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**Analyzing the Patterns of ICT Utilization for Online Public Participatory Planning in
Queensland, Australia**

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Introduction

Public participation in planning includes involving, informing and consulting the public in planning, management and other decision-making activities that are part of an urban planning process. It is an important part of the planning process, providing opportunity and encouragement for members of the public to express their views.

Information and communication technologies (ICTs) potentially can make a significant contribution to the urban planning process and specifically in providing information to the public. Internet and geographic information systems (GIS) are important ICT tools to implement online participation in urban planning that encourages individuals to contribute to decisions about their neighborhood through, for example: (a) involvement in decision and plan making; educating local people about planning and sustainability issues; (b) making planning services more sensitive to the needs of users; (c) establishing accountability and transparency by open planning processes; and (d) empowering local people to gain control over their future by building partnerships with local communities. But, despite the usefulness

of new technologies, the majority of Internet and GIS applications have not been very successful in developing significant public participation. One reason for this is a low level of readiness to accept ICTs on the part of both planning agencies, such as local councils, and members of the public.

This paper evaluates the readiness of local councils in Queensland, Australia, for implementing online urban planning. Local government authorities (LGAs) comprise the third tier of government in Australia. In Queensland those local councils have statutory powers over land use zoning and the development approval processes and they are obligated to develop and implement strategic and local plans, including land use plans. The paper considers the extent to which those local councils are willing to embrace ICTs as a public participation tool and the extent to which households might be ready to access new computer technologies.

The following questions are considered:

- Why is online public participation important in urban planning, and how might web-based technologies and public participation fit together for successful urban planning?
- What are current local government policies and projects with respect to online urban planning, and what mechanisms are being used to provide wider access to planning resources?

- What are the patterns of computer and Internet use across communities, and what might be done to widen computer and Internet usage?
- What might local councils do to adopt web-based technologies to support online urban planning?

We begin by briefly discussing the data sources used in the paper, and we then consider technology usage both across local councils in Queensland's LGAs and by households within those LGAs. The paper concludes by proposing recommendations relevant for how local councils might benefit from ICTs in urban planning.

Methodology

The research reported here is based on secondary data analysis and primary data collection and analysis.

Secondary data was used first to ascertain the degree to which local councils have the potential to use the Internet for public participation in planning, and this was carried out through a search of council websites. Secondary data analysis also focused on using Australian Bureau of Statistics (ABS) 2001 census data to conduct a spatial and demographic analysis of ICT adoption by households in LGAs in Queensland. That analysis helped identify the factors effecting computer and Internet usage (for example, age, gender, education,

occupation, language, geographic location, income) which in turn helped in assessing the potential and readiness of communities to adopt online public participation in planning.

Primary data collection and analysis involved conducting a survey of planning officers in Queensland's 125 LGAs (see Figure 1 for a map of those LGAs). A response rate of 50 per cent was achieved. The survey instrument used was designed to obtain information on the extent to which local councils are making use or plan to make use of ICTs to support public participation in planning. The survey was conducted electronically (via e-mail) with council planning department officials, and focused on issues including: Internet and GIS use; data sharing and exchange; and opportunities for using the Internet for public participation in urban planning processes. The questionnaire was designed also to provide an overview of opinions and views on existing policy and applications and assessment of future prospects of the success of Internet assisted participatory urban planning. The results of that survey are used to assess the potential and willingness of local governments to adopt ICTs in favor of participatory urban planning.

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Online Public Participatory Planning

Involving citizens is a key issue in the democratic process. Public participation in urban planning can be justified on several grounds, including: (a) increasing democratic equality; (b) increasing public trust in institutions; and (c) strengthening local communities. In a

democracy, the success of an urban plan depends largely on public support (Stillwell, Geertman, and Openshaw 1999). Public involvement in planning also spurs innovative ideas and suggestions and it assists in arriving at a consensus among the diverse citizenry. Furthermore, public participation approaches aim to broaden public awareness of government issues and provide opportunities for the public to exercise control over the decision making process (Fonseca et al. 1995). Consequently, public participation in planning may serve as a tool from the initial stages of the planning process to reduce conflicts and delay that would occur in later stages.

Recent changes in ICTs have meant that traditional paths for public participation that have relied on the ability of citizens being able to contact public officials and to access information—which was more often than not held in hard copy at council offices—have become less important. In short, in urban planning—as in so many aspects of contemporary society—the potential is significant for technology to vastly change traditional processes.

The extent to which ICTs may assist in public participation potentially is considerable. Advances in computing software and hardware, and in particular the evolution of the Internet, have given planners significantly more freedom in the way they consider urban planning outcomes. GIS can integrate diverse physical and social data needed to help plan for and manage cities, and the Internet provides an interactive tool for simulating environmental outcomes for local and regional planning with analytical tools to interrogate data and perform analysis of data in more meaningful ways (Sadagopan 2000) including visualization of output. Many local, regional, state and national level planning agencies have Internet sites, and their

existence offers the potential to deliver goods and services in an electronic format. Moreover, the presence of data on the Internet provides the potential for those technologies to be adopted by local communities as a significant new source of information. That information—which might include, for example, details of local government planning by-laws, zoning regulations, development plans, and future planning scenarios—can then be used by individuals and community organizations to assist their participation in the planning process and perhaps improve the quality of that contribution.

Over and above the use of the Internet as an information source, the wider adoption of ICTs throughout the community can result in wider information sharing between grassroots organizations and local residents. For example, the provision of local community networks and electronic bulletin boards provides an incentive for information sharing. Electronic communication systems such as email can also assist local residents in having a more effective voice in planning outcomes (Shiffer 1995). As many scholars have argued, the Internet and computer technology generally have generated a new public sphere supporting interaction, debate, new forms of democracy and cyber cultures, which feed back to support participatory urban planning and as well may engender a renaissance in the social and cultural life of cities (Al-Kodmany 2001; Angelides and Angelides 2000; Craig 1998; Doyle, Dodge, and Smith 1998; Harder 1998; Kingston et al. 2000; Longley et al. 2001; Plewe 1997; Sarjakoski 1998).

There is sufficient evidence to suggest that online planning and public participation will have widespread use. But to date most online planning—Internet GIS sites tend to: (a) often use

simple data that is not problem specific; (b) be demonstrative in approach; (c) have a propensity to be academically oriented; (d) do not deal particularly well with complex real world issues; and (e) do not allow interaction with the presented information in the sense that the user does not get to interrogate the data and send information back to the server (Yigitcanlar 2002; Kingston et al. 2000). In addition, many of those Internet GIS implementations have not been very successful in establishing substantial participation among the public.

One of the reasons behind the current failures in online public participation may be traced to the lack of matching available technology with user needs. Not everyone in the community will be comfortable with electronic formats or have access to the necessary technology. As demonstrated in recent research, a digital divide is developing in many societies that is effectively shutting some citizens out of the digital age (Woodbury and Thompson 1999; Goslee 1998; Graham 2002; Pelletiere and Rodrigo 2001). As Graham (2002: 34) states:

...societal diffusion of ICTs remains starkly uneven at all scales. It is in the contemporary city that this unevenness becomes most visible. In cities, clusters and enclaves of 'super-connected' people, firms and institutions, with their increasingly broadband connections elsewhere and their intense access to information services, often rest cheek-by-jowl with large numbers of people with non-existent or rudimentary communications technologies and very poor access to electronic information.

Moreover, the general failure so far to achieve widespread ICT use in public participation in planning may be linked to failures at the level of planning agencies. It may be that local councils do not have the infrastructure, experienced staff, vision, or even willingness to adopt these technology tools. As shown by Angelides and Angelides (2000), although the technology is available, in the United Kingdom many local authorities do not make full use of it; and neither have they developed technical and information systems in the most appropriate way.

Computer and Internet Use in Australia

As in other developed countries, Australia has experienced substantial growth in the use of ICTs. The Commonwealth Government's National Office for the Information Economy (NOIE) (2002) recognizes that, as a society, Australia is among the world's leaders in the incidence of online participation, with 50 per cent of adults (persons aged 18 years and over) accessing the Internet during the 12 months to November 2000. Table 1 shows that Australia ranks number eight.

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A survey on the use of the Internet by householders by the ABS (2000, 2001) in Australia found that:

- 37 per cent of households had Internet access

- 66 per cent of adults used a computer during the 12 months to 2000
- in the same period, 90 per cent of young adults aged 18 to 24 used a computer
- 89 per cent of adults earning more than \$40,000 dollars per annum used a computer
- 56 per cent of households had a computer at their homes.

Another survey conducted by Nielsen Netratings in February 2000 found the national capital, Canberra, to be ahead of every other city in Australia (and also including those in the United States), with the proportion of its population that is online (DFAT 2002). That survey, and those conducted by the ABS (2000, 2001), found that:

- at September 2000, 57 per cent of students accessed the Internet at school
- in the year to November 2000, more than 1.3 million adults purchased goods and services for private use over the Internet
- by January 2001 more than 1,100 Commonwealth Government services were provided online, with plans to deliver a further 691 by December 2001
- at February 2001 there were 1,023 Internet Service Providers (ISPs) in Australia.

Internet subscribers are customers (individuals or businesses) with internet service provider (ISP) accounts, and the count of subscribers differs from that of people/organizations/households with Internet access. Of the 4.2 million Internet subscribers in Australia, 3.7 million household were subscribers and there were 505,000 business and government subscribers. At the end of March 2002 there were 571 ISPs supplying Internet

access services to 4.2 million active subscribers (ABS 2002). The ABS survey also found that there were:

- just six very large ISPs (more than 100,000 subscribers) providing Internet access to 66 per cent (2.8 million) of all Internet subscribers
- 26 large ISPs (10,001 to 100,000 subscribers) providing access to 19 per cent (0.8 million) subscribers
- 161 medium ISPs (1,001 to 10,000 subscribers) providing access to 12 per cent (0.5 million) of subscribers
- 276 small ISPs (101 to 1,000 subscribers) providing access to 3 per cent (0.1 million) of subscribers
- 102 very small ISPs (100 or fewer subscribers) providing access to only 0.1 per cent (4,073) of subscribers.

While Australian computer and Internet use overall is increasing very rapidly, disparities in online access do exist. Those people less likely to use computers and the Internet include the following groups:

- people on low incomes, without full secondary and/or without tertiary education
- those living in rural and remote areas
- Aboriginal and Torres Strait Islanders
- people with disabilities

- people with a language background other than English
- people aged 55 years and over.

ABS data showed that, at August 2000, 67 per cent of Australian households were not connected to the Internet. Adult Internet users tend to be younger, male, and they earn in excess of \$75,000, employed, and they are likely to be living in metropolitan areas. For those people not connected to the Internet the barriers they face in achieving online access are very similar to those experienced by the disadvantaged in other developed industrialized countries. These barriers include: (a) set-up and access costs; (b) lack of physical access; (c) a perceived lack of relevant content; (d) security concerns; (e) lack of skills and training; and (f) illiteracy (NOIE 2002).

Evaluating the Potential for Online Planning Participation in Queensland

Given the potential for ICTs to transform public participation in planning, we address two issues with reference to the state of Queensland. The first relates to the potential and readiness of local councils in LGAs, which we address by scrutinizing the following: (a) legislation; (b) technology utilization; (c) dedicated staff; (d) data sources; (e) existing projects; (f) council vision statements, and (g) the budget of councils. That information helps provide an indication of the willingness of councils to embrace ICTs. The second relates to the extent of use by people of computers and the Internet and access across LGAs.

Legislation for Planning Sources on the Internet

Within Queensland there exists no direct legislation to mandate local councils to disseminate their planning information on the Internet. However, the Queensland Integrated Planning Act 1997 requires that copies of all planning schemes for every local government must be kept open for inspection. That Act encourages a vision for placing all urban plans and planning information on the Internet to foster public participation in urban planning. Under the Act the planning departments of councils are responsible for maintaining a range of documents for inspection and purchase (Queensland Government 2002). These may include the following:

- current State Planning Policies
- explanatory Statements about current State Planning Policies
- terms of reference for all Regional Planning Advisory committees
- reports of regional planning advisory committees
- written direction of the Minister given to a local council to:
 - make or amend a Planning Scheme
 - make or repeal a Temporary Local Planning Instrument
 - make, amend or repeal a Planning Scheme Policy
- reports of independent reviewers given to the Minister about current Planning Schemes
- notices given by the Minister directing the assessment manager to attach conditions to an approval
- notices given by the Minister calling in a development application

- reports by the Minister on a decision to call in an application for assessment
- an official copy of the Integrated Planning Act 1997 and every regulation made under this Act and in force
- current local government planning schemes
- amendments of planning schemes
- current local government planning scheme policies
- current temporary local planning instruments.

Members of the public may view and, if they wish, purchase documents relating to local government planning schemes and other documents from the planning departments of the LGAs. At present, in most local councils all planning scheme documents are held in 'hard copy' format and planning scheme maps are stored on microfiche. In the future, it is envisaged all zoning and land use data will be transferred to an Internet GIS (Queensland Government 2002).

Councils in LGAs in Queensland

Over the past couple of decades, GIS has contributed significantly in advancing planning support tools and systems. In common with other ICTs, GIS is socially constructed via negotiations between various social groups (Harvey and Chrisman 1998). In the case of urban planning, those groups include: (a) professional staff; (b) decision-makers; (c) developers; (d) special interest groups; (e) citizens; and (f) other stakeholders. GIS technology promises to

improve public access to information and facilitate public participation in the planning processes and in the policy-making process. GIS can enhance democracy and empower disadvantaged groups particularly at the local level. Meanwhile there is an increasing trend toward empowering communities to plan through the provision of integrated GIS software and planning databases. Several studies offer examples of the positive effect of GIS and other technologies on community participation in the planning process (Craig 1998; Sarjakoski 1998; Sawicki and Craig 1996; Schon, Sanyal, and Mitchell 1999). New developments strive to include in GIS-based systems subjective information on citizens' perceptions, views, and ideas which promises to enhance the potential of geospatial technology and tools to aid public participation in the planning process (Talen 1999; Al-Kodmany 1999; Nedovic-Budic 2000).

An increasing number of cities around the world are now providing public works and government services over the Internet utilizing Internet GIS technology. To do this, local councils needed to provide over the Internet plans, maps, and other information about existing public infrastructure. This information needs to be accessible by citizens, planners, developers, engineers, and contractors for use in designing and constructing new bridges, streets, utilities, sewers, drains, and other facilities. Internet GIS and spatial data analysis on the web create robust networks which allow members of the public and public agencies to view maps of actual system usage. That can help people to see the relationships among and to identify problems in their community that might otherwise remain obscure or hidden. That can help local councils to adjust their mode of operation accordingly and to provide more effective services.

Using secondary information obtained from local council websites and the results of the survey of local council planning officials which provided primary data, our analyses showed that there is a diverse range of outcomes in relation to the use of online participatory planning and the readiness of local councils across Queensland's LGAs to use ICTs in public participation in planning (see Table 2). Perhaps not surprisingly, the following generalizations may be made:

- Councils in larger LGAs are making much greater use of ICTs—Internet and GIS. They have greater capacity and are supporting it with dedicated staff. This is confirmation of the much talked about the urban-rural split in the digital divide. Level of ICT use is generally correlated to the capacity of local councils to invest in technology. Councils in large urban centers—and particularly the metropolis—generally have a higher level of ICT utilization compared with small town and rural shire councils.
- Electronic communication is the number one online activity, and is thus one of the most popular ways of communicating and conducting business activities in Australia. The current literature indicates that local council web sites are necessary to encourage civic participation and to allow citizens access to local government services twenty-four hours a day, seven days a week. Our analyses found that councils in 85 of the 125 LGAs in Queensland (68 per cent) have web sites. In addition to that, all of the councils have emails and use them as an alternative channel for communication and public enquiries.

- Our survey found that 86 per cent of the responding local councils have an established GIS, and on average they have had it for six years. However, few than half (43 per cent) of the responding councils in LGAs that do not have GIS say they are likely to consider adapting that technology for use in their daily planning routines.
- GIS is viewed by the vast majority of officials in the planning departments in local councils surveyed as being an important system for storing, analyzing and displaying planning information. In those council planning departments, on average two full-time, one part-time, and 103 casual users make use of GIS for planning applications. Among a vast variety of GIS software, in the majority of these councils mainly two software products were used for their planning tasks, namely MapInfo and ESRI products. The councils collect their planning data primarily through in-house data production, and they also use private companies and governmental agencies.
- Councils mainly indicated that the primary purpose for using GIS is for urban planning applications. Other major application areas of that technology are for engineering, urban design, urban renewal, neighborhood planning, environmental planning, property services enquiries, and infrastructure planning.
- While in just over half (52 per cent) of the responding councils say that they distribute planning information, fewer than half (46 per cent) of those councils prefer paper format to distribute information, while fewer than half (44 per cent) of those councils distribute

that information in digital format, and only 14 per cent of them distribute that information via the Internet. However two-thirds (68 per cent) of the responding councils said they intend to use the Internet for planning in the next five years. Those councils mostly intend to use the Internet for information sharing and community feedback purposes, while fewer than one-quarter (20 per cent) of councils seem to be unwilling to benefit from online decision making and from public participation in planning.

- Councils in those LGAs that have not established online planning systems expressed a range of reasons for not putting information online. The primary reason cited is budgetary problems, with the lack of technical staff the second most commonly cited reason. Other relatively frequent cited reasons are: the lack of technology; the council does not have a computer system; or the current computer system is not adequate to set up online planning services. A wide variety of other less-frequently cited responses include lack of public interest, concerns about privacy, and security.
- For 90 per cent of LGAs in Queensland more than one-quarter of the residents use computers, and for over one-half of the LGAs (57 per cent) more than one-quarter of their households use the Internet (see Figure 2).

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Basic Community Profiles of Queensland

An objective of our research was to find a way to assess factors that might influence the development and use of online planning services in Queensland. Those services will be dependent on a web-based or computer-network-based delivery system. Consequently, important considerations are: (a) who has access to computers and the Internet; (b) how people use those technologies; (c) peoples attitudes toward them; and (d) the sharing of information on the Internet. If an insufficient number of people use and feel comfortable with computer and Internet systems, then moving planning services to online mode may be questioned.

While ABS 2001 census data does not provide information telling us about people's attitudes towards or the ways that ICTs are utilized, it does provide some information on the extent of Internet and computer use, and that data can be used to analyze technology adoption across households across LGAs in Queensland. That data has been analyzed to identify those factors affecting computer and Internet use. Variables such as age, gender, education, occupation, language, geographic location and income were considered. The 2001 census data, together with other spatial datasets, were examined using SPSS (Statistical Package for the Social Sciences) and GIS analytical tools to develop basic profiles of computer and Internet users by households in Queensland's LGAs (see Table 3). The main findings may be summarized as follows:

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- Average computer use by households is 33 per cent. Almost equal numbers of males and females use computers, with use by females being slightly higher (36 per cent).
- Computer use spans every age group. Not surprisingly, Internet use is highest among those aged under 35 years, with especially high use being by those aged between 10 and 34 years. However, at least one-quarter of the population in most age groups use computers, with the second highest user group being those aged 35 to 54 years.
- Average Internet use is 26 per cent, which is slightly more than one-quarter of the population. Almost equal numbers of males and females use the Internet, with females holding a slight edge (28 to 25 per cent). More than half of the Internet users (51 per cent) have access to the Internet from their home. Apart from people who connect to the Internet mostly from their workplace, people also connect from public libraries and Internet cafes.
- Overall, users of computers and the Internet generally have the following characteristics: 90 per cent of the household speak English at home; 64 per cent of users have secondary education; 22 per cent have tertiary education; 38 per cent of employees are professionals and 33 per cent are clerical, sales and services workers; the unemployment rate among users is 7 per cent; and the average weekly household income of users is below \$1,000 (which is less than \$52,000 per annum).

As the Internet becomes an increasingly common-place aspect of daily life, online technology continues to shape household activity, personal interaction, and careers. Our research findings show computer and Internet users are not technology elites any more as has been the case in the early days of the Internet. Everyday more and more ordinary people are starting to use the Internet, as this technology becomes a fundamental tool for education, communication, and even leisure.

Analysis of computer and Internet use by residents of Queensland's LGAs led us to identify three groups of LGAs (see Figures 3, 4 and 5): (a) The first group comprises LGAs where there is a low incidence of people using a computer and the Internet, where the number of the users is less than a quarter of households. (b) The second group is LGAs where there is a medium level of computer and Internet usage, where one-quarter to one-third of households are users. (c) The third group is LGAs where there is high computer and Internet usage, where the computer and Internet are being used by one-third to half of the population.

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When we analyze community profiles for each of those three categories of LGAs, distinguished by levels of household use of the computer and the Internet, we find that Brisbane City—the capital of Queensland—has the highest concentration of computer and

Internet use (Figure 6). There we find that half of its residents have access to computers (50 per cent) and the Internet (49 per cent). The main reasons for this high technology involvement of households in Brisbane City are probably because: (a) it is the capital city located at the centre of a rapidly growing metropolis; (b) it has four universities with several campuses; (c) it is the nerve center of commercial and telecommunications for the State; and (d) there is a high incidence of tertiary educated resident workers.

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Conclusions

Public participation in urban planning is crucial, and this paper highlights the importance and potentiality of online systems for information sharing and decision making in urban planning, with the Internet being viewed as a vitally important source of planning information. The paper evaluates the readiness of local councils and the residents of LGAs in Queensland for potentially adopting technologies that supply these online systems.

Our research confirms that many councils in LGAs across Queensland have the background and infrastructure to establish online planning services. Furthermore, councils in nearly three-quarters of those LGAs surveyed consider the Internet to be a very important or extremely important source of planning information, and a significant number of the residents in Queensland are able to use computers and the Internet, but that level of use does vary

significantly across LGAs. But the prerequisites for the adoption and development of online planning systems are there in many councils. Besides those findings, the study also generates several potential recommendations, and some possible directions for the state government and for local councils in their efforts to establish and develop online planning services:

- The research shows that a remarkably high and increasing number of Queenslanders are able to use computers and the Internet, and that the councils in most LGAs have the infrastructure to develop their existing online planning systems, while the councils in the remaining LGAs are keen on acquiring and implementing the technology within the next five years.
- Efforts in establishing online planning services do need to be accelerated, particularly in those councils in LGAs where there exists among households and people a high rate of computer and Internet use.
- The research shows that Queensland residents who are poorer, older, or do not speak English at home are less likely to use computers, and thus local councils need to be aware of the incidence of those populations in their LGA who may be those least able to use the online services. As a result, such councils may need to consider alternative strategies to make ICTs accessible to more people in their LGA. The state government might also consider how it can educate people to use and feel comfortable with computers and the Internet.

- Since our research confirms that access to the Internet may be lower in remote/rural areas, the state government might look at initiatives that will better address problems of rural access which may be necessary to help the adoption of online planning serve rural areas.
- As local councils cannot assume that everyone has a computer or Internet access, then providing widespread access to computers that are linked to the Internet becomes important (through, for example, public libraries, information kiosks, Internet cafes). Understanding where people are comfortable using computers and how they interact with Internet-based services may help guide decisions regarding possible sites for supplying online planning services that are readily accessible to the public.
- The state government and local councils will need to continue to monitor levels of computer and Internet use among the population in order to assess who does and does not use the Internet, and why.
- Technophobia is most common among new Internet users, and the state government and local councils therefore may need to consider ways of targeting those groups making the least use of computers and the Internet and conduct pilot experiments with different settings, technologies, or interfaces that can address the hesitations of such people about using the Internet and online planning services.

- The state government and local councils also may need to develop and publicize privacy, security standards, and data sharing strategies for providing more secure and reliable systems.
- Broadband users spent more time online than modem users in Internet activities. The transition of Internet access from telephone modem to faster methods on broadband will be a crucial issue. Hence, the state government and local councils may need to explore opportunities for shifting from telephone modem connections to broadband so that Internet use can become faster, more convenient, and more commonplace for users.

It is appropriate to conclude with the words of Martin Luther King (March 31, 1968) which sum up the potential of information and communication technologies for the communities:

There can be no gainsaying of the fact that a great revolution is taking place in the world today...That is, a technological revolution, with the impact of automation and cybernation ...Modern man through his scientific genius has been able to dwarf distance and place time in chains ...Through our scientific and technological genius, we have made of this world a neighborhood and yet we have not had the ethical commitment to make of it a brotherhood. But somehow, and in some way, we have got to do this...

Undoubtedly very significant progress has been made; but much more remains to be done to realize, on an equitable basis of access and participation, that aspiration.

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Figure 1: LGAs in Queensland

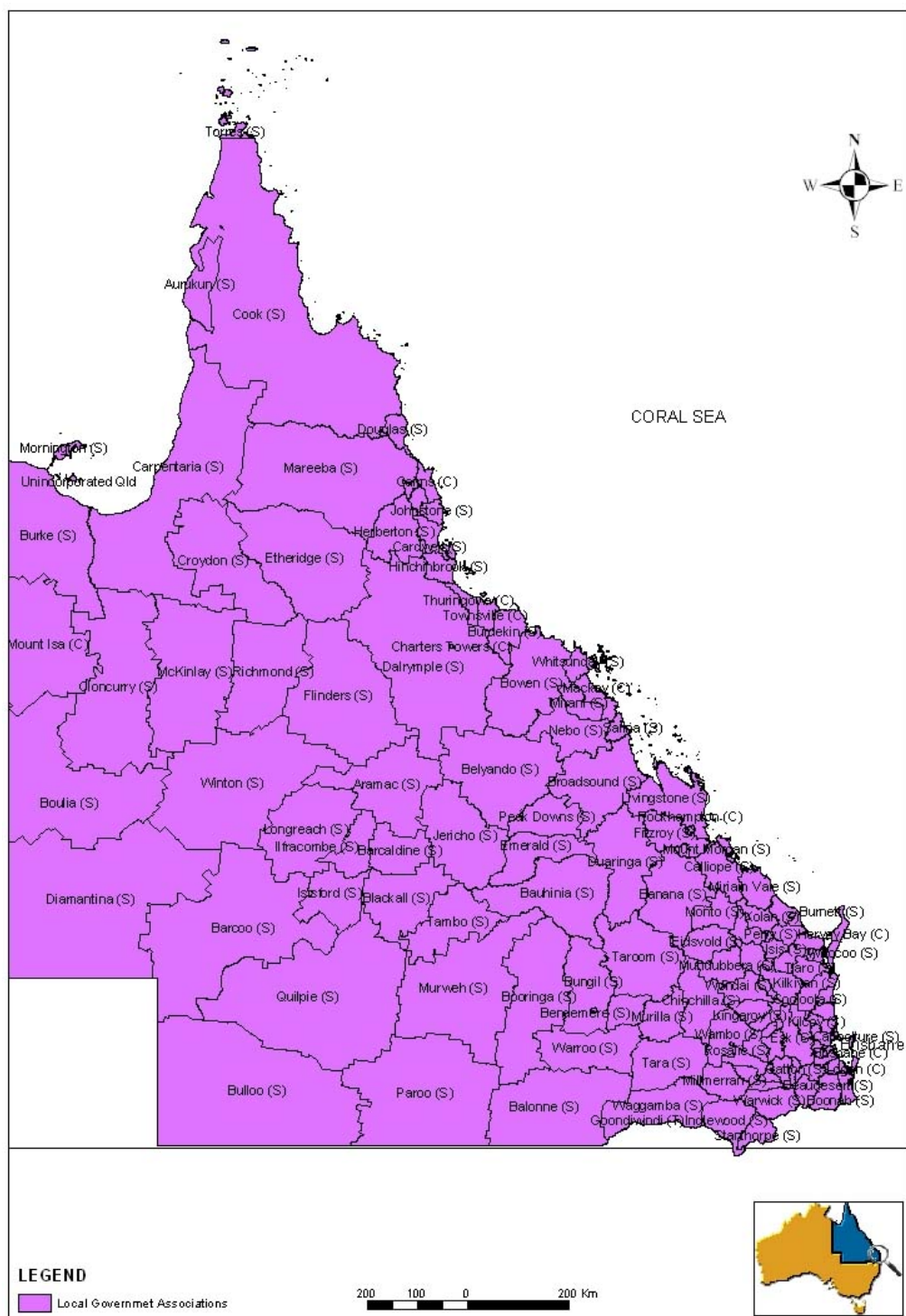


Table 1: Australia's International Ranking in Computer and Internet Use

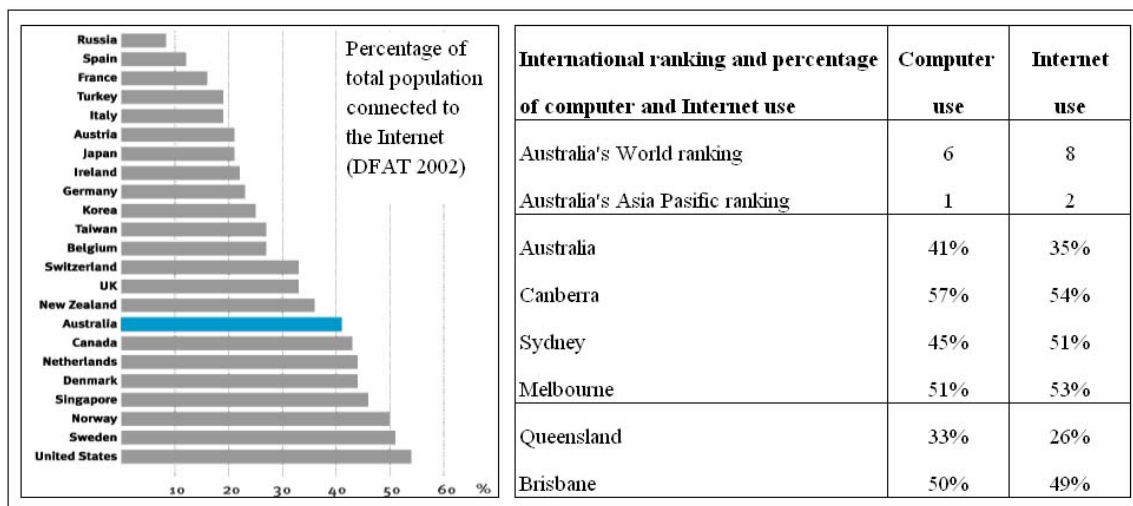


Table 2: LGA Profiles of ICT use in Queensland

Local government associations' profiles in establishing online urban planning: (Queensland averages)	
Established GIS:	
Established GIS (%)	86
For how long (years)	6
Considering GIS (LGAs which has not got GIS): (%)	
Looking into GIS	43
Staff and users: (#)	
Full-time staff	2
Part-time staff	1
Casual users	103
Main software:	
Primary	MapInfo
Secondary	ESRI
Purpose: (%)	
For urban planning	70
For urban design	26
For urban renewal	12
For neighbourhood planning	26
For infrastructure planning	66
For engineering	66
For environmental planning	10
For property services and enquiries	18
Data from: (%)	
In-house data production	74
ABS (census) data	28
Private data companies	34
Governmental departments	34
Data distribution and format: (%)	
GIS data/information distribution	52
In paper format	46
In digital format	44
At an internet site	14
Intention to use Internet and purpose: (%)	
Intention to use Internet for planning	68
For information sharing	64
For community feedback	42
For polling	6
For online decision/plan making	20
Difficulties in establishing online systems: (%)	
Technology	34
Budget	52
Technical staff	44
Public interest	24
No difficulties	2

Figure 2: Computer and Internet use by Households in LGAs in Queensland

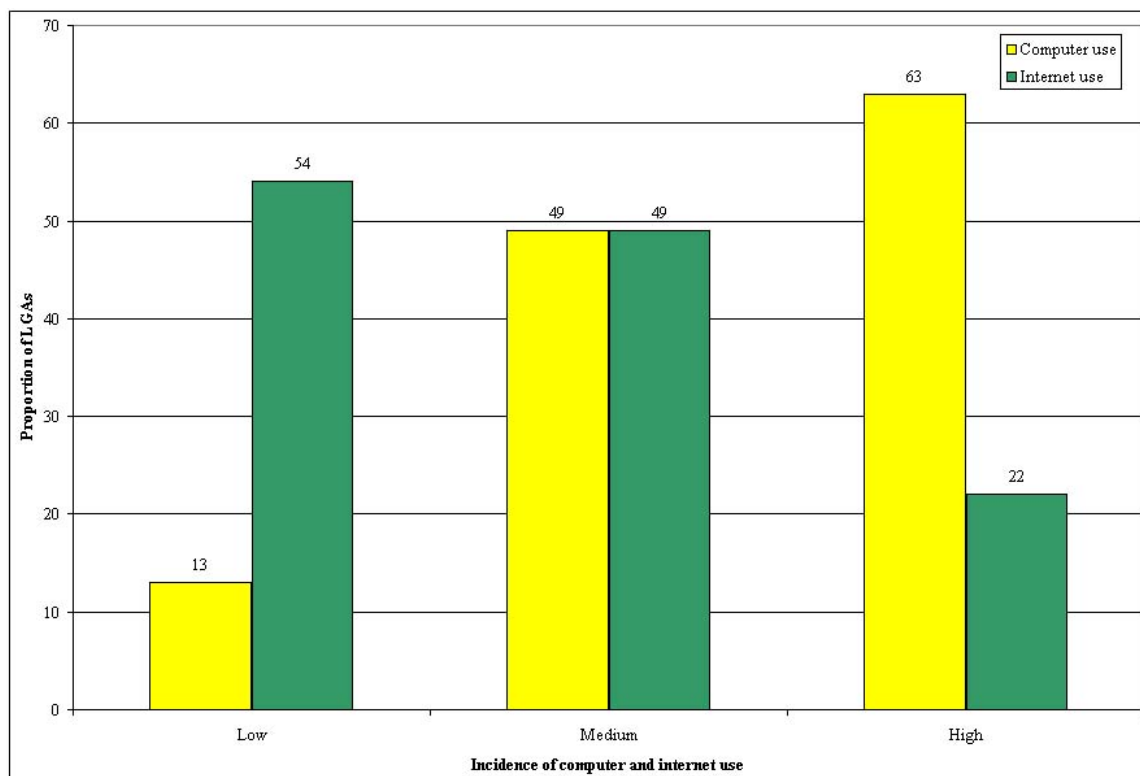


Table 3: Profiles of Computer and Internet Users

Computer and internet users' profiles (%)	Computer use more than 34% (high)	Computer use between 25-34% (medium)	Computer use less than 25% (low)	Queensland average computer use 33% internet use 26%
Computer use: MALE	38.1	26.9	15.8	31.4
Computer use: FEMALE	41.0	32.9	19.4	35.6
Computer use: AGE 0-9	31.0	26.6	12.5	27.3
Computer use: AGE 10-34	49.5	37.8	19.9	41.8
Computer use: AGE 35-54	44.4	34.7	22.3	38.3
Computer use: AGE 55+	16.2	11.9	8.5	13.7
Internet use: MALE	30.5	20.7	14.6	25.0
Internet use: FEMALE	31.6	25.2	17.8	27.7
Internet use: TOTAL	31.0	22.9	16.0	26.2
Uses internet at: HOME	54.8	50.5	39.2	51.5
Uses internet at: WORK	12.6	15.1	25.0	14.8
Uses internet at: ELSEWHERE	13.2	17.3	17.5	15.3
Uses internet at: HOME & WORK	13.5	12.5	15.1	13.3
Uses internet at: HOME & ELSEWHERE	4.5	3.5	1.6	3.8
Uses internet at: WORK & ELSEWHERE	0.2	0.3	0.3	0.2
Uses internet at: HOME & WORK & ELSEWHERE	1.1	0.8	1.0	0.9
Basic community profiles (%)	Computer use more than 34% (high)	Computer use between 25-34% (medium)	Computer use less than 25% (low)	Queensland average computer use 33% internet use 26%
Language spoken at home: ENGLISH	91.4	91.3	79.6	90.1
Language spoken at home: NON-ENGLISH	8.6	8.7	20.4	9.9
Level of education: NO-SCHOOL	0.2	0.7	1.2	0.5
Level of education: 1 to 8 YEARS	10.4	14.5	18.0	12.8
Level of education: 9 to 12 YEARS	65.1	63.5	62.3	64.2
Level of education: HIGHER EDUCATION	24.0	21.4	18.5	22.4
Occupation: PROFESSIONALS	36.6	40.5	31.6	37.7
Occupation: TRADESPERSONS	13.8	12.2	11.0	12.9
Occupation: CLERICAL-SALES-SERVICE				
PRODUCTION WORKERS	37.3	29.4	28.1	33.2
Occupation: LABOURERS	12.3	17.9	29.2	16.3
Unemployment rate: UNEMPLOYED	7.2	6.2	6.3	6.7
Weekly household income: \$ 0-499	34.3	40.0	35.5	36.7
Weekly household income: \$ 500-999	32.0	32.0	34.4	32.2
Weekly household income: \$ 1000-1499	17.8	14.9	16.7	16.6
Weekly household income: \$ 1500-1999	9.8	6.5	7.7	8.3
Weekly household income: \$ 2000+	6.1	4.6	5.4	5.4
Number of urban localities (cities, towns & shires)	63	49	13	125

Figure 3: Computer and Internet Users' Basic Profiles

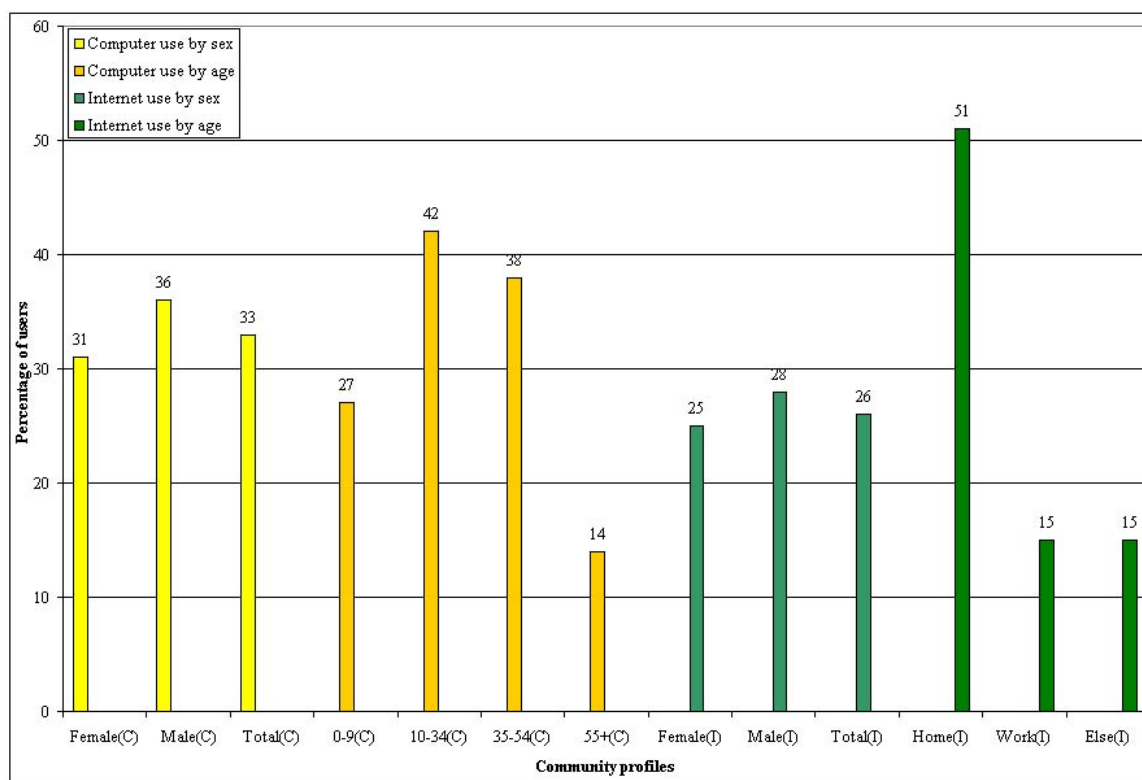


Figure 4: Computer use among residents in LGAs in Queensland

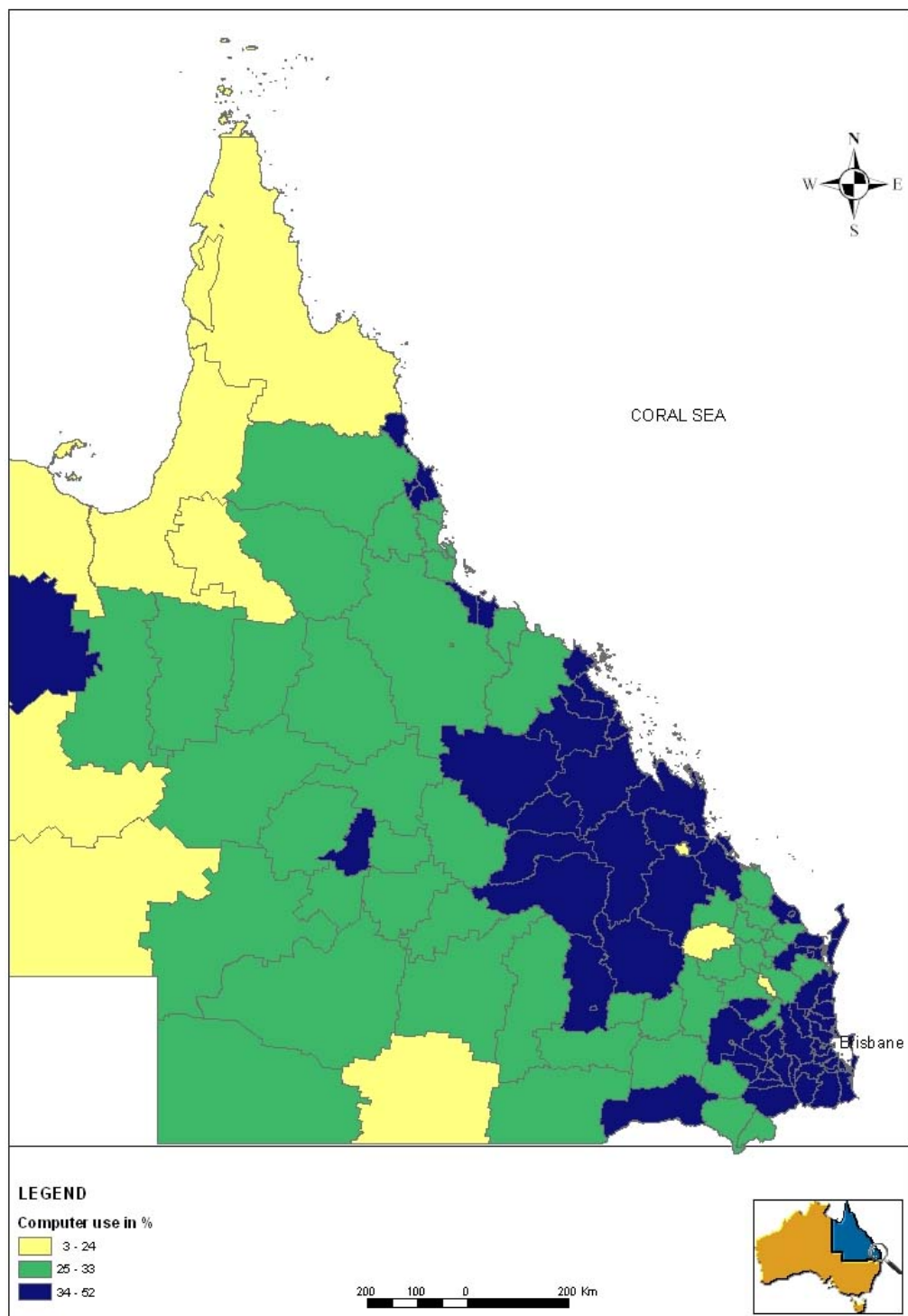


Figure 5: Internet use among the residents in Queensland

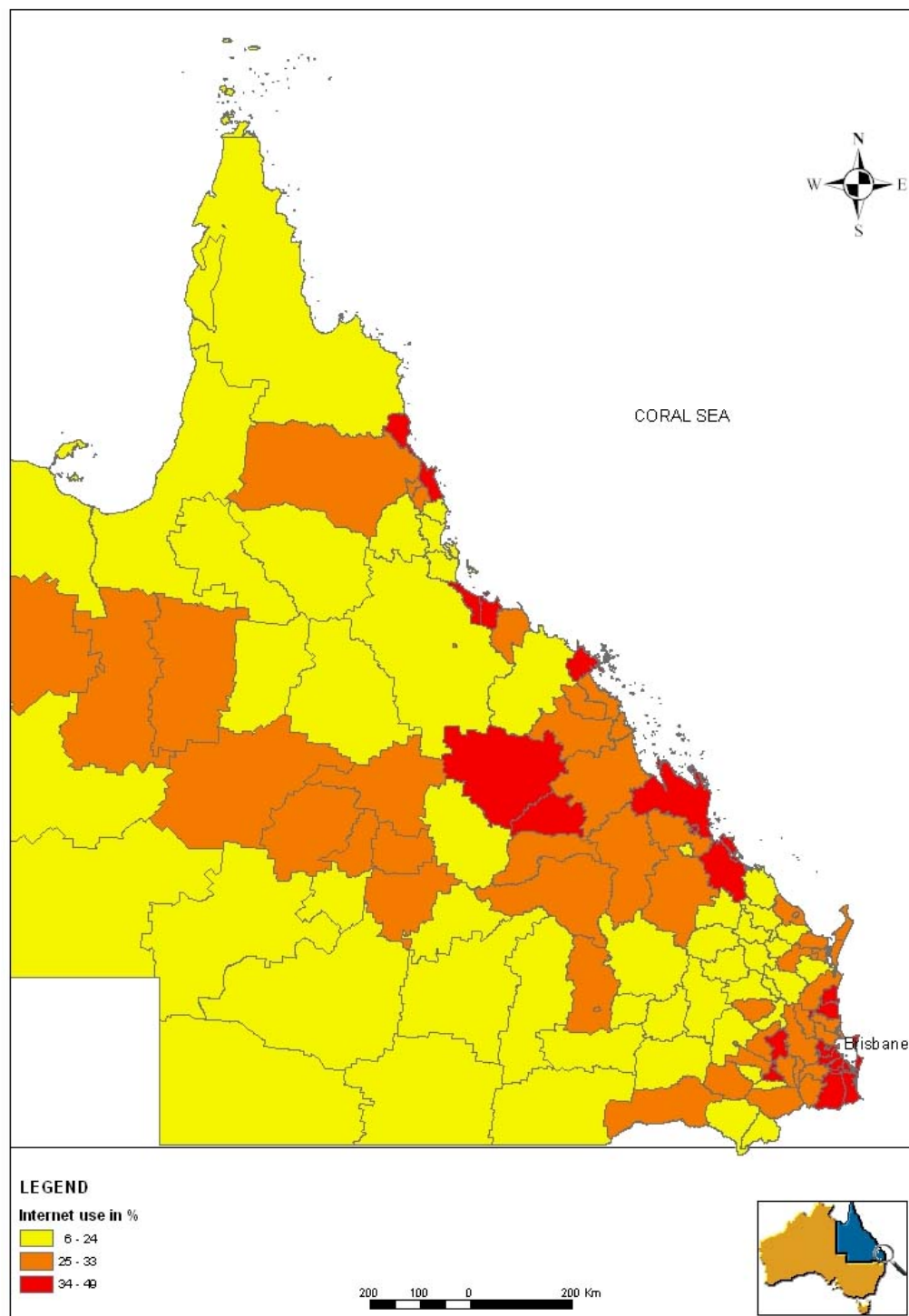


Figure 6: Community Profiles – Brisbane

