

Broadband Connect and Clever Networks Response to Discussion Paper

Department of Communications, Information Technology and the Arts
Regional Broadband Policy and Technical Support
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MidCoast Consortium Submission to the *Broadband Connect & Clever Networks:
Supporting Investment in Sustainable Broadband Infrastructure* Discussion Paper,
November 2005.

Thank you for the opportunity to comment on the Broadband Connect and Clever Networks regional broadband programs.

MidCoast Consortium includes representatives from Local Government, Health, Education and Industry to provide models for the provision of services into Sunshine Coast and Wide Bay areas of Queensland. This consortium has come together to respond to the discussion paper. Ultimately, funding submissions may come from differently constituted consortia.

The Consortium response is contextualised from the perspective of the consortium preparing submissions to a future Broadband Connect and Clever Networks funding opportunity. The response identifies a set of fundamental principles for a consortium based response along with highlighting potential barriers to effective collaboration models including limitations in funding models and a historic focus on sector segmentation rather than holistic engagement.

Responses to questions outlined in the Broadband Connect and Clever Networks Discussion Paper are provided in summary form, referenced to existing collaborative models involving Consortium member institutions that are believed to represent best practice initiatives and demonstrate successful collaboration models.

The Consortium response represents the views and thoughts of the respective individuals involved, working with a common purpose and towards the shared goal of increasing broadband availability in Regional and Remote areas of Queensland. Unless expressly stated they do not necessarily represent the views of the respective institutions.

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Introduction

MidCoast Consortium includes representatives from Local Government, Health, Education and Industry to provide models for the provision of services into Sunshine Coast and Wide Bay areas of Queensland. This consortium has come together to respond to the discussion paper. Ultimately, funding submissions may come from differently constituted consortia, permitted within the context of the DCITA program.

The Consortium response is contextualized from the perspective of consortia preparing submissions to a future Broadband Connect (BC) and Clever Networks (CN) funding opportunity. The response identifies a set of fundamental principles for a consortia based response along with highlighting potential barriers to effective collaboration models including limitations in funding models and a historic focus on sector segmentation rather than holistic engagement.

Responses to questions outlined in the Broadband Connect and Clever Networks Discussion Paper are provided in summary form, referenced to existing collaborative models involving Consortium member institutions that are believed to represent best practice initiatives and demonstrate successful collaboration models.

The Consortium response represents the views and thoughts of the respective individuals involved, working with a common purpose and towards the shared goal of increasing broadband availability and capability in Regional and Remote areas of Queensland. Unless expressly stated they do not necessarily represent the views of the respective institutions.

The Consortium

The members of the MidCoast consortium are listed. Information on each member can be found in Appendix 1.

Hervey Bay City Council (Widelinx, WBBROC)
SunROC Suncoast Broadband Program
University of Southern Queensland
University of the Sunshine Coast
University of Queensland
Queensland Health
Queensland Rail
Pipe Networks
IP Systems
AARNet Pty Ltd
Queensland Regional Network Organisation (QRNO)

Other members of the QRNO were consulted in production of this submission, the list of QRNO member organisations being:
University of Queensland

University of Southern Queensland
University of the Sunshine Coast
James Cook University
Central Queensland University
Griffith University
Queensland University of Technology

While this submission focuses on the MidCoast Consortium there would almost certainly be separate submissions from consortiums headed by one or many of these institutions e.g. current members and users of the Sunshine Backbone network/s.

Current Projects

Hervey Bay City Council (HBCC) recently received telecommunications carrier status for its wholly owned company Widelinx and in conjunction with IP Systems, is developing a triple play (voice, data, video) solution to service the needs of their local community and to provide services to neighbouring councils and communities. A fibre trunk is being installed from Hervey Bay to Baddow Station, jointly funded by HBCC and the University of Southern Queensland. Backhaul to Brisbane will be provided through the Queensland Rail (QR) rail path from Baddow Station, initially utilising a 70Mb DS3 channel provided by QR, which will connect to AARNet 3.

The Hervey Bay campus of USQ and the Sippy Downs campus of USC however ultimately require broadband (1 Gbps) connectivity to the AARNet network to support teaching, learning and research demands.

The USC campus is planned to be the centre of a health and education precinct with Queensland Health planning a major health services facility adjacent to the USC campus. Education Queensland has a presence on the campus, and the campus will host the Sunshine Coast's knowledge precinct. These precincts will require high bandwidth for research, education, administrative services and telemedicine.

The councils of Noosa, Maroochydore and Caloundra (SunROC) have engaged the services of the region's Demand Aggregation Broker, and an Expression of Interest has been released to the market for the provision of last mile and backhaul broadband services to those communities.

The 22 Councils of the Wide Bay Burnett Regional Organisation of Councils (WBBROC) have also engaged a Demand Aggregation Broker and will call for an Expression of Interest for supply of Telecommunication Services including Backhaul services in the near future.

The proposed fibre infrastructure would provide a strategic enhancement of backhaul services capability in the regions. The community and last-mile ISP demand will require high bandwidth.

QRNO Vision for University Networking

The Queensland Regional Networking Organisation (QRNO) represents the Queensland universities in the endeavour of provisioning adequate network infrastructure to connect university campuses to national and international Research & Education networks, and open the opportunity for integration with primary, secondary and VET components of the Education sector, along with collaborating with the Health sector (universities have a presence in around 30 hospitals in Queensland).

The QRNO seeks to secure consortium and funding arrangements for its members and works in concert with AARNet on projects to deploy, manage and improve connectivity for its members.

These projects contribute to the strategic vision for university networking in Queensland. The challenges for the universities include; to connect all campuses at adequate broadband speeds (at or near 1Gbps) to support teaching, learning and research, to provide a backbone to support collaboration with Health and Education, and to provide a resilient network that can tolerate failure of a major link. Resilience may be provided through the development of a linked-ring communications architecture model, with reticulation on the coast and inland, from Brisbane to Cairns, providing primary links and link redundancy and implemented through a phased approach.

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 by changing the termination equipment, keeping transmission costs independent of the bandwidth required.

The provisioning of bandwidth under projects such as those outlined above will provide access to transmission facilities in line with this vision.

The QRNO and AARNet were instrumental in the Sunshine Backbone project resultant from the original HEBAC Report recommendation. Stage 1 provides a gigabit-per-second production network to AARNet from JCU Townsville and CQU Rockhampton utilising Powerlink infrastructure with a 10 year IRU (Indefeasible Right to Use). Sunshine Backbone Interim Stage 2 will provide improved bandwidth to JCU Cairns, CQU Mackay, Gladstone and Bundaberg with another project identified for UQ Ipswich and Gatton. Fibre to the Gatton campus could form the basis of backhaul for a community wireless broadband service in Gatton delivered by UQConnect. UQConnect is the University of Queensland's ISP that provides a range of broadband services to students, staff, friends of the university, and the broader community

The Sunshine Project stage II network obligations fall to AARNet, as AARNet implements the project to extend the national R&E backbone to Cairns, providing high bandwidth campuses for research and education.

Principles

The consortium believes in the following principles as tenets for a successful and sustainable service delivery model:

1. Open network approach – backhaul infrastructure under a horizontally layered governance model, for use by competing service providers
2. Governance framework for an open network approach
3. Education/Health/Local Government as anchor tenants for broadband capacity (as they are for employment and consumption in many communities)
4. Sustainability – a solid base of stakeholders from the public and private sectors, core backhaul infrastructure, offering value-added applications
5. Preference for infrastructure funding, to maximise investment in this area
6. Effective use - reuse of existing capacities where feasible, build where necessary
7. Incentive payment model, equity, encouraging capital investment sharing
8. Adding value to infrastructure, applications deliverable via the infrastructure
9. Private Public Partnerships
10. Demonstrator models – proof of the viability of the concept and commitment by stakeholders

Response to Broadband Connect-Clever Networks Discussion Paper

The response to the Broadband Connect / Clever Networks represents a summary of the outcomes of two focus group meetings of consortium members, held at USC Sippy Downs in December 2005 and January 2006, and is referenced to a consortium model, using current projects by HBCC and SunROC as exemplars.

A number of members have also submitted responses in their own right, or through their respective organisation/institution.

Risk Mitigation

The risks associated with capital investment in broadband infrastructure are somewhat mitigated with a Consortium approach. A strong consortium, representative of Public and Private stakeholders, with a good business case, jointly shares risk on the initial investment and improves sustainability over the longer term with stakeholders having a vested interest in keeping services operational.

With service provider, last mile and backhaul viewed as horizontal layers, rather than the traditional single vertical layer, the consortium approach

provides a number of alternative options to using the “dominant carrier”, driving competitive cost solutions and encouraging further investment.

The consortium model is targeted at becoming self sustaining and would operate as a “not for profit” entity. One model is to use the principles of the Local Government Authority Act relating to the provision of services such as water, sewage and garbage collection. Another model is to use AARNet, which manages infrastructure nationally and internationally on behalf of the Education sector.

It is also necessary to highlight the potential risks to a Consortium approach associated with the inability to overcome political or industry barriers to ensure a fair playing field. The dominant and major players potentially have the influence in government to stifle creativity and innovation. Policy should be considered to prevent the dominant carriers from placing barriers (political or technical) on the provision of specific services, e.g. VoIP.

Sustainability

The principles alluded to in this response have been drafted to support the implementation and management of a sustainable resource.

Encouraging the consortium approach to infrastructure implementation offers opportunities to share, and to provide infrastructure that realises revenue generation and delivers sustainability.

The users of the communications technology should have control over its deployment and utilisation, moving away from the current inefficient and cost-prohibitive “per MB” carrier charging models. User-controlled networks, managed by the stakeholders, should provide more efficient operation, lower cost and wider community benefit.

Legislative changes could assist in development and sustainability; i.e legislative changes that will empower local government to mandate the provision of carrier neutral telecommunications infrastructure in new developments; changes to the integrated planning act to allow local government to levy 'infrastructure charges' for telecommunications infrastructure in the same way they do for other infrastructure such as sewer and water; local government policies to influence developers to include additional pit & pipe infrastructure in civil construction in new estates.

Dark fibre is the preferred medium, which, through the use of xDWM technologies, can support many Gbps, providing Gbps wavelengths for backhaul and for users. A consortium approach lends itself to installation and management of such fibre infrastructure. Where economic and technical criteria are met the use of existing fibre infrastructure could be employed (QR example). A funding submission could target the upgrade of QR fibre to

provide Gbps capacity, or the installation of new fibre as has been achieved with Powerlink for the existing Sunshine Backbone network.

The upgrade/reuse of existing infrastructure, and the use of government-owned corridors, such as the proposed upgrade of QR fibre infrastructure, may provide an increased return on investment through extending reach to smaller communities, and hence should not be excluded from funding. The possible breakout points for such infrastructure are shown in Appendix 2. These corridors can be utilised to run new fibre services.

The Sunshine Backbone university sector education network (using services from Powerlink) provides high bandwidth into smaller centres of interest to education and health, and can provide bandwidth that can be used to aggregate services to smaller centres. Access to such infrastructure has already encouraged other service providers and commercial carriers to expand into smaller communities and regional areas e.g. (the 10Gbps network is now fully subscribed, the education network providing the base tenant). This arrangement has the potential to provide a redundant diverse path for communication consortia throughout Queensland as this network expands.

An Open Network approach with an appropriate governance framework provides non-exclusive access to the infrastructure, and provides an equity charging model between the metro and regional areas. An equivalent paradigm is the road system – open to all, funded by local, state, federal and private entities. This reinforces sustainability through affordability. The effectiveness and affordability is further extended through multi-peering arrangements with other carriers.

Backhaul is critical. Broadband has the proven ability to change the user and business usage paradigm. A strategic approach to BC funding is subsequently required, where core infrastructure is considered so that last mile services can then be offered at reasonable cost. It is also recommended that expenditure of some of the BC funding be awarded for tails and POPs for the connection of last mile services to available backhaul infrastructure.

The scalability, maturity and development (see Effective Use) of any selected technology should be a contributing factor to funding decisions.

An effective governance framework for Consortium based broadband infrastructure is required. A potential model developed by the Midcoast Consortium is included in Appendix 3.

Funding, Incentive and Capital Investment

Communications technology underpins the development of knowledge based economies, enabling economic growth and development. Regional development criteria and demographics are subsequently believed to provide

the key to investment prioritisation e.g. funding where growth is occurring and demand is created.

For education, health, and government the bandwidth available through ISDN is often inadequate to meet business requirements. Services provided to the community also require adequate bandwidth for backhaul and the availability of ISDN is not believed to be a suitable yardstick for determining the incentive payments of capital funding allocation.

The incentive payment scheme currently discourages further investment if ISDN is available.

A funding focus on capital investment for infrastructure will encourage infrastructure development and an open network backbone will support competitive services from ISPs.

The current Backbone infrastructure is biased in favour of the dominant carriers, is expensive, and is not providing true broadband access to communities. Consider a focus on infrastructure,

- Leave service provision to providers that can generate a revenue stream over the infrastructure.
- Link BC and CN (and Mobile Connect) strategically to provide funding for infrastructure investment.
- Involve State, Local Government and utilities and encourage State and Local Government participation through in-kind (Qld Government has already stated that there is no funding in the current climate) such as access to rights-of-way, ducting, preferred (low margin) pricing for services from government authorities.

Broadband Connect funding should be available to supplement the Clever Networks funding in providing infrastructure investment for capital and backhaul.

Per customer funding is applicable for last mile services, with a suitable funding model dependent on the modularity of the solution, hence a combination approach may be warranted. If the solution is modular and equipment infrastructure scaleable as demand requires, then a connected customer model may suffice. Where a greater commitment to infrastructure is required to provide a service, the potential premises model may be applicable. Many proposals will involve components of each model.

A combination of methods is subsequently believed appropriate;

- A demand aggregation approach with a relationship between the backhaul provision and the end-user service provision is more favourable in considering future demand and expansion.
- Establish an Open Network paradigm to attract competition and encourage regional participation.

- Encourage an anchor service provider to provide value added services, such as triple play services (data, voice, and video) on the network.
- The backhaul infrastructure can be managed by a consortium to be open access, with enough revenue to be sustainable, to expand to meet demand, but not generating a commercial profit to any stakeholder (excludes value add services and applications that may be provided by members over the backhaul).
- An IRU (Indefeasible Right to Use) for dark fibre or WDM wavelengths can provide a return on investment for the provider, but permit the consortium to manage the bandwidth and traffic. The backhaul will bring in services that have a profit motive, allowing competitive forces to control price and performance to consumers.
- Threshold models should recognise true QoS standards for delivery of applications such as voice, video and mission critical applications, thereby shifting the measure to effective use and services rather than 'pipe speed'. The EGRRS (Eastern Goldfields Regional Reference Site) standards may be a useful reference - http://www.egmdgp.com.au/Eastern%20Goldfields%20Regional%20Reference%20Site/eastern_goldfields_regional_refe.htm
- Provide upfront payment for capital applied to infrastructure, with the funding decision by DCITA based on a sustainable business case and provided against agreed milestones. Progress payments made on achievement of milestones).
- Tariffs driven by market forces effectively managed where competition is immature.

One possible measure for benefit assessment is the number of residents/businesses that can reasonably connect and be serviced by the infrastructure, weighted positively if there are few other options available.

Upfront in-advance payment may be required for infrastructure roll-out, e.g. dark fibre/wavelengths with a long (e.g. 10 years) contracted IRU.

Government funded projects in the past have suffered with problems in committing funding within the funding expenditure period. Funding must recognise realistic implementation timeframes and the difficulties that may be encountered in contract negotiation and technology rollout.

The progressive transition to high/higher bandwidth networks for communities requires suitable backhaul media.

- Plan to progressively push fibre deeper into the communities. This also provides an effective strategy for wireless deployment as fibre between the nodes greatly improves overall performance.
- Assess new last mile technologies such as wireless and broadband-over-power-lines.

- The installation of, and open access to, dark fibre/wavelengths, provides opportunity for an evolution of equipment, improved as demand increases, without taking a hit when bandwidth is increased.

Effective backhaul supports proposals that deliver competition into an area where there is no/little effective competition.

In terms of eligibility the potential for the solution to dovetail into the drivers for the regional economy is relevant. Local government is a key stakeholder in all communities. All education sectors should be considered for eligibility - primary, secondary, tertiary and VET, government and non-government, with a preference for collaborative approaches. Similarly, all health sectors should be considered. Health and education are represented in most communities, and offer significant opportunities for collaboration if current paradigms are changed.

Effective Use

Availability of new and evolving broadband technologies can be used to optimise and extend existing network investments and, depending on the provided services, operational costs can be managed/lowered and network availability increased to meet the expanding consumer demand.

Due to the vast and varied nature of regional centres across Australia requiring services, a complementary and combination approach to the availability and utilisation of broadband technologies can provide more favourable outcomes for services delivery.

For the high bandwidth applications required in Regional and Rural Queensland terrestrial services are necessary, with optic fibre being the best medium.

Dark fibre is preferred so that bandwidth can be increased by changing the end equipment, such that costs for the medium are not tied to bandwidth. Wavelengths on a fibre are also acceptable. For voice and video interactive applications, satellite introduces unacceptable latency and delays. Satellite service delivery remains appropriate where other services are not possible or cost prohibitive. Satellite cannot deliver the full range of metropolitan services. The economics for each mode of delivery will be instance based.

Technologies that will have the most impact are fibre and wireless, as these technologies have the advantage of the following criteria:

- Scalability – ability to grow in bandwidth, coverage, number of supported users, number of simultaneous users
- Maturity – well known characteristics, costs, limitations
- Developing – developing standards and equipment, providing higher bandwidth, greater reach, lower cost per Mbps, with a developing applications base

Services may be extended to the community (rural, residential, small business) through the adoption of wireless technologies from local POP's. Wireless technology currently provides bandwidth from 2Mbps, to 11Mbps, to 54Mbps, with greater bandwidths possible through new WiMax (802.16) technologies.

CWDM and DWDM systems offer very high bandwidth growth potential and efficient utilisation of fibre media.

ADSL/ISDN technologies generally do not provide satisfactory bandwidth for education and health locations.

In considering funding proposals DCITA should not preclude upgrading weakest link components (e.g. Brisbane-Maryborough QR fibre, upgrading from DS3 (70Mbps) to Gbps speeds or Cairns to Townsville from 118Mbps to Gbps when the Powerlink build occurs). The upgrade/reuse of available infrastructure, and the use of government-owned corridors, is a key enabler to the deployment of effective broadband solutions into regional areas.

Minimum broadband specifications should characterise infrastructure that supports value-add applications and should be scoped to support QoS (Quality of Service capability) required for triple play (or at least double play) i.e. Voice, Data and Video-On-Demand. For research applications and high performance computing applications, network latency is a key criterion.

Funding incentives could be considered for early or first time take up (e.g. First Home Owners Scheme) to encourage effective use.

Broker Network

As proposals may focus on particular sectors of interest, the opportunities for a joint effort of mutual benefit to several sectors may be overlooked. On receiving funding submissions, DCITA might consider acting in an aggregator capacity to encourage the bringing together of parties in a region (or adjoining regions) for a more efficient, scalable and sustainable solution.

This may be facilitated through the community and state Demand Aggregation Brokers – and the application of conceptual Strategic vs Competitive funding models. Such an approach would also permit an aggregation of the funding deed across BC, CN, Mobile Connect and other available funding schemes.

Consequently, the community and state DAB role should evolve to be the DCITA representative to coordinate CN, BC and MC funding streams. Continuity of the State Broker role is also required, with the development of overarching governance frameworks between DAB and specialist brokers (Education, Health).

Brokers can be most effective if they are intimately aware of State and Federal programs, industry programs, and are involved in the coordination of capital works projects, telco activities, local government (planning permission), and commercial arms of government. A single register, and/or State/Fed coordination, of telecommunications-relevant capital works projects may subsequently prove beneficial.

The brokers need an effective linkage to regional economic development bodies, so they can map effective use outcomes required by the region to back State and Federal programs.

A registry of services would assist with service awareness and opportunities for collaborative use of infrastructure can be facilitated if stakeholders are aware of what services exist (e.g. fibre and microwave paths). A GIS database based on the Geoserver open source geospatial information system could potentially be used to record the installed telecommunications assets for easy reference, planning, design and policy decisions.

Anchor Tenants, Targeted Groups

Holistic benefit is realised through a consultative process that brings together funding applicants who have submitted overlapping or synergistic proposals with the intent to create a larger or more advanced project, i.e. a process to capture the greatest investment/co-contribution from the community or private sector

Education/Health/Local Government indeed can be thought of as anchor tenants for broadband capacity (as they are for employment and consumption in many communities). However, focussing on any one as a priority has the tendency to undermine the benefits of a collaborative model.

All parties should all be around the table as stakeholders sharing in the development of regional broadband infrastructure solutions.

Added Value

Proposals which encompass both infrastructure and applications provide a more complete and integrated solution. The provision of new applications may see a faster take up by the consumer (have the facility and something to use it for), and offer economies of scale and price reduction through bundling of services and applications.

Piloting applications for use by future target groups should be supported to establish benchmarks of application service delivery across different broadband environments.

The balance between infrastructure and applications streams, and hence the efficacy of integrated solutions, can be best determined by including parameters that measure and assess both economic and community benefits.

Assessment on merit is viewed as warranted where infrastructure provides a strategic advantage, on which commercially competitive offerings can be delivered, and there is both a service provider to deliver these and the identified demand.

Strategic investment in such things as core network upgrade (or new rollout) should form the larger portion. The majority should be strategic, with due consideration for long term benefit, implementation lead time, etc.

Education campaigns within the community will raise the level of awareness of the benefits of high bandwidth communications and the value adding applications that these support.

Appendix 1: The Members

Information is presented on each on the members of the MidCoast Consortium (alphabetical order).

AARNet Pty Ltd

AARNet Pty Ltd, Australia's Research and Education Network, provides high capacity, cost-effective Internet services to the education and research communities and their research partners both nationally and internationally. The research and education community has benefited from far-sighted investments under a range of Government programs including the government's Backing Australia's Ability. This Strategic Infrastructure Initiative funding to the universities has assisted AARNet to acquire access to high bandwidth capacity on the advanced fibre optic network, NextGen Networks (spanning the nation from Brisbane to Perth) and to Southern Cross Cable Networks for SXTransPORT (spanning the Pacific Ocean). In addition, AARNet has acquired access to fibre and capacity to provide individual connections to a large number of regional locations across Australia including Tasmania, Darwin and Far North Queensland.

Communication networks are among society's most important infrastructures. They underpin the economic growth of Australia. They are vital to the operations of many sectors of our society: from research and education and healthcare to the commercial competitiveness of our financial and manufacturing sectors.

Australia has in its research an education network, AARNet, a world leader in the provision of communications infrastructure and the continued investment in this network will provide the best possible return to the nation. This network is a vital element in international collaboration engendering the development of intangible networks; and of 'person to person collaboration'. Researchers and educators across Australia are engaging in joint research, exchanging information using the wide range of collaboration models, tools and information that is facilitated by AARNet.

Hervey Bay City Council

Hervey Bay, on the Queensland coast 300 kilometres north of Brisbane, is among Australia's fastest growing regional centres (pop. 50,000), with a \$12 million redevelopment of the city's airport, announcement of a \$75 million Industrial Park, and a spate of new residential and resort developments. The Hervey Bay CBD is some 30km from the main Queensland communications corridor which follows the Bruce highway and the North-South Railway. Maryborough is its closest Point of Interconnect (POI) to the national telecommunications grid with Telstra currently being the only carrier to have fibre optic infrastructure into Hervey Bay.

The State Government [Strategic Directions Paper](#) clearly identifies telecommunications infrastructure as a challenge to development in Hervey Bay and the Wide Bay Burnett region. HBCC recognises that a world-class communication and information infrastructure will enable its residents and business community to more successfully participate in the information economy and that a lack of competition in the regions Customer Area Network (CAN) is an impediment to delivering reduced telecommunications costs to consumers.

HBCC is currently implementing a telecommunications project to deliver equitable, affordable and sustainable ultra broadband and other advanced telecommunications services to Hervey Bay City and its neighbouring regional community. HBCC has allocated significant financial and staff resources and engaged with telecommunications services provider IP Systems to achieve this ambition. HBCC has created a separate business entity (Widelinx Pty Ltd) to enable the project to be managed commercially and has recently been awarded carrier status for Widelinx. This project will be a catalyst for social, economic and welfare benefit in the Wide Bay community.

IP Systems

IP Systems is a specialist supplier of IP Telephony and managed services over its own Multi-service network, providing businesses with solutions since 1994. IP Systems provides enhanced carrier-class voice and data services, via broadband connectivity – providing quality, reliability and functionality. IP Systems provides best feature services for IP applications, for lower costs and excellent service. IP Systems is a triple-play provider, offering data, voice and video services over IP networks.

PIPE Networks

PIPE Networks is now recognised as Australia's largest peering provider and operates 16 IX points in 6 cities with over 130 active connections. The Company's peering customers include some of Australia's largest content and internet service providers including WebCentral, The Australian Broadcasting Corporation, iiNet, Primus, TPGi and AsiaNetcom.

In July 2002, PIPE Networks was granted a Telecommunications Carrier Licence by the Australian Communications Authority as part of the Company's plans to interconnect each of its IX locations in the same city via its own fibre optic network. Upon constructing the fibre optic network between its Brisbane IX locations, PIPE Networks recognised there was substantial demand from corporate and government organisations seeking direct access to dark fibre.

PIPE Networks currently operates a fibre optic-based network servicing the CBDs and certain metropolitan areas of Sydney and Brisbane with over 140 buildings "on-net". The Company also plans to further expand its fibre network in Brisbane, Sydney and Melbourne.

Queensland Health

Queensland Health is a dynamic organisation committed to providing a range of services aimed at achieving good health and well-being for all Queenslanders. Through a network of 38 Health Service Districts and the Mater Hospitals, Queensland Health delivers a range of integrated services including hospital inpatient, outpatient and emergency services, community and mental health services, aged care services and public health and health promotion programs.

Queensland Rail

Queensland Rail 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. QR has specifically designed and installed this network to provide telecommunications services for QR's business and operational needs as a railway, however QR has, over the past 10 plus years, selectively entered into commercial arrangements with telecommunications carriers for the provision of telecommunications services and the use of QR telecommunication infrastructure and railway corridor. QR continues to develop and evaluate commercial opportunities on a needs, risk and business basis

Queensland Regional Network Organisation

All of the Queensland universities work co-operatively together to build common infrastructure to benefit the higher education sector in Qld. The universities are represented by two organisations - the *Queensland Regional Network Organisation (QRNO)* and the *Queensland University Education, Science and Technology Network (QUESTnet)*, as vehicles for co-operation, government funding, project management, technical training and government and industry liaison.

The Queensland Regional Networking Organisation (QRNO) represents the Queensland universities in the endeavour of provisioning adequate network infrastructure to connect university campuses to national and international Research & Education networks, and open the opportunity for integration with the Education sector.

SunROC

SunROC is the Regional Organisation of Councils for the Sunshine Coast region. The participating Councils are:

- The Caloundra City Council
- The Maroochy Shire Council
- The Noosa Shire Council

SunROC's mission is to be known as the pre-eminent lobbying organisation for the regional interests of the City of Caloundra and the Shires of Maroochy

and Noosa and, through effective lobbying and council co-operation, the Sunshine Coast will have the best physical infrastructure of any region in Australia.

The Suncoast Broadband Project is a regional SunROC project to provide increased Shire-wide broadband availability, leading to improved productivity and service for local business as well as yielding benefits for the wider community. This project is a major step towards making broadband access the norm for more businesses, homes and schools across the Sunshine Coast.

The University of Queensland

The University of Queensland was founded in 1910 as the first university in Queensland and the fifth in Australia. Now it is known internationally as a leader among Australia's 39 universities. The University ranks in the nation's top two or three institutions by most performance measures. Nationally, the University is a founding member of the Group of Eight – a coalition of leading research-intensive Australian universities. Internationally, the University is one of only three Australian founding members of Universitas 21, a select alliance whose membership is limited to 25 research-intensive universities dedicated to world-best practice.

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 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.

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. In 2000, USQ was joint winner of the Good Universities Guide's "University of the Year" award for "Developing the e-University". Also, in 1999, USQ was awarded the prestigious ICDE award for the best on-campus/off-campus dual-mode university in the world!

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 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.

WBBROC

WBBROC is the Regional Organisation of Councils in the Wide Bay Burnett region. The participating Councils are:

- Biggenden Shire Council
- Bundaberg City Council
- Burnett Shire Council
- Cooloola Shire Council
- Eidsvold Shire Council
- Gayndah Shire Council
- Hervey Bay City Council
- Isis Shire Council
- Kilkivan Shire Council
- Kingaroy Shire Council,
- Kolan Shire Council
- Maryborough City Council
- Miriam Vale Shire Council
- Monto Shire Council
- Mundubbera Shire Council
- Murgon Shire Council
- Nanango Shire Council
- Perry Shire Council
- Tiaro Shire Council
- Wondai Shire Council
- Woocoo Shire Council

The objectives of the WBBROC Demand Aggregation Project parallel those of the Suncoast Broadband Project


Appendix 2: Possible Fibre Breakout Locations



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APPROVED FOR INSTALLATION/TESTING

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		SCALE		RECOMMENDED		RAIL SYSTEMS SERVICES TELECOMMUNICATIONS ENGINEERING	
		DRAWN G.R.A. 6/01/06		A.I. WILLATON DESIGN ENGINEER		WDM SYSTEM PROPOSED LOCATIONS	
		CHECKED G.R.A. 6/01/06		DATE : 6/01/2006			
		PASSED		APPROVED		 TF02585	
				J.J. WIMBERLEY For/ PR. ENGR OPERATIONAL TELECOMMS DATE : 6/01/2006			
ISSUE	ALTERATION	C/K/D	DESIGN	PEOT		SHEET NUMBER	1
		DATE	ENGR			ISSUE NUMBER	1.B

Appendix 3: Governance and Sustainability Model

For any collaborative network management model to operate effectively it must exist within a governance framework that ensures equity in decision making; maintains sustainability of service and provides cost effective delivery.

Previous models such as the Sydney Basin Fibre Network which involved collaboration among a group of five Universities and AARNET Pty Ltd have proved successful in managing collaborative networks and were founded on a set of objectives that included;

- Enabling secure communications within and between participating institutions.
- Providing dedicated capacity for purposes consistent with a defined acceptable use policy.
- Providing access to AARNet and the Internet to institutions authorised to use the Network
- Developing a working arrangement to plan, manage and maintain the network.
- Ensuring effective support, utilisation and maintenance of the network.

and principles that included;

- Establishment, management and operation to be fully funded by participating institutions and all work undertaken by a Facilities Manager.
- Consensus on decisions making.
- Administering and maintaining the agreement through a common commitment to meeting the research and education network needs of all parties,
- Assets loaned or rented and forming part of the network remain the property of the original owner.
- Assets and infrastructure implemented as part of the core network (including ducts, pits, cable, conduit etc.) held in trust for the term of the agreement by the Facilities Manager.
- The Facilities Manager is responsible for ensuring network assets and infrastructure is fully maintained, licensed, insured etc.

Governance Framework

The consortium model presented in this paper adopts a number of principles viewed as “best practice” examples learned through the experience of the Sydney Basin Fibre Network Consortium. These have been adapted for a broader context to include the consortium parties represented in this submission and align with key policy objectives of Broadband Connect and Clever Networks initiatives including;

- supporting equitable access to broadband services for residential, small business and not-for-profit consumers across regional, rural and remote Queensland.
- ensure that quality services are delivered and maintained; and
- ensure that high cost delivery areas receive services at prices comparable to metropolitan areas.
- increase access to, and effective use of competitive broadband networks in regional, rural and remote communities.
- focus on the delivery of government services such as, but not limited to, health, education and emergency services.
- build additional infrastructure to support Broadband Connect in extending the reach of competitive broadband in rural, regional and remote communities; and
- facilitate sustainable competition.
- improve terrestrial broadband for unserved users; that is, communities either outside the reach of ADSL, or too small to attract ADSL.
- create a situation under which regional infrastructure can improve network reach and competition within a more coherent and commercially sustainable environment.
- support development and use of innovative broadband applications that deliver improved health, education and other services.
- leverage multiple sources of investment including from service providers and all levels of government to provide the greatest possible benefit.

The following fundamental objectives of the consortium have initially been identified:

- Increase broadband capability and services to regional and remote areas through the establishment of a series of meshed optic fibre rings that will form a fibre backbone network traversing major cities and towns throughout Queensland and servicing remote communities through a hub and spoke model from major nodes.
- Create an open access model that stimulates market competition.
- Implement an equitable cost model for broadband service delivery across metropolitan, rural and remote areas.
- Provide opportunities for collaborative partnerships in service delivery.
- Leverage existing infrastructure investment (Public & Private) through peering and partnering arrangements.

- Extend the role and involvement Demand Aggregator Brokers in facilitating service delivery and the uptake of value added services in regional and remote areas.
- Allow providers to deploy new broadband services in regional rural and remote areas on a competitive, commercially sustainable basis.
- Create a self-sustaining model

As with the Sydney Basin Fibre Network Consortium the proposed consortium governance framework would operate under a Memorandum Of Understanding (MOU) between participating parties that;

- Defines the respective roles, responsibilities and obligations of all parties.
- Defines the communication framework that will ensure an effective and mutually satisfactory relationship between the parties for the life of the agreement.
- Defines the procedures for managing change.
- Defines the principles for the funding arrangements between the parties.
- Identifies the decision-making processes.

The MOU would be for an initial term of 5 years (renewable) and reviewed bi-annually.

A Facilities Manager who is a carrier in their own right would be engaged to manage the operational aspects of the network under a formal service level agreement.

Consortium members would form a steering committee constituted similarly to the following.

- Each member institution would appoint a representative to the Steering Committee and where a person must be replaced in the Steering Committee, then the body that has appointed them will nominate a replacement.
- Representatives to the Steering Committee may bring advisers or observers to attend meetings.
- There would be separate positions for Chair and Secretary of the Steering Committee with these positions to rotate amongst eligible members on an annual basis.
- The Facilities Manager would provide a representative to the Steering Committee to act in an advisory capacity only.
- The Steering Committee would determine the meeting frequency necessary to carry out its functions effectively and would be expected to meet no less than bimonthly.

- The agenda and papers for meetings would be circulated at least ten business days prior to a meeting.
- Decisions of the Steering Committee would be made on the basis of a majority of the members present and voting. A quorum defined as greater than 60% of voting members being in attendance.
- The chair of the Steering Committee may call additional unscheduled meetings with one week's notice to deal with urgent business.
- The Secretary would record the minutes of each meeting and circulate these to participating members no later than two weeks after the respective Steering Committee meeting.

The roles and responsibilities of the Steering Committee would be similar to the following:

- To ensure that the network is managed and provisioned efficiently and effectively in accord with consortium principles and objectives,
- To oversee the operation of the network and provide a forum for discussion and agreement between the members,
- Approve the connection of new institutions,
- Appoint the Facilities Manager,
- Provide high-level management direction to the Facilities Manager,
- Prepare an annual operational budget for the network based on estimates provided by the Facilities Manager.
- Activities will be subject to the appropriate level of accountability necessary to meet statutory financial reporting and audit requirements.
- Determine strategic direction and changes to the network, and
- Make those decisions defined in the MOU as decisions of the Steering Committee.

Sustainability Model

The consortium model proposed is targeted at becoming self sustaining and would operate as a "not for profit" entity using the principles of the Local Government Authority act relating to the provision of services such as water, sewage and garbage.