access seekers' investment in telecommunications infrastructure, and the confidence that competitors have in the government and the ACCC to oversee and regulate the telecommunications industry. Giving Telstra favoured treatment would certainly be looked upon poorly by potential foreign investors in other telcos, as the remarks of the US Trade Representative, cited earlier in this chapter, would suggest.

# 3.4 The Long Term Interests of End Users Test

In making its decisions on which policy options to pursue, the Government should be mindful of the Long Term Interest of End Users Test. This test, which is defined under Part XIC of the Trade Practices Act, requires the ACCC when it considers whether to regulate (declare) a telecommunications service, or whether to accept an access regime, to have regard to the primary objectives of:

- promoting competition in a market for listed services;
- achieving any-to-any connectivity in relation to carriage services that involve communications between end users; and
- encouraging economically efficient use of, and the economically efficient investment in, the infrastructure by which telecommunications services are supplied.

The ACCC generally uses the "with and without" test to assess whether or not to accept an undertaking. In this case, the ACCC needs to consider the state of competition in a world "with" Telstra's FTTN proposal — namely Option 1— and "without" that proposal — namely Options 2 and 3. In making this assessment, the ACCC will need to consider a range of factors, including:<sup>77</sup>

- the customer access market this is a national wholesale market for the supply of customer access services. By virtue of its fixed public switched telephone network, Telstra is the major supplier of customer access services, including the ULLS service.
- the broadband services market this is a national market for the supply of high bandwidth carriage services by service providers to end users. These services are 'always on' and involve the carriage of communications at speeds around, and exceeding, 1.5–2 Mbps. These services can be supplied by means of copper, optical fibre or HFC fixed networks or wireless networks. Telstra is the main supplier of these customer access services and is thus in a position where it controls access to the majority of inputs necessary for competition in this market. An FTTN network would provide broadband provision capabilities and therefore would be able to affect this market.

<sup>&</sup>lt;sup>77</sup> The ACCC has previously defined these markets in a number of publications including the annually reported competitive safeguards report.

In addition to these markets, other related telecommunications markets are likely to be affected.

#### **Promotion of Competition**

As discussed in this report, it is clear that Telstra's proposal (Option 1) would not promote competition; quite the opposite, it would severely retard competition. On the other hand, Option 3, which would involve a network operating under the arrangements described in chapter 4, with independent control of key decisions and an open access regime, would promote competition. For those access seekers with already existing networks, the FTTN network will allow them to combine the coverage of their own networks with the FTTN network, increasing overall coverage and therefore their ability to compete more effectively in the broadband and other telecommunication services markets. Access to the FTTN network under Option 3 would allow competitors to offer differentiated services, which would also promote competition. Some competitors might offer their customers greater upload speeds, traded off for less reliability; this might be attractive for example to customers who will use broadband for gaming applications. Other customers, for example those who want to use IPTV applications, will be less interested in upload speed, and more interested in high levels of reliability.

Thus, competition is less likely to be promoted with Telstra's proposal (Option 1), than without it. On the other hand, competition is more likely to be promoted with Option 3 than without it.

#### Any-to-any connectivity

As discussed in the previous chapter, physical access to Telstra's proposed FTTN network will be very difficult, if not totally infeasible, in comparison to access to the ULLS, where competitors can combine their own infrastructure with network elements they lease from Telstra.

Thus, any-to-any connectivity is less likely to be promoted with Telstra's proposal than without it.

On the other hand, with competitors able to access the FTTN under Option 3, in a way that will enhance their ability to provide superior services to their customers, any-to-any connectivity will be enhanced. An access seeker would connect to the FTTN network with its own equipment at an exchange enabling it to carry data, voice and other communications to and from the FTTN network and its own infrastructure to provide communications to its customers.

Thus, any-to-any connectivity is more likely to be promoted with a broadly owned and independently operated network than without it.

# Efficient use of, and investment in, infrastructure

Telstra's proposal fails this test because:

- it will lead to the stranding of investments already made by Telstra's competitors;
- the uncertainty created by it will chill investment in new ULLS infrastructure;

- according to market analysts, Telstra's proposal is uncommercial in its own right, and is only being made as a strategic device to foreclose competition; and
- Telstra will 'cherry pick' the most profitable metropolitan areas leaving the rest of Australia unserved by high quality broadband, because it will be uneconomic for other carriers to serve these areas on a stand alone basis. By contrast, it would be economically efficient for the owner of a more widespread broadband infrastructure to sell wholesale broadband access to carriers who may seek to serve the national market, or more specialised regional markets.

Thus, efficient use of, and investment in, infrastructure, is less likely to be promoted with Telstra's proposal than without it.

On the other hand, Option 3 passes this test because it will avoid duplication

An instructive recent example is that the ACCC approved (specifically, declined to oppose) the joint ownership of 3G mobile assets by Telstra and Hutchison, and by Optus and Vodafone, because such joint ownership was consistent with the principles of efficient investment and efficient use of infrastructure.

# 3.5 Lessons from international experiences

International experiences provide some valuable lessons for the Australian Government and the ACCC on how to fully realise the benefits from the rollout of a new high bandwidth broadband network. Notably, overseas jurisdictions have been reluctant to give their incumbents the kind of deal that Telstra is seeking. This has been particularly evident in nations which are in the same position as Australia and do not enjoy an alternative source of broadband competition coming from independently owned cable television companies.

# United Kingdom

In considering its approach to regulation of next generation networks, the UK communications regulator Ofcom has stated its position as follows:

- Regulatory forbearance versus certainty Ofcom believes that the appropriate means for regulators to encourage investment and innovation is by minimising the regulatory risk for both incumbents and their competitors.
   "This is not achieved through regulatory holidays".<sup>78</sup>
- Minimising regulatory risk for incumbents the next generation business case depends on the ability to deliver efficiency savings, so anything which prevents this (e.g. a regulatory requirement to maintain legacy services) puts the business case at risk.

<sup>&</sup>lt;sup>°</sup> Next Generation Network based competition: an Ofcom perspective, presentation to Centre for European Policy Studies, Tom Kiedrowski Ofcom, May 2006.

• Minimising regulatory risk for competitors — competitors investing in next generation networks will be dependent on access to bottlenecks controlled by incumbents. They therefore need certainty that efficient access and interconnection arrangements will be provided, so they can compete with services provided end-to-end over incumbents' next generation networks.<sup>79</sup>

BT's next generation network investment covers only the *core* network (and not the access network), where the company believes there are significant cost savings and efficiency gains to be made. To date, BT has *not* announced plans to replace copper with fibre in the *access* network, because there is not a profitable business case for undertaking such an investment.

Indeed, most incumbents and access seekers in the UK appear to have ruled out the deployment of next generation access networks for the time being, because they perceive that services requiring higher bandwidths could be delivered in the medium term by other means, such as developments in ADSL technology.<sup>80</sup> For example, BT Wholesale is already trialling download speeds of up to 8Mbps per second over ADSL.<sup>81</sup>

# BT's undertakings to Ofcom regarding next generation network deployment

In September 2005, BT submitted formal undertakings to Ofcom regarding deployment of its Next Generation Network deployment. BT's undertakings include the following principles:<sup>82</sup>

- No foreclosure of network access:
  - BT to provide unbundled network access in Significant Market Power markets, in a manner that permits competition with downstream end-to-end services.
  - Full consultation before any network design decisions which might prevent this.
- Efficient design to deliver these requirements, or BT pays the cost of retrofitting.<sup>83</sup>
- Charges for SMP products to be based on efficient design:

"Where charges for Network Access are required by a Significant Market Power Condition to be on a cost-oriented basis, and BT provides such Network Access using its Next Generation Network, BT shall set its charges for such Network Access on the basis of the costs it would have incurred in designing and building its Next Generation Network in the most efficient manner that could reasonably have been employed in order to provide such Network Access."

- Provision of Network Access on an Equivalence of Inputs basis:
  - Equivalence of Inputs means that BT and competitors buy exactly the same Significant Market Power products, using exactly the same systems and processes.
- 79 Ibid

European Competitive Telecommunications Association (ECTA) comments on Next Generation Network public policy, page 2. ECTA's website is www.ectaportal.com

BT media release, "BT announces plans for higher speed Broadband nationwide" 13 October 2005, go to www.bt.com

<sup>&</sup>quot;Final Statement on the Strategic Review of Telecommunications", Ofcom, September 2005, section 11.

<sup>&</sup>lt;sup>83</sup> "Next Generation Network based competition: an Ofcom perspective", presentation to Centre for European Policy Studies, Tom Kiedrowski Ofcom, May 2006

- BT will design its Next Generation Network to support Equivalence of Input where Significant Market Power may reasonably be expected.
- Availability of network access:
  - Network access to be made available in advance of any new downstream service.
  - Lead time must be sufficient to permit simultaneous launch of competing products.

Ofcom believes theses undertakings will:

- allow all communications providers to gain real equality of access to critical BT infrastructure on fair and equal terms, encouraging investment in infrastructure and enabling innovations through multiple services and the increasing deployment of next-generation technology;
- (ii) lead to lower prices and greater choice of products and services for consumers and businesses; and
- (iii) help to underpin the UK's industrial and economic competitiveness in the future.<sup>84</sup>

# France

The experience in France shows that where regulation is implemented effectively, including better availability of unbundled services, then investment by entrants is forthcoming. This has been the key to increasing broadband take up and promoting choice and has allowed France to catch up on its delays in broadband adoption.

The French regulator ART first identified competition concerns back in 1999 and requested that France Telecom make wholesale DSL available. A series of interventions by the regulator subsequently ensured the prices offered were attractive to the market and left a margin so that there were incentives to move to other bitstream offers and to unbundled offers.<sup>85</sup>

As a result, local loop unbundling (LLU) began to pick up in France in late 2002, leading to rapid developments in the broadband market. In 2003, only a mere 11 per cent of the French population was covered by LLU. By 2005, France's LLU rollout covered 50 per cent of the population and the country had 6.7 million broadband subscribers for 25 million households.<sup>86</sup>

French consumers have benefited from the rich diversity of products on offer, including TV over DSL and VoIP, bit rates of up to 20 Mbps now with LLU and retail tariffs decreasing by a factor of 2.5 in 2 years.<sup>87</sup>

 <sup>&</sup>quot;Ofcom accepts undertakings from Board of BT Group plc on operational separation", Ofcom media release,
 22 September 2005

<sup>&</sup>quot;ECTA publishes latest Broadband developments in EU", ECTA regulatory update 2004, available at www.ectaportal.com

Autorite de Regulation de Telecommunications (ART), presentation by Commission Gabrielle Gauthey, April 2005

<sup>&</sup>lt;sup>87</sup> Ibid

The French regulator, ART, has focused on effective regulatory scrutiny. For example, contracts for LLU include a service level agreement to meet the following targets: (i) delivery time for shared and full access, (ii) restoration time for full access aimed at business customers, and (iii) penalties if the line (shared access or full access) is declared repaired by France Telecom, but is actually not.

In addition, the French regulator applies a price squeeze test between wholesale DSL products and LLU. The French regulator applies the price squeeze test across the whole value chain — for example, bitstream tariffs should not be set at a level that induces price squeeze on LLU.

# Germany

Deutsche Telekom plans to invest 3 billion euros (A\$4.9 billion) in a new fibreoptic network (VDSL) capable of broadband speeds of up to 50 Mbps and available in 50 German cities by 2007. The upgrade would mean removing large parts of its existing copper wire network and replacing it with a high capacity fibre-optic network.

Deutsche Telekom, which is 15 per cent government owned, has called for regulatory clarity around this investment. The ongoing debate between the German regulator, Deutsche Telekom and its competitors is being viewed as a test case for how other European regulators could treat next generation network investments.

An important differentiator between Australia and Germany, is that the German regulator forced Deutsche Telekom to divest itself of its cable network business.<sup>88</sup> Deutsche Telekom is facing increased competition from cable operators in the process of upgrading their networks. The incumbent's fibre optic network plans are in part a response to the competitive threat from the cable operators, who offer an alternative physical infrastructure over which broadband services can be delivered (a feature which is largely lacking in Australia). Deutsche Telekom intends to pursue a 'triple play' strategy (voice, data, video) which would include offering free to air, pay television and movies on demand.

In November 2005, the German government proposed that investments in "new markets" should be exempt from regulations for a "certain period of time" in order to stimulate demand for broadband communication services and tabled legislation granting Deutsche Telekom an access holiday.<sup>89</sup> However, this has generated the prospect of regulatory intervention by the EU, which has the power to overrule the German state. The EU Information Society Commissioner Viviane Reding warned in January 2006 that she is prepared to take Germany to the European Court of Justice over its revised telecommunications law. The German government's exception, she argues, would create a new monopoly in violation of EU laws. Commissioner Reding's position is that where new monopolies may be established on the basis of old ones, new infrastructure should be opened to competition.

Minister Coonan speech, "A Telecommunications Odyssey", address to Deutsche Bank Sydney, 14/12/2005
 See http://www.computerwire.com/industries/research/?pid=B8D172E2-34D2-4139-8284-F509C2E9A7DB

# The US's view of Deutsche Telekoms' attempts at being granted a regulatory holiday

The Office of the US Trade Representative (USTR) is responsible for developing and coordinating US international trade, commodity, and direct investment policy, and overseeing negotiations with other countries. The head of the US Trade Representative serves as the President's principal trade advisor, negotiator, and spokesperson on trade issues.

In its 2006 review of telecommunications trade agreements, the US Trade Representative states:

"A key concern in Germany's telecommunications regulatory policy is its apparent endorsement of temporary monopoly power as a condition for innovation and as justification for broad deregulation of Deutsche Telekom. For example, a draft amendment to Germany's telecommunications act proposed by the Ministry of Economics and Technology endorses the concept of a temporary regulatory holiday for certain services offered by Deutsche Telekom. While the United States strongly supports deregulation as an important element of promoting facilities—based competition, the promotion of deregulation before competitive conditions warrant such steps may undermine the development of an efficient and competitive market. The EC appears to share this concern and are investigating whether it is in compliance with European law. The US Trade Representative will continue to monitor Germany's activity related to deregulation of the broadband market."

# Ireland

The Irish regulator ComReg has given some consideration to the regulation of next generation networks in Ireland in its "Forward Looking Strategic Review of the Irish Telecoms Sector," April 2005.<sup>91</sup> ComReg notes the general regulatory environment is "perhaps the most important factor in encouraging investment" in next generation networks, and that regulators must "strike a balance between encouraging operators to keep prices low for consumers in the short term with creating an environment that encourages operators to invest".<sup>92</sup>

# ComReg adds:

"Regulators must be vigilant as incumbents migrate to next generation network access architectures, as this could potentially result in a more difficult environment for other licensed operators to access unbundled lines for example."

After referring to the UK consultation on next generation networks ComReg notes that it is currently reviewing LLU products and associated processes and that any new issues that emerge as a result of next generation network rollout that could potentially threaten equality of access would have to be considered by ComReg.

<sup>&</sup>lt;sup>90</sup> The Office of the US Trade Representative, "Results of the 2006 Section 1377 Review of Telecommunications Trade Agreements, available at: http://www.ustr.gov/assets/Trade\_Sectors/Telecom-E-commerce/ Section\_1377/asset\_upload\_file43\_9276.pdf

ComReg, "Forward Looking Strategic Review of the Irish Telecoms Sector, 5 April 2005, Section 8

Ibid, page 85

# *Chapter 4* A model for competitive FTTN

This chapter describes an alternative proposal that provides the opportunity for Australia to realise many of the benefits that can be derived from a high bandwidth network. The proposal addresses some key advantages of this model compared to Telstra's in terms of the control and ownership of the high bandwidth network, the reach of the network and associated cost of the expansion. This chapter also discusses the planned transition from ULLS access to the high bandwidth network and the steps going forward in processing and implementing this model.

# 4.1 Introduction

We have argued in this report that Telstra's FTTN model should be rejected by the Government and ACCC because it is anti-competitive.

However, we believe it is possible to identify a path forward to higher bandwidth services in Australia through the introduction of FTTN — while protecting and stimulating competition.

In this chapter, we set out our recommendations on this path forward.

It is a model which:

- provides for joint control in relation to key aspects of decision making over the FTTN network, thus removing the elements of Telstra's FTTN model which would be so damaging to competition, while avoiding the lengthy, legalistic, uncertain decision making processes which are a feature of telecommunications regulation today;
- provides for joint investment, thus allowing for the contribution of substantially greater investment than the \$3.1 billion proposed by Telstra, and which in turn therefore allows for the FTTN network to have substantially greater reach than the four million service addresses proposed by Telstra;
- ensures a managed transition from ULLS, not the sudden destruction of it;
- provides the necessary certainty of outcome to allow an investment in the FTTN network to be justified;
- allows for the agreement of Telstra's competitors to be secured, hence allowing rapid industry wide agreement on the arrangements for FTTN rollout instead of a protracted and uncertain legal process;
- protects and sustains competition;
- delivers higher bandwidth to more Australians more quickly than Telstra's model; and
- ensures that the new high bandwidth network operates under the discipline of competition thus delivering more innovation, lower prices, better service and greater penetration than Telstra's model.

This model has been developed in consultation with the nine leading telecommunications companies which have come together in a consortium to commission this report.<sup>94</sup>

In this chapter, we:

- briefly revisit the problems with Telstra's model, which our model is designed to solve;
- propose governance arrangements for key decisions regarding the FTTN network — through joint stakeholder participation in a special purpose company called 'SpeedReach';
- propose a process to secure more extensive capital investment in the FTTN access network thus delivering high bandwidth broadband to millions more Australians than under Telstra's proposal;
- recommend an approach to the pricing of access to the FTTN access network; and
- lay out the elements of an integrated process to move forward.

# 4.2 Problems our model is designed to solve

# The fibre access network is a bottleneck asset – and an 'access regime' will not solve the problem

The FTTN network will be a bottleneck asset. That is, it will be an asset owned by one party which must be used by all competitors to reach the end customer and provide service. It will be economically inefficient to build more than one FTTN network; a superior outcome will allow all competitors to use the bottleneck FTTN network on reasonable terms.

To be more specific, three key elements of the fibre to the node access network (FAN) constitute a 'bottleneck'. These are the node; the fibre from the node back to the exchange; and the electronic equipment (probably a router) in the exchange, as shown in the following figure.



#### Figure 4.1 THE BOTTLENECK IN THE FTTN NETWORK

AAPT, iiNet, Internode, Macquarie Telecom, Optus, Powertel, Primus, Soul and TransACT

The reason to single out these three components as constituting the bottleneck is that the person which controls these components will determine all key aspects of the service which is provided to end users. If the network is controlled by Telstra, and if both Telstra and its competitors are using the FTTN network to provide retail services, Telstra will have a fundamental advantage which will fatally undermine competition. Telstra will be able to configure the network to support its marketing strategy and customer needs; whereas Telstra will not adequately take account of the needs of its competitors in configuring the network.

One example of this problem might be if Telstra chooses to use the network solely to deliver consumer services, whereas competitors wish to use it to deliver both consumer and business services. A competitor using the network to deliver business services will likely wish to deliver a high and guaranteed bandwidth which is the same in both directions. By contrast, a competitor using the network to deliver a consumer grade broadband service will likely offer a service which is asymmetrical (eg ADSL), has lower bandwidth and is probably not guaranteed.

The technical configuration to support these different products will be a function of the cards which are installed in the mini– DSLAM in the node; the amount of bandwidth which is allocated on the fibre between the node and the centre of the network; and other factors as well. If Telstra is making these decisions solely to support a consumer grade service, it will not configure the network in a way which meets the needs of competitors wishing to deliver business grade services.

The traditional policy solution to the problem of a bottleneck asset is to make the asset subject to an access regime. This is the approach which has been followed with ULLS. In the ULLS world, an operator which installs a DSLAM in an exchange, and owns or leases fibre into the exchange, has complete control of the services it delivers. Once Telstra has been required to allow the owner of a DSLAM to interconnect with the Telstra copper wire to the customer, the essential prerequisite for genuine competition has been met.

However, as discussed in chapter 2, by moving to an FTTN network, Telstra is imposing a network architecture where an access regime will no longer be sufficient to protect competition. Instead, there will need to be a mechanism by which decisions about FAN configuration are made in the interests of all users of the FAN.

# Capital scarcity constrains the network's reach

As we discussed in chapter 2, Telstra's FTTN network would serve four million service addresses in Australia's five largest cities.

According to Telstra, it has approximately 8.6 million customer premises nationally.<sup>95</sup> Hence, Telstra's proposal would serve less than half of all Australians. It would exclude all rural areas. It would exclude all regional centres including fifteen cities with a population of over 50,000 — Albury Wodonga, Ballarat, Bendigo, Cairns, Canberra,<sup>96</sup> Darwin, Geelong, Gold Coast, Hobart, Launceston, Newcastle, Rockhampton, Toowoomba, Townsville and Wollongong.

Telstra also appears to claim that the FTTN network will serve 100 per cent of customers in the five largest cities.<sup>97</sup> However, data from the Australian Bureau of Statistics (ABS) indicate that over 60 per cent of Australia's population is in the five major cities.<sup>98</sup> Making the reasonable assumption that service addresses have the same distribution as population, if there are 8.6 million service addresses nationally, there should be approximately 5.2 million service addresses in the five largest capital cities.<sup>99</sup> Put another way, it appears that many people who are defined by the ABS to live in the five major cities will not, in fact, be served by the new FTTN network.

The relatively limited reach of Telstra's FTTN network is evidently due to capital constraints and the fact that Telstra is funding the network on its own balance sheet. Telstra has already been criticised for increasing its capex to revenue ratio<sup>100</sup> and is presumably sensitive to increasing its investment further.

The result of Telstra's funding approach will be to create a two-tier Australia. A minority of Australians will enjoy high bandwidth services. The majority will receive only lower speed, lower quality services. Given the importance of broadband as an economic enabler, Australians in the communities unserved by FTTN will likely see a steady decline in the relative standing of their local economies.

# The access pricing arrangements are unclear

A key requirement if competition is to be effective in the FTTN world is that the access pricing arrangements are clear and certain. That is, competitors must have certainty about:

- the price that they will pay for access to the network; and
- the service or services to which they will be given access.

<sup>&</sup>lt;sup>95</sup> Telstra, The Digital Compact & National Broadband Plan, Canberra, 11 August 2005, slide 9 of pack entitled 'National Broadband Plan: Equitable Access to High Speed Internet for Families and Businesses Across Australia'. This presentation was released to the Stock Exchange on 9 September. It states that there are 8.6 million 'premises' nationally, of which 6.8 million are urban. We believe that 'premises' means the same thing as 'service addresses.'

While Canberra will not be included in Telstra's proposed FTTN network, Canberra enjoys high bandwidth services provided by the TransACT network.

Telstra ASX Release, 16 November 2005, 'Telstra Technology Briefing', Page 7, slide headed 'Delivering at Least 12 Mbps'.

ABS 1301.0, Year Book Australia, 2006.

This conclusion is supported by another piece of data. Telstra stated in its 16 November briefing that the five capital cities have 5.4 million PSTN and ISDN lines. (Slide 15, headed 'Today's Fixed Voice Network.') But Telstra's 2005 annual report states that Telstra has 10.12 million PSTN lines (page 78) and 1.3 million ISDN lines (page 88), for a total of 11.4 million – meaning that the replaced lines will represent around 47.4% of all lines nationally. Again this is significantly lower than the population share of the five largest cities.

JP Morgan Asia Pacific Equity Research, *Telstra Corporation Enlarged capex bill puts the stock back into purgatory*, "The market will be reluctant to give Telstra the benefit of the doubt for a heavy (A\$15bn) capex spend over the next 3 years in the hope that EBITDA margins will increase to 50–52% and capex will correspondingly decline to 12% of sales", 15 November 2005.
To date there has been no public disclosure of Telstra's plans and hence there is no certainty as to the access pricing which will apply once the FTTN network is in place.

#### Uncertainty over the transition from ULLS is chilling competition

A further key requirement to protect competition is to provide certainty about the future for ULLS based services which Telstra's competitors are providing. As explained in chapter 2, once an exchange is converted to FTTN, around two-thirds of the customers on that exchange will no longer be able to receive a ULLS-based service from a competitor. This is so for both technical and economic reasons. Hence, it is critical that competitors have certainty — at a level of detail, that is, exchange by exchange — as to the timing of the network being upgraded to FTTN. Without this certainty, Telstra's FTTN plans will have a serious chilling effect on ULLS investment. The chilling effect will be compounded if there is insufficient clarity (as there presently is) about how much notice Telstra needs to give to competitors before converting an exchange to FTTN – even if competitors are using that exchange for ULLS–based services.

# 4.3 Control of the fibre access network

Our core recommendation is that the FTTN access network (FAN) must not be under Telstra's exclusive control. This is a consequence of the fact that the FAN is a bottleneck asset. Instead, key network design and operational decisions must be made by a separate body, which considers the interests of all users of the FAN. Under such a model, we believe that Telstra can upgrade its network to FTTN while preserving competition.

One mechanism to achieve this outcome would be for the FAN to be spun off from Telstra and owned separately by all telcos — including Telstra — which use the network. But we do not believe that ownership is the optimal policy tool to use for this purpose. An approach which linked decision making to ownership would mean that Telstra would dominate decision making; and many smaller players would be unable to afford an ownership stake sufficient to have any influence at all.

The optimal ownership of the FAN is certainly an open question: we discuss it later in this chapter. As we discuss, there are good reasons to explore ownership by parties other than Telstra — particularly the capacity to raise additional capital and hence achieve a more extensive rollout.

Therefore, we recommend that control issues should be handled separately from ownership issues. Specifically, we propose the creation of a special purpose company — to be named SpeedReach<sup>101</sup> — to make key decisions in relation to the FAN.

<sup>&</sup>lt;sup>101</sup> We suggest the name SpeedReach for three reasons. This company's actions will determine: the speed with which decisions will be made; the speed with which the network will reach customers; and the speed of the services that will be provided over the network.

#### The role of SpeedReach

SpeedReach will take a central role in the regulatory and commercial scheme under which the FAN will be built. It will take the key operational decisions on such matters as the bandwidth between the exchange and the node; the cards which are installed in the node, thus determining the characteristics of the services which can be offered from the node (bandwidth, symmetrical or asymmetrical etc); which equipment suppliers will be used; and so on.

SpeedReach will not interfere with the ownership rights of the owner of the FTTN Access Network. However, by contract with SpeedReach and with the members of SpeedReach, the network owner will agree that certain key operational decisions will be made by SpeedReach.

SpeedReach will be a company governed by company law. Its members will be all telcos which use the FAN. It will have a board of respected independent directors and a small high quality executive staff.

SpeedReach will charge a management fee to the owner of the FAN. This will be set to cover costs. (In turn, the access fees charged by the FAN owner to all users of the FAN will be set to allow recovery of this management fee.)

SpeedReach will be charged with maximising the utilisation of the network, so that its management has the incentive to take decisions which maximise traffic on the network. However, the prices that are charged for access to the FAN will be determined through a regulatory process.

SpeedReach will contract with Telstra (or another specialist operator if it chooses) to carry out such physical and operational services on the FAN on a day-to-day basis as are necessary to give effect to SpeedReach's decisions.

These arrangements will allow rapid decision making, in contrast to the slow and legalistic ACCC processes which apply today. However, they will ensure that key decisions are made in the interests of all users of the FAN, rather than solely in the interests of Telstra.

The process followed by the UK regulator Ofcom is an important reference point for the model we are suggesting. In the UK, a special purpose body named NGN UK has been established; its members include the incumbent British Telecom and several of its major competitors; and NGN UK is determining key network design issues.

Figure 4.2 shows the reach of the FAN; it is the network elements specified in this diagram which SpeedReach will have the power to make decisions about.



SpeedReach's role would include strategic direction setting; provisioning of the FTTN access network; and operation of the FTTN access network.

# Strategic Direction Setting

SpeedReach would take responsibility for determining the criteria, and process, for making decisions within its jurisdiction. In effect, this would include the scope and minimum requirements for the initial roll–out, and the establishment of service levels for changes to the configuration of DSLAMS in the node. SpeedReach would also establish the criteria and process for key decisions, including decisions about:

- the design of new components of the network; and
- technical upgrades to the network.

# Provisioning the FTTN

SpeedReach's role in provisioning of the FTTN build would include ensuring that individual nodes are capable of supporting services offered by a range of providers, and via a range of platforms (ADSL, VDSL and SHDSL). It would, for example, ensure that a reasonable number of business consumers and heavy residential consumers could be supported by the core infrastructure. It would also have an active role in forecasting and taking account of likely demand growth in particular geographies.

#### **Operation of the FTTN Access Network**

SpeedReach would take key decisions related to the operation of the network. At a technical level, it would oversee the process for:

- changing cards at the node;
- setting and changing contention ratios at the node; and
- provisioning the fibre from the node back to the local exchange, including the process of making changes to those provisions.

SpeedReach would take responsibility for overseeing the effective and timely implementation of its decisions. It would also be responsible for ensuring that service level agreements were adhered to. As part of this function, SpeedReach would:

- work closely with Telstra and others on achievement and reporting against service levels; and
- report to SpeedReach members on performance against service level targets.

Table 4.1 summarises SpeedReach's proposed operations and governance.

#### Table 4.1

# SPEEDREACH: OPERATIONS AND GOVERNANCE

Issue	Question	Recommended
Role and accountability	Does SpeedReach operate the asset, or simply oversee its operation?	Makes decisions in specified areas. Decides and contracts SLAs for critical technical and operational performance and provides transparent reporting to appropriate authorities (with capacity to invoke penalties) on the extent to which these SLAs are met. It would make decisions on vendors due to implications for future provisioning.
Scope and boundaries	What specifically, does it control at a technical level?	SpeedReach makes decisions on control of network configuration, contention ratios, backhaul provisioning, interconnect at local exchanges, removal/installation of cards, setting of limits for capacity of nodes, fault repairs, setting of SLAs, scheduling of works (including access to nodes), prioritising of requests, maintenance of the network and changes, future network upgrades and expansion.
Direction setting	Who decides on further build — where and when?	SpeedReach as part of its network provisioning function, unless shared ownership exists where potential for monopolistic behaviour is reduced. SpeedReach takes responsibility for migration planning (eg any phasing out of copper from node to exchange; any phasing out of its own role eg as genuinely alternative access technologies challenge natural monopoly).
Funding	How is SpeedReach funded?	Management Fee charged to network owner — referrable to traffic volumes.
Board and governance	Membership Dispute resolution	Membership is compulsory for access seekers. Board of independent professional NEDs (non executive directors). Threshold for key decisions that exceeds voting rights of any one player. Articles of association/ constitution should set out purpose of company, rules for entry and exit, fixed terms, other Board parameters. Reports to members but requires ACCC authorisation in line with current regulatory processes. Participates in transparent dispute resolution process. Answers to its members, set under its shareholders' agreement and constitution. Employs small executive team.
Staff	Does it actually employ technicians?	Contracts with third parties for technical services and third parties will employ technicians.

#### 4.4 Ownership, funding and network reach

In the previous section, we discussed the control of the FTTN access network. We recommended a model under which key decisions are made by a special purpose company called SpeedReach, which has as its members all telcos which use the network.

The control of the FTTN access network is one issue; ownership is another.

Telstra's model is that it would own 100 per cent of the FAN. However, there is a range of alternative ownership structures, where the FAN could be owned by

- a consortium of telcos including Telstra; or
- a range of financial investors, in addition to, or excluding, Telstra.

We believe that a model in which the FAN is not totally owned by Telstra, but instead is owned wholly or partly by players other than Telstra, offers clear public policy benefits; as well as offering potential private benefits for Telstra and its shareholders.

The first public policy benefit is that, with additional parties contributing capital, there will be additional funds available to support the construction of the fibre to the node network. In turn, this will mean that the network can be built to serve a significantly larger number of Australians than the four million service addresses proposed by Telstra.

The second public policy benefit is that, if the FTTN network is owned by a range of investors (particularly financial investors), this will further reduce the capacity for Telstra as the dominant, vertically integrated player to suppress competition. (This is in addition to the benefits which will flow from the delegation of key decision making powers to SpeedReach, as explained in the previous section of this report.) Telstra's full focus will be on its retail business, using network capacity it purchases from the FTTN access network owner. Similarly, Telstra's competitors will purchase such capacity and will compete vigorously at the retail level.

The third public policy benefit is that, with more vigorous retail competition, there will be a more rapid take up of broadband services than in a scenario where Telstra is the monopoly provider over the FTTN network.

Fourthly, a shared ownership model would minimise the wasteful duplication of national infrastructure.

A fifth public policy benefit, we believe, is that by attracting capital from outside the telecommunications industry, the shared ownership model will free up investment capital within the telecommunications industry. This capital will then be available to industry participants — both Telstra and its competitors — to re–invest into services, which, in turn, will drive faster take–up. After all, it is services, not the network they are delivered over, which drives take–up by end users.

The key private benefit to Telstra from a jointly owned FAN is that it can build and use the new high speed FTTN network without needing to fund the \$3.1 billion cost on its balance sheet. Instead, the network would be funded by investors, and Telstra would pay a usage charge. This would be a more capital–efficient way for Telstra to manage the transition to this new technology.

In this section, we:

- describe the potential ownership structure under which the FTTN access network would be partly or wholly owned by a party other than Telstra;
- comment upon the likely interest from non Telstra parties in part ownership of an FTTN access network;
- set out our analysis as to the likely increase in network reach;
- set out our analysis as to the likely increase in customer take-up;
- describe the national benefit of reducing the wasteful duplication of infrastructure; and
- describe the benefit of freeing up capital to invest in services.

#### The Ownership Structure

We set out below the schematic of a model under which the FTTN access network would be owned by a party other than Telstra. We have used the generic term FTTN access network ownership company, or 'FANOC', to describe the entity which would own the FTTN access network.

There are a range of possibilities about who would own FANOC, and in what proportions. The three likely classes of owner would be Telstra; other telecommunications companies; and financial investors.

As we have indicated, the ownership of the network would not give the owner control of all key decisions. FANOC would own the network, but key decisions would be made by SpeedReach.



It is important to be clear that Telstra would continue to own all of its other assets. In particular, it would continue to own the local exchange. Also, Telstra would continue to own the 'last mile' of copper between the nodes and the customers' premises.

The diagram below illustrates the key parties, and the relationships between them, under a model where the FTTN access network is not 100 per cent owned by Telstra, but instead the FTTN access network is owned by FANOC.



FANOC will have the object of profit maximisation. However, because it will be the monopoly owner of the FAN, the access prices (and other conditions of access) that it will charge access seekers will be approved by the ACCC. FANOC will submit a special access undertaking pursuant to Part XIC, which sets out access prices and their basis. SpeedReach will manage this on its behalf.

#### Likely Interest from non Telstra Parties

A model in which the FTTN access network is owned in part or in whole by parties other than Telstra assumes that ownership of this network would be attractive to such other parties.

Some equity analysts and financial market commentators have questioned whether Telstra's decision to build this network can be justified on financial grounds. For example, Citigroup has commented:<sup>102</sup>

...we struggle to identify the commercial benefits associated with investing in fibre networks other than for customer and revenue protection on Telstra's behalf ...The construction overseas of fibre networks has been driven by customer retention strategies (eg: Verizon) or through massive tax incentives (eg: Japan). We struggle to identify any offshore markets where the ROIC on this type of investment is accretive in any way.

The Allen Consulting Group

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Citigroup, Telstra Corporation Ltd: Any takers for a 40 year payback on FTTN? 15 May 2006, p.2.

Evidently, there is a question as to whether Telstra will secure incremental returns from the new network which are sufficient to justify the incremental capital investment. But this is a separate question to whether, under the structure set out in figure 4.4 above, the FANOC would be able to pay a rate of return which would be sufficient to attract investors — be they financial investors or existing telecoms industry participants.

We believe that investment in the FANOC would be considered by investors as an alternative to investment in other utility infrastructure investments such as gas and rail networks. Such investments today attract substantial support from a range of private investors, such as retail investors, superannuation funds, and specialist infrastructure investors. Both equity and debt instruments are issued, and widely taken up, to fund such infrastructure investments.

We have set out in table 4.2 below the rate of return currently paid on a range of selected comparable infrastructure and utilities investments, to the end of February 2006. Based upon these data, and bearing in mind the unusually good performance of the Australian stock market over the past few years, we believe that FANOC would be able to attract capital with a rate of return of between 8 per cent and 10 per cent.

Entity	One Year (%)	2 yrs annualised (%)	3 yrs annualised (%)
ConnectEast Group	11.5	n.a.	n.a.
Envestra	16.3	14.9	15.0
Hastings Diversified Utilities	11.0	n.a.	n.a.
Macquarie Infrastructure Group	2.2	22.9	12.8

**RETURNS TO INFRASTRUCTURE INVESTMENTS (YEAR ENDED FEB 2006)** 

Table 4.2

Source: UBS Investment Research, Australian Infrastructure & Utilities Index

Based upon this brief review of comparable infrastructure investments, we believe that investment in FANOC would be attractive to a range of private investors. Like other such entities, we believe FANOC could have a high level of gearing. Further, as in many such financial structures, it could be supported by capacity commitments from Telstra and other access seekers, as to the volume of capacity on the FTTN access network which they would commit to take.

If the FTTN access network needs to generate a rate of return in the range of 8 per cent to 10 per cent, this raises the question: what would this mean for the prices that FANOC would need to charge to access seekers to generate this return? How would they compare to the retail prices that users of the network would charge their customers? Our view is that network users would readily be able to set prices sufficient to cover their costs, including the access price charged by the FANOC, and still generate a sufficient return.

The table below sets out directional calculations, showing that the access price per retail customer would need to be only \$18.75 per month, given plausible assumptions about penetration. This leaves a substantial margin available at the retail level, when compared to current retail prices for a bundle of the services which would be delivered over the FTTN network.

#### Table 4.3

#### RATE OF RETURN, ACCESS CHARGES AND RETAIL PROFITABILITY

Network cost	\$3,000,000,000
Required rate of return %	10%
Required annual return on capital	\$300,000,000
Assumed annual depreciation and operating costs*	\$250,000,000
Total required revenue	\$550,000,000
Customers served	4,000,000
Assumed penetration	50%
Customers	2,000,000
Required annual access cost per customer	\$275.00
Required monthly access cost per customer	\$22.92
Current monthly ARPU	\$72.00 **
Retail margin available	\$49.08
Retail margin available (per cent)	68%

\* In determining a depreciation charge, it is important to note that the fibre and the trenches will have long lives, although the electronics will need to be replaced more frequently. This gives an annual depreciation charge of \$200 million. We have allowed \$50 million annually for operating costs.

\*\* Source: Citigroup Equity Research, 'In the Loop', 15 May 2006.

We believe it would be prudent to go to market to test whether, as we believe, a public offering of equity or debt securities in FANOC would be attractive to investors. This would require a structured process to develop the investment proposition and test the willingness of investors to commit funds. In section 4.6 below, we comment on how such a process should be incorporated into an integrated plan to implement an FTTN model which is in the national interest.

#### Likely Increase in Network Reach

#### Overview

A clear public policy benefit of a model in which other parties can co–invest with Telstra in the FTTN network is that, with additional capital available, the network will serve a larger number of Australians, compared to Telstra's model. To assess this benefit, it is necessary to estimate the number of additional services which could be provided, and the location of those services, for given levels of additional investment.

Accordingly, we have conducted a directional cost modelling exercise to determine the cost of expanding the FTTN network beyond the four million services proposed by Telstra. Based upon this work, we estimate that the reach of the network could be expanded by approximately 25 per cent, or almost one million additional services, for additional capital expenditure of approximately \$1 billion.

This estimate is necessarily directional. Our methodology has been top down rather than bottom up. Much of the relevant information is kept confidential to Telstra and has not been released publicly. Nevertheless, we believe it is directionally robust.

In particular, it is sufficient to allow us to conclude that there would be a substantial public policy benefit from allocating additional capital to investment in the FTTN network — as many more Australians could therefore be served.

#### The Methodology at a High Level

The directional cost modelling exercise was conducted drawing on:

- information which has been publicly revealed by Telstra about its plans for its FTTN network, including particularly the material which was disclosed by Telstra in its presentations given on 16 November 2005;
- data which are available to Telstra's major competitors about the cost of telecommunications switching equipment (such as DSL access multiplexers and routers; and the cost of installing fibre optic cable);
- publicly available data regarding population distribution and density; and
- general principles of telecommunications network design and costing, including particularly the relationship between population density and network cost per customer.

Given general information on telecommunications costs, we can develop robust cost estimates of the approximate cost per node of building extensions to the fibre to the node network. We describe this estimate below.

To convert this estimate into a total cost for expanding the network to a given population centre, it is necessary to determine the number of nodes required to serve that centre. A bottom up estimate of this figure would require detailed information about the network which serves that centre today, including the number of exchanges; the number of customers served by each exchange; and the distribution of those customers into distance bands around the exchange.

While that information is held by Telstra and is not available to its competitors, it is possible to develop a top down estimate based on population distribution.

We can arrive at reasonable estimates of the cost of expanding the network by recognising that in general metropolitan areas of similar population density are likely to require a similar network design. That is, given that we know the cost of a network with four million service addresses in the five largest cities in Australia, we can use this to approximate the cost of expanding the network to other metropolitan areas with similar population density outside the five largest cities.

The approach therefore has been to:

- estimate the total number of services in metropolitan and regional centres outside the five largest cities, with similar population density to the average of the five largest cities, and
- apply the same implied ratio of nodes to services to determine the number of nodes required to serve these centres.

#### Determining Cost per Node

There are three components of the FTTN Capital costs which are relatively independent of location:

- DSLAM, Street Cabinet and Power System \$43,000;
- Installation and Customer cutover (jumpering and rearrangements) \$50,000; and
- Fibre installation, ducts and trenching \$82,000.

These components give a total installed cost of \$175,000 per node.

#### DSLAM, Street Cabinet and Power System

Optus has provided the authors of this report with extensive information regarding these costs from its relationships with Vendors (Lucent and Huawei in particular) following the XYZ Network build and its more recent DSLAM rollout programs.

Utilising Huawei equipment at a conservative level:

- DSLAM 176–port capacity With POTS and ADSL2+
- Cabinet ONUF01D200 Assembly (220V, heat exchanger, with heater)
- Power, battery and cabling.

Total cost for this equipment (shown below) is \$42,924.





#### Installation and Customer Cutover

The cost for site preparation, interconnection to the mains power supply, copper cabling to the interconnection pillar and the cutover of each of the customers has been estimated at \$50,000 comprised of:

- Site preparation (slab, ducts and civil works) \$16,000
- Mains power interconnection \$6,000
- Copper tie to interconnect pillar & terminations \$8,000
- Customer cutover 200 x \$100 \$20,000.

#### Fibre Installation Ducts and Trenching

The average distance to the Node locations has been taken as 1,700m. This is as a result of assuming that the exchange serving area for a 12M ADSL 2+ service is 1.7km. This is a very conservative estimate, as shown in the graph below where the ADSL 2+ copper distance is seen to be (theoretically) at 2.3km from the standards and reduced to 1.5km by the ACIF estimate for a high penetration worst case, and the Nodes are on the periphery of this serving area.



# Figure 4.6 COMPARATIVE DATA RATES

The costs for an 'average' mix of leased and build duct capacity and a 72 Fibre cable are shown in the table below as \$82,000.

Table 4.4

Select state		External Plant Estimate Build Calculator						
			Build Type	Elected	Specific			
Adelaide	О		Construction	225	225			
Brisbane	О		Lease	1,475	1,475			
Canberra	О		ltem	Quantity	Cost (\$)			
Melbourne	О		Pit 55	1	1,800			
Perth	0		Pit P10	4	15,200			
Sydney	•		100mm conduit	225	23,625			
Select Region		Subduct	1,700	8,500				
CBD	0		Cable haul	1,700	8,500			
Metro	٠		Enclosure AJL	4	3,976			
Regional	0		Enclosure BJL	4	2,568			
Total Dis	tance (m)		Enclosure bracket	8	480			
1,7	/00		O36F ●72F O144F O312F	1,700	4,539			
		_	Splice/test per fibre	72	1,008			
		Additional lease costs	3	11,600				
		Total cost		82,000				

#### DUCTS AND TRENCHING COST COMPONENTS

#### Determining Population Reach Where Expansion Occur at Similar Costs

Telstra is proposing to invest \$3.1 billion to build its FTTN network to potentially serve four million customers in the five major capital cities.<sup>103</sup>

According to Telstra, it has approximately 8.6 million customer premises nationally.<sup>104</sup> Hence, Telstra's proposal would serve less than half of all Australians. It would exclude all rural areas. It would exclude all regional centres including fifteen cities with a population of over 50,000 — Albury Wodonga, Ballarat, Bendigo, Cairns, Canberra,<sup>105</sup> Darwin, Geelong, Gold Coast, Hobart, Launceston, Newcastle, Rockhampton, Toowoomba, Townsville and Wollongong.

<sup>&</sup>lt;sup>103</sup> There has been some confusion around the amount that Telstra is proposing to spend. The figure of \$3.1 billion comes from Telstra's "National Broadband Plan", 11 August 2005, attached to ASX release 9 September 2005. This plan spoke of the delivery of 6Mbps in the FTTN network. Telstra's Technology Briefing of 16 November spoke of a network that could deliver 12 Mbps, but did not give any updated cost figures. Subsequent media reports (e.g. in the Australian, June 11, 2006) have said that Telstra's FTTN network will cost \$3.4 billion, but this figure may be confused with the amount that Telstra will pay Alcatel to upgrade its networks generally (not just FTTN). Other media reports (e.g. Herald Sun, 23 May 2006) have the cost of the FTTN network at \$3 billion.

Telstra, The Digital Compact & National Broadband Plan, Canberra, 11 August 2005, slide 9 of pack entitled 'National Broadband Plan: Equitable Access to High Speed Internet for Families and Businesses Across Australia'. This presentation was released to the Stock Exchange on 9 September. It states that there are 8.6 million 'premises' nationally, of which 6.8 million are urban. We believe that 'premises' means the same thing as 'service addresses.'

While Canberra will not be included in Telstra's proposed FTTN network, Canberra enjoys high bandwidth services provided by the TransACT network.

Telstra also appears to claim that the FTTN network will serve 100 per cent of customers in the five largest cities.<sup>106</sup> However, data from the Australian Bureau of Statistics (ABS) indicate that over 60 per cent of Australia's population is in the five major cities.<sup>107</sup> Making the reasonable assumption that service addresses have the same distribution as population, if there are 8.6 million service addresses nationally, there should be approximately 5.2 million service addresses in the five largest capital cities.<sup>108</sup> Put another way, it appears that many people who are defined by the ABS to live in the five major cities will not, in fact, be served by the new FTTN network.

Therefore, to estimate the scope for expansion of the FTTN network with additional investment, we believe it would be reasonable to consider two categories of customers who would be served as a result of additional investment:

- customers within the five largest cities who will not be reached by Telstra's FTTN network; and
- customers outside the five largest cities.

However, we have taken a conservative approach in our estimation procedure, by disregarding customers in the first category and considering only customers in the second category.

Tables 4.5 and 4.6 below give the populations of Australia's 20 largest cities, and total population.

<sup>&</sup>lt;sup>106</sup> Telstra ASX Release, 16 November 2005, 'Telstra Technology Briefing', Page 7, slide headed 'Delivering at Least 12 Mbps.

<sup>&</sup>lt;sup>107</sup> ABS 1301.0, Year Book Australia, 2006.

This conclusion is supported by another piece of data. Telstra stated in its 16 November briefing that the five capital cities have 5.4 million PSTN and ISDN lines. (Slide 15, headed 'Today's Fixed Voice Network.') But Telstra's 2005 annual report states that Telstra has 10.12 million PSTN lines (page 78) and 1.3 million ISDN lines (page 88), for a total of 11.4 million – meaning that the replaced lines will represent around 47.4 per cent of all lines nationally. Again this is significantly lower than the population share of the five largest cities.

City	Population ('000)
Sydney	4,232.1
Melbourne	3,600.1
Brisbane	1,774.9
Perth	1,457.6
Adelaide	1,124.3
Newcastle	505.4
Gold Coast–Tweed	469.8
Canberra	323.6
Wollongong	274.1
Sunshine Coast	207.2
Hobart	202.1
Geelong	164.5
Townsville	144.2
Cairns	120.3
Toowoomba	116.1
Darwin	109.5
Launceston	102.0
Albury–Wodonga	101.8
Ballarat	87.1
Bendigo	83.2
Five largest cities	12,189.0
Next 15 largest cities	3,010.9

Table 4.5
POPULATION OF TWENTY LARGEST AUSTRALIAN CITIES

Source: ABS, 1301.0, Year Book Australia, 2006, Table 5.18

Table 4.6

#### **BREAKDOWN OF AUSTRALIAN POPULATION**

Population ('000)
12,189.0
7,911.0
3,010.9
4,900.1
20,100.0

Source: ABS, 1301.0, Year Book Australia, 2006, Table 5.18.

The five largest cities have a population of 12.2 million and four million service addresses. Applying the same ratio, there are 2.6 million service addresses in the rest of Australia.<sup>109</sup>

Applying this ratio to the next 15 largest cities in Australia, with a total population of 3.01 million, these cities have 984,000 service addresses.

These cities have similar population distribution characteristics to the average population distribution in the five capital cities.<sup>110</sup> We have therefore applied the same ratio of services to nodes, namely one node per 200 services.<sup>111</sup>

This produces a total capital cost to serve these cities of \$861 million, as follows:

- total number of nodes required: 984,000 services/200 services per node = 4,920 nodes; and
- total cost of an FTTN network encompassing these nodes: 4920 x \$175,000 = \$861 million.

Therefore, we estimate that the network could be expanded to serve approximately 25 per cent more service addresses for an estimated additional \$1 billion.

#### Likely Increase in Customer Take–Up

Under the pro-competitive model for FTTN which we propose, retail competition will be significantly more vigorous than a model in which Telstra is the monopoly provider of broadband services over the FTTN. In turn, this will cause more customers to take up high bandwidth services on the FTTN network, more quickly, than under the base case scenario in which Telstra is the sole operator.

The reason is that, firstly, in a competitive environment, prices will be lower and hence take–up higher than in a monopoly environment. Secondly, with multiple operators competing to attract new customers to the high bandwidth category, there will be vigorous advertising and other initiatives to attract customers.

There are several examples in the recent history of Australian telecommunications which demonstrate that a market with multiple competitors will grow more rapidly than a market with a sole provider.

The first example is the market for retail DSL. As discussed in chapter 1, following Optus' entry into the DSL resale market in February 2004, the rate of subscriber growth in the category jumped appreciably. Broadband subscribers nationally increased at a rate of 20 per cent per quarter, or at an annual rate of about doubling every 12 months. This was because the marketplace responded eagerly, through faster adoption, to a new competitive tension that resulted in improved retail offers at lower prices. Significantly, this new competitive tension also narrowed the gap between the 'previous generation' Internet service (dial–up) with the 'new generation' service (broadband).

The population densities (people per square kilometre) for the five largest cities: are: Sydney, 345.7; Melbourne, 479.6; Brisbane, 379.8, Perth, 274.4; Adelaide, 615.0, giving an unweighted average of 418.9. The population densities for the next 5 largest cities are: Newcastle, 575.5; Gold Coast, 374.5; Canberra, 401.0, Wollongong, 263.5; Sunshine Coast, 433.9, giving an unweighted average of 401.7..

This ratio is derived from Telstra's figures for the five largest cities: four million service addresses and 20,000 nodes. Note that each node will typically have less than 200 services on it because of the four million service addresses, only two-thirds are served via a node; the balance are served via copper directly from the exchange.

The second example is found in the early history of the mobile telecommunications industry. Initially, only Telstra provided mobile services, with its AMPS service launched in Sydney in February 1987 and in Melbourne 3 months later.<sup>112</sup> The 100,000th AMPS service was connected in June 1989. Optus entered the market in June 1992 as an AMPS reseller, and the rate of market growth jumped sharply with the 500,000 connection made in October of that year.

We think that the boost to growth which will result from multiple competitive providers of FTTN based services will be even greater than it might be otherwise as a result of the fact that high bandwidth services are still only at the 'early adopter' stage. Were Telstra to become the monopoly owner of an FTTN network with the ability to control what services were offered over that network and under what terms and conditions, it would initially offer highly priced services to the early adopter segment before gradually developing broader retail offerings. That is, Telstra would follow the model that it has followed in other new technologies until forced by competitive pressure (such as Optus' entry into the DSL resale market in early 2004) to competitively respond.

By contrast, a model in which there is joint ownership of the FTTN access network — whether by a consortium of telcos or a broader range of financial investors — will result in a better outcome for retail end-users of broadband and high bandwidth-dependent services and also a better public policy outcome for Australia. This is because there will be vigorous service-based retail competition, meaning in practice higher levels of innovation and customer service, lower prices and faster take-up.

In the two tables below, we modelled the likely benefit of such FTTN competition. We have taken as our starting point the work done by Citigroup in modelling the likely take up of high bandwidth services on the FTTN network.<sup>113</sup>

Table 4.7 below assumes that Telstra is the monopoly owner of an FTTN network and controls which services and under what terms and conditions are offered from it. Table 4.8 assumes that there is joint ownership of an FTTN network and that there is vigorous retail competition for the services that are offered.<sup>114</sup>

Our analysis suggests that retail consumers of broadband and other high–bandwidth services would save a total of over \$1.1 billion between 2010–15 while utilising more customer–orientated innovative services.

<sup>&</sup>lt;sup>112</sup> http://www.amta.org.au/default.asp?Page=142.

Any takers for a 40 year payback on FTTN, Telstra Corporation Ltd, Tim Smeallie, Citigroup, 15 May 2006

Assumptions are from "'In the Loop' Issue #1: Broadband Demand Side Dynamics", Citigroup, 15 May 2006 • 75% household Broadband penetration by 2010 (p2), increasing to ~80% by 2015 (p12)

Internet/Broadband annual growth of 17.5% in 2004–10 (p5)
 Internet/Broadband monthly growth of 17.5% in 2004–10 (p5)

<sup>•</sup> Internet/Broadband monthly spend of \$11 in 2004, rising to \$29 by 2010 (p5)

<sup>•</sup> Fixed Line annual growth of -6% in 2004-10 (p5)

<sup>•</sup> Fixed Line monthly spend of \$65 in 2004, declining to \$45 by 2010 (p5)

Incremental monthly ARPU of \$3 to be captured through an FTTN from 2010 via substitutable services, e.g. DVD, music, games, pay TV (p6)

Market penetration in 2010–15 takes straight line assumption of 75% in 2010 to 80% in 2015 (i.e. 1% pa). Penetration in 2006–10 assumes 17.5% growth between 2004–10.

We calculate the total welfare benefit (i.e. consumer surplus) from the increased competition – compared to a base case in which FTTN is a Telstra monopoly – would be around \$2.3 billion over this period.<sup>115</sup>

#### Table 4.7

#### **TELSTRA FTTN OWNERSHIP**

FTTN Total Addressable Market (4 million premises)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Internet/ Broadband Market Penetration	39%	46%	54%	64%	75%	76%	77%	78%	79%	80%
Annual Internet/ Broadband ARPU	\$180	\$216	\$252	\$300	\$348	\$348	\$360	\$360	\$360	\$360
Annual Fixed Line ARPU	\$684	\$648	\$600	\$576	\$540	\$540	\$540	\$540	\$540	\$540
Annual Fixed Line + Internet/ Broadband ARPU	\$864	\$864	\$852	\$876	\$888	\$888	\$900	\$900	\$900	\$900
Annual Incremental ARPU with FTTN	n/a	n/a	\$0	\$0	\$36	\$36	\$36	\$36	\$36	\$36
Total ARPU	\$864	\$864	\$852	\$876	\$924	\$924	\$936	\$936	\$936	\$936
Total Annual FTTN Market Revenue (\$ Billions)	n/a	n/a	\$1.84	\$2.24	\$2.77	\$2.81	\$2.88	\$2.92	\$2.96	\$3.0

#### Table 4.8

#### JOINT FTTN OWNERSHIP

FTTN Total Addressable Market (4 million premises)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Internet/ Broadband Market Penetration	39%	46%	54%	64%	75%	77%	79%	81%	83%	85%
Annual Internet/ Broadband ARPU	\$180	\$216	\$252	\$300	\$313	\$313	\$324	\$324	\$324	\$324
Annual Fixed Line ARPU	\$684	\$648	\$600	\$576	\$486	\$486	\$486	\$486	\$486	\$486
Annual Fixed Line + Internet/ Broadband ARPU	\$864	\$864	\$852	\$876	\$799	\$799	\$810	\$810	\$810	\$810
Annual Incremental ARPU with FTTN	n/a	n/a	\$0	\$0	\$36	\$36	\$36	\$36	\$36	\$36
Total ARPU	\$864	\$864	\$852	\$876	\$835	\$846	\$846	\$846	\$846	\$846
Total Annual FTTN Market Revenue (\$ Billions)	n/a	n/a	\$1.84	\$2.24	\$2.51	\$2.57	\$2.67	\$2.74	\$2.81	\$2.88

<sup>&</sup>lt;sup>115</sup> This is a conservative estimate that assumes that the increase in consumer surplus is entirely due to increased penetration arising from lower prices, with no outward shift in the demand curve. If there were to be such a shift (as analysed in section 1.6 of Chapter 1), then the increase in consumer surplus could be double that calculated here.

Another benefit from such accelerated take–up of high bandwidth services over the FTTN network will be to significantly reduce the payback period on the investment in the network.

In its analysis, *Any takers for a 40 year payback on FTTN?*<sup>116</sup> Citigroup demonstrates that based on share of wallet analysis and Australian Bureau of Statistics data, FTTN operators will be able to secure about \$3 per month of incremental EBITDA, as substitution from existing products, e.g. video rental.

Citigroup then calculates that assuming that the 4 million homes covered by the FTTN rollout have a 60 per cent penetration (i.e. 60 per cent of the households covered by the FTTN network take up services), then the average cost of connecting a customer is around \$1,300 and it would take around 40 years to recoup the FTTN investment. If, however, the presence of multiple retail competitors increases penetration from 60 per cent to say 70 per cent, this will reduce the average cost of connecting a customer to the FTTN network from \$1300 to \$1070.

Competitor access to the FTTN network would also lead to greater innovation in the services delivered by the network, for example a richer choice of content, development of new products, etc. If such innovation leads to FTTN operators securing \$5 per month in incremental EBITDA (rather than \$3), this will be another factor leading to a reduction in the payback period. If the two assumptions are combined, the payback period for the FTTN investment reduces from 40 years to around 18 years.

Our comments should not be taken as endorsing Citibank's conclusion that the investment case is a weak one with only a 40 year payback. Rather, we are making a *directional* point — that stimulating retail competition will stimulate take–up and hence improve the return on investment and payback period. This will be so, whatever assumptions are made about the investment case at the outset.

#### Avoidance of Wasteful Duplication of Infrastructure

The shared ownership model we have proposed would avoid the wasteful duplication of investment that has cost the Australian telecommunications industry (and in turn the nation) so much in the past. The best known example is the duplication of the Telstra and Optus HFC networks. The first passes 2.5 million households; the second passes 2.2 million households. There is near total duplication of the homes which are passed. This means that something under one–third of Australian households are over serviced (having access to two separate HFC networks as well as Telstra's PSTN); the remainder of households have no HFC service at all.

FANOC would enable a co-ordinated approach to investment so as to maximise the availability of high speed broadband while avoiding the inefficiency of duplication. While co-ordination of investment by competitors is not normally recommended in market economies, network industries such as telecommunications are an exception. The infrastructure — including the fibre and the contents of the nodes — is a natural monopoly.

The Allen Consulting Group

Any takers for a 40 year payback on FTTN, Telstra Corporation Ltd, Tim Smeallie, Citigroup, 15 May 2006

This coordination could be enhanced through a process under which FANOC could acquire the existing network assets of telecommunications companies.

The ACCC has, in the recent past, approved (or at least not opposed) infrastructure sharing arrangements between telecommunications suppliers. An important recent example is that the ACCC permitted the third generation mobile radio access network infrastructure sharing arrangement between Optus and Vodafone, and a similar arrangement between Telstra and Hutchison. In the Optus/Vodafone case, the ACCC noted approvingly that the arrangements are likely to avoid unnecessary duplication of infrastructure while encouraging the deployment of a more extensive 3G network, and that Optus and Vodafone would be free to differentiate their retail services and content offered to 3G customers.<sup>117</sup>

While it could be argued that theoretically all this could be achieved with Telstra as the sole owner of the infrastructure, with SpeedReach making key decisions, and competing suppliers of broadband services utilising the FTTN network via an access regime, in practice that structure is unlikely to deliver optimal outcomes. If FANOC was the owner of the infrastructure rather than Telstra, the resources of the entire Australian telecommunications industry could be pooled and the result would be more investment and more customers — especially outside the major cities — able to receive high speed broadband, resulting in a network coverage that extends significantly beyond Telstra's proposal to rollout to 4 million service addresses.

Moreover, as an infrastructure company, FANOC would focus solely on making efficient infrastructure investments without these decisions being compromised by consideration of downstream retail operations. Unlike Telstra, it would not have an incentive to make strategic anti–competitive investments with the purpose of foreclosing rival companies.

Ownership of the FTTN network by a range of investors (particularly financial investors) would further reduce the incentive and capacity for Telstra as the dominant vertically integrated player to suppress competition. This is in addition to the benefits which will flow from the delegation of key decision making powers to SpeedReach as explained previously in this report. Under this model, Telstra's focus will be on its retail business, using network capacity it purchases from FANOC. Similarly, Telstra's competitors will purchase such capacity and will compete vigorously at the retail level on quality of service, price, variety of services and other features that are valued by consumers. In turn, this will cause a more rapid take–up of broadband services.

It is true that under the model we propose, Telstra would have a reduced ability to do certain things it can do today, namely exploit its market power and gain monopoly rents by overcharging its customers, while at the same time doing its best to exclude rival telecommunications companies from the market, through a variety of anti–competitive strategies. But these are tactics which Telstra does not have the legitimate right to pursue; so it would lose only the ability to do things which it is not supposed to be doing.

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# A virtuous cycle as industry capital is freed up

A significant benefit of the shared ownership model we believe, is that attracting capital from outside the telecommunications industry will free up investment capital within the telecommunications industry. This capital will then be available to industry participants, both Telstra and its competitors, to re–invest into services, which in turn will drive faster take–up. After all, it is services, not network, which drives take up by end users. For example, consumers have moved from dial up to DSL because of the services they can obtain over DSL — faster internet access; faster sending of files back and forth; and so on.

The freed up capital would come from:

- capital which Telstra had intended to allocate to building the FTTN network;
- capital which competitors had intended to allocate to building out ULLS based networks;
- savings to all parties through reduction in duplication compared to the wasteful duplication epitomised by the HFC network overbuild; and
- lower rates of return required by investors in FANOC due to greater certainty about the volumes of traffic to be carried over that network from all industry participants.

As we have seen with the rollout of 3G networks, competition and innovation is increasingly occurring at the service layer rather than the network layer. With funding able to be reallocated from network duplication to service innovation, we will see more vigorous competition and better outcomes for end users.

As an indication of the size of the benefit, if 75 per cent of the cost of the FTTN network were funded from independent investors, both debt and equity, that would free up over \$2 billion for investment in content and services.

Furthermore, we believe that the reallocation of this capital will drive a virtuous cycle of reinvestment across the telecommunications industry, which will drive more rapid take up of high bandwidth services.

This in turn will deliver better returns and more efficient investment *in the long term*. It will position the Australian telecommunications industry for ongoing future investment – for example, in moving from fibre to the node to fibre to the home in future years. We show this virtuous cycle in figure 4.7 below.

Figure 4.7



# VIRTUOUS CYCLE OF COMPETITION, TAKE-UP AND INVESTMENT

# 4.5 Pricing of access to the network

We envisage that FANOC would submit a special access undertaking to the ACCC which would be used to determine access prices. The key underlying principle, in accordance with Part X1C of the Trade Practices Act, will be that access prices will be in the Long Term Interest of End Users (LTIE). That is, the access pricing regime will be consistent with the primary regulatory objectives of the ACCC, which are:

- promoting competition in a market for listed services, in this instance, the market for broadband services;
- achieving any-to-any connectivity in relation to carriage services that involve communications between end-users; and
- encouraging economically efficient use of, and the economically efficient investment in, the infrastructure by which telecommunications services are supplied.

The prices should also serve the legitimate business interests of the asset owners, and equally importantly, the interests of access seekers. In particular, the pricing should promote efficient use of the network by network owners and non-network owners.

As discussed below, access prices should be cost–reflective, viz. set on the basis of the Total Service Long Run Incremental Cost (TSLRIC) of providing access to the FAN. Given costs and demand, measured for example by the number of services being provided, access prices would be determined.

The ACCC determined in its July 1997 access pricing principles paper that a costbased pricing approach would be the most appropriate pricing approach in most cases. More specifically, the ACCC considers that the access price should, in general, be based on the total service long-run incremental cost (TSLRIC) of providing the service:<sup>118</sup>

There are many variants of cost-based pricing depending upon the costs that are included, how they are allocated and how they are measured (particularly common costs and capital costs). The Commission's view is that for the types of services mentioned above, the access price should, in general, be based on the total service long-run incremental cost (TSLRIC) of providing the service.

As defined by the ACCC, TSLRIC is the incremental or additional cost the firm incurs in the long term in providing the service, assuming all of its other production activities remain unchanged. It is the cost the firm would avoid in the long term if it ceased to provide the service. As such, TSLRIC represents the costs the firm necessarily incurs in providing the service and captures the value of society's resources used in its production. TSLRIC consists of the operating and maintenance costs the firm incurs in providing the service, as well as a normal commercial return on capital. TSLRIC also includes common costs that are causally related to the access service.<sup>119</sup>

# The Underlying Cost Elements, Revenue and Prices

The fundamental organising principle for determining access prices is the same as the ACCC uses for most declared services. That is:

- a model of costs determines the amount of revenue that the access provider needs to obtain from access seekers to recover its costs; and
- given forecast measures of demand (i.e. quantities of the service being provided), this then determines prices.

The underlying cost elements of the TSLRIC model for FTTN access would be capital costs and operating costs.

# Capital costs

There are two components of capital costs: the return *on* capital, and the return *of* capital. The latter is depreciation, and would be determined by the economic life of the assets involved in the provision of the service. The former would be determined as the allowed rate of return on the assets multiplied by the asset base.

In keeping with Australian regulatory practice, the allowed rate of return on the assets would be the Weighted Average Cost of Capital (WACC). The WACC is calculated as the weighted sum of the rate of return on equity (RoE) and the rate of return on debt (RoD), with the weights equal to the proportion of equity and debt in the capital structure of the asset owner.

There are several ways to estimate the RoE, but the most common regulatory practice is to use the Capital Asset Pricing model (CAPM). Under this model, the return on equity is conceptually the opportunity cost faced by holders of equity when they invest in a company i.e. what they are giving up by not investing in their next best alternative.

ACCC 1997, *Access pricing principles – Telecommunications*, July, p. 34.

ACCC 1997, Access pricing principles – Telecommunications, p. 34.

The value of the assets to which the WACC is being applied must also be calculated. Often, in regulatory settings, this is quite difficult, because the assets are old and may have a low book value – which does not reflect the value of the assets in terms of their service potential. In these circumstances, a forward looking estimate of the assets must be made — by asking what it would cost to replace the existing asset base with assets that would efficiently replicate the services provided by the existing assets. Such estimates are not easy to make, and in telecommunications settings require an engineering–economic model. In the case of the FTTN, however, because these assets do not yet exist (for the most part), then it should be a relatively simple matter to estimate the value of the asset base. It will be the cost of new FTTN assets, and the cost of installing them (say, \$3.1 billion, according to Telstra's announcements).

Over time, the value of the asset base will change, due to depreciation, which will reduce it and new investment, which will increase it. The WACC may also be different from year to year, though typically in regulatory settings it is fixed for five years, to give regulatory certainty for both access providers and access seekers.

#### **Operating costs**

Additionally, costs will be incurred in operating the FTTN network e.g. repairs and maintenance. The key question will be whether these costs are *incremental*. If FANOC owns the FTTN assets, then this should be an easy question to answer, because FANOC, a stand-alone company, will own no other assets. In practice, operating costs are in any case likely to be a small proportion of the total.

#### Allowed revenue

Allowed revenue is the sum of capital costs and operating costs. Given the above construction, allowed revenue permits the asset owner to earn a competitive return on the capital employed and to recover efficiently incurred operating expenses. Thus, if the regulation works as it should, the efficient outcomes of a competitive market are replicated in a natural monopoly setting.

# Prices

Given allowed revenue, prices then need to be set by dividing revenue by forecast demand, in the units of the service being provided. In an FTTN setting, however, it is not obvious what these units should be. Candidates include minutes of use, megabytes transported and number of customers.

The simplest pricing structure would be simply based on the number of installed services. For example, if total costs are (say) \$500 million per annum, and there are 2.5 million installed services, the price of access would be \$200 per service.

This approach can be varied to deal with more complex issues which may arise. First, there may be incremental costs incurred by the access provider associated with the provision of service to an extra customer by the access seeker, in which case the access price should reflect those incremental costs.

Second, it may be efficient to impose different pricing approaches for different services.

There are a number of different forms of access price that could be applied to FANOC. These include:

- a schedule of cost-determined individual prices (e.g. access prices for business-grade and household-grade broadband) with no flexibility for variation by FANOC;
- a control of aggregate prices, which could take the form of a revenue cap (leaving FANOC to determine individual access prices) or a cap on a weighted average of prices, again leaving FANOC to determine individual access prices; and
- setting access prices initially with reference to FANOC's costs, but with subsequent changes in prices related to the long run growth of total factor productivity in the broadband infrastructure industry.

Another possibility would be that foundation buyers might enter into take-or-pay contracts with FANOC (i.e. guarantee to purchase a minimum volume of wholesale broadband services). This should serve to reduce the risk to FANOC in deploying the FAN, and hence lead to lower access prices. In other words, FANOC's cost of capital could be determined in part by the market structure, by having an industry agreement to build one network, with industry participants having pre-committed for giving volumes of wholesale broadband services. This market structure is likely to deliver a lower cost of capital for the network than would be the case under Telstra's proposal.

We would recommend that a weighted average price cap be employed. This type of cap provides appropriate incentives for cost minimisation as well as providing appropriate incentives for setting efficient prices. Under a weighted average price cap the weighted average price is fixed for a set period of time (say five years). Subject to that cap (and for the regulated period) the regulated business can keep any returns it generate by either cutting operating costs or increasing network usage (increased network usage might come through price reductions or price structures which encourage more usage). At the end of the regulated period the price cap is reset taking into account these lower costs and greater usage. It would be expected that access seekers (and end–users) will receive lower prices in the next regulated period.

FANOC would adopt as long a regulatory period as possible (subject to reliable forecasting), as this provides the greatest incentives to minimise costs as well as providing all parties (including investors, access seekers and end–users) with a high degree of certainty.

In setting the cap for a regulatory period the following approach would be employed.

- first, a building block approach would be adopted. This would involve summing the annuitised capital costs (including a return on and of capital) and operating costs (including tax) to set total revenues allowed over the regulatory period. This might incorporate an efficiency factor reflecting likely improvements in the productivity of assets ;
- second, forecasts of demand and prices would be made, taking into account take or pay agreements;
- third, the path for weighted average prices would be set based on the first and second step.

FANOC would be required to keep track of the extent to which its investment in the FAN had been recovered and adjust its maximum revenues appropriately.

The pricing structure determined by FANOC would be applied uniformly across network usage. That is, the same charging structure would apply irrespective of whether the user was a FAN investor or new entrant. The revenues from FANOC would be distributed to its investors in proportion to their investment.

As well as the price of accessing the FTTN network, access seekers would also have to pay to access the 'last mile' of copper which runs from the node to the premises, which would still be owned by Telstra. The price for this would be set based upon the existing ULLS price setting process – with a reduction in pricing likely to reflect the shorter copper runs.

# 4.6 An integrated process to move forward

A fundamental problem with Telstra's proposal to upgrade its network to FTTN has been a lack of consultation with other interested parties, and, in turn, the failure to design a process and a model which will best advance Australia's national interest. This lack of consultation has led to suspicion that Telstra's primary motive is to stifle existing competition.

In this chapter, we have laid out an alternative model for FTTN which will address the anti competitive problems with Telstra's model. But there are a number of issues which will require further consultation, further design work and market testing.

Therefore, in this section of the chapter, we propose an integrated process to move forward towards finalisation and implementation of an acceptable FTTN model.

We recommend a staged process involving the following steps:

- Scope investment appetite and required terms.
- Finalise network design.
- Finalise and implement governance arrangements including SpeedReach.
- Determine access pricing.
- Agree network upgrade timetable and ULLS lifetime by exchange.
- Obtain final stakeholder sign off.
- Raise additional capital.
- Commence construction and ULLS to FTTN transition period.
- Complete transition period.

We believe that following these steps in a logical sequence is the best way to deliver an FTTN network as rapidly as possible, and deliver the national benefits of high bandwidth services which the network promises.

Our recommended process involves negotiation and working between all interested parties. We believe it will take less time, and deliver more certainty to all parties including Telstra, than the aggressive winner take all model which Telstra has been pursuing. In the balance of this section, we describe these steps in more detail.

#### Scope investment appetite and required terms

As we explained above, we believe that there would likely be considerable interest from investors, including both existing telecommunications companies and financial investors, in participating in FTTN. Our analysis indicates that additional investment would permit significant expansion of the network, thus serving a larger number of Australians.

Accordingly, we believe that the first step in delivering the optimum FTTN outcome would be to appoint financial advisers to develop further the FANOC model we have outlined above, and to test the market appetite for investment in FANOC.

#### Finalise network design

Once it is clear how much additional investment will be forthcoming, it will then be possible to determine the final reach of the network. The task at this stage will be to optimise the network design having regard to the capital available.

#### Finalise and implement governance arrangements including SpeedReach

We believe that SpeedReach will play an important role in managing the steps along the path to implementation of a national FTTN network. Accordingly, an early priority will be to finalise the governance arrangements for SpeedReach and to get the company operational. Once it is established, SpeedReach will negotiate and sign contracts with key stakeholders including Telstra and other fixed line telecommunications companies setting out its role and the nature of the tasks delegated to SpeedReach.

#### Determine access pricing

The first major task for SpeedReach will be to prepare and lodge with the ACCC, on behalf of FANOC, a special access undertaking. This will set out the terms and pricing of access to the FTTN access network. This will be a much more straightforward process than a special access undertaking lodged by Telstra. The main requirement will be to achieve access pricing which allows FANOC to generate a rate of return sufficient to raise capital.

#### Agree network upgrade timetable and ULLS lifetime by exchange

With the FTTN network designed, and with access pricing agreed, the next step will be to determine the timetable to build the FTTN. This will in turn allow SpeedReach to determine the timetable under which existing ULLS services will be withdrawn.

The process will be managed along the following lines:

• SpeedReach will develop the forward plans for upgrading exchanges to FTTN, by consulting with all stakeholders including Telstra and ULLS users, by considering demand forecasts and other factors, and by developing a rational plan to upgrade on an exchange by exchange basis.

- SpeedReach will publish this plan in a forward schedule which runs over a five year period and which gives a minimum of three years' notice of any given exchange being upgraded.
- Any provider which has built ULLS infrastructure before the plan is published will be compensated for its expenditure on that infrastructure, at an agreed rate, to be paid as a first claim on the access revenues generated from the FAN.
- All ULLS providers will be given the opportunity to provide FTTN services, using the access regime thus allowing them to transition their customers on their terms from ULLS to FTTN.

# Obtain final stakeholder sign off

With the previous steps taken, it will now be possible to notify the formal proposal for construction of the FTTN network. SpeedReach will conduct the formal approval process.

SpeedReach members — being prospective users of the FTTN network — will vote for or against the proposal. Formal approval will require 75 per cent support.

Members will be contractually bound, once the vote is taken, not to challenge the process through legal action, or to initiate separate proceedings for access to the FTTN network. In this way, the process will deliver certainty to FANOC and to all users of the network.

Hence, a key benefit of the model we propose is that it will deliver certainty in allowing the FTTN network to proceed. There will be no risk of regulatory intervention or legal challenge by Telstra's major competitors, because they will be partners in a co-operative venture, and be bound contractually by it.

# Raise additional capital

With the network design finalised, access pricing finalised and all stakeholders being bound by the approval process, the capital raising will then occur. Investors will have confidence that the regulatory risk associated with the venture is very low. They will also have the knowledge that the investment opportunity is underpinned by take or pay contracts from established retail telecommunications brands.

# Commence construction and ULLS to FTTN transition period

With funds raised, construction will begin. During the construction period, as exchanges are completed and come on line as part of the FTTN network, they will be removed from service as a ULLS exchange (except as regards the one third of customers within 1.5 kilometres of the exchange.) This will be a managed process occurring in accordance with the timetable specified by SpeedReach, so as to give certainty to users of the ULLS service. Any variations to the timetable will be managed by SpeedReach.

# Complete transition period

At the completion of the transition period, the FTTN network will be fully operational.

# Chapter 5 Next steps

This chapter describes the steps going forward for the government to facilitate the transition from ULLS to FTTN now and in the medium term. Concluding remarks are provided at the end of the chapter.

# 5.1 Issues for government

The deployment of an FTTN network offers the potential for Australia to drive benefits from more widely available broadband services, including:

- economic benefits in the form of increased productivity, innovation and growth; and
- benefits to the community, particularly regional and rural consumers.

However, if Telstra succeeds in its objective of re monopolising the Australian telecommunications industry, via a monopolisation of the broadband network, these benefits will not be realised.

The Government has a critical role in ensuring that the benefits from broadband are available to all Australians, by putting in place policy settings that promote competition. As we have highlighted throughout this report, high bandwidth of itself is not a sufficient objective for government. It must first encourage a competitive market structure in telecommunications as the best means by which superior technology (i.e. higher bandwidth) as well as lower prices and better service, can be delivered.

This should be the ongoing objective of telecommunications policy.

In the short to medium term, a number of implications for government arise from Telstra's proposal and the industry response to it, as set out in this report.

# Reject Telstra's scare campaign and any link to T3

The first, and perhaps most important, implication is that the Government should not rush into making any hasty policy decisions, forced by the T3 timetable. Telstra must not be allowed to force the Government's hand by making ambit claims which in terms of good policy and the future of the Australian telecommunications industry, are unsupportable. There is, quite simply, far too much as stake.

Telstra must likewise not be allowed to get away with a scare campaign that the Telstra share price will be adversely affected by policy decisions which promote competition and which will lead to significantly larger broadband take up and a larger and more vibrant telecommunications industry.

# 5.2 Measures to manage ULLS to FTTN transition

As discussed in the previous chapter, SpeedReach will play a critical role in managing the transition from ULLS to FTTN. The Government and ACCC can facilitate this transition by assisting in the resolution of the several issues:

- regulatory certainty;
- investment certainty; and
- continuity of access.

#### **Regulatory certainty**

The Government and ACCC can provide regulatory certainty by:

- announcing that it will not overrule the ACCC on ULLS pricing; and
- publicly supporting ULLS as a basis for broadband competition, in the transition to FTTN, and on an ongoing basis for customers that are close to local exchanges.

As noted in this report, continued ULLS access for competing carriers during the transition period to the FTTN network and after this time, is vital for competition to be maintained at reasonable price and non price terms and conditions. A commitment by government will reassure all carriers of the likely regulatory environment. For those carriers that have invested in existing networks, or plan to, such a commitment would substantially promote roll out.

#### Investment certainty

The Government can support investment certainty in the transition to FTTN by declaring, as a matter of government policy, that any provider that has built ULLS prior to any plans for upgrading exchanges to FTTN, will be appropriately compensated. This policy would be given effect to by the ACCC refusing to approve any Special Access Undertaking from Telstra which did not make appropriate provision for compensation.

#### Continuity of access

The transition path from ULLS to FTTN must be seamless so that service providers which use ULLS can switch to FTTN with minimal disruption to them and their customers. The Government should announce that all ULLS providers will have the opportunity to provide FTTN services, under the FTTN access regime.

Policy settings which assist the resolution of these transitional issues will be an important complement to the encouragement of a competitive market structure and institutions which facilitate that structure (i.e. FANOC and SpeedReach).

#### 5.3 The path forward

As described in Chapter 4, the process to move forward towards finalisation and implementation of an acceptable FTTN model involves the following steps:

- Scope investment appetite and required terms.
- Finalise network design.
- Finalise and implement governance arrangements including SpeedReach.
- Determine access pricing.
- Agree network upgrade timetable and ULLS lifetime by exchange.

- Obtain final stakeholder sign off.
- Raise additional capital.
- Commence construction and ULLS to FTTN transition period.
- Complete transition period.

This process will involve a wide range of parties but the Government and ACCC will each have important facilitating roles to play.

Now is an excellent time for the Government to re-state its commitment to an open, competitive, telecommunications sector, and to back that statement with policy action to deliver competition to the broadband component of that sector. As shown in this report, the potential gains to the Australian economy, and the Australian community more generally, of a competitive, vibrant, broadband industry, will be extremely large. We believe the important next step for Government and the ACCC is to indicate public support for a process under which a model for competitive provision of an FTTN model is developed and finalised. To date there has been a process initiated by Telstra, discussed behind closed doors with the ACCC, proposing terms which appear likely to suit Telstra's interests exclusively. After many months, no concrete proposal has emerged from these discussions.

In this report we have laid out a model which would allow FTTN to proceed under a structure which would address the competition concerns of Telstra's major competitors. This has been done at the request of those competitors, with the objective of initiating a sensible and transparent public policy process to establish the path forward to a higher bandwidth Australia.

We urge the Government and the ACCC to now proceed on the basis of the model we have outlined.

# 5.4 Final thoughts

The model we propose establishes a sensible public policy process to protect competition as we move to a higher bandwidth Australia. It will enable the Government and the ACCC to say to Telstra: "*here are the conditions you would need to meet in order to satisfy competition concerns and be granted a special access undertaking to proceed with an FTTN rollout*". It would also allow alternative investment models to be tested, potentially allowing the benefits of an FTTN network to reach more widely than under Telstra's plans.

If, however, Telstra maintains its insistence that it will only build an FTTN network on terms which suit its interests exclusively, the Government and the ACCC should decisively reject that proposal. FTTN is not an absolute good. If it comes at the cost of destroying competition, it is not worth having. High speed, high bandwidth, high quality broadband can and will be obtained through ULLS, provided the regulatory settings promote competition. FTTN may be a useful way of enhancing Australia's broadband capability, but certainly not at the cost of allowing Telstra to remonopolise the telecommunications sector.

# Appendix A

# Are other technologies effective substitutes for FTTN?

# A.1 Do alternative technologies provide a competitive constraint?

Historically there have been few alternative technologies that could bypass the copper loop, meaning that for the provision of Internet services (particularly broadband) access to the Telstra network was usually the only viable route to market for a competitor. However telecom markets are characterised by dynamic and rapidly evolving technologies meaning it is important to consider whether there is an expectation that any other technologies could prove a viable alternative to a Telstra owned fibre network. Clearly, any alternative access network to the proposed fibre rollout must provide an equivalent range of broadband services and service quality. This was also the view advocated by Telstra Clear in New Zealand in 2002 when it was arguing for the introduction of local loop unbundling in front of the New Zealand Commerce Commission.<sup>120</sup> In a presentation before the Commission it commented, "triple play/NGN services should be the benchmark for evaluating the substitutability of wireless for copper". Similarly this range of 'triple play/NGN (next generation network)' broadband services should be the benchmark when considering the substitutability of fibre with any other technology. The key broadband services often referred to, as 'Triple Play' are high speed Internet access, voice over Internet (VoIP) and video over the Internet.

# A.2 Advantages of a fixed line network

# Shared and dedicated technology

dandolopartners

A key quality of traditional fixed line telecom networks, be they copper or fibre, is that they are dedicated platforms. On a dedicated platform it is possible to reserve capacity by isolating an individual part of the network for a particular customer and guaranteeing a certain level of performance. If necessary a service provider will dedicate bandwidth entirely to an individual customer so that other users will not compromise performance. This is often vital, particularly for business customers that want a service level agreement and expect a committed rate of access. As discussed in more detail below most alternative technologies are however shared platforms. This means that the service levels are contingent on the number of users accessing the network at any one time. As more users access the network the bandwidth and therefore speed available to each of them declines: in effect users compete with each other for a scarce amount of bandwidth.

#### Wireless local loops and NGN's, Public, John davenport, Team Leader, Access network

# A.3 Alternative technologies

#### Power line communications

High voltage electricity power lines operated by the distribution companies could theoretically be used to transmit high bandwidth data signals over an electrical power distribution network. This technology has been under development for a number of years, but has not yet been rolled out on a significant scale and is still largely unproven.

The most significant problem is that running high bandwidth data signals through a high voltage electricity cable, causes the power line to act as a large radio antenna and causes significant distortion to surrounding radio signals. Unless this problem is solved it is unlikely that power lines will be a viable means for broadband access.

#### HFC

HFC improves overall bandwidth using optical fibre connection down tree and branch system with tributaries built from the network serving each individual house.

The two existing HFC networks are limited in size: the Telstra Network covers 2.5 million homes and the Optus addressable network is 1.4 million homes, much of which overlap. It is unlikely therefore that HFC will prove a viable alternative to any network used on the PSTN (which serves all home in Australia) given the extent to which the footprint would need to be expanded.

#### Wireless solutions

#### Wireless local loop (WLL)

Wireless local loop describes technologies that utilise radio spectrum (both public and licensed) to connect customers to a local exchange via a wireless connection. Theoretically wireless technology could bypass the traditional fixed line network, be it the copper loop or the FTTN and connect directly to the broadband suppliers core network. Some wireless systems (e.g. WiFi) are becoming increasingly popular for providing short range Internet connections often in public areas, such as coffee shops, airports, or for creating wireless connections in the home.

Wireless technologies such of these are line of sight communications meaning most applications suffer signal loss from obstruction or environmental conditions. With wireless systems there is a trade off between distance from the base station and the capacity of the service.

The performance of wireless applications is often compromised by interference. This takes a number of forms;

- Multipath interference: caused when radio frequencies bounce off an object creating a duplicate signal, these two signals travel different distances arriving at the destination at different times causing interference.
- Radio frequency is a limited resource which users must share, therefore the higher the number of users the lower the capabilities of the service. As such wireless Internet suffers from the disadvantages of a shared network.

• Wireless systems that use public spectrum (such as WiFi) have the added disadvantage that they can suffer interference from other users on the same frequency. As the service provider cannot manage access to that spectrum saturation can mean that applications reliant on high speed data transfers become of limited use.

In 2002 the House of Representatives standing committee on Communications, Information Technology and the Arts looked at the potential for wireless technology in the supply of broadband services.<sup>121</sup> The view of the committee was that wireless broadband should be seen as a complementary to wire line broadband. During a recent hearing in front of a Senate committee Telstra also suggested that it did not view wireless Internet technologies as a substitute or potential competitor to their fixed line network. In its view wireless networks played a different role and should be seen as a complement to FTTN.<sup>122</sup>

#### Cellular solutions — 3G

Designed initially to serve the needs of mobile users 3<sup>rd</sup> generation (3G) mobile telecommunications systems offer the potential to deliver broadband services to fixed computer terminals or portable laptops. One of the purchases of 3G capable spectrum auctioned in 2000 has already deployed a technology known as iBurst to provide wireless broadband in Australia. Whilst 3G/CDMA technologies offer Internet portability, which could prove popular, they are unlikely to be capable of ever usurping the kind of fibre network proposed by Telstra. As IBurst's own promotional material makes clear, its service has a number of limitations.<sup>123</sup> Fundamentally the bandwidth is simply not comparable with fixed line services, meaning that it cannot provide comparable speeds or the range of services offered by fixed line operators. Even where speeds up to 2 Mbs are possible these will be limited by a number of factors:

- the distance from the nearest base station;
- obstructions between the user and the base station;
- how many people are connected to the base station; and
- the speed at which the user is travelling.

#### Satellite

There are two types of satellite systems that can be used for providing broadband services — one way systems and two way systems. Unidirectional (or one way) satellite services provide downstream internet connection but need to be combined with an existing access network to send or upload data. Bi directional (or two way) satellite provides both downstream and upstream services over the satellite. Whilst satellite systems are very efficient for delivering broadcast services and wide area coverage, there are a number of challenges in using them for two way internet usage:

• the amount of spectrum available to them is limited;

 <sup>&</sup>lt;sup>121</sup> Connecting Australia! Wireless Broadband, House of Representatives Standing Committee on Communications, Information Technology and the Arts, November 2002.

Environment, Communications, Information Technology and the Arts Senate committee, Budget Estimates, 22<sup>nd</sup> May 2006

http://www.iburst.com.au/?faq=general&services=faq&main=services&appCode=&

- the technology is relatively expensive; and
- it is not possible to use phone and internet services simultaneously, a feature of DSL broadband services that has proved very attractive to customers.

In a similar vein to wireless networks, satellite technologies have to date provided a complementary service to the traditional fixed line broadband services. Satellite services have a particular advantage in remote communities where broadband services using traditional fixed line networks cannot reach. For instance the Federal Government is helping to make two way satellite available to regional Australia through subsidies under its Broadband Connect initiative.<sup>124</sup>

The Allen Consulting Group

http://my.bigpond.com/internetplans/broadband/satellite/2\_way\_plans/bbc/default.jsp