Central Highlands ICT Study

Centre for eCommerce and Communications

Lateral Plains

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Project team

Report prepared by:

Centre for eCommerce and Communications (CeCC)
www.cecc.com.au

Lateral Plains (LP)
www.lateralplains.com

Project team:

Dr Helen Thompson (CeCC)

George Fong (LP)

Jennifer Corbett (CeCC)

Barbara Fong (LP)

With support from:

Angela Cox (CeCC)

Andrew Macleod (CeCC)

Paul Feely (CeCC)

Craig Briody (CeCC)

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Executive summary

The Central Highlands Mayors and CEOs Forum together with the Grampians Regional Development Australia (RDA) Committee are working to position the Central Highlands region as a key centre for future growth, especially in knowledge based industries. The potential of ICT as a driver of economic and social development is well recognised. The Central Highlands ICT Study seeks to build on past successes and position the region to take full advantage of next generation broadband, infrastructure and services.

The combination of a regionally based education and training network with an information technology and computing employment cluster places the Central Highlands region at a substantial advantage and at the forefront in its capacity to readily rollout national and state priorities. An accelerated rollout of next generation broadband is needed to replicate and extend existing models for innovative service delivery in areas including education, health and government and to broad effective use of ICT in line with state and national priorities.

The Central Highlands ICT Study has built an evidence base to support regional strategic directions and priority actions. While community terminology around priorities varies, issues linked to broadband technologies and telecommunications are a very consistent theme across the research which has actively engaged more than 600 residents and businesses.

Information gathered through the Central Highlands ICT Study confirms significant unmet demand for fixed broadband services. Better and faster broadband, reducing the costs of access, enhancing safety and security and better supporting mobility were confirmed as the most pressing issues about the internet. Usage would increase if the internet was faster and cheaper. Enhanced mobile coverage, service and reception will generate economic and social benefits for local businesses and residents, benefit those who are visiting or travelling through the region and enhance safety in an emergency event such as a bushfire.

Collaboration at a regional scale will more effectively support advocacy and other actions directed towards ensuring all residents and businesses can access and effectively use quality ICT services. The key strategic directions and actions outlined below build upon and extend the *Grampians Region Strategic Directions*, *Central Highlands Regional Strategic Plan*, *Ballarat ICT 2030 Strategy* and the *Moorabool Regional Broadband and Telecommunications Strategy*.

Strategies	Strategic Actions
Leadership	▪ Forge a common vision and understanding of the needs and requirements for ubiquitous high capacity broadband and mobile communications ▪ Ensure ICT and broadband remain clearly embed in regional strategic planning and development ▪ Bring related agencies, organisations and individuals together to progress the priority strategies and actions as set out in the Central Highlands ICT action plan ▪ Actively promote and brand the Grampians region as a dynamic and vibrant ICT region ▪ Celebrate ICT success through an annual ICT Showcase and the establishment of the Grampians Region ICT Awards ▪ Co-invest to expand the geographical reach of Ballarat ICT Ltd ▪ Be proactive in identifying opportunities for using ICT to enhance economic and social policies and strategies at a regional and LGA level.
Advocacy	▪ Use outputs of the Central Highlands ICT Study to support advocacy targeted towards immediate improvements in mobile telecommunications and broadband services ▪ Advocate for a rapid and comprehensive deployment of next generation broadband throughout the Grampians region ▪ Continue to develop an evidence base to assist the region in building and shaping its ICT policy in the coming years ▪ Conduct periodic surveys and map outputs to illustrate ICT trends, take up and satisfaction levels and respond to clusters of unmet demand for services ▪ On an ongoing basis gather and publish case studies which demonstrate local adoptions of ICT and associated economic and social impacts ▪ Get involved in Australian Communications Consumer Action Network via membership or participation in campaigns and activities.
Infrastructure	▪ Pursue partnerships and maintain an ongoing dialogue with government, NBN Co, telecommunications providers and others to accelerate the rollout of high speed broadband and comprehensive mobile coverage ▪ Support local government and property developers in adopting a proactive approach to broadband provisioning to facilitate a rapid introduction of FTTP infrastructure and services ▪ Engage directly with Telstra, Optus and other mobile providers to achieve improved mobile telecommunications with particular priority for towns most at risk this fire season ▪ Support maintenance and extension of the telecommunications and broadband service mapping which was initiated through the Central Highlands ICT Study
NBN	▪ Create an enabling environment for broadband deployment and ICT adoption and effective use ▪ Gather and aggregate data that assists NBN Co and others in planning and/or extending broadband and telecommunications services

	▪ Provide efficient and effective access to planning and other information by extending the online services established through the Central Highlands ICT Study ▪ Build business and community readiness for a rapid take-up of next generation broadband infrastructure and services ▪ Support the Moorabool Shire in capturing and sharing learning from the Bacchus Marsh Stage 2 release site ▪ Source and regularly disseminate NBN, ICT and other information.
Local government	▪ Recognise effective use of ICT as a core part of service delivery ▪ Identify priorities for the development of applications and local content ▪ Strengthen support for existing and new networks across local government with the goal of fostering and sharing ICT knowledge ▪ Allocate and attract seed funding to support collaborative ICT projects.
Collaboration models	▪ Continue to support the development and growth of the University of Ballarat Technology Park and Ballarat ICT Cluster ▪ Work with regional health and education providers to identify opportunities for leveraging existing broadband networks ▪ Bring health, agribusiness, tourism and manufacturing sector representatives together with researchers and other key stakeholders to identify potential ICT opportunities ▪ Identify scope for innovative niches in the use and application of ICT ▪ Contribute to the development of project plans and preliminary business cases for ICT projects ▪ Promote interoperability at the regional level via adoption of global information management standards ▪ Aggregate ICT requirements in areas such as connectivity, training, hardware, software, knowledge management and digitisation ▪ Support the implementation of local broadband projects that are well-organised and that support industry engagement and participation from the local community ▪ Attract funding for innovative projects using ICT and broadband to deliver enhanced regional services
Skills	▪ Build local ICT capability and expertise through industry engagement ▪ Facilitate regular forums and knowledge exchange events to bring local firms and organisations together around ICT innovation ▪ Attract high profile speakers to present the latest ICT thinking ▪ Assist community based organisations and education providers in promoting ICT literacy, training and other essential ICT skills development ▪ Establish a regional business and community education program which would draw in participation from NBN Co, DIIRD, DBCDE, the Institute for a Broadband Enabled Society, etc.
Research and development	▪ Continue to gather evidence of the social and economic impacts of ICT and broadband diffusion in the Grampians region ▪ Through future community and business surveys build reliable evidence and comparable indicators in areas such as ICT access, use and impact

- Capture and share best practices of broadband use, ideally using an online repository
- Support the University of Ballarat and other stakeholders in attracting private and public sector funding for ICT and broadband research and development
- Produce an annual report card on regional ICT activities, achievements and priorities that details the project that have been given priority, informs on progress and highlights areas that need further attention and consideration
- Establish research linkages with the Institute for a Broadband-Enabled Society.

Glossary[1]

Term	Description
ACCAN	Australian Communications Consumer Action Network - the peak body that represents all consumers on communications issues including telecommunications, broadband and emerging new services.
ADSL	Asymmetric Digital Subscriber Line is one form of the Digital Subscriber Line technology, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voiceband modem can provide. It is called asymmetric because the download and upload speeds are not symmetrical (download is faster than upload).
ADSL2	Asymmetric Digital Subscriber Line 2 adds new features and functionality targeted at improving performance and interoperability and adds support for new applications and services. ADSL2 is a fixed broadband service delivering speeds between 8 Mbps to 50 Mbps).
BDSL	Business Digital Subscribe Line is usually characterized by the fact that it is a symmetric connection, providing equal upload and download speeds. It is a premium, business grade broadband service that is more suitable for bandwidth-intensive applications.
CAPs	Community action plans
DOCSIS 3.0	An international telecommunications standard supporting high-speed data transfer and internet access over hybrid fiber coaxial (HFC) infrastructure. Version 3.0 significantly increases transmissions speeds (both upstream and downstream) and introduces support for Internet Protocol version 6 (IPv6).
First wave broadband	Fixed broadband services delivering speeds typical of initial broadband offerings (i.e. 256 Kbps to 8 Mbps), such as first generation ADSL.
FTTP (FTTH, FTTN)	Fibre to the Premises (Fibre to the Home, Fibre to the Node)
GWIP	Government Wide Internet Protocol – A product analogous to a virtual private network for multiple sites. Those sites can be connected up at speeds of anywhere between 2Mbps to 1Gbps depending on the technologies used (DSL vs Fibre)
HFC	Hybrid fibre-coaxial is a telecommunications industry term for a broadband network which combines optical fibre and coaxial cable.
IBES	Institute for a Broadband-Enabled Society - a cross-disciplinary research institute dedicated to products, services, and innovations that maximise the benefit of new broadband technologies to Australian society

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[1] Adapted from Telecommunications Spend and Demand in Victoria, June 2010, Report by Access Economics Pty Limited for the Department of Innovation, Industry and Regional Development

Term	Description
ICT	Information and communication technologies
IPv6	Internet Protocol version 6 is an internet layer protocol for packet-switched internetworking. IPv6 has a vastly larger address space, plus better networking, mobility and security features.
LGA	Local Government Area
LMDS	Local Multipoint Distribution Services is a broadband wireless access technology commonly operating on microwave frequencies.
Mbps	An abbreviation for megabits per second. It refers to data transfer speeds as measured in megabits.
NBN	National Broadband Network
RSP	Regional Strategic Plan
Second wave broadband	Fixed broadband services delivering speeds typical of technologies such as ADSL2+ (i.e. 8 Mbps to 50 Mbps).
Supply/coverage	The share of the households, businesses or individuals who are able to receive a service. That is the proportion who could use the service on the basis of their home or business address.
Take up	The share of the households, businesses or individuals who are customers of a services, reflecting both demand and availability.
Third wave broadband	Fixed broadband services delivering speeds greater than 50 Mbps.
Unmet demand	The share of households, businesses or individuals who would like to subscribe to a service but are unable to do so due to a lack of coverage

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1. The Central Highlands Region

The Central Highlands region covers the eight municipalities of Moorabool, Golden Plains, Central Goldfields, Hepburn, Ballarat, Pyrenees, Ararat and Northern Grampians. The Central Highlands ICT Study builds upon the Central Highlands Regional Strategic Plan (RSP) which was launched during August 2010. The RSP noted major attributes of the Central Highlands including:

- Proximity and access to Melbourne
- Sustained population growth
- Outstanding built and natural heritage
- Victoria's best developed and integrated regional higher education and training system network
- Regional Victoria's strongest concentration of information communications and technology (ICT) and computing services and capacity
- A restructuring economy embracing new opportunities in areas such as ICT, advanced manufacturing, education and tourism

DEMOGRAPHY

The Central Highlands region (population 199,000[2]) exhibits great diversity in terms of population spread, demographic and economic activity. It incorporates bustling retail and service centres, diverse agricultural enterprises, historic gold mining towns, rolling green hills, mountainous areas and rugged bush landscapes. The Western Highway, which traverses the region linking the cities of Melbourne and Adelaide is the second busiest national highway in Australia, in terms of freight movements, with over five million tonnes annually.

The City of Ballarat (population 94,000) is the most geographically compact and densely populated LGA in the Central Highlands region. Ballarat has a strong commercial and industrial base as well as a significant tourism industry. It is also a hub for service delivery in areas including property and business services, construction, health and education. Local competitive advantage is supported by Victoria's major regional employment cluster in the ICT sector through the University of Ballarat, the University of Ballarat Technology Park and the substantial presence of firms such as IBM.

The Moorabool Shire (population 28,000) and the Golden Plains Shire (population 18,000) border the major population and economic activity centres of Melbourne, Geelong and Ballarat. A significant percentage of their residents regularly commute outside their LGA to

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[2] Regional population estimates as at 30 June 2009. Source: Australian Bureau of Statistics: http://www.ausstats.abs.gov.au/ausstats/nrpmaps.nsf/NEW+GmapPages/national+regional+profile?opendocument#from-banner=LN

access education and employment opportunities. Economic development strategies are directed towards business and resident attraction and the reduction of escape expenditure in both locales.

The Hepburn Shire (population 15,000) has a strong tourism focus centred on Daylesford and to a lesser extent, Creswick with the establishment of the five star Forest Resort Hotel and Convention Centre. The agriculture and construction sectors contribute significantly to the economic activity of the shire. Another aspect of the Hepburn Shire's profile is the 'part-time' residents who share their time between living and working in the region and in metropolitan Melbourne. The increasing mix of established residents and 'tree-changers' is also evident in other LGA in the Central Highlands.

The Central Goldfields Shire (population 13,000) is centred on the town of Maryborough. Urban renewal plans and community initiatives have recently resulted in the return of the passenger rail service to Melbourne and the redevelopment of the area comprising the train station and surrounds as the Station Domain and Community Hub. The agricultural sector is an important contributor to their local economy (32%). There has also been a distinct push towards leveraging the region's history and heritage to increase their economic activity and tourism.

The Rural City of Ararat and the Northern Grampians Shire (populations around 12,000 each) are geographically the largest of the Central Highlands LGAs. Both areas have active business, industrial and retail hubs, significant agricultural bases and complimentary tourism assets, including the Grampians area centered on Halls Gap. Both regions also have notable wine industries, in particular the Great Western region in the Northern Grampians Shire.

The Pyrenees Shire (population 7,000) has the lowest LGA population in the Central Highlands region. Agriculture remains the region's major industry (60.6%), with key areas of production including wool, meat and grain. Other production areas include timber and the well established wine industry centred on Avoca, which builds on regional tourism opportunities.

ICT STRENGTHS AND CAPACITY

The Central Highlands region is exceptionally well placed with its existing strengths and ICT capacity compared to the rest of Victoria and regional Australia. Major attributes of the Central Highlands region include[3]:

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[3] Includes extracts from the Central Highlands Regional Strategic Plan.

- A clear vision for the broadband future and a commitment to crafting policies that encourage rapid ICT deployment and adoption.
- Victoria's best developed and integrated regional higher education and training system network. Education and training programs ranging from Certificate 1 in Information Technology through to Master and Doctoral degrees in ICT.
- Australia's most vibrant and dynamic regional technology park. The University of Ballarat Technology Park currently employs 1,750, people generating significant economic and social benefits. Expansion plans identify the potential for a further $200 million of capital investment through the development of eight major buildings and an employment increase of between 1,500 to 2,000 people.
- Regional Victoria's strongest concentration of computing services, ICT capacity and employment. This is delivered through the Ballarat ICT Cluster and the substantial presence of firms such as IBM and iGate Corporation.
- Significant telecommunications and broadband provider presence. Telstra Countrywide who employ in excess of 350 people in the Central Highlands, Neighbourhood Cable and the Ballarat Community Telco.
- Strong regional innovation capacity with established clusters of research excellence. The cluster includes the Centre for Informatics and Applied Informatics and Optimization, the Internet Commerce Security Laboratory and the Centre for eCommerce and Communications.
- Significant track-record in delivering regional scale ICT initiatives and programs. These initiatives and programs support service delivery innovation in areas including health, education and environmental sustainability.
- Strong ongoing ICT investment in the region. Vertex Australia was recently announced as part of ongoing Australian expansion plans, a financial commitment in excess of $10 million to establish a site employing up to 600 staff in Ballarat. Another planned initiative is the $10 million redevelopment of one of the buildings on the University of Ballarat Technology Park to enable the establishment of a tier three data centre.

The Central Highlands Region has a concentration of expertise to take full advantage of the NBN. The accelerated rollout of high speed broadband will strengthen existing ICT strengths and capacity. Comparative advantages in education, training and ICT will support the region in more readily adopting new models for an array of service provision that extend across education, training, health services, information provision, skills upgrading and their integration and effective delivery at the regional and local levels and to urban and rural areas.

TELECOMMUNICATIONS SPEND

Recent research conducted by Access Economics[4] gives an insight into the central role that telecommunications play in the Central Highlands regional economy and in the day-to-day

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[4] Telecommunications Spend and Demand in Victoria, June 2010, Report by Access Economics Pty Limited for the Department of Innovation, Industry and Regional Development.

life of its citizens. The study sought to model Victoria's telecommunications markets at the regional level, in terms of variables such as coverage, demand, take-up, expenditure and unmet demand, and to provide a picture for these markets over the next five years. Figure 1 confirms 2009/10 total telecommunications expenditure for the Central Highlands region was estimated to be $339 million[5]. This amount combined fixed broadband ($46.14m), mobile data ($35.62m), voice ($228.35m) and Pay TV ($28.9m).

Figure 1 – Central Highlands telecommunications expenditure 2009/10
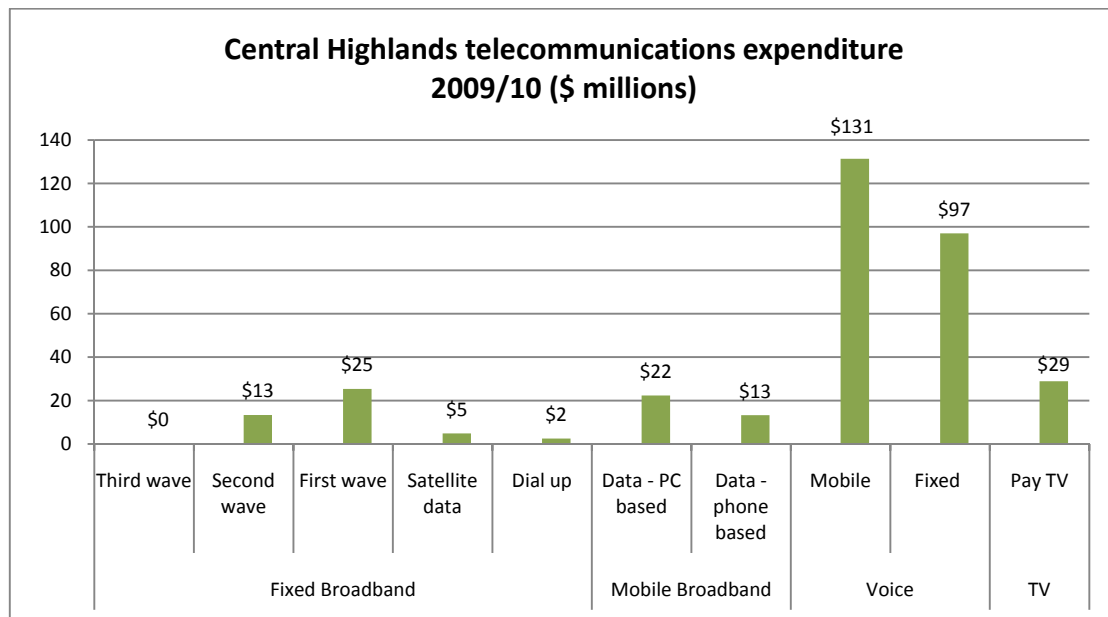
BROADBAND COVERAGE

Broadband is the new essential utility, as vital to economic growth as clean water and good roads[6]. Access Economics confirms significant gaps in broadband coverage in the Central Highlands region. While coverage for first wave broadband is near universal, second wave broadband is restricted to regional cities and towns where exchanges are enabled for ADSL2+. Until very recently there was no third wave broadband available in the Central Highlands region. As a result of an upgrade to Neighbourhood Cable's broadband services, some Ballarat residents can now access services which include Premium 60 Mbps and Premium 100 Mbps speed packs. This is well above the average maximum bandwidth of 6.20 Mbps which has been reported for the Grampians Region[7].

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[5] op cit, p. 65-68.
[6] Intelligent Community Forum www.intelligentcommunity.org
[7] Access Economics, p. 70.

UNMET DEMAND

In the Central Highlands region there is significant unmet demand for second and third wave fixed broadband services. Unmet demand includes areas where demographic and business characteristics are generating significant demand for services, areas that lie beyond the reach of high speed services from the exchange, or in areas where exchanges have not yet been enabled for second or third wave broadband services.

Figure 2 – Unmet demand for fixed broadband services[8]
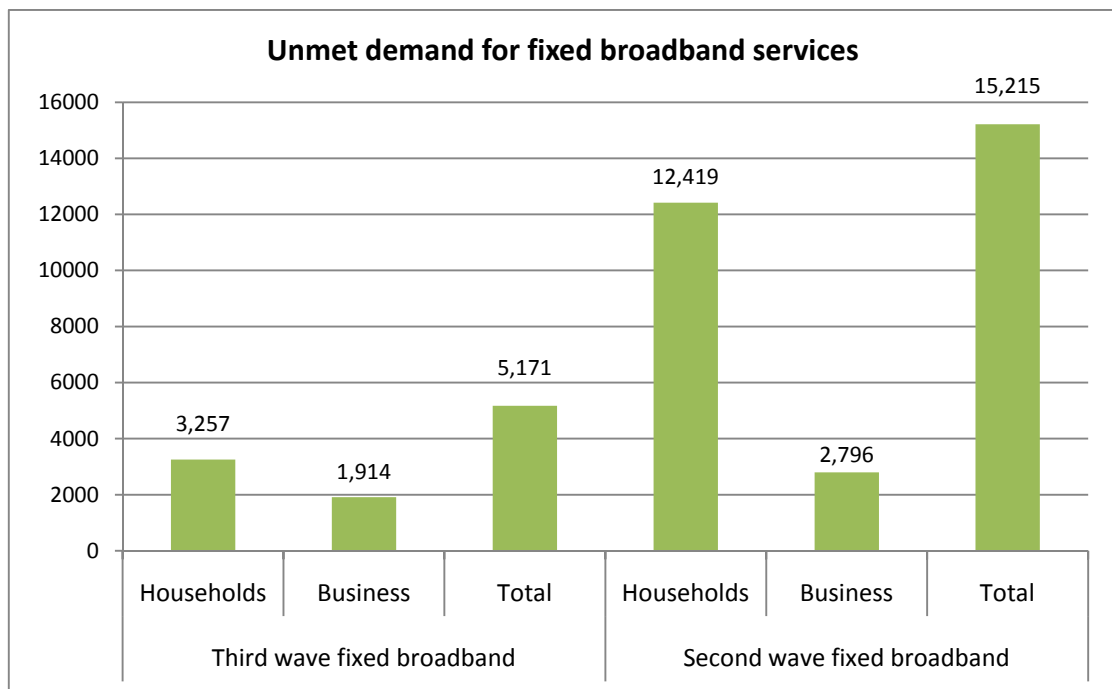
More than 3,250 Central Highlands households and 1,900 businesses would have subscribed to a third wave broadband service in December 2009 if it was available. An even higher number of households and businesses would have adopted second wave broadband services but were unable to do so due to a lack of coverage (12,419 householders and 2,796 businesses).

FUTURE DIRECTIONS

The Central Highlands Mayors and CEOs Forum together with the Regional Development Australia (RDA) Grampians Committee are working to position the Central Highlands region as a key centre of future growth, especially in knowledge based industries. The Central Highlands ICT Study complements and builds upon:

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[8] Op cit, p. 72-73.

- Ballarat ICT 2030 Strategy (see www.ballaratict.com.au/2030)
- Moorabool Regional Broadband and Telecommunications Strategy (see ICT project link at www.moorabool.com.au)
- Wimmera Southern Mallee ICT Study (in progress)

The Central Highlands region is ready to take full advantage of the rollout of the NBN. The announcement of Bacchus Marsh as a second stage release site (see Figure 3) for the National Broadband Network (NBN) will assist in positioning the region for an early rollout of the high-speed communications network. Regional stakeholders are working collaboratively across the Central Highlands and Wimmera Southern Mallee Regions to embrace the NBN.

Figure 3 – Bacchus Marsh NBN Second Stage Release Site
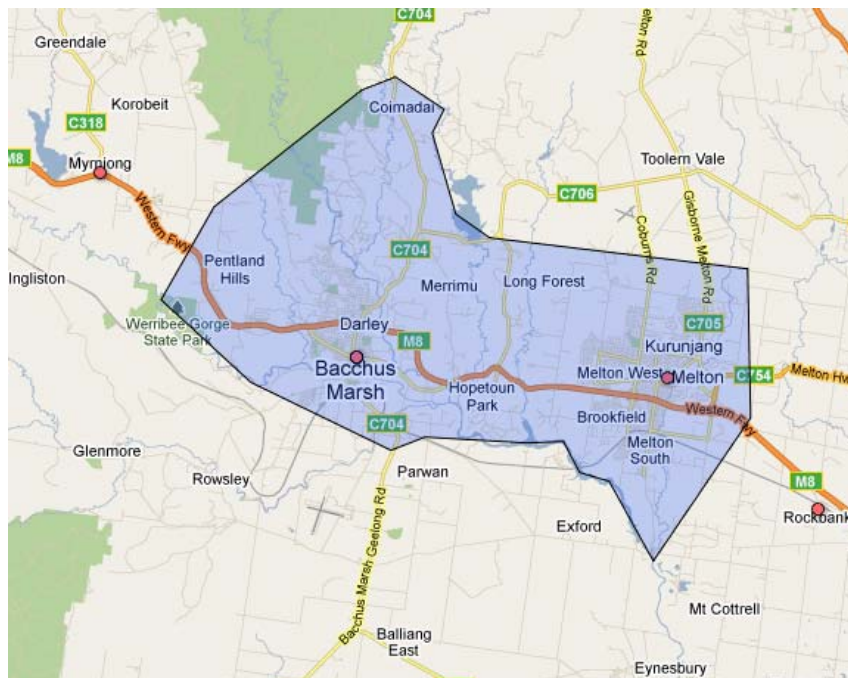
A proactive approach to knowledge capture and transfer will ensure that learning captured through the Bacchus Marsh experience is shared across the Central Highlands and Wimmera Southern Mallee region.

2. Policy context

2.1 FEDERAL GOVERNMENT

- Regional Development Australia is an Australian Government initiative that brings together all levels of government to enhance the growth and development of Australia's regions. A network of 55 RDA Committees has been established to achieve this objective. On 14 September 2010, the Hon Simon Crean was sworn in as Minister for Regional Australia, Regional Development and Local Government.

- The Grampians RDA Committee will provide strategic input into national programs and will be the conduit for regional engagement with Canberra. Global infrastructure for local growth – universal, affordable access to ICT is a major driver of change and holds the key to sustainability and growth throughout the region. The Grampians RDA Committee is focused on being well planned and ready for the rollout of the NBN.

- During April 2009, the Australian Government launched its 21st Century Broadband policy to establish a new company to invest up to $43 billion over eight years to build and operate a national broadband network. The NBN will deliver affordable, high speed broadband services to all Australians no matter where they live or work.

- The NBN will extend optical fibre to 93 percent of premises, with speeds of 100 Mbps – 1,000 times faster than many people experience today. Other communities will be served by next generation wireless and satellite services, with average data rates of 12 Mbps or more – 20 times higher than most users of these technologies experience today.

- A further aspect of this national policy is the mandating of FTTP in all new estates. This has significant implications for LGAs, as planning provisions will need to be changed to enable the mandating of FTTP.

- On the 7 September 2010 the Australian Labor Party and the Independent Members (Mr Tony Windsor and Mr Rob Oakeshott) entered an Agreement which incorporates a commitment to better meeting the needs of regional Australia, to 'place-based thinking' and 'localism' and to establishing new accountability requirements such as the development of a spatial accounting model which will result in better reporting and visibility of Government spending and service delivery in regional Australia in areas such as education, health and transport.

- Federal Government initiatives available for building capacity and enhancing the economic and social potential in regional Australia include:
  - Priority in connecting regional areas to the National Broadband Network
  - $800 million for the new Priority Regional Infrastructure Program to fund projects identified by local communities
  - A Regional Priorities Round of $500 million from the Education Investment Fund for regional universities and TAFEs

- The Digital Regions Initiative which is a four-year $60 million program that co-funds innovative digital technology projects with state, territory and local governments

- Granting $8 million for a new Regional Development Policy Centre

- As part of its funding agreement with the Department of Broadband, Communications and the Digital Economy, the Australian Communications Consumer Action Network administers an independent grants program scheme that provides funding for research and representation projects

2.2 STATE GOVERNMENT

- *Victorian ICT Action Plan – An ICT Plan for Victoria's Future* – was released during October 2010. It is a comprehensive policy framework to maximise the economic and social benefits from the use of ICT over coming years. It will accelerate innovative use and application of ICT across the economy, direct new investment and effort into building Victoria's global ICT research and development, focus on the innovative use of ICT in government and position Victoria for the most extensive broadband enabled economy in Australia as part of the NBN roll out. Examples of specific initiatives are detailed below.
    - The $15m Collaborative Internet Innovation Fund (cIIF) fosters innovative usage of web based technologies (Round One) and supports applications which drive usage of high capacity broadband (Round Two).
    - The $10 million *Re-Innovate Broadband Program*, will facilitate the development of innovative next-generation broadband applications.
    - The Victorian Government will advocate to the Australian Government for the NBN to exceed its minimum roll out obligations and facilitate a quick roll out across the state.

- *Ready for Tomorrow – A Blueprint for Regional and Rural Victoria* was released during June 2010. The approach outlined includes strategies for investing in skills and young people, backing jobs and industry, building infrastructure and connecting communities, supporting the regional and rural way of life and planning better regions. A new and strong partnership between state government, local councils and regional stakeholders will allow for better planning and management of the long term future for regional and rural Victoria and their communities. Examples of specific initiatives are detailed below.
    - A $37.1 million *Planning for Regional Growth Package* to ensure well planned and managed future growth that supports a high quality regional way of live.
    - The $28 million *Industries for Today and Tomorrow* program to assist regional businesses to expand, invest in regional Victoria and generate more exports.
    - A $21.8 million *Local Government Partnership package* to support local councils in their key leadership role of guiding the growth and development of their regions.
    - Providing $20 million for the *VicFibre Links program* which is designed to improve access to competitive fibre backhaul.

- A \$4.8 million program to strengthen innovation and productivity in key regional Victorian industries through the new *Innovation through Clusters program* targeting industry areas including ICT and the high-performing Ballarat ICT Cluster.

- *Government 2.0 Action Plan* – Government 2.0 involves direct citizen engagement in conversations about government services and public policy through open access to publishing sector information and new internet based technologies. It also encapsulates a way of working that is underpinned by collaboration, openness and engagement. The Government 2.0 Action Plan focuses on:
  - Driving adoption in the Victorian Public Service   -   Leadership
  - Engaging communities and citizens   -   Participation
  - Opening up government   -   Transparency
  - Building capability   -   Performance

2.3 REGIONAL PLANNING

The Grampians Regional Development Australia (RDA) Committee and all LGAs in the region have endorsed the Central Highlands Regional Strategic Plan. The RSP identifies a number of regional scale strategic directions and priority actions to best position the Central Highlands region to address identified issues, capitalise on key drivers, confront major challenges, take advantage of comparative advantages and deliver the agreed vision. These include expanded and better health services, ICT development, broadband provision and access and services. Foundations for this strategic direction include:

- The combination of a regionally based education and training network with an IT and computing employment cluster places the Central Highlands region at a substantial advantage and at the forefront in its capacity to readily rollout national and state priorities.
- There are opportunities for replicating existing models for the delivery of education, and potentially health and other services using ICT across much of the region, and the region can be used as a case study with pilots for the whole of regional Victoria.
- The accelerated rollout of broadband is needed to deliver those services at the earliest possible date. The Central Highlands region can better provide the trained workforce and network services to demonstrate how service delivery can be underpinned by ICT and effectively meet the needs of a network of urban centers and rural settlements.
- The regional ICT employment cluster can make a substantial contribution to the state's comparative strengths.

2.4 LOCAL GOVERNMENT

A review of Central Highlands LGA *Council Plans 2009-2013* confirms the high regional priority which is afforded to ICT infrastructure and broadband services and the commitment to building an evidence base to support regional strategies and actions. Associated benefits

include a collaborative approach toward advocacy for improved services, recognition that ICT has an important role in industry development, innovation and in service delivery and the identification of the potential for eGovernment approaches to deliver service improvements for both LGAs and the broader community.

▪ The **Central Goldfields Shire** is seeking to build an engaged, connected and inclusive community and is embracing education as the key for future advancement. Growing employment in new economy sectors will assist in establishing a diverse, prosperous and sustainable future. Effective management of environmental threats, including the lack of water and the risk of fire is also critical.

▪ The **City of Ballarat** is committed to planning for tomorrow's infrastructure requirements with ICT identified as a priority area for industry development. A significant portion of the city's economic development budget is directed towards ICT sector development through the implementation of the Ballarat ICT 2030 strategy. This is in recognition of Ballarat's competitive advantage in ICT. The Council Plan also identifies the important role that ICT and innovation have in renewing traditional industry sectors such as manufacturing and meeting the care, health, and education needs of local residents.

▪ The **Hepburn Shire** is seeking to enhance its communications through better use of web-based information and broadcasting services. Council is also seeking to build a sound evidence base for community advocacy in areas including broadband and telecommunications services. The Council Plan explicitly identifies the benefits of ensuring the shire is ready to grasp opportunities that will emerge from the NBN. Advocacy efforts are being directed towards influencing the timing of high-speed broadband and lobbying telecommunications companies to reduce mobile telephone blackspots across the shire.

▪ The **Golden Plains Shire** Council Plan confirms new residents have taken advantage of the proximity to services and employment opportunities available in Ballarat and Geelong. Advocacy for improved telecommunications is identified as a key result area for the future economic and social development for the region.

▪ The **Moorabool Shire** seeks to provide representation and leadership on behalf of local communities and to identify appropriate solutions and funding options to fill infrastructure and service funding gap priorities. eGovernment skills are identified as a critical foundation for the development of new and improved services, both to the community and within council. Local actions to date have included undertaking the Moorabool Community Broadband and Telecommunications Strategy. On 8 July 2010 Bacchus Marsh was announced as one of 14 new locations for the second stage of the NBN rollout.

▪ Regional priorities for the **Northern Grampians Shire** include implementing a regional telecommunications strategy that meets the requirements for key growth industries and the community. Advocacy for improved telecommunications infrastructure across the shire is linked to the goal of a sustainable economy

attracting and encouraging new enterprises while supporting existing businesses. There are also opportunities for council's services to be enhanced through improved ICT, communications and record management systems and through the development and implementation of a geographic information systems strategy.

- The **Pyrenees Shire's** vision is for a healthy, vibrant, prosperous and connected community. Equitable access to services is a guiding principle for council's advocacy. Collaboration with regional partners, government and telecommunications providers is identified as the pathway for improving mobile phone, telecommunications and broadband internet access throughout the shire.

- The benefits of regional collaboration are strongly supported in the **Rural City of Ararat** as many issues impacting on regional communities simply cannot be addressed by one council alone. These include improving telecommunications and strengthening capacity between councils to undertake regional planning. Collaboration can achieve quality services, enhanced economic activities and lead to better management of existing infrastructure to maximise regional service delivery potential.

2.5 COMMUNITY PRIORITIES

Many townships within the Central Highlands region have been supported in the development of Community Action Plans (CAPs). CAPs provide a roadmap for creating community change. They generally specify what will be done, who will do it and how it will be done. In other words, CAPs detail what groups of residents want to accomplish, what activities are needed during a specified timeline and details the resources (money, people and materials) that are needed for them to be successful. While community terminology around priorities varies, issues linked to broadband technologies and telecommunications are a very consistent theme across many of the community action plans which were reviewed as part of this study. The following excerpts help to illustrate this:

- **Amphitheatre:** Improve mobile phone coverage to assist local businesses, residents and tourists. Lobby for a tower in the district.
- **Avoca:** There is a lack of affordable broadband access which inhibits businesses, groups, farmers and the general community at a time when the internet is the governments preferred communication tool. It is difficult to encourage new businesses that work from home if the speed is slow. To combat this, the possibilities of providing affordable, high speed broadband access to the community will be investigated.
- **Beaufort:** Better mobile phone coverage is required as a lot of 'out of range' areas still exist. The pay phones in Beaufort and Trawalla are not to be removed as they offer a communication point for emergencies and phone access for those who have no home or mobile phones.
- **Clunes:** Community infrastructure priorities include working to improve telecommunications.

- **Evansford:** The current mobile phone and broadband internet services have been given a very high priority for improvement.
- **Korweinguboora:** Economic development objectives include improved mobile phone coverage.
- **Lake Bolac:** Specific projects have been requested to achieve affordable broadband internet connections for the youth.
- **Lexton:** A Mobile phone tower is required for better reception for the community.
- **Lyonville:** Communications infrastructure comparable to metropolitan areas has been prioritised, including the provision of email, wireless internet and mobile phone coverage. The construction of a tower is acceptable.
- **Moonambel:** Would like better telephone services and technology to be more readily available.
- **Newlyn/Rocklyn:** Project ideas include access to broadband via landlines.
- **Snake Valley:** Investigate reliable and faster internet options for residents who work from home. Lobby to ensure that 3G delivers equal or superior coverage to what is currently available.
- **Trawalla:** There is limited mobile phone coverage in the area so it is important for the pay phone at the roadhouse to stay.
- **Waubra:** Lobby for improved mobile phone coverage and broadband internet access.
- **Yendon:** Future economic development projects include the improvement of all forms of telecommunications media such as landlines, mobile phone services, broadband and television reception.
- **Marnoo:** Improved mobile phone coverage and internet services.

In the Hepburn Shire, residents and visitors are actively lobbying for more effective telecommunications and broadband services. More than 800 individuals in the towns of Glenlyon, Blackwood, Bullarto, Little Hampton, Lyonville, Musk and Newbury recently contributed to a petition directed towards addressing inadequate mobile phone and broadband coverage. The qualitative comments made by participants are illustrated in the 'word cloud' image below. The word cloud gives greater prominence to words that appear more frequently in the comments made by residents and visitors.

Figure 4 – 'Word cloud' capturing small town sentiments about ICT services

The 'word cloud' illustrated in Figure 4 highlights the need for mobile coverage, service and reception particularly to ensure safety in an emergency event such as a bushfire (coverage n=111, need n=98, service n=73, reception=39, mobile=38, emergency=32, safety=26, fire=20, bushfire=11).

The home location of respondents to the petition is illustrated in Figure 5. This map was created based on the address details which participants included along with their name, signature, comments and date. The largest response numbers were from Trentham (n=169), Blackwood (n=115), Daylesford (n=63), Lyonville (n=59), Newbury (44) and Little Hampton (19). Six individuals from interstate and one international also participated in the petition.

Figure 5 – Map illustrating home location of petition respondents
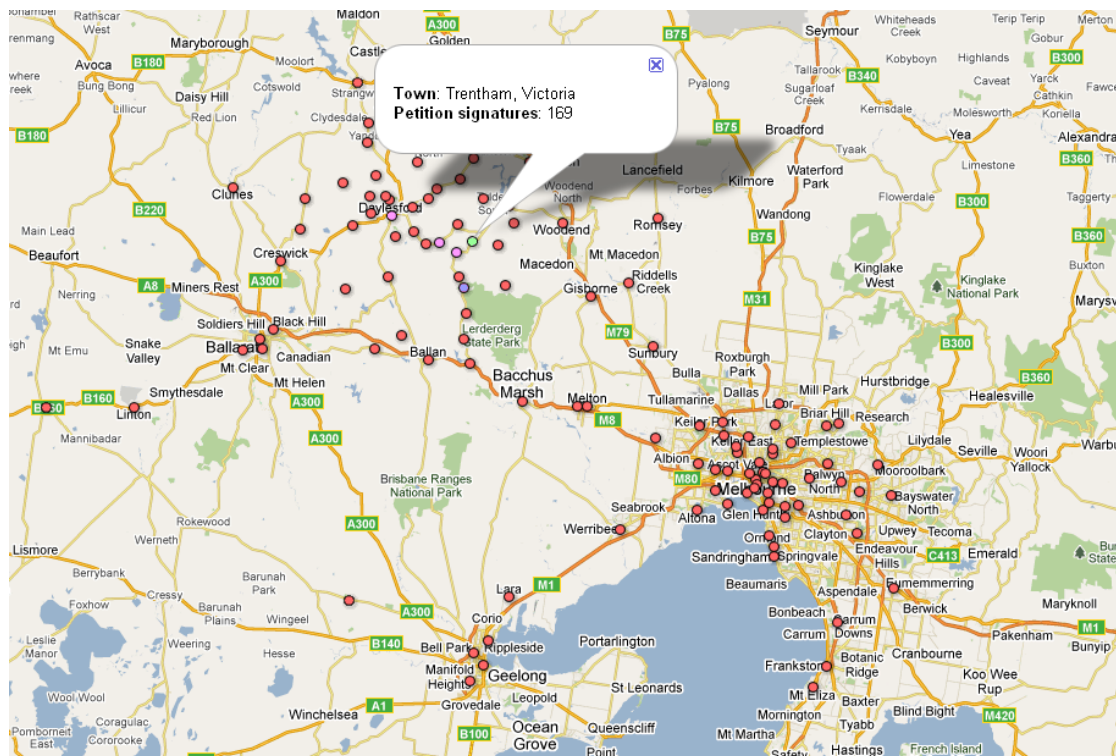
This visualisation of respondents' place of residence illustrates that the impact of inadequate mobile phone and broadband coverage extends to those who are visiting the region.

2.6 REFLECTIONS LINKED TO POLICY CONTEXT

The above review gives some insight into national, state, regional, LGA and community programs, plans and policies. It also provides a context for examining the potential for collaborative planning and responses in the Central Highlands region of Victoria. The ICT challenges which small communities and individual LGAs are facing are difficult to tackle alone. Collaboration at a regional scale may more effectively support advocacy and other actions directed towards ensuring all residents and businesses can access and effectively use quality ICT services. The following reflections illustrate that regional plans will be

influenced by a combination of external factors and a range of more localised opportunities and challenges.

- While the NBN is expected to be rolled-out in regional Australia as a priority, it is likely that simultaneous activity will be occurring in metropolitan areas. Given the NBN rollout is an eight year program, some regions will inevitably receive services earlier than others. As such, there is an opportunity to identify and prioritise local or regional scale actions that will facilitate a rapid rollout and uptake of services.

- The Central Highlands region has many towns with populations of less than 1,000. It is understood that as a rough benchmark, towns of less than 500 are likely to be targeted for a wireless broadband infrastructure solution, capable of delivering a minimum of 12Mbps. The opportunity to bring forward the introduction of wireless and satellite services so that regional areas outside the 93 percent fibre rollout can get access to better broadband sooner will be of key interest to local communities and potential residents.

- Implications for developers and LGAs as a result of changes to service arrangements for the provision of telecommunication infrastructure in new estates will need to be fully understood and accommodated. There are some implementation strategies that can and should be considered regardless of the timeline, such as conduit policies for new estates, industrial and commercial developments.

- Clear forward planning in relation to accommodating the NBN rollout is identified as critical for the Central Highlands region. Regional stakeholders across government, business, education and health have an articulate understanding and appreciation of broadband and telecommunications infrastructure and services are as important as infrastructure such as roads and electricity. Regional advantage will be strengthened as a result of an accelerated rollout and effective use of high speed broadband.

- The Central Highlands region wants to position itself to take advantage of all relevant Federal and State Government programs. Timely provision of additional information on new programs such the Regional Broadband Innovation Program *Re-Innovate* and the *Priority Regional Infrastructure Program* will assist collaborative regional planning.

- A continuing effort will be required to ensure effective coordination between State and Federal initiatives, as they impact on the region, to gain optimal advantage.

- While the core business of LGAs does not include that of being a telecommunications, broadband or Internet service provider, there is growing recognition of the positive role that can be played in supporting the planning and provision of new telecommunications and broadband infrastructure. Working proactively with NBN Co, DBCDE and the State Government to ensure timely information provision and effective community engagement is key to stakeholders in the Central Highlands region.

- A continued focus on long-term regional scale planning will assist in identifying funding opportunities to support ICT initiatives which are capable of generating economic development and social inclusion benefits for the Central Highlands region and for local businesses and communities.

3. Central Highlands ICT Study

3.1 PROJECT BRIEF

The University of Ballarat's Centre for eCommerce and Communications (CeCC) and Lateral Plains were engaged by the Central Highlands Mayors and CEOs Forum to coordinate the Central Highlands ICT Study. The study builds upon and is integrated with the Ballarat ICT 2030 and the Moorabool Community Broadband and Telecommunications Strategy. The objectives of the study included:

- Mapping current ICT adoption levels and service satisfaction
- Identifying areas of pent up demand for ICT services
- In the light of the study findings, examining the consequences for the Central Highlands region and the state of Victoria
- Recommending actions to overcome the issues and identifying areas of opportunity for residents and businesses that can be addressed.

The study was completed in the period between March and November 2010. The parallel study in the Wimmera Southern Mallee will be completed during December 2010.

3.2 PROJECT METHODOLOGY

The research that underpins the Central Highlands ICT Study involved developing an understanding of a number of critical aspects which were implicit to the project and the task of planning for the future. These included:

- Identifying current ICT adoption trends for LGAs, residents, businesses and other stakeholders.
- Considering the desires and intentions of LGAs, residents, businesses and other stakeholders.
- Understanding regional development, NBN and the broader ICT context sufficiently.
- Setting desirable and achievable goals.
- Determining what needed to be done to achieve these goals.

The approach used to develop an understanding of the critical aspects of the project included:

- Wide ranging and intensive consultation with the community and key stakeholders.
- Obtaining expert opinions through meetings with government representatives (local, state and federal) and telecommunications specialists.
- Gathering ICT related data from a regional level and analysing it to provide a sound context and insight for moving forward.
- Exploring opportunities that connect well with the plausible ICT and business development directions and the aspirations of stakeholders.

3.3 PROJECT WEBSITE

At the outset of the Central Highlands ICT Study a project website providing background information to the study, details of the consultation approach to be used, links to the online and PDF versions of the ICT survey, and contact details of the project team was established at www.cecc.com.au/ch_ict_study.

**Figure 6 – Project website for ICT studies**

The project website was used as a reference point for the project control group and the key contacts from each of the LGA to support community engagement and to disseminate information throughout the project period. In the period to 30 October 2010, the project updates section of the website was viewed a total of 883 times. Other ICT study pages were viewed at total of 2,515 times in the same period. Website content was progressively expanded throughout the project. Figure 7 illustrates the section that was established to provide information about the NBN. Available information includes maps showing first and second stage release sites, and proposed fibre and wireless coverage areas.

Figure 7 – NBN coverage maps
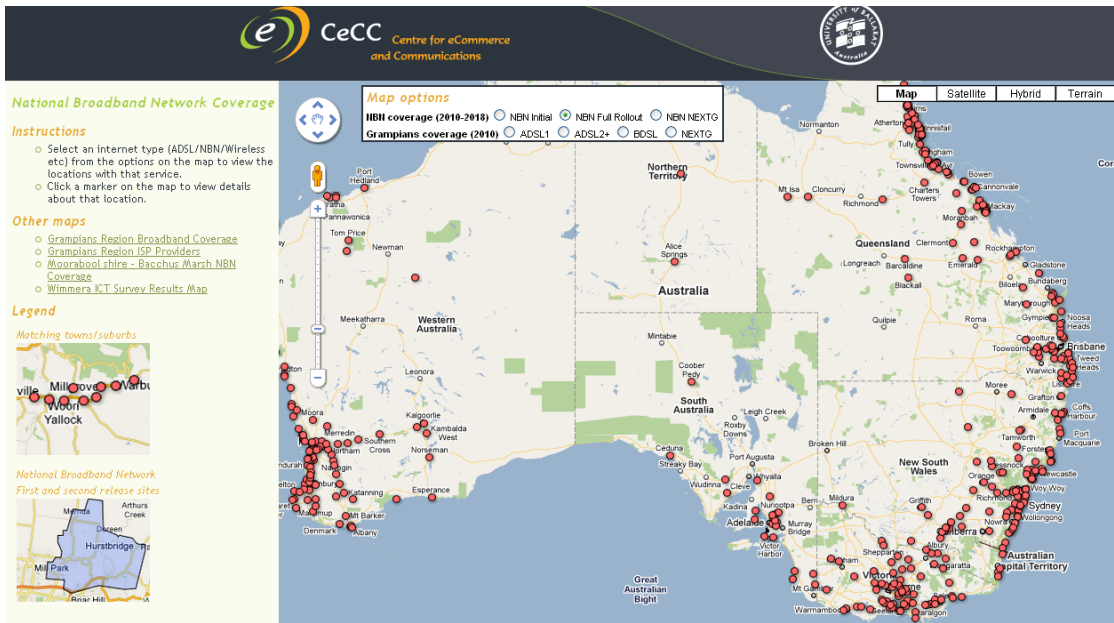
The ICT supply and demand information displayed on the sidebar of the maps were gathered from public domain sources and through the ICT survey. This was then analysed using spatial modelling techniques. The mapped outputs of this modelling are being disseminated via the project website and were included in presentations for project stakeholders and community members, at various stages during the project period. Figure 7 illustrates business and resident sentiment about mobile quality in the region. Further survey output maps can be accessed online at www.cecc.com.au/grampians_map.php.

Figure 8 – Example of mapped outputs – Mobile quality
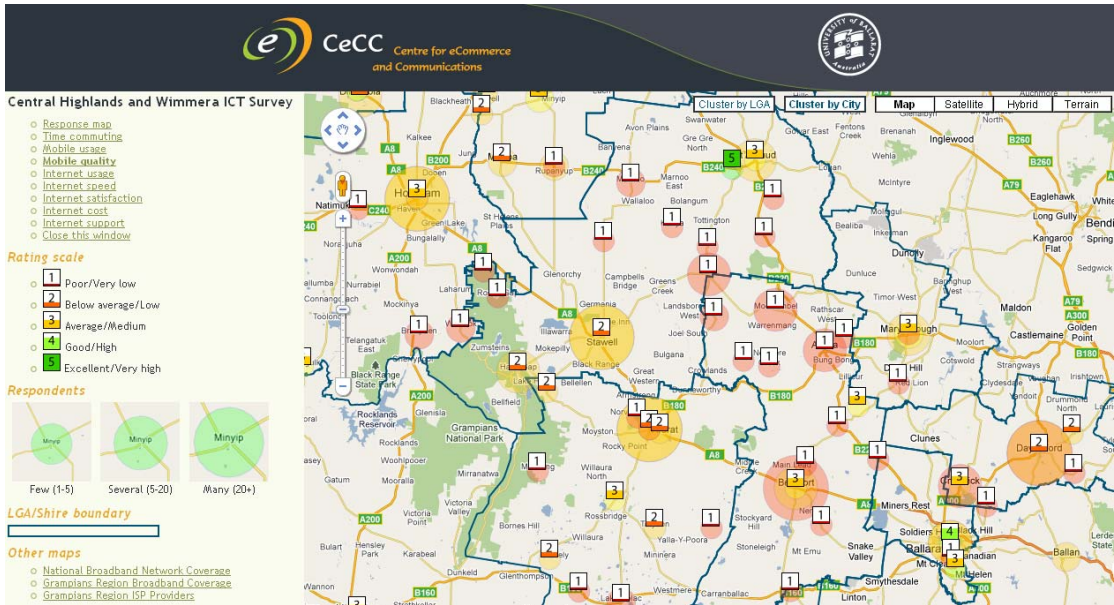
3.4 PROJECT ELEMENTS

The engagement of key stakeholders and community members was a key goal of the Central Highlands ICT Study. Activities included:

- **Desktop research** reviewing the local, regional, state and federal ICT policy contexts.
- **Stakeholder consultation** with the Central Highlands Mayors and CEOs Forum, Grampians RDA Committee, Grampians Regional Management Forum, key government representatives, NBN Co representatives and telecommunications specialists.
- **Forums and round table discussions** with local, regional, state and federal government representatives, NBN Co, local businesses, and community members.
- **Mapping communications infrastructure** in the Central Highlands region from public sources, LGAs, telecommunications providers and community members.
- **ICT survey** in online and hard-copy formats used to gather an evidence base to support ICT planning and development at a local and regional level.
- **ICT case studies** conducted using telephone interviews and an online case study survey template profiling the adoption and challenges of broadband and mobile technologies in local businesses and regional entities.

3.5 PROJECT OUTPUTS

The Central Highlands ICT Study produced outputs including:

- **ICT Study project website** which was used as a reference point to support community engagement and to disseminate information throughout the project period.
- **ICT Study survey results report** plus mapped output of spatial modelling techniques available via the project website.
- **ICT Study infrastructure mapping** with online access to a series of maps of the ICT infrastructure and services in the Central Highlands region.
- **ICT Study case studies** detail the ICT outcomes of local businesses and regional entities within the Central Highlands region, spanning the ICT, education, tourism, agriculture and business sectors.

4. Key findings

4.1 ICT SURVEY

The Central Highlands ICT Survey was conducted between April and September 2010. A summary of results is included in this section. Appendix 1 (*Central Highlands ICT Survey Results*) presents a full report on the ICT Survey and results. A total of 305 valid responses were received. Where comparable questions were asked through the *Moorabool Community Broadband and Telecommunications Strategy*, these responses have also been included, bringing the total number of respondents across most questions to 525.

Seventy-six percent (76%) of respondents were aged between 35 and 64. The majority of responses came from the Moorabool Shire (220), Rural City of Ararat (79), Northern Grampians Shire (77), Pyrenees Shire (56) and Hepburn Shire (41).

Qualitative comments from the online survey are illustrated in the 'word cloud' image in Figure 9 below. Greater prominence is given to words that appeared more frequently in the submitted survey responses. This visualisation provides insight into regional sentiment around ICT services, particularly around mobile phone service, coverage and use.

Figure 9 – 'Word cloud' capturing regional sentiments about ICT services
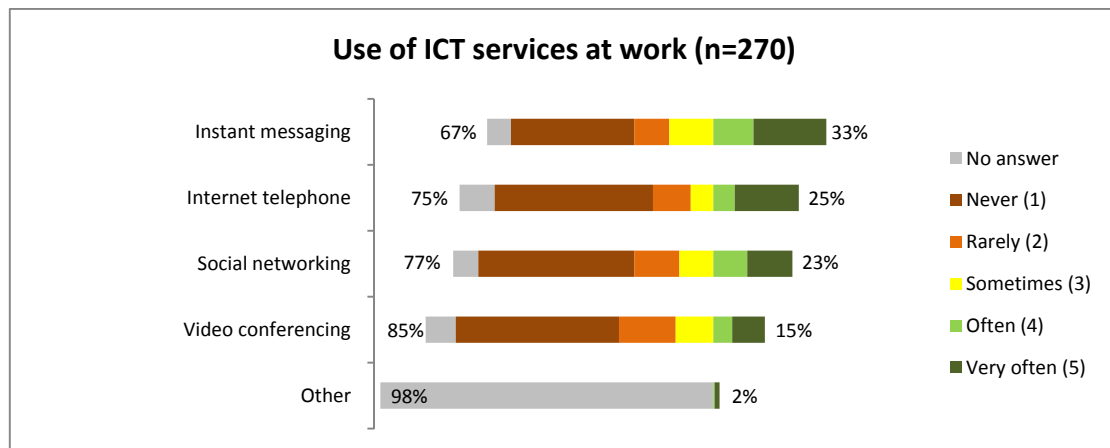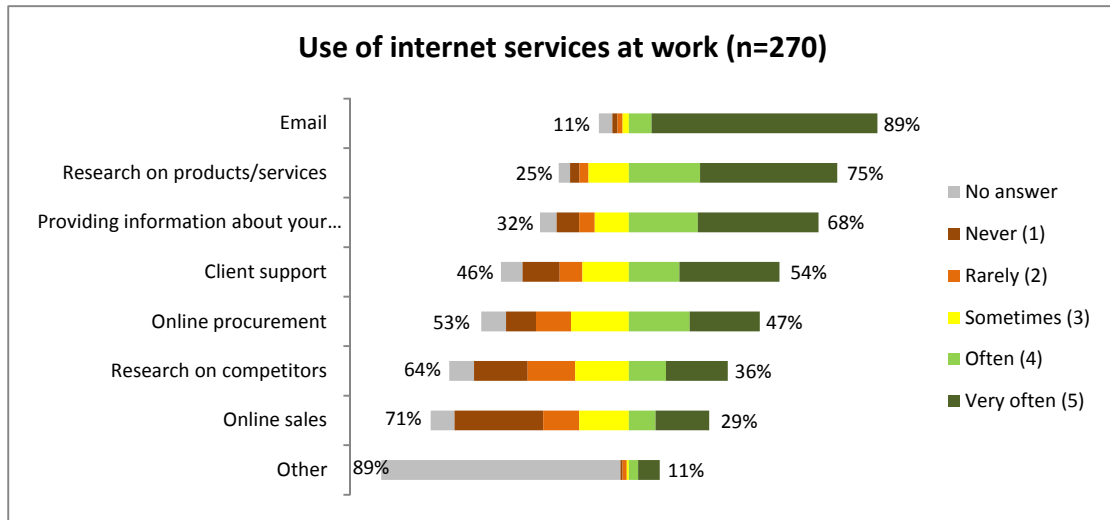
The most frequent words used within the qualitative responses included mobile (n=257), service (n=190), phone (n=167), have (n=152) coverage (n=142) and use (n=123). Other examples were internet (n=119), area (n=109), work (n=108), would (n=94), more (n=89), outs (n=81), slow (n=76), home (n=75) and speed (n=62).

This visualisation of the qualitative data highlights the importance of lobbying and advocacy focused on enhanced mobile service and the potential benefit of actively engaging with regional telecommunications providers. The following responses highlight some of the impacts of current service gaps:

- *Mobile phone coverage is dreadful once out of town centres. There is no coverage at all for Vodaphone or 3 in our area* - Halls Gap, Tourism sector

- *Online banking often uses SMS codes to approve online transfers of money. This becomes a big problem when you can't get any mobile reception to receive the SMS's* – Roses Gap, Tourism sector

- *Mobile coverage is very minimal in Landsborough and surrounding districts and as our school travels to other surrounding schools frequently, sometimes we have no mobile coverage for up to 15 to 20 minutes during the trip.* Landsborough, Business and Government sector

- *Tourists don't have mobile coverage in Moonambel and come to our workplace frustrated and use our phones* – Avoca, Tourism sector

- *Mobile services are very scattered. You can literally walk from one side of a house to the other and dramatically change your mobile reception from nil to full. There are many areas of my service catchment where there is no mobile phone service* – Skipton/Beaufort, Health sector

Ninety percent (90%) of respondents indicated they work, with the highest proportion employed in the Business and Government (32%), Agriculture (11%), Tourism (9%) and Service (7%) sectors. Figure 10 illustrates how respondents use internet services at work. Eighty-nine percent use email (81% very often, 8% often), seventy-five percent conduct research on products/services (49% very often, 26% often), sixty-eight percent conduct research on products/services (43% very often, 25% often) and fifty-four percent provide client support online (36% very often, 18% often). Other significant uses include instant messaging with thirty-three percent (21% very often, 12% often), internet telephony with twenty-five percent (19% very often, 6% often) and social networking with twenty-three percent (13% very often, 10% often).

Figure 10 – Use of internet services at work

Use of internet services at work (n=270)

	No answer	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very often (5)
Email	11%					89%
Research on products/services	25%					75%
Providing information about your…	32%					68%
Client support	46%					54%
Online procurement	53%					47%
Research on competitors	64%					36%
Online sales	71%					29%
Other	89%					11%

Use of ICT services at work (n=270)

	No answer	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Very often (5)
Instant messaging	67%					33%
Internet telephone	75%					25%
Social networking	77%					23%
Video conferencing	85%					15%
Other	98%					2%

The main frustrations or barriers encountered in using mobile, internet or other ICT services at work included speed (36%), mobile coverage (29%), internet reliability and drop outs (12%).

- *Slow internet, slow latency, ADSL 1 only services, low data download limits, no competition, only Telstra as a provider, thus very expensive service!* – Laverton, Business and Government sector

- *As a farmer, I am incredibly frustrated with the internet service at my workplace… Our Agribusiness Manager from the bank had difficulty connecting to the internet on his laptop during a business meeting the other day* - Tatyoon, Agriculture sector

- *Our internet is VERY slow. It gets worse the more people we have in the office. We're being encouraged to use the internet to transfer items as well as communicate to the public and yet we're being hamstrung by low speeds* – Ballarat, Journalist

- *There is no broadband service available forcing me to use the more expensive mobile broadband, with sluggish speeds. The lack of service provider competition*

has forced me to stay with an unsatisfactory provider, resulting in high costs and extremely frustrating customer service issues – Moyston, Business and Government sector

- *Connection to phone/3G… is so frustrating… We are trying to run a business at half the speed of competitors because of internet services always dropping out* - Moonambel, Manufacturing sector

Respondents identified diverse opportunities for the future use of mobile, internet and other ICT services in their work. Examples include:

- *Everything from purchasing to customer contact to information retrieval and supply is now done online and mobile by most companies and customers we service and to do this currently is very difficult. Better ICT would make us very competitive in the current market place and would allow further expansion / growth of our business* - Stawell, Automotive

- *Efficiencies for staff, being able to contact staff in the field* – Creswick, Business and Government sector

- *Field capture of data and mobile office abilities can be implemented if coverage is improved* – Daylesford, Business and Government sector

- *Limitless – provided the connections are reliable and fast* – Ararat, Tourism sector

- *Many – the next phase of our expansion plan – hindered by no broadband* – Navarre, Retail sector

- *Significant improvements in teleconferencing, VoIP, mobile messaging, clinical contact with patients, radiology, pathology, hospital* – Ararat, Health sector

- *Huge – we rely completely on ICT in our accounting practice. Having the ability for staff to work more flexibly is imperative to the ongoing success of the practice and the attraction and retention of staff into rural areas* – St Arnard, Business and Government sector

- *Everything - if we had a decent service here we would have our restaurant till linked to our office and we would have an electronic booking service instead of a manual one. We would have our restaurant kitchen linked to our office and suppliers* – Halls Gap, Hospitality sector

Eighty-three percent (83%) of respondents commute between home and work, with the car being the most common method (89%), followed by walking (13%) and the train (9%). Forty-one percent (41%) of respondents spend an average of one hour or less commuting each week.

Using a mobile phone is the predominant ICT service used when commuting (84%), followed by the internet (15%), email (15%), and handsfree (14%). Mobile coverage (70%) was identified as the main frustration or barrier encountered in using ICT services when

commuting. The following are illustrative of qualitative responses about frustrations whilst commuting:

- *Erratic/unreliable service* - Hepburn Shire, Mail Contracting

- *Fifty percent of travel has no mobile phone coverage* - Northern Grampians Shire, Retail sector

- *Fluctuations in mobile network coverage* - Northern Grampians Shire, Manufacturing sector

- *Lack of consistent coverage* – Pyrenees Shire, Business and Government sector

- *Patchiness of mobile phone coverage* – Northern Grampians Shire, ICT sector

- *The signal constantly drops out making it very unproductive* – Hepburn Shire, Community Services sector

- *Very poor reception while on the road and at home office* – Hepburn Shire, ICT sector

- *Within the 45 minute drive from home to work there are six black spots where the coverage will cut out. These black spots can last for up to five minutes* – Pyrenees Shire, Business and Government sector

Reasons why ICT services are not used when commuting include the trip is short (19%), driving is involved (14%), it is illegal (14%), there is no need (13%) or because of poor coverage (13%).

Many respondents (n=204) confirmed ICT services would be used differently if they were to improve – sixteen percent (16%) of respondents would increase their use when mobile, twelve percent (12%) would increase their use overall, and eight percent (8%) would increase their productivity.

- *I would be able to do more business on the road, be able to spend less time and be more productive doing other things at work, and would be able to spend more time at home with my family.* Ballarat resident, Avoca tourism sector

- *I would be able to answer calls without waiting to get better reception!* – Bannockburn, Business and Government sector

- *I could better utilise time travelling between my two workplaces if able to communicate on my mobile phone* – Skipton and Beaufort, Health sector

- *Better integration of mobile field devices with office network* – Ararat, Business & Government sector

- *Greater opportunity to connect with office and clients remotely, therefore delivering services faster* – Ballarat, Business and Government sector

- *It would just make the biggest difference to running our business efficiency* - Stawell, Automotive sector

- *I would have a home based office and work from home* – Ballarat, Building and Construction sector

- *Would perhaps travel less and utilise remote access of internet more* – Stawell resident, Ballarat employment – Business and Government sector

Ninety-seven percent (97%) of respondents use a mobile phone. Telstra (70%) holds the largest market share for mobile phone providers. Other mobile providers include Optus (14%) and 3 (5%). Voice calls (51% very often, 23% often) and messaging (43% very often, 24% often) are the most common mobile services accessed for work purposes.

Only nineteen percent (19%) of respondents ranked the quality of mobile phone coverage in their LGA as very good (16%) or excellent (3%) (see Figure 11). Fifty-five percent (55%) ranked mobile coverage as poor (33%) or fair (23%). Appendix 1 details the highest priority areas for improvements in mobile phone coverage in each of the participating LGAs.

Figure 11 – Quality of mobile phone coverage
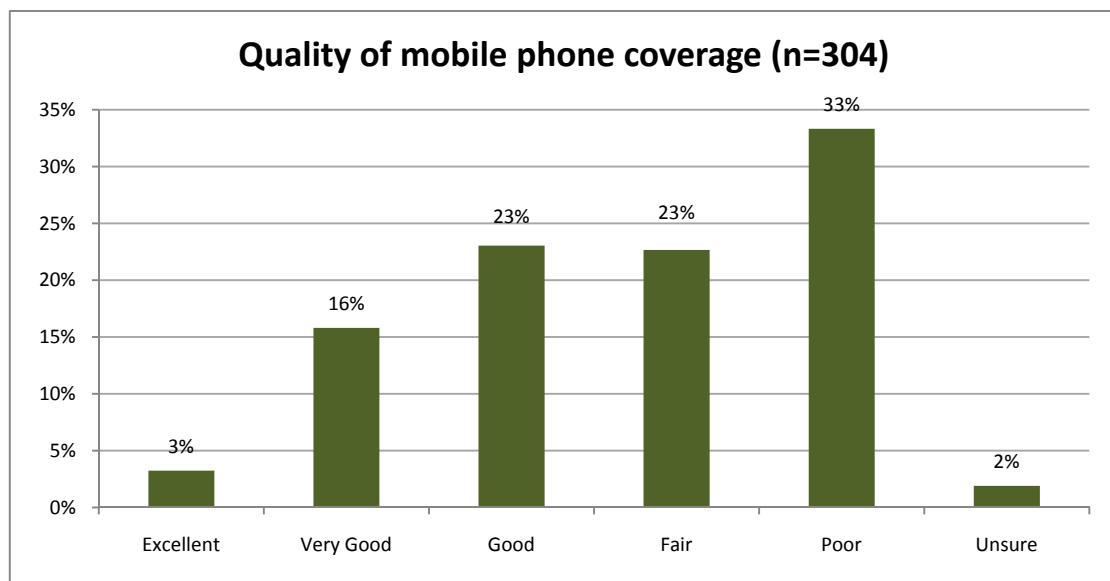
Ninety-nine (99%) of respondents use the internet, with most accessing the internet at home (80%) and/or at work (68%) and spending either 1-2 hours (37%) or 3-6 hours (34%) online daily. Internet services used very often for personal use include email and general web browsing (63%), researching products and services (34%), keeping in touch with family and friends (29%) and learning and education (22%). Thirty-one percent (31%) reported usage of Skype for personal use.

ADSL (54%), wireless 3G (29%) and satellite (17%) were the most common methods of internet access, with the largest share of the regional ISP market held by Telstra BigPond (43%). Other providers with market share include TPG (7%), Activ8me (5%), Internode (4%) and Optus (4%). Figure 12 confirms that sixty-one percent (61%) of respondents pay more

than $45 for monthly internet services (27% pay $45 - $59, 14% pay $60 - $74, 13% pay $75 - $99, 5% pay $100 - $149 and 2% pay more than $150).

Figure 12 – Monthly cost of internet services

Monthly cost of internet service (n=520)
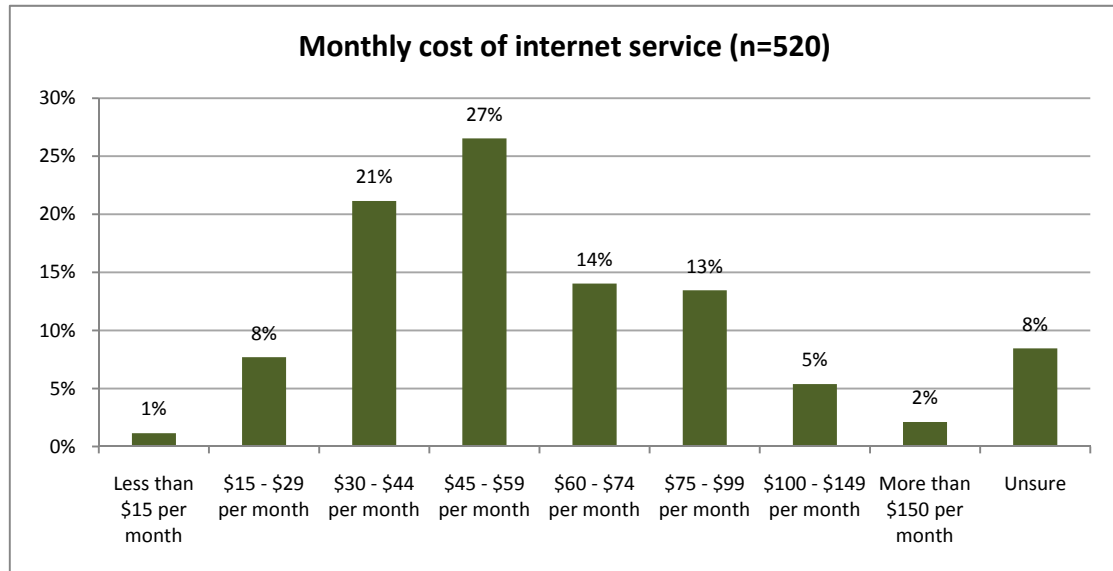
Thirty-one percent (31%) of respondents indicated they always get good support from their ISP. Forty-six percent (46%) sometimes get good support.

While 40% of respondents plan to upgrade their internet service, many respondents are unsure of the timeframe (67%) or type of upgrade planned (38%).   The most common reasons for not upgrading are that no better options are available (41%), they are satisfied with their current plan (22%) or the cost of upgrading (9%).

- *Because nothing better is available, in particular no ADSL* – Dereel, Agriculture
- *I don't believe there are any good options out there for us in our location. If something became available like ADSL I would definitely upgrade from satellite* Roses Gap, Tourism sector
- *ADSL is the fastest internet currently available at the Ballan exchange. We will upgrade to faster broadband when available but no timeline has been provided for this upgrade to the exchange* - Ballan, Business & Government sector
- *We are at maximum. Need the service to improve before we can upgrade* – Avoca, Manufacturing sector
- *It's adequate for me at the moment. It's faster than the work connection* – Ballarat, Journalist
- *I've got a good plan now* – St Arnaud, Business and Government sector
- *Can't afford anything more* – Mt Egerton, not in paid workforce

Figure 13 confirms that seventy-five percent (75%) of respondents rate their satisfaction with internet costs as average or below (33% average, 23% poor, 13% very poor). Similar levels of dissatisfaction (66%) are associated with internet speed (33% average, 18% poor, 12% very poor).

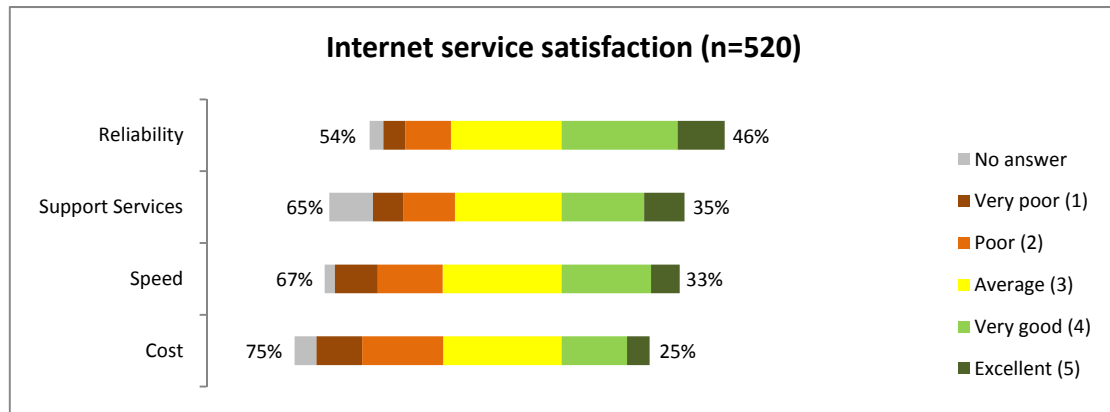Figure 13 – Internet service satisfaction

Figure 14 confirms the most important or pressing issues about the internet are better and faster broadband (69% strongly agree, 19% agree) and reducing the cost of access (64% strongly agree, 20% agree). Respondents also supported enhanced internet safety and security (43% strongly agree, 23% agree) and better support for mobility (30% strongly agree, 26% agree).

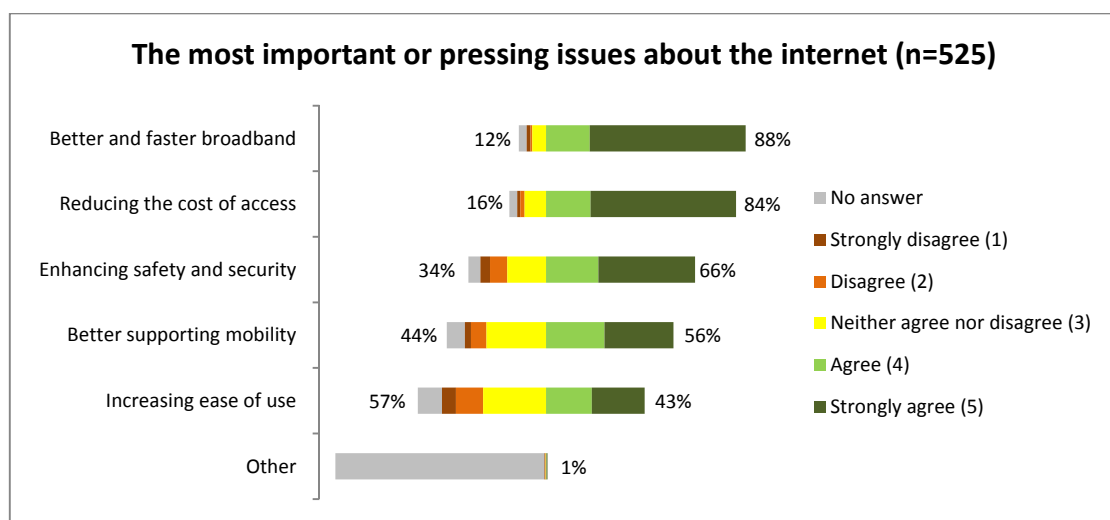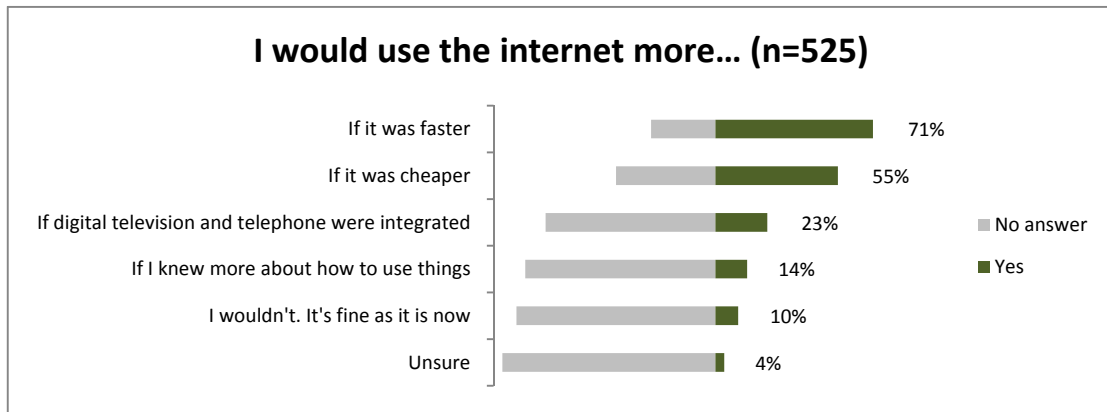Figure 14 – The most important or pressing issues about the internet

Figure 15 illustrates that usage would increase if the internet was faster (71%) and cheaper (55%).

Figure 15 – Internet service satisfaction

I would use the internet more… (n=525)

If it was faster	71%
If it was cheaper	55%
If digital television and telephone were integrated	23%
If I knew more about how to use things	14%
I wouldn't. It's fine as it is now	10%
Unsure	4%

No answer
Yes

The opportunity for residents in the Central Highlands to submit feedback via the ICT survey remains available at www.cecc.com.au/cb_pages/CH_ICT_home.php. Mapped outputs are automatically generated using spatial modeling techniques each time a new survey is submitted online.

4.2 ICT SERVICE MAPPING

A number of approaches have been used to gather and share information about ICT service offerings in the Central Highlands. Research activities included:

- Consultation and review of data supplied by telecommunications providers
- Desktop research to identify and analyse public domain data about current and future telecommunications
- Feedback gathered through face-to-face consultation, the ICT survey and case studies
- Spatial modelling and information dissemination via the project website
- Preparing summary overviews of key telecommunications and broadband providers

Figure 16 provides an example of the maps which have been developed to communicate information about the availability and quality of regional broadband services (see www.cecc.com.au/grampians_broadband.php). This example shows information about the ICT services available in Avoca and their quality. It also identifies that local businesses and residents in Avoca, based on currently available information, will be able to access the NBN in the future via next generation wireless services. Visitors to the ICT service maps have a range of options.   They can turn LGA boundaries (blue lines) off and on, zoom to a particular location of interest, and can click on the red dot to access summary information. Alternatively they can browse between different views of the maps by selection options from the 'map options' table at the top of the map.

Figure 16 – Regional broadband services map

Figure 17 illustrates the map that is displayed as a result selecting the 'NBN Full Rollout' option and then zooming from the map of Australia to the Central Highlands region. During the project implementation period there has been very positive feedback in relation to the intuitive nature of this approach to sharing information. Google analytics statistics for the project website confirm that the NBN section of the project website has been viewed 2,900 times during the period to 31 October 2010.

Figure 17 – National Broadband Network services map
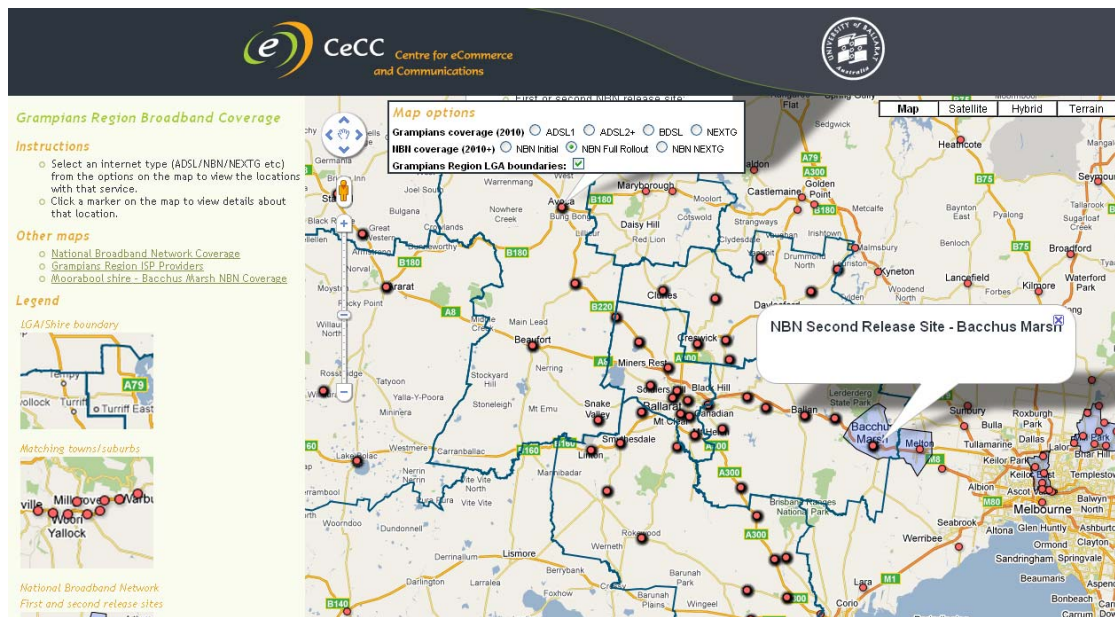
Feedback from NBN Co, Telstra Countrywide, ACCAN, the State Government and other stakeholders during the study period has confirmed that the collation and presentation of information about service availability, access costs, adoption trends and areas of unmet demand is important and can assist in planning and prioritising upgrades of existing infrastructure and rollouts of new infrastructure. Extended benefits will be gained by extending information and maintaining currency through an ongoing commitment to survey and mapping activities beyond this study period.

4.3 TELECOMMUNICATIONS AND BROADBAND SERVICES

Regional representatives are proactive in canvassing issues associated with the NBN. Activities have included consultations with the Federal Minister for Broadband, Communications, and the Digital Economy, a presentation to the NBN Senate Select Committee, NBN Forums for LGA representatives (Ballarat and Horsham), Broadband Community Information Sessions (Ballarat and Horsham), ongoing liaison with NBN Co and the Institute for a Broadband-Enabled Society (IBES). The aim is to place the Central Highlands and Wimmera Southern Mallee regions in an excellent position to extend the benefits of the early rollout of the NBN in Bacchus Marsh.

Regional stakeholders are committed to continued success in attracting both public and private investment to further enhance regional telecommunications and broadband services. Past lobbying efforts have achieved significant success and encouraged government and telecommunication companies to invest in and test new technologies such as DOCSIS 3, IPV6, next generation networks and optical fibre. As a result some geographical areas (particularly Ballarat) and sectors (including education and health) have achieved early access to leading edge technologies and high-speed broadband.

Economic and social advantages will be rapidly extended through the extensive rollout and effective use of high-speed broadband across the Central Highlands region. Existing telecommunications and broadband foundations include the significant presence of Telstra Country Wide, Neignbourhood Cable, Ballarat Community Telco, the Grampians Rural Health Alliance and a number of microwave and wireless services.

Telstra Country Wide (TCW) provides telecommunications services to customers beyond the large mainland capital cities in the outer metropolitan, regional, rural and remote parts of Australia. Ballarat is the regional headquarters for the TCW South West region. TCW have a significant presence in the Central Highlands region both in terms of providing telecommunications and broadband services and through the employment of more than 350 people. The region has benefited significantly from the introduction of NextG wireless

broadband which is reported to be capable of download speeds of up to 42 Mbps in some parts of the region. NextG has become an important part of many business activities. It has also provided a new service option in areas where fixed broadband services are limited.

Neighbourhood Cable, a company owned by Canberra based Transact, is an advanced telecommunications company headquartered in Ballarat servicing the Victorian regions of Mildura, Ballarat and Geelong. Neighbourhood cable delivers high-speed cable broadband and entertainment services over a hybrid fibre and coaxial (HFC) network. Deployed primarily as an aerial deployment (over existing power poles) the Ballarat network first launched services in 2002. It currently passes 32,000 Ballarat homes covering a potential population of 70,000. Coverage limitations exist in built areas where power was delivered underground at the time of the network build (2000-2002) and in newer estates established since that time. Neighbourhood Cable recently upgraded its HFC infrastructure to DOCSIS 3, providing 100 Mbps broadband plans into the Ballarat market. The company employs 20 full time staff and over ten contractors in the Central Highlands region.

Ballarat Community Telco pools local telecommunications demand and aggregates the spending of local businesses. Through its operations Ballarat Community Telco attempts to influence carriers to offer better service, advance infrastructure investment and deliver enhanced market competition for regional Australia. The Ballarat Community Telco employs 14 staff.

Grampians Rural Health Alliance (GRHA) supports improved regional health outcomes by providing technology, applications, and communications solutions to connect the region's health services. The Alliance comprises 12 hospital-based health services, four bush nursing centres and stand-alone community health centres, all spread across over 40 sites. Additionally GRHA has many customers and partners spanning the aged care sector, medical sector, community service organisations, LGAs and the higher education sector.

GRHA, with the assistance of the Australian Commonwealth and State governments, have developed a major communications network including internet access, data connectivity, shared application services, IP Telephony, and room, mobile-based and desktop video solutions. The Alliance also undertakes various projects that support streamlined workflow and continuity of care across the region's multiple healthcare agencies and sites.

The GRHA network build resulted in many exchanges in the Central Highlands region being upgraded. Most of the smaller Alliance partners access connections at 2 Mbps (BDSL). Work is in progress to raise base speeds to 10 Mbps. Alliance partners in areas including Ararat, Bacchus Marsh, Ballarat, Nhill, Melton and Warracknabeal access GWIP services with speeds

between 4 Mbps and 20 Mbps. Fibre connections in areas including Ballarat and Stawell deliver speeds of up to 100 Mbs.

Broader service benefits have resulted from exchange upgrades linked to the GRHA network development. Businesses and residents located in the immediate vicinity of upgraded exchanges can now access services including ADSL2+. Future collaboration with GRHA, significant regional telecommunications users and service providers may assist in identifying further opportunities for aggregating demand and result in earlier delivery of services that can respond to significant levels of unmet demand.

Microwave wireless services include significant regional backhaul linkages shadowing the Western Highway. Education, health, emergency services and large corporates have been co-investors and early adopters of these services. Assistance from the Federal Government in the 1990s and early 2000s contributed to the deployment of regional backhaul infrastructure.

Omniconnect offer consumer grade high bandwidth microwave services in the Central Highlands region. Connection speeds vary depending on customer locality with a range between 2 Mbps and 622 Mbps. Examples of localities where services are available include Avoca, Beaufort, Stawell, St Arnaud, Moonambel, Halls Gap and surrounds. The relatively high cost of service offerings act as a barrier for greater update by business including some of the wineries in the Pyrenees region.

Radcomp Computers provide wireless broadband services via a combination of WiFi and Wimax services. The main WiFi transmission points are at Mt Egerton, Ballan, Greendale and Bald Hills. Radcomp have advised that between the two types of services they are able to service eighty percent (80%) of the geographical area of the Moorabool Shire.

National Broadband Network rollout planning is underway in Bacchus Marsh. The Moorabool Shire has been assisting NBN Co in gathering a range of information to determine the best possible location for the initial Fibre Serving Area (FSA) which will cover 3,000 premises. An announcement of the FSA location is imminent.

4.6 VARIANCES IN ICT SERVICE AVAILABILITY

Information gathered through the Central Highlands ICT study confirms significant unmet demand for fixed broadband services (particularly ADSL and ADSL2+) and concerns about the current reliability and accessibility of mobile coverage. A variety of factors influence ICT service variability in the region, for example:

- Government support has been a significant factor in the establishment of major communications networks and backhaul infrastructure (e.g health, education and microwave broadband services).

- Equality of service is not just an issue for small towns and rural communities. The Rural City of Ararat, for example, with a population approximately 12,000 only has one of four exchanges ADSL2+ capable. Residents and businesses in the neighbouring local government areas are able to access ADSL2+ and BDSL services from small towns including Great Western, Beaufort and Avoca (populations under 1,000).

- The presence of organisations with large communications requirements has in some instances benefited businesses and residents accessing telecommunications services through the same exchange.

- The national broadband guarantee has assisted some individuals in addressing internet coverage issues. For others, the launch and rapid uptake of the NextG network has assisted in resolving internet access challenges.

Regional variances in ICT availability have obvious and some less obvious impacts:

- Mobile coverage tends to shadow major regional transport routes. Limits on ADSL range impact on a greater percentage of residents in LGAs where the population is geographically dispersed.

- Telecommunications blackspots are a significant concern in the context of emergencies (e.g. bushfires, motor vehicle and farm accidents).

- The availability and quality of ICT services is a significant factor influencing the location and relocation decisions. Negative economic and social consequences are already evident for areas lacking quality telecommunications and broadband services.

- New residents and visitors experience frustration when they find that broadband and telecommunications services are inferior to their expectations.

5. Strategic directions

This Central Highlands ICT study has been undertaken to assist in positioning the region as a key centre of future growth, especially in knowledge based industries. The key strategic directions and actions outlined below build upon and extend the *Grampians Region Strategic Directions*, the *Central Highlands Regional Strategic Plan*, the *Ballarat ICT 2030 Strategy* and the *Moorabool Regional Broadband and Telecommunications Strategy*.

5.1 REGIONAL DEVELOPMENT AUSTRALIA GRAMPIANS

The Grampians is a proud region, developing the life of its small and large communities, well positioned to adapt to climate change and making the most of its natural assets. The region is Australia's first National and Natural Heritage Region, with expertise in renewable energy, innovative manufacturing and a burgeoning economy based on the uptake of new communications technology and applications spurred on by access to high speed broadband. The region is well connected and central to the movement of goods, services and people, with healthy population growth and good quality lifestyle choices[9].

The Grampians RDA Committee supports economic and social development in the Grampians region, working across three levels of government – local, state and federal. It provides strategic advice on regional planning, economic and social issues and job creation. *Global Infrastructure for Local Growth* has been identified as one of six themes that apply across the region as catalysts for significant positive change. Universal, affordable, access to ICT is a major driver of change and holds the key to sustainability and growth throughout the region. The Grampians RDA's focus is on being well planned and ready for the rollout of the NBN[10].

5.2 CENTRAL HIGHLANDS

The Central Highlands Regional Strategic Plan (CHRSP) deliberately focuses on regional scale directions and actions. The Plan sets out a vision that is designed to best position the Central Highlands to 2030 and beyond so as to provide a productive, sustainable and liveable region for its people[11].

The Central Highlands region has the capacity to utilise its strengths and capacities in ICT and through the NBN to roll out new models of co-located and integrated service delivery in area such as health, education, emergency services and the environment.

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[9] Grampians Region Strategic Directions (2010)
[10] op cit.
[11] Central Highlands Regional Strategic Plan (2010

5.3 BALLARAT

Ballarat is increasingly being acknowledged for the strength and innovativeness of its ICT industry. The *Ballarat ICT 2030 Strategy* projects that by 2030 Ballarat will become acknowledged internationally for the strength and innovativeness of its ICT industry, the strategic use of ICT by lead users in the region, and the rapid diffusion and effective use of new technologies by its community.

Ballarat ICT Ltd is a partnership of industry, government and educational institutions dedicated to sustaining and growing a globally competitive ICT industry in Ballarat. It leads and supports Ballarat's ICT industry for the benefit of the community, by significantly enhancing research and innovation, providing world class infrastructure and by creating high quality jobs in the region's ICT industry.

The City of Ballarat's Economic Strategy 2010-2014 confirms the vision for Ballarat to become Australia's premier high tech and knowledge based regional economy – Ballarat's diversified knowledge based economy – defined by higher education, health services, research, manufacturing, information technology and business services – will grow, integrate and evolve to generate significant new investment and employment.

5.4 MOORABOOL

Metropolitan equivalent mobile connectivity and high-speed broadband communications are fundamental drivers for regional development and innovation. It is projected that Moorabool Shire will accelerate its goal of achieving metropolitan equivalent ICT through the second stage NBN rollout in the region and be renowned for the effective use of new technologies by 2015. Priority themes identified in the *Moorabool Community Broadband and Telecommunications Strategy* have been translated into four major areas, with each supported by a number of recommended programs and actions.

The first priority is the leadership role that the Moorabool Shire can have through rethinking some of its internal strategies and processes. The second is regional advocacy and profiling which will be critical to improving ICT adoption and effective use. Local stakeholders have actively advocated and lobbied to achieve an early rollout of the NBN. Construction will start in Bacchus Marsh in 2011. The third theme focuses on infrastructure and planning. The Moorabool Shire has been proactive in responding to the information requirements of NBN Co. Recent changes in local planning regulations now require consideration of a conduit strategy in all new residential and industrial developments. External strategies are the fourth area of focus with associated actions focused on educating local businesses and the broader community about the benefits of positioning the Moorabool region as NBN ready.

6. ICT action plan

The Central Highlands Region has a concentration of expertise to take full advantage of the NBN. The accelerated rollout of high speed broadband and comprehensive mobile coverage will strengthen existing capacity. Comparative advantages in education, training and ICT will support the region in more readily adopting new models for an array of service provision that extend across education, training, health services and information provision. Priority ICT strategies and actions are set out below.

6.1 LEADERSHIP

The Grampians RDA Committee and the Central Highlands Mayors and CEOs Forum will provide regional leadership and foster an enabling environment for creating a broadband development dynamic. Specific recommendations include:

- Forging a common vision and understanding of the needs and requirements for ubiquitous high capacity broadband and mobile communications

- Ensuring ICT and broadband remain clearly embedded in regional strategic planning and development

- Bringing related agencies, organisations and individuals together to progress the priority strategies and actions as set out in the Central Highlands ICT action plan

- Actively promoting and branding the Grampians region as a dynamic and vibrant ICT region

- Celebrating ICT success through an annual ICT Showcase and the establishment of the Grampians Region ICT Awards. The ICT Showcase would recognise innovation and excellence in areas including local government, education, health, environment, community and business applications of ICT. The ICT Awards would prepare regional entities for participation in state and national awards such as the Australian Information Industry Association – iAwards and the Australian Community ICT Awards.

- Co-investing to expand the geographical reach of Ballarat ICT with a focus on outcomes including universal, affordable access to next generation broadband services, creating communities that use ICT services to their best advantage and encouraging ICT innovation and new initiatives throughout the general and business community

- Being proactive in identifying opportunities for using ICT to enhance economic and social policies and strategies at a regional and LGA level

6.2 ADVOCACY

A continuing commitment to advocacy will assist the region in achieving its goal of universal, equitable and affordable access to ICT. The Grampians RDA Committee and the Central Highlands Mayors and CEOs Forum recognise ICT as a major driver of change and understand the key role it will play in future sustainability and growth throughout the region. Recommended advocacy actions and strategies include:

- Using outputs of the Central Highlands ICT Study to support advocacy targeted towards immediate improvements in mobile telecommunications and broadband services

- Advocating for a rapid and comprehensive deployment of next generation broadband and enhanced mobile services throughout the Grampians region

- Continuing to develop an evidence base to assist the region in building and shaping its ICT policy in the coming years

- Conducting periodic surveys and mapping outputs to illustrate ICT trends, take up and satisfaction levels within the region

- Continuing to be proactive in identifying and responding to clusters of unmet demand for services

- Gathering and publishing case studies on an ongoing basis which demonstrate local adoptions of ICT and their associated economic and social impacts

- Getting involved in the Australian Communications Consumer Action Network via membership or participation in campaigns and activities.

6.3 INFRASTRUCTURE

Broadband will be the foundation for digital invention and innovation and a driver for the knowledge economy and society. The Central Highlands ICT Study has confirmed significant unmet demand for second and third wave fixed broadband services in the Central Highlands region. Addressing inadequate mobile coverage has been identified as another key infrastructure priority. Recommended infrastructure actions and strategies include:

- Pursuing partnerships and maintaining an ongoing dialogue with government, NBN Co, telecommunications providers and other stakeholders to accelerate the rollout of high speed broadband and comprehensive mobile coverage

- Supporting LGAs and property developers in adopting a proactive approach to broadband provisioning to facilitate a rapid introduction of FTTP infrastructure and

services in greenfield and brownfield residential, commercial and industrial developments

▪ Engaging directly with Telstra (70% market share), Optus (14% market share) and other mobile providers to advocate for improved mobile telecommunications with particular priority for towns most at risk this fire season (e.g. Blackwood, Creswick, Daylesford, Deans Marsh, Dereel, Greendale, Halls Gap and St Arnaud)

▪ Supporting the maintenance and extension of the telecommunications and broadband service mapping which was initiated through the Central Highlands ICT Study so that service improvements can be monitored and service black spots identified

6.4 NBN

The Central Highlands region is ready to take full advantage of the rollout of the NBN. The announcement of Bacchus Marsh as a second stage release site will assist in positioning the region for an early rollout of next generation broadband services. Regional stakeholders recognise the importance of continuing to work collaboratively to embrace the NBN. Specific recommendations include:

▪ Maintaining a proactive and progressive approach to creating an enabling environment for broadband deployment and ICT adoption and use

▪ Gathering and aggregating data that assists NBN Co and others in planning and/or extending broadband and telecommunications services across the Grampians region. As an outcome establish a web-service to support data contribution, aggregation and sharing via spatial mapping and other formats

▪ Extending the online services established through the Central Highlands ICT Study to provide efficient and effective access to information such as the location of commercial and industrial precincts; growth corridors, environmental and heritage overlays; government properties, education and health facilities, greenfield sites, barriers to construction, existing telecommunications infrastructure, areas poorly serviced by existing broadband and location of future civil works

▪ Building business and community readiness for a rapid take-up of next generation broadband infrastructure and services through collaboration with NBN Co, DBCDE, IBES, etc.

▪ Supporting the Moorabool Shire in capturing and sharing learning from the Bacchus Marsh Stage 2 release site to best facilitate a rapid rollout of the NBN across the Central Highlands and Wimmera Southern Mallee regions

▪ Through collaboration with Ballarat ICT Ltd and other stakeholders source and regularly disseminate NBN, ICT and other information.

6.5 LOCAL GOVERNMENT AS A LEAD ADOPTER

New technologies, improved telecommunications and next generation broadband services provide opportunities for more cost effective and efficient delivery of LGA services to businesses and residents. As a lead adopter, LGAs will gain organisational, economic and social benefits through the application of ICT. Specific recommendations for LGAs include:

- Local government recognising that effective use of ICT is a core part of the strategic deployment of broadband infrastructure and service delivery

- Proactively identifying priorities for the development of applications and local content that will assist in achieving development priorities and enhance the long-term economic competitiveness of the region

- Strengthening support for existing and new networks across local government with the goal of fostering knowledge sharing among ICT managers, GIS officers and non-ICT areas such as community services, economic development etc

- Allocating and attracting seed funding to support collaborative ICT projects across LGAs

6.6 COLLABORATION MODELS

Next generation ICT and broadband will generate long-term economic competitiveness through jobs, growth and productivity gains. It will provide a platform for new content, services and applications and foster collaboration models and best practice in local ICT development. Specific recommendations include:

- Continuing to support the development and growth of the University of Ballarat Technology Park and Ballarat ICT Cluster whilst also seeking to extend benefits across the Grampians region

- Working with regional health and education providers to identify opportunities for leveraging existing broadband networks

- Bringing health, agribusiness, tourism and manufacturing sector representatives together with researchers and other key stakeholders to identify potential ICT opportunities

- Identifying scope for innovative niches in the use and application of ICT – for example the use of sensors in strategic regional industries, the development of regional cyber safety responses or supporting innovative online approaches to career training

- Contributing to the development of project plans and preliminary business cases for ICT projects

- Promoting interoperability at the regional level via adoption of global information management standards

- Aggregating ICT requirements in areas such as connectivity, training, hardware, software, knowledge management and digitisation

- Supporting the implementation of local broadband projects that are well-organised and that support industry engagement and participation from the local community

- Attracting funding for innovative projects using ICT and broadband to deliver enhanced regional services in education, health, emergency services, agriculture, manufacturing, tourism and transport through sources such as cIIF, ReInnovate and Digital Regions Initiative

6.7 SKILLS

Economic and social benefits will be maximised by a focus on broadband inclusion for all. Regional benefits will be enhanced if all citizens have the skills and confidence to use ICT in ways that improve their lives. Specific recommendations relating to skills include:

- Building local ICT capability and expertise through engagement with education and training providers, business groups, the agricultural, manufacturing and transport sectors and other sectors

- Facilitating regular forums and knowledge exchange events to bring local firms and organisations together around ICT innovation

- Attracting high profile speakers to present the latest ICT thinking

- Assisting community based organisations and education providers in promoting ICT literacy, training and other essential ICT skills development

- Establishing a regional business and community education program which would draw in participation from NBN Co, DIIRD, DBCDE, IBES etc.

6.8 INNOVATIVE RESEARCH AND DEVELOPMENT

The Central Highlands ICT Study has supported research which has gathered evidence of regional progress in broadband deployment and ICT adoption. Specific recommendations in relation to extending ICT research in the future include:

- Continuing to gather evidence of the social and economic impacts of ICT and broadband diffusion in the Grampians region

- Building reliable evidence and comparable indicators through future community and business surveys in areas such as ICT access, use and impact

- Capturing and sharing best practices of broadband use, ideally using an online repository

- Supporting the University of Ballarat and other stakeholders in attracting private and public sector funding for ICT and broadband research and development

- Producing an annual report card on regional ICT activities, achievements and priorities that details the project that have been given priority, informs on progress and highlights areas that need further attention and consideration

- Establishing research linkages with IBES which is a cross-disciplinary research institute dedicated to products, services, and innovations that maximise the benefit of new broadband technologies to Australian society

7. Further information

Further information on the Central Highlands ICT Study can be accessed online at www.cecc.com.au/ch_ict_study or by contacting:

Helen Thompson

Director

Centre for eCommerce and Communications

University of Ballarat

Email: h.thompson@ballarat.edu.au

Phone: 03 5327 9418