

Introduction

The University of Southern Queensland (USQ) and the University of the Sunshine Coast (USC) require access to high-speed telecommunications services to support and to enable teaching and learning and research at each of their University campuses.

The challenges for USQ and USC include:

- to connect all campuses at adequate broadband speeds (at, near or greater than 1Gbps)
- to provide a network backbone to support collaboration with Health and Education
- to provide a resilient network capability that addresses failure of a single link

Currently the existence of a fibre black spot between Brisbane and Maryborough is a major impediment to USQ and USC having access to the cost-effective, highly available high bandwidth services that are available to most metropolitan universities.

This response to the Backhaul Blackspots Initiative is seeking to raise awareness of the current difficulties in supporting teaching and learning and research endeavours within the Fraser and Sunshine Coast areas and to demonstrate the existing and significant commitments made by both USQ and USC in partially addressing this issue.

Stakeholders

University of Southern Queensland

The University of Southern Queensland is located on 86 hectares of scenic parkland just 7 kms from the city centre of Toowoomba. Toowoomba is Australia's "Garden City", has a growing population of over 90,000 and is within comfortable driving distance of the State's capital city, Brisbane, and the Gold and Sunshine Coasts.

The University of Southern Queensland is an exciting, rapidly developing university with approximately 23,000 students, nearly three-quarters of whom are studying by distance education. High quality and innovative teaching programs combined with flexible delivery have earned USQ a reputation as a progressive university.

Of significance to this proposal, the University also has campuses at Hervey Bay, a fast growing region of Queensland and gateway to Fraser Island and at Springfield, located in the corridor between Ipswich and the Gold Coast and part of Education City.

A range of USQ undergraduate and postgraduate programs and courses can be studied at or through the Fraser Coast campus, including, health, education, accounting, community welfare and marketing. USQ's Fraser Coast campus is located on the Queensland coast at Hervey Bay which is about a three hour drive north from Brisbane. Approximately 750 students are currently studying on-campus while another 200 students study externally and regularly access the University's services.

University of the Sunshine Coast

The establishment of the University of the Sunshine Coast in 1996 created the first public university on a greenfield site in Australia in 23 years. The University was founded to serve

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the needs of the wider Sunshine Coast community, one of Australia's fastest growing regions. Representatives of the Sunshine Coast region had long lobbied for a university to be established in the area, recognising a need to provide local residents access to tertiary education. It was also recognised that the establishment of a university would provide unprecedented economic benefits to the region.

The University of the Sunshine Coast (USC) located at Sippy Downs is one of the few universities in Australia without Broadband connectivity to support their educational research and development to the AARNet standard of one Gigabit. This proposal would address this requirement. The University will be positioned to deliver innovative applications to the rapidly expanding Sippy Downs education and knowledge precinct which also includes the Innovation Centre Sunshine Coast and proposed Technology Park.

AARNet

AARNet continues to develop options for Gbps Internet services to the University sector leveraging commercial infrastructure where appropriate. The current status of Gbps Internet services to the USQ at Fraser Coast and USC at Sippy Downs under AARNet management is progressing; however due to the Blackspot (on the coastal strip between Brisbane and Rockhampton) the timeline for this to be addressed remains indeterminate and funding dependent.

QRAIL/Widelinx

The Fraser Coast Regional Council and IP Systems have partnered to form Widelinx, which was established to provide improved networking connectivity to the Hervey Bay region. IP Systems is a specialist supplier of IP Telephony and managed services over its own Multi-service network, providing enhanced carrier-class voice and data services, via broadband connectivity.

The fibre path between Maryborough to Hervey Bay now provides Gigabit capability, however the only affordable, though limited, solution for backhaul capacity to Brisbane remains via Queensland Rail.

Queensland Rail (QR) owns and maintains a large and diverse telecommunications network covering the entire railway network in Queensland. This network consists of microwave radio, copper and fibre optic cable and associated telecommunications network equipment and infrastructure. Over the past 10 plus years, QR has selectively entered into commercial arrangements with telecommunications carriers such as Ergon subsidiary, Nexium Telecommunications, for the provision of telecommunications services utilising QR telecommunication infrastructure and the railway corridor. QR and Nexium continue to develop and evaluate commercial opportunities on a needs, risk and business basis however, a cost-effective high-bandwidth backhaul solution between Brisbane and Maryborough is not available at this present time.

University Infrastructure Investment

Table A2 highlights the University of Southern Queensland's significant investment in providing external connectivity to its remote campuses. The Maryborough to Hervey Bay

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initiative was jointly funded by USQ and the Fraser Coast Regional Council and demonstrates the University's commitment to the region.

There is a backhaul black spot between Brisbane to Maryborough which prevents high-bandwidth capability from the University's Fraser Coast campus at Hervey Bay to Toowoomba. Because of its current investment in fibre infrastructure, the University has the capability to provide 1Gbps between Toowoomba and Brisbane, and 1Gbps between Maryborough and Hervey Bay.

However, the only cost-effective offering between Brisbane and Maryborough is to use QR infrastructure that currently provides a managed service of 45Mbps bandwidth capacity. The only other viable services available are managed services from Telstra with no opportunity for high bandwidth capacity at this time.

Table A3 sets out the University of the Sunshine Coast's current position in relation to its Internet backhaul services. For the purposes of this response, Internet backhaul services relates to University's Internet connection between the Sippy Downs campus and AARNet (Brisbane POP).

It is also to be noted that the University of the Sunshine Coast has made a significant contribution of capital for the construction of optical fibre infrastructure between the Brisbane QR backhaul corridor (Palmwoods), Sippy Downs / Maroochydore

Backhaul Issues

- 1 The absence of an alternative backhaul supply between Brisbane and Maryborough is the primary factor that prevents the USQ providing Gigabit network connectivity for staff and students at its Fraser Coast campus at Hervey Bay. This regional area is not serviced by a competitive market and key stakeholders must rely on high-cost and low-bandwidth service offerings. The current backbone infrastructure is biased in favour of the dominant carriers and is expensive.

Both the USQ and USC have strong commitments with the Health and Education sectors and their current investment in infrastructure highlights their support and commitment to their region. However a number of opportunities for access to Government, sector-wide and commercial projects and initiatives which are dependent on high bandwidth access cannot be undertaken.

The provision of quality backhaul fibre optic infrastructure between Brisbane and Maryborough will also provide the capability for USQ and USC to significantly increase bandwidth capacity within their networks to facilitate 'high performance computing' access for researchers.

Because of USQ's and USC's regional location, high-bandwidth is required for online teaching modes including video-conferencing and remote lecture delivery that enrich the student experience. Specialised access to services such as remote site health care training;

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real-time medical diagnosis and medical imaging are also required to support commitments to the Health and Education sectors.

- 2 The preference in provisioning such networks is to use fibre as the medium, and access dark fibre or wavelengths through ownership or long term IRU (Indefeasible Right to Use), such that the bandwidth can be expanded in accordance with requirement by changing the termination equipment, thereby keeping transmission costs independent of the bandwidth utilised.

Major breakout points from Brisbane to Maroochydore would include consideration for the Sunshine Coast Regional Council area (inclusive of USC) in addition to complementary submission made under the Backhaul Blackspots Initiative. Continuing the route to Maryborough would provide a significant breakout point which would satisfy the requirements of the USQ and the Fraser Coast local government area.

Attachment A

Current Financial Commitments

USQ Telecommunication Service	Provider
Toowoomba to Brisbane	AARNet NextGen Network (Dark fibre tails plus Wavelength)
Brisbane to Maryborough	St Lucia to Pipe Networks (Dark fibre) Pipe Networks to Queensland Rail (Dark fibre) QR Brisbane to QR Maryborough (Managed QR Service 45Mbps)
Maryborough to Hervey Bay	Wideline (Dark Fibre)
Hervey Bay to Fraser Coast Campus	Wideline (Dark Fibre)

Table A1

Provider	Bandwidth
AARNet NextGen	1Gbps
Queensland Rail	45Mbps
Wideline	45Mbps

Table A2

USC Telecommunication Service	Bandwidth
USC, Sippy Downs / BNE AARNet (Telstra GWIP)	50Mb/s
USC, Noosa "J" / Sippy Downs (Telstra GWIP)	20Mb/s

Table A3