

# Broadband Infrastructure to support Innovation, Health and Education in Queensland

## The Importance of Innovation

Technical and social innovation supports and drives the development of the Queensland economy. The availability of adequate, cost effective broadband services are now an important enabler of innovation worldwide. A number of studies both in Australia and overseas provide evidence that broadband services contribute significantly to economic development, and maintenance of competitive advantage.

Examples can be taken from many sectors of the Queensland economy where broadband services of sufficient quality and availability are needed to support their further development:

- The agri-business sector needs broadband to stay in touch with world markets, and manage its operations effectively over large distances
- Mining is critically dependant on efficient transport and control of high cost assets
- Energy distribution needs to improve the reliability of supply and monitor demand
- Tourism depends on the Internet for marketing and provision of services to overseas visitors
- Access to cultural and media content should be available throughout the State without being limited by geographic isolation

Government agencies in a state as large and dispersed as Queensland require equitable access to broadband to innovate service delivery:

- Health services needed to be provided safely by regional hospitals and regional GPs over large distances using specialists only available in urban centres
- Both the well and the not so well population need fast access to health information, support and monitoring of conditions.
- Rapid response to emergency situations is built of the availability of communications wherever the event occurs
- Education at all levels is dependant on access to digital content and the ability to use scarce specialist teaching resources to reach students in all parts of the State

## **Healthcare**

State healthcare providers, in collaboration with their partners, need to provide a comprehensive suite of health services to the public. The spectrum of services ranges from supporting those who are well, those who are at risk of developing a health condition, those who need treatment when they are injured or ill and people who have long term conditions. Health services are supplied individually, via community care, home care, emergency care (hospitals), and by via population health campaigns.

Health care outcomes can be improved and innovation occurs when providers can work together to deliver services to patients. Providers may work together to form communities of interest along geographical, disease or service delivery interests.

In the regions the shortage of health professionals means that metropolitan areas must use whatever means of communication are available to extend health services to regional areas.

Health services require technology and communications for data backup, patient monitoring, self management, messaging, paging/SMS/email, voice communications, web publishing, video communications, financial transactions, health event summaries, acute signs monitoring, patient entertainment, medical records and demographic information, diagnostic data (especially images) and reports, and analysis of large data sets of health information.

There are about 200 key healthcare facilities across the state, the majority of which are located in regional areas. There are several hundred smaller locations, including itinerant locations for dental and breast screening where healthcare is regularly delivered. A large number of health workers would benefit from improved mobile data services.

Broadband services used in healthcare need to be available and supported on a 24 hour basis. Technically services need to be able to be flexible enough to transmit large amounts of information within a matter of seconds or trickle to the destination the same information over several hours. Peak broadband capacities to support many health facilities will be in the 1 to 10 Gbps range, transmission latency will be low, and broadband service costs will need to contribute only a small amount to health service costs.

The extent to which new health care delivery models and technologies can be supported by broadband is entirely related to the capacity, availability, reliability and cost of broadband in regional areas.

The availability of open access fibre to a large proportion of healthcare facilities complemented by greater competition could lead to affordable high capacity services within communities. GP surgeries, community care workers, emergency personnel, and patients at home would then have access to the basic infrastructure upon which collaborative and innovative healthcare solutions could be built into the future.

## **Education**

In the education sector innovative learning models are seeking to provide flexible education in the right place at the right time, that combine classroom, virtual and private study.

The provision of additional computers for students will assist the development of these learning models if adequate support in their use is available, and the learning environments and resources that exist across the country are available. Teachers and parents have a key role in supporting learning and need access to resources from both work and home.

Educational services require technology and communications for data backup, student records, virtual learning environments, messaging, email, voice communications, web publishing, video based teaching and interaction with students, financial transactions, access to large data sets of educational resources, and research.

Use of real time video, audio and messaging systems will continue to grow. Peak broadband capacities to support many education facilities will be in the 1 to 10 Gbps range, and a large proportion of schools will require 100Mbps services. However broadband service costs will need to contribute only a small amount to educational budgets.

There are about 1900 schools in Queensland of which nearly half are outside metropolitan areas, 30 university campuses, and numerous other research centres. There is a significant health education presence in the State hospitals.

The continuity of access to learning environments across such a wide range of locations and organisations can only be guaranteed by high speed broadband networks that are capable of supporting many communities of interest across diverse, but interconnected broadband infrastructure.

The availability of open access fibre to all important education institutions and schools complemented by greater competition could lead to affordable high capacity services within communities. Teachers, researchers, workplace learners, students and parents at home would then have access to the basic infrastructure upon which innovative and collaborative educational environments could be built into the future.

## Issues for a National Broadband Network

A number of concerns arise regarding the ability current Commonwealth-led initiatives to provide the type of broadband infrastructure needed to support innovation in the economic life of Queensland and the delivery of services to its people.

1. The development of monopolies – either geographic or in the provision of particular services
2. Unnecessary over-investment and duplication of fibre-optic infrastructure
3. The mechanisms for ongoing cross-subsidisation of high-cost/low-return regional and rural areas for both the development of infrastructure and the maintenance of infrastructure
4. The level of involvement and level of negotiation/consultation with State Government and State-based organisations in any commercial deals done in relation to the provision and operations of broadband infrastructure in Queensland

These are covered in more detail below:

### **1. The development of monopolies – either geographic or in the provision of particular services**

Queensland has the most distributed and decentralised population of any State in Australia. The development of a world-class broadband network to service the large export sectors of mining and agriculture is critical to the ongoing prosperity of Queensland, and subsequently Australia.

Of equal importance, however, is the short and longer-term commercial and operational structure of any broadband infrastructure built.

The concern is that a deal for the provision of higher-bandwidth services may be done with one or two providers that will ultimately limit access to services delivered over the Internet, and/or will not adequately separate retail Internet and data services from wholesale bandwidth provision.

Any fibre broadband infrastructure built in Queensland with Commonwealth contributions to be:

- ‘Open access’ with a limit on the percentage of the infrastructure able to be owned by equity groups that also sell media/entertainment, telephony, or online business services<sup>1</sup>
- A ‘mosaic’ model of infrastructure provision, rather than a ‘one or two provider’ model – e.g. a fibre network built to service the Gold Coast would be owned by a different group to any fibre network built to service Brisbane or Cairns. In this regard, many plans to lay down fibre-to-the-curb or fibre-to-the-home networks by local council groups are worthy of consideration.

### **2. Unnecessary over-investment and duplication of fibre-optic infrastructure in low-cost/high-return areas**

Market segmentation and the ability for telecommunications carriers to ‘cherry pick’ areas of high population density or low-cost/high-return has seen metropolitan areas quickly attract multiple broadband providers, and regional and rural areas suffering a significant lag in infrastructure provision.

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Respondents to both the Regional Telecommunications Service Inquiry (2000) by Besley and the Regional Telecommunications Inquiry (2004) by Estens stated that they did not trust an operational separation of Telstra into wholesale and retail divisions. The vertical integration of telephony and then media services into the business case of Telstra meant that Telstra has an ongoing interest in restricting access to other telecommunications and media service providers. This, in turn, has led to disincentives for Telstra to upgrade network services until their investment in infrastructure could be protected from sharing. These problems could equally arise with other infrastructure owners that have commercial interest in the provision of retail media or online services (such as an Optus-led consortia).

Greater choice and market competition may also significantly drive down future broadband prices in metropolitan areas, while higher costs in infrastructure development combined with the possible formation of geographic monopolies may inversely drive up prices for broadband services in regional and rural areas.

There should be active measures undertaken by all tiers of Government to discourage over-investment both metropolitan areas and uneconomic duplication of infrastructure in regional areas. These measures include:

- The facilitation of co-operative development of open access telecommunications infrastructure. In particular, any fibre to the home laid by carriers should be made accessible to all suppliers to reduce infrastructure duplication
- The amendment of planning regulations to require cooperation in laying infrastructure between “connectivity” (telecommunications, electricity, gas, road, rail and broadcasting) service providers
- Encouragement of non-telecommunications service providers building fibre or wireless infrastructure to support their own business to make that infrastructure available to broadband service providers through “open access” agreements
- Facilitation of national broadband access, choice, and infrastructure through legislation to support the connection of regional initiatives with national providers using internet peering arrangements and broadband service inter-connection.
- An inter-government committee per geographic zone to coordinate and promote cooperation between major telecommunications carriers, electricity transmission, road and rail providers in the provision of advanced fibre optic and wireless infrastructure. This is so that regional centres can be linked and new residential, commercial and industrial developments can be serviced
- inclusive of “open access” infrastructure funded by the Commonwealth and States under existing programs.

### **3. The mechanisms for ongoing cross-subsidisation of high-cost/low-return regional and rural areas for both the development of infrastructure and the maintenance of infrastructure**

When the telecommunications market was first opened to competition in 1991, the Universal Service Obligation (USO) was introduced to a) ensure that minimum telephony services were provided across Australia, and b) create a mechanism for the cross-subsidisation for the provision of higher-cost regional and rural telephone services in an open telecommunications environment.

Since 1991 the USO has become increasingly problematic due to a) the diversification of the telecommunications market, b) the introduction of new services such as mobile phones and the Internet, and c) the partial and then full privatisation of Telstra.

Although the Australian telecommunications landscape is vastly different from what it was in 1991, the need for minimum services and a mechanism for the ongoing cross-subsidisation of rural and regional telecommunications services still exists.

The USO should be retained and reformed. A Universal Service tax/levy on the profits of all telecommunications companies (including Telstra), could be collected and paid to Local Government or Regional Bodies that would potentially undertake a Community Service Obligation to ensure that minimum nationally agreed benchmarks in bandwidth and broadband services are provided within their local geographic area. This may involve bringing in commercial providers of services, or developing their own joint or fully-owned broadband infrastructure to meet their obligations.

Telecommunications carriers that provide existing open-access fibre optic infrastructure in regional and rural areas could be given tax/levy-credits, thus providing further incentives to invest in infrastructure outside metropolitan areas.

This reform would provide ongoing financial incentives and assistance for the development and maintenance of regional and rural broadband infrastructure.

In addition to the reform of the USO, regional and rural areas can be supported by:

- The use of government purchasing influence as major buyer of telecommunications to provide for “anchor tenancy” of new regional broadband infrastructure.
- Increased availability of radio spectrum for radio technologies that will provide broadband capacity to residents located outside an exchange coverage area.
- A range of initiatives to extend the range of Australian and State based digital and multimedia content available via communications networks (including the internet, cable TV and broadband) so that all Australians can participate in government, community organisations, business, educational and cultural activities irrespective of their location.

#### **4. The level of involvement and level of negotiation/consultation with State Government and State-based organisations in any commercial deals done in relation to the provision and operations of broadband infrastructure in Queensland**

A far greater level of consultation and negotiation with State Governments could occur regarding the provision of broadband networks and any deals being negotiated between the Commonwealth and private providers.

In undertaking further negotiations with State Governments:

- Commonwealth Government broadband initiatives should coordinate with and leverage regional broadband infrastructure
- Seed funding for telecommunications infrastructure should be directed to long term projects based on regional alliances and industry clusters for broadband infrastructure.
- Collaboration between communications users, communities, local and State Government and major service providers such as health and education should be encouraged to aggregate the demand for services in order to improve the quality of services available in regional and remote areas
- Access by rural, remote and disadvantaged communities to telecommunications and information technology should be supported by the use of government purchasing influence as major buyer of telecommunications to provide for “anchor tenancy” of new regional broadband infrastructure.
- Innovation in the delivery of health, education and other government services using broadband services should be supported by combined infrastructure build and service delivery initiatives.
- Improvements in the efficiency of transportation, energy supply, land and labour management should be encouraged through partnership with the private sector in combined broadband infrastructure build and technology development programs.