

INQUIRY INTO INFRASTRUCTURE AND THE DEVELOPMENT OF AUSTRALIA'S REGIONAL AREAS

Submission from James Cook University Townsville – Cairns

Introduction

James Cook University [JCU] is the primary tertiary education provider for northern Queensland, is a research institution of international significance, particularly with respect to issues of tropical and regional relevance, and plays a critical role in the regional economy¹. It has both a mission and an obligation to provide a diverse curriculum for a relatively small student population, to produce graduates for the region's businesses and professions, and to improve the region's low tertiary education participation rate. JCU is in itself part of the region's infrastructure – it is a community facility of considerable value and importance – and it is vital to its economically sustainable development.

However, JCU has two main campuses that are over 400km apart, and it is remote from major cities – and hence from options to access and utilise, either singly or in partnership, the infrastructure enjoyed by metropolitan institutions. The impact of infrastructure deficiencies on JCU affects its role as a vital part of its regional infrastructure; many of those deficiencies likewise impact on the prospects for economic development of the region.

Information

Universities are, in essence, generators, providers and users of information. Their capacity to produce and transmit knowledge is highly dependent on the means by which information is stored and disseminated. Invariably the regions have a poorer information infrastructure than metropolitan areas and the gap is widening – for example, in its traditional mode: regional state and business libraries have been closed or downsized, and the options to form cooperative links with major libraries (state and university) are severely limited by distance's tyranny. Regional university libraries are required to be more self-sufficient, but on a smaller resource base. This is certainly so for JCU.

Information transmission for the regions is becoming increasingly dependent on telecommunications, particularly via the Internet. The role of the Internet in teaching, research and general economic activity is now well established; not only is it absolutely critical for the continued well-being of a regional university – and hence for the region's key information resource – that Internet access in northern

¹ Without it, the North Queensland economy would contract by over 4%, and its labour force by over 6.3%.

Queensland is adequate, but also for the capacity of the region's community and businesses to fully participate in activities that rely on data transmission, such as electronic commerce. This submission therefore focuses on the vital infrastructure item of telecommunications.

Telecommunications

Background

Australian Universities pioneered the introduction of the Internet to Australia with the development of the Australian Academic and Research Network (AARNet). AARNet in its current form connects a single node or hub in each State at very high speed (currently 155Mbps [megabits per second]). In Queensland this hub is physically sited at the University of Queensland (St Lucia). Because of their physical proximity to the AARNet hub at UQ, universities in the SE-corner of Queensland can connect to the Internet at high speed (34Mbps) by use of microwave base communications at modest capital and maintenance costs.

JCU and Central Queensland University [CQU] have much poorer access to the Internet. JCU's major campuses at Townsville and Cairns are approximately 1450 and 1850 km from the Qld AARNet hub in Brisbane and thus have no direct access to the hub. Instead both JCU and CQU's communications are currently supported by a shared, inadequate and saturated 2Mbps frame-relay connection leased from TELSTRA. A recent CISCO survey confirms that **JCU has the lowest ratio of Internet bandwidth per staff/student of any Australian University.**

The cost of building microwave based communications infrastructure to Brisbane would be prohibitive for JCU. A preliminary estimate from a commercial vendor has indicated a conservative capital cost of \$3,500,000 and annual maintenance of \$450,000 for a 34Mbps microwave connection running from Cairns to Brisbane *via* Townsville. Essentially such a project would duplicate the microwave based communications infrastructure of TELSTRA over this region. Alternatively a 34Mbps connection from JCU's Cairns and Townsville campuses to the AARNet hub at UQ can be purchased at ~\$800,000 per annum, a cost that would severely impact on JCU's ability to adequately resource its teaching and research programs.

Alternate sources of governmental support for JCU and CQU have been exhaustively explored. The RTIF (Regional Telecommunications Infrastructure Fund) has been approached, however the provision of services to centers such as Townsville which have access to communications infrastructure, albeit at astronomical cost, is not within their remit. The DETYA Australian Partnership for High Performance Computing program (\$19.5M) has also been approached regarding JCU's access to the national supercomputing facilities that are to be established in Canberra. However, the program's board has indicated that access issues are the remit of individual states and beyond the capacity of its budget to address. State organisations such as the Office of Higher Education, the Department of Communications Information, Local Government and Planning and the Department of State Development have also been approached over the issue of JCU's bandwidth requirements.

Consequences

Consequently JCU's (and CQU's) capacity to fulfil its missions of teaching and research are at a significant disadvantage compared to institutions in the rest of Australia. The costs to opportunities available to regional universities come in many areas, including:

- national competitive research grants,
- a range of options for basic, environmental, applied and industrial research,
- high performance computing,
- remote and electronic library access
- teaching and learning,
- capacity to recruit and retain staff of high quality.

This list is not exhaustive, but indicates the range of activities that are increasingly being negatively impacted by the absence of high-speed data connections. In effect, there is a significant distance based discrimination for the regional institutions that prevents them from full participation in new developments in teaching, learning and research that make significant demand of high-bandwidth communications.

Furthermore, many of these missed opportunities also apply to regional industries and businesses, which cannot afford the very high charges required for high-speed connections. Without these broadband connections, their ability to compete, or survive in the developing information-based economy are seriously compromised. The issue of staff recruitment and retention is particularly serious. The success of many strategic initiatives in northern Queensland is becoming increasingly reliant on the availability of underlying IT infrastructure. Examples of negative impacts already felt by businesses because of the absence of affordable high-bandwidth communications in North Queensland include:

- high density imagery cannot be digitally transmitted outside the region (a major problem for environmental, multimedia and GIS bureaus);
- graphic designers cannot e-mail digital files to separators in Brisbane;
- colour separations cannot be prepared for printing;
- engineers cannot work interactively on CAD-CAM based projects;
- 3D computer simulation skills based at the Queensland Manufacturing Institute in Townsville cannot be accessed interactively by the stereo lithography unit at the Queensland Manufacturing Institute in Brisbane.

Businesses wanting to participate in enterprise-wide knowledge management and electronic commerce (eg. sending images and data around the world to support their products; teleconferencing; data transfer; and product research access) cannot do this presently in northern Queensland. Unless the region can get access to high-speed data transfer, national and international businesses will increasingly avoid the region. Any competitive advantages this region may have in terms of other features will be compromised without an effective modern communications system. Regional economic development in globally competitive markets is going to be severely

restricted, or indeed made impossible without an improvement in high speed telecommunications access.

Currently the ACA Telecommunications Act restricts the ability of regional universities, business and government to effectively aggregate their data communications requirements. While the intent of the Act is to foster competition in the telecommunications market, in northern Queensland the Act has had the unforeseen effect of potentially restricting the region's access to high bandwidth communications as the stakeholders are prevented from effectively running data across the same network.

Options

Currently there is no commercial competitor to TELSTRA for the provision of broadband communications in regional Queensland. While there is the possibility of satellite based competition (from AAPT and Optus) to TELSTRA's terrestrial fibre optic infrastructure (only TELSTRA runs a coastal fibre optic service from Brisbane – Cairns), the quality of service provided by satellite-based broadband communications is currently not of a level that could adequately deal with the requirements of JCU (and CQU). Lack of competition and the small population base of Northern Queensland make the prospect of the development of a highly competitive market for high-speed data telecommunications rather bleak in the short to medium term. Moreover the carriers continue to charge their services on the basis of distance, despite the absence of a justifiable business case for this practice. Deregulation and competition of the telecommunications industry have not yet impacted on the pricing structures of the carriers in regional Queensland.

There is an urgent need for the provision of *affordable* broadband communications to Queensland's regional universities if they are to remain as the high quality information providers required of them by their regions. The establishment of a telecommunications trust fund for higher education that has sufficient funds to subsidise universities for their broadband data expenses for a short period (3-5 years) would be one strategy that may generate sufficient interest for alternative carriers to TELSTRA to enter the market. If this fund could be used to attract carriers other than TELSTRA to the region the competition in the marketplace (and subsequent reduction in charges) would have a significant positive short term impact in northern Queensland. This would also result in a dramatic improvement in the long term prospects of the region as the development of the information economy grows.

An alternative or possibly complementary approach would be for there to be cooperation between the various levels of government with interests in IT and for communications to be facilitated so that there is a consistent whole-of-government approach to bandwidth issues in the regions.