



**Queensland
Government**

**Queensland Spatial Information Infrastructure Council
Capabilities Committee**

INCREASING COMMUNITY CAPABILITIES

Discussion Paper, July 2001

Prepared by the Department of Natural Resources and Mines

1. Definition of Community Capabilities

It has been proposed by the QSIIC Capabilities Committee that community capabilities incorporates the following dimensions:

- Knowledge
- Analytical skills
- Decision-making
- Communication

with respect to the use and understanding of spatial information and associated technologies.

It should be noted that capabilities not only includes knowledge and skills development. The growing emphasis being placed on the need for data and information held by Federal and State Governments to be provided online also predicates access to the physical infrastructure to access the relevant information e.g. access to computers, sufficient network bandwidth and Internet access.

The following matrix is not meant to be exhaustive, but is an attempt to identify that there are a range of skill and knowledge levels with respect to spatial information and associated technologies in various community sectors.

RANKING	CAPABILITY INDICATOR	EXAMPLES OF HOW ATTAINED
Basic	Ability to read a map	Primary or secondary education; orienteering experience; navigating using a UBD or street directory; work content
	Ability to use a Compass	Secondary education; membership of Cubs, Scouts, Brownies, Girl Guides, Venturers etc; orienteering experience;
	Ability to create, access and save files using a computer	Exposure through Primary and/or secondary education; Tertiary Education; computer use at home and/or work
	Ability to browse the Internet	Training through Primary and/or secondary education; Tertiary Education; access at home, work or public library
Intermediate	Ability to use and understand Atlas applications	Developing knowledge base via membership of community group involved in ecological or Natural Resource Management issues; accessing online resources for research for school or university projects;
	Ability to use and/or understand principles of a GPS	Exposure through Tertiary education; Commercial fisherman; airline pilot; surveyor; environmental field worker; archaeologist
	Ability to use a GIS application for basic queries	Local Government Rates officer; property management or spatial database validation staff in Government agencies; Enquiry BLIN users within Government agencies
	Ability to download files from internet	Exposure through Primary and/or secondary education; Tertiary Education; accessing for research/personal interest at home, work or public library
Advanced	Ability to Create layers/themes in GIS application	Secondary or Tertiary education; community involvement with NRM projects; professional – town planner, researcher, GIS officer, engineer

RANKING	CAPABILITY INDICATOR	EXAMPLES OF HOW ATTAINED
	Ability to manipulate vector and raster data from a range of sources	Professional - town planner, researcher, GIS officer, engineer
Expert	Ability to use GIS for modelling	Specific work or research projects; Engineer
	Ability to analyse data sets for decision making	GIS officer; Tertiary education; education through centres such as HRIC

2. Rationale for improving community capabilities

2.1 What are the drivers?

ANZLIC has identified that there is a need to “stimulate the development of a robust and commercially viable national private sector geospatial industry”. The spatial information services provided by this industry to:

- Government;
- other industry sectors, and
- the community

will ultimately lead to an improvement in business decision making, social well being and environmental sustainability. ANZLIC has established the Industry Development Standing Committee to progress this agenda.

In May 2000 the Federal Government launched the Spatial Information Industry Action Agenda (SIIAA) (<http://www.isr.gov.au/agendas/Sectors/siiaa/index.html>). It is intended that the SIIAA will provide a means by which Government and industry may work collaboratively to articulate a “vision of where the spatial information industry should be positioned globally in five to ten years time”. The SIIAA will map out the changes necessary to capitalise on opportunities for future industry growth. The setting of outcomes, with appropriate performance measures, and identification of an action agenda for both Government and industry to achieve the necessary changes, will also form part of the SIIAA.

According to Tony Jowett, Manager SIIAA, two issues of considerable significance that will be addressed by the SIIAA will be education and skill formation. Mr Jowett has foreshadowed the incorporation of GIS and remote sensing into secondary school geography curricula.

The new Geography curriculum being phased into senior secondary schools in Queensland, as noted in section 5.4.2, has a strong focus on natural resource management issues. This focus dovetails neatly into the suite of initiatives that the Federal Government currently has in place to manage natural resource issues:

- Natural Heritage Trust:
 - National Landcare Program
 - Bushcare Program;
 - Farm Forestry Program;
 - Fisheries Action Program;
 - National Rivercare Program;
 - National Land and Water Resources Audit;
 - National Weeds Program;
 - National Feral Animal Control Program, and
 - Waterwatch Australia.
- National Action Plan for Salinity and Water Quality

Such initiatives are increasingly requiring more detailed natural resource data to make better decisions on natural resource management issues at a regional level. The ANZLIC discussion paper **“An Australian Spatial Information Industry: Development of a viable, robust, national private sector spatial information industry for Australia”** identified that (ecologically) sustainable development:

Is a process that effectively incorporates economic, social, political, environmental and resource factors into decision-making. The challenge of balancing these competing tensions in sophisticated decision-making requires access to accurate and relevant information in a readily accessible and interactive form. In delivering this objective in Australia, information technology, spatial data infrastructures, multi-purpose cadastral systems and land information business systems play a critically important role.

The above premise is further supported by the **“Steering Committee report to Australian Governments on the public response to: Managing Natural Resources in Rural Australia for a Sustainable Future: A discussion paper for developing a national policy”** which identified:

- In the section entitled “Capacity building for improved natural resource management”, that GPS, GIS and other technologies will play a valuable role in the future and should be a focus for training; and
- In the section entitled “Enhancing knowledge and information”, that “data, information and computer technologies should be made readily available to assist regional communities, industry, governments and landholders to plan and monitor the effects of management practices on the condition of the resource base”.

A useful overseas example that embodies a number of the initiatives and programs enunciated in this discussion paper is that of GeoConnections (<http://cgdi.gc.ca/english/index.html>). GeoConnections is the agency responsible for the implementation of the Canadian Geospatial Data Infrastructure, which has aims similar to QSIIC, and oversees the following programs:

- *Access – a partnership program to make geo-info in government agencies accessible via the Internet;*
- *Framework Data – a national geo-info framework (foundation) to enable applications development and value adding;*
- *GeoPartners - a federal-provincial/territorial partnership program to facilitate data sharing and guide the vertical integration of information sharing and access to geo-info holdings;*
- *GeoInnovations – an industry-partnership program to accelerate the development of promising and advanced geo-info technologies;*
- *Sustainable Communities – builds or strengthens the capacity of Canadian communities to effectively plan and manage their economic and social development using geo-info and services delivered via the internet;*
- *National Atlas of Canada – provides via the Internet a national perspective of Canada’s physical, environmental, economic, social and culture issues for students at all levels and the general public, and*
- *Geomatics Skills Network – a skills-matching program to sustain industry growth and fill job vacancies.*

2.2 How is the community currently using, or how would they like to use, spatial information?

The following examples illustrate how a range of community sectors are using or thinking about using spatial information:

GIS in Archaeology

The University of Sydney maintains a database of Archaeological GIS Projects (in Australia and New Zealand) that can be interrogated online at

http://www.archaeology.usyd.edu.au/~scripts/projects/list_generator.cgi?aust_gis.txt

that demonstrates the breadth of activities for which GIS is used in archaeological research.

Bicycle Federation of Australia

A proposal was prepared for the *Centenary of Federation* by the Bicycle Federation of Australia to map “convenient, safe, scenic and desirable bicycling routes” within Australia. The completed map products were to be distributed on CD and published to the Internet.

Recreational Surfers

The Queensland Wavefinder website provides very basic maps showing the best places to surf in South East Queensland <http://www.queenslandwavefinder.com/location.htm>.

Regional GIS Special Interest Groups

Regional GIS groups have been established in Queensland. These include:

- Diggars (Downs Interest Group for GIS and Remote Sensing) based at Toowoomba – refer <http://www.usq.edu.au/USERS/apana/diggars/>.
- Central Queensland GIS Users Groups <http://www.directionsmag.com/usergroups.asp?a=details&groupid=101>
- Far North Queensland GIS User’s Group <http://www.fungis.org>
- Wide Bay Spatial Information Group <http://www.wb2020.qld.gov.au/wbsig/>.

Recreational Fishing

A number of online basic maps are being provided for recreational anglers at websites such as:

- Fishing Cairns website <http://www.fishingcairns.com.au/page3.html>, and
- Fishing Online Mackay <http://www.fishingonlinemackay.com.au/Maps.asp>.

Some have also included GPS data <http://www.fishntales.com/qldgps2.htm> to enable anglers to access and contribute information about the best fishing spots.

Management of Koala Habitat

The Australian Koala Foundation uses the Australian Koala Habitat Atlas, which incorporates spatial information from a range of sources, as a tool for lobbying for protection of existing koala habitats.

Natural Resource Management by Community Groups

Spatial information is being collected and analysed for a range of natural resource management projects sponsored by Natural Heritage Trust funding eg Bushcare, Land Care and Integrated Catchment Care. Substantial funding is expected to continue to flow to these groups through long term national initiatives such as the National Action Plan for Salinity and Water Quality. Section 7 of this document incorporates specific examples of regional natural resource management focused groups that are using spatial information for planning and strategic purposes.

Queensland Government Agencies

Within the Queensland Government, a number of agencies are creating or have created applications that provide interpreted spatial information on GovNet and/or the Internet. These applications target general as well as specific audiences and include:

- Department of Primary Industries – Coastal Habitat Research Information System (CHRIS) <http://chrisweb.dpi.qld.gov.au/chris/>;
- Public Works – Queensland Building Information System (QBIS) <http://www.build.qld.gov.au/amps/qbis.htm>;
- Environmental Protection Agency/Department of Primary Industries – Queensland node of the Australian Coastal Atlas <http://acaweb.dpi.qld.gov.au/atlas/atlaspage.html>;
- Sport and Recreation Queensland – Outdoor Resource Inventory System (ORIS), and
- Natural Resources and Mines – Natural Resources Atlas <http://www.dnr.qld.gov.au/resourcenet/atlas/>, Burnett Catchment Web GIS <http://www.dnr.qld.gov.au/resourcenet/land/lris/webgis/burnett/maps/mapdisplay.html>, and Interactive Resource and Tenure Maps of Queensland http://www.dme.qld.gov.au/resdev/qmin_ims.htm.

3. How are community capabilities increased?

The following are suggested as being some of the possible pathways by which community capabilities may be increased:

- Formal education – school, TAFE, University and other education providers;
- Work-related experience – as part of normal work requirements or as a means of improving business outputs;
- Awareness – World GIS Day, GIS in Schools, Career Markets;
- Community groups – involvement with groups such as Landcare, Bushcare, etc. that have a strong reliance on spatial information, and
- Self-learning – books, journals, exposure to data and tools on the world wide web (e.g. Atlases).

The author suggests that access to computers and the Internet is becoming a prerequisite for using spatial information products and services that are becoming more widely available on the World Wide Web. Statistics provided in a special article *The information society and the information economy in Australia* (Year Book 1999), indicate that in the first quarter of May 1998, Queensland had the following profile:

Accessing a Computer	%	Number ('000)
Home	33.6	824
Work	31.6	775
Neighbour/friend's house	6.7	166
Public library	10.4	256
TAFE/Tertiary institution	11.3	276
Other	10.0	244

Accessing the Internet	%	Number ('000)
Home	8.4	206
Work	9.5	234
Neighbour/friend's house	5.5	135
Public library	2.7	66
TAFE/Tertiary institution	4.5	110
Other	3.0	72

(Further to the above, Communication and Information Technology statistics recently released by the Australian Bureau of Statistics reveal that at May 2000, 45% of Queensland homes had a home computer and 21% of homes had access to the Internet).

Farm computer & Internet access	1999 %	1998 %
Farms with a computer	44.7	36.9
Farms with Internet access	15.6	9.9

4. Community Segments

In addition to the examples provided in Section 2.2 that illustrate how spatial information is being used by the general community, information concerning existing programs within the following segments that may contribute to the development of community capability will be detailed:

- **Government:** Federal
State
Local
- **Education:** Tertiary
Secondary
Primary
- **Initiatives:** Herbert Resource Information Centre
CHRRUPP
GIS in Libraries
GIS in Schools Competition
Geography Awareness Week
Career Information and Teacher Resources
WALIS – Reporting of Government Agency GIS projects

5. Overview of Community Segments

5.1 Federal Government

The Federal Government has a range of initiatives that have the potential to contribute to the building of community capacity:

- The Spatial Information Industry Action Agenda coordinated by the Department of Industry, Science and Resources which is a whole-of government initiative;

- The Commonwealth Spatial Data Committee has been established to develop a whole-of-government policy on spatial data access and pricing;
- Networking the Nation Online which provides for the upgrading of regional telecommunication services, establishing affordable internet access in rural and regional Australia, and to provide online access to Local Government services, and
- Government Online Project which aims to make information concerning all appropriate Federal Government services available online by the end of 2001 and to establish a single point of access to information about Government agencies.

Organisations such as ANZLIC and AUSLIG also provide a national focus for the identification and resolution of issues associated with access to and use of spatial information.

5.2 Queensland Government

5.2.1 Innovation and Information Economy

The State Government has implemented the **Smart State** initiative that aims to create “jobs of the future for Queenslanders”, with a focus on the communication and information technology industries. This will be achieved through the development of an innovative and competitive workforce with appropriate skills, knowledge and confidence. An analysis of the major objectives and funding priorities of this initiative reveal that in a number of instances, existing programs have been “rebadged” under the umbrella of **Smart State**. The major themes that **Smart State** addresses are:

- Education for life;
- Building job opportunities;
- Foundations for growth;
- Industry development;
- Culture and community;
- Working with the world, and
- Innovation.

The Department of Innovation and Information Economy is implementing the State Government’s IT&T development and training programs through initiatives such as:

- **IT&T Stuff Kit** – launched in May 2001, this kit contains a booklet and two videos that provide an overview of the IT&T industry for students thinking of pursuing a career in this area. These kits will be distributed to schools and TAFE institutes;
- **New Windows into IT Careers Forums** - to launch the **IT&T Stuff** kits, Forums organised by Commerce Queensland were conducted in 12 regional Queensland centres during May and June 2001. These Forums also sought to link employers with possible student trainees. (Commerce Queensland is Queensland’s peak employer body and develops, monitors and evaluates employment, education and training policies/programs);
- **Is IT for me website** – the Information Industry Bureau at the Department of Innovation and Information Economy has established a website targeting youth interested in finding out more about an IT&T career (<http://www.iib.qld.gov.au/ITCareers.html>), and
- **Community Skills Development Program in IT&T** – funding for IT&T training and development of local/regional technology resources is available to community organisations in towns with a population of 10,000 or less. A recent example of a project funded under this scheme is that to develop a community website for Murilla Shire (<http://www.murilla.org/>) whose principal town is Miles.

5.2.2 Centres for Excellence

As part of the **Smart State** initiative, the State Government announced in May 2001 that \$10 million over three years will be allocated to the establishment of eight **Centres for Excellence** in:

- South-East Queensland – Ironside State School (Brisbane), Helensvale State School (Gold Coast) and Redcliffe State School, and
- Regional Queensland – Pioneer State School (Mackay), Townsville State High School and three (yet to be named) additional regional centres.

The **Centres for Excellence** aim to provide services to schools in the surrounding area and will focus on the following themes:

- Partnerships – between schools, local industry and tertiary institutions;
- Intensive remedial intervention and assistance – targeted at students experiencing difficulties with technology, mathematics and science;
- Residential workshops – targeted at Primary School students to nurture talent in technology, mathematics and science;
- Professional development and training – targeted at mathematics, science and technology teachers, and
- On-line learning materials – developing an extensive range of materials.

5.3 Local Government

GIS applications are increasingly being used by Local Government Authorities (LGAs) for a diverse range of asset management and planning purposes such as:

- Inventory of existing and proposed sewerage, water and drainage infrastructure;
- Inventory of existing and potential gravel pit locations;
- Inventory of parks;
- Inventory of roads infrastructure – bridges, culverts, grids and floodways;
- Inventory of bus shelters;
- Management of zoning information flowing from Town Plans.

Individual LGAs have begun to make spatial information available to the public via their GIS applications (at a fee for service) or through Atlas or data warehouse facilities. The following are examples of this trend:

- Noosa Shire Council has an excellent webpage at <http://www.noosa.qld.gov.au/gis/> that markets the services of the GIS Unit within Council.
- Caloundra City Council has established an Atlas facility (using ArcIMS) at <http://maproom.caloundra.qld.gov.au/Other/entry.htm> where clients can inquire about tourist and environmental information within the Caloundra LGA area.
- Toowoomba City Council has established an e-Business Applications website at <http://gis.toowoomba.qld.gov.au/index.html> and intend to provide the community with relevant business services, including land information using interactive maps accessed via their web browser. Toowoomba City Council intends to develop a local government data warehouse of Toowoomba specific and Eastern Downs Regional Organisation of Councils (EDROC) information. (Regional Organisation of Councils are aggregations of LGAs that represent the collective interests of their constituent LGAs and the communities that comprise them).

The South East Queensland Regional Organisation of Councils (SEQROC), comprising 18 LGAs has a number of Working Groups that deal with specific issues. One of the current groups is the GIS and IT Working Group - refer <http://www.seqroc.qld.gov.au/doclibrary/sr-groups.asp>.

Local Government Association of Queensland

The Local Government Association of Queensland submitted as part of its two April 2001 applications to the **Networking the Nation** program, details for a proposed project entitled Geographical Information System (GIS) Capabilities. Total funding sought for the project was \$184,500.00, with the aim of establishing a framework of GIS capabilities within LGAs in rural and remote Queensland.

The LGAQ is also lobbying the Queensland Government with respect to establishing an integrated coordination framework for natural resource management in Queensland – involving the three tiers of government. Within the proposed framework, access to spatial information and natural resource management data have been identified as a necessary component.

It should be noted that the LGAQ conducts an annual conference at which various issues impacting on LGAs throughout Queensland are considered. Annual conferences are also conducted by regional Local Government Associations, with recommendations often flowing through to the LGAQ conference agenda.

LGAQ.Net

LGAQ.Net is a service provided by the Local Government Association of Queensland. Access to the databases and discussion forums that comprise this environment is by subscription and is limited to Local Government Authorities; LGAQ's insurance, legal and superannuation suppliers, and government agencies approved by the LGAQ board.

Data is stored in **Lotus Notes** databases (no plans in the immediate future to adopt new software platforms) and subscribers only may access LGAQ.Net using **Lotus Notes View** software or browsers such as **Netscape** and **Internet Explorer**. Update of databases is limited to subscribers who have **Lotus Notes Client** installed on their desktop.

More than 4000 users currently have access to LGAQ.Net and of this total, approximately 1500 access via the Internet (no statistics unfortunately are maintained of the number of hits per week/month). Every Council in Queensland has access to LGAQ.Net. Councils not accessing via the Internet use domino servers, lotus servers or stand-alone versions.

The Environmental Protection Agency has been using LQAQ.Net for several years as a means of disseminating information such as:

- legislation
- supporting information for legislation i.e. user manuals etc
- standard/regulatory forms
- procedures
- operational information
- guidelines
- educational materials
- training information
- diary (training dates, meetings)
- information on prosecutions under the *Environmental Protection Act 1995*

Public Libraries

Most Queensland Local Government Authorities provide Internet access to the general community through their libraries and 320 of these libraries are currently assisted through the Public Libraries Division of the State Library of Queensland.

A list of Queensland libraries that have access to the Internet is available at <http://slq.qld.gov.au/pub/directory/internetaccess.htm>. It is possible to determine what percentage of a population in a given LGA is a member of their local library, by using the interactive map provided at <http://slq.qld.gov.au/pub/directory/map.htm> and then selecting a region, specific LGA and then the statistics option for that LGA.

The State Library of Queensland hosts a number of mailing lists at <http://slq.qld.gov.au/projects/maillist/lists.htm>. These currently comprise:

- Comserv - Community services in public libraries
- Cwpeople - Community Web Publishing Project
- Infobroker - Information brokerage issues
- Localstudies - Local studies librarians
- Mobilelib - Mobile libraries
- Opalinfo - Online public access in libraries
- Qcollserv - Queensland Collection Services
- Qldpubill - Queensland public libraries inter-library loans
- Qldpubref - Queensland public library reference group
- Qskill - Queensland SIG Kinetica & Inter-Library Loans
- YPLib - Young people and public libraries

These mailing lists are a means for State Library to disseminate information to target audiences.

5.4 Education – Primary and Secondary Schools

5.4.1 Federal Sphere

The Curriculum Corporation is an education sector initiative of all Australian Ministers of Education. The company develops products and services to help schools improve student learning. It is the key national organisation:

- providing curriculum support to schools and school systems;
- producing and disseminating high quality education products and services including:
 - books, videos, magazines, multimedia, on-line services and professional development, and
- marketing and distributing resources developed by some State and Territory schools systems.

The Corporation also provides consultancy services to those organisations that service or wish to service the education sector – but require expert understanding of the environment, the curriculum and the issues.

5.4.2 Queensland

The Queensland School Curriculum Council creates and provides high quality curriculum and testing materials for use in Queensland schools – covering the preschool to Year 10 range. The key learning areas are currently:

- English;
- Science;
- Languages other than English;
- Health and Physical Education;
- Mathematics;
- Studies of Society and Environment;
- Technology, and
- The Arts.

The Queensland Government is currently implementing a new **Curriculum Framework** for years 1-10 that is designed to assist schools in developing Curriculum Plans that focus on:

- Core learning areas;
- Teaching strategies;
- Assessment, and
- Reporting guidelines.

The new Curriculum Framework is one of the reforms that form part of the implementation of the QSE:2010 (QSE = Queensland State Education) initiative. A media release from the Minister for Education, the Hon. Anna Bligh MP on 27 June 2001 listed the main thrusts of QSE:2010 as:

1. *The development and implementation of Queensland State Education: 2010, which confirms the focus of the QSRLS (Queensland School Reform Longitudinal Study) with renewed emphasis on: quality; curriculum for the future; supporting schools and unlocking the skills of the workforce;*
2. *Establishment of the Council for Educational Renewal which focuses its work on providing advice on strategic issues facing Education Queensland;*
3. *Establishment of the Learning and Development Foundation for professional development and support of teachers;*
4. *Minimum standards for teachers in learning technology;*
5. *Development of a Curriculum Framework Years 1-10, and the establishment of the Assessment and Reporting Taskforce;*
6. *New Basics Trial currently under way in 38 schools and soon to be expanded by another 20 schools;*
7. *Literate Futures – boost in literacy programs and funding including the establishment of 20 Literacy Development Centres;*
8. *8 Centres of Excellence in maths, science and technology will be established.*
9. *Alternative School trial, and*
10. *Development of virtual schooling.*

It is suggested by the author that there are possibly two subjects in the current Secondary School curriculum – Information Processing and Technology, and (the already recognised) Geography – that may provide opportunities for the introduction of GIS and spatial information skills into the course content.

Information Processing and Technology is a Board subject offered by the Queensland Board of Senior State Secondary Schools. It currently incorporates the following topics:

- Information systems;
- Algorithms and programming;
- Artificial intelligence;
- Social and ethical issues, and
- Computer systems.

Geography is a board subject included within the key learning area of Studies of Society and Environment. The new syllabus for Years 11 and 12 incorporates the following eight core topics:

- Responding to natural hazards;
- Managing catchments;
- Contrasting Developments;
- Feeding the World's People;
- Sustaining Urban and Rural Communities;
- Planning Places;
- Living in Physical Systems, and
- Managing Resources.

An examination of Queensland school websites reveals that some schools are already incorporating GIS use into the subject content of the above topics eg St Aidan's Anglican Girls' School at Corinda (<http://www.staidan.qld.edu.au/>) and St Hilda's School at Southport (<http://www.sthildas.qld.edu.au/>). In examining the online course content information of a range of schools concerning the possible career opportunities that may develop from the study of Geography, it is evident that a consistent message is not being delivered.

5.4.3 School Programs

There are a number of school-based programs operating within Queensland that may provide opportunities for both students and their teachers to further develop their knowledge and skills base with respect to the use of spatial data and associated technology:

- **Teacher Placements in Industry** – this program is accessible to teachers in all sectors and curriculum areas. It provides teachers with the opportunity to update knowledge and skills based on workplace placements;
- **Work Education Programs** – 26652 students participated in this program in 2000;
- **Student Work Placements** – 1917 students participated in this program in 2000, and
- **Students and Industry Links (SAILS) Project** - Provides teachers with links to people in industry that can provide students, in a classroom environment, with detailed and current information about the IT industry, IT careers and the specific IT skills being used in that person's industry. The SAILS Project also encourages the use of online communications technologies to permit industry representatives to be virtual visitors in the classroom, act as online consultants with respect to relevant student projects. Industry representatives are also free to discuss with teachers how they might interpret the curriculum and meet the needs of the relevant IT industry sector. The following computer studies are covered by the project:
 - Information Processing and Technology;
 - Vocational Education programs in Information Technology, and
 - Technology Education.

The Department of Employment and Training administers the **School-based Apprenticeships and Traineeships** program, which provides for students completing their Senior Certificate to undertake paid employment (within the framework of a structured training program) while still attending school. At present, there are more than 3400 school-based apprentices and trainees in training in Queensland.

School Local Area Networks Project

By the end of 2001, Education Queensland will complete the School Local Area Network Project (SLANP). This project provides for cabling and active network equipment to be installed in all Queensland schools. Connecting to the Connect-ED network via the Connect-ED router, these LANs will permit both Internet and Intranet access to both administration and curriculum users.

5.4.4 Educational Special Interest Groups

The following special interest groups provide a means by which teaching staff can be kept abreast of the latest trends and technology with respect to GIS and spatial information:

- Geography Teachers Association of Queensland (<http://www.gtag.webcentral.com.au/>);
- Queensland Society for Information Technology in Education (<http://www.qsite.edu.au/>).

5.4.5 Teacher Resources

Education Queensland provides a digital resource centre called *Curriculum Exchange* at http://education.qld.gov.au/tal/curriculum_exchange/. One of the services provided is Teaching Ideas and Practices (TIPS) – a search of which for “GIS” revealed the following matches:

- *Suggestions for using the geographic information system E-RMS (Environmental Resource Mapping System) in Year 11 and 12 geography*. Helen Statham, Head of Geography, Brisbane Girls Grammar School;
- *Geographic Information Systems (GIS)*. Peter Hoffenberg, SEQ 2001 Regional Resource Unit, and
- *ArcView 2 – a GIS package and Australian Rainman in Secondary Geography*. Georgina Littleboy, Head of Geography, St Aidan’s Anglican Girls School, Corinda.

Helen Weil, the 1999 Raybould tutorial Fellow at the University of Queensland (in conjunction with Education Queensland) developed the **Maps and Compasses** web pages at <http://www.education.qld.gov.au/tal/kla/compass/index.html>. The aim of the Fellowship is each year to complete a project supporting senior secondary mathematics.

Maps and Compasses covers the following topics:

- Compasses and Bearings;
- Maps and Charts;
- Orienteering;
- Coastal Navigation;
- Air Navigation;
- Surveying;
- Satellite Navigation Systems, and
- Taking Geometry Seriously.

5.5 Education – Tertiary Institutions

The Australasian Surveying and Mapping Education Directory is hosted by Curtin University at <http://www.cage.curtin.edu.au/~asmla/ed/> and sponsored by the Australasian Surveying and Mapping Lecturers’ Association. It purports to be a comprehensive index to all undergraduate and postgraduate surveying, cartography and GIS related courses throughout Australia, New Zealand and Papua New Guinea. It would appear that this site is not being maintained and similar courses currently available at James Cook University (http://cathar.tesag.jcu.edu.au/~pmap/Spatial_Analysis/spatial_analysis.html) are not included.

There are currently four Queensland Universities that offer undergraduate and post-graduate studies with a spatial information and GIS content:

- Queensland University of Technology;
- University of Queensland;
- University of Southern Queensland, and
- James Cook University.

TAFE Queensland offers a number of online courses (with most of the course content being delivered over the Internet). The website may be accessed at <http://www.tafe.net/online/>. No online courses with GIS content for the general community are offered by TAFE at present. A search for GIS or spatial information courses, also designed for the general community, that are being offered by the 16 institutes of TAFE Queensland at <http://www.tafe.net/courses/> also failed to find any matches.

Existing TAFE courses specifically address the needs of the surveying and engineering sectors. It should be noted that TAFE Queensland has more than 800 accredited courses and more than 226,000 local and international students.

By means of demonstrating a much more integrated approach to education needs across the various education streams, South Australia has the Spatial Education Australia (SEDA) initiative. This incorporates a consortium of providers of spatial information education and training products and services in South Australia. Membership of this consortium includes:

- Key Centre for Social Applications of GIS;
- University of Adelaide;
- University of South Australia;
- Flinders University of South Australia;
- TAFE;
- Local Government Training Authority;
- ESRI Australia;
- ERSIS Australia, and
- Secondary School Assessment Board of South Australia.

The Onkaparinga Institute of TAFE offers the following courses:

- Certificate IV in Spatial Data Systems;
- Diploma in Spatial Data Systems, and
- Diploma of Geographic Information Systems.

6. Online GIS training

As an alternative to formal training provided at Universities in Queensland, there are a number of industry providers offering training courses (including self-paced online training) in spatial information analysis and GIS e.g. ESRI and MapInfo. It is not the intent of this section to identify specific organisations that provide GIS training – as it is noted that Spatial Queensland would already have this information at their disposal.

There are also non-proprietary and self-paced GIS teaching packages available on the World Wide Web such as:

- Northeast Pilbara GIS teaching package (Australian Geological Survey Organisation),
- An Introduction to Geographical Information Systems (GISCA).

7. Selected Initiatives

There are a number of initiatives that have been successfully implemented at a national level, in other Australian states and in Queensland that have contributed to, or have the potential to contribute to, increasing community capabilities. These initiatives also encompass, to varying degrees, the concepts of knowledge, analytical skills, decision-making and communication.

Herbert Resource Information Centre (HRIC)

The Herbert Resource Information Centre is a good working example of a catchment-based GIS facility. HRIC is a non-profit, community organisation that provides access to spatial information, GIS tools and skilled users to assist with land and water management issues in the Herbert River Catchment. HRIC has an active program of introducing GIS into Queensland schools and makes spatial datasets available to schools implementing their own GIS.

A core user group of more than 30 local people, skilled in the use of GIS applications, has developed since the inception of HRIC. Most of these individuals are members of local or regional organisations and also act as “GIS Champions” for HRIC.

Central Highlands Regional Resource Use Planning Project (CHRRUPP)

CHRRUPP has as its focus regional planning for sustainable natural resource use – where outcomes are identified using a negotiated approach and then evaluated using the same approach. CHRRUPP supports a range of stakeholders and assists them in managing regional natural resource management issues. The project has a coordinating body called the Regional Coordinating Committee (RCC). The RCC includes representatives or observers from a range of groups and agencies such as:

- Pastoralists;
- Graingrowers;
- Aboriginal community;
- Food and fibre producers;
- Mining industry;
- Local Government;
- State Government;
- Federal Government;
- Central Queensland University, and
- Landcare.

CHRRUPP has had a strong focus on community capacity building and has ensured that all participants in significant regional issues have a foundation level of understanding of the issue before attempting to negotiate outcomes. CHRRUPP has also produced the **Central Highlands Atlas** (<http://chrrupp.tag.csiro.au/Resources/>) that presents on-line maps featuring basic coverages of vegetation, soils, land systems and socio-demographic data.

GIS in Libraries

Some Australian Universities and public research libraries e.g. Mitchell Library within State Library of NSW have installed GIS applications. The USA implemented the Association of Research Libraries GIS (ARL/GIS) Literacy Project in 1992 – in collaboration with the Environmental Research Science Institute (ERSI). There are a number of instructive papers that may be sourced from the Internet and relate to the use of GIS in libraries. The following are representative and detailed reports:

- *GIS in Libraries: An Overview of Concepts and Concerns* at <http://www.library.ucsb.edu/istl/99-winter/article3.html>.
- *A Critical Study of GIS Services in Research Libraries: A Case Study of SUNY Albany and New York State Libraries* at <http://princeton.edu/~shawatw/gis.html>
- *Strategic Considerations in Establishing a GIS in a Library* at <http://www.nla.gov.au/nla/staffpaper/mo1.html>.

GIS in Schools Competition

AURISA has been coordinating the **National GIS in Schools** competition since 1996. Participants in the 2001 competition will have the following flow-on benefits:

- Access to GIS software and local datasets;
- Development of GIS skills by teachers and students;

- Real life experience in project research and presentation;
- Improved career prospects for Geography students;
- The chance to win prizes as a project team and school, and
- Retaining the GIS software to utilise in the classroom.

Geography Awareness Week

The National Geographic Society has sponsored **Geography Awareness Week** since 1987. The aim of this event is to promote 'geographic literacy in schools, communities, and organisations'. **GIS Day** is held during Geography Awareness Week, with ESRI Australia being one of the major sponsors of this event in Queensland.

Career Information and Teacher Resources

National organisations such as the Australian Geological Survey Organisation (AGSO) and the Institution of Surveyors Australia (<http://www.isaust.org.au/whatis/surveying.htm>) provide useful content on their websites concerning potential career paths within the areas of geoscience and surveying. Extensive teacher resources are provided by AGSO under its Geoscience Education programs (<http://www.agso.gov.au/education/>).

WALIS – Reporting of Government Agency GIS Projects

WALIS (Western Australian Land Information Strategy) has a webpage that identifies the GIS projects being undertaken by 16 different Government agencies at <http://www.walis.wa.gov.au/walis/content/projects.html>

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For further information or to provide feedback concerning this Discussion Paper, email David.Hill@dnr.qld.gov.au or telephone (07) 3405 6919. Feedback may also be provided by completing a brief [online survey](#).

Please note that all URLs included in this document were active as at 1 August 2001.