



# Mapping Youth-At-Risk: GIS and its Potential as a Service Integration Tool

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## Mapping Youth-At-Risk: GIS and its Potential as a Service Integration Tool

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*This paper examines the utility of a spatial information tool in the form of a Geographic Information System (GIS) in assisting human service agencies involved in integrated service approaches to engage in coordinated planning and service delivery initiatives. In accordance with an action research strategy, the aim of this study was to engage with stakeholders in the area of youth services and supports in a reflexive multidisciplinary environment regarding the potential of a spatial information tool in assisting integration and service delivery efforts. A number of maps depicting snapshots of demographic, disadvantage and housing data were produced, with the present paper reporting on stakeholders' perceptions of both the mapped content and the potential of GIS in the development of a shared information system. Key issues relating to data collection, positioning in the information hierarchy and trust are discussed.*

*Keywords: GIS, Service Integration, Youth Services*

### INTRODUCTION

Current trends in human service policy involve a move away from silo-based service frameworks towards 'whole-of-government', evidence-based and client-oriented service systems that attempt to transcend disciplinary and funding boundaries. A recent public service advisory committee defines whole-of-government approaches as:

... public service agencies working across portfolio boundaries to achieve a shared goal and an integrated government response to particular issues. Approaches can be formal and informal. They can focus on policy development, program management and service delivery. (Management Advisory Committee, 2004, p. 1)

In the Australian whole-of-government context, the terms 'whole-of-government' and 'service integration' are used to cover a myriad of service structures that occur on a continuum from agency linkages and collaborations, coordinated case plans through to pooled resources and budgets. It is argued that these approaches "can create synergies leading to innovation and streamlining of service delivery through information and skill sharing" (Fine, Pancharatnam, & Thomson, 2005, p.7). There are a number of reasons for the move towards coordinated or integrated approaches in the human services arena, including the recognition: that service delivery models based on centralised, hierarchical models are not working adequately; that some social 'problems' cannot be solved without collaboration; that there is increasing demand for social services with decreasing public funds available; and that the 'silo' approach has resulted in a multitude of interventions with little evidence of successful outcomes or cost-effectiveness (Clarke & Stewart, 1997; Fine et al., 2005; Szirom, Lasater, Hyde, & Moore, 2002).

Many services have moved towards coordinated, multidisciplinary case planning to provide more holistic long-term solutions to their client base, but the move towards integrated planning or structures with pooled budgets has proved considerably more difficult. There are a number of reasons for this, for example the competitive governmental funding environment whereby services are independently funded by differing funding bodies at differing legislative levels (local, state, federal) and often for short, or pilot, time periods. Alongside these structural barriers are the very real barriers that services face regarding the collection of different types of data, evidence bases and collaborative understandings of needs and priorities. Importantly, underlying the whole-of-government or integration approach is the assumption that services

can engage with each other in an integrated planning and strategic sense, share information and skills to better meet the needs of their client group and respond to emerging sectorial issues with little attention given to the tools that could assist services in these endeavours. Foley (2002) identifies the planning challenge within health and social service systems as a key issue in the 21<sup>st</sup> century in light of changing policy systems, demands and decreasing resources. The paper now turns to a discussion of one potential tool in the integration or whole-of-government challenge, geographic information systems (GIS).

GIS is "a set of database, mapping, and statistical tools that allow visual and qualitative assessment of geographic information...geographic in the broad sense, meaning any type of information that has a physical location (Luke, 2005, p.191). In effect, it allows the visual layering of information or variables related to specific locations and is a tool that has been used nationally and internationally in a variety of areas including land and natural resource management (Tsou, 2004), neighbourhood planning (Elwood & Leitner, 2003), crime (Australian Institute of Criminology, 2000; Wieczorek & Hanson, 1997), and health and human services (Goldstein, 2003; Kaneko, Takano, & Nakamura, 2003; Luke, Esmundo, & Bloom, 2000). In the Australian context the application of GIS to social and community planning has been much more limited, with a predominant focus on land and resource management (Hugo, 2001).

Two recent international studies point to the potential of GIS in health and human service contexts: A Japanese study using GIS to conduct a community health needs assessment and an American study examining social ecologies of adolescent drug use. Kaneko, Takano and Nakamura (2003) used GIS to produce visualizations of indicators based on demographic, life and environmental factors related to community health needs (health promotion, support for the aged, maternal and child support and sexually transmitted disease prevention in young people) in the Tokyo region of Japan. The authors argued that a community health needs assessment facilitated by a GIS "could explicate diverse geographical distributions of these needs at the local level...and...facilitate rational decision-making in planning and implementing public health services" (Kaneko et al., 2003, pp 249-250). Mason, Cheung and Walker (2004) applied GIS in order to explore the social networks, environments and health outcomes of drug-using adolescents in an innovative study focusing on an African-American 18 year-old female substance user. An ecological interview was conducted which produced geographically referenced listings and perceptions of the young woman's daily activities, including perceived safe and risky locations.

The literature surrounding GIS focuses on a number of key areas of application originating from a diverse array of disciplines: GIS as a conflict management strategy, GIS as a diagnostic and decision making tool, GIS as a form of communication and integration whereby multiple epistemologies are embedded; and GIS as a participatory empowerment tool (Curry, 1995; Hugo, 2001; Kyem, 2004; Leitner, McMaster, Elwood, McMaster, & Sheppard, 2002; Pickles, 1995; Schuurman, 2003; Wood, 2005). In addition, another key theme of GIS research is that of Public participation GIS (PPGIS) which has come to be the theoretical site of exchanges regarding GIS as a simultaneous tool of empowerment and of marginalization (Pickles, 1995; Sieber, 2003). PPGIS can be defined as "a variety of approaches to make GIS and other spatial decision-making tools available and accessible to all those with a stake in official decisions" (Schroeder, 1996, p.1). The idea that this type of technology is accessible or acceptable to all often overshadows the very real barriers to participation that may exist, such as where an individual or agency sits in the policy and service 'chain', the capacities of staff, and goals contrary to group visions or aims.

The process of GIS acceptance within a community committee was examined by Kyem (2000) where he describes a case study in Ghana examining the use of GIS in the protection of forest resources. Prior to their involvement in the public participation GIS project, 85% of the members of the forest committee perceived GIS technology as a potential hindrance to their ability to participate in decision making within the committee. Following the completion of the project, only 10% perceived GIS technology as a hindrance to participation. Similarly, prior to involvement 5% felt that GIS would help foster understanding between competing groups, whilst following involvement, 85% felt that GIS could foster understanding between competing groups. Interestingly, through their actual involvement with the technology, barriers surrounding the uptake of a spatial tool were minimized and members came to recognize the value in the facilitation of shared understandings. Recently, geographer Francis Harvey (2003) framed the development of geographic information systems within the context of trust, that underpinning models of sharing of information and the governance of such arrangements is the assumption that agencies will engage in 'vertical integration' where information is shared at different levels of government.

### THE PROJECT CONTEXT

Thus, in a social or human services context, GIS enables an analysis of a myriad of variables at a person-environment level, thereby potentially providing a vehicle for the sharing of information by diverse stakeholders at different levels of government, and importantly the deriving of a common language and framework to examine the needs and services attached to differing target groups within certain regions. A collaborative understanding of the needs of certain target groups or regions enables both more coordinated approaches to the delivery of services and decision making regarding strategic initiatives and directions.

The present paper explores the potential of GIS in facilitating greater levels of integrated planning and service delivery with a group of service providers, the Youth-at-Risk Alliance (YARA), on the Gold Coast, Queensland. This service region extends from Beenleigh in the north to Coolesongatta near the New South Wales border in the South. The Youth-at-Risk Alliance (YARA) is funded by the Department of Communities to facilitate processes of integration and collaboration among youth agencies and to provide direct support services to young people aged 10 to 17 years with complex needs. Approximately 20 to 25 key agencies and governmental departments are members of the alliance, covering areas such as drug and alcohol, accommodation and homelessness, youth services, education and health. The individuals involved exist at differing organisational levels from management to direct service provision. The paper presents the perceptions of YARA stakeholders involved regarding the potential of a spatial information planning tool in their policy and service contexts. The current project is a component of the Queensland Parallel Supercomputing Foundation (QPSF) funded project – "Transforming Geographic Information Systems into Community Information Systems" – which aims to develop a community information system that service providers, community members and stakeholders could utilize to enhance decision making capacities. The pilot project was undertaken in order to demonstrate the way that human services and publicly available data could be visualized using GIS technology and to assess the perceptions of service providers and stakeholders in the field of human services regarding the utility of a tool such as GIS in service integration efforts. Thus, this project focuses on this largely neglected area of the service integration literature by examining the utility of a spatial information tool (GIS) in the facilitation of integrated planning processes and the sharing of information.

## METHODOLOGY

The overarching framework adopted in the present project is participatory action research, which is concerned with research “alongside” stakeholders, rather than doing research “about them” (Quixley, 1997). In addition, participatory action research:

...argues that any change or action in service delivery should be managed by those who are most affected by it. It shares a power base with all Stakeholders and holds the belief that Stakeholders have the capacity, creativity, and resources to deal with emerging issues and change. Such a process encourages stakeholders to take responsibility in owning the process and the service they receive and its outcomes. (Sutherland, Kirk, & Clark, 2003, p. 2).

In accordance with this research strategy, the aim of this study was to engage with stakeholders in the area of youth services and supports in a reflexive multidisciplinary environment regarding the potential of a spatial information tool in assisting integration efforts. Two focus groups and four semi-structured interviews were carried out with YARA members during the project.

A number of maps were produced (see Table 1 for complete list and Appendix A for five example maps) based on areas of YARA's interest identified through an initial focus group session with approximately 12 YARA members. The areas identified by members included general distributions of young people, levels of disadvantage and housing accessibility and affordability. The focus group consisted of employees from governmental departments and non-government organizations (NGO's). Initially, local organisational data was to be sourced from housing, youth and homelessness services and overlaid with publicly available data. Three services provided data for analyses. It quickly became apparent that data collection issues would make this task impossible. Of the three services that provided client data, none could provide both entry and exit data suitable for analysis. For example, a service may have collected postcode data pertaining to a client's entry into the system but could not provide postcode and information regarding eventual exiting into the housing system. In addition, 'unmet' need data was not in a form suitable for analysis.

Publicly available data was sourced regarding distributions of young people, levels of disadvantage and housing accessibility and affordability. The data supporting the demographic and disadvantage aims was sourced from the Australian Bureau of Statistics (ABS) 2001 Census CDATA and SEIFA products. The SEIFA indices are statistical measures developed by the ABS which include a number of variables such as educational attainment and employment in skilled occupations, number of low income earners and number of persons with low educational attainment.

The accommodation profile data for the region was sourced from the Residential Tenancies Authority (RTA). The accommodation profile data (Median Rental Data, 2004) enables a rental profile of the region, demonstrating areas of high rental cost and areas of low rental cost. In addition a dataset pertaining to RTA disputes was obtained because it allowed an identification of any 'hot spots' in terms of accommodation problems. 'Notice to Leave' disputes were extracted as a percentage of the overall number of disputes for the individual postcode. Age breakdowns were not available from the RTA. Finally, in order to gain a comprehensive view of the youth social security profile of the region, data was obtained from Centrelink (2005). The data was then queried and payments potentially pertaining to youth and children were extracted. Again, specific age-specific data was not available, severely limiting the analyses conducted. The payments included in the overall youth social security profile were: Newstart

Allowance, Sickness Allowance, Austudy, Youth Allowance, Disability Pension, Parenting Payment – Single and Parenting Payment – Partnered.

Service provision data aimed to demonstrate the location of services pertinent to youth with a focus on accommodation and income support and the public transport networks servicing these. Databases were sourced to provide address details of income and accommodation services, with these addresses being geo-coded for inclusion within the GIS environment.. The public transport service data was obtained from two sources. The first source was Queensland Transport's dataset which displays the routes of all bus services in South East Queensland. The second source was from the ABS CDATA product of which contained all major rail lines in Queensland.

The data was collated and visualized using the Environmental System Research Institute (ESRI) software ArcView 9. A series of maps of the region were created using different combinations of the data in order to represent varying representations of demographic and 'disadvantage' data in the region. Table 1 details the information produced and data sourced. Appendix A contains examples of maps produced (maps 1, 2, 6, 8 and 9)

Table 1. Data Sources & Maps Relating to Demographic, Social & Housing Disadvantage

Map No.	Title	Data Source
1*	Selected Centrelink Payments 2005, Gold Coast Region	Centrelink, 2005 (All Payment Types by Postcode)
2*	RTA Notice to Leave Dispute Data 2004, Gold Coast Region	Residential Tenancies Authority, 2004 (Notice to Leave Dispute Data by Postcode)
3	SEIFA Index of Disadvantage Overlaid with Percentage of SLA Aged 15-25 and Public Transport Networks, Gold Coast Region	ABS 2001 Census CDATA Product (Percentage of persons aged 15-25, SEIFA Index of Education and Occupation, SEIFA Index of Disadvantage)
4	SEIFA Index of Disadvantage by SLA, Gold Coast Region	ABS 2001 Census CDATA SEIFA Index of Disadvantage
5	SEIFA Index of Education and Occupation by SLA, Gold Coast Region	ABS 2001 Census CDATA Product SEIFA Index of Education and Occupation
6*	Number of Newstart Recipients (Centrelink, 2005) vs Percentage of SLA aged 15-25 (ABS, 2001) Plus Accommodation and Income Support Services and Public Transport Networks, Gold Coast Region	Centrelink, 2005; ABS 2001 Census CDATA, Service Latitude /Longitude Coordinates sourced from <a href="http://www.multimap.com">www.multimap.com</a> ; QLD Transport
7	Number of Youth Allowance Recipients (Centrelink, 2005) vs Percentage of SLA aged 15-25 (ABS, 2001) Plus Accommodation and Income Support Services and Public Transport Networks, Gold Coast Region	Centrelink, 2005; ABS 2001 Census CDATA; Service Latitude /Longitude Coordinates sourced from <a href="http://www.multimap.com">www.multimap.com</a> ; QLD Transport
8*	Number of Parenting Payment - Single Recipients (Centrelink, 2005) vs Percentage of SLA aged 15-25 (ABS, 2001) Plus Accommodation and Income Support Services and Public Transport Networks, Gold Coast Region	Centrelink, 2005; ABS 2001 Census CDATA; Service Latitude /Longitude Coordinates sourced from <a href="http://www.multimap.com">www.multimap.com</a> ; QLD Transport
9*	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – One Bedroom Flats (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
10	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Two Bedroom Flats (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
11	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Three Bedroom Flats (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
12	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Two Bedroom Houses (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
13	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Three Bedroom Houses (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
14	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Four Bedroom Houses (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
15	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Two Bedroom Town Houses (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data
16	Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – Three Bedroom Town Houses (RTA, 2004), Gold Coast Region	Centrelink, 2005; RTA, 2004 Median Rental Data

\* See Appendix A for map produced

A feedback session was held with approximately 20 members of YARA to display the maps with the intention of assessing general perceptions of both the mapped content and GIS as a tool to assist in service integration efforts. This brief session indicated that the maps correlated to the on-the-ground picture from the perspective of workers in the field and that depending on service context a number of agencies would find access to this type of spatial representation a useful tool. To gain a greater depth of information and variety of perspectives, semi-structured interviews were held with four YARA members from differing organisational contexts (one governmental departmental employee, two workers in non-government organisations and one YARA employee).

Participants were asked questions relating to how they perceived the spatial representations of their geographic region (including marking on a blank map of the region their perceptions of areas of significance or issues relating to young people and gaining perceptions of each map, 1 to 16), and the potential of a spatial planning tool in terms of enhancing service delivery and planning for YARA stakeholders. Finally participants were asked to respond to the following quotation from Kyem (2004):

Mapping capability aside, GIS offers opportunities for parties to collect and analyse data jointly, explore alternative scenarios, create a medium for stakeholders to exchange views about their values and interests, see results of value choices, and learn to develop trust for each other. (p.39)

Semi-structured interviews were transcribed and analysed using NVivo qualitative software. Themes relating to the broad areas of the relationship to the on-the-ground picture, implications for service delivery and perceptions of a community information system relating to young people at-risk were used to code the interview data.

## **FINDINGS**

Findings are presented in terms of the relationship of the visualizations to the 'on-the-ground' picture, perceived implications for service delivery, and the potential of a spatial information tool in assisting with planning and decision making activities. Selected participant quotes are used to demonstrate the dominant themes. It is not the purpose of the current paper to provide a detailed analysis of the maps produced, but rather, to explore the perceptions of stakeholders of the information presented and the relevance to their current and future service contexts.

### **Relationship of the visualizations to the 'on-the-ground' picture**

Overall, interviewees perceived the maps as reflecting the attributes of the region, but importantly, local knowledge proved to be of considerable value in interpreting the visualizations. Interviewees commented on the validation of their current service delivery approaches, with recognition that the visualizations starkly demonstrated the issue of access and equity for the inland regions of the Gold Coast. Consistently, participants commented on the "service deserts" (Feedback Session Participant) in the region and issues of availability of transport to access services. Where participants were asked to map issues onto a blank map issues such as the lack of services in the inland regions of the coast, problems associated with growth corridors, rising mental health and drug issues relating to young people and the invisibility of younger children such as those aged 10 to 14 years. The accommodation problem was also highlighted, with one participant commenting, "*There is no cheap housing, the only way to afford rentals when you are not working is to share.*" In the areas where accommodation is cheaper there is a distinct lack of access to transport and services.



Selected Semi-Structured Interview Quotations:

*Yes! I can see out here are high need areas I would think and there's not a lot of services out there so that leads to the shift between you know young people probably having to leave home to get to here which means they leave their supports then that works to come into the coastal strip to gain access to employment opportunities service delivery and agencies and so forth. (Government Employee)*

*It sort of validates what we are doing in the areas that we are doing it, and it actually does show where the clientele we are working with are actually at those areas...It does reiterate what we are I guess already doing... (NGO Employee)*

*...there's a real imbalance of equity...So the coastal area indicates there is greater access and there is less in the western areas...there's definitely clustering happening across the strip...there are major gaps where it is totally lacking. (NGO Employee)*

*But that's what I mean in terms of resource poor, they just don't have a lot...whether it's transport, schooling, health services... (NGO Employee)*

For some of the visualizations, interviewees identified gaining a new perspective or having local knowledge which contradicts the data presented. Centrelink data is not typically available and/or accessible to agencies and proved to be of interest to participants. High proportions of disability pensions in certain areas surprised most participants. Rising numbers of young people with mental health and/or substance abuse issues was thought to be a potential reason for this pattern. Local knowledge surrounding rising rental costs suggests that even using the most current data available, in an area such as the Gold Coast, rental prices can rise rapidly in a period of 12 months<sup>1</sup> changing the affordability picture considerably. Additionally, it is important not to lose the 'smaller' picture as agencies or workers may only be funded to work within a small geographical area or very specific target group. The ability to drill down to more specific geographic or demographic levels requires the availability of appropriate datasets.

Selected Semi-Structured Interview Quotations:

*Palm Beach, again, I definitely thought there would be a lot higher people on youth allowance. Palm Beach is very cheap rent and obviously with Centrelink and a few services down there. I know a lot of my clients live around the Palm Beach/ Southport area... I'm a bit surprised that there's not more people living in that environment... (NGO Employee)*

*...but it doesn't reflect what I had thought which is that Eagleby, Beenleigh...escalating accommodation price, rental accommodation. Its been, like gentrified...but this map doesn't show that. (Government Employee)*

*The disability stuff is a big surprise though. (Government Employee)*

*So that's what this says to me...it says there's a lot of information about the gold coast but even though I'm on the map...we're not...the statistics for our particular region aren't shown and I only work within a 10km radius...so...so once again the stuff that everyone's using isn't particularly relevant because we have such a small piece of the action. (NGO Employee)*

*So that local knowledge...I know Canberra can't get that stuff because when you put on a tie no-one will talk to you. (NGO Employee)*

### Perceived Implications for Service Delivery

All participants saw some value in GIS as a planning tool, enabling for example, the targeting of services (such as outreach and early intervention) to those in areas or demographics of high

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<sup>1</sup> Rental data was sourced from the Residential Tenancies Authority's most recent dataset – 2004.

need and doing so in a visual medium which can often provide a more accessible picture of the variables at stake. Although this is the case, in the words of one participant, "...these maps would be great for us to look at in terms of our planning...but at the end of the day we would just look at wherever the client is."

Selected Semi-Structured Interview Quotations:

*I mean if we were doing outreach for example, we would obviously look at areas that were I guess where a lot of young people with youth allowance are we'd probably be looking around that area. (NGO Employee)*

*Yeah definitely, I think transience is obviously a major issue for young people on the Coast so young people move around all the time. I guess mapping and showing where these young people are at will sort of give a bit of a history of being at, give us more of an indication of where young people are at and we can adjust our you know service delivery according to that but due to the flexibility we have we are able to that as is anyway. (NGO Employee)*

*...it's definitely a useful tool...it's definitely something we can be looking at through our planning days... (NGO Employee)*

*Visual tools are very handy...especially at a time where everything is heavily worded, heavily documented...I think it's hard to get to the point of everything and sometimes you need a snapshot. (NGO Employee)*

### **The Potential of a Shared Information System**

Although most participants in the feedback session and interviews could see the potential value in a shared information system the journey to such a system would clearly involve overcoming a number of hurdles. The main issues identified by participants surround data collection, positioning of self/agency in the information hierarchy, and the trust involved in sharing information horizontally and vertically.

#### **(a) Data Collection**

The challenge attached to the collecting and maintaining of suitable databases of information cannot be underestimated in the human services context. Aside from ethical issues of confidentiality attached to client information, services are often stretched financially and administratively so the ability to collect and maintain detailed data is considerably constrained. The view of information from a geographical perspective often requires a shift in data collection activities, for example, in the feedback session with YARA members, one participant commented: *"It challenges me about what data I'm keeping to enable the building of a collective picture. If the data I'm collecting can't be used I need to re-think what I'm collecting."* Participants also commented on the difficulty and complexities attached to the collecting of data and the visualizing of certain social problems, such as homelessness.

Although problems were recognized, most participants in the feedback session and the semi-structured interviews acknowledged the potential of such an information source if services had the capability to collect consistent data also enabling temporal analyses. One participant commented on the potential outcomes attached to this type of information system:

*If the information is kept up on a consistent basis and all the services did this I think this could give some good outcomes as to where young people are at and the give the opportunity for that kind of information to be shared. (NGO Employee)*

## (b) Positioning of Self/Agency in the Information Hierarchy:

Although conceptually participants could often see the value in the use of a spatial information tool, there were clearly different perceptions of the role they could take in such a system. This type of database and set of analytical tools were either seen as the domain of policy makers and statisticians or as a system that they would help build and maintain. For example, one participant commented:

*I know that Canberra's got a bigger job to try and justify where they're putting their money and they need proof to do it. And they need statisticians and bureaucrats and academics and everything...so I rely on them to do that part of it. (NGO Employee)*

Inevitably, there are also challenges regarding the acceptance of a computer-based tool by those that have a discomfort with technology:

*I think there are technophobes out there who would be very uninterested if you called it computer-based anything...that would lose them straight away. (NGO Employee)*

## (c) Trust

The following section represents participants' perceptions of Kyem's (2004) comments regarding trust. Most participants identified the potential for GIS to initiate discussion from a 'safer' perspective but acknowledged that the building of trust is a complex process that exists in the context of services attempting to maintain their own funding sources and agendas.

*I'd agree with that statement...I do believe that it could be a really extremely important tool that services could use. (NGO Employee)*

*It sounds like Kyem's got a vested interest in GIS and he's lived it and breathed it and he's very convinced about it. I don't think that's the way that the sector and the groups that I work with think...they would just say "oh well that's some academic who like maps and mouthing off about how useful it is". (NGO Employee)*

*It wouldn't necessarily I think in the first instance build trust...but they could at least see there is evidence based stuff, this isn't you know a situation of skewing or whatever, it's just the way it is. They work hard together, but at the end of the day you know everybody is trying to maintain and sustain existence in their service or service provision...so trust is a tricky concept. (NGO Employee)*

*Perhaps it would mean that...it would hopefully lead to a more open and trusting discussion, so for instance if we showed that a whole bunch of young people living independently with no support lived up here and the only youth support service was down here it would I guess provide a vehicle to begin that discussion without people necessarily becoming defensive or wanting to know what the agenda is. (Government Employee)*

**The Potential Utility of GIS**

All participants registered interest in the ability of GIS to depict a range of 'views' of the position of young people. Specific data mentioned by participants included mapping the service flows of young people accessing different services, mapping temporal / seasonal movements (migration patterns) of young people ("it just seems to be an influx of young people in certain areas at certain times of the year and it would be good to get a bit of a clearer picture around that." (NGO Employee)) and the mapping of domestic violence and crime data. The mapping of qualitative data was also mentioned by one participant in the context of mapping young people in a more micro-sense and at the level of relationships with family, friends and support services. This would include exploring the impact of the lack of transport on young people in a micro economic and social sense. Another participant, who works directly with young people,

could see the potential in detailed youth recreation and leisure maps to explore the temporal recreational situation of young people on the coast. In terms of housing, participants also identified the importance of detailed depictions of the cheaper end of the housing market such as caravan parks and boarding houses. Significantly, participants mentioned the challenges attached to the mapping of some social problems, such as homelessness, where clients do not have an address. The complexity of issues and how to measure variables alongside the ability to physically locate some target groups were cited as potential barriers.

## Discussion & Conclusion

Human service organizations are in a process of change. They are being asked to collaborate and plan together across both spatial and portfolio divides to shape new, evidence-based, cost effective responses to complex needs. They must do this within a context of welfare retreat and intensified competition between agencies for funds. Such a challenge requires new thinking and new tools. Whilst no one tool will provide the answers, this paper has argued that GIS has a contribution to make.

The aim of the action research project was to work alongside YARA members to assess the potential usefulness to them of this spatial information tool. At the same time, it was anticipated that participants would have varied reactions to the technology involved and to what might seem like an over-emphasis on data collection. The action research project was a journey into new territory for researchers and participants alike. In the beginning it was unclear what data would be available and what story this would tell when it was mapped to the information system.

The findings suggest that maps with layered information are able to generate useful discussion and analysis between agencies that carry quite different professional and spatial responsibilities. They successfully engage some participants with a bigger geographical picture than they usually deal with. The visual impact assisted some participants to connect what happens inside their familiar "ten km radius" with what happens beyond. For other participants who have a wider planning focus, the discussion enabled juxtaposition of what the data appears to say with what the lived experience of practitioners on the ground is.

The action research project enabled participants to identify that the data collected both by local and state level agencies is not always adequate to the development of a finely layered information system. Governments may already be using GIS but this project was concerned with community information systems which facilitate horizontal integration between those at the coalface.

In the first phase of the research the team encountered the first barrier to the sharing of information in the form of data collected by stakeholders. To enable the use of a spatial mapping tool service, it is necessary that services collect client data with a locator such as an address or postcode. If data is only collected at the level of postcode, analyses at more detailed levels (such as streets) are not possible. Local knowledge should enable organizations to code data by identified localities within postcodes, for example street clusters. Agreement across agencies about such coding would allow both informative mapping and protection of privacy. Data provided to the study by local agencies proved unsuitable for analysis because of lack of detail and consistency. Thus, the view of information from a geographical perspective often requires a shift in data collection activities. In the feedback session with YARA members, one participant commented: *"It challenges me about what data I'm keeping to enable the building of a collective picture. If the data I'm collecting can't be used I need to re-think what I'm collecting."* Agencies with some key data, such as the Residential Tenancies Authority could not provide some essential variables such as the age of the person involved in a 'notice to leave' dispute. The level of data provided enables a broad level identification of tenancy 'hotspots', but without additional data few conclusions relating to young people specifically can be drawn.

The resourcing and maintaining of a shared information system where agencies and departments could layer service, social and demographic data is a considerable task. The

design and building of a shared information system would need the direct involvement of stakeholders to determine the types of data required and the best mechanisms for the collection of such data. In order to overcome the idea that statisticians and bureaucrats are the purveyors of information related to their sector, considerable work would be required to develop a sense of ownership regarding a shared information system. As part of this process the differing geographic areas or demographic groups that services are funded to work in or with needs to be considered, again with the understanding that the more data is 'drilled' down, the greater the level of data that needs to be collected at the service level.

Although the challenges inherent in the development of a shared information system that could be used by stakeholders in human service sectors are considerable, the present study indicates that even access to the spatial mapping of publicly available data generates interest in the potential of a tool such as GIS in service integration efforts. All participants identified the presentation of data in this form as being of use in service planning and of certain outreach or targeting activities. Information presented in a visual form proved to be a welcome change from the text-laden documents that are often the carriers of statistical information. The mapped data starkly demonstrates issues of access to services and transport for certain regions and groups on the Coast. Median rental data in the region demonstrated the clustering of cheap accommodation in certain areas, particularly in areas with little transport or access to services. The importance of local knowledge in identifying areas of rapid change was evident in all interpretations of mapped content.

Conceptually participants could often see the value in the use of a shared information system, but there were clearly different perceptions of the role they could take in such a system. This type of database and set of analytical tools were either seen as the domain of policy makers and statisticians or as a system that they would help build and maintain. For some participants involved in direct service delivery the reality of client demands inevitably consumes their time, leaving little energy for the challenges of engagement with multiple stakeholders in integrated service planning. For government employees directly involved with planning activities, the incentive for involvement is much clearer. Trust becomes a central issue in this process where agencies that are often fighting for their own survival can fear the permeability of integrated stakeholder data. Most participants identified the potential for GIS to initiate discussion from a 'safer' perspective but acknowledged that the building of trust is a complex process that includes the recognition that services are attempting to maintain their own funding sources which can impact on their ability to openly share information.

A significant benefit of GIS systems was seen by participants to be the ability to map the temporal dimension of issues, that is to layer data pertinent to different points in time. This could possibly allow the tracking of the impacts of events such as closing of a caravan park, cut backs in transport services or the impacts of residential and industrial developments on the welfare of populations, or it could be a useful evaluation tool in tracking change brought about by service or program inputs.

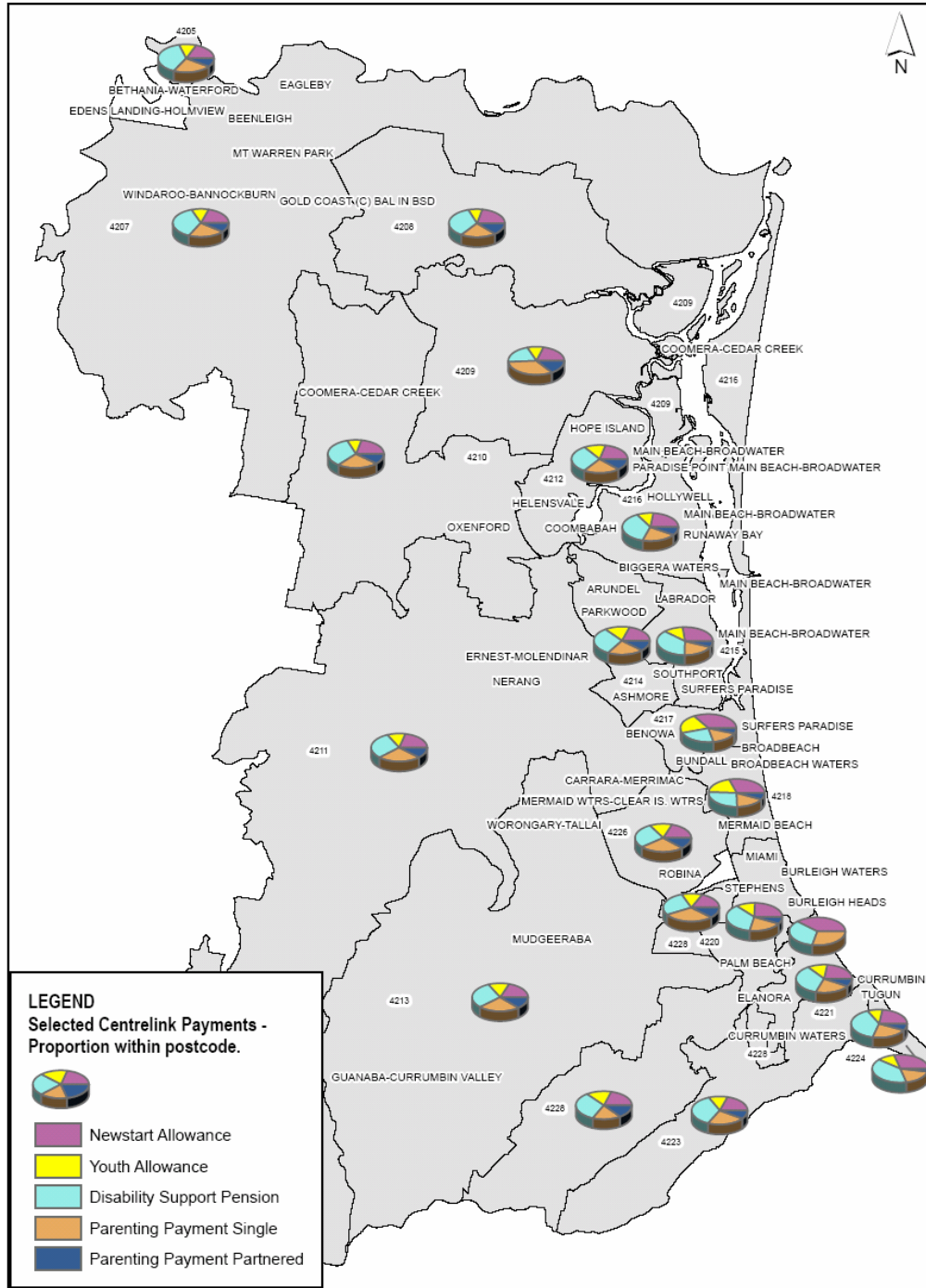
GIS clearly cannot be presented as the great 'cure-all' for overcoming challenges attached to needs analyses and the integrating of services. There is a danger of practitioners feeling pushed by inflated claims about the innovative and practical applications of the system. GIS is simply a tool that could assist services in developing collective pictures of issues and needs. How this information is developed, interpreted and utilized remains dependant on the specific social and political context that GIS is embedded in. It may be that through involvement with the technology many of the barriers to the use of GIS are broken down, as was found in the

Kyem (2000) study examining the acceptance of GIS in a community committee. In the context of a group of service providers engaged in integrated approaches to young people at-risk, the potential of GIS was evident in both engaging participants visually around the spatial patterns evident in their geographical area, and around the specific types of data or issues that participants identified as being of interest in their service context. The types of themes proposed include: the mapping of young people's transience, the mapping of service flows, recreation and leisure maps and the mapping of crime patterns including domestic violence. Overlaying with qualitative data and data at the more micro sense of young people and their relationships, such as in the study by Mason, Cheung and Walker (2004) was also mentioned by participants. Conceptualising how GIS can inform action around social problems, such as homelessness, remains challenging, but there is a geographic perspective to all social issues, and it is only when researchers and practitioners together explore the possibilities of the technology that new possibilities become evident.

In conclusion, GIS is not a great panacea, yet, there are clear potential uses of GIS in human service environments. Working collectively to decipher maps of a broader geographical system than one confronts in the local agency assists practitioners to shift their gaze to the wider planning task. It facilitates more integrated approaches to the assessing of needs within and across regions and the development of shared knowledge bases across sectors. Barriers do exist to the development of shared information systems, such as the requirement for major shifts in data collection activities, the positioning of agencies and individuals in the information and technology hierarchy, trust and the very real structural factors that result in a competitive funding environment. The natural skepticism of stakeholders must also be acknowledged, where top-down approaches that are seen to be peddling new technologies or academic agendas can result in comments of: *"Oh well that's some academic who like maps and mouthing off about how useful it is."* (Interview Participant). Yet, the human service environment is changing and change in practitioner outlooks is inevitable if a more co-ordinated and evidence based approach is to eventuate. The meta-perspective offered by a tool such as GIS can provide local practitioners with visual and spatial points of reference more commonly available to planning hierarchies. Community information systems offer a vision of a planning future in which agencies and community members can engage horizontally and vertically to influence local and regional futures. New technologies such as GIS and the shared information systems they make possible are one key to successfully negotiating the shifts towards integration in the human service field.

Appendix A

Figure 1. Selected Centrelink Payments 2005, Gold Coast Region



Selected Centrelink Payments  
 (Centrelink, 2005)

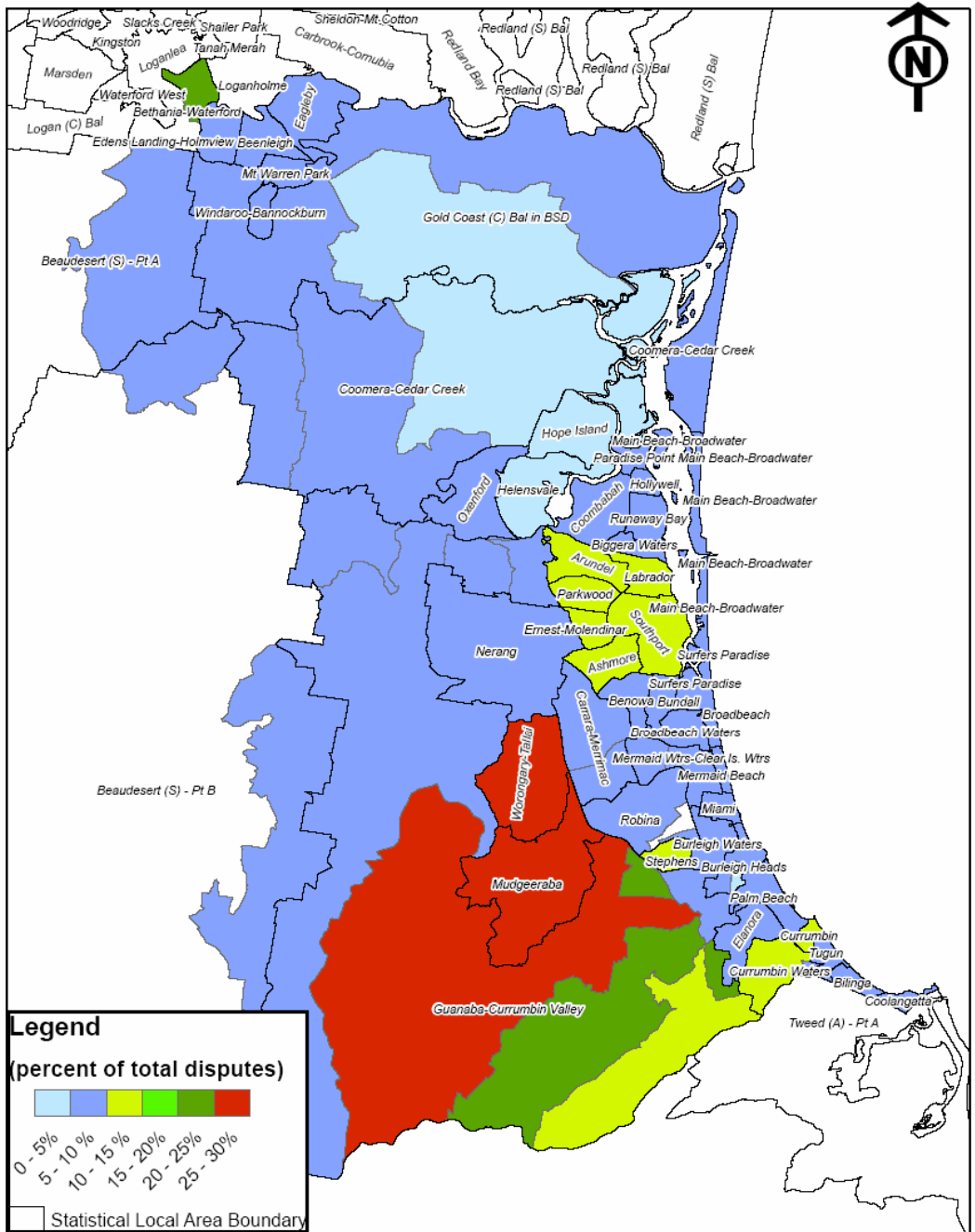
0 1.5 3 6 9 12 Kilometres





### Appendix A Continued

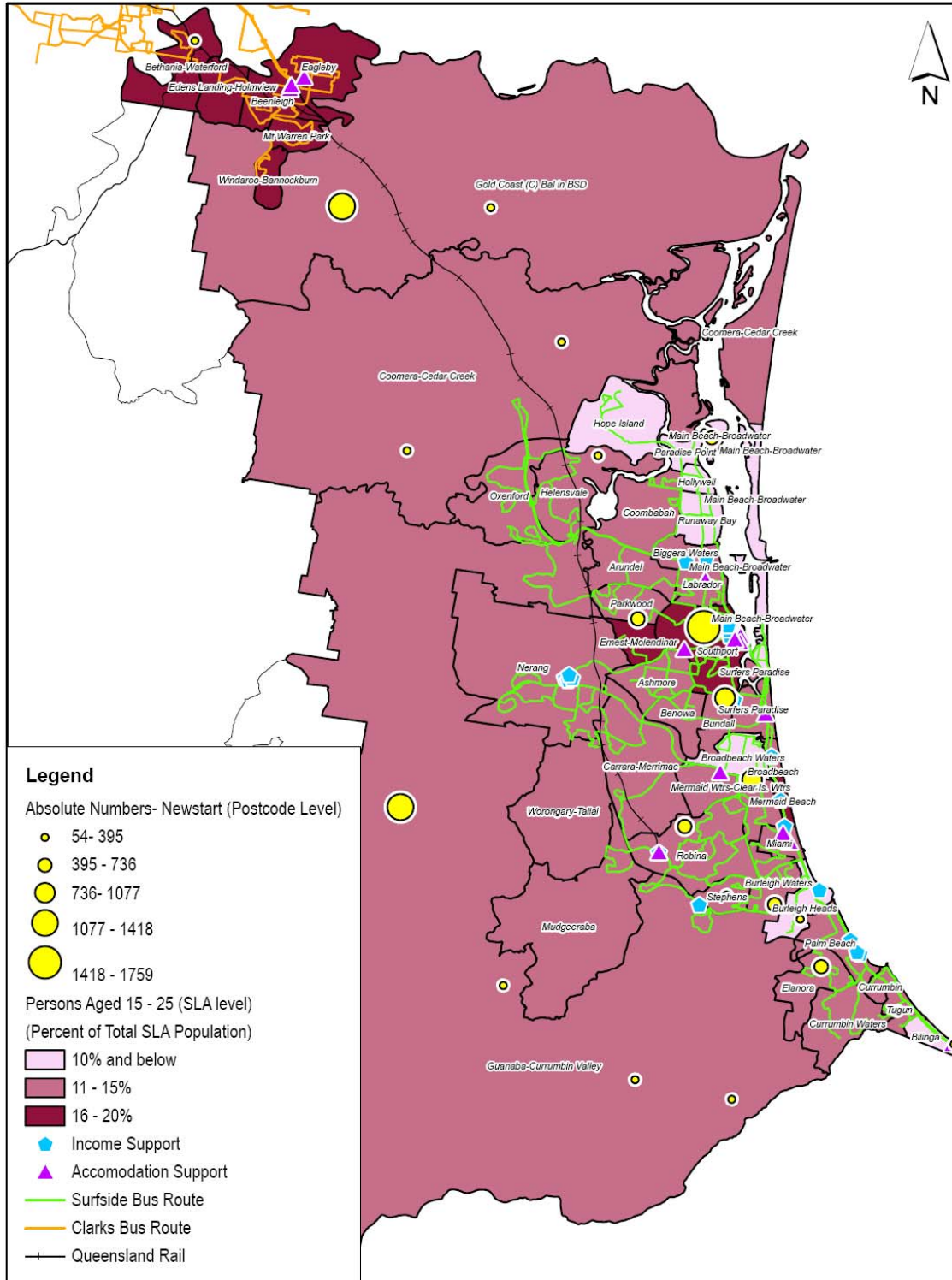
Figure 2. Residential Tenancies Authority - Notice to Leave Dispute Data 2004, Gold Coast Region



## Notice To Leave Dispute Data Gold Coast Region 2004 (RTA, QLD)

Appendix A Continued

Figure 3. Number of Newstart Recipients (Centrelink, 2005) vs Percentage of SLA aged 15-25 (ABS, 2001) Plus Accommodation and Income Support Services and Public Transport Networks, Gold Coast Region

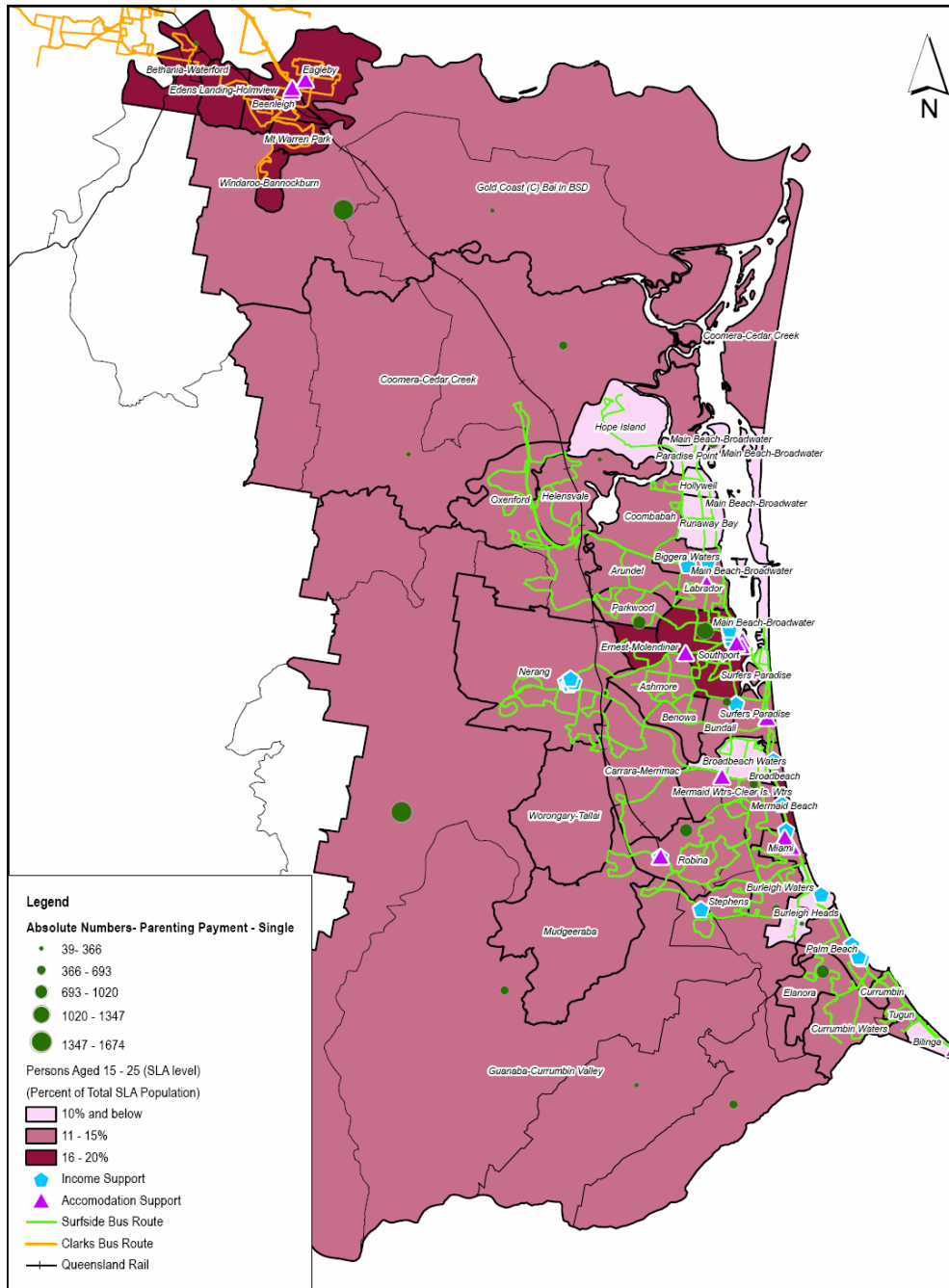


Number of Newstart Recipients (Centrelink, 2005)  
vs Percent of Statistical Local Area (SLA) aged 15-25 (ABS, 2001)  
Plus Accommodation and Income Support Services  
And Public Transport Networks  
Gold Coast Region

0 1.5 3 6 9 12 Kilometres


Appendix A Continued

Figure 4. Number of Parenting Payment - Single Recipients (Centrelink, 2005) vs Percentage of SLA aged 15-25 (ABS, 2001) Plus Accommodation and Income Support Services and Public Transport Networks, Gold Coast Region



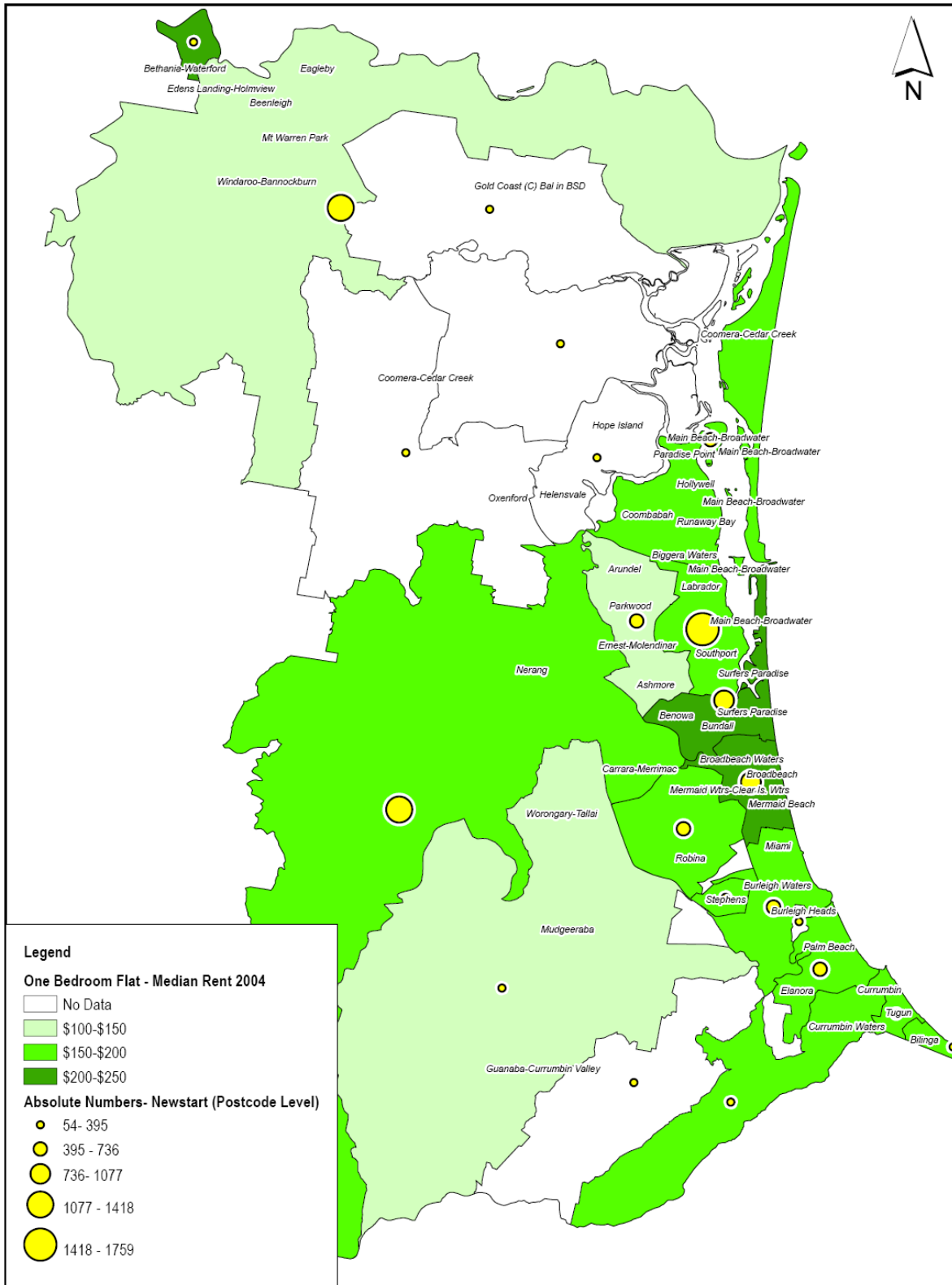
Number of Parenting Payment - Single Recipients (Centrelink, 2005) vs Percent of Statistical Local Area (SLA) aged 15-25 (ABS, 2001) Plus Accommodation and Income Support Services And Public Transport Networks Gold Coast Region

0 1.5 3 6 9 12 Kilometres



Appendix A Continued

Figure 5. Number of Newstart Recipients (Centrelink, 2005) vs Median Weekly Rent – One Bedroom Flats (RTA, 2004), Gold Coast Region



Number of Newstart Allowance Recipients (Centrelink, 2005) vs Median Weekly Rent (RTA, 2004)  
Gold Coast Region  
(One Bedroom Flat)



## References

- Australian Institute of Criminology. (2000). *A Crime Atlas of Australia*. Canberra: AIC.
- Clarke, M., & Stewart, J. (1997). *Handling the wicked issues—a challenge for government*. Birmingham, UK: School of Public Policy: University of Birmingham.
- Curry, M. R. (1995). GIS and the inevitability of ethical inconsistency. In J. Pickles (Ed.), *Ground Truth: Social Implications of Geographic Information Systems* (pp. 68-87). New York: Guilford.
- Elwood, S., & Leitner, H. (2003). GIS and Spatial Knowledge Production for Neighborhood Revitalisation: Negotiating State Priorities and Neighborhood Visions. *Journal of Urban Affairs, 25*(2), 139-157.
- Fine, M., Pancharatnam, K., & Thomson, C. (2005). *Coordinated and Integrated Service Models*. Sydney: Social Policy Research Centre The University of New South Wales.
- Foley, R. (2002). Assessing the applicability of GIS in a health and social care setting: planning services for informal carers in East Sussex, England. *Social Science and Medicine, 55*, 79-96.
- Goldstein, A. O., Peterson, A.B., Ribisl, K.M., Steckler, A., Linnan, L., McGloin, T, Patterson, C. (2003). Passage of 100% tobacco-free school policies in 14 North Carolina school districts. *Journal of School Health, 73*, 293-299.
- Hugo, G. (2001). Addressing Social and Community Planning Issues with Spatial Information. *Australian Geographer, 32*(3), 269-293.
- Kaneko, Y., Takano, T., & Nakamura, K. (2003). Visual localisation of community health needs to rational decision-making in public health services. *Health and Place, 9*, 241-251.
- Kyem, P. A. K. (2000). Embedding GIS applications into resource management and planning activities of local and indigenous communities: A desirable innovation or a destabilizing enterprise. *Journal of Planning Education and Research, 20*, 176-186.
- Kyem, P. A. K. (2004). Of Intractable Conflicts and Participatory GIS Applications: The Search for Consensus amidst Competing Claims and Institutional Demands. *Annals of the Association of American Geographers, 94*(1), 37-57.
- Leitner, H., McMaster, R. B., Elwood, S., McMaster, S., & Sheppard, E. (2002). Community Participation and Geographic Information Systems. In W. J. Craig, T. M. Harris & D. Weiner (Eds.). New York: Taylor & Francis.
- Luke, D. (2005). Getting the big picture in community science: Methods that capture context. *American Journal of Community Psychology, 35*(3/4), 185-200.
- Luke, D., Esmundo, E., & Bloom, Y. (2000). Smoke signs: Patterns of tobacco billboard advertising in a metropolitan region. *Tobacco Control, 9*, 16-23.
- Management Advisory Committee. (2004). *Connecting Government: Whole of Government responses to Australia's priority challenges*. Canberra: Commonwealth of Australia.
- Mason, M. J., Cheung, I., & Walker, L. (2004). The social ecology of urban adolescent substance use: A Case study utilizing geographic information systems. *The Journal of Primary Prevention, 25*(2), 271-282.
- Pickles, J. (Ed.). (1995). *Ground Truth: Social Implications of Geographic Information Systems*. New York: Guilford.
- Quixley, S. (1997). *The Action Research Resource Kit*. Canberra, ACT: Commonwealth Department of Human Services and Health.
- Schroeder, P. (1996). *Criteria for the design of a GIS/2*. Paper presented at the Specialists' meeting for NCGIA Initiative 19: GIS and Society Summer 1996, Maine.
- Schuurman, N. (2003). The ghost in the machine: spatial data, information and knowledge in GIS. *The Canadian Geographer, 47*(1), 1-4.
- Sieber, R. E. (2003). Public participation geographic information systems across borders. *The Canadian Geographer, 47*(1), 50-61.

- Sutherland, R., Kirk, S., & Clark, A. (2003, 6-8 April). *Action Research...What's That?* Paper presented at the 3rd National Homelessness Conference 'Beyond the Divide', Brisbane.
- Szirom, T., Lasater, Z., Hyde, J., & Moore, C. (2002). *Working together: Integrated Governance*. Canberra, ACT: IPAA/Success Works.
- Tsou, M.-H. (2004). Integrating web-based GIS and image processing tools for environmental monitoring and natural resource management. *Journal of Geographical Systems*, 6, 155-174.
- Wieczorek, W. F., & Hanson, C. E. (1997). New modeling methods: Geographic information systems and spatial analysis. *Alcohol Health and Research World*, 21, 331-339.
- Wood, J. (2005). 'How green is my valley?' Desktop geographic information systems as a community-based participatory mapping tool. *Area*, 37(2), 159-170.