

TRANSPORT ENERGY WATER TELECOMMUNICATIONS



# infrastructure report card 2010

*Victoria*



ENGINEERS  
AUSTRALIA

# TELECOMMUNICATIONS

## 11.1 Summary

Infrastructure type	Victoria 2010	Victoria 2005	National 2005	National 2001
Telecommunications	C	Not rated	Not rated	Not rated

In 2007, Engineers Australia rated telecommunications in the *Telecommunications Infrastructure Report Card 2007*. It used Local Government Statistical Divisions as the geographic basis for rating fixed and mobile infrastructure, and it did not rate the infrastructure State-wide nor rate backhaul infrastructure. Below are its ratings. It is not possible to compare its rating with the one in this chapter due to their different rating methodologies.

Statistical Division Name	Fixed Infrastructure Rankings (2007)	Mobile Infrastructure Rankings (2007)
Melbourne	B	B
Barwon	D	D
Western District	D	E
Central Highlands	E	E
Wimmera	F	E
Mallee	F	E
Loddon	E	E
Goulburn	D	E
Ovens–Murray	E	E
East Gippsland	D	E
Gippsland	D	E

This rating recognises that telecommunications have become an essential service for business and the community, and while voice and mobile phone services are almost universally available, this is not the case for fast, affordable broadband across the State. Specifically, there is under-provision of fixed broadband infrastructure at exchanges in Melbourne and across Victoria, as well as under-provision of backhaul fibre in regional Victoria. Overall, there is a lack of an integrated strategic plan for telecommunications.

Developments since the *2007 Telecommunications Infrastructure Report Card* have included:

- ▶ Increased demand for high speed broadband services
- ▶ Continual growth in mobile phone ownership
- ▶ Increased competition in the provision of telecommunication services
- ▶ Increased capability of mobile telephone networks including increases in coverage, reliability, function and capacity.

Major in-progress infrastructure projects include:

- ▶ The Australian government's national broadband network project
- ▶ The Victorian Government's VicFibreLINKS regional broadband initiative.

Challenges to improving telecommunications infrastructure include:

- ▶ Creating a value proposition for ubiquitous high speed broadband
- ▶ Accessing investment in the global financial crisis
- ▶ Meeting rising telecommunication demand
- ▶ Balancing market driven telecommunication developments and government intervention to create a competitive telecommunication industry that delivers affordable and widespread access
- ▶ Selecting optimal technologies
- ▶ Addressing the lack of clarity in regulation and access arrangements.

## 11.2 Infrastructure overview

### 11.2.1 System description

Victoria's telecommunications infrastructure consists of fixed infrastructure related to customer access networks (CAN) and backhaul transmission networks. The key elements rated in this section are:

- ▶ Fixed line CAN infrastructure
- ▶ Mobile CAN infrastructure
- ▶ Backhaul infrastructure.

The provision of telecommunications services operates within a market structure comprising:

- ▶ Carriers: The owner of a network used to supply carriage services to the public
- ▶ Carriage service providers. The organisations that use a carrier service to supply telecommunications services to the public using carrier-owned networks; internet service providers (ISPs) are carriage service providers
- ▶ Content service providers. The organisations that supply broadcasting and on-line services to the public.

This section does not address satellite telecommunication infrastructure, government radio networks, fixed wireless broadband or content service providers. Private telecommunication systems that have no impact on public telecommunications are also not considered.

Table 11.1 lists the infrastructure that this section assesses.

*Table 11.1: Infrastructure assessed in the Report Card<sup>430</sup>*

Type	Purpose	Technologies
Customer Access Network (CAN) Fixed line Mobile	Connects customer to an aggregation point	Copper twisted pairs DSL Access Multiplexers (using twisted pairs, possibly in the form of ULL or LSS) Coaxial access part of hybrid fibre-coaxial (cable TV) systems Access fibre networks (fibre to the premises/home) Cellular 2G, 2.5G and 3G mobile networks
Back haul	Connects aggregation points to major nodes in capital cities or regional centres, and provides high-capacity links between capital cities, or from regional centres to capital cities	Transmission fibre Fibre trunks Microwave links Satellite links

#### **Fixed line CAN infrastructure**

The fixed line CAN represents the link between the telephone exchange and the customer. Fixed line infrastructure includes twisted pair copper wire, broadband cable and fibre to the

home/premises, and it provides telephony, data transfer and internet connections. Copper wire is the standard medium for connecting fixed line services to end-user premises.

The largest fixed line CAN in Victoria is Telstra. Other fixed line service providers are AAPT (including PowerTel), Neighbourhood Cable, Optus, Primus and SP Telemedia.

### ***Mobile CAN infrastructure***

Mobile CAN infrastructure provides mobile telephone, data and multimedia services to mobile handsets. There are three mobile carriers operating six mobile networks in Victoria. These networks use either 2G/2.5G (henceforth known as GSM) or 3G services. From an infrastructure perspective, there are really only four discrete networks as GSM and 3G share substantial common network systems. The networks are owned by Telstra, Optus, Vodafone and Hutchison.

GSM networks are operated by:

- ▶ Telstra
- ▶ Optus
- ▶ Vodafone.

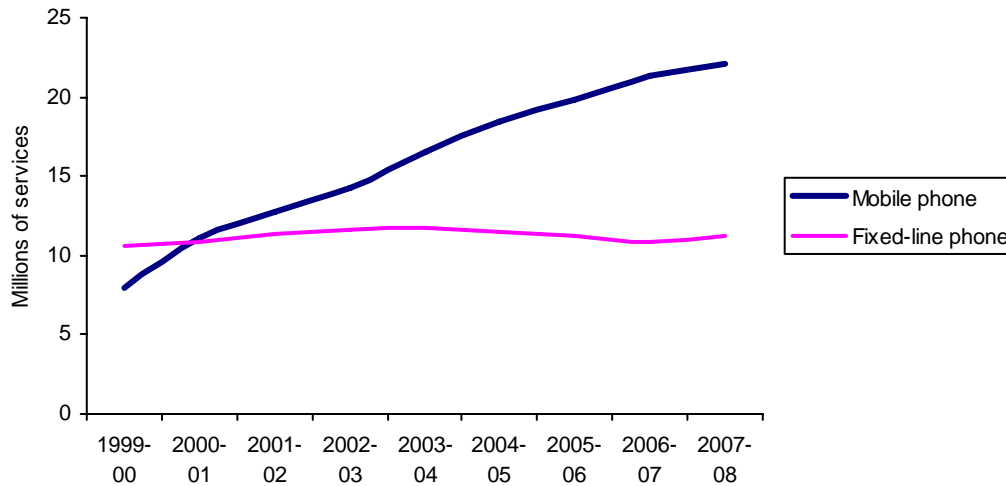
3G networks in Victoria are operated by:

- ▶ Telstra's Next G™ Network
- ▶ Hutchinson '3' (Hutchinson/Telstra network)
- ▶ Optus/Vodafone (shared network).

In June 2009, Vodafone and Hutchison 3G Australia merged to form Vodafone Hutchison Australia. Although these companies now operate as a single entity, as of November 2009 they are yet to announce any plans to merge the 'Vodafone' and '3' networks or offer roaming between them.

The GSM networks were primarily designed for voice services but are capable of supporting data services at a lower rate than 3G networks. The 3G network allows much higher data transfer rates than the GSM networks, allowing consumers to access a wider range of applications. The 3G technology allows carriers to offer a wider range of service to consumers and achieve a more efficient use of spectrum that allows for greater network capacity. 3G networks provide access to data and the internet through either a mobile handset or a data card that is inserted into a computer. The 3G networks can provide peak download speeds of up to 14.4 Mbps and upload speeds of up to 1.9 Mbps.<sup>431</sup> However, it should be noted that mobile broadband capacity is typically shared amongst multiple simultaneous users and is therefore subject to contention.

The growth in mobile phones has been substantial over the last decade as seen in Figure 11.1 which shows that the number of mobile phones exceeded fixed-line phones from 2000.

Figure 11.1: Take-up of fixed-line and mobile phones (Australia-wide)<sup>432</sup>

While the primary use of mobile phones and other devices is voice, increasingly, non-voice services are providing a greater share of total revenue. The main uses of mobile phones are:

- ▶ Short Message Service (SMS) and Multimedia Message Service (MMS)
- ▶ Email
- ▶ Web browsing and other data services
- ▶ Personal aids include personal digital assistants (PDAs), GPS-enabled navigation and USB drives
- ▶ Mobile TV and video streaming
- ▶ Mobile commerce, interactive services and location-based services.<sup>433</sup>

The growth in mobile broadband speed is significant and likely to accelerate the uptake of mobile phones for applications that require large amounts of data in near real-time. It is expected that by 2012, mobile networks will be capable of speeds of 100 Mbits<sup>434</sup> given sufficient bandwidth allocation.

### **Backhaul infrastructure**

Backhaul infrastructure connects telecommunication aggregation points to major nodes in capital cities or regional centres, and provides high-capacity links between capital cities, or from regional centres to capital cities. Backhaul is provided by fibre or microwave technologies, and while fibre-based infrastructure provides the highest bandwidth, construction is more capital intensive.

### **Business headquarters**

Melbourne is the location of a number of nationally significant telecommunications organisations. These include the headquarters of Telstra and its principal operations centre in Melbourne, other carriers, service providers and major vendors such as Ericsson and NEC. These have resulted in making Melbourne a major telecommunications knowledge centre.

## **11.2.2 Policy and governance**

The Australian and Victorian Governments' strategic vision for telecommunications are very similar. The vision reflects that while telecommunication can be an enormous contributor to economy, lifestyle, health and safety, telecommunication provision and innovation is primarily driven by market forces. Consequently, governments consider that their major role is to encourage the uptake of telecommunications and the development of telecommunication goods and services. The key to achieving this is a supportive regulatory framework and selective intervention when markets fail to deliver competition or appropriate services.

Both governments seek to increase broadband provision in underserved regions. In July 2009, the Australian Government released its *Australia's Digital Economy: Future Directions* paper which aims to develop the digital economy.

The Victorian Government's policy blueprint to achieve this is the 2005 strategy document *Broadband Framework – Pathways to the future*. The *Broadband Framework* defines how the Victorian Government will meet its broadband requirements in a strategic manner that also facilitates the delivery of telecommunications infrastructure, greater take-up of broadband services, increased competition in the broadband market and lower prices for households and businesses. The policy focus is on providing access to broadband in non-metropolitan areas as the distance, geography and low customer density of rural Victoria has proven to be an impediment to commercial investment in telecommunication infrastructure.

The Victorian Government is also intent on developing the ICT sector. Its key documents are the *ICT Industry Plan 2005-2010 (2005)* and *Progress Report 2005-2010 (2009)* which identify what the Government has achieved in Victoria's ICT sector and what support it plans to provide in 2010.

Australia's telecommunications industry is subject to a regulatory framework defined by the *Telecommunications Act 1997*. Its core aim is to promote the long-term interests of end-users of telecommunications services.

The framework relies on industry self-regulation to develop codes and standards in all areas which apply to the sector. However, Government regulators have powers to intervene if industry self-regulation is not working effectively in specific instances. The key types of framework documents developed under self-regulation are:

- ▶ Industry Codes, which are rules or guidelines governing particular aspects of telecommunications, developed by industry
- ▶ Industry Standards, which are rules or guidelines similar to industry codes, but determined by the ACMA
- ▶ Technical Standards, which cover the technical parameters of customer equipment, such as cables and networks.<sup>435</sup>

Two other key elements of the regulatory framework are the:

- ▶ *Telecommunications (Consumer Protections and Service Standards) Act 1999* which legislates a number of consumer protection matters, particularly the Universal Service Regime, the National Relay Service, and continued access to untimed local calls
- ▶ *Trade Practices Act 1974*, which includes two telecommunications specific parts, Parts XIB and XIC, that cover anti-competitive conduct provisions and a telecommunications-specific access regime respectively.<sup>bb</sup>

The radio spectrum framework is defined in the *Radiocommunications Act 1992* that sets out the tools to manage the spectrum including frequency planning, licensing and technical standards.<sup>cc</sup>

<sup>bb</sup> The access rules under this legislation provide a framework for determining the services to which content service providers have a right to access for the purpose of providing their own competing services, and the cost at which such services will be provided to them.

<sup>cc</sup> The Act specifies three types of transmitting licences:

A: Apparatus licences which are usually site-based and specify the category of service, e.g., fixed or mobile, and the technical characteristics including the location, power, frequency of operation and the radiofrequency emission type.

B: Spectrum licences which are area-based licences, are intended to be technology and service neutral to the extent possible to give maximum flexibility to the licensee. Once allocated, these spectrum assets are fully tradeable, and can be sub-divided or amalgamated in either the geographic or the frequency band domain. This allows licensees to acquire, through participation in auctions or through trading in the secondary market, whatever spectrum space is necessary to deploy the type of service required.

C: Class licences are umbrella licences designed to provide 'public parks' for the authorised use of various low powered devices that have a low interference potential. Common examples of these devices are garage door openers, remote car door locks and intruder alarms, wireless microphones, automatic tollway systems and tag security systems.

In September 2009, the Australian Government announced that it would be seeking major telecommunication reforms as the existing telecommunications anti-competitive conduct and access regimes are cumbersome, open to gaming and abuse, and provide insufficient certainty for investment. The proposed reforms involve:

- ▶ A structural separation of Telstra that primarily involves separating the network operations/wholesale functions from the retail functions
- ▶ Streamlining the competition regime to provide more certain and quicker outcomes for telecommunications companies
- ▶ Strengthening consumer safeguards, notably the Universal Service obligation, Customer Service Guarantee and Priority Assistance
- ▶ Removing redundant and inefficient regulatory red tape.<sup>436</sup>

The Commonwealth *Telecommunications Act 1997* exempts low-impact and certain other telecommunications facilities from most planning requirements under State legislation.<sup>437</sup> However, for other facilities, State and Local Government planning schemes apply. To facilitate the efficient development of telecommunications infrastructure, the Victorian Government in 1999 introduced the *Code of Practice for Telecommunication Facilities in Victoria*, which was updated in 2004. This code is an incorporated document in all planning schemes in Victoria. It was the first such code in Australia. The Code sets out the circumstances where a telecommunications facility requires a planning permit and how such a planning decision should be made. It also sets out under what conditions a telecommunications facility does not need a planning permit. The Code has four principles that must be applied where relevant to the design, siting, construction and operation of any telecommunications facility that is not exempt under Australian Government legislation.

- ▶ A telecommunications facility should be sited to minimise visual impact
- ▶ Telecommunications facilities should be co-located wherever practical
- ▶ Health standards for exposure to electromagnetic emissions will be met
- ▶ Disturbance and risk relating to siting and construction should be minimised. Construction activity and site location should comply with State environment protection policies and best practice environmental management guidelines<sup>438</sup>

Key multi-jurisdictional bodies and government agencies are:

- ▶ **Australian Government, Department of Broadband, Communications and the Digital Economy (DBCDE):** The DBCDE has a leading role in outlining the strategic direction of the telecommunications sector, and providing advice on all regulatory policy aspects of the telecommunications and radiocommunications sectors. Its Telecommunications Industry Division also provides advice on legislative and administrative arrangements for Telstra and Australia Post.
- ▶ **Australian Communications and Media Authority (ACMA):** The ACMA is a regulator of the Australian communications industry, with specific responsibilities for the regulation of broadcasting, the Internet, radiocommunications and telecommunications consumer and technical matters.
- ▶ **Australian Competition and Consumer Commission (ACCC):** The ACCC regulates competition in the telecommunications industry with specific responsibilities for the administration of the regulation of anti-competitive conduct, and the approval and arbitration of access codes developed by the industry.
- ▶ **Telecommunications Industry Ombudsman (TIO):** The TIO provides an independent dispute resolution forum for complaints made by residential and small business consumers of telecommunications services. The TIO is funded through charges levied on carriers and service providers on the basis of complaints received against them.
- ▶ **Communications Alliance Ltd:** The Communications Alliance is the peak communications industry body and has primary responsibility for developing technical, operational and consumer industry codes and standards for the industry.<sup>439</sup>

- Victorian Government, Department of Innovation, Industry and Regional Development (DIIRD):** DIIRD is the agency responsible for economic and regional development with a particular focus in innovative technology. Part of DIIRD is **Multimedia Victoria (MMV)**. The core responsibilities of Multimedia Victoria are growing the information and communications technology (ICT) industry in Victoria and implementing a strategic approach to broadband telecommunications.
- Department of Sustainability and Environment (DSE):** DSE publishes the Victorian code of practice for telecommunication facilities.

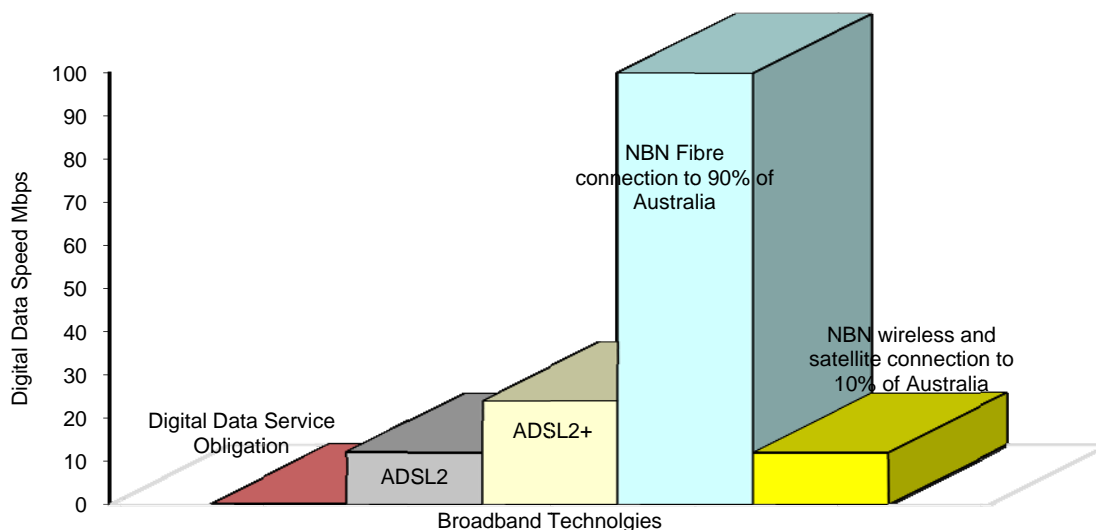
### 11.2.3 Sector trends

#### *Growth in broadband uptake*

Broadband is a class of data transmission technologies, including optic-fibre (FTTx), xDSL (such as ADSL, ADSL2+ and VDSL), HCF cable and wireless (such as WiMax, HSDPA and LTE).<sup>440</sup> Broadband speed is continuing to increase with the faster speeds being delivered by fixed line followed by wireless networks.

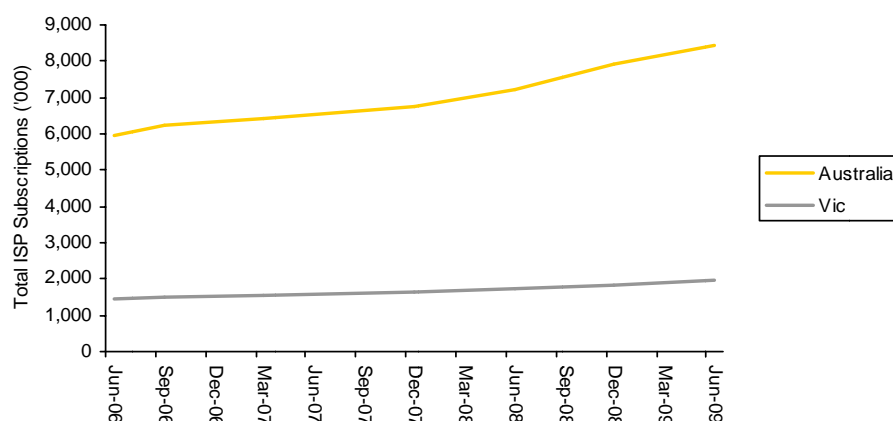
Figure 11.2 illustrates the speed comparisons for different broadband technologies.

Figure 11.2: Digital data speed comparison<sup>441</sup>



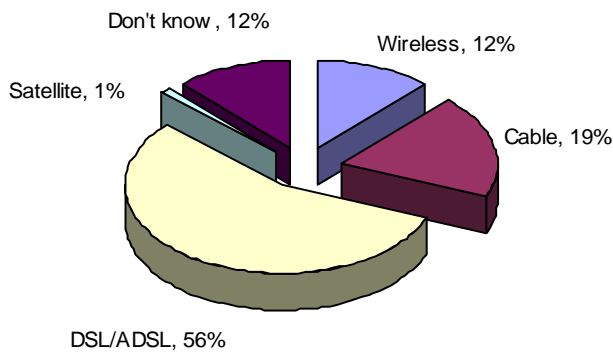
The combination of increased speed and increased demand has resulted in continual growth in broadband connections. Figure 11.3 displays both Victoria's and Australia's take-up of ISP subscriptions.

Figure 11.3: Total ISP subscriptions<sup>442</sup>



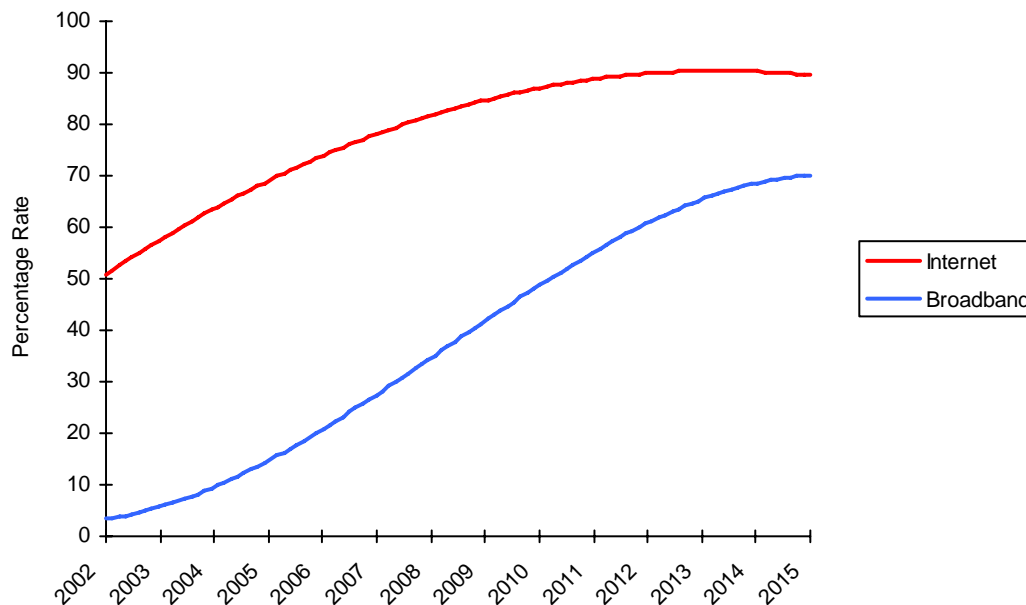
The percentage of connections using different broadband technologies is shown in Figure 11.4.

Figure 11.4: Type of broadband connection<sup>443</sup>



The past growth in broadband is expected to continue as illustrated in Figure 11.5. The availability of reasonably priced fourth generation (4G) cellular and wireless telecommunication technology and the rollout of the NBN will accelerate this.

Figure 11.5: Forecast Internet and broadband take-up<sup>444</sup>



#### Rollout of Government broadband infrastructure

In response to the increasing demand for high-speed broadband services, and need to provide broadband services in regional and other areas with limited access, governments have initiated a number of projects to develop broadband networks.

#### National Broadband Network

In early 2009, the Australian Government announced that it would be building the National Broadband Network (NBN). The NBN aims to connect 90% of Australian homes, schools and workplaces with 100Mbps broadband services through fibre FTTH and FTTB connections. The remaining 10% will be provided with 12Mbps wireless and satellite broadband services.

The network will be built and operated by a new company specifically established by the Australian Government for the project. Investment in the company will, according to preliminary estimates, total up to \$43 billion over eight years. Funding for the company will come primarily from the Australian Government through the *Building Australia Fund*, which will be the majority shareholder. The Australian Government expects private sector investment in the company through the Australian Government issuance of Aussie Infrastructure Bonds (AIBs). The Australian

Government intends to sell its interest in the company after the network is built and fully operational.

The Australian Government claims that the NBN will lead to a significant reform in the telecommunication industry as it will create a complete separation between the infrastructure provider and the retail service providers. This separation is expected to lead to greater retail competition and lower prices.

Rollout of the network in Victoria is expected to commence in 2010, simultaneously in metropolitan, regional, and rural areas.

#### ***Fibre in Greenfield Estates***

The Australian Government has announced that all greenfield estates that receive planning approval after 1 July 2010 will require fibre-to-the-premises infrastructure. This initiative is designed to ensure that homes built in new developments or major redevelopments are connected via fibre infrastructure. In December 2009, the Australian Government released an exposure draft of a bill to implement the changes.<sup>445</sup>

#### ***Backhaul Blackspots Initiative***

To immediately enhance broadband access in regional Australia, the Australian Government announced in April 2009 the Backhaul Blackspots Initiative. This program provides \$250 million to be used to immediately address 'backbone blackspots' in regional Australia. In June 2009, the Australian Government announced that South West Gippsland has been named as one of six initial locations in the first round of the program. It was the only Victorian location to be funded. The contract for the initiative was awarded to Leighton Holdings owned Nextgen Networks in December 2009 and was announced as part of the first building blocks of the National Broadband Network.<sup>446</sup>

#### ***Victorian Government initiatives***

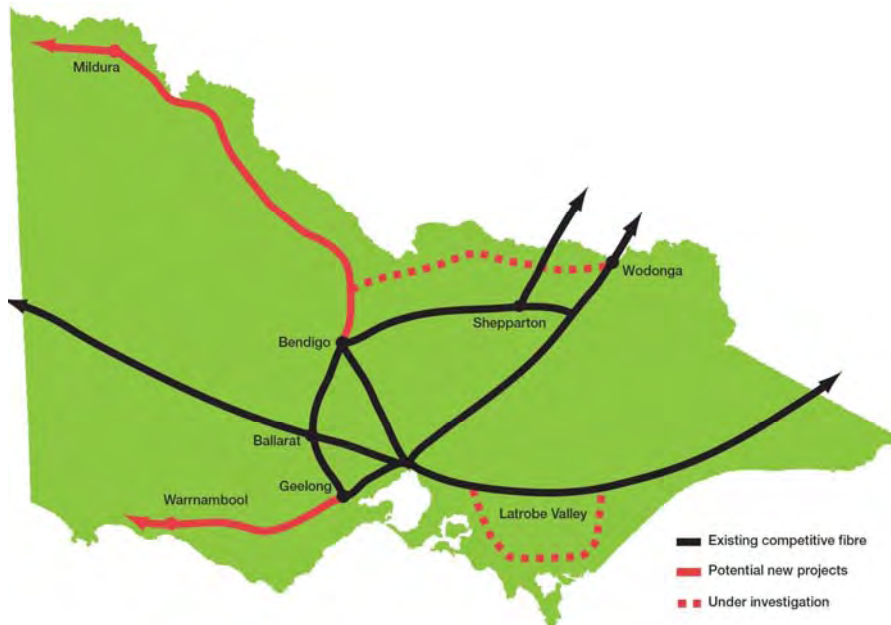
The Victorian Government has a number of initiatives that have the policy objectives of:

- ▶ Achieving better broadband services for users in significant and underserved regional markets
- ▶ Improving regional government organisations' needs for high capacity telecommunications services.<sup>447</sup>

One initiative is the TAFE Broadband Program. This \$20 million program, announced in August 2008, will provide high capacity broadband connectivity (one gigabit per second fibre cable) to the head office of 14 TAFE institutes across Victoria. It will also provide for greater connectivity to the within-institute campus network.

The main initiative is the VicFibreLINKS (VFL) Program. This \$20 million program, announced in August 2008, involves the deployment of competitive open access fibre backhaul infrastructure in regional Victoria with two priority routes, Bendigo to Mildura and Geelong to Warrnambool. Eight other routes are being examined. These routes were selected as they are currently serviced by only a single fibre backhaul infrastructure provider and were believed to have a lack of competitive supply of services such as mobile broadband and fixed line broadband. They also have significant unmet demand. The objective of the VFL is to introduce a competitive backhaul capability into the region with the aim that it will generate innovation from competitors.<sup>448</sup> See Figure 11.6.

Figure 11.6: The locations and extent of the VicFibreLINKS project<sup>449</sup>



The Victorian Government has asked the Australian Government to fund the VFL Extensions Program, valued at \$57.4 million, as the State cannot fund this by itself. The program would provide fibre links to cover the additional seven routes, which are:

- ▶ South to West Gippsland
- ▶ Echuca to Wodonga
- ▶ Bellarine Peninsula
- ▶ Mornington Peninsula
- ▶ Warrnambool-Portland-Hamilton loop
- ▶ Seymour loop
- ▶ Benalla loop
- ▶ Wangaratta loop.<sup>450</sup>

To facilitate this, the Victorian Government has stated that it will adapt its VFL program and consider providing access to VicTrack's existing fibre and other telecommunications assets as part of any 'package'. The government-owned VicTrack has an extensive metropolitan FOC footprint along the urban rail corridors and a regional FOC footprint that extends along the regional fast rail network to Geelong, Ballarat, Bendigo and Traralgon.<sup>451</sup>

Another set of infrastructure initiatives has been advanced by the Victorian Government as a way of developing areas of excellence in key areas. Examples include:

- ▶ Victorian eResearch Strategic Initiative (VeRSI): VeRSI is a \$16 million project that includes investment in grid infrastructures, services and applications, essential to providing researchers with the tools (networks, data stores and grids, portals, applications, demonstration projects, skills and training) that will enable eResearch practices to develop.<sup>452</sup>
- ▶ The Victorian Education and Research Network. VERNet links university campuses state-wide via a fibre network. Announced in June 2006, VERNet will eventually connect into 200 locations across Victoria and is already linked to the national Australian Research and Education Network and to global education and research communities in the US, Europe, Asia and South America.<sup>453</sup>

The Victorian Government's agency, VicTrack, is a significant niche telecommunication provider operator. VicTrack is primarily involved in managing government assets, primarily rail land and infrastructure, but also owns fibre infrastructure along the four regional fast rail corridors for rail signalling and control purposes, a network of wireless towers to provide radio communications with

the trains, and a Network Operations Centre. While it primarily provides telecommunication services for transport operators, it also provides it for government and other groups. In 2008, it began building the intra-Government Secured Network (iGSN) on behalf of the Victorian Government. The iGSN links a number of government central business district (CBD) buildings with the main government remote data centres through secure and protected high bandwidth data channels (1-10 GBps).<sup>454</sup> VicTrack also provides backhaul data services to Basslink Telecoms between Traralgon and Melbourne's CBD.<sup>455</sup> Figure 11.7 illustrates VicTrack's metropolitan fibre network.

Figure 11.7: VicTrack's metropolitan fibre network<sup>456</sup>

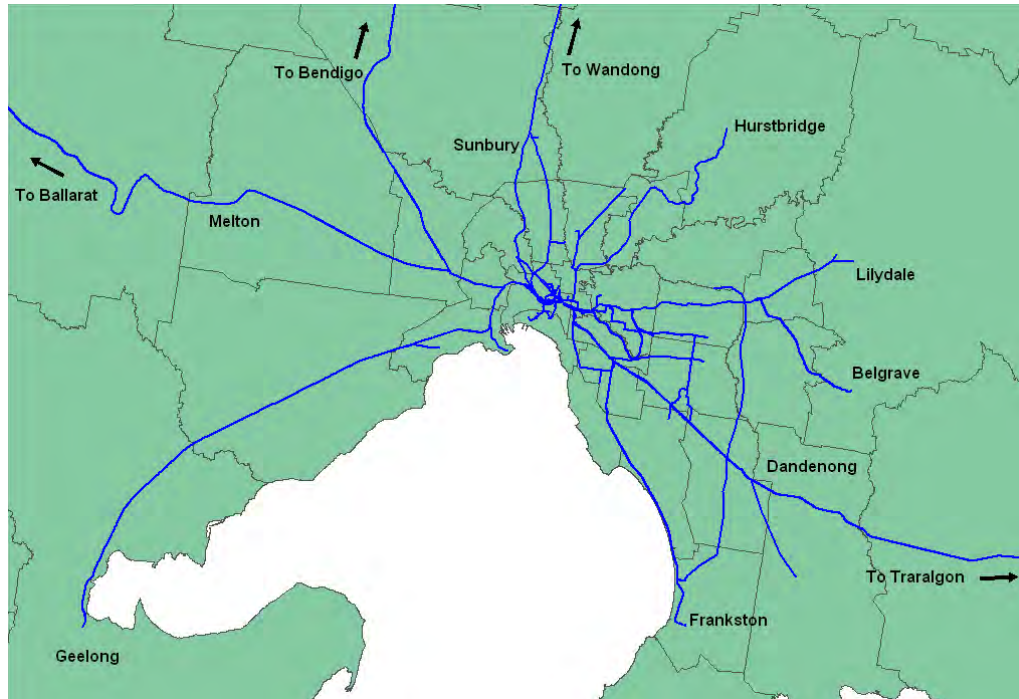
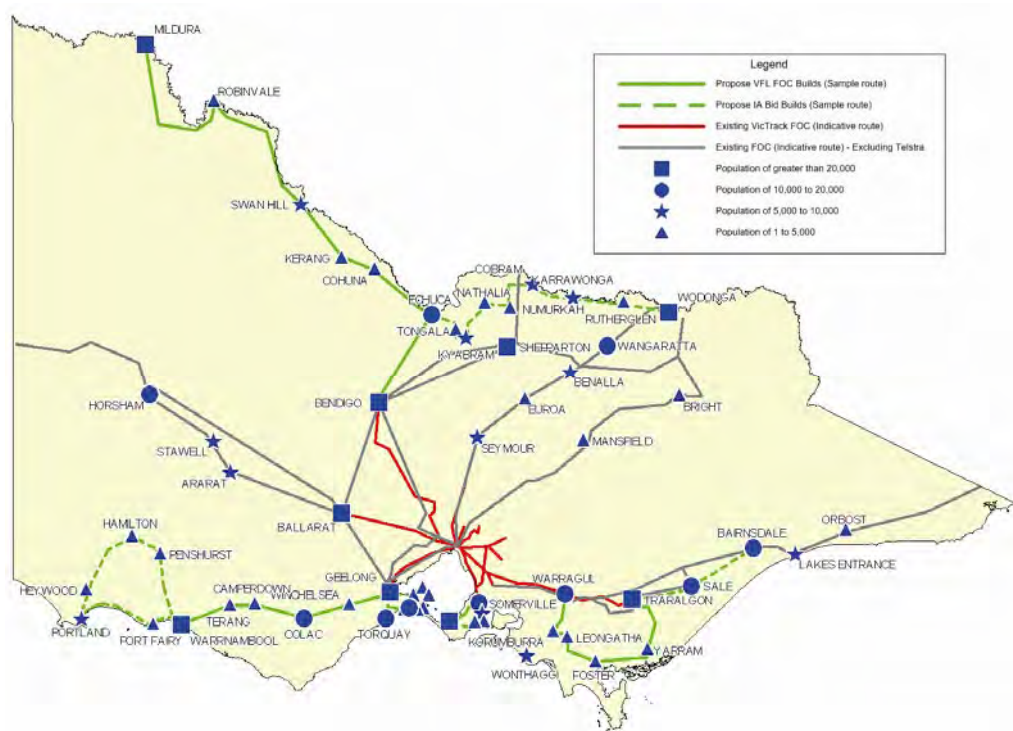


Figure 11.8 identifies existing and proposed non-Telstra fibre optic cables.

Figure 11.8: Existing and proposed non-Telstra fibre optic cables (FOC)



## 11.3 Performance

### 11.3.1 Fixed line CAN infrastructure performance

Fixed line telephone provision is universal as it is a requirement for Telstra, under the Australian Government's universal service obligation (USO), to ensure that standard telephone services are reasonably accessible to all people in Australia on an equitable basis.<sup>457</sup> The cost of supplying loss-making services that are required to fulfil the USO is shared among all carriers.

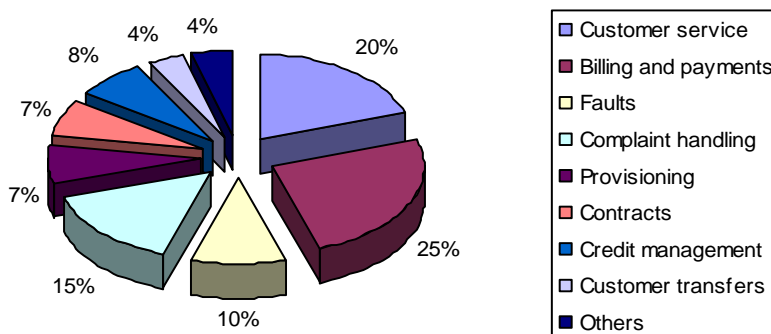
ACMA's surveys identify that the majority of Australians are largely satisfied with their fixed-line service. As seen in Table 11.2, over 80% of people stated that their fixed line phone service met or exceeded their expectations.<sup>458</sup> This perception did not appear to differ by the caller's location or the call's destination.

*Table 11.2: Household consumer satisfaction with fixed-line service providers by location Australia-wide, January–June 2008<sup>459</sup>*

Consumer opinion	Local		Long distance		International	
	Metro	Non-metro	Metro	Non-metro	Metro	Non-metro
Exceeded my expectations	7%	9%	6%	8%	7%	8%
Mostly met my expectations	73%	73%	74%	75%	73%	73%
Sometimes met my expectations	14%	13%	15%	12%	15%	13%
Rarely met my expectations	6%	5%	5%	5%	5%	6%

Figure 11.9. identifies the nature of complaints relating to fixed lines.

*Figure 11.9: Fixed line complaints Australia-wide, 2008/09<sup>460</sup>*



Evaluating the performance of broadband involves assessing the grade and quality of services. This normally involves assessing not only infrastructure issues, such as coverage and capacity, but also market issues such as pricing and packages offered. However, the Report Card focuses on infrastructure issues and while making comment on the existence of multiple broadband infrastructure providers in a market, does not rate the affordability of broadband.

The majority of broadband connections are provided by the copper wire fixed lines. About 70% of broadband connections are DSL, and the most common form is asynchronous DSL (ADSL). ADSL uses Telstra's copper phone network to connect to the home from exchanges.<sup>461</sup>

In Victoria, DSL is available from 2,757 out of 5,069 exchange service areas, and some 98% of homes and businesses are located in these exchange service areas as of 30 June 2008.<sup>462</sup> However, some premises within an exchange service area may not be able to access DSL because they are:

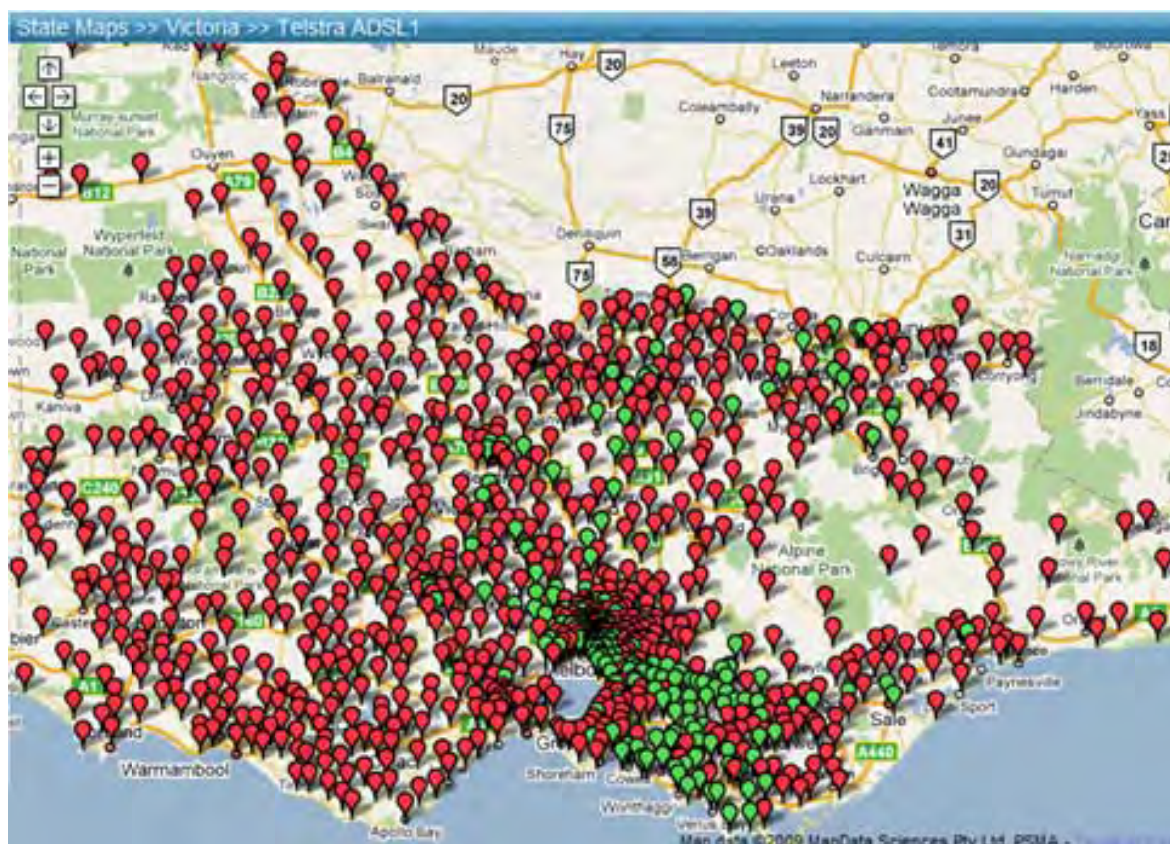
- ▶ Located too far from an exchange as the quality of DSL decreases with distance

- ▶ Have a technology problem such as having a large pair gain system (LPGS) already on their line which results in no additional capacity being available, not being connected to a copper phone line, or suffering from external interference such as a tram line.<sup>463</sup>

A faster version of DSL is ADSL2+. This service can provide download speeds of up to 24 Mbps; however, the premise typically needs to be within 1.5km of an exchange to get speeds greater than 12 Mbps.<sup>464</sup> As of September 2008, there were 1,403 exchanges enabled with ADSL2+, and it is available in nearly all metropolitan exchanges.<sup>465</sup> About 48% of the population lives within 1.5 km of an ADSL2+ enabled exchange.<sup>466</sup> The Municipal Association of Victoria states that 70% of the rural population has broadband availability.<sup>467</sup>

Figure 11.10 shows the physical ADSL-capable exchanges in Victoria.

Figure 11.10: ADSL enabled exchanges in Victoria (red signifies ADSL1 and green ADSL 2+ exchanges)<sup>468</sup>.

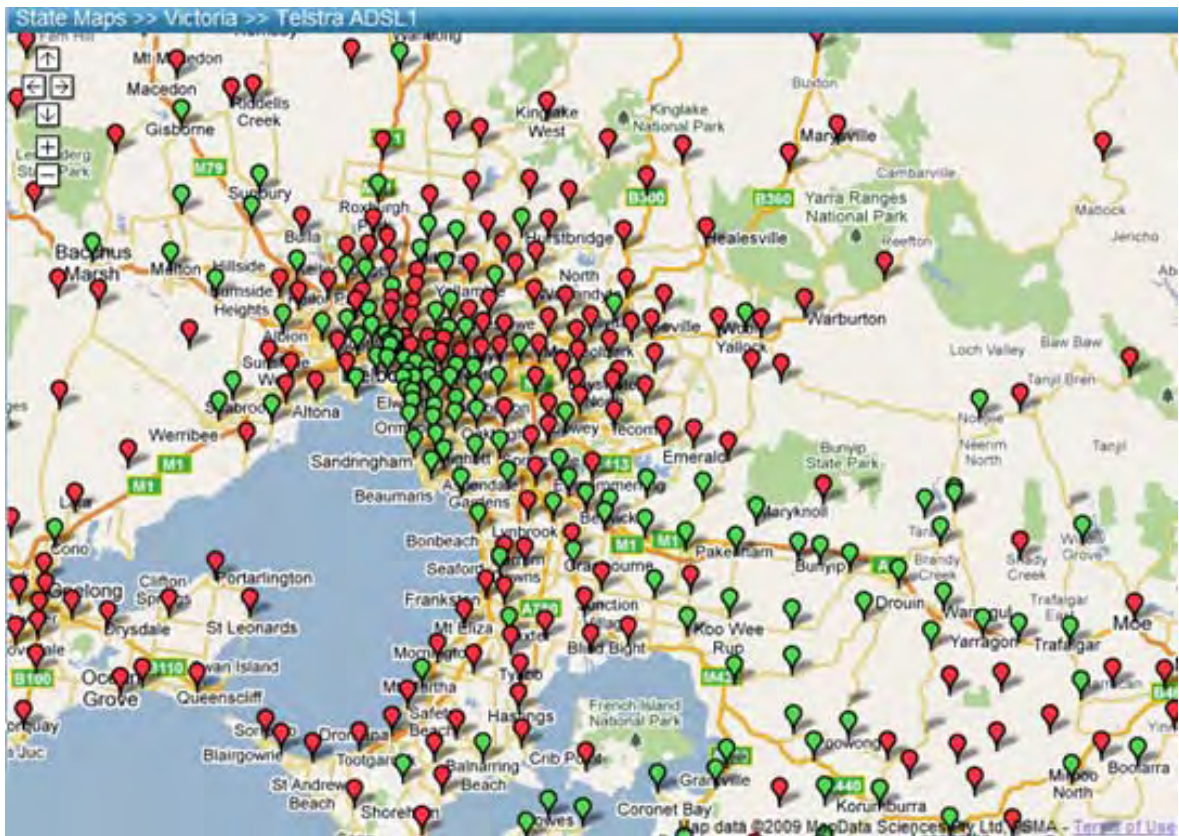


Upgrading of exchanges is continuously occurring and details of the availability of ADSL ports in exchanges and by CMUX are available from Telstra Wholesale at <http://telstrawholesale.com/products/data/adsl-reports-plans.htm> and on [ADSL2exchanges.com.au](http://ADSL2exchanges.com.au) under the RIM section

Telstra is the largest provider of fixed-line broadband via its DSL enabled exchanges. Some 92% of Melbourne's population has Telstra DSL access. Several more percent of the population can access broadband via other providers. However, there is still several percent of the population that do not have access. These are in developed areas where the infrastructure cannot support additional lines, or in new areas where DSL is not available from the exchange. To increase supply, investment by the telecommunication providers is required, but this will only occur where providers can make a commercial return on the investment. Consequently, in developed areas where the vast majority of demand is met, addressing small scale blackspots is not a priority.

Figure 11.11 shows the physical ADSL-capable exchanges in Melbourne.

Figure 11.11: ADSL enabled exchanges in Melbourne (red signifies ADSL1 and green ADSL 2+ exchanges)<sup>469</sup>

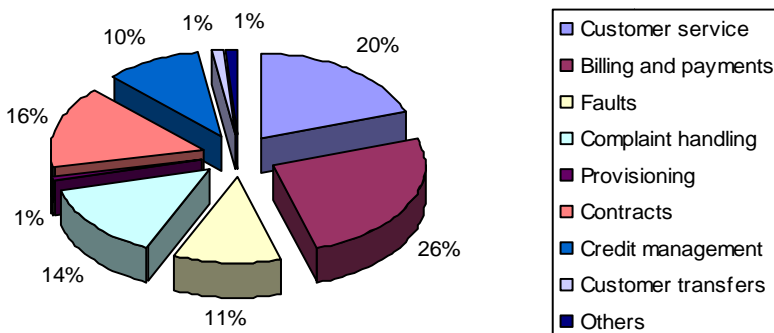


Another form of fixed line broadband services includes hybrid fibre coaxial (HFC) (which are used by cable modems) and FTTx. In March 2009, Telstra announced an upgrade to its Victorian cable network which could give up to a million Melbourne homes access to ultra-high-speed broadband by December. This was announced as part of a \$300 million national upgrade to Telstra’s HFC network. The average speed of the upgraded network will be between 70 and 100Mbps.

**11.3.2 Mobile CAN infrastructure performance**

Figure 11.12 identifies the number and type of complaint issues for mobile phones. Of the complaints, 13,056 of these were relating to faults in the mobile network. With the introduction of the 3G services, the level of complaints has fallen significantly.

Figure 11.12: Mobile complaints issued by category, 2008/09<sup>470</sup>



The main geographic areas of poor coverage performance in Victoria are East Gippsland and the Victorian Alpine region. The Municipal Association of Victoria states that 99% of the rural population has Next G™ mobile phone coverage.<sup>471</sup>

### 11.3.3 Backhaul infrastructure

Melbourne's inter-capital transmission infrastructure consists of:

- ▶ Over 10 long-haul fibre systems with POPs with four alternative paths serving the direct routes of Brisbane, Canberra, Sydney, Adelaide, Hobart
- ▶ Over long-haul microwave links.

Intra-regional links are strongly associated with whether or not a particular regional city is located on a major inter-capital route. Regional transmission infrastructure is almost entirely a hub-and-spoke model with Melbourne at the hub.

In some regions of Victoria, backhaul infrastructure consists of only one primary fibre cable line. These can be cut, typically accidentally by a backhoe, which can result in a loss of most telecommunication access for as many hours as the cable is repaired. The other major problem with single fibre links is that there is a lack of competition, resulting in high broadband prices.

## 11.4 Future challenges

The challenges to achieving improvements in infrastructure are:

- ▶ **Creating a value proposition for ubiquitous high speed broadband.** The NBN aims to provide universal high speed broadband access, and it is claimed that this will deliver significant improvements in business efficiency and innovation, and quality of life improvements. However, while there is no doubt that its higher speed and universal access will be welcome, the cost of it will be significant. Already the vast majority of all businesses have high speed access, as do the majority of urban Australians if they wish to purchase it. A challenge will be in ensuring that the NBN benefits justify their costs. Victorian-specific decisions affecting the NBN include what role that VicFibreLINKS will play in the NBN, and what will be the use of VicTrack's assets. These decisions will not only shape the final form of the NBN, but also the speed of rollout.
- ▶ **Accessing investment in the global financial crisis.** Following the global financial crisis, capital availability has not returned to pre-crisis levels. As telecommunication companies are capital intensive, reduced capital availability slows upgrade and expansion plans.
- ▶ **Meeting rising telecommunication demand.** Congestion in mobile CAN infrastructure may occur in areas of very dense population or during peak demand. This will be managed by increasing the number of cells and microcells, providing that there is sufficient space. The Victorian Government's *Code of Practice for Telecommunication Facilities in Victoria* facilitates the rapid installation of new telecommunication facilities. In a few regional areas, access to competitive speed bandwidth services will improve with the completion of the currently under way VicFibreLINKS and Blackspot projects, but significant improvements will depend on the development of the enhanced VicFibreLINKS program and the NBN.
- ▶ **Balancing market driven telecommunication developments and government intervention to create a competitive telecommunication industry that delivers affordable and widespread access.** Telecommunication infrastructure investment decisions are made by telecommunication providers on the basis of market decisions. Consequently, areas of good financial returns have better telecommunication capabilities than other areas. Areas that are served by a single provider generally experience higher prices and lower quality services than areas with competitive provision. Therefore, for social and economic reasons, improved services are required for under-served areas. This invariably requires some form of government intervention. Certain difficult to access areas of Victoria are not served by fibre and are unlikely to be served by commercial players, thus government subsidy to these areas will be required.
- ▶ **Selecting optimal technologies.** There are many technologies that telecommunications companies can deploy. All have tradeoffs such as cost, risk, capability and compatibility. The selection of technologies is critical in preventing stranding of assets, particularly for smaller telecommunication companies that do not dominate the market, and for those wishing to be compatible with the NBN.

- ▶ **Addressing the lack of clarity in regulation and access arrangements.** A lack of clarity in regulation and access arrangements has slowed telecommunication companies investing in infrastructure. Consequently, the nature of the Australian Government's current telecommunication reforms will be critical in providing the certainty required for telecommunication investment.

## 11.5 Report Card Rating

Infrastructure type	Victoria 2010	Victoria 2005	National 2005	National 2001
Telecommunications	C	Not rated	Not rated	Not rated

Based on considerations of planning, funding, and infrastructure capacity and condition, Victoria's telecommunication infrastructure has been rated C. This rating recognises that telecommunications have become an essential service for business and the community, and while voice and mobile phone services are almost universally available, this is not the case for fast, affordable broadband across the State. Specifically, there is under-provision of fixed broadband infrastructure at exchanges in Melbourne and across Victoria, as well as under-provision of backhaul fibre in regional Victoria. Overall, there is a lack of an integrated strategic plan for telecommunications.

Positives that have contributed to the rating are:

- ▶ Increased quality of broadband services for the majority of Victorians
- ▶ Multiple backhaul providers on main trunk routes
- ▶ Victorian Government initiatives to provide competitive fibre links to regional Victorian
- ▶ NBN vision to provide fibre to premises or wireless broadband capability for all Australians
- ▶ Evolution of VicTrack as a telecommunications infrastructure provider.

Negatives that have contributed to the rating are:

- ▶ Existence of high speed, broadband blackspots in Melbourne and in many regional areas
- ▶ Lack of competition in backhaul links to many parts of regional Victoria, and thus high prices
- ▶ Lack of clarity on converting the NBN vision into reality
- ▶ Lack of use by Victorian Government agencies of dark fibre owned by third parties, as some agencies require their own dedicated fibre network
- ▶ Lack of an overarching integrated telecommunication strategic plan.